

# Community Intervention to Increase Seafood Consumption (CIISC) Project



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CENTRE OF EXCELLENCE  
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Prepared by  
Centre of Excellence Science Seafood & Health (CESSH)  
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# Community Intervention to Increase Seafood Consumption (CIISC) Project

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## List of acronyms and abbreviations



ACCC	Australian Competition and Consumer Commission
AD	Alzheimer's disease
ADHD	Attention Deficit Hyperactivity Disorder
AGHE	Australian Guide to Healthy Eating
AHP	Allied Health Professional
ALA	$\alpha$ -Linolenic acid
AMC	Australian Maritime College
AMD	Age-related macular degeneration
AMDR	Acceptable Macronutrient Distribution Range
BMD	Bone mineral density
BMI	Body Mass Index
CESSH	Centre of Excellence for Science, Seafood & Health
CHD	Coronary heart disease
CHF	Cardiac heart failure
CHO	Carbohydrate
CIISC	Community Intervention to Increase Seafood Consumption
CoM	City of Mandurah
COPD	Congestive Obstructive Pulmonary Disease
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVD	Cardiovascular disease
DHA	Docosahexaenoic acid
EAR	Estimated Average Requirement
EPA	Eicosapentaenoic acid
ESADDI	Estimated Safe and Adequate Daily Dietary Intake
FAO	Food and Agriculture Organisation
FRDC	Fisheries Research and Development Corporation
FSANZ	Food Standards Australia and New Zealand
GI	Glycaemic Index
GP	General Practitioner
JECFA	Joint Expert Committee for Food Additives
LDL	Low-density lipoprotein
MUFA	Monounsaturated fatty acid
NHMRC	National Health and Medical Research Council
NIP	Nutrition information panel
NSAID	Non-steroidal anti-inflammatory drugs
Omega-3s	Omega-3 long chain polyunsaturated fatty acids
Omega-6s	Omega-6 long chain polyunsaturated fatty acids
OR	Odds Ratio
PUFA	Polyunsaturated fatty acid
POS	Point of sale
RA	Rheumatoid arthritis
RBT	Revised Blooms Taxonomy
RDI	Recommended Daily Intake
RR	Risk Ratio
SEA	Seafood Experience Australia
SFN	Standard Fish Name
SMOG	Simple Measure Of Gobbledygook
SSA	Seafood Services Australia
TAFE	Technical And Further Education
TPA	Trade Practices Act
US	United States
WA	Western Australia
WAFIC	Western Australian Fishing Industry Council
WAGP	WA General Practitioner (Network)
WHO	World Health Organisation

# Non-technical summary

## Background



A diet that includes regular servings of seafood offers significant health benefits to individuals of all ages. All seafood including fish contains long-chain omega-3 fatty acids which are vital nutrients required by every cell in the body and are essential to brain growth and visual development. Omega-3s are scientifically credited with, among other things, reducing the risk of heart attack and stroke, helping to manage diabetes, relieving the symptoms of inflammatory conditions such as rheumatoid arthritis and autoimmune disease and protecting against asthma and allergies in young children. There are also strong indications that they can help fend off dementia and depression and assist in the treatment of behavioural problems such as attention deficit hyperactivity disorder (ADHD). Because our bodies cannot make omega-3s, they need to be ingested, and seafood – particularly oily fish – is the best source. In addition to this, seafood is an excellent source of protein, minerals, vitamin D (second only to the sun) and vitamin B12 and is low in saturated fat. It is also a good source of iodine and zinc, both of which are lacking in the Australian diet.

Getting people to eat more seafood is a simple, effective, low-cost way of helping to reduce pressure on a health system under strain from an ageing population and the increasing incidence of lifestyle-related diseases (such as diabetes and heart disease). Given the wide range of conditions that increased omega-3 intake can either help to prevent or better manage, increased seafood consumption offers significant benefits to the community in terms of both reduced health care costs and increased productivity. It also aligns with Australian government health policies to increasingly shift the focus from acute care to preventative care and long-term health maintenance. To date, however, there has been no concerted effort – either by industry or health authorities – to encourage broader seafood consumption or to better educate the community about its scientifically proven health benefits. There are generally quite low levels of understanding within the community about what types of seafood people should be including in their diet, and in what amounts. Community perceptions about the difficulties involved in choosing, storing, preparing and affording seafood have also actively discouraged greater seafood consumption.

## The Community Intervention to Increase Seafood Consumption (CIISC) Project




The aim of the Community Intervention to Increase Seafood Consumption (CIISC) Project, was to translate the most up-to-date evidence around the health benefits of regular seafood consumption into a suite of resources and educational programs specific to the needs of various sectors within the Australian community and to use these resources as part of a whole-of-community intervention to increase seafood consumption.

The CIISC Project – based firmly on scientific evidence and a researched understanding of existing community habits and attitudes around seafood consumption – was aimed not only at improving health outcomes for Australians, but strengthening the viability and profitability of the Australian seafood industry.

The following resources were developed as part of the CIISC Project

- *'Kidzone'* - an interactive online nutritional education resources for primary school children;
- *'Seafood and Health: Teachers Resource for Secondary Schools'* – a comprehensive stand-alone module for use in the Health and Physical Education Year 10-12 Curriculum that covers nutrition and the importance of seafood as part of a healthy balanced diet;
- *'Seafood and Health: A Vocational Training Resource'* - that provides instructors with everything required to administer the course to industry participants across all seafood sectors providing an overview of the relationship between seafood and health;
- Point of sale consumer resources around seafood and health;
- *Industry guidelines for seafood health nutrition messages* (including a guide to food labeling laws/regulations); and
- A series of *'Seafood and health'* booklets to assist General Practitioners (GPs) and other health professionals when recommending healthy diets for patients with conditions that may be prevented, managed or treated through nutritional intervention. A GP user manual was also developed that outlines the evidence on which the resources were developed. Currently the series includes booklets for arthritis, diabetes, coronary heart disease (both male and female), nutrition related cancers and during pregnancy

## Evaluation of the project



To investigate the effectiveness of the resources, the Centre ran a community intervention project in the City of Mandurah in April and May 2011. This sought to determine whether distribution of the information and resources would lead to changed consumption habits. The intervention was preceded by a community survey, conducted to explore awareness, attitudes and consumption habits in the community. Resources were then sent to businesses, medical practices, GPs, schools (primary and secondary) and vocational educational organisations. Point of sale materials were also distributed to major seafood retail outlets. The local council included promotion of the health benefits of seafood in their weekly advertisements in the community newspaper which was supported by several media stories by CESSH staff over the intervention period.

Seafood sales during the intervention period, compared both with adjacent months, and with the same period in the previous year were used to evaluate success.

**The intervention resulted in an increase in seafood consumption (as measured by sales) of 24% over the intervention period and a residual increase of 15% in the month following the intervention.**

These results, when viewed in conjunction with the overwhelmingly positive feedback provided by those using the resources (notably, from a health and nutrition perspective, by GPs) there is a strong case for the continued use and development of this approach to the promotion of seafood as a healthy dietary choice.

# Executive summary

## Introduction



The Community Intervention to Increase Seafood Consumption (CIISC) Project aimed to translate the most up-to-date evidence around the health benefits of regular seafood consumption into a suite of resources and educational programs specific to the needs of various sectors within the community. The resources were then trialed and evaluated in a single community to determine whether seafood consumption in that community is significantly altered through access to the developed resources. The project followed a participatory action research model with each stage of the research informing the subsequent stages, thus ensuring the outcomes were relevant to the end users.


## Literature review



The first stage of this project consisted of a comprehensive review of the most up-to-date evidence around the health benefits of regular seafood consumption. The results of the review formed the basis of the CIISC intervention.

The evidence reviewed showed significant health benefits of the regular consumption of seafood as part of a healthy diet. It would appear from the evidence reviewed that most people would benefit from the ingestion of at least two serves of seafood (particularly those high in omega-3s) each week. There was substantial evidence supporting a diet high in seafood to prevent or manage chronic lifestyle conditions such as arthritis, nutrition-related cancers, cardiovascular diseases, diabetes and obesity. In addition, emerging but significant evidence supports the ingestion of seafood or fish oil in the management of mental health conditions including behaviour management associated with conditions such as attention deficit hyperactivity disorder.

## Industry guidelines for seafood health and nutrition messages



The Industry Guidelines for Seafood Health and Nutrition Messages were developed to assist the seafood industry to recognise and promote health and nutrition messages regarding seafood consumption and health. The Industry Guidelines summarise the relevant regulations, guiding principles and scientific evidence to be considered when using health and nutrition to promote seafood on food labels and in advertising material.

## Resources for general practitioners and allied health professionals



The findings of a scoping exercise indicated the need to develop evidence-based, user-friendly nutritional resources across a number of key health conditions. Based on the strongest evidence and the level of funding available for this project, five 'Seafood and Health' booklets resources were developed. The conditions chosen were: arthritis (particularly rheumatoid arthritis); nutritional-related cancer (particularly prostate and colorectal); diabetes; and heart diseases (particularly coronary heart disease). Given the lack of clear nutritional direction during pregnancy, a nutritional resource was also developed for prenatal, antenatal and postnatal women. Each resource provides basic information about the condition (e.g. arthritis, cancer, coronary heart disease, diabetes and pregnancy) and how a balanced diet high in seafood could provide health benefits. Each booklet also contains a condition-specific 14 day meal planner developed using dietary modelling.

In addition, a user manual was designed to provide general practitioners and other health professionals with more detailed information about the evidence on which the resources were developed and suggestions of how to use the user manual effectively with patients or clients. The manual includes a summary of the evidence supporting nutritional intervention for each condition plus an extended version of the nutritional composition of each of the 14-day meal planners.



## Point of sale consumer messages



A brief observational supermarket audit was conducted to determine what health messages were being displayed near seafood products on supermarket shelves. Results from the supermarket audit and a review of media messages showed that there is an opportunity to promote specific health benefits of seafood consumption to consumers with clear messages, in 'eye-catching' formats.

Based on the findings of the literature review and known barriers and facilitators to seafood consumption, a number of point of sale seafood shelf tags were designed and subsequently evaluated by consumers. A fish-shaped tag was found to be the preferred design, and Smart Choice - Fish Twice a Week was the preferred descriptor to promote seafood. The preferred promotional design and wording are sufficiently generic to be used in any campaign that promotes seafood in general. It would also work as a brand or logo on products to increase recognition, or in individual campaigns across a number of ranges and promotions (e.g. shelf tags, in-store branding, information pamphlets) as a trigger for purchasing and to draw attention to seafood displays.

## Educational communications resources on the health benefits of seafood



Three suites of resources on the health benefits of seafood were developed for primary and secondary schools and vocational training courses.

A dedicated section of the CESSH website was created to house resources for primary school-aged children that are accessible, relevant and specifically tailored for each target group. A child-friendly name (Kidzone) and cartoon-themed brand identity were created, focusing on a cast of six young characters that would be used in various ways across the range of resources. The two resources developed for primary school-aged children were: Seafood the Super Food – an interactive 'body click' resource that shows how each of the major nutritional components of seafood impact on the body's physiology and the health benefits that each can provide; and Amazing Omega-3s – an interactive game that encourages children to 'catch' their required omega-3 intake for a week. Support materials for both resources were also developed.

The Seafood and Health: Teacher Resource for Secondary Students was produced for secondary schools to develop students' understanding of the benefits of seafood for health. The teachers' resource package contains a set of five activities and assignments covering nutrition and the importance of seafood as part of a healthy balanced diet. The assessments include a group activity in spatial mapping, a critical media review, the development of a health survey for fish and seafood consumption in school, and the development of a fact sheet and presentation delivery. Each activity outlines the rationale for the assessment, the course outcomes covered, suggested duration and sequence of the lesson, as well as a guide for any advance preparation needed by the teacher. The resource package also includes assessment sheets, answer sheets and resource lists for ease of use. The resource activities are based on the Curriculum Council Sample Unit Package for easy adoption into the existing education framework for teachers.

A senior educational specialist with expertise in curriculum development and familiarity with the training needs of the seafood industry was employed to develop a vocational training skills package. The training resource pack is entitled Seafood and Health: A Vocational Training Resource and includes: Instructor Resource; PowerPoint; Handout; Quick Seafood Quiz; Quick Seafood Quiz Answer Sheet; Student Task Handout; and Self Assessment Handout/Peer Assessment Handout. The resource was developed to provide instructors with everything required to administer the course to industry participants across all seafood sectors, and to give an overview of the relationship between seafood and health.

## Community survey



The aim of the CIISC community survey was to gain an understanding of the seafood purchasing and consumption behaviours of the target community, the City of Mandurah, a coastal Western Australian town situated approximately 72 kilometres south of Perth. The survey was mailed in February 2011 and 300 completed surveys were returned.

Respondents purchased most of their food from large supermarkets (93%) or independent supermarkets (74.35%). Around half (55%) had purchased seafood in the past month and 93% had eaten seafood during that time. One fifth of respondents (21.7%) would buy more seafood if it was more readily available. Canned fish was the most popular purchase (36.7%) followed by fillets (19.4%). Grilled or pan fried seafood was the preferred preparation mode in the home (39.3%) and 67.3% felt that seafood was easy to prepare. Interestingly, 84% of respondents checked food labels when making purchasing decisions and 54.3% wanted more accurate food labelling to aid their decision making process. Almost half (44%) of respondents wanted more recipes and preparation details at point of sale. Overall the main enablers to increased purchases of seafood were affordability, easy to understand food labels, quick and easy recipes and availability of seafood at local outlets.

## Communication strategies



The CIISC intervention was promoted through a diverse range of strategies. These included: editorials; newspaper advertisements, industry magazines and newsletters; radio interviews; television coverage; online media; articles in Curtin University magazines and newsletters; conference presentations; peer-reviewed journal articles; and research reports. In addition, target-specific resources were developed and disseminated to schools, general practitioners and allied health professionals, and TAFEs.

## Evaluation of the CIISC community intervention



The major outcome of interest used to assess the effectiveness of the CIISC project was the survey of food outlet sales prior to, during and after the implementation of the community intervention. Outlets that sold seafood in the target community were invited to take part in the survey. Respondents were asked to provide information about: the variety of seafood available in their outlet; the main types of seafood purchased for preparation and resale; their knowledge and availability of healthy food choices; and factors influencing the choice of seafood available to their clientele. Pre-intervention surveys were distributed in March 2011 and follow-up surveys were distributed in June/July 2011.

The intervention was conducted during the month of April 2011 and the number of kilograms sold was used as a standardised measure of success. During the CIISC Project, there was an absolute increase of 23.36% in sales over the intervention period (April 2011), and there was a residual increase of 15.29% in the month following the intervention (May 2011).

Another measure of success was the process evaluation of the 'Seafood and Health' booklets for arthritis, nutrition-related cancers, coronary heart disease (males and females), diabetes, and during pregnancy, supplied to general practitioners and allied health professionals. Thirty medical practices and 109 general practitioners agreed to be involved in the process evaluation of the 'Seafood and Health' booklets for GPs/AHPs and the user manual. All general practitioners who reviewed the resources found them very useful as a complement to traditional medical treatment. They were also interested in supporting the development of additional booklets for general good health, specific populations (such as adolescents and seniors) and for a number of medical conditions that they felt would benefit greatly from evidence-based, tailored nutritional education.

## Conclusion



The Community Intervention to Increase Seafood Consumption (CIISC) Project used a whole-of-community approach resulting in an increase in seafood consumption (as measured by sales) of 23.36% over the intervention period and a residual increase of 15.29% in the following month.

The success of the CIISC Project was due, in a large part, to the involvement of a multi-disciplinary team of scientists, researchers, practitioners, key community stakeholders and members of the seafood industry in the extensive planning stage of the project. Their input from the onset of the project ensured that all resources developed were relevant to each of the end-users targeted. This collaborative approach allowed all parties direct input into the project and thus afforded them ownership of the research process. The use of a participatory action research model where each stage informs the subsequent stage was also essential to the success of this project. This model assured currency and relevance of the intervention to the community.

In addition to the outcomes from the CIISC project which have already been achieved, a number of additional outcomes will be achieved by early February 2012 including: 5 additional peer reviewed articles from the CIISC Project (currently in end stage preparation – making 12 in total); and promotion of educational resources through existing networks across Australia to maximise reach. A forum for investigators, researchers and key stakeholders within the City of Mandurah will be held to present the findings of the CIISC project. A half-day forum will be held in Perth with members of the seafood industry to provide an outline of what has been learned from the CIISC Project that may be of benefit to the industry. Other forums can be presented across Australia if additional funding is provided.

The CIISC Project could quite readily be implemented in any city or town across Australia using the methodology, resources and evaluation framework developed. It could be scaled up or down as required with minimal modification depending on the specific target groups involved in the target communities. It would also be suitable for use in urban regional or remote locations. The cost of further implementation would be greatly reduced as the CIISC resources have national relevance and were developed in paper-based and electronic formats. Costs of production could be shared. The educational resources could also be extrapolated to the electronic whiteboard used in schools across Australia with minimal cost making it more accessible to teachers and students. Furthermore, considerable value could be added to any future interventions developing additional resources as requested in the evaluation of CIISC (e.g. additional GP resources); addressing recommendations herein and through the conduct of a more rigorous evaluation of impact on attitudes and behaviours over time.

## Recommendations



### Recommendation 1 – Planning for success

Interventions targeting food security, seafood supply and seafood consumption across a community must adopt a collaborative and multi-faceted approach that targets key stakeholder groups within that community. It is essential to form an Advisory Group representing key stakeholders that could assist to make the project successful. The CIISC Advisory Group was extensive; however, it is important to inform potential members on recruitment of their expected level of commitment and what it would entail.

A research team with expertise across all major areas involved in the project is essential for success. A whole-of-community project requires input from a large number of people with varying levels of expertise, input and commitment to the project. Detailed planning based on the most current available evidence and with input from representatives from all sectors involved in the proposed intervention is the key to success.

### Recommendation 2 – Considerations for interventions aimed at influencing local food supply

Although supermarkets and other food retail stores have state or national management, there is often potential for communities to influence local decisions regarding stock, promotion and pricing policies. This is particularly true when dealing with food stocks from local primary industries such as the seafood industry. Opportunities to improve the promotion of seafood food options at retail outlets in a localised area may involve enlisting the support of a significant number of businesses in the area and auditing these businesses to build a picture of the sales profile of various types of seafood (using one or more indicative types as a measure/s) within that community. In addition to the paper-based food audit, an observation study of the promotion of seafood within a large range of food outlets should be conducted.

### Recommendation 3 – Involving restaurants and take-aways

Fast food and take-away outlets vary enormously in the quality and variety of the seafood served, and improvements in the range and nutritional quality of the seafood supply can have a big impact on the diet of a local community. Many people obtain a regular and significant proportion of their seafood from prepared food outlets, therefore it is important to consider the preparation methods, quality of ingredients, and the variety and relative price of the seafood served. There is often potential to improve the nutritional quality of seafood on these menus, as well as introducing identified healthy choices.

### Recommendation 4 – Involving convenience stores and local shops

Small corner shops, general stores, and convenience stores are commonly used as 'top up' shops to supplement larger shopping trips to a supermarket. However, for many vulnerable people who are unable to access supermarkets on a regular basis, the small local shop can represent the primary seafood retail outlet. Those reliant on local stores include: people without cars; older people and people with a disability who find public transport difficult to negotiate; those living on the urban fringe where public transport is limited and where supermarkets do not exist yet; and people in remote areas with limited retail outlets. The key difficulties faced by those who rely on corner shops or general stores for their primary seafood supply are that the range of seafood available is usually quite limited and the prices are often higher than in most supermarkets.

Small seafood retailers are often unable to modify the range and price of their goods due to: an insufficient volume to achieve wholesale prices; small margins and under-capitalisation in refrigerated storage facilities; customers with little cash; and slow turnover and thus risk of spoilage of perishable goods. Although convenience stores continue to sell basic 'top up' items such as bread and milk, they are also more oriented to the sale of high profit snack foods and drinks. Despite this, there is potential for motivated community organisations and consumer groups to negotiate with these stores to include the type and range of seafood that would benefit those who rely on them as their primary seafood source.

### Recommendation 5 - Opportunities for local government and community involvement

The 1992 Australian Food and Nutrition Policy identified that local government action could significantly impact on the food system and nutrition. Opportunities exist for health professionals to work with local government to promote nutrition and to impact on the food and nutrition system. Responsibilities of local government that impact on the food system include information provision, monitoring and enforcement of food regulations, and community services. Among the key factors that should be considered by local government when aiming to improve seafood availability and accessibility within the community are:

#### *Location of supermarkets*

Supermarkets are a key factor in determining the quality of seafood supply in a community. Mapping the location of supermarkets and influencing decisions around access to healthy seafood across all sectors of the community can significantly improve the food security of whole communities. For example, coordination of public transport routes with locations of healthy seafood outlets can significantly improve the quality of a food supply for those on limited incomes who do not own their own cars.

#### *In-store price, availability and promotion*

While supermarkets usually contain a wide variety of foods, the stock of healthier foods is often minimal, and in-store delis and salad bars often offer a limited range of relatively high fat dishes. Local government entities, researchers and organised consumers working

together can significantly improve the range and quality of fresh seafood stocked in food retail outlets, the price competitiveness of those foods, and the way healthy seafood options are displayed and promoted within stores. In-store promotion can assist consumers to locate the healthy choices, and the use of healthy catering practices for the prepared seafood lines in supermarkets has considerable scope for improving nutrition. These strategies can also be implemented as part of a holistic approach to improving community health through the promotion of seafood as part of a healthy diet.

Activities focussing on seafood promotion may include regular 'specials' offering: healthy food/prepared dishes at a reduced price; product tasting and demonstrations on how to prepare seafood; more efficient displays of fresh seafood; in-store radio promotions and simple shelf-tags identifying cost effective and healthy seafood options.

#### *Local government involvement in improving seafood consumption*

A number of recommendations are made for other councils who may wish to improve the health of their constituents whilst supporting local industries. These include:

- Provision of incentives for businesses to promote local seafood produce — including grants or reductions in business fees for businesses providing reasonably priced healthy food options;
- Provision of leadership in developing mixed-use retail 'clusters' in which small or independent seafood outlets can flourish;
- Streamlined applicable licence and permit processes;
- Provision of technical assistance to entrepreneurs and storeowners who are interested in improving their communities' access to nutritious seafood;
- Improved transportation services to local seafood and fresh food markets;
- Nutrition education classes and activities including education on shopping, storage, freezing and preparation of a variety of cost effective and easy seafood meals;
- Public health campaigns promoting seafood consumption as part of a healthy diet;
- Inclusion of small fresh food markets (including local seafood outlets) as a vital component of neighbourhood revitalisation projects.

## Legacies of the CIISC project



- Effective links between State/Territory Departments of Fisheries, Professional Industry Associations and social scientists/researchers;
- An understanding within the seafood industry of the benefits of working with research-active social scientists;
- Strong professional relationships between the seafood industry and seafood scientists and researchers that support proactive engagement;
- The seafood industry values the contribution of scientists and researchers to the promotion and profitability of the seafood industry;
- Institutionalisation of seafood as a core component of nutritional plans in general practice that complement existing best practice treatments for nutrition-related health conditions;
- Communication of seafood health messages to a range of end users;
- A suite of evidence-based nutritional education resources for specific target groups within the Australian population;
- A comprehensive intervention that can be scaled to fit any sized community within Australia with the potential to improve biomarkers for health through increased seafood consumption at a population level; and
- A significant number of scientists, researchers, educators and industry members with a clear understanding of the processes required to develop, implement and/or evaluate a community-based intervention to increase seafood consumption.

# Section 1

## Introduction to the Community Intervention to Increase Seafood Consumption (CIISC) project

## 1.0 Background



It is estimated that nine in 10 Australians have at least one risk factor for cardiovascular disease (CVD), 3.5 million have a form of cancer, up to two million are living with diabetes and over 60% are considered overweight or obese. Together these conditions account for the majority of the burden of disease in Australia with the highest prevalence being in lower socioeconomic areas (up to 2.3 times higher than that of high income areas) and in indigenous populations. Research has shown that a healthy diet, that includes regular seafood consumption, is one of the major protective factors against these conditions. There is also a growing body of evidence showing that specific types of seafood have a positive effect on conditions such as dementia, allergies, overweight and obesity, asthma, depression and bipolar disorders.<sup>1-5</sup>

Establishing regular fish consumption as a healthy, cost effective option for families has the potential to impact upon their short and long-term health. It may also act to prevent the development of common lifestyles conditions (such as diabetes or coronary heart disease) by establishing seafood consumption habits in the early years of life. There is some published research in this area, and most particularly from an Australian perspective, various Retail Sale and Consumption of Seafood reports funded by the Fisheries Research Development Corporation (FRDC). However there had been little work completed on the development, implementation and evaluation of coordinated and specific educational and training resources across a number of sectors (e.g. school curriculum from primary through to vocational sectors, point of sale resources for consumers, condition-specific resources and information for health professionals) to encourage regular seafood consumption.

## 1.1 Consultation process



An extensive consultation process was conducted throughout the research project. A number of key stakeholders and experts that could potentially add value to the project were recruited at the onset of the project. As required, members were asked to comment on aspects of the project relevant to their areas of expertise and/or experience. Key collaborators on the project were: the Western Australian Fishing Industry Council (WAFIC); Naturalist Marine Discovery Research Centre, Department of Fisheries; Flinders University; University of South Australia; University of the Sunshine Coast; Heart Foundation; Cancer Council; Diabetes Australia; Arthritis Australia; Omega 3 Centre; Western Australian Health Department; Technical and Further Education (TAFE) institutions; Seafood Services Australia (SSA), Seafood Experience Australia (SEA), the WA General Practitioner (WAGP) Network; City of Mandurah; people across all sectors of the seafood industry and those with expertise relevant to the development of education resources. These extensive collaborative links added considerable value to the research outcomes and were fundamental to the success of such a comprehensive project.

## 1.2 Needs assessment



There was a need to overcome the barriers to seafood consumption, particularly those cited in the general seafood consumption<sup>6</sup> and the peri-natal seafood consumption studies conducted in Perth, Western Australia.<sup>7</sup> Establishing regular seafood consumption as a healthy, cost effective dietary option has the potential to impact upon short and long-term health, both in the general population and in those with specific health conditions.

## 1.3 Aim



This study aimed to develop strategies to increase seafood consumption by targeting specific sectors of the population (e.g. school-aged children, families, women of childbearing age), trainees within the seafood industry, and groups with specific health conditions (e.g. those that evidence shows respond to nutrition therapies). The outcome measure of success of the project was an increase in seafood consumption with concomitant increases in value for the seafood industry.

## 1.4 Level of Impact



The condition/sector educational resources were developed in user-friendly formats/programs to meet the needs of specific target groups and to ensure maximum uptake. For example, health condition specific resources are in formats that facilitate discussion between general practitioners and clients to promote consumption of seafood as part of a healthy diet. Resources for schools were developed in line with existing curriculum frameworks across a range of disciplines and piloted through existing and relevant educational programs.

## 1.5 Project objectives



The objectives of the project were:

- To conduct a systematic review and gap analysis to:
  - a. inform the development of industry guidelines around health messages and seafood, and
  - b. identify research gaps and priorities in seafood health benefits research;
- To develop, implement and evaluate a series of targeted seafood health benefits communication resources for educational institutions, health professionals and their clients, seafood consumers and members of the seafood industry;
- To develop and evaluate a seafood health benefits skills set for incorporation into relevant vocational training packages administered through TAFE institutions; and
- To trial and evaluate the seafood health benefits communication resources developed in a single community to determine whether seafood consumption in that community is significantly altered through access to the developed resources.

The project followed a participatory action research model with each stage of the research informing the previous stages, thus ensuring the outcomes were relevant to the end users.

## 1.6 Stages of the Community Intervention to Increase Seafood Consumption (CIISC) Project



The CIISC project included a number of stages that culminated in the community intervention:

- Review of published literature relating to seafood consumption and human health, plus identification of organisations, institutions and spokespersons that currently provide information on seafood and health including their level of credibility (Section 2);
- Development of industry guidelines for seafood health and nutrition messages to summarise the regulations and guidelines to consider when using health and nutrition to promote seafood on food labels and in advertising material (Section 3);
- Critical review of relevant resources available to General Practitioners and Allied Health Professionals relating to seafood and nutrition (Section 4);
- Development of 'Seafood and your Health' booklets for specific health conditions that can be used by health professionals to assist clients within a 5 - 10 minute consultation (Section 4);
- Supermarket and media audit of health messages relating to seafood (Section 5);
- Development of point of sale seafood and health messages (Section 5);
- Development of educational resources for primary, secondary and vocational institutions (Section 6);
- Implementation and analysis of a cross-sectional community-based survey on seafood purchasing and consumption behaviours (Section 7);
- Discussion of communication strategies to promote the community intervention (Section 8);
- Evaluation of the CIISC community intervention (Section 9); and
- Formulation of recommendations based on the outcomes of the CIISC project (Section 10).

# Section 2

## Literature review



## 2.0 Introduction

The first stage of this project consisted of a review of the most up-to-date evidence around the health benefits of regular seafood consumption. The results of the review formed the basis of the CIISC intervention.

## 2.1 Objectives of the review of evidence

The review of published literature pertaining to seafood consumption and human health had the following objectives:

1. Review the latest evidence of health benefits associated with seafood consumption by condition;
2. Identify the work that has been done on how communication of health benefits can and does change consumer behaviour, particularly those in the target groups (young people, older people, pregnant women and health condition specific sectors);
3. Identify the barriers to and drivers for the use of seafood benefits information;
4. Identify current communication material used to disseminate health benefits information to target groups, and consider the strengths and weaknesses of these; and
5. Identify the appropriate delivery frameworks for health benefits information and detail any specific requirements for these.

In addition to the review of published literature, an organisational review was conducted to complete the investigation and identify opportunities for collaboration and co-funding. The objectives of this second phase of the review were to:

1. Identify which organisations, institutions and spokespeople are currently providing information on seafood health benefits and the level of credibility of those organisations and institutions;
2. Undertake an initial assessment of organisations, institutions and spokespeople capacities and relevance to the seafood industry; and
3. Assess the availability of trained people to develop resources and to deliver health benefits information to the target audiences.

Results of the review of published literature are presented in Section 2.3 and the organisational review in Section 2.4.

## 2.2 Methodology

A comprehensive search was conducted utilising the following databases: Archive of Life Sciences; Proquest; PubMed; Science Direct; Taylor and Francis; The Cochrane Collaboration; Web of Knowledge; Web of Science; and Wiley Interscience.

Other sources of information were: national and international seafood-based databases; seafood industry websites or databases; major national and international academic libraries; electronic sources of information (e.g. Google, Google Scholar, international websites); Departments of Health within Australia; and educational institutions.

## 2.3 Literature review results

Key findings from published studies are presented in summary form by health condition.

### 2.3.1 Alzheimer's Disease

*What we know:*

- Research has revealed that a diet high in fish, nuts, salad dressings, poultry, tomatoes, fruit, cruciferous and dark green leafy vegetables is strongly associated with a lower risk of Alzheimer's Disease (AD).<sup>1</sup>
- Reduced risk of dementia is thought to be associated with consumption of the marine sourced omega-3 fatty acids: eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).<sup>8</sup>

- Post-mortem examinations have revealed that the brains of persons with AD contain less DHA in the grey matter of the frontal lobe and hippocampus.<sup>9</sup>
- Large population based studies consistently reveal that omega-3 fatty acids retard cognitive decline over time.<sup>10</sup>
- Dietary omega-3 fatty acids are shown to be beneficial in correcting high levels of omega-6 fatty acids in the brains of normal subjects thereby reducing the potential of damage to the brain.<sup>8</sup>
- Promotion of the evidence in order to induce an increase in consumption of sustainable seafood within a healthy diet has the potential to significantly reduce the human and public health burden of AD for the future.<sup>11</sup>

*What we need to know:*

- The influence of nutrients, foods and dietary behaviors on cognitive decline should be explored to identify preventative strategies that can be implemented to delay onset or slow decline.

### 2.3.2 Asthma and allergies

*What we know:*

- Recent research suggests that eating fish and seafood during pregnancy may protect some children from asthma.<sup>12, 13</sup>
- Fish consumption in the first year of life is associated with a reduced risk of asthma and allergic rhinitis in childhood.<sup>2</sup>
- Epidemiological studies of Australian school children reveal that children who eat fish more than once a week have one third the risk of airway hyper-responsiveness compared with children who do not eat fish regularly.<sup>14, 15</sup>
- Regular consumption of fresh, oily fish is associated with a reduced risk of asthma and airway diseases.<sup>13, 16</sup>
- Fish sticks consumption during pregnancy significantly increased asthma risk in children (odds ratio 2.04). This negative outcome is thought to be associated with the trans fat content of the processed fish sticks.<sup>12</sup>

*What we need to know:*

- Future research is needed to investigate the protective mechanisms associated with eating fish and seafood during pregnancy.
- The protective link between common childhood allergies and seafood consumption (both maternal and child) should be investigated further.
- Further evidence is needed to support the association between eating fish and seafood and reduced prevalence and severity of asthma among asthma sufferers.
- Investigation of the physiological function of the major nutrients found in various types of seafood and identification of those that impact on the risk of asthma is warranted.<sup>17, 18</sup>
- The relationship between the increased risk of asthma and trans fats should be investigated further. Clear delineations need to be made between those seafood products that have positive benefits and any that do not.

### 2.3.3 Cognitive development (including behavioural issues and ADHD)

*What we know:*

- DHA and EPA are essential to foetal and neonatal brain development and maturation. Fatty acids accumulate expressly during periods of rapid brain growth and development occurring between gestation and the first year of life. Foetal accretion of omega-3s is notably high during the last trimester of pregnancy.<sup>19, 20</sup>
- Thirteen per cent of school-aged children in Australia have been diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). Significant co-morbidities include mood and impulsivity disorders, oppositional defiance disorder, obsessive compulsive disorder and depression. 60% of symptoms or difficulties remain throughout life.<sup>21, 22</sup>
- There is limited evidence for seafood, fish oil or supplements in the management of attention disorders such as ADHD. However the evidence that is available is promising.<sup>22-27</sup> A diet high in omega-3s, for instance, has shown marked improvement in behaviours in children with ADHD.<sup>21, 22</sup>
- The onset of 75% of all mental disorders occurs prior to 25 years of age. Fourteen per cent of adolescents in Australia are living with a mental health disorder.<sup>28</sup> Adolescents may have the additional compounding concerns of: poor diet (high in meats, sugars, fats, and salt); adverse socioeconomic conditions; increased screen time; risky health behaviours; alcohol misuse; smoking and risky sexual behaviours.<sup>29</sup>

- Strongest evidence relating to the benefits of a diet high in omega-3s is associated with depression, behavioural problems, mood and impulsivity disorders.<sup>3</sup> Research has shown that low levels of red blood cell DHA have a positive correlation with clinical depression scores in children with juvenile bipolar depression.<sup>4</sup>
- Emerging evidence strongly shows that adequate levels of omega-3s in early development and into adulthood may prevent aggression and hostility.<sup>30</sup>

*What we need to know:*

- Treatment and/or prevention of attention disorders (including ADHD) in children and adults with omega-3s either through fish consumption and/or supplements warrants further attention.
- Nutritional trials with children who have behavioural issues should include a high intake of marine sourced omega-3s.

#### 2.3.4 Cardiovascular disease

*What we know:*

- Fish intake is beneficial to heart health.<sup>31-34</sup> One serve of fish per week reduces the risk of coronary heart disease (CHD) and stroke. Two or more serves of fish each week provide increased protection against all cardiovascular diseases (CVD).<sup>35-37</sup>
- The benefits of eating fish depend on the type of fish meal prepared. Broiled or baked fish are better than fried fish; fried fish is not associated with a lower risk of ischemic heart disease<sup>38</sup>. Differentiation of fish meal types is noted by some researchers. Consumption of non-fried fish containing omega-3s, for instance, is associated with a lower odds ratio of atherosclerosis.<sup>39, 40</sup>
- Regular consumption of omega-3s may decrease cholesterol levels.<sup>41-43</sup>
- Consumption of fish is associated with beneficial structural changes in veins and arteries.<sup>44</sup>
- Regular consumption of fish and omega-3s found in fish and seafood can lower blood pressure levels.<sup>45</sup>
- Consumption of omega-3s is associated with a reduced risk of CVD, cardiac events (heart attack) and mortality.<sup>46-48</sup> For people with pre-existing coronary disease, increasing fish consumption or fish-oil supplementation is associated with reduced coronary mortality.<sup>49</sup>
- Fish consumption is associated with a reduced risk of death from stroke and all-cause ischemic heart disease (blockage of the arteries) in both men and women. Even consumption of fish as little as one to three times per month may reduce the risk of ischemic stroke.<sup>34, 38, 47</sup>
- Fish and/or omega-3s consumption is associated with lower inflammatory markers indicating lower risk of CHD<sup>50</sup>. These benefits are particularly pronounced when consumed in the form of fish rather than in supplement form (0.6g of omega-3 per day).<sup>50</sup>
- Fish and seafood are preferred sources of the marine sourced omega-3s, DHA and EPA, as the body processes them more efficiently (compared with supplements and planty-based omega-3s).<sup>51</sup>
- Although evidence clearly shows that fish intake provides greater benefits than supplements such as fish oil, supplements may be beneficial to those who cannot or do not eat seafood.<sup>52</sup>
- Fish oil supplements and EPA/DHA enriched concentrates need to ensure accurate content claims, oxidative stability, negligible levels of environmental contaminants, the appropriate accompanying presence of physiological anti-oxidants, plus other factors.<sup>52</sup>
- Despite knowledge of the benefits of fish oil and favourable attitudes toward nutritional therapy, family physicians infrequently recommend fish oils to CVD patients.<sup>53</sup>

*What we need to know:*

- Regular fish intake is protective against all CVD and is also beneficial to those with pre-existing CVD. Guidelines that outline what a healthy diet, protective against CVD at a population level looks like are urgently required.
- Population-based dietary guidelines for those who are at higher risk of developing CVD and other lifestyle conditions such as diabetes, hypertension and arthritis are also required.
- Evidence is mounting regarding problems associated with the composition and variability of over-the-counter omega-3 supplements. Further research is needed to assess the health impact of commonly available supplements in relation to: accuracy of health claims; variability of fillers used; possible contaminants; stability over time; properties of common components; shelf life and interactions with various medications and herbal preparations.

### 2.3.5 Cancer

#### *What we know:*

- High fish intake has been associated with significantly reduced risk of ovarian and colorectal cancer.<sup>54,55</sup>
- High level evidence supports fish consumption as protective in reducing the risk of prostate and lung cancers in males.<sup>56-60</sup>
- Epidemiological studies assessing the benefits of fish and seafood consumption associated with the risk of lung, prostate, breast, colorectal, ovarian, pancreatic, skin (basal cell carcinoma), stomach and esophageal cancer, and non-Hodgkin lymphoma show promising results.<sup>23, 58, 61-65</sup>

#### *What we need to know:*

- More evidence is needed to link the health benefits of fish and marine omega-3s to particular types of cancer.<sup>58</sup>
- More research is needed around the mechanisms by which fish consumption appears to protect against lung cancer.<sup>60</sup>
- Animal experiments have shown marine sourced omega-3s (EPA and DHA) slow the growth rate of breast and prostate cancer cells in vitro. However, the impact of a high intake of EPA and/or DHA on the risk of these cancers or other hormone-dependent cancers in humans is unclear and needs further investigation.<sup>58</sup>
- Guidelines for diets protective against various types of cancer are required.

### 2.3.6 Cystic fibrosis

#### *What we know:*

- Regular intake of omega-3s may provide some benefits for people with cystic fibrosis with relatively few adverse effects.<sup>66</sup>

#### *What we need to know:*

- More research is needed to determine whether or not there is a significant therapeutic effect of omega-3s to further assess the influence of disease severity, dosage and duration of treatment.
- Results are required to support treatment decisions for people with or affected by cystic fibrosis.

### 2.3.7 Diabetes

#### *What we know:*

- Regular fish consumption should be considered as part of a healthy diet for diabetic management.<sup>67,68</sup>
- Physical activity, a Body Mass Index (BMI) lower than 25, and a Mediterranean diet characterised by high levels of fruit, vegetables, carbohydrates that are low Glycaemic Index (GI) or high fibre, and 30-35% total fat (high in monounsaturated fatty acids and omega-3s and low in saturated fat) appear to be preventative for type 2 diabetes.<sup>69,70</sup>
- Regular fish consumption is strongly associated with positive management of triglyceride levels in individuals with diabetes and helps the kidneys to function more efficiently in patients with type 1 diabetes.<sup>67</sup>
- A higher intake of oily fish also has a positive effect on triglyceride levels in type 2 diabetes, although researchers note an accompanying slight but significant increase in low-density lipoprotein (LDL) cholesterol.<sup>71</sup>
- A significant reduction in type 2 diabetes has been associated with high fish and seafood consumption. A lower risk of albuminuria, an indicator of damage to the kidneys, has been identified with higher levels of fish consumption.<sup>72</sup>
- In healthy subjects, moderate levels of fish oil supplementation do not modulate insulin sensitivity or secretion. Fish oil has been found to impair glucose tolerance in individuals with high phospholipid omega-6:omega-3 ratios. Fish oil supplementation for these individuals should either be avoided or accompanied by decreased omega-6 dietary intake.<sup>73</sup>

#### *What we need to know:*

- Mixed results of previous research raise the need for further investigations on the link between fish consumption, omega-3 intake and risk of diabetes.<sup>74</sup> The background diet of subjects needs to be closely considered.
- Evidence is needed on the levels of regular fish (seafood) consumption that provides the best protection against developing or managing the various forms of diabetes, across the lifespan.
- Further evidence around the positive impact of regular fish consumption on the management of diabetes is needed.

## 2.3.8 Gender-specific conditions

### 2.3.8.1 Men

- CHD is the most common underlying cause of death for Australian men, accounting for 18.5% of male deaths.<sup>75</sup>
- An inverse relationship exists between fish consumption and death from CHD in men. Men who consume 35g or more of fish daily are identified as having a relative risk of death from CHD and myocardial infarction of 0.62 and 0.56 respectively.<sup>76</sup>
- Fish consumption in men is also strongly linked to the risk of incident cardiac heart failure (CHF). Consumption of broiled or baked fish one or two times a week is associated with greatly reduced risk factors: 20% lower risk of CHF, 36% of coronary death and 17% in total mortality.<sup>31</sup>
- There is some research indicating omega-3s may have a role in the conversion of androgen precursors in males to active metabolites, thus producing a protective effect against prostate cancer.<sup>77</sup>
- Strong evidence exists for a reduced risk of prostate cancer and lower lung cancer mortality in men who consume a high seafood diet (independent of cigarettes, animal fat minus fish fat, and vegetable and fruit consumption).<sup>78</sup>
- Increased consumption of seafood has been shown to confer protection against the development of esophageal cancer in males aged 45 years and older in large population-based studies.<sup>79,80</sup>
- Dietary intake of omega-3s is a factor in the production and function of normal spermatozoa.<sup>81</sup> Positive associations have been identified between high DHA concentrations in ejaculate and spermatozoa motility.<sup>82,83</sup>
- Men are less likely to consume seafood as a main protein source.<sup>84</sup> The influence of males on eating habits within the family unit should be considered in any intervention to increase regular seafood consumption.<sup>85</sup>
- In Australia, around 70% of men aged 35-44 years are overweight or obese.<sup>86</sup> Several studies have identified that overweight men tend to underestimate their weight and are less likely to attempt weight loss.<sup>87-89</sup>
- Fish and seafood form a valuable part of a healthy diet and present a low fat, high quality protein source also contributing omega-3s, iodine and selenium. Weight reduction among overweight younger men has been associated with the inclusion of fish as part of an energy-restricted diet.<sup>5</sup>

### 2.3.8.2 Women

- Cross-national studies support recommendations that women of childbearing age should ingest at least 200mg of DHA per day.<sup>90</sup>
- Pregnant and lactating women have greater nutritional requirements and as such may be at greater risk of nutrient deficiencies which may consequently increase their risk of depression.<sup>3</sup>
- At least 340g of seafood should be ingested weekly during pregnancy for beneficial effects on child development.<sup>91</sup>
- Depression is consistently responsible for the greatest burden of disease in women across low-, middle- and high-income countries.<sup>92</sup>
- Frequent fish consumption has been associated with a decreased risk of depression.<sup>29</sup> It is estimated that the global disease burden of postpartum depression potentially attributable to low levels of omega-3s is 65.5%.<sup>93</sup>
- Adequate DHA concentration in breast milk has a strong negative correlation with postpartum depression rates.<sup>94</sup>
- High intake of sea fish is independently associated with greater bone mass and lower osteoporosis risk in women, especially those consuming more than 250g per week of seafood.<sup>95,96</sup>
- Post-menopausal women who consumed fish experienced a significantly reduced risk of breast cancer when compared with red meat consumers, indicating reduced risk in older women who prefer fish as a primary protein source to the exclusion of red meat.<sup>97</sup>

*What we need to know:*

- We need to know the real risk of potential exposure to pollutants such as methylmercury through fish and seafood. More research is needed to determine safe levels of exposure and the source/s of exposure e.g. local fish/seafood, imported fish/seafood.<sup>98</sup>
- Further investigation into exposure levels of imported seafood and regulatory food standards relating to exposure of seafood to pollutants is required.
- Gender differences in the metabolism and physiological effect of seafood and associated nutrients need to be further explored. Of particular interest are gender-specific health conditions.

### 2.3.9 Healthy ageing

*What we know:*

- Seniors can gain significant health benefits from the consumption of 3.5g-4.0g of omega-3s each week.<sup>99, 100</sup> Oily fish such as sardines, salmon and farmed rainbow trout provide enough omega-3s in one 150g serve to meet the recommended weekly intake.
- As CVD is the leading cause of death in Australia, seafood intake can play a vital role in preserving life. One to two serves of oily fish per week provides significant protection against health conditions such as CVD, particularly ischemic stroke,<sup>101, 102</sup> arthritis and some cancers, with the strongest evidence for older women.<sup>103, 104</sup>
- Recent research suggests that marine sourced omega-3s may prevent or delay age-related hearing loss (presbycusis). Consumption of at least two servings of fish per week significantly reduced the risk of hearing loss.<sup>105, 106</sup>
- Regular fish and seafood consumption may reduce the likelihood of age-related macular degeneration (AMD) with the odds of AMD 51% lower in the highest quartile of fish intake compared to the lowest quartile. Many studies support significant protective effects of a diet high in seafood.<sup>107-109</sup>
- There is evidence that dietary DHA may reduce the progression of periodontal disease in older people.<sup>110</sup>
- Intake of omega-3 rich seafood is linked to increased dispositional optimism in the elderly, and has, in some long term studies, been linked to reduced depression.<sup>111-113</sup>
- DHA is a catalyst for the slowing of early stage progression of dementia.<sup>114, 115</sup>
- Seafood is a rich source of both calcium and vitamin D, important bone-building micronutrients.
- A diet high in oily fish may aid in the prevention of vitamin D deficiency, and as such, vitamin D rich seafood can play an important role in the maintenance of bone mineral density as people age. Reduced sun exposure, an increased requirement of vitamin D, and a reduced capacity to synthesize provitamin D3 in skin and to hydroxylate vitamin D3 in kidneys in older people<sup>96, 116</sup> underpins the need for high-quality, bioavailable vitamin D. Seafood is the best dietary source of vitamin D, and is second only to the sun.
- Commonly consumed, affordable sources of seafood such as Australian salmon and silver perch contain more than double the recommended daily intake of vitamin D in a 150g serve.<sup>117, 118</sup>
- Loss of calcium through urinary excretion is of concern for bone health in seniors. Evidence is emerging showing lower fracture rates and higher bone mineral density (BMD) with the consumption of adequate levels of calcium rich, high protein seafood. This may be due to increased intestinal absorption, which negates the impact of urinary excretion. When calcium and vitamin D intake is adequate, dietary protein at moderate levels is beneficial to total body BMD particularly for seniors. Seafood is a good source of calcium, vitamin D and protein, therefore can favourably contribute to BMD.<sup>119-122</sup>

*What we need to know:*

- Further promotion of a diet high in seafood for healthy ageing should be a priority.
- Development of low cost, nutrition-rich seafood meals should also be a priority given the significant increase in the aged population worldwide.

### 2.3.10 Inflammatory conditions

*What we know:*

- Evidence shows that fish intake is beneficial in the management of inflammatory diseases.<sup>123, 124</sup>
- Dietary intake of omega-3 fatty acids is associated with lower levels of inflammation.<sup>125</sup>
- Moderate to high intake of fish appears to be protective against rheumatoid arthritis (RA). An increase of 30g oily fish (8g fat/100g fish) consumption per day has been associated with a 49% risk reduction of RA.<sup>126</sup>

- Dietary fish oil supplementation has demonstrable benefits for RA and other inflammatory conditions (e.g. bowel disease and immunoglobulin A nephropathy) and may also reduce pharmacological dosages required to treat RA.<sup>127</sup>
- Ingestion of omega-3 fatty acid supplements has consistently shown improvement in joint tenderness and the amount of morning stiffness in those with RA.<sup>123, 127</sup>
- Fish oil is currently used as an adjuvant to approved medications for arthritis and studies support its efficacy in conjunction with non-steroidal anti-inflammatory drugs (NSAID). While consumption of fish and fish oil does not prove efficacious in all cases, some individuals have been able to discontinue or reduce NSAID therapy while continuing fish oil ingestion.<sup>127-129</sup>

*What we need to know:*

- Further research is needed to confirm that fish intake is beneficial to the prevention and management of inflammatory diseases.
- Improving consumer understanding of the ratio of omega-3 and omega-6 fatty acids is important and its absence from the materials reviewed should be addressed in future health promotional materials.
- The continued, unqualified promotion of ALA sources as efficacious sources needs to be addressed, and further study of this issue would be beneficial as this misconception may lead RA sufferers to dismiss the therapeutic effects of omega-3 fatty acids after doses of ALA fail to result in positive outcomes.
- Confusion between cod liver oil and fish oil, and consumer concerns about vitamin A toxicity (cod liver oil is a rich source of vitamin A) need to be clarified.

### 2.3.11 Maternal health

*What we know:*

- Maternal nutrition is important to foetal brain development.<sup>130</sup>
- Seafood is an excellent source of omega-3 fatty acids, which are essential for optimum foetal neural development.<sup>91</sup>
- High levels of fish intake during pregnancy have been associated with longer gestation, increased birth weight and lower hypertension during pregnancy.<sup>131-135</sup>
- Fish and seafood are potential sources of exposure to pollutants such as methylmercury that may adversely affect pregnancy outcomes. Thus, advising pregnant women about fish consumption requires consideration of potential risks as well as benefits.<sup>131,136</sup> Not enough women of childbearing age are consuming adequate fish for health benefits.<sup>137</sup>
- The beneficial effects on child development of maternal seafood intake of more than 340g per week were found in a United States study. This suggests that advice to limit seafood consumption could actually be detrimental. These results show that risks from the loss of nutrients were greater than the risks of harm from exposure to trace contaminants in 340g seafood eaten weekly.<sup>91, 138</sup>
- Higher maternal fish consumption has been linked to higher child developmental scores at 18 months, and improved performance on language and visual motor skills.<sup>134, 135</sup>

*What we need to know:*

- We need to understand the real risk of potential exposure to pollutants such as methylmercury through fish and seafood. More research is needed to determine safe levels of exposure and the source/s of exposure (e.g. local fish/seafood, imported fish/seafood).<sup>98</sup>
- Further investigation into exposure levels of imported seafood and regulatory food standards relating to exposure of seafood to pollutants is required.

### 2.3.12 Mental health

*What we know:*

- Fish consumption is significantly associated with higher self-reported mental health status.<sup>139, 140</sup>
- A mean daily intake of 10g of seafood is linked to lower prevalence of poor cognitive performance.<sup>141</sup>
- There are significant negative correlations between worldwide fish consumption and rates of depression (including post-partum), bipolar disorder and suicidal ideation.<sup>139, 142-144</sup>
- Fish intake has been shown to have a negative association with depressed mood, risk of recurrent depressive episodes and depressive symptoms.<sup>145-147</sup>

- A growing body of evidence suggests a protective effect of omega-3 fatty acids against dementia.<sup>148, 149</sup> Intake of at least one fish serve per week reduces the risk of Alzheimer's Disease.<sup>150-152</sup>

*What we need to know:*

- Further research is needed to establish a significant association between fish consumption and its effect on mental health and cognitive impairment.
- Further research is needed to establish a strong positive association between fish and seafood consumption and mood disorders.
- Research into the protective properties of seafood consumption in childhood and adolescence on prevention, behaviour management, delay to onset and reductions in severity of mental health conditions is required.<sup>29, 30</sup>
- Research that provides estimates of omega-3s required to offer protection against cognitive decline and delay of onset of Alzheimer's and/or dementia are required. Recommendations to slow cognitive decline are also required.<sup>152-167</sup>
- Evidence of a therapeutic effect on general mental wellbeing would contribute to a population level campaign promoting the benefits of fish and seafood consumption.

### 2.3.13 What are the health risks associated with eating fish and seafood?

*What we know:*

- A balance of risk-benefit in relation to the consumption of fish and seafood is recommended in the literature, as well as taking into consideration meal size and frequency of consumption.<sup>168</sup>
- Guidelines are available to assist people to make informed choices about the types and amount of seafood they ingest based on higher omega-3 content and low mercury concentrations.<sup>98</sup>
- Levels of dioxins and other pollutants in fish are low, and potential carcinogenic and other effects are outweighed by potential benefits of fish intake and should have little impact on choices or consumption of seafood.<sup>169</sup>
- Fish low in mercury and high in omega-3s are recommended.<sup>170</sup> Light tuna has relatively low levels of mercury, and other fish, such as wild and farmed salmon and shrimp, contain very low levels of mercury.
- Fish containing the highest amounts of omega-3s in the United States (US) are farmed trout, farmed Atlantic salmon, Coho salmon, toothfish, Copper River salmon and sockeye salmon.<sup>171</sup>
- Women of childbearing age should consult regional advisories for locally caught freshwater fish. The benefits of modest fish intake, excepting a few selected species, also outweigh risks.<sup>169</sup>
- Women who are pregnant, may become pregnant or are breastfeeding, as well as very young infants should avoid fish with higher mercury content. Consumption of fish and seafood should not, however, be avoided altogether as it is the predominant source of omega-3s, which are essential for optimum foetal neural development.<sup>91</sup>
- Advances have made biomonitoring a cost-effective public health tool for helping federal, state and local health agencies develop optimal dietary guidance.<sup>172</sup>

*What we need to know:*

- There is very little information available about actual dangers of mercury levels in seafood from Australian waters.
- More research is required on the nutritional security of fish and seafood in Australian waters. This should include guidelines for consumption of seafood.
- Evidence based guidelines on the amount of fish that Australian pregnant women and infants can safely eat are required.

### 2.3.14 Consumer attitudes towards fish and seafood consumption

*What we know:*

- Perceived cost, freshness, quality, availability, ease of use, and confidence in preparation were considered to be the main influences in consumer choice of fish and seafood products. Quality is perceived by appearance and odour.<sup>85, 173</sup>
- Taste is identified as the most important driver for eating fish, followed closely by perceived health benefits.<sup>174, 175</sup> Bones and price influenced purchase type but not intention to purchase.<sup>174</sup>
- Eating fish in compliance with health recommendations is higher among women and increases with increasing age. The presence of children in the household is associated with lower fish consumption.<sup>174</sup>



- The influence of family members (particularly husbands or partners) impacts upon the likelihood of the serving fish and seafood, and the types of products served.<sup>175, 176</sup>
- Lower income is positively associated with lower fish consumption. Higher education is linked with a higher intention to eat fish but has no effect on how often fish is actually eaten.<sup>174</sup>
- Odours common to fish and seafood are often a deterrent to consumption. These are often related to bacteria.<sup>177</sup>
- Fresh fish and seafood are preferred to alternative products including processed, smoked, canned and frozen products.<sup>173</sup> Packaged fresh fish is often perceived by heavy fish purchasers as inferior to fresh fish and by infrequent fish purchasers as having all the issues associated with fresh fish.<sup>178</sup>
- Plain fresh frozen fillets are sometimes rejected as they are perceived as grey, lifeless, anonymous and basic. They are associated with factories and processing.<sup>178</sup>
- Fish is often perceived to be tasteless and preparation of sauces imposes extra cost. Consumers often fry fish in batter or butter which reduces the healthful effects on disease and conflicts with the health guidelines.<sup>178</sup>
- The highly processed product varieties (battered and crumbed fish, and fish in sauce dishes) are often popular among families and perceived as easy and convenient to cook. However, they are perceived to be made from poor quality fish, less healthy due to the cooking techniques associated with them (e.g. deep frying), and lacking in variety.<sup>178</sup>
- Strategies directed at parents and children should include experimental 'hands-on' components to encourage experimentation, particularly focussing on ease of preparation and the variety of lower cost seafood available.<sup>176</sup>

*What we need to know:*

- The influence of the male within the family unit on attitudes towards seafood consumption should be researched further.
- Interventions seeking to promote seafood (particularly fish) as an integral part of a healthy diet should be investigated further and should address existing negative attitudes and beliefs around cost, storage and preparation of seafood.

### 2.3.15 Marketing and advertising

*What we know:*

- Modern marketing techniques, in particular advertising, have a strong influence on food choice.<sup>177</sup>
- Many consumers obtain health information regarding seafood from the media.<sup>175</sup>
- A health benefit message may increase consumers intention to eat fish by a greater amount than a health risk message may lower their intention.<sup>179</sup>
- More consumers recall hearing positive messages regarding fish consumption than negative messages.<sup>175</sup>
- Food advertising to children predominantly features Snack foods/fast foods and confectionery. Advertising campaigns often use themes that promote grazing, denigrate core foods and include exaggerated health claims.<sup>180</sup>
- Changing the food advertising environment within children's television viewing time to an environment where nutritious foods are promoted and less healthful foods unrepresented would lead to the normalisation and reinforcement of healthy eating.<sup>181</sup>

*What we need to know:*

- More research is required to inform a comprehensive social marketing campaign to promote the regular inclusion of fish and or seafood in the diet of Australian families.

### 2.3.16 Health literacy

*What we know:*

- Almost half of Australians do not have adequate health literacy to understand health information and instructions.<sup>182</sup>
- Internationally, health literacy levels are similar to those in Australia. In the US, 28.7% of parents have been identified as having basic or below basic health literacy,<sup>183</sup> while 30% of Taiwanese adults have marginal or inadequate health literacy despite over 20% of the population possessing tertiary qualifications.<sup>184</sup>

*What we need to know:*

- The challenge for public health professionals transpires in communicating complicated and evolving scientific knowledge with simple and straightforward messages that have widespread availability.

## 2.4 Seafood health benefits communication strategic review

### 2.4.1 Capacity needs

Having completed an extensive review of the literature including the latest scientific evidence of health benefits associated with seafood consumption and consumer motivations, a review of corporate and organisational resources and capacity was conducted. The objectives of this second phase of the review were to:

1. Identify which organisations, institutions and spokespeople are currently providing information on seafood health benefits and the level of credibility of those organisations and institutions;
2. Undertake an initial assessment of organisations, institutions and spokespeople capacities and relevance to the seafood industry; and
3. Assess the availability of trained people to develop resources and to deliver health benefits information to the target audiences.

The strategic review generated large amounts of information. Tables 4.1 to 4.9 in Section 4 - Appendices provide information sourced sorted by health condition. Table 4.10 provides a comprehensive list of websites associated with all resources reviewed.

### 2.4.2 Summary of information provided

- Many relevant organisations reviewed did not provide any advice on the health benefits of seafood; furthermore, little information was available from most health and food agencies.
- When information was provided, messages were generally similar. The most common messages referred to omega-3s and health benefits (high in protein, vitamins and minerals) and usually recommended two serves of fish per week. Some messages related fish to: slimming; specific health benefits of vitamins and minerals (e.g. iodine); and the omega-3 levels in different fish types. The balance between risks and benefits associated with mercury levels in fish was reported.
- A particular source of information was usually discussed; however, the actual reference details were rarely given. While reliable resource references were not numerous, the most common Australian references were:
  - a. What's so Healthy About Seafood: A Guide for Seafood Marketeers published by the Fisheries Research and Development Corporation (FRDC);<sup>185</sup>
  - b. The Australian Dietary Guidelines;<sup>186, 187</sup>
  - c. The National Health and Medical Research Council (NHMRC); and
  - d. Food Standards Australia and New Zealand (FSANZ).
- It appeared very little information on the health benefits of seafood was included in training packages/curriculum at a primary, secondary and technical level. However, it is noteworthy that there is considerable scope to include such information in already developed competencies and curricula. The research does indicate that a single reference point for seafood health benefits (updated frequently) may be advantageous.
- Few simple pamphlets or educational materials were available for point of sale (except FRDC's What's so Healthy About Seafood).
- Cooking demonstrations (live and telecast) and formal cooking classes are extremely popular in Australia. However, little research has been conducted assessing the effectiveness of these modes of communication on short or long-term changes to healthy eating.

## 2.5 Summary



This systematic review of published literature has sought to provide an overview of the best available evidence around seafood consumption and human health. It is expected there will be a number of reports and publications that have not been included as they are either not substantiated by evidence or have not included references to support the comments therein.

The evidence presented clearly shows significant health benefits of the regular consumption of seafood as part of a healthy diet. There is also substantial evidence supporting a diet high in seafood to prevent or manage chronic lifestyle conditions such as arthritis, nutrition-related cancers, cardiovascular diseases, diabetes and obesity. Emerging but significant evidence supports the ingestion of seafood or fish oil in the management of mental health conditions including behaviour management associated with conditions such as ADHD.

It would appear from the evidence available that most people would benefit from the ingestion of at least two serves of seafood (particularly those high in omega-3s) each week. There is also good evidence indicating a positive association with increased seafood consumption in the prevention and management of chronic health conditions in both men and women.

# Section 3

Industry guidelines  
for seafood health and  
nutrition messages

## 3.0 Introduction

The *Industry Guidelines for Seafood Health and Nutrition Messages* were developed to assist the seafood industry to recognise and promote health and nutrition messages regarding seafood consumption and health. The Industry Guidelines are intended to summarise the relevant regulations, guiding principles and scientific evidence to be considered when using health and nutrition to promote seafood on food labels and in advertising material.

## 3.1 How to use this guide

This guide is written to assist the seafood industry to recognise and promote health and nutrition messages regarding seafood consumption and health. The guide summarises relevant regulations, legislation and guidelines governing the use of health and nutrition messages to promote seafood on food labels and in advertising material. Although this guide provides the main points that should be considered when promoting the health benefits of seafood, it is recommended that the original documents are referred to when planning any labelling or advertising materials. A list of relevant websites and references are provided at the end of the guide. The guide also summarises scientific evidence regarding the health benefits of seafood consumption.

## 3.2 Food labels

### 3.2.1 Food labelling and relevant legislation

What can and can't be said on food labels and advertising is covered primarily by the Australia and New Zealand Food Standards Code developed by Food Standards Australia & New Zealand (FSANZ). The Code sets out the requirements for food and beverage labels in Australia and applies to all food sold and prepared for sale in Australia, as well as food imported into Australia. Enforcement and interpretation of the Code is the responsibility of Australian State/Territory Health Departments. Food labelling compliance may also be monitored by the Australian Competition and Consumer Commission (ACCC), State/Territory Department of Health Food and Safety units and Local Government food inspectors and Environmental Health Officers.

While FSANZ offers assistance in navigating the Code, they do not provide approval of labels or food compliance of any type. FSANZ can only provide information about the Code and does not provide legal advice or interpretation of the Code. User guides are available; however, these have no legal power. The Code of Practice on Nutrient Claims in Food Labels and in Advertisements, developed by FSANZ, may also be a relevant useful document but is not legally enforceable. States and Territories do not have to accept every part of the Code, and each State and Territory is responsible for ensuring compliance with the Code and State legislation (e.g. Western Australia: Food Act 2008, South Australia: Food Act 2001).

As well as the Food Standards Code and the relevant State or Territory legislation, Part V of the Trade Practices Act (TPA) (Consumer Protection) covers misleading or deceptive conduct and false or misleading representations and should be considered when planning food labels or advertisements. The TPA is Commonwealth legislation which overrides State and Territory laws.

The Food Standards Code is available from: <http://www.foodstandards.gov.au/foodstandards/foodstandardscode/>

The Trade Practices Act is available from:

<http://www.comlaw.gov.au/comlaw/management.nsf/lookupindexpagesbyid/IP200401339?OpenDocument>

### 3.2.2 Health claims/messages

Health claims can be described as claims, words or statements on food labels or advertising materials that refer to the potential for a component of a food or the food itself to assist in reducing the risk of, or improving existing cases of, a disease or health condition. Currently, health claims are not generally permitted on food labels or advertising in Australia (claims related to folate are the only current exception). However, as noted previously, the relevant websites listed in section 3.2.1 should be consulted for updates and revision made after the completion of these guidelines.

Health claims on food labelling have been under review for several years. However as of the 23rd of October 2009 food labelling law and policy in its entirety is being reviewed, which will further delay any new outcomes for health claims. Health claims are covered by Standard 1.1.A.2 of the Food Standards Code. According to Standard 1.1.A.2, food labels and advertisements for food must not:

- Make a claim or statement that the food is a slimming food or has intrinsic weight-reducing properties;
- Make a claim for therapeutic or prophylactic action or a claim described by words of similar import;
- Include the word 'health' or any word or words of similar import as a part of or in conjunction with the name of the food;

- Use any words, statement, claims, express or implied, or design that directly or by implication could be interpreted as advice of a medical nature from any person; or
- Contain the name of, or a reference to, any disease or physiological condition. There are exceptions to this rule prescribed by the Code (e.g. folate & neural tube defects in babies).

Information on the omega-3 content of fish and seafood can be made available to the public. Pamphlets which include factual information on the benefits of omega-3 can also be made available to the public, but the information must not be linked to seafood (or any food). The consumer must make the link between omega-3 and seafood for themselves (see Figure 3.1).






<p><b>Food labels:</b></p> <p> <b>Correct</b> This product contains 1500mg of omega-3 per serve.</p>	<p> <b>Incorrect</b> Seafood contains omega-3 which prevents cardiovascular disease.</p>	
<p><b>Informational pamphlets:</b></p>		
<p><b>Pamphlet 1 (Health benefits of omega-3)</b></p> <p>Omega-3 may:</p> <ul style="list-style-type: none"> <li>• reduce the risk of heart disease</li> <li>• reduce arthritis symptoms</li> <li>• reduce the risk of some types of cancer</li> </ul> <p></p>	<p><b>Pamphlet 2 (Foods containing omega-3)</b></p> <p>Omega-3 is found in most fish and seafood, including Atlantic salmon, mussels and sardines.</p> <p></p>	<p><b>Pamphlet 3 (Health benefits and foods containing omega-3)</b></p> <p>Omega-3s are good for your health. They can prevent heart disease and are found in fish, other seafood and walnuts.</p> <p></p>

Figure 3.1: Example 1 - Dos and don'ts on food labelling.

### 3.2.3 Nutrition information panels

According to Standard 1.2.8 of the Food Standards Code, most packaged foods are required to display a nutrition information panel (NIP). Some exemptions include foods such as:

- Food that comprise a single ingredient or category of ingredients;
- Unpackaged food;
- Food in a small package (smaller than 100sq cm);
- Food made and packaged on the premises from which it is sold;
- Food that is packaged in the presence of the purchaser; and
- Food delivered packaged, and ready for consumption, at the express order of the purchaser (See Figure 3.2).




<p> A package of frozen fish with added ingredients (such as crumbed fish) does require an NIP.</p>	<p> Frozen fish which comprises a single ingredient, such as frozen salmon, does not require an NIP.</p>	<p> Fish sold at a deli counter, packaged in the presence of the purchaser does not require an NIP.</p>
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Figure 3.2: Packaged foods requiring and not requiring NIP.

These exemptions do not apply if there is a nutrition claim being made in relation to the food (see Section 3.2.4).

NIPs must carry the following information:

- The number of servings of the food in the package expressed as either the number of servings of the food or the number of servings of the food per kg (or other units as appropriate);
- The average quantity of the food in a serving (in grams for solids or millilitres for liquids);
- The unit quantity of the food;
- The average energy content (in kilojoules or kilojoules and kilocalories), of a serving of the food and of the unit quantity of the food;
- The average quantity (in grams) of protein, fat, saturated fat, carbohydrate and sugars in a serving of the food and in a unit quantity of the food;
- The average quantity of sodium (in milligrams or milligrams and millimoles) in a serving of the food and in the unit quantity of the food; and
- The name and the average quantity of any other nutrient or biologically active substance in respect of which a nutrition claim is made, expressed in grams, milligrams or micrograms or other units as appropriate, that is in a serving of the food and in the unit quantity of the food.

FSANZ can provide nutritional information for a wide number of foods, however laboratory testing can provide accurate results and protect against legal action. There are some private companies which offer assistance with NIP generation to comply with relevant codes and laws.

Visit <http://www.foodstandards.gov.au/thecode/nutritionpanelcalculator/>

The NIP should be set out as outlined in Figure 3.3.

NUTRITION INFORMATION		
Servings per package: (insert number of servings)		
Serving size: g (or mL or other units as appropriate)		
	Quantity per Serving	Quantity per 100 g (or 100 mL)
Energy	kJ (Cal)	kJ (Cal)
Protein	g	g
Fat, total	g	g
- saturated	g	g
Carbohydrate	g	g
- sugars	g	g
Sodium	mg (mmol)	mg (mmol)
(insert any other nutrient or biologically active substance to be declared)	g, mg, µg (or other units as appropriate)	g, mg, µg (or other units as appropriate)

Figure 3.3: NIP content and format requirements.

### 3.2.4 Nutrition claims

Nutrition claims are covered by Standard 1.2.8 (Nutrition Information Requirements) of the Food Standards Code. This Standard covers the nutritional information that is required to be provided on food labels, and the specific conditions that must be complied with when making claims. A nutrition claim refers to a representation that states, suggests or implies that a food has a nutritional property. This may be general or specific, and expressed affirmatively or negatively. If a nutrition claim is made in relation to a food, a NIP must be displayed on the label of the food. If the food is not required to carry a label (such as those exemptions listed in Section 3.2.3), a NIP must be displayed on or in connection with the display of the food or provided to the purchaser on request (see Figure 3.4).



	<p>As shown in Section 2.3, some foods do not require an NIP. However, if a nutrition claim is made, a NIP must be displayed.</p>		<p>For example, fish which comprises a single ingredient, such as frozen salmon, does not require a NIP. However, if a nutrition claim is made in regards to that item, a NIP must be available to the purchaser. A pamphlet containing a NIP would fulfil this requirement.</p>
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Figure 3.4: NIP summary.

If a nutrition claim is made, the NIP must include the name and the average quantity of the nutrient that is in a serving of the food. This quantity must be expressed in grams, milligrams or micrograms (or other units as appropriate).

If an advertisement for food contains a nutrient claim, the label on the food to which the advertisement applies must include a NIP.

The claim must apply to the food in the form in which it is intended to be consumed. If the claim's accuracy depends on the consumer's method of preparation then the label must include information that will enable the consumer to prepare the food so that it meets the nutrition claim.

If a nutrition claim is being made about a food which is naturally or intrinsically high or low in the nutrient about which the claim is being made then it must be clear that the claim refers to the class of food and not only the brand on which the claim appears (see Figure 3.5).



Figure 3.5: Example 2 - Dos and don'ts on food labelling.

For more information see the User Guide to Standard 1.2.8 - Nutrition Information Requirements and the Code of Practice for Nutrient Claims in Food Labels and in Advertisements.

### 3.2.5 Nutrition claims and omega-3

Nutrition claims regarding omega-3, and requirements for NIPs are covered by the Food Standards Code, Standard 1.2.8 clauses 5 and 13.

A nutrition claim may be made in relation to the omega-3 fatty acid content of fish or fish products with no added saturated fatty acids if it contains:

- 200mg alpha-linolenic acid (ALA) per serving; or
- 30mg total eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) per serving.

Products with added saturated fatty acids must also meet the following criteria:

- The total of saturated fatty acids and trans fatty acids must be no more than 28 per cent of the total fatty acid content of the food; or
- The food contains no more than 5g of saturated fatty acids and trans fatty acids per 100g of the food.

A nutrition claim may be made that a food is a 'good' source of omega-3 fatty acid if the food satisfies the requirements above and contains no less than 60mg total of EPA and DHA per serving (see Figure 3.6).

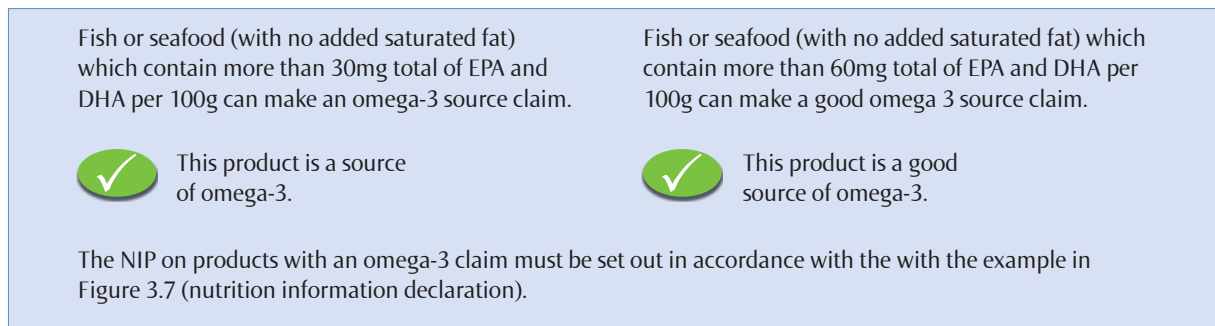


Figure 3.6: Omega-3 source claim summary.

If the nutrition claim is made, the NIP must indicate the source of omega-3s, namely, ALA, DHA and/or EPA.

When a nutrition claim using the word 'omega' is made, the word 'omega' must be qualified by the type of omega fatty acid present. This qualification appears immediately after the word 'omega' (e.g. 'omega-3', 'omega-6' or 'omega-9').

A nutrition claim must not be made in relation to the omega-6 or omega-9 fatty acid content of a food, unless:

- The total of saturated fatty acids and trans fatty acids content of the food is no more than 28 per cent of the total fatty acid content of the food; and
- The fatty acid in respect of which the nutrition claim is made comprises no less than 40 per cent of the total fatty acid content of the food.

For nutrition claims made regarding omega-3, omega-6 or omega-9 fatty acids the NIP must include declarations of all the trans, polyunsaturated and monounsaturated fatty acids as set out in Figure 3.7.



NUTRITION INFORMATION		
Servings per package: (insert number of servings)		
Serving size: g (or mL or other units as appropriate)		
	Quantity per Serving	Quantity per 100 g (or 100 mL)
Energy	kJ (Cal)	kJ (Cal)
Protein	g	g
Fat, total	g	g
- saturated	g	g
- *	g	g
- trans	g	g
- *	g	g
-polyunsaturated	g	g
- *	g	g
- monounsaturated	g	g
- *	g	g
Carbohydrate	g	g
- sugars	g	g
Sodium	mg (mmol)	mg (mmol)
(insert any other nutrient or biologically active substance to be declared)	g, mg, µg (or other units as appropriate)	g, mg, µg (or other units as appropriate)

\* sub-sub-group nutrient

Figure 3.7: NIP requirements for fatty acids.

### 3.2.6 Vitamin and mineral claims

Standard 1.3.2 (Vitamins and Minerals) of the Food Standards Code covers claims regarding the presence of vitamins and minerals in a food. Claims can be made regarding the presence a vitamin or mineral in a food if certain conditions are met:

- The claim must be specifically permitted in the Code; or
- If the vitamin or mineral is listed\*, the food is a claimable food\*\*, and a reference quantity of the food contains at least 10% of the Recommended Daily Intake (RDI)\*\*\* or Estimated Safe and Adequate Daily Dietary Intake (ESADDI) for that vitamin or mineral (see Figure 3.8).

\*Vitamin A, thiamin (vitamin B1), riboflavin (vitamin B2), niacin, folate, vitamin B6, vitamin B12, biotin, pantothenic acid, vitamin C, vitamin D, vitamin E, vitamin K, calcium, chromium, copper, iron, iodine, magnesium, manganese, molybdenum, phosphorus, selenium, zinc.

\*\*A food which is at least 90% by weight a primary food (which includes fish). Refer to the standard for processed seafood products.

\*\*\*Information on RDIs can be found on the NHMRC website: <http://www.nrv.gov.au/nutrients/index.htm>

Fish X contains 2mg of zinc per 150g serving size. For males, the RDI for Zinc is 14mg; for females it is 10mg. The 150g serving of fish contains more than 10% of the RDI for Zinc for both males and females, and Zinc is a listed mineral in the Code. A nutrient claim could be made for fish X.



Fish X is a source of zinc

Figure 3.8: Example 3 - Dos and don'ts on food labelling.

To make a claim that a food is a 'good' source of a vitamin or mineral, the reference quantity of the food must contain no less than 25% of the RDI or ESADDI for that vitamin or mineral.

When a claim is made in relation to the presence of a vitamin or mineral in a food, the label or NIP must include a statement containing the following information:

- Serving size;
- Number of servings per package;
- The vitamin or mineral in respect of which the claim is made; and
- The average quantity of the vitamin or mineral in 100g or 100ml of the food as the case may be; and the proportion of the RDI, of that vitamin or mineral contributed by one serving of the food; or the average quantity of the vitamin or mineral for which an ESADDI has been prescribed in the Food Standards Code in a serving of the food (see Figure 3.9).

NUTRITION INFORMATION		
Servings per package: 1		
Serving size: 150g		
	Quantity per Serving	Quantity per 100 g
Energy	kJ (Cal)	kJ (Cal)
Protein	g	g
Fat, total	g	g
- saturated	g	g
Carbohydrate	g	g
- sugars	g	g
Sodium	mg (mmol)	mg (mmol)
Zinc	2mg (16% of RDI)	1.33mg
* Percentage of Recommended Dietary Intake (RDI)		

Figure 3.9: NIP requirements for vitamins and minerals (example).

Vitamin and mineral claims cannot make comparison claims (with other foods), unless permitted by the Food Standards Code. A claim must not be made if such a claim is prohibited in the Code.

Listed vitamins and minerals are vitamin A, thiamin (vitamin B1), riboflavin (vitamin B2), niacin, folate, vitamin B6, vitamin B12, biotin, pantothenic acid, vitamin C, vitamin D, vitamin E, vitamin K, calcium, chromium, copper, iron, iodine, magnesium, manganese, molybdenum, phosphorus, selenium, zinc.

### 3.2.7 Country of origin labelling

Country of origin labelling provides consumers with information on the country/countries where food has been grown, manufactured, produced, or packaged. A country of origin claim is any words or pictures on labels, packages or advertising that makes or implies a statement or claim about the origin of the goods.

Country of origin food labelling is covered by both the Food Standards Code Standard 1.2.11 (Country of Origin Requirements), and the Trade Practices Act. Other pieces of legislation in different states/territories may also cover food labelling. Standard 1.2.11 does not apply to food sold to the public by restaurants, canteens, schools, caterers or self-catering institutions where the food is offered for immediate consumption. According to the Food Standards Code, all packaged and some unpackaged foods must be labelled with country of origin.

Packaged food is required to be labelled with either:

- A statement that identifies where the food was made or produced; or
- A statement that identifies the country where the food was made, manufactured or packaged for retail sale; and
- A statement to the effect that the food is constituted from ingredients imported into that country or from local and imported ingredients as the case may be.

If fish or seafood is sold unpackaged, a label must be displayed on or in connection with the display of the food which:

- Identifies the country or countries of origin of the food; or
- Contains a statement indicating that the foods are a mix of local and/or imported foods.

If fish or seafood is sold unpackaged, and the label is in connection with the display of the food (not on it), the following conditions must be met:

- The size of type on the label must be at least 9mm; or
- If the food is in a refrigerated assisted service display cabinet, the size of type on the label must be at least 5mm.

Refer to Standard 1.2.9 for further information on legibility requirements for food labels. While country of origin claims are not mandatory under the Trade Practices Act, those that are made must be accurate.

The Trade Practices Act prohibits claims that may mislead or deceive, or make false representations about the origins of food.

For products to make a 'Made in country of origin' claim, the following conditions must be met:

- The goods were substantially transformed in the country claimed to be the origin; and
- Fifty per cent or more of the costs of production must have been carried out in that country.

For goods to make a 'Product of country of origin' claim, the following conditions must be met:

- The country of the claim must be the country of origin of each significant ingredient or significant component of the goods; and
- All, or virtually all, processes involved in the production or manufacture of the goods must have happened in that country.

If a product does not comply with the above criteria, other qualifying statements may be used, such as 'Packaged in Australia', 'Made/manufactured in Australia from imported ingredients' or 'Australian Owned'.

*Sources:*

*Food Standards Code:* <http://www.foodstandards.gov.au/foodstandards/foodstandardscode/>

*Trade Practices Act:*

<http://www.comlaw.gov.au/comlaw/management.nsf/lookupindexpagesbyid/IP200401339?OpenDocument>

### **3.2.8 Australian Fish Names Standard AS SSA 5300-2009**

The Australian Fish Names Standard was prepared by Seafood Services Australia's (SSA) Fish Names Committee. The Standard defines standard fish names for use in Australia and specifies when standard fish names are to be used. It is intended to be used by those involved with fish or seafood in Australia.

To comply with the Standard, fish sold directly to consumers must be identified at the point of purchase by the Standard Fish Name (SFN) for that species. The scientific name also may be specified in addition to the SFN. When fish are not sold directly to consumers, the fish may be identified by either the SFN or the scientific name for that species. Publications written by scientists, recreational fishers, chefs, media, teachers, fisheries managers, and others must use either the SFN or the scientific name for that species to comply with the Standard. A SFN 'may cover a single species or all species in a particular scientific family or group of fish'. According to the Standard it is recommended that fish are identified by the SFN for that particular species only. However there are some circumstances that the SFN for the scientific group or family to which a fish belongs may be used instead. These are:

- The fish does not have a SFN for that particular species; or
- The fish is in a batch of different species of fish, all of which are from the same scientific group or family; and
- Using the SFN for the scientific group or family to which a fish belongs does not mislead, misrepresent or confuse the identification of the fish.

A group name may be capitalised to indicate that it is a group name. If a group name in the Standard shows a pluralisation in brackets, this indicates that the group name is shared with an individual species name. If a species does not have an SFN specified in the Standard, it may be identified by a name that is in common use for that species in Australia or overseas. If an alternative fish name is used, SSA must be notified within 30 days. Obsolete fish names may be used if the correct SFN is displayed more prominently and in larger text above the obsolete name. The obsolete name must be contained in brackets.

The Australian Fish Names Standard can be found at: <http://www.seafood.net.au/fishnames/standard.php>

### **3.2.9 Glycaemic Index (GI)**

There is currently no reference in the Food Standards Code regulating Glycaemic Index (GI). GI ranks the extent to which blood sugar levels are raised after consumption of carbohydrates in a food. High GI foods are those which are digested faster and cause a spike in blood sugar levels. To be considered 'low GI,' the GI value of the food must be below 55. To be considered 'medium GI', the GI value of the food must be between 56 and 69. Foods with a GI value of 70 and above are considered 'high GI'. A GI claim is voluntary and currently requires no additional information for the NIP. The GI level of foods can be tested by a food laboratory.

More information on GI and GI testing can be found at:

<http://www.glycemicindex.com/> and <http://www.gisymbol.com.au/index.htm>.

## 3.2.10 Other labelling considerations

### 3.2.10.1 Trade Practices Act

There are several areas to consider for food labels and advertisements to comply with the Trade Practices Act. These can be summarised as: words, images and the overall impression; target audience; and qualifying claims, fine print and disclaimers.

For compliance with the Trade Practices Act, the ACCC considers that food and beverage labelling descriptors fall broadly under the following categories:

- **Food type assurance claims:** These claims refer to specific assurances about the quality or characteristics of particular foods (e.g. kosher, vegan).
- **Process/preparation/production claims (similar to previous):** Claims regarding the specific processes which the food has undergone must be represented accurately to the consumer. This may refer to production claims (e.g. organic), preparation claims (e.g. chilled), and process claims (e.g. non-sweetened).
- **Origin claims:** Food labels or advertisements which contain claims regarding the origin or source of food should be accurate. This includes claims that a food is a 'Product of', 'Made in', and 'locally grown' and also claims regarding the origin of a product from a geographical area. Consider what the consumer may decide when reading this claim. For more information when making an origin claim, read the Food and Beverage Industry: Country of Origin Guidelines to the Trade Practices Act guideline.
- **Standard/style/select claims:** The ACCC describes these claims as those which imply a relationship with a particular standard, style or product selection. If there is an objective component to the claim it must be substantiated before it is made to consumers.

Claims that foods are pure, fresh or natural may be considered misleading or deceptive if the food is not what a consumer would understand to be 'pure', 'fresh', or 'natural'. For example, the word 'pure' implies that there are no added ingredients. This would apply to a single ingredient food. The word 'fresh' would imply that the food had not been canned, cured, dehydrated, frozen, processed or preserved. The term 'natural' (or similar words or combinations of words which include 'natural') may suggest to consumers that the product is made of natural ingredients, with no added chemicals. The use of the words is still misleading if used as the brand name of a food that would not be considered 'pure', 'fresh' or 'natural'. The ACCC also flags the use of the terms 'real', 'true' and 'genuine', as these terms may suggest that other similar foods or products may not have the same qualities as the one referred to in the advertisement/label.

- **'Puffery':** The ACCC describes a fifth category, 'puffery'. This describes claims which may be fanciful, vague or exaggerated and would not reasonably be considered meaningful to consumers or their intentions to purchase.

### 3.2.10.2 Images and pictures

When using images and pictures on labels or in advertisements, consideration should be given to the impression that may be made on the consumer. Images which are considered to give a misleading impression of the product may breach the Trade Practices Act.

### 3.2.10.3 Checklist: To avoid breaching the Trade Practices Act

When designing or reviewing food labelling and advertisements, the following points should be considered:

- What impression is given to consumers about the predominant ingredients of the product? Is this impression accurate?
- Are there any aspects of the labelling or packaging which need stronger emphasis to accurately reflect the product?
- What overall impression do the words and images used create? How will your target audience interpret this? What conclusions might consumers draw from your words and images?
- What might consumers miss or not understand?
- If your label uses a disclaimer or qualification, is it prominent and clear? Will it be sufficient to dispel any misleading impressions?
- How would a reasonable consumer react to your label/advertisement?

The ACCC Food Labelling Guide can be found at: <http://www.accc.gov.au/content/index.phtml/itemId/877504>.

### 3.3 Evidence relating to health conditions and seafood consumption

The following provides an overview of evidence from studies published in peer-reviewed journals associated with seafood consumption and health. Table 3.1 shows the criteria used to estimate the level of evidence supporting each health issue:

Table 3.1: Criteria used to estimate level of evidence.

<b>A High</b>	<ul style="list-style-type: none"> <li>■ Further research is very unlikely to change our confidence in the estimate of effect</li> <li>■ Several high-quality studies with consistent results</li> <li>■ In special cases: one large, high-quality multi-centre study</li> </ul>
<b>B Moderate</b>	<ul style="list-style-type: none"> <li>■ Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate</li> <li>■ One high-quality study</li> <li>■ Several studies with some limitations</li> </ul>
<b>C Low</b>	<ul style="list-style-type: none"> <li>■ Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate</li> <li>■ One or more studies with significant limitations</li> <li>■ Any estimate of effect is very uncertain</li> </ul>

#### 3.3.1 Strongest evidence (A)

- Regular fish consumption is associated with a significantly reduced risk of total mortality for both men and women.
- 1-2 serves fish/wk, especially those high in n-3 polyunsaturated fatty acids (PUFAs, omega-3s), decreases the risk of total mortality by 17%.
- 20% decreased risk in total mortality is associated with at least 1 serve fish/wk in men.
- Fish intake is beneficial to heart health.
- Adequate intake of n-3 PUFAs decreases the incidence of cardiovascular disease (CVD); furthermore 2-3 fish meals/wk is protective against CVD.
- There is good evidence that fish consumption protects against CVD and chronic respiratory disease in males.
- 1 serve fish/wk (20gm/day) reduces the risk of coronary heart disease (CHD).
- Decreased risk of CHD by:
  - 31% if fish consumed 3-4 meals/wk; and
  - 32% if consumed at least 5 meals/wk.
- 1-2 serves fish/wk (especially species high in n-3 PUFAs) reduces the risk of:
  - coronary death by 36%;
  - coronary heart failure by 20%;
  - arterial fibrillation (28% reduced risk for 1-4 serves/wk, 31% decreased risk for at least 5 serves/wk); and
  - myocardial infarction.
- Higher levels of fish consumption are associated with a lower risk of CHD in diabetic women.
- 1 serve fish/wk (white or oily fish) reduces risk of stroke.
- Reduced risk of ischemic stroke:
  - 1-4 serves fish/wk decreases risk by 27%.
  - At least 5 serves fish/wk decreases risk by 30%.
- However, there is a 44% increased risk of ischemic stroke for more than 1 serve/wk of fried fish or fish paste.
- For women, oily fish intake was significantly lower in those who subsequently experienced a stroke.
- Evidence that fish consumption is protective against rheumatoid arthritis and ulcerative colitis in males.

- At 30yr follow-up, men who ate no fish had a 2-3 fold higher frequency of prostate cancer than those who ate moderate or high amounts of fish.
- At least 4 serves fish/wk is associated with a decreased risk of prostate cancer. Strongest association with metastatic cancer (Relative Risk (RR) 0.56).
- Evidence that fish consumption is associated with a decreased risk of lung cancer mortality in men (independent of cigarettes, animal fat minus fish fat, vegetable and fruit consumption).
- Higher consumption of fish is associated with a lower risk of islet autoimmunity precursor for type 1 diabetes in children at increased risk of type 1 diabetes.
- Negative association between a diet rich in fruit, vegetables and fish, and the risk of Congestive Obstructive Pulmonary Disease (COPD).
- Women of childbearing age should consume at least 2 serves of fish/wk.
- Pregnant and lactating mothers should consume up to 12oz of a variety of fish each week (including shellfish low in mercury).
- Fish consumption does not adversely affect infant gestation and birth size at a population level.
- Evidence that at least 340g/wk maternal seafood intake is beneficial to child cognitive development.
- Low maternal seafood intake during pregnancy could lead to adverse effects on neurodevelopment.
- Occurrence of preterm delivery varied from 7.1% in the group who never consumed fish, to 1.9% in those consuming fish at least 1/wk.
- Low maternal fish consumption is a strong risk factor for preterm delivery and low birth weight.
- Small amounts of n-3 PUFAs (provided as fish or fish oil) are protective against preterm delivery and low birth weight.
- Consumption of n-3 PUFAs during pregnancy is essential for optimum foetal neural development.

### 3.3.2 Moderate evidence (B)

- Evidence that increased consumption of n-3 PUFAs reduces risk of all-cause mortality.
- Ingestion of n-3 PUFA supplements has consistently shown a reduction in joint tenderness and the amount of morning stiffness in those with rheumatoid arthritis.
- Good evidence that regular fish intake is beneficial for management of inflammatory diseases.
- Moderate to high intake of fish appears to be protective against rheumatoid arthritis.
- Fish consumption in the first year of life lowers the risk of asthma and allergic rhinitis in childhood.
- Risk of allergic rhinitis is substantially lower in children who had fish during the first year of life (RR 0.025) compared with children who had fish later in life (RR 0.060).
- Early introduction to fish shows consistent negative association with the risk of allergic rhinitis.
- Results suggest that early intake of fish protects against airway disease in early life.
- For children born to mothers with a history of asthma, the Odds Ratio (OR) for asthma was 0.20 (20% lower risk) when mothers ate oily fish at least once a month during pregnancy compared with no consumption.
- In contrast, fish sticks (source of trans fats) consumption during pregnancy increased asthma risk in children (OR 2.04 - more than twice the risk).
- Traditional fish-based diets appear to be protective against CVD.
- Daily intake of marine fatty acids associated with 24% decreased risk in metastatic cancer.
- Slightly reduced risk of colorectal cancer in fish consumers, more pronounced in women.
- Higher consumption of fish is associated with a decreased risk of colorectal cancer in women.
- Maternal intake of very-long-chain-fatty-acids during pregnancy and lactation may be favourable for mental development of children.
- Compared with low intake (21mg/d), high intake (407mg/d) of n-3 PUFAs was associated with fewer depressive symptoms in adults (OR 0.46).

- The level of pollutants in Australian seafood was, in general, very low.
- Benefits of seafood consumption far outweigh the risks associated with possible pollutants.
- Fish low in mercury and high in n-3 PUFAs are recommended.

### 3.3.3 Some evidence but more research required (C)

- Fish is more beneficial than fish oil in combating CVD and all-cause mortality.
- Fish oil acids may reduce potentially fatal arrhythmias in people at high risk.
- The influence of dominant males (whether child or adult) within the family unit should be considered in any intervention to increase regular seafood consumption.
- Nutritional education for pregnant women is required.
- Fish consumption is associated with increased length of gestation in women with a low risk of adverse pregnancy outcomes.
- High shellfish intake is associated with a higher risk of small for gestational age births.
- Higher maternal fish intake during pregnancy is associated with longer gestation, increased birth weight, reduced risk of intrauterine growth retardation and lower prevalence of pregnancy-induced hypertension.
- An average intake of 400mg/d of n-3 PUFAs may reduce depression.
- Fish consumption may be associated with slower cognitive decline with age.
- Greater seafood consumption predicted lower lifetime rates of bipolar disorders.
- There is limited evidence around seafood, fish oil or supplements in the management of attention disorders such as ADHD, however available evidence is promising.
- Brains of patients with Alzheimer's Disease have lower DHA in gray matter. N-3 PUFAs retard the decline in cognition over time.
- Mercury levels in Alaskan women who had a greater fish intake were well below World Health Organization effect levels.
- National fish advisories overemphasise risks and undervalue benefits of fish consumption.
- Interventions seeking to promote seafood as an integral part of a healthy diet should address existing negative attitudes and beliefs around the storage and preparation of seafood.
- Strategies directed at parents and children should include experimental hands-on components to encourage experimentation, particularly focussing on use of, preparation of and the variety of lower cost seafood available.
- Involvement in food preparation and cooking is correlated positively with increased levels of both intention to purchase and consumption of fish.
- Dietary fish and weight loss had significant independent and additive effects on 24 hour ambulatory blood pressure and heart rate in overweight persons.

### 3.3.4 Consumer behaviour in relation to fish and seafood consumption

- Perceived cost, freshness, quality, availability, taste and easy preparation were considered to be the main influences in consumer choice of fish and seafood products. (B)
- The lowest income households had the lowest fish consumption frequency. (B)
- The highly processed product varieties (battered and crumbed fish, and fish in sauce dishes) were often popular among families and perceived as easy and convenient to cook. (B)
- Odours common to fish and seafood are often a deterrent to consumption. (B)
- Fresh fish and seafood are preferred to alternative products (processed, smoked, canned and frozen products). (C)
- Presence of bones and price influence purchase type but not intention to purchase. (C)
- The presence of children in the households led to lower fish consumption. (C)

### 3.3.5 Marketing and advertising

- Food advertising directed at children predominantly featured Snack foods/fast foods and confectionery. (A)
- Modern marketing techniques have a strong influence on food choice. (B)
- Changing the food advertising environment during children's television viewing time to an environment where nutritious foods are promoted and less healthful foods unrepresented would lead to the normalisation and reinforcement of healthy eating. (B)

## 3.4 Useful contacts



The Industry Guidelines are reproduced in section 3 of the appendices. This includes a list of useful contacts on pages 28 and 29 of the guidelines.

## 3.5 Bibliography



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- Seafood Services Australia Limited, (2009) Australian Fish Names Standard, Australian Standard AS SSA 5300-2009, Ascot, Seafood Service Australia.
- Williams, P (2005), "Consumer Understanding and Use of Health Claims for Foods," Nutrition Reviews, 63 (7), 256 - 64.



### 3.6 Websites

- FSANZ <http://www.foodstandards.gov.au/>
- The Food Standards Code <http://www.foodstandards.gov.au/thecode/>
- The ACCC <http://www.accc.gov.au/content/index.phtml/itemId/142>
- The Trade Practices Act <http://www.comlaw.gov.au/comlaw/Legislation/ActCompilation1.nsf/0/0769050E539E97DACA257678007F8AA2?OpenDocument>
- Information on the review of food labelling <http://www.health.gov.au/internet/main/publishing.nsf/Content/review-food-labelling-law-&-policy>
- For information on RDIs <http://www.nrv.gov.au/nutrients/index.htm>
- Australian Fish Names <http://www.fishnames.net.au>
- Glycaemic Index <http://www.glycemicindex.com/> or <http://www.gisymbol.com.au/index.htm>
- Food Legal - Food law experts <http://www.foodlegal.com.au/resources/regulationoverview/FoodLabellingInformation/>

### 3.7 Access to report

The *Industry Guidelines for Seafood, Health and Nutrition Messages* document was reviewed by the CESSH Industry Advisory Group, Western Australian Fishing Industry Council (WAFIC), Seafood Services Australia (SSA) and other key stakeholders within the seafood industry. Legal advice was received from a lawyer conversant with the food labelling laws and regulations plus Food Standards Australia & New Zealand.

The *Industry Guidelines for Seafood Health and Nutrition Messages* (see Figure 3.10) is now available on the CESSH website at <http://cessh.curtin.edu.au/resources/industry.cfm>.



Figure 3.10: *Industry Guidelines for Seafood Health and Nutrition Messages*.

# Section 4

Development of resources for general practitioners and allied health professionals

## 4.0 Introduction



General Practitioners (GPs) are considered to be trusted and reliable sources of health-related information and, as such, are expected to provide nutritional advice on a variety of diets specific to common health conditions. Resources developed for use with patients must be based on the best available evidence and designed to suit the needs of the end user. These resources should also be specific to health conditions, easy to read (Year 8 school student level), short, informative and suitable for use within the time restraints of a standard GP consultation (5-10 minutes).<sup>188</sup>

Initially, all resources available to GPs and allied health professionals (AHPs) in Australia that promoted seafood consumption within a healthy diet, as a preventative or treatment measure for common lifestyle or medical conditions, were identified and critically reviewed. The findings of the initial scoping exercise indicated the need to develop user-friendly nutritional resources across a number of key health conditions.

## 4.1 Review of current seafood health benefit resources available for use of general practitioners and allied health professionals



This review focused on the collection and critical review of relevant resources that were available to GPs and AHPs to use with patients as either a prevention or treatment measure for common lifestyle or medical conditions.

### 4.1.1 Methods

Resources for this research project were identified through multiple avenues including: individual organisations; medical service networks; health information services; and Internet search engines. All resources reviewed were printed in English and available during 2008.

Assessment included the critical review of: format; appropriateness for target groups; reference to seafood and supporting evidence; credibility; readability; and suitability for use by practitioners in a short consultation.

Based on background research that promoted seafood consumption as part of a healthy diet for certain lifestyle and specific medical conditions, all the materials available from the following individual organisations were assessed for their relevance: Arthritis Australia; Australian General Practice Network; Better Health Channel; Children, Youth and Women's Health Service; Commonwealth Scientific and Industrial Research Organisation (CSIRO); Department of Health and Ageing; Diabetes Australia; Dietetics Association of Australia; Heart Foundation; New South Wales Department of Health; Nutrition Australia; Pharmaceutical Society of Australia; South Australian Department of Health; and South Australian Dental Service.

The South Australian Health Information Services promoted a large range of appropriate resources. These services include a Health Promotion Shopfront located at the Royal Adelaide Hospital (Central Northern Adelaide Health Service) and the Health Information Centre located at the Women's and Children's Hospital (Children, Youth and Women's Health Service). Visiting such services provided an opportunity to access resources that were not well promoted or accessible to the public but could be ordered in hardcopy by organisations and individuals such as GPs and AHPs throughout Australia.

The two Internet search engines used to research and gather resources for this research project were 'HealthInsite' and 'Google Australia'. 'HealthInsite' ([www.healthinsite.gov.au](http://www.healthinsite.gov.au)) is an Australian Government website that provides up-to-date and quality-assessed information on a range of health topics. 'Google Australia' ([www.google.com.au](http://www.google.com.au)) is one of the most popular search engines in Australia.

The following key terms were used to research and source electronic information: seafood health benefits; fish health benefits; seafood healthy eating; fish healthy eating; seafood and arthritis; seafood and cholesterol; seafood and heart health; seafood and osteoporosis; seafood and pregnancy; fish and arthritis; fish and cholesterol; fish and heart health; fish and osteoporosis; and fish and pregnancy.

### 4.1.2 Key criteria for critical review

All resources collected were critically reviewed based on a strict range of criteria in an endeavour to minimise rater bias. Resources were also reviewed for accuracy, bias and obvious commercial interest. A wide range of sources were accessed to ensure that a thorough assessment was conducted. A range of readability formulas, assessment tools and guidelines were used to assess each resource.

The criteria used to review all resources were: format of resource (web/hardcopy/PDF etc); source of information; date of publication/latest review; key message(s) of the resource; key information in relation to seafood; target audience; appropriateness for use in a five to ten minute consultation; ease of readability for the public; and overall credibility of the resource.

All resources assessed needed to be able to be used by GPs and AHPs within the average timeframe available for the majority of consultations (5 to 10 minutes). This is important because the best outcomes for consumers are achieved when health information, discussion and decision-making are provided as part of an ongoing professional and trusting relationship with members of a health care team.

Information imparted by medical and health practitioners or displayed in GPs' waiting rooms is considered trustworthy in comparison to information from other sources such as the Internet. Providing easily understood and relevant 'take-home' health information as part of a consultation allows patients to be more involved in their own decision-making process, and allows time to consider treatment options.

Readability was included as it was essential to assess whether resources were developed in a manner that enabled target audiences to understand the content, thus maximising the likelihood of the resource being used by consumers. The level of readability of the resources was assessed with the SMOG (Simple Measure of Gobbledygook) Readability Formula.<sup>189</sup>

The overall credibility of each of the resources was assessed to ensure that the credibility and acceptance of health information was also incorporated into the criteria. This included: the name and expertise of the author(s); the name of the publisher, and publication date; current, accurate and consistent information; non-judgmental language; unbiased information; references to support information related to research and statistics; information that is relevant and related to the consumer's experience; disclosure of sponsors; quality presentation of the information; and references to other relevant literature.

In addition, interviews were conducted with GPs to ensure the time factors were appropriate and the overall credibility was acceptable 'in practice'.

#### 4.1.3 Results

The identification process realised 120 current resources associated with the health benefits of regular consumption of seafood as part of a healthy diet that could be used by GPs and AHPs. The resource topics included arthritis (n=7), cancer (n=6), dementia (n=1), dental health (n=2), diabetes (n=3), heart health (n=30), nutrition (n=40), osteoporosis (n=6) and preconception, pregnancy and breastfeeding (n=25) (see Tables 4.1 to 4.9 in chapter 4 - Appendices).

The critical review of resources revealed information about the format, target group, reference to seafood, credibility and suitability of the identified resources. The majority (88.4%, n=106) of identified resources were available electronically as either PDF files or webpages, a preferable, quick and easy mode of access for GPs and AHPs. Just over half (57.5%, n=69) of the identified resources were targeted at specific audiences. All of the resources made reference to the health benefits of regular consumption of fish (100%, n=120), 22.5% (n=27) made reference to seafood, and 5% (n=6) made reference to fish oil as part of a healthy diet. Only 15% (n=18) of the identified resources were suitable for use with the general Australian population at or below the recommended reading level of Year 8. The majority (87.5%, n=105) of the critically reviewed resources were found to be 'credible' or 'highly credible' based on the credibility criteria used in this research project. Resources that were found to be 'definitely not credible', 'not credible' or 'somewhat credible' (12.5%, n=15) were primarily due to information sources being commercial sources with competing interests.

#### 4.1.4 Conclusion

With support from appropriate health care professionals, written health information can provide accurate information to facilitate informed health choices.<sup>42</sup> Such health information can enable health professionals to assist patients to make changes to behaviours that can positively impact on their own health.

In summary, the most pertinent outcome from this research was that only 18% (n=15) of the resources critically reviewed were suitable for use with the general English-speaking Australian population (recommended reading level of Year 8 or lower).<sup>30, 33, 10, 18</sup> Clearly, it is not sufficient to provide resources with relevant information to assist GP and AHP with patient care if these resources are not developed in a manner that make them easily understood by end users. Therefore, it is essential that all resources developed should not only contain accurate information but also be rigorously tested with specific target groups prior to distribution.

### 4.2.1 Introduction

The development of seafood and health resources was based on a review of all resources available to GPs and AHPs in Australia that promoted seafood consumption within a healthy diet, as a preventative or treatment measure for common lifestyle or medical conditions. Whilst it is acknowledged that written health information alone cannot change health behaviours, with support from appropriate health care professionals, it can provide a credible source of information to support behavioural change.

### 4.2.2 Selection of key health conditions

The findings of the initial scoping exercise indicated the need to develop user-friendly nutritional resources across a number of key health conditions. The conditions chosen were based on the level of evidence associated with regular seafood consumption and health. Conditions that benefit from high levels of seafood consumption for prevention and/or treatment include:

- Arthritis (particularly rheumatoid arthritis);
- Cancer (particularly prostate and colorectal);
- Diabetes; and
- Heart disease (particularly coronary heart disease).

Given the lack of clear nutritional direction during pregnancy, a nutritional resource was also developed for prenatal, antenatal and postnatal women.

### 4.2.3 Seafood recommendations for selected conditions

Recommended serves of seafood were determined for each of the selected conditions based on existing guidelines and information, where available. Seafood recommendations for people with arthritis and diabetes were based on recommendations for the CHD population, with special consideration of the physiological implications of diabetes and the specific dietary requirements of this condition.

#### 4.2.3.1 Pregnancy

- Pregnant women should consume 200-300mg of DHA and EPA per day.<sup>190, 191</sup>
- DHA in infant formula must be at least 0.2% by weight of total fatty acids; and arachidonic acid (AA) should not be lower than DHA.<sup>192</sup>

Mercury recommendations were based on the following information:

- Pregnant women should consume no more than one serve per week of orange roughy or catfish, with no other fish being consumed that week; or consume no more than one serve per fortnight of shark or billfish, with no other fish being consumed that fortnight; or consume two to three serves per week of any other fish and seafood.<sup>193</sup>
- The Joint Expert Committee for Food Additives (JECFA) of the World Health Organization (WHO) and Food and Agriculture Organisation (FAO) set a tolerable intake of 1.6µg per kilogram body weight for methylmercury exposure in order to protect the foetus from neurotoxic effects.<sup>194</sup>

#### 4.2.3.2 Coronary heart disease

- The 2005 American Dietary Guidelines recommend consuming two servings of fish per week to help reduce the risk of mortality from CHD.<sup>195</sup>
- The National Heart Foundation recommends consuming at least two servings of fish (preferably oily fish) every week to obtain the recommended amount of omega-3s to help reduce the risk of heart disease.<sup>196</sup>
- WHO recommends one to two servings of fish per week to protect against CHD.<sup>197</sup>
- The NHMRC has set the recommended intakes of omega-3s (combined DHA, EPA and DPA) at 160mg per day for men and 90mg per day for women.<sup>118</sup>
- Suggested Dietary Targets (SDT) set up by the NHMRC recommend an intake of omega-3s of 610mg for men and 430mg for women per day for primary prevention of CHD.<sup>118</sup>

#### 4.2.3.3 Cancer

- The regular consumption of oily fish high in omega-3 offers protection from lung cancer in men. Furthermore, high fish intake in males with lung cancer reduces inflammation of the lungs thus reducing lung cancer mortality, particularly if the lung cancer is associated with tobacco use and diets high in animal fats.<sup>198</sup>
- One serve of one dark fish (salmon, mackerel, bluefish) or shellfish (prawn, lobster, crab, oyster) per week is protective against aggressive prostate cancer with reductions in risk of 57% and 49% respectively.<sup>199</sup>
- Eating at least four serves of fish per week is associated with a reduced risk of prostate cancer, with the strongest association with metastatic cancer.<sup>61</sup> This is further emphasised in studies showing a 2-3 fold increase in prostate cancer in men who ate no fish compared with those who eat moderate to high levels of oily fish.<sup>64</sup>
- The risk of colon cancer is increased by 46% in diets high in processed meats, red meat, fried foods and refined grains compared with a Mediterranean diet high in oily fish, fruit, vegetables, legumes, poultry and whole grains.<sup>200</sup>
- 80g of fish per day reduces breast cancer risk by 26%, and 100g of oily fish per week is protective against colorectal cancers, particularly in women. For breast cancer, this would be equivalent to 7.5 serves of fish per fortnight (150g serves) and for colorectal cancer; this would be four serves of fish at 150g serves.<sup>201</sup>
- The Cancer Council recommends an intake of 80-120g of cooked fish fillet each week for people living with cancer. The types of seafood recommended include tuna, sardines and salmon.<sup>202</sup>

#### 4.2.3.4 Arthritis

- For rheumatoid arthritis there is proven benefit of approximately 3.5g per day of EPA and DHA. As this is such a high dose of omega-3 intake per day, capsules are recommended.<sup>203</sup>

### 4.2.4 Nutritional modelling

Professor Lynne Cobiac and Dr Jessica Grieger from Flinders University were engaged to conduct the initial modelling of the 14-day dietary cycles for each of the conditions chosen.

#### 4.2.4.1 Food groups and serving sizes used for nutritional modelling

Food groups from the Australian Guide to Healthy Eating (AGHE) were chosen to model the 14-day menu cycle for pregnant women. The 19-60 years age range for males and females was chosen for CHD patients and people with arthritis, diabetes and cancer, with pregnancy being an additional group (see Table 4.10).

*Table 4.10: Daily sample serves from the Australian Guide to Healthy Eating.*

	Breads & cereal	Vegetable	Fruit	Milk, yoghurt, cheese	Meat & alternatives	Unsaturated fats & oils	Extras
Women 19-60 years	4-6	4-7	2-3	2-3	1-1.5	1	0-2.5
Men 19-60 years	5-7	6-8	3-4	2-4	1.5-2	1	0-3
Pregnancy	4-6	5-6	4	2	1.5	1	0-2.5

The 'unsaturated fats and oils' group was not included in the AGHE model but was included in this project to increase intake of healthy fats in small quantities. Seafood was included as a separate category to the AGHE 'meat and alternatives' category. Serving sizes used in the CIISC project are listed in Table 4.11.

The menus were developed to meet estimated energy requirements for males and females who are sedentary. It is acknowledged that some individuals may need more food due to their higher energy requirements (based on body weight and physical activity levels). In these cases it is recommended that an additional one to two servings of the following core food groups be allowable: breads and cereals; fruit; vegetables; and dairy (low-fat options).

Table 4.11: Serving size equivalents used in the modelling of the 14-day meal planners.

Food item	Measure	Quantity
Steamed/poached fish	1 serve	170g
Raw fish	1 serve	150g
Cooked/grilled fish	1 serve	120g
Canned salmon	1 serve	105g
Crab/mussels	1 serve	100g
Canned tuna	1 serve	95g
Frozen fish	1 serve	70g
25g fish paste/spread	1 serve	25g
Margarine/dairy spreads	1 teaspoon	7g
Oil	1 tablespoon	20g
Cheese	2 slices	40g
Milk/custard	1 cup	250ml
Yoghurt	1 tub	200g
Ice cream	3 scoops	100g
Fresh fruit	1 medium	150g
Tinned fruit (drained)	1 cup	150g
Vegetables/salad vegetables	1 cup (cooked)	75g
Red meat (cooked)	1 serve	65g
Deli meat	2 slices	30g
Legumes (as red meat alternative)	1 cup, drained	170g
Poultry (cooked)	1 serve	100g
Pasta/rice (cooked)	1 cup	180g
Bread	2 slices	40g
Bread roll/pita	1 medium	70-90g
Oats (dry)	½ cup	50g
Cereal	¾ cup to 1¼ cup	30g
Crisp bread (savoury)	1 serve	35g
Nuts/seeds	⅓ cup	30g
Extras (cake, bun, chocolate, alcohol)	1 serve	~600kj
Jam/Honey (on bread)	1 serve	14g
Cream (on biscuits/bread)	1 serve	1 tablespoon

#### 4.2.4.2 Recommended nutrient intakes used for nutritional modelling

The menus also meet the estimated average requirements (EAR) for all nutrients (see Table 4.12). However, there is difficulty in doing this with some of the selected conditions. For example, the difficulty of meeting the folate and iron requirements during pregnancy is acknowledged. During pregnancy, the dietary folate and iron estimated average requirement is high (520µg and 22mg, respectively). It is important to include many green, leafy vegetables where possible. Another option would be to include iron and folate fortified breakfast cereals during this time. Exchanging chicken or other white meat for lean, red meats will also help to increase iron intake.

Table 4.12: Nutrient reference values used to develop 14-day diets

Nutrient	Estimated Average Requirement*	Recommended Dietary Intake**	Adequate Intake***	Upper Limit of Intake****	Suggested Dietary Targets
	Male/ female/ pregnancy	Male/female/ pregnancy	Male/female/ pregnancy	Male/female/ pregnancy	Male/female
Protein (g/day)	52g/37g	64g/46g	-	-	-
Dietary fibre (g/day)	-	-	30g/25g/28g	-	38g/28g
Thiamin (mg/day)	1mg/0.9mg/1.2mg	1.2mg/1.1mg/1.4mg	-	-	-
Riboflavin (mg/day)	1.1mg/0.9mg/1.2mg	1.3mg/1.1mg/1.4mg	-	-	-
Niacin (mg/day of niacin equivalents)	12mg/11mg/14mg	16mg/14mg/18mg	-	35mg/35mg/35mg	-
Vitamin C (mg)	30mg/30mg/40mg	45mg/45mg/60mg	-	-	220mg/190mg
Folate as dietary folate equivalents (µg/day)	320µg/320µg/520µg	400µg/400µg/600µg	-	1000µg/1000µg/1000µg	An additional 100-400µg dietary folate equivalents
Vitamin A (retinol equivalents) (µg/day)	625µg/500µg/550µg	900µg/700µg/800µg	-	3000µg/3000µg/3000µg	1500µg/1220µg
Sodium (mg/day)	-	-	460 - 920mg	2300mg/2300mg/2300mg	1600mg/1600mg
Potassium (mg/day)	-	-	3800mg/2800mg/2800mg	-	4700mg/4700mg
Magnesium (mg/day)	350mg/265mg/300mg	420mg/320mg/360mg	-	350mg/350mg/350mg	-
Calcium (mg/day)	840mg/1100mg/840mg	1000mg/1300mg/1000mg	-	2500mg/2500mg/2500mg	-
Phosphorous (mg/day)	580mg	1000mg	-	4000mg/4000mg/3500mg	-
Iron (mg/day)	6mg/5mg/22mg	8mg/8mg/27mg	-	45mg/45mg/45mg	-
Zinc (mg/day)	12mg/6.5mg/9mg	14mg/8mg/11mg	-	40mg/40mg/40mg	-
Long chain omega-3s (mg/day)	-	-	160mg/90mg/115mg	-	610mg/430mg
Linoleic acid (g/day)	-	-	13g/8g/10g	-	-
µ-linolenic acid (g/day)	-	-	1.3g/0.8g/1g	-	-

\*Daily nutrient level estimated to meet the requirements of half the healthy individuals in a particular life stage and gender group.  
 \*\*Average daily intake level that is sufficient to meet the requirements of nearly all (97-98%) healthy individuals in a particular life stage and gender group. \*\*\*Average daily nutrient intake level based on observed or experimentally-determined approximations or estimates of nutrient intake by a group (or groups) of apparently healthy people that are assumed to be adequate. \*\*\*\*Highest average daily nutrient intake level likely to pose no adverse health effects to almost all individuals in the general population.<sup>204</sup>



#### 4.2.4.3 Development of the 14-day meal planners

In the first stage of the nutritional modelling, 456 commonly consumed foods were chosen from the AUSTNUT database<sup>205</sup> and their energy and nutrient content was extracted using the FoodWorks program. Forty-six items were chosen for the 'breads and cereals' group, in which 15 were white/plain/refined options, 23 were wholegrain/wholemeal options and 6 were classed as 'other' (e.g. fruit bread and fruit scone). The numbers of food types (e.g. rice, bread, and rolls) in the 'breads and cereals' group were based on the percentage of these foods consumed by males and females aged 19 to 44 years from the 1995 National Nutrition Survey<sup>206</sup> (e.g. approximately 22% of the breads and cereals group was consumed as cereal/cereal products).

Fifty-seven items were chosen for the 'fruits' category in which 35 were fresh fruits, six canned, 11 dried and five fruit juices. Seventy-two vegetables were chosen and were subdivided into darker green vegetables (22), orange (6) and other (37). To increase folate and vitamin A intakes, a serve of darker green and orange vegetables were chosen on seven of the 14-days, with the remaining serves being randomly selected by the computer.

There were 56 options for the 'meat and alternatives' category in which 12 were red meat; seven were poultry; four eggs (e.g. boiled, scrambled, poached, raw); 16 legumes; and 17 nuts/seeds. Dairy products were categorised into a combined low fat (16) and medium fat (31) category and a high fat category (10 high fat cheeses). The numbers of food types (e.g. milk, yoghurt, and cheese) in the dairy group were based on the percentage of these foods consumed by males and females aged 19 to 44 years from the 1995 National Nutrition Survey<sup>206</sup> (e.g. 70% of dairy was consumed as milk).

There were 15 options for the 'unsaturated fats and oils' category and 89 options for 'extras' (high fat; high sugar; high fat/sugar; and saturated fats and oils). It should be noted that although some 'extras' are included in most diets, they have been minimised in the diets developed therein.

For CHD, arthritis and diabetic patients, nuts and seeds were separated from the meats and alternatives group to promote an increase in intake of healthy fats and zinc which may be reduced when replacing red meat with seafood. A serve (35g) of nuts and seeds were included on seven of the 14-days. High fat cheeses were limited to one serve (40g) per week; foods rich in saturated fat were eliminated from the 'extras' food group; and whole milks (including whole soy/evaporated/condensed milks) were eliminated from the milk, yoghurt and cheese group. For pregnancy, high fat cheese was limited to twice per week.

#### 4.2.4.4 Modelling of seafood within the 14-day meal planners

Eighty fish options (which also included various methods of cooking: e.g. salmon steamed/poached; salmon baked/cooked/grilled; salmon, raw) were categorised into 'high fat' (>0.6%, n=30; >550mg EPA+DHA), 'medium fat' (0.25-0.6%, n=22; 300-550mg EPA+DHA) and 'low fat' (<0.25%, n=28; <300mg EPA+DHA) (refer to Tables 4.13 to 4.16 in Section 4 - Appendices for further nutritional breakdown of these categories). A fourth category 'very high fat' ( $\geq 1.5\%$ , n=12; >1400mg EPA+DHA) was extrapolated from the 'high fat' category as there was an approximate 1000mg higher EPA+DHA content in salmon and trout compared to the other high fat options. This extra category enabled the target fatty acid intake to be met more effectively when running the optimisation model.

Seafood serving sizes used in the development of the meal plans are identified in Table 4.17.

Table 4.17: Serving sizes for seafood/fish.

Category	Measure	Quantity
<b>Fresh/cooked</b>		
Anchovies	6 thin fillets	30g
Clams/crabmeat		100g
Fish, fresh/raw		150g
Fish, steamed, poached, foil, boiled		170g
Fish, cooked in oil, baked, grilled, smoked		120g
Prawns, peeled, cooked	5-6 prawns	100g
Calamari (all types)		100g
Lobster (steamed, boiled)		170g
<b>Frozen</b>		
Fish fillet, plain		100g
Fish fillet, crumbed, breaded		70g
Fish fillet, salmon, crumbed		135g
Fish finger	4 fingers	100g
Fish cake	2 cakes	100g
Scallops		100g
Calamari/squid		100g
<b>Canned</b>		
Canned tuna		95g
Canned salmon		105g
Sardines		100g
Mussels/oysters		100g
<b>Other</b>		
Fish spread/paste	1 tablespoon	25g
Seafood stick/extender		70g
Smoked fish (salmon)	1 slice	12g
Fish meals (curry, bakes)		200
Marinara mix		100
Fish, roe (caviar), black	1 tablespoon	25g
Fish, roe (caviar), red	1 tablespoon	25g

#### 4.2.4.5 Optimisation and simulation

**Optimisation:** Optimisation is a process used to optimise an outcome (e.g. a target intake of EPA and DHA) based on various variables and constraints. A target intake was set for EPA and DHA for each of the populations (e.g. 8540mg EPA and DHA per fortnight for primary prevention of CHD for males) so the optimal intake of fish (e.g. servings per fortnight) could be determined. A 'constraint' was set where the serving size of fish was at least 90g; and the total number of servings was more than one and less than 42 (3 serves per day over 14 days). If these constraints were not set, 46 serves of 18g of fish may have been suggested as the 'optimal' intake, which is not practical. Ideally, a constraint for pregnancy should have been included so that no or limited 'high mercury fish' were chosen. Due to the lack of data on mercury in fish, this was not possible. Therefore only the 'very high fat', 'high fat', and 'medium fat' fish categories were included for this group as these fish are generally lower in mercury.

**Simulation:** Simulation tests the optimal model (described above) using iterations of foods. That is, the computer randomly selects the imputed number of daily serves for each food group (e.g. five serves of breads and cereals, and one serve of fish on one day; four serves of breads and cereals, and no fish on another day). This results in a mean intake of energy and nutrients for the whole day and for each food group.

Based on a 14-day menu (varying in the number of serves for each food group/day), the simulator process runs the varying combinations 1000 times (e.g. 1000 combinations of 5 items of breads and cereals from the 46-item category) to get a 14-day, mean energy and nutrient intake. Using this mean intake, it is possible to calculate the likelihood that an individual would meet nutrient recommendations.

#### 4.2.5 Results of simulations for seafood included in meal planners

The number of serves for each type of seafood was then included into a 14-day diet based on AGHE recommendations. The results of the simulations for CHD for males are described below (the same process was followed to develop the meal planner for CHD for females and for the rest of selected conditions).

##### 4.2.5.1 Optimisation

The recommended numbers of serves of seafood were determined using the optimisation process to achieve the recommended EPA and DHA intake (see Table 4.18).

*Table 4.18: Recommendations of EPA+DHA serves.*

	EPA+DHA recommendation (mg/day)	Number of serves				Total (g/fortnight)
		Very high fat	High fat	Medium fat	Low fat	
CHD - males	610	2.1	1	1	1	510

##### 4.2.5.2 Simulation

When this information was used in the simulation process (e.g. allowing the computer to randomly select two serves of very high fat fish and one serve of high, medium and low fat fish for CHD males), and for at least 90% (arbitrarily chosen) of the population to meet recommended intakes of EPA and DHA, the optimal intake of fish was often less than what was needed to meet recommendations (e.g. only 39% of the population would have met the 610mg per day requirement if this combination of seafood was chosen 1000 times). Therefore, the number and types of fish required was matched with recommendations of EPA and DHA intakes (see Table 4.19). The number of serves for each type of fish is shown below that would meet EPA and DHA intakes for more than 90% of the population:

*Table 4.19: Number of serves of seafood required to meet EPA+DHA recommendations.*

Total no. of serves	Number of serves			
	Very high fat	High fat	Medium fat	Low fat
4	4	0	0	0
5	4	0	0	1
6	4	0	0	2
7	3	2	1	1

Results indicated that including a high seafood diet into a diet based on the core food groups and that also meets nutrient intake recommendations, is achievable. Consuming fish 5-7 times per fortnight is therefore an appropriate way for target populations to meet fatty acid recommendations, as well as achieve core food group servings, without compensating nutrient intake or compromising energy intake.

#### 4.2.6 Simulation of 14-day menu meal planner

Results of the simulation for a 14-day diet for males at high risk of developing CHD or males who have CHD show that males would benefit from complimentary nutrition therapy that included three serves of very high fat fish and four serves of high fat fish per fortnight. Table 4.20 shows the number of serves and the percentage contribution to daily intake for nutrients from each of the food groups for males at high risk of CHD.

Table 4.20: Number of serves and % contribution for energy and nutrients from each of the food groups for males at high risk of CHD.

	Breads & cereals	Veg	Fruit	Milk, yoghurt, cheese	Seafood	Meat & alt	Nuts & seeds	Fats & oils	Extras
<b>Serves/day</b>	6	5	2.5	2.5	2.5	3	0.5	1	1
<b>Contribution (%)</b>									
Energy	32	8	9	16	7	10	5	5	8
Protein	20	9	3	23	16	23	3	0	4
Saturated fat	12	1	0	33	12	12	6	9	16
Fiber	33	28	20	1	0	10	4	0	2
Iron	28	21	8	3	13	18	4	0	4
Zinc	25	12	5	18	9	21	5	0	4
Calcium	9	10	5	59	8	6	1	0	2

The serving size equivalents used in this diet were: vegetables - 375g cooked vegetables; fruit - 2.5 pieces of medium fruit; meat and alternatives - 105g cooked meat; seafood - 75g cooked fish; and nuts and seeds - 18g.

Table 4.21 shows the Acceptable Macronutrient Distribution Range (AMDR), including the AMDR recommendations, the average AMDR from simulation, and the percentage of people who would meet the lowest AMDR recommendation.

Table 4.21: CHD Males - Acceptable Macronutrient Distribution Range (AMDR).

	Carbohydrate	Protein	Fat	Saturated fat
AMDR recommendations	45-65%	10-35%	20-35%	-
Average AMDR	48%	20%	28%	7%
% meeting lowest AMDR	74%	100%	99%	-

Tables 4.22 and 4.23 compare the mean intakes of nutrients from the optimal diets developed using nutritional simulated modelling with the estimated average requirements (EAR) recommended for Australians. Diets are examples of nutrient frameworks used to develop the menus for each condition. Using the EAR as a measure, it is estimated that an individual adult (male in this case) on the CHD meal plan would be likely to ingest between 88% and 100% of their estimated average nutrient requirements.

Table 4.22: CHD Males RDI - Recommended Dietary Intake (RDI) and Estimated Average Requirement (EAR).

	Sodium (mg)	Calcium (mg)	Iron (mg)	Zinc (mg)	n-3 (g)	Long-chain fatty acids (EPA+DHA+DPA)	ALA (g)
Average intake	2121	1371	15.9	14.2	1.57	878mg	0.58
RDI	-	82%	100%	48%	-	87% (610mg/day)	21%
EAR	-	96%	100%	88%	-	-	-

Table 4.23: CHD Males - Average energy and nutrient intakes, and % of people who would meet nutrient recommendations.

	Energy (kJ)	Protein (g)	CHO (g)	Fat (g)	Saturated fat (g)	PUFA (g)	MUFA (g)	Fibre (g)	Thiamine (mg)	Niacin equiv. (mg)	Vit A equiv. (µg)
Ave intake	8594	100.1	246.8	64.1	19.7	15.1	23.3	40.8	1.6	40.2	1333.9
% meeting RDI	-	100%	-	-	-	-	-	94% (AI)	70%	100%	78%
% meeting EAR	-	100%	-	-	-	-	-	-	97%	100%	92%

As discussed earlier, the remainder of the simulations for the chosen conditions followed a similar process (refer to Tables 4.24 to 4.48 in Section 4 - Appendices).

#### 4.2.7 Deduction of raw data into meal planners

The raw data were provided to CESSH for review and deduction into formats appropriate for the target groups. The process of developing 42 meals plus Snacks from the nutritional requirements provided for each condition was time consuming due to the large amount of data and the many possible nutrient combinations. It should be noted that there were recommendations in the simulated diets for high fat extras and alcohol. These were not included in the final 14-day meal planner as it was considered inappropriate to recommend these foods, particularly as the diets were designed for people at high risk of developing chronic conditions that are often associated with dietary restrictions of alcohol, foods high in saturated foods and sugars.

The resultant 14-day meal planners developed are provided in Tables 4.49 to 4.54.

The meal planners were reviewed by a research team, which included a nutritionist and a dietitian, for accuracy and compliance with nutritional recommendations and evidence to support the nutritional needs of each of the conditions under review.

Table 4.49: Arthritis meal planner - Day 1-14

Breakfast	Lunch	Dinner	Snacks
65g high-fibre breakfast cereal (Bran flakes); ¼ C RF milk	2 slices mixed grain bread; 1 tsp margarine; 30g turkey slice; 2 slices LF cheddar cheese; 75g mixed salad; 1 medium fruit	<b>Salmon</b> (1 tin, 105g), potato (100g); 75g each: broccoli, carrots, beans; 1 medium fruit; 1 tub RF yoghurt; Snack: 1 slice cake (70g)	1 medium fruit OR ½ C brazil nuts
65g high-fibre breakfast cereal; ¼ C RF milk	Wholemeal bread roll (90g); 1 tsp margarine; 75g mixed salad; 2 slices RF cheese; 1 medium fruit	120g cooked <b>rainbow trout</b> ; 150g broccoli; 75g each: beans, carrot; 20g butter; 1C drained tinned fruit; 1C LF custard	medium fruit OR 1 tub RF yoghurt
2 slices mixed grain bread; 2 boiled eggs, 2 rasher, grilled bacon; 4 slices tomato	Roast beef salad (65g lean beef, 1C salad leaves, 2C mixed vegetables, 2tbsp low-fat dressing) 1 medium fruit; ½ C mixed nuts/seeds	Risotto: 180g cooked rice; 1C spinach leaves; 75g each; beans; zucchini; carrot; 20ml olive oil; 1C LF custard, 1 medium fruit	1 tub RF yoghurt
65g 'own choice' cereal ¼ C RF milk	2 slices wholegrain bread; 1 tsp margarine; 2 <b>sardines</b> (30g); 75g salad vegetables; 1 medium fruit; 1 tub RF yoghurt	130g lean, cooked, beef steak; 300g mixed vegetables; 1 small dinner roll (30g); scoop LF ice-cream; 1 medium fruit	1 medium fruit OR 35g dried apricots
3 Weetbix; ¼ C RF milk; 5 prunes (40g)	Roast beef salad: 65g lean, cooked beef, 150g vegetable salad, 1tbsp low-fat dressing; 1C LF, flavoured milk OR 250ml dairy dessert; 1 med fruit	Mixed chicken and rice (100g lean chicken; 180g cooked rice; 150g pumpkin; 75g each: broccoli, carrot; 20g olive oil); 1 medium fruit	½ C walnuts OR 1 medium fruit
1 banana, 1 tub RF yoghurt	Soy bean and vegetable mix: 170g soy beans (canned, drained); 100g cabbage /coleslaw; 5 cherry tomatoes; 20ml coleslaw dressing, 1 medium fruit	170g steamed <b>bream</b> ; 120g cooked, spinach pasta; 2C mixed salad vegetables; scoop RF ice-cream; 1C drained tinned fruit	1 slice boiled, fruit cake (50g) OR 1 tub LF yoghurt OR 1 medium fruit;
¼ C dry oats; 1C RF iced-coffee/LF milk	2 Sushi rolls (vegetable, meat) 1 tub RF yoghurt; 1 medium fruit	Lamb and vegetable hot-pot (130g cooked, lean, lamb leg; 75g each: green beans; broccoli; carrot; 1 small potato; 1tbsp olive oil; stock; mixed herbs); scoop RF ice-cream; 1C fruit salad	½ C peanuts OR 1 medium fruit
65g high-fibre breakfast cereal; ¼ C RF milk	2 slices whole grain bread; 1 tsp margarine; 30g beef slice; 75g mixed salad; 2 slices RF cheese; 1 medium fruit	Warm <b>salmon</b> salad (120g grilled salmon, 120g cooked pasta; 1C salad leaves, 2C salad vegetables); 1C RF custard; 1C drained, tinned fruit	1 medium fruit OR 250ml RF dairy dessert
3 Weetbix; ¼ C RF milk; 5 prunes (40g)	Mixed grain roll; 1 tsp margarine; 75g mixed salad; 40g RF cheese; 1 medium fruit	120g grilled <b>mullet</b> ; 1 medium potato (140g); 75g zucchini; 75g carrot, 75g beans; 20g butter; 1 tub RF yoghurt; 1 medium fruit	1 medium fruit OR muesli bar (32g)
2 slices mixed grain bread; 2 boiled eggs; 2 rashers grilled bacon, 4 slices tomato	Potato salad (150g potato; 1C salad leaves, 2C salad vegetables; 2tbsp low-fat mayonnaise); 1 medium fruit	120g lean, cooked lamb; 150g broccoli; 90g cooked rice; 75g carrots; 75g beans; 20ml olive oil; 1C drained, tinned fruit; 1C RF custard	1 tub RF yoghurt
65g high-fibre breakfast cereal; 5 prune; ¼ C RF milk	2 slices wholegrain bread; 1 tsp margarine; 30g roast beef slice; 75g salad vegetables; 2 slices RF cheese; 1 medium fruit	170g steamed, <b>bream</b> ; 150g pumpkin; 75g each: broccoli; carrots; scoop RF ice-cream; 1 medium fruit	½ C walnuts OR 1 tub RF yoghurt
65g high-fibre breakfast cereal (e.g. bran flakes) ¼ C RF milk	Vegetable and bean soup (½ carrot; ½ stick celery; 3 cherry tomatoes; ½ onion; 75g beans; 250ml stock; mixed herbs); 1 slice bread with margarine; 1 tub RF yoghurt	Chicken bolognaise (85g (½ C) cooked, premium minced chicken; 75g each: carrot, onion, beans, corn; ½ can tinned tomatoes); 1 medium fruit	½ C brazil nuts OR medium fruit OR 250ml dairy dessert
2 wholemeal crumpets; 2tsp light margarine with jam/spread	Wholemeal pita; 1 tsp margarine; 30g ham; 4 slices tomato; 2 slices RF cheese; 1 medium fruit	130g grilled beef; ½ C (85g) drained soy beans; 2C mixed salad vegetables; 1C RF custard; 1C drained tinned fruit	1C LF, flavoured milk OR savoury crispbread (35g) OR ½ C nuts/ raisins
¼ C dry oats	3 rye crisp bread; 4 slices avocado (60g); 6 slices tomato; 8 slices cucumber; 2 slices RF cheese; 1 medium fruit; 250ml RF, dairy dessert	105g grilled lentil burger; 75g each: green beans; broccoli; carrot; 1 medium potato; scoop RF ice-cream; 2 small pieces of fruit	1C RF, flavoured milk OR 1 small slice cake (80g) OR 1 small fruit

Table 4.50: Coronary Heart Disease - Women meal planner - Day 1-14

Breakfast	Lunch	Dinner	Snacks
45g high-fibre breakfast cereal; ½ C LF milk	2 slices whole grain bread; 1tsp margarine; 30g turkey slice; 75g mixed salad; 1 medium fruit	120g Grilled/cooked <b>Bream</b> ; 120g cooked pasta; 75g each: broccoli, carrots, beans; 1 C drained, tinned fruit salad; 1C RF custard	1 tub RF yoghurt OR 1 medium fruit
45g high-fibre breakfast cereal; ½ C LF milk	Wholemeal bread roll; 75g mixed salad; 40g cottage cheese; 1 medium fruit	Stirfry: 100g cooked chicken breast (no skin); 75g each: zucchini; beans; carrot, onion; 20g olive oil; 1C RF dairy dessert; 1C drained, tinned fruit	1 tub RF yoghurt OR 1 medium fruit
2 slices mixed grain bread; 1 boiled egg, 50g lean, grilled ham; 4 slices grilled tomato	Roast beef salad (65g cooked, lean beef, 1C salad leaves, 1C mixed vegetables, 1tbsp low-fat dressing)	Risotto: 180g cooked rice; 1C spinach leaves; 75g each; zucchini; carrot; beans; 20g olive oil; 1C LF custard, 1 medium fruit	1 tub RF yoghurt OR 1 medium fruit
45g 'own choice' cereal; ½ C RF milk	2 slices wholegrain bread; 30g <b>smoked salmon</b> ; 75 salad vegetables; 1 tub RF yoghurt	130g lean, cooked, beef steak; 300g mixed vegetable salad; 20g oil; scoop LF ice-cream; 150g drained, tinned fruit	1 medium fruit
3 Weetbix; ½ C LF milk; 5 prunes (40g)	Mixed beans and salad: 85g mixed, drained beans, 150g vegetable salad, 1tbsp low-fat dressing; 1C LF flavoured milk	Fettuccini with pine nuts: 180g cooked fettuccini pasta; 20g pine nuts; 15g olive oil; 75g spinach; 2 mushrooms; 1C RF custard	1 medium fruit
1 banana, 1 tub RF yoghurt; ½ C walnuts	Chicken salad: 75g cooked, skinless chicken, 1C salad leaves; 2C mixed salad vegetables; 1tbsp LF dressing; 1 medium fruit	120g grilled <b>trout</b> ; 120g cooked rice; 2C mixed salad vegetables; scoop ice-cream; 1C drained tinned fruit	1C RF custard OR 1 medium fruit
½ C dry oats; 1C LF milk	4 rye crispbread, 2tsp margarine; ½ avocado; 6 slices tomato; 1 tub RF yoghurt	Vegetable and bean stew: 1C mixed beans (drained); 2 mushrooms; 75g green beans; 1 small potato; 1 small carrot; 1tbsp olive oil; scoop LF ice-cream; 1C drained tinned fruit	1 medium fruit
45g high-fibre breakfast cereal (e.g. bran flakes) ½ C LF milk	2 slices whole grain bread; 1tsp margarine; 30g beef slice; 75g mixed salad; 2 slices RF cheese; 1 medium fruit	Warm salmon salad: 120g grilled <b>salmon</b> , 120g cooked pasta; 2 mushrooms, 1C spinach, 75g carrots; 75g snow peas; slice home made banana cake (80g); 1 medium fruit	1 medium fruit OR 1 tub RF dairy dessert
3 Weetbix; ½ C RF milk; 5 prunes (40g)	Wholegrain bread roll; 1tsp margarine; 75g mixed salad; 2 slices RF cheddar cheese	100g cooked chicken (no skin); 1 medium potato; 150g pumpkin; 75g broccoli; 1 tub RF yoghurt; 1 medium fruit	1 medium fruit
2 slices mixed grain bread; 1 boiled egg; 4 slices tomato	Potato salad (1 large potato; 1C spinach, 1C salad vegetables; 2tbsp low-fat mayonnaise)	130g lean, cooked beef; 75g each broccoli; corn; carrot; beans; 1C drained, tinned fruit; 1C LF custard	1 tub RF yoghurt OR 1 medium fruit
45g high-fibre breakfast cereal (e.g. bran flakes); ½C LF milk	Wholemeal pita (70g); 1tsp margarine; 30g roast beef slice; 75g salad vegetables; 1 medium fruit	170g <b>steamed bream</b> ; 75g zucchini; 150g pumpkin; 75g broccoli; scoop RF ice-cream; 1C drained tinned fruit	1 tub RF yoghurt
2 wholemeal crumpets; 2tsp light margarine and honey/jam/spread	Vegetable and bean soup: ½ carrot; ½ stick celery; 3 cherry tomatoes; ½ onion; 85g beans (250ml stock, mixed herbs); 1C LF flavoured milk	Vegetarian paella: 180g cooked rice; 75g each: pumpkin, onion, zucchini, peas; scoop RF ice-cream; 1 medium fruit	1 medium fruit OR ½ C walnuts
1 banana; 1 tub RF yoghurt	Ham salad: 30g lean, salt-reduced ham, 1C salad leaves; 2C mixed salad vegetables; 2 slices RF cheese	170g steamed <b>bream</b> ; 120g cooked pasta; 2C mixed salad vegetables; 1C custard; 1 medium fruit; 35g dried fruit	½ C mixed nuts/ seeds OR 1 medium fruit
½ C dry oats; 1C LF milk	2 rye crispbread; 4 slices avocado (60g); 4 slices tomato; 6 slices cucumber; 1 tub RF yoghurt; 1 medium fruit	130g cooked, lean beef; 75g each: green beans; broccoli; carrot; 1 small potato; scoop RF ice-cream; 1 medium fruit	250ml LF dairy dessert OR 1 medium fruit

Table 4.51: Coronary Heart Disease - Men meal planner - Day 1-14

Breakfast	Lunch	Dinner	Snacks
65g high-fibre breakfast cereal (e.g. bran flakes) ¾ C LF milk	2 slices whole grain bread; 1 tsp margarine; 30g turkey slice; 2 slices RF cheese; 75g mixed salad vegetables; 1 medium fruit	130g Grilled/cooked lamb leg; 120g cooked pasta; 75g each: broccoli, carrots, beans; 1 medium fruit; 1 tub RF yoghurt	1 medium fruit OR ⅓ C walnuts
65g high-fibre cereal; ¾ C RF milk	2 slices whole grain bread; 75g mixed salad; 2 slices RF cheese; 1 fruit; muesli bar (32g)	120g cooked <b>rainbow trout</b> ; 1 small potato; 150g broccoli; 75g each: peas, carrot; 1C drained, tinned fruit; scoop RF ice-cream;	1 medium fruit OR 1 tub RF yoghurt
2 slices mixed grain bread; 2 boiled eggs, 2 small rasher grilled bacon; 4 slices tomato	Roast beef salad (65g cooked, lean beef, 1C salad leaves, 2C mixed vegetables, 2tbsp low-fat dressing); 1 medium fruit	Risotto: 180g cooked rice; 1C spinach leaves; 75g each; beans; zucchini; carrot; 20g margarine; 1C LF custard, 1 medium fruit	1C LF flavoured milk OR 250ml LF dairy dessert
65g 'own choice' cereal; ¾ C RF milk	2 slices wholegrain bread; 1tsp margarine; 30g <b>smoked salmon</b> ; 75g salad vegetables; 1 medium fruit; 1 tub RF yoghurt	130g lean, cooked, beef steak; 300g cooked vegetables; 20g olive oil; scoop LF ice-cream; 1C drained, tinned fruit	1 medium fruit OR ⅓ C walnuts
3 Weetbix; ¾ C RF milk; 5 prunes (40g)	Mixed beans and salad: 170g mixed, drained beans, 150g vegetable salad, 1tbsp low-fat dressing; 2 rye biscuits with margarine; 1C LF flavoured milk; 1 medium fruit	Fettuccini with pine nuts: 180g cooked fettuccini pasta; 20g pine nuts; 15g olive oil; 75g spinach; 75g zucchini; 2 mushrooms; 1 medium fruit	Yoghurt coated muesli bar (32g) OR 1 medium fruit
1 banana, 1 tub yoghurt; 1 weetbix	Chicken salad: 100g cooked, skinless chicken, 1C salad leaves; 2C mixed salad vegetables; 2tbsp LF dressing; 1 medium fruit	170g steamed <b>bream</b> ; 120g cooked rice; 2C mixed salad; scoop RF ice-cream; 1C drained tinned fruit	Slice boiled fruit cake (80g) OR 1 medium fruit
¾ C dry oats; 1C RF or LF milk	2 Sushi rolls (vegetable, meat) 1 tub RF yoghurt; 1 medium fruit	Lamb and vegetable hot-pot: 130g cooked, lean, lamb leg; 75g each: green beans; broccoli; carrot; 1 small potato; 1tbsp olive oil; scoop LF ice-cream; 1C drained, tinned fruit	1 medium fruit OR 35g mixed dried fruit
65g high-fibre breakfast cereal (e.g. bran flakes) ¾ C LF milk	2 slices whole grain bread; 1tsp margarine; 30g beef slice; 75g mixed salad; 2 slices RF cheese; 1 medium fruit	Warm salmon salad: 120g grilled <b>salmon</b> , 120g cooked pasta; 1C salad leaves, 2C salad vegetables; 1C RF custard; 1C drained, tinned fruit	1 medium fruit OR 1 tub RF yoghurt
3 Weetbix; ½ C RF milk; 5 prunes (40g)	Wholegrain bread roll; 75g mixed salad; 40g RF cottage cheese; 1 medium fruit; ⅓ C almonds	120g cooked, <b>mullet</b> (no skin); 1 medium potato; 75g corn; 75g carrot, 75g beans; 20g canola oil; scoop LF ice-cream; 1 medium fruit	1 tub RF yoghurt OR 2 Anzac biscuits
2 slices mixed grain bread; 2 boiled eggs; 2 rashers grilled bacon; 4 slices tomato	Potato salad (150g potato; 1C salad leaves, 2C salad vegetables; 2tbsp low-fat mayonnaise) 1 tub RF yoghurt	130g lean, cooked lamb; 150g broccoli; 75g each: corn; carrot; beans; 1C drained, tinned fruit; 1C RF custard	1C LF, flavoured milk OR 1 medium fruit
65g high-fibre breakfast cereal (e.g. bran flakes) ¾ C LF milk	2 slices wholegrain bread; 1tsp margarine; 30g roast beef slice; 75g salad vegetables; 2 slices RF cheese; 1 small fruit; 1 tub RF yoghurt	120g <b>trout</b> ; 150g pumpkin; 75g each: broccoli; carrots; corn; scoop LF ice-cream; 1C drained tinned fruit	1 small fruit; biscuit (35g) OR 1 medium fruit
65g high-fibre breakfast cereal (e.g. bran flakes) ¾ C LF milk	Vegetable and bean soup: ½ carrot; ½ stick celery; 3 cherry tomatoes; ½ onion; 75g beans (250ml stock, mixed herbs); 1 slice bread with margarine; 1 tub RF yoghurt	Beef bolognaise: 85g (½ C) cooked, premium, minced beef; 75g each: carrot, onion, zucchini, beans; 1 mushroom; ½ C (90g) tinned tomatoes; 20g oil; 1 medium fruit; 250ml RF dairy dessert	1C LF, flavoured milk OR 1 medium fruit OR ⅓ C mixed seeds
2 wholemeal crumpets; 2tsp light margarine and honey/jam/spread	Wholemeal pita; 1tsp margarine; 30g lean, leg ham; 75g salad vegetables; 40g RF cottage cheese; 1 fruit; muesli bar (32g)	120g grilled <b>salmon</b> ; 120g cooked pasta; 300g cooked vegetables; 1C RF custard; 1C drained tinned fruit	1 tub RF yoghurt OR 1 medium fruit
¾ C dry oats	3 rye crisp bread; 4 slices avocado (60g); 6 slices tomato; 8 slices cucumber; 2 slices RF cheese; 1 medium fruit; ⅓ C walnuts	105g grilled lentil burger; 75g each: green beans; broccoli; carrot; 1 medium potato; scoop ice-cream; 1 medium fruit	250ml RF dairy dessert OR Home-made, carrot cake (80g)



Table 4.52: Cancer meal planner - Day 1-14

Breakfast	Lunch	Dinner	Snacks
65g high-fibre breakfast cereal (e.g. bran flakes) ¾ C RF milk	2 slices mixed grain bread; 1 tsp margarine; 30g chicken slice; 2 slices LF cheddar cheese; 75g mixed salad; 4 dried apricot halves (15g)	Chicken stirfry (100g lean, cooked chicken; 75g each: snow peas, carrots, beans; 1C capsicum/mushroom; 20ml peanut oil); 1 medium fruit; 1 tub RF yoghurt; 1 slice apple cake (80g)	1 medium fruit OR ⅓ C mixed nuts/ seeds
65g high-fibre breakfast cereal; ¾ C RF milk	Wholemeal bread roll (90g); 1 tsp margarine; 75g mixed salad vegetables; 2 slices RF cheese 1 medium fruit	120g cooked <b>rainbow trout</b> ; 150g broccoli; 75g each: beans, carrot; 20ml olive oil; scoop LF ice-cream; 1C drained tinned fruit	1 medium fruit OR 1 tub RF yoghurt
2 slices mixed grain bread; 2 boiled eggs, 2 rashers grilled bacon; 4 slices tomato	Roast beef salad (80g cooked, lean beef, 1C salad leaves, 2C mixed vegetables, 2tbsp low-fat dressing); 1 medium fruit	Risotto (180g cooked rice; 1C spinach leaves; 75g each; capsicum, mushroom, carrot; 20g butter); 1C LF custard, 1 medium fruit	1 medium fruit OR 1 tub RF yoghurt
65g 'own choice' cereal; ¾ C RF milk	2 slices wholegrain bread; 1 tsp margarine; 30g roast beef; 75 salad vegetables; 1 medium fruit; 1 tub RF yoghurt	<b>100g oysters</b> ; 1 large potato (150g); 150g roast pumpkin; 75g each: broccoli, carrots; scoop LF ice-cream; 1C drained tinned fruit	1 medium fruit OR ⅓ C walnuts OR 1 medium fruit
3 Weetbix; ¾ C RF milk; 5 prunes (40g)	Mixed beans and salad: 85g mixed, drained beans, 150g vegetable salad, 2tbsp low-fat dressing; 1C LF, flavoured milk <b>OR</b> dairy dessert; 1 medium fruit	Mixed chicken and rice (100g lean chicken; 180g cooked rice; 150g pumpkin; 75g each: broccoli, carrot); 1 medium fruit	1 small fruit OR 250ml RF dairy dessert OR savoury crackers (35g)
1 banana; 1 tub RF yoghurt; 2 Weetbix	Ham + vegetable frittata (2 egg whites; 2 cherry tomatoes; 1 mushroom; 1C diced vegetables; 70g lean ham; mixed herbs; dash milk); 1 medium fruit	120g grilled <b>mullet</b> ; 120g cooked pasta; 2C mixed salad vegetables; scoop RF ice-cream; 1C drained tinned fruit	muesli bar OR 1 medium fruit OR 250ml RF dairy dessert
¾ C dry oats	2 Sushi rolls (vegetable, meat) 1 tub RF yoghurt; 1 medium fruit	105g grilled lentil burger; 75g each: green beans; broccoli; carrot; 1 medium potato; scoop RF ice-cream; 1C drained, tinned fruit;	1C RF iced-coffee or LF milk OR 1 medium fruit
65g high-fibre breakfast cereal (e.g. bran flakes) ¾ C RF milk	2 slices whole grain bread; 1 tsp margarine; 30g beef slice; 75g mixed salad; 2 slices RF cheese; 1 fruit-topped muesli bar (30g); 1 medium fruit	120g grilled <b>trevally</b> ; 120g cooked, pasta; 75g each: broccoli; pumpkin, carrot; 20ml olive oil; 1C RF custard; 1 medium fruit	1 medium fruit OR 1 tub RF yoghurt
3 Weetbix; ¾ C RF milk; 5 prunes (40g)	Mixed grain roll (90g); 1 tsp margarine; 75g mixed salad; 2 slices RF cheese; ⅓ C almonds	120g grilled <b>mullet</b> ; 1 medium potato (140g); 75g zucchini; 75g carrot, 75g beans; 20ml olive oil; 1 tub RF yoghurt; 1 medium fruit	1 medium fruit OR 1 tub RF yoghurt
2 slices mixed grain bread; 2 boiled eggs; 2 rashers grilled bacon; 4 slices tomato	Potato salad (150g potato; 1C salad leaves, 2C salad vegetables; 2tbsp low-fat mayonnaise); 1 medium fruit	Lamb and vegetable hot-pot (120g lean, lamb leg; 75g each: green beans, broccoli, carrot; 1 small potato; 1tbsp olive oil); 1C drained, tinned fruit; 1C RF custard	1 tub RF yoghurt
65g high-fibre breakfast cereal (e.g. bran flakes) ¾ C RF milk	2 slices wholegrain bread; 1 tsp margarine; 30g roast beef slice; 75g salad vegetables; 40g RF cheese; 1 medium fruit	170g steamed, <b>bream</b> ; 150g pumpkin; 75g each: broccoli; carrots; 1 small potato; scoop RF ice-cream; 1 medium fruit	⅓ C brazil nuts OR 1 tub RF yoghurt
65g high-fibre breakfast cereal (e.g. bran flakes); ¾ C RF milk	Vegetable and bean soup: ½ carrot; ½ stick celery; 3 cherry tomatoes; ½ onion; 75g beans (250ml stock, mixed herbs); 1 tub RF yoghurt	Beef bolognaise (85g (½ C) cooked, premium minced beef; 75g each: carrot, onion, beans, corn; ½ can tinned tomatoes; 2tbsp oil); 1 medium fruit	Rye crisp-bread (35g) with avocado (30g) OR 1 medium fruit
2 wholemeal crumpets; 2tsp light margarine with jam/spread	2 slices wholegrain bread; 1 tsp margarine; 30g ham; 4 slices tomato; 2 slices RF cheese; 1 medium fruit	120g grilled <b>salmon</b> ; 180g cooked, wild rice; 2C mixed salad vegetables; 1C RF custard; 1C drained tinned fruit	250ml dairy dessert OR 1C LF, flavoured milk OR 1 medium fruit
¾ C dry oats	3 rye crisp bread; 4 slices avocado (60g); tomato; cucumber; 1 medium fruit; 250ml RF, dairy dessert or 1C RF, flavoured milk	105g grilled lentil burger; 75g each: green beans, carrots; 150g broccoli; 1 medium potato; scoop RF ice-cream; 1 medium fruit	1 medium fruit OR 1 small slice cake (80g)

Table 4.53: Diabetes meal planner - Day 1-14

Breakfast	Lunch	Dinner	Snacks
65g high-fibre breakfast cereal (e.g. bran flakes) ¾ C RF milk	2 slices mixed grain bread; 1 tsp margarine; 30g turkey slice; 40g LF, salt-reduced cottage cheese; 75g mixed salad vegetables; 1 medium fruit	<b>Tuna</b> (1 tin, 95g), potato (100g); 75g each: broccoli, carrots, beans; 1 medium fruit; 1 tub artif. sweetened yoghurt	1 medium fruit OR ⅓ C walnuts OR 2 rye crispbread (35g)
65g high-fibre breakfast cereal; ¾ C RF milk	Wholemeal bread roll; 1 tsp marg; 75g mixed salad; 2 slices RF cheese; 1 tub artif. sweetened yoghurt; 1 med fruit	120g cooked <b>rainbow trout</b> ; 150g broccoli; 75g each: beans, carrot; zucchini; 20ml canola oil; 1 medium fruit; 4 squares carob chocolate	1 medium fruit
2 slices mixed grain bread; 2 boiled eggs, 2 rashers grilled bacon; 4 slices tomato	Roast beef salad (65g lean beef, 1C salad leaves, 2C mixed vegetables, 2tbsp low-fat dressing); 1 medium fruit	Risotto: 180g cooked rice; 1C spinach leaves; 75g each; corn; zucchini; carrot; 20g butter; 1C LF custard, 1 medium fruit	1 tub artif. sweetened yoghurt
65g 'own choice' cereal ¾ C RF milk	2 slices wholegrain bread; 1 tsp margarine; 30g <b>smoked salmon</b> ; 75gm salad vegetables; 1 medium fruit; 1 tub artif. sweetened yoghurt	130g lean, cooked, beef steak; 300g mixed vegetables; 20g butter; scoop LF ice-cream; 1C drained, tinned fruit	1 medium fruit
3 Weetbix; 125ml RF milk; 5 prunes (40g)	Mixed beans and salad: 170g mixed, drained beans, 150g vegetable salad, 1tbsp low-fat dressing; 1C LF milk; 1 medium fruit	Fettuccini with pine nuts (180g cooked fettuccini pasta; 20g pine nuts; 15g olive oil; 75g spinach; 75g zucchini; 2 mushrooms); 1C drained, tinned fruit with 2tbsp unsweetened cream	1 medium fruit OR 3 SAO biscuits
1 banana, 1 tub artif. sweetened yoghurt; 1 Weetbix	Chicken salad: 100g cooked, skinless chicken, 1C salad leaves; 2C mixed salad vegetables; 1tablespoon LF dressing; 1 medium fruit	170g steamed <b>bream</b> ; 120g cooked rice; 2C mixed salad vegetables; scoop RF ice-cream; 1C drained tinned fruit	Bran + fruit muffin (80g) OR 1C RF custard OR ⅓ C walnuts
¾ C dry oats; 250ml RF iced-coffee or LF milk	2 sushi rolls (vegetable, meat); 1 tub artif. sweetened yoghurt; 1 medium fruit	Lamb and vegetable hot-pot (130g cooked, lean, lamb leg; 75g each: green beans, broccoli, carrot; 1 small potato; 1tbsp olive oil; (stock, mixed herbs); 2 rye crispbread; unsweetened cream and jam	⅓ C peanuts OR 1 medium fruit
65g high-fibre breakfast cereal (e.g. bran flakes) ¾ C RF milk	2 slices whole grain bread; 1 tsp margarine; 30g beef slice; 75g mixed salad; 40g RF and salt, cottage cheese; 1 medium fruit	Warm barramundi salad (120g grilled <b>barramundi</b> ; 120g cooked pasta; 1C salad leaves; 2C salad vegetables; 2tbsp artif. sweetened dressing); 1C RF custard; 1C drained, tinned fruit	1 medium fruit OR 1 tub artif. sweetened yoghurt
3 Weetbix; ¾ C RF milk; 5 prunes (40g)	2 slices rye bread; 1 tsp margarine; 75g mixed salad; 40g RF/salt cottage cheese; 1 medium fruit; ⅓ C walnuts	130g lean beef steak; 1 medium potato (140g); 75g zucchini; 75g carrot, 75g beans; 20ml olive oil; 1 tub artif. sweetened yoghurt; 1 medium fruit	1medium fruit OR 2 high fibre biscuits (35g)
2 slices mixed grain bread; 2 boiled eggs; 2 rashers grilled bacon; 4 slices tomato	Potato salad (150g potato; 1C salad leaves, 2C salad vegetables; 2tbsp low-fat mayonnaise); 1 medium fruit	130g lean, cooked lamb; 150g broccoli; 120g cooked rice; 75g carrots; 75g beans; 20g butter; 1C drained, tinned fruit; 1C RF custard	250ml RF dairy dessert
65g high-fibre breakfast cereal (e.g. bran flakes) ¾ C RF milk	2 slices wholegrain bread; 1 tsp margarine; 30g roast beef slice; 75g salad vegetables; 2 slices RF cheese; 1 medium fruit	170g steamed <b>bream</b> ; 150g pumpkin; 150g cauliflower; 75g each: broccoli; zucchini; 4 Vita-Wheat with unsweetened cream and jam	1 medium fruit OR 1 tub artif. sw. yoghurt; OR ⅓ C mixed nuts/seeds
65g high-fibre breakfast cereal (e.g. bran flakes) ¾ C RF milk	Vegetable and bean soup: ½ carrot; ½ stick celery; 3 cherry tomatoes; ½ onion; 75g beans (250ml stock, mixed herbs); 1 slice bread with margarine; 1 tub artif. sweetened yoghurt	Chicken bolognaise (85g (½ C) cooked, premium minced chicken; 75g each: carrot, onion, zucchini, corn; ½ can tinned tomatoes); 1 medium fruit; 250ml RF dairy dessert	1 medium fruit 2 rice cakes with rye (25g)
2 wholemeal crumpets; 2tsp light margarine and low joule jam/ spread	2 slices wholegrain bread; 1tsp margarine; 30g ham; 75g salad vegetables; 2 slices RF/salt cheese; 1 medium fruit	120g grilled <b>salmon</b> ; 120g cooked pasta; 2C mixed salad vegetables; 20g butter; 1C RF custard; 1C drained tinned fruit	1C RF, flavoured milk OR ⅓ C nuts/ seeds
¾ C dry oats	2 rye crisp bread; 4 slices avocado (60g); 1 medium fruit; Bran + fruit muffin (80g)	105g grilled lentil burger; 75g each: green beans; broccoli; carrot; 1 medium potato; scoop RF ice-cream; 2 small pieces of fruit	250ml RF dairy dessert OR 1C RF milk OR 1 medium fruit OR 3 SAO biscuits with marg

Table 4.54: Pregnancy meal planner - Day 1-14

Breakfast	Lunch	Dinner	Snacks
45g high-fibre breakfast cereal (e.g. bran flakes) ½ C LF milk	2 slices whole grain bread; 1tsp margarine, 30g turkey slice; 2 slices LF cheese; 1C mixed salad vegetables; 1 medium fruit	120g Grilled/cooked <b>Bream</b> ; 120g cooked pasta; 75g each: broccoli, spinach, carrot; 1C LF custard; 1C drained, tinned fruit	1 medium fruit OR tub yoghurt
45g high-fibre breakfast cereal; ½ C LF milk	Wholemeal bread roll; 1tsp margarine; 1C mixed salad; 2 slices LF cheddar cheese; 1 medium fruit	Stirfry: 120g cooked chicken breast (no skin); 150g broccoli; 10-12beans (75g); 75g carrots; 4 squares dark chocolate (60g)	1 tub RF yoghurt OR 1 medium fruit
2 slices mixed grain bread; 2 boiled egg; 4 slices tomato	Roast beef salad (65g cooked, lean beef, 1C salad leaves, 1C mixed vegetables, 2tbsp low-fat dressing); 1 medium fruit	Risotto (1C cooked rice; 1C spinach leaves; 75g each: zucchini, carrot, peas); 1 tub RF yoghurt OR 1C LF custard with 1 medium fruit	30g mixed nuts
45g 'own choice' cereal ½ C LF milk	2 slices wholegrain bread; 30g <b>smoked salmon</b> ; 75g salad vegetables; 1 tub RF yoghurt	130g lean, cooked, beef steak; 3C salad vegetables (include 1 serve of green vegetables - e.g. 75g snow peas); 1C drained tinned fruit; scoop LF ice cream	1 medium fruit OR 1C dairy dessert
3 Weetbix; 125ml LF milk; 5 prunes (40g)	Roast beef salad (65g cooked, lean beef, 1C salad leaves, 1C mixed vegetables, 2tbsp low-fat dressing); 1 tub RF yoghurt	Fettuccini with pine nuts (180g cooked fettuccini pasta; 20g pine nuts; 15g olive oil; 75g spinach; 2 mushrooms); 1 medium fruit; scoop LF ice-cream	1 medium fruit
1 banana, 1 tub yoghurt; ½ C walnuts	Chicken salad (75g cooked, skinless chicken, 1C salad leaves; 1C mixed salad vegetables; 1tbsp LF dressing)	120g grilled <b>trout</b> ; 90g cooked pasta; 2C mixed salad; 75g broccoli; scoop LF ice-cream; 1C drained, tinned fruit	Muesli bar (32g) OR 1 medium fruit
½ C dry oats; ¼ C milk	2 slices wholemeal bread; 1tsp margarine; 30g roast beef; 75g salad vegetables; 1 medium fresh fruit; ½ C almonds	Vegetable and bean stew (1C mixed beans/legumes (drained); 2 mushrooms; 75g green beans; 1 small potato; 1 small carrot; 1tbsp olive oil); scoop ice-cream; 1C drained tinned fruit	1 tub RF yoghurt OR 1C LF, flavoured milk
45g high-fibre breakfast cereal (e.g. bran flakes) ½ C LF milk	2 slices whole grain bread; 1tsp margarine; 30g beef slice; 75g mixed salad; 2 slices RF cheese; 1 medium fruit	Warm salmon salad (120g grilled <b>salmon</b> , 120g cooked pasta; 2 mushrooms, 1C spinach, 75g carrots; 75g snow peas); 1C LF custard; 1 medium fruit;	1 medium fruit OR 1 tub RF yoghurt
3 Weetbix; ½ C LF milk; 5 prunes (40g)	Wholegrain bread roll; 1tsp margarine; 75g mixed salad; 2 slices RF cheese; 1 medium fruit	100g cooked chicken (no skin); 75g corn; 150g pumpkin; 150g broccoli; 1 slice home-made banana cake (80g)	1 medium fruit OR 1C RF dairy dessert
2 slices mixed grain bread; 1 boiled egg; 50g grilled, lean bacon; 4 slices tomato	Potato salad (150g potato; 1C spinach, 2C salad vegetables; 2tbsp low-fat mayonnaise); 1 med fruit	130g lean, cooked beef; 150g broccoli; 75g carrot; 75g green beans; 1 medium fruit; 1 C RF custard	1 tub RF yoghurt OR 1C LF, flavoured milk
45g un-toasted muesli ½ C LF milk	Wholemeal pita; 1 tsp margarine; 30g roast beef slice; 75g salad vegetables; 2 slices RF cheese; 1 medium fruit	Pork stirfry (100g cooked pork; 2 mushrooms; 1C spinach; 75g each: zucchini, onion, carrot; 2tbsp marinade); scoop RF ice-cream; 150g drained, tinned fruit	250ml RF dairy dessert
2 wholemeal crumpets; 2tsp light margarine and honey/jam/spread	Vegetable and bean soup: ½ carrot; ½ stick celery; 3 cherry tomatoes; ½ onion; 85g beans (250ml stock, mixed herbs); 1C LF, flavoured milk OR yoghurt	Vegetarian paella (180g cooked rice; 75g each: pumpkin, onion, zucchini, peas); 4 squares dark chocolate plus one medium fruit	250ml RF dairy dessert OR 1 medium fruit
1 banana; 1 tub yoghurt; ½ C mixed nuts/seeds	Ham salad: 30g lean, salt-reduced ham, 1C salad leaves; 2C mixed salad vegetables; 2 slices RF cheese; 1 medium fruit	170g steamed <b>bream</b> ; 120g cooked pasta; 150g broccoli; 75g green beans; scoop RF ice-cream; 1C drained tinned fruit	1C RF flavoured milk
½ C dry oats; 1C LF milk	2 rye crispbread; 4 slices avocado; 4 slices tomato; 6 slices cucumber; 1 tub RF yoghurt; 1 medium fresh fruit	Lamb and vegetable hot-pot (130g lean, lamb leg; 150g broccoli; 75g each: green beans, carrot; 1 small potato; 1tbsp olive oil); scoop RF ice-cream; 1 medium fruit	1 medium fruit OR 50ml RF dairy dessert

### 4.3 Development of Seafood and Health booklets for GPs and AHPs

Evidence from the literature review, the review of resources, and the nutritional modelling was amalgamated into a series of resources for each of the chosen conditions: arthritis, some cancers, coronary heart disease, and diabetes, plus the nutritional intake during pregnancy. Each resource provides basic information about the condition and how a balanced diet high in seafood could provide health benefits. They also include information about healthy diet choices, and include suggested 14-day meal planners tailored to meet the nutrient needs of each condition. The format was tested with members of the target groups and the final booklets were printed in A5 size. All resources were written to the level of English appropriate to each target group, using the SMOG Readability Index.<sup>207</sup>

During July/August 2010, the resource booklets were further reviewed by 65 health professionals and modified based on their feedback. The main changes related to a request for more explanation around the methods used to develop the 14-day planners and the suggested nutrition intake for each diet presented in 'restaurant menu style' format. Several pages of the 'Seafood and Health' booklet for diabetes are shown in Figures 4.1 to 4.4 to illustrate the format of the booklet series.



Figure 4.1: 'Seafood and Health' booklets



## Contents

Seafood and your health	2
How can seafood help with diabetes?	3
How much seafood do I need to stay healthy?	3
Omega-3s	4
How much omega-3?	4
Which fish to choose?	5

### Food guide

14-day meal planner	6 - 7
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2

## Seafood and your health

Evidence shows that eating a balanced diet high in seafood will reduce your risk of some chronic conditions, or help you manage your symptoms.

This booklet will help guide your food choices and includes a 14-day meal planner specifically designed for people who are at high risk, or who have diabetes that is related to diet (commonly called Type 2).

## How can seafood help with diabetes?

A healthy diet can help you manage your weight and may help prevent type 2 diabetes. If you already have diabetes, a healthy diet can help you manage your condition. Diabetes may also increase your risk of other chronic conditions such as heart disease.

fatty acids in oily fish can actually help to prevent coronary heart disease. In addition to omega-3s, seafood contains many other nutrients beneficial to health, including selenium, iodine, zinc, calcium and vitamin D.

It's also low in saturated fat, high in protein, and a good source of energy.

Selecting seafood is also a smart choice for lowering cholesterol, and the omega-3

<b>Iron</b>	Iron is important for maintaining energy levels and a strong immune system. Mussels, oysters and tinned sardines are good sources of iron.
<b>Iodine</b>	Iodine is important for growth and seafood is the best natural source of iodine. Oysters, mussels and scallops are good sources of iodine.
<b>Folate</b>	Folate aids the prevention of neural tube defects in growing babies. Oysters and mussels are sources of folate.
<b>Vitamin B12</b>	Vitamin B12 helps the brain to work normally. Sardines, mussels and tuna are good sources of vitamin B12.
<b>Vitamin D</b>	Vitamin D is good for the immune system and strong bones and muscles. Australian salmon, Atlantic salmon and tuna are good sources of vitamin D.
<b>Vitamins A and E</b>	Vitamins A and E are powerful antioxidants which help the immune system and eye health. Mussels are the richest seafood source of vitamin A. Atlantic salmon and sardines are good sources of vitamin E.
<b>Calcium</b>	Calcium is important for maintaining healthy teeth and bones. Australian salmon and sardines are rich sources of calcium.

## How much seafood do I need to stay healthy?

Evidence suggests that we should aim to consume 600mg of omega-3s per day for men, and 500mg for women.

Some types of seafood contain higher levels of omega-3s than others so the number of serves of seafood you need to eat each week to maintain good health depends on the type of seafood you eat. Generally, one serve of seafood is around 150g.



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Figure 4.2: 'Seafood and Health' booklet for diabetes - table of contents and health benefits of seafood.

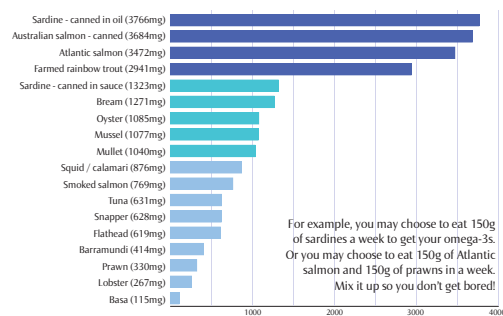


## Omega-3s

Omega-3 fatty acids (omega-3s) are essential to our health. Our bodies cannot produce these fatty acids and so we need to eat foods that contain them. The best source of omega-3s is seafood. In fact, the regular intake of omega-3s as part of a healthy diet provides health benefits for conditions such as diabetes, heart disease, arthritis and some cancers.

## How much omega-3?

Adults should aim to include 3500 - 4000mg of omega-3s in their diet each week. This table shows you how much omega-3 is in a 150g serve of a variety of fish and seafood:



For example, you may choose to eat 150g of sardines a week to get your omega-3s. Or you may choose to eat 150g of Atlantic salmon and 150g of prawns in a week. Mix it up so you don't get bored!

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## Which fish to choose?

Examples of seafood that are excellent, very good, or good sources of omega-3s.

A	B	C
Excellent sources of omega-3s	Very good sources of omega-3s	Good sources of omega-3s
Atlantic salmon	Bream	Barramundi
Trout	Mussels	Snapper
Sardines	Oysters	Smoked salmon
Canned salmon	Mullet	Canned tuna



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Figure 4.3: 'Seafood and Health' booklet for diabetes - omega-3 content of selected seafood.

## 14-day meal planner

This 14-day meal planner has been developed with a dietitian for people at high risk of developing diabetes or who already have diabetes that is related to diet.

### Menu suggestion: week one (Choose one item for each meal)

#### Breakfast

Cereal and reduced fat milk  
Poached eggs on toast  
Egg white omelette with smoked salmon

#### Lunch

Tuna bean salad  
Canned salmon salad  
Tuna Caesar wraps  
Tuna and green bean sushi rolls

#### Dinner

Grilled tuna steak with parmesan potatoes and vegetables  
Grilled trout with BBQ vegetables  
Simple fish in green curry  
Garlic prawn skewers

#### Dessert

Fruit (2 pieces)  
Low fat yoghurt (200ml tub)  
Small bowl of low fat ice-cream  
A handful of nuts



### Menu suggestion: week two (Choose one item for each meal)

#### Breakfast

Cereal and reduced fat milk  
Sardines on toast  
Boiled eggs and tomato slices on toast

#### Lunch

Tuna and salad roll  
Potato salad  
Coleslaw and bean salad  
Caesar salad (no dressing)  
Smoked salmon sushi rolls

#### Dinner

Baked barra fillets with chunky mushroom, tomato and basil sauce  
Steamed bream with honeyed vegetables  
Curried fish in foil with julienne vegetables  
Salmon pasta with fresh garden salad

#### Dessert

Fruit (2 pieces)  
Small bowl of low fat custard  
Low fat yoghurt (200ml tub)  
A handful of nuts



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Figure 4.4: 'Seafood and Health' booklet for diabetes - 14-day meal planner.

### 4.3.1 Guide to Manual

A user manual to support the 'Seafood and Health' series of nutrition education resources was developed to assist health professionals with the management of patient nutrition (see Figures 4.5 to 4.7). The manual was designed to provide GPs and other health professionals with more detailed information about the evidence on which the resources were developed and suggestions of how to use the user manual effectively with patients or clients. The manual includes a summary of the evidence supporting nutritional intervention for each condition plus an extended version of the nutritional composition of each of the 14-day meal planners. Nutritionally modelled diets are included to support the maintenance of patients' overall health.

This manual is designed to be used with the 'Seafood and Health' booklet series to help GPs and AHPs to assess and make health recommendations for patients.

### 4.3.2 Summary

In summary, the 'Seafood and Health' booklets were designed for patients to use at home to assist them to make better dietary choices and include consumption of seafood in line with current recommendations for optimal health benefit. The GP/AHP User Manual was designed to assist health professionals with the prevention or management of health conditions that would benefit from complementary nutritional therapies. The extended dietary information provided in the GP/AHP User Manual was provided to allow practitioners to modify the suggested 14-day planners by substituting meals or components of the dietary plan with foods that have the same nutritional value, thus ensuring the evidence-based dietary modelling outcomes are not compromised.



Figure 4.5: 'Seafood and Health GP/AHP User Manual'





# Section 5

## Point of sale consumer messages

## 5.0 Introduction

There has been much written about the importance of tailoring point of sale (POS) messages for consumers. The main function of POS messages, beyond simply marketing products, is to emphasise points of difference, inform consumers about specific benefits, and increase market share. POS resources may also be used, as in this case, to provide a health message based on current national dietary recommendations and guidelines.

This section reports on a supermarket and media audit of health messages relating to seafood and the development of POS messages for consumers.

## 5.1 Supermarket and media audit of health messages relating to seafood

### 5.1.1 Introduction

A brief observational supermarket audit was conducted to determine what, if any, health messages were being displayed near seafood products on supermarket shelves. A research assistant visited a total of 18 shopping districts in the Perth metropolitan area during January 2009 to record the number and type of health messages that were available for consumers, as well as other messages displayed near fish and seafood products. Messages displayed near meat and poultry products were also recorded. In addition, a brief literature search was conducted to determine what seafood related health messages had appeared in locally available print media in the six months prior to the supermarket audit (1 July 2008 to 31 Dec 2008).

### 5.1.2 Supermarket Audit

#### 5.1.2.1 Methods and sample

Using data from the Australian Bureau of Statistics (ABS), a sample of eight shopping centres were selected, four from economically 'advantaged' suburbs and four from 'disadvantaged' suburbs. These suburbs were then mapped, and using visual representation a further 10 shopping centres were chosen from other Perth metropolitan suburbs (See Figure 5.1). These centres were grouped geographically and a schedule was developed to ensure efficiency.

The types of retailers visited were categorised into three groups. Large supermarkets such as Coles or Woolworths were grouped as 'majors'. Large independent retailers, such as Supa IGA or Farmer Jack's, were grouped as 'independents'. Fish outlets (stores that sold only fish and seafood products) were grouped as 'fish retailers'.

#### 5.1.2.2 Audit instrument

Prior to conducting the supermarket audits, a brief audit questionnaire was developed to record any health messages displayed near fish or seafood products, as well as any other messages displayed near these products. Where available, the price of a pre-determined selection of Australian seafood was also recorded.



Figure 5.1 Audited locations in the Perth metropolitan area.

### 5.1.2.3 Results

#### 5.1.2.3.1 Demographics

A total of 18 shopping districts were visited resulting in 43 retailer audits. Of these, 28 retailers were major supermarkets, five were independent supermarkets, and 10 were fish retailers.

#### 5.1.2.3.2 Health messages

Of the 43 outlets audited, 30% (n=13) displayed some kind of health message near fish or seafood products. Of these 13 outlets, one was a major supermarket, four were independent supermarkets and eight were fish retailers.

There were 20 health messages relating to fish or seafood products observed (see Tables 5.1 - 5.4 in Section 5 - Appendices). Of the 20 messages, almost half (n=9) described specific health benefits linked to omega-3 consumption. A further four messages referred to omega-3 without being specific about health benefits associated with consumption. Six messages made reference to fish or seafood being a healthy food choice, and one resource linked fish consumption to specific health benefits. These messages included information such as:

- 'It is now well established that, in general, people who eat fish regularly live longer, healthier lives.' (Major)
- 'Fresh oily fish is associated with reduced asthma risk in children.' (Fish retailer)
- 'Look after your health and treat your tastebuds with these quick and easy recipes' (Fish retailer)
- 'Omega 3 helps prevent coronary heart disease, high blood pressure, rheumatoid arthritis and other disorders.' (Fish retailer)
- 'Seafood is an important part of a healthy diet and becoming the food of choice for the health conscious.' (Fish retailer, major)
- 'Omega 3's are essential to life and good health. Important for the brain and nervous system. Hence fish really is brain food.' (Fish retailer, major)

Other, more generic health messages included:

- 'Healthy heart needs fish' (Fish retailer)
- 'Live Longer Eat Seafood' (Fish retailer)
- 'Large serves of chicken, pork and fish are a great alternative to red meat' (Independent)
- 'Seafood! Eat your way to better health with Omega 3' (Fish retailer)

#### 5.1.2.3.3 Other messages

Of the 43 retailers audited, 39 (91%) displayed a non-health related message near fish or seafood products. Of that 39, 26 retailers (67%) were major supermarkets, nine were fish retailers (23%) and four (10%) were independent supermarkets. There were 32 seafood related messages and seven non-seafood related messages.

##### 5.1.2.3.3.1 Seafood related messages

Of the 32 seafood related messages, 12 were promotions or messages placed by the retailer. The most commonly occurring seafood related message was generic signage or images designed to promote seafood (n=16 retailers). These included pictures such as cooked salmon or prawns. A further eight retailers displayed other generic fish or seafood images; however these were branded with the retailer's slogan. Six retailers promoted fish or seafood specials with signage. Three retailers linked fish or seafood items with Australia Day by displaying banners or flags near these items. Only one message promoted a specific branded product (see Table 5.5 in Section 5 - Appendices).

Nine messages were produced by industry related sources. These messages varied, but included promotions of specific products and recipes which used seafood products (see Table 5.6 in Section 5 - Appendices). A further nine messages related to the promotion of specific fish or seafood products, and were produced either by retailers or fish/seafood companies. The most common of these messages was produced by 'John West' (see Table 5.7 in Section 5 - Appendices).

Finally, there were two other messages displayed near fish products. One was produced by an animal rights group, and the other was a newspaper feature which included seafood recipes (see Table 5.8 in Section 5 - Appendices).

#### 5.1.2.3.3.2 Non-seafood related messages

Of the seven non-seafood related messages displayed near fish or seafood products, all were most likely placed by the retailer. The range of products promoted included petrol, credit cards, and deli products and services. There were also several warning messages, reminding customers to watch their belongings or to be aware of security cameras in the area (see Table 5.9 in Section 5 - Appendices).

#### 5.1.2.3.4 Fish oil products

The audit also included a review of resources available near the nutritional supplements section of supermarkets. One company produced three resources which contained information on the health benefits of fish oil and omega-3 and other minerals which occur naturally in seafood, such as iodine and selenium. One resource in particular highlighted the benefits of using a fish oil supplement, as well as outlining the health benefits of omega-3. A health food store was also visited. Resources were available in printed form, as was a poster outlining some health benefits of omega-3 fish oil tablets.

#### 5.1.2.3.5 Cooking demonstrations

A total of five outlets were conducting food or cooking demonstrations at the time of the audit. Three of these were major supermarkets, one was an independent supermarket and one was a fish retailer. Three of the demonstrations involved seafood products. The seafood products were shark, golden trevally and salmon.

#### 5.1.2.3.6 Other foods

Twenty-nine outlets (67%) displayed prominent messages near meat or poultry products. Of those 29, 24 outlets were major supermarkets and five were independent supermarkets. The types of message varied by retailer; as with the seafood messages, some were specifically promoting a certain food product, and other messages bore no relation to the product near which they were placed. Figure 5.2 shows a seafood health message placed near meat products:



*Figure 5.2: Seafood health message placed near meat products.*

In particular, certain brands or products were promoted at particular outlets. In addition, outlets also promoted certain items with their own branding, for example, meat for Australia Day (see Figure 5.3). Another common message was the 'Buy West Eat Best' campaign, observed at 10 outlets.



Figure 5.3: Australia Day promotional materials placed near meat products.

Messages near other foods found in major and independent supermarkets are presented in Tables 5.10 to 5.12 presented in Chapter 5 - Appendices.

#### 5.1.2.3.7 Price comparison

Where possible, prices were recorded for Australian salmon, Australian mussels and Australian prawns. Results are presented in Table 5.13.

Table 5.13: Cost comparison of Australian Seafood (price/kg)

	Salmon	Prawns - Banana	Prawns - Tiger	Prawns - King	Mussels
Supermarket	\$27.90 (skin off) - \$34.98 (skin on)	\$13.88 - \$20.99	\$22.88 - \$30.99	\$22.49 - \$24.99	\$5.99 - \$7.99
Independent Supermarket	n/a	\$17.99	\$26.95 - \$38.99	n/a	\$4.99 - \$5.99
Fish retailer	\$23.99 - \$39.99	n/a	\$18.99 - \$36.95	\$35.99	\$5.95 - \$5.99

### 5.1.3 Media review

#### 5.1.3.1 Methods

The Factiva database was searched for articles that appeared in The West Australian (TWA), Sunday Times (ST) or The Australian (TA) newspapers between 1st July 2008 and 31st December 2008 containing the terms 'seafood' or 'fish'. The search retrieved 244 matches, with 11 articles related to health risks and benefits associated with seafood (in general or a specific variety/species). The same newspapers were searched for articles containing the term 'omega-3'. A total of 22 articles were retrieved, 18 of which related to health.

## 5.1.3.2 Results

### 5.1.3.2.1 Risks/Negative messages

The risk/negative messages identified were:

- Fish farmed in China may contain melamine. (TWA)
- Eczema sufferers should avoid seafood, as these may be reactive. (TWA)
- Esperance shellfish may be contaminated with lead. A Conservation Council spokesman is concerned contamination may have spread to other seafood. The Health Department stated that it had a longstanding warning against people eating shellfish collected in developed areas. (1xTA, 1xTWA)
- Hemp oils contain a better balance of fatty acids than fish oil. (TWA)
- Fish at seafood van at Royal Show is cooked in vegetable oil - which contains essential omega-3 fatty acids. (TWA)
- Children may be deficient in omega-3. (TWA)

### 5.1.3.2.2 Benefits/Positive messages

The benefits/positive messages identified were:

- A low GI diet which includes seafood may reduce acne. (1xTWA, 1x ST)
- Fish oil (in combination with other ingredients) is recommended for babies delivered by caesarean section to prevent eczema. (TWA)
- Seafood Lovers website article - states that people at risk from health problems such as heart disease, rheumatoid arthritis, diabetes, obesity and hypertension could benefit from eating seafood. (TWA)
- Diabetes Australia recommends seafood as a source of dietary protein for diabetics. (TWA)
- Maintaining a traditional diet, which could include seafood, may reduce heart disease and diabetes in Australian Aboriginals. (TWA)
- Seafood is a source of iodine, which is good for the thyroid. (3xTWA)
- Omega-3 will reduce the body's level of reactivity to allergens. (TWA)
- For general health, two 1000mg capsules of omega-3 supplements once a day will suit most people. (TWA)
- Omega-3 was suggested as part of a remedy for blepharitis (an ocular condition). (TWA)
- Fish and omega-3 fatty acids named as 'superfoods' by The CSIRO Healthy Heart Program. (ST)
- Health experts urge more consumption of the essential fatty acids, omega-3, after preliminary research found Australians are not consuming enough of the oils, putting them at a higher risk of heart disease. The Omega-3 index is a biomarker for heart disease. Omega-3 will protect against heart disease. National Heart Foundation recommends 500mg daily dose of omega-3 for all adults to protect against heart disease. Fish oils reduce the risk of heart disease by boosting good cholesterol, lowering blood pressure, keeping blood vessels supple and maintaining a stable heart rate. The recommended weekly dose of 3,500mg can be achieved by having two to three 150g serves of oily fish, such as salmon, blue-eye trevalla or canned fish, or by taking 500mg a day in fish oil supplements or omega-3 enriched foods and drinks. Those who have signs of heart disease need double the dose, or 1000mg a day. (TWA)
- Omega-3 is recommended for itchy skin/allergies. (TWA)
- Omega-3 is essential for healthy skin (x2) and hair. (TWA)
- Eating fish could help prevent memory loss and stroke as we age - but not if it's fried. (TA)
- A recipe with egg and salmon states that omega-3 will keep your heart healthy. (ST)
- For expecting mums - Fish oil is rich in omega-3 fatty acids. Special fats found to protect the heart and improve neurological function. Fish oil helps alleviate inflammation such as sore muscles and back. (TWA)
- Omega-3 products will improve your pet's skin and coat. (TWA)

## 5.1.4 Discussion and recommendations

### 5.1.4.1 Locations

Of the 43 outlets visited, only 13 retailers displayed a health message for consumers near seafood products. Fish retailers and independent supermarkets were most likely to promote the health benefits associated with seafood consumption to consumers. Only one of 28 major supermarkets visited displayed a health message near seafood products. There are opportunities to promote the health benefits associated with seafood to consumers in retail settings, particularly major supermarkets.

### 5.1.4.2 Health messages

Twenty health messages were observed during the audit. Half of these referred to specific benefits of omega-3 or seafood consumption. Messages were mostly produced by industry or manufacturers. Half of the messages were in the form of a pamphlet. These messages were not 'eye-catching' and often placed on the back of printed materials requiring the consumer to read them in their entirety. The health messages were often secondary to other information, such as recipes. There is an opportunity to promote specific health benefits of seafood consumption to consumers with clear messages, in 'eye-catching' formats.

### 5.1.4.3 Other messages near seafood

Most outlets displayed some kind of non-health related message near seafood. Thirty nine messages were identified. These messages were mostly produced by industry, manufacturers or the retailer and mainly in formats such as shelf tags, posters or A4 placards placed on a counter. Messages included shopper warnings, recipes, and promotions for particular products and events. Australia Day was linked to seafood as a promotion at three retailers. Seafood as a choice for barbeques was promoted at one retailer. Non-health related messages were often in more 'eye-catching' formats than the health messages.

### 5.1.4.4 Other foods

Two thirds of retailers displayed messages near other food products. These messages were mostly produced by the retailer or manufacturers. Messages often promoted specific products, and linked products to events, such as Australia Day and barbeques. Promotions linking meat and barbeques were observed at 20 locations, and Australia Day was used to promote meat products at 12 locations. Meat and poultry products used health messages at only three locations.

Although meat products were linked to special events or activities on more occasions than seafood, meat and poultry were linked to health benefits less often than seafood. Seafood could create a 'niche' position in marketing for health benefits.

### 5.1.4.5 Fish oil

Resources near fish oil products specifically promoted the health benefits of seafood consumption, including intake of omega-3 and other nutrients. Fish oil is a direct competitor to fresh fish for health benefits. Seafood products may be able to market health benefits in the same way fish oil does.

### 5.1.4.6 Media audit

Information published in the media can be confusing, conflicting or incorrect; however some articles are specific about the health benefits of seafood. The community are exposed to a wide range of messages about the health benefits of seafood. It is important to present clear informative messages to help educate and guide health behaviours and decision making.

### 5.1.4.7 Other considerations

Existing codes, regulations and practices that govern the development and display of consumer 'point of sale' resources in Australia should be reviewed to ensure compliance. For further information please refer to the Industry Guidelines for Seafood Health and Nutrition Messages developed by CESSH.<sup>208</sup>



## 5.2 Development of point of sale consumer messages

### 5.2.1 Initial development

A number of potential point of sale messages were designed in February 2009 based on the findings of the literature review and known barriers and facilitators to seafood consumption (see Figure 5.4).



Figure 5.4 Potential Point of Sale messages

An overarching message of *Fish twice a week* plus a series of by-lines were developed. An Advisory Panel of key stakeholders (CESSH Industry Advisory Group, CESSH Advisory Panel and consumers) were invited to comment on the concepts, and preliminary feedback was used to modify the health messages. The by-lines included:

- *A healthy heart* - fish twice a week
- *Smart Choice* - a healthy diet includes fish twice a week
- *A hearty meal* - fish twice a week
- *Love your heart* - fish twice a week
- *Hooked on fish* - twice a week
- *Time for a sea change* - fish twice a week



- A hearty diet includes fish twice a week
- *Food for thought* - Fish Health - twice a week
- For better health top up to 2
- 2 serves a week for heart health
- *No bones about it* - canned fish twice a week
- For the BBQ - fish and salad - twice a week
- Steam, grill or BBQ - Fish twice a week
- *No bones about it* - TUNA twice a week
- *Feed 'em fish* - twice a week.

The results of the review of possible consumer messages found that a block design and a fish design were the most popular choices. Messages favoured were: Brain Food, Feed'em Fish, Love your Heart, Smart Choice and Smart Heart.

## 5.2.2 Consumer evaluation of the seafood shelf tags

### 5.2.2.1 Aim & Objectives

The aim of this component of the project was to evaluate the messages on the shelf tags with consumers. The main objectives of the evaluation were to:

- Determine the preferred shelf tag design format (block design or fish-shaped design); and
- Determine the most appealing descriptor for the shelf tag: Brain Food, Feed'em Fish, Love your Heart, Smart Choice and Smart Heart.

### 5.2.2.2 Methods

The shelf tags to be tested were developed by inserting the selected messages: Brain Food, Feed'em Fish, Love your Heart, Smart Choice and Smart Heart onto tags in both block and fish designs (see Figure 5.5).



Figure 5.5: Shelf tags to be tested.

Figure 5.6 shows examples of shelf tags placed in supermarket shelves:



Figure 5.6: Examples of shelf tags 'in situ'.

Once the shelf tags were developed, an independent marketing company conducted the evaluation of the shelf tags and consumer messages using a sensory research design.

### 5.2.2.3 Consumer sample

Respondents from locations across Australia were recruited using computerised Sensory Software through personalised mail invitation. The survey was rolled out on 7 May 2010 and 422 respondents participated in the online research.

### 5.2.2.4 Sensory research design

The computerised sensory tool EyeQuestion was used. Consumers were initially shown two shelf tag designs (block design and fish-shaped) and asked to rank their preferred shelf tag design format. They were later asked to rank the most appealing descriptor for the chosen shelf design format. Respondents who voted for the fish-shaped shelf tag were shown five different descriptors on the fish-shaped design while those who selected the block shelf tag were shown five different descriptors on the block design.

### 5.2.2.5 Research findings

A higher percentage (61%) of the respondents voted for the fish-shaped design to be their preferred shelf tag design format (95% confidence level).

As shown in Figure 5.7, Smart Choice was ranked as the most preferred descriptor for the fish-shaped design shelf tag, statistically significant at 95% confidence level.

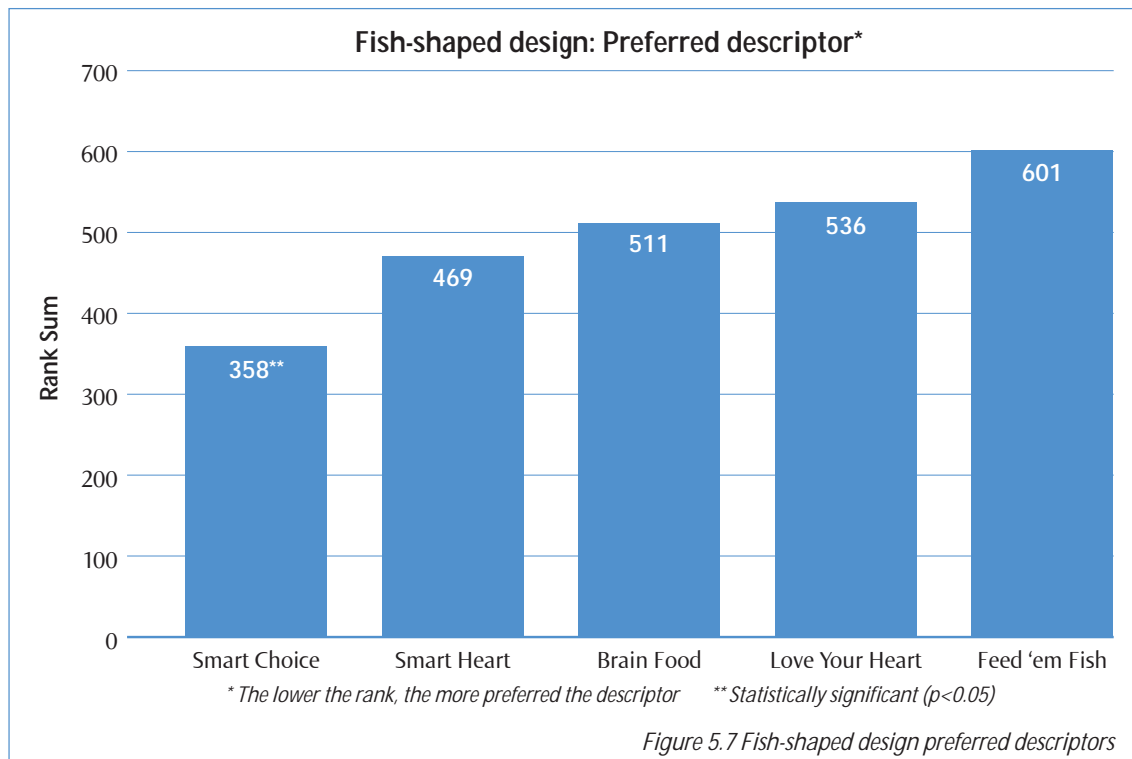
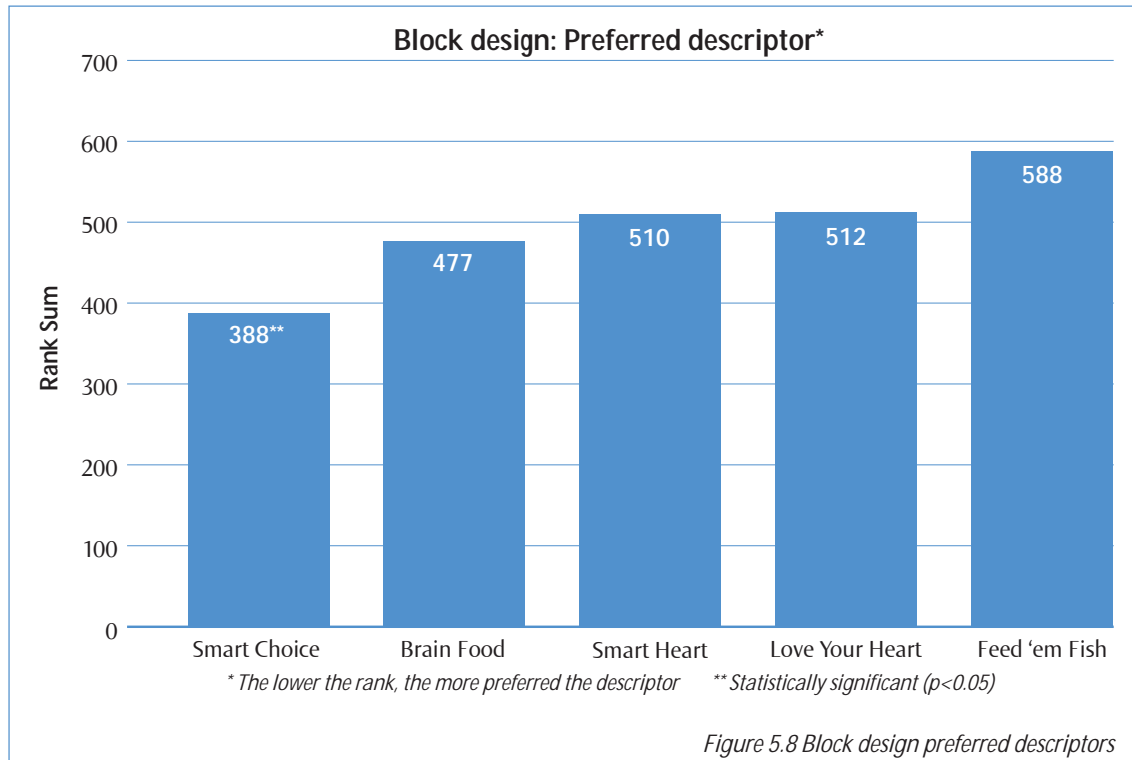


Figure 5.7 Fish-shaped design preferred descriptors

Those who selected the block shelf tag also ranked Smart Choice as their most preferred descriptor, statistically significant at 95% confidence level (see Figure 5.8).



The outcome of the independent evaluation of the POS resources found that a fish-shaped tag was the preferred design, and Smart Choice Fish Twice a Week was the preferred descriptor to promote seafood.

The preferred promotional design and wording are sufficiently generic to be used in any campaign that promotes seafood in general. It would also work as a 'brand' or 'logo' on products to increase recognition or individual campaigns across a number of ranges and promotions (e.g. shelf tags, in-store branding, information pamphlets) as a trigger for purchasing and to draw attention to seafood displays.

### 5.3 Conclusion

The results of the supermarket audit identified opportunities to promote the health benefits associated with seafood to consumers in retail settings, particularly major supermarkets. In particular, using more 'eye-catching' formats and marketing health benefits. Presenting clear and informative messages will be critical.

## Section 6

Educational communication  
resources on the health  
benefits of seafood

## 6.0 Introduction

The Centre of Excellence for Science, Seafood and Health (CESSH) aims to effectively promote the benefits of seafood consumption, mindful that resources that we create must not only act as effective tools for stimulating behaviour change and the acquisition of knowledge; they also need to sit comfortably within the rationale of external structures including whole school health curricula. CESSH has developed primary school resources, a secondary resource and a vocational training resource, all of which are compliant with existing structures, such as the Curriculum Framework. The secondary school resource also meets the requisites of future structures in that it was developed to meet the broad range of key skill and knowledge areas highlighted in the 2010 National Curriculum Board's Shape of the Australian Curriculum.<sup>209</sup>

## 6.1 Communication strategies: Education

There is no 'one size fits all' philosophy that is effective for communication within educational settings. To ensure optimal effectiveness, however, key outcomes first need to be identified, resources developed, and knowledge transfer considered in educational communication strategies. A number of the key issues that should be considered are discussed below.

### 6.1.1 Identifying key outcomes and providing novel information

What do we want the target audience to know? What do they want to know? In determining the outcomes to be achieved in terms of knowledge, attitudes and skills, the educational procedures and protocols are often externally determined, known as a 'top-down' approach. While this may be appropriate for the desired outcomes of the funding bodies and key stakeholders, it can impact on the effectiveness of interventions. Working closely with educators and specific target groups, interventions can be tailored to consider, clarify and/or incorporate existing knowledge and beliefs of the target group. This approach maximises opportunities for knowledge transfer.

Assessing the needs, resources, opportunities and challenges of working in particular settings with specific target groups is essential to successful planning. Existing programs, measurement tools (e.g. assessments, tests, surveys and interview schedules) and people already working in the area should be considered or consulted as part of the needs assessment process. The results of these types of in-depth analyses provide evidence required to produce student or target centred learning resources that effectively fulfil existing and future educational needs.

### 6.1.2 Designing target appropriate resources

Target appropriate: readability testing is not enough. Developing resources includes encompassing appropriate grading of language for age and developmental levels. The language level used in resources can easily be assessed using simple validated measures such as the SMOG (simple measure of gobbledegook) readability test.<sup>207</sup> Attention should also be given to the manner in which new and complex terminologies and ideas are introduced. Furthermore, the progression of incremental and accelerated learning must be considered in conjunction with cognitive and neurological development. What is needed by resource developers is an understanding of how to introduce new and complex terminology in an accessible manner, to a variety of target groups.

Accessibility and equity. Resources should be appropriate to the widest possible spectrum within a target group and must not support or contain stereotypical representations of any gender, culture or class. Resources must be developed so that barriers to uptake are minimised, whether they be geographic, socio-economic, linguistic or otherwise.

Script competence friendly. When preparing educational experiences that will take people out of their familiar environments, consideration must be given to facilitating the transition. For example, familiarisation training around the use of an online delivery system would be required before accessing an online resource using that delivery system. The inbuilt training of resource delivery systems will maximise the uptake, usability and learning experience of participants. On this note, it is vital that the choice of mode of delivery that will likely be uptaken by a designated target group be part of the needs assessment planning. For example, younger children respond better to pictorial and experiential learning styles. Overall, most people, regardless of age, retain knowledge if it is delivered within a familiar context and retain skills if they are first allowed to practise these skills in a supportive environment with assistance on hand if required.

### 6.1.3 Rationales, guides and user manuals

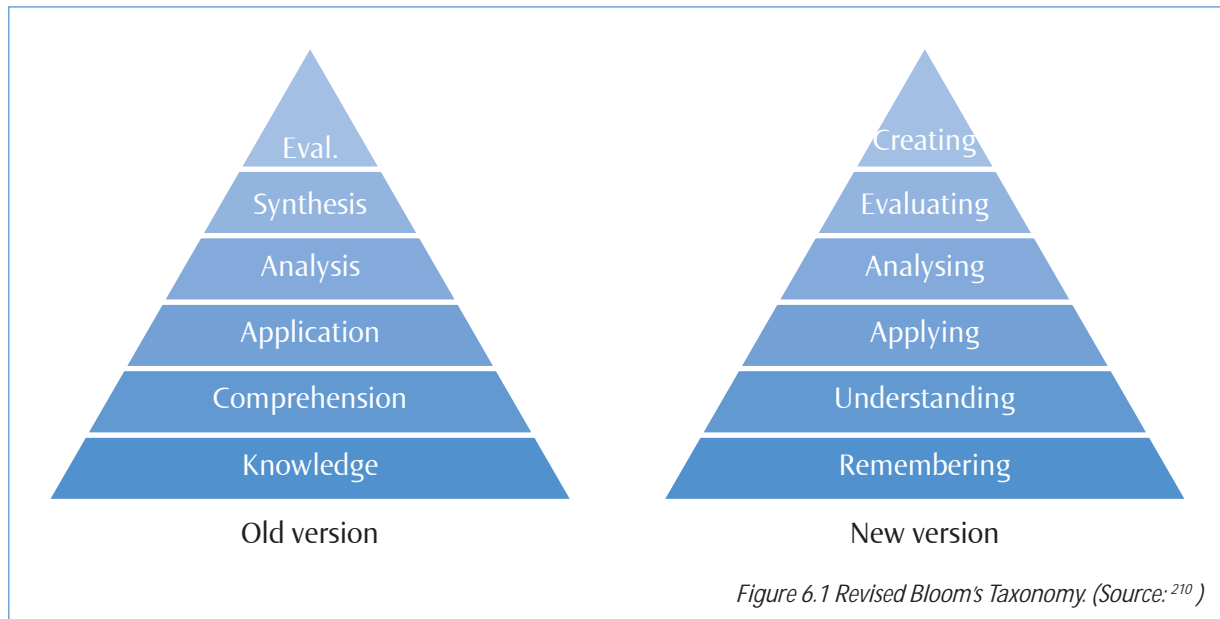
Guidelines are developed to support implementation of resources. They may include: a rationale for the resource; frameworks, theories and/or models on which the resource was developed; evidence on which the resource is based; how to deliver the resource; how to assess the learning experience; and detailed information on how the dissemination, implementation and evaluation of the resource should occur.

### 6.1.4 Transmission of knowledge

People are likely to engage with resources or programs that are interesting, relevant and attractive. Understanding how a target group perceives itself is essential to produce materials with optimal efficacy. The most successful resources are: those that are evidence-based; have input from a number of experts in each of the areas that the resources cover; are piloted prior to extensive dissemination; and, most importantly, are developed in consultation with the end-users.

### 6.1.5 The Revised Bloom's Taxonomy

The Revised Bloom's Taxonomy (RBT)<sup>210</sup> is useful for ascertaining the level of thinking that specific materials require to engage the target group (see Figure 6.1).



Most health promotional material resides at the base of the RBT, demanding only that knowledge provided be remembered, though the goal is actually to move up at least the next two levels, to understanding and applying. The challenge is to provide engaging materials that require the target to do more than passively acquire knowledge. The target group needs to understand and ultimately apply the knowledge learned to achieve behaviour change. CESSH's interactive 'Seafood the Super Food' resource facilitates the movement from remembering to understanding for primary school-aged children; tasks in the secondary school resource take students to the very top of the RBT, where students are required to not only develop their critical literacy in understanding the manner in which advertising and health promotion intersect, they are also called upon to use those new principles in creating their own health promotion materials.

### 6.1.6 Assessment beyond the traditional concept

Self and peer assessment are important learning tools. They encourage participants to engage in neutral critiques of their work and the work of others. While formal assessment is important, post-modern education places a much greater importance on anecdotal evidence than ever before. Non-traditional assessment may involve portfolios of student work and other measures such as teacher records of student attitudes and comments.

Resources developed as part of the CIISC Project are evidence-based and have incorporated a variety of assessment and learning types in an effort to maximise their effectiveness.

## 6.2 Primary school resources

### 6.2.1 Introduction

Having identified a need for tailored educational resources for younger students, a team was created within CESSH, tasked with translating research findings into a suite of electronic assets. The multidisciplinary team had a range of skills and expertise including research, classroom teaching experience, curriculum development, graphic design and Flash (Actionscript 3) programming.

### 6.2.2 Kidzone

A dedicated section of the CESSH website was created to house resources for primary school-aged children. This was considered important in providing an accessible and immediately recognizable entry point to the site, both for schools and for individual children rather than requiring them to navigate through the website. A child-friendly name (Kidzone) and cartoon-themed brand identity was created, focusing on a cast of six young characters that would be used in various ways across the range of resources.

### 6.2.3 Research findings

The basis of the project was the comprehensive CESSH Review of literature relating to the health benefits of regular consumption of seafood as part of a healthy diet.<sup>211</sup> Findings from this review were grouped into two areas - general health benefits of seafood consumption, and specific information related to omega-3 intake.

An early decision was made to shift the focus from general chronic conditions, to benefits for specific parts of the human body. This was deemed important in making the resources accessible for younger children, who would be unlikely to have either a full understanding of conditions such as arthritis or diabetes, or the maturity to understand the connection between their current actions and their future health and well-being. Thus, speaking about seafood 'helping to keep our hearts healthy' was deemed better than discussing the prevention of coronary heart disease to this target group; likewise, saying fish was 'good for our brains' was preferable to saying it had been shown to reduce rates of Attention Deficit Hyperactivity Disorder (ADHD) and Alzheimer's Disease.

This approach also made it possible to include information about less significant (but still valid) seafood health claims - such as those for skin, teeth, and hair. It also necessitated further supplementary research. Additional information was obtained from a number of sources.<sup>212-214</sup>

The team met with educational experts and graphics designers to discuss the most effective formats for communicating the key messages to school-aged children. A rigorous process of development, consultation, revision and testing followed resulting in an online resource developed in association with the Australian National Curriculum to maximise uptake by schools and educational organisations. They were also tested with the target group to ensure acceptability, accessibility, knowledge transfer and enjoyment by users from the target group. The interactive format of the resource package makes it accessible to students throughout Australia across metropolitan, regional, rural and remote areas.

The two resources developed for primary school-aged children were:

- Seafood the Super Food - an interactive 'body click' resource that shows how each of the major nutritional components of seafood impact on the body's physiology and the health benefits that each can provide. A quiz to test knowledge transfer associated with the game is also available.
- Amazing Omega-3s - an interactive game that encourages children to 'catch' their required omega-3 intake for a week. Support material includes a quiz, word sleuth and seafood identification activity. Teacher support material was also developed.

### 6.2.4 'Seafood the super food'

The first resource was intended to give children an overview of the health benefits of seafood consumption, using a 'body parts' approach. Research findings were grouped based on the parts of the body that could be said to be benefiting according to the various health claims. Table 6.1 presents a brief summary of the grouped findings.

Table 6.1. Health claims grouped by anatomy.

Hair	Vitamin A in fatty fish strengthens hair and slows down hair loss. <sup>212</sup>
Eyes	Vitamin A and omega-3s in fatty fish assist vision and can be preventative against certain eye complaints. <sup>212</sup>
Skin	Vitamins A and E, and zinc, found in fatty fish, promote better complexion and assist skin healing. <sup>212</sup>
Teeth	Calcium and fluoride found in bony fish assist with dental health. <sup>212</sup>
Brain	Omega-3s in seafood are important components in brain growth and development, and are preventative against some behavioural and learning problems, including ADHD. <sup>211, 214</sup>
Lungs	Omega-3s in oily fish may be preventative against asthma. <sup>211</sup>
Heart	Omega-3s in oily fish may be preventative against heart disease. <sup>211, 213, 214</sup>
Muscles	As a source of vitamin D and a lean protein source, seafood plays a role in growth and development. <sup>212</sup>
Nerves	Vitamin B12 in fish protects human nerve cells from damage. <sup>212</sup>
Blood	Iron in fish and some seafood promotes red blood cells count, assisting circulation and respiration. <sup>213</sup>
DNA	Vitamin B12 in fish assists with DNA multiplication. <sup>212</sup>
Bones	Fluoride, omega-3s, vitamin D and calcium in fish promote bone strength and are preventative against osteoporosis. <sup>212</sup>
Thyroid	Iodine and selenium in shellfish and other fish promote thyroid health, assisting metabolism. <sup>212</sup>
Immunity	Vitamin A in fish strengthens the human immune system. <sup>212</sup>

Great care was taken in converting these research findings into finished copy for the resources. It was deemed important to produce lively and accessible language that remained factually accurate. This task was overseen by team members with both classroom and curriculum development experience. Two examples follow:

*Eating mussels can help your muscles! The vitamin D in fish can increase your strength, and the protein in seafood is used to build and repair muscles. You can beef up without the beef!*

*The fluoride, omega-3s, vitamin D and calcium in fish keep your bones strong, helping to stop a disease called osteoporosis which can make your bones break really easily when you get older. Eating fish is like banking for your bones; depositing calcium now will help your body in the future.*

A finished copy was then passed on for graphical treatment and production. Using the Kidzone character 'Jack' (see Figure 6.2), an interactive small web file was created, in which users are able to click various body parts and be presented with applicable seafood and health information (see Figure 6.3).



Figure 6.2: 'Seafood the super food' resource.



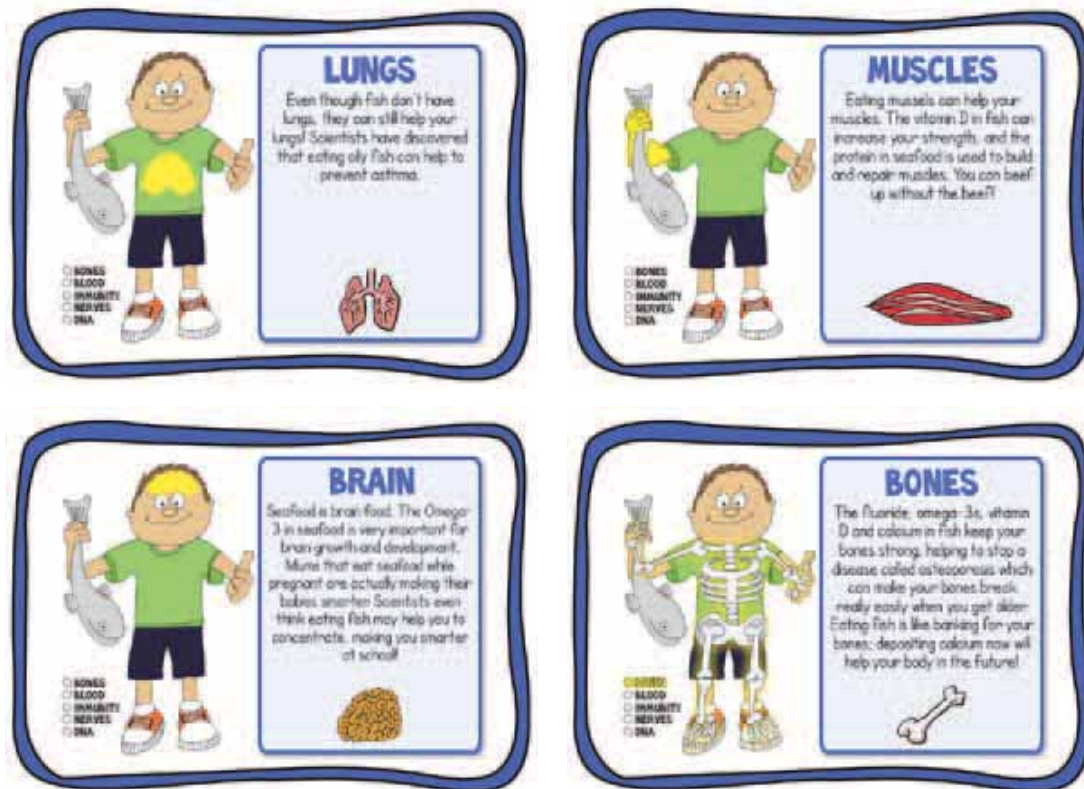


Figure 6.3: Screen shots from 'Seafood the super food' resource

A worksheet was also developed for teachers to use in the classroom, in conjunction with the web resource.

### 6.2.5 'Amazing omega-3s'

A second resource focused on omega-3s, their effect on human health, and the important role that fish and seafood plays in the provision of these essential fatty acids. Once again, findings from McManus, Howieson and Nicholson<sup>211</sup> and other sources<sup>213, 214</sup> were compiled and reworked into appropriate child-friendly copy. This was supplemented with the specific omega-3 levels found in various fish species and seafood types, obtained from the 2007 Australian Nutrients Database (AUSNUT).<sup>205</sup>

This resource took the form of a game in which the user plays a Kidzone character 'Sally', who is fishing from a pier (see Figure 6.4). As the user makes catches - randomly selected from a pool of 15 fish species, three seafood types, and four whimsical 'booby prizes' (such as a boot or unicycle) - an appropriate figure is added to their omega-3 score. This is based on the omega-3 value contained in a 100g serving, and is represented on a meter at the side of the game screen. The user's objective is to 'catch' 10,000mg of omega-3s before randomly landing a giant squid, at which time the game ends. This nominal figure was decided upon after extensive testing to find the optimal point at which the game was challenging, but not overly long. This proved a difficult balance to strike, given the disparity of values involved (over 2000mg of omega-3s for one species, less than 200 for another).



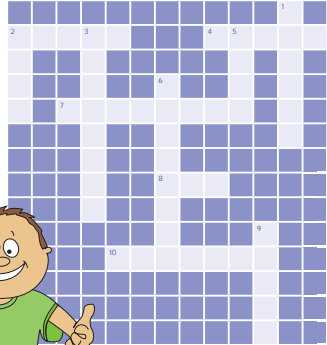
Figure 6.4: 'Amazing omega-3s' game.

In addition to the gameplay itself, a number of screens present background information about omega-3s and their role in human health (see Figure 6.5). Two worksheets were developed to assist teachers in using this resource, and all three assets were published on the CESSH Kidzone website.

## SEAFOOD THE SUPER FOOD


**Across clues**

- The omega-3s in seafood make it 'smart food' because they are good for your \_\_\_\_\_.
- The omega-3s, vitamin D and calcium in fish are good for strong \_\_\_\_\_.
- The vitamin B12 in fish helps DNA to \_\_\_\_\_.
- The iron in fish helps your \_\_\_\_\_ blood cells.
- Eating mussels can help to build your \_\_\_\_\_.



**Down clues**

- Vitamin B12 helps your \_\_\_\_\_.
- \_\_\_\_\_ fish are good for your teeth and bones.
- Vitamins A, D and E as well as zinc and iron in fish protect you from getting sick; they are good for your \_\_\_\_\_.
- \_\_\_\_\_ fish can help to prevent asthma.
- Seafood contains vitamins and \_\_\_\_\_ that are important for good health.
- Eating seafood rich in omega-3s can help to prevent \_\_\_\_\_ disease.




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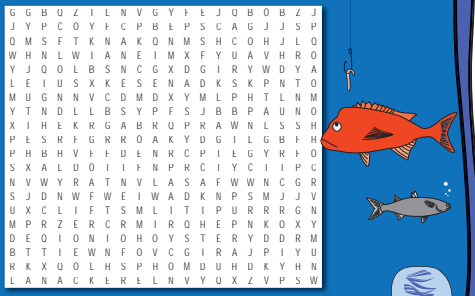
## AMAZING OMEGA-3<sup>s</sup>

**Which fish?**  
Now it's time to test your memory! Now that you have played the fishing game, can you remember how many milligrams of omega-3s were in 100 grams of each kind of fish? Strain your brain and fill out the table below.

Omega-3s per 100g	Type of fish
2500	c _____ d s
251	ba _____
232	flat _____
200	flo _____ r
400	sym _____
175	gr _____ r
400	mack _____
693	mul _____
723	uy _____
220	p _____ dw _____
231b	antic sal _____



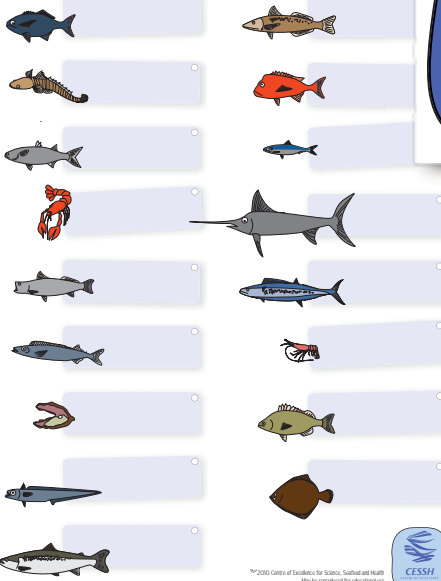
**Fishing for Words**  
Now look for your solutions in the word search.



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## AMAZING OMEGA-3<sup>s</sup>

**One fish, two fish, red fish, blue fish**  
How many of the species of fish and types of seafood can you identify from the game? Tick the ones you caught.



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Figure 6.5: Worksheets for online resources

## 6.3 Secondary School Resources

The *Seafood and health: Teacher resource for secondary students* was produced for secondary schools to develop students' understanding of the benefits of seafood for health. The rationale for the development of this resource was:

- To provide an independent resource for use in the Health and Physical Education Year 12 Curriculum in Western Australia;
- To provide students with a brief introduction to the nutritional benefits of seafood, additionally making reference to current issues that may impact on seafood consumption;
- To provide a resource that is easy to understand, factual and engaging;
- To provide a basic introductory resource that can be utilised in diverse classroom contexts; and
- To raise awareness of the importance of regular seafood consumption in the diet as a nutritional imperative.



Figure 6.6: Secondary resource front cover and overview page.

The teachers' resource package is a set of five activities and assignments covering nutrition and the importance of seafood as part of a healthy balanced diet. The assessments include a group activity in spatial mapping, a critical media review, the development of a health survey for fish and seafood consumption in school, the development of a fact sheet and delivery of a presentation. Each activity outlines for the teacher the rationale for the assessment, the course outcomes covered by the assessment, suggested duration and sequence of the lesson, as well as a guide for any advance preparation needed by the teacher. The resource package also includes assessment sheets, answer sheets and resource lists for ease of use.

The first activity 'Healthy Living Introductory Activity' highlights the importance of nutrition and exercise as part of a healthy lifestyle based on the Australian Guide to Healthy Eating<sup>215</sup> and the National Physical Activity Guidelines.<sup>216</sup> This minor informal assessment is designed to be a student-centred self assessment, introducing core concepts central to health promotion in adolescents and fostering introspection about personal practices of exercise and eating.

The second activity is designed for group work and involves spatial mapping. It aims to establish foundation knowledge about the nutritional benefits of seafood, and knowledge about the environment, sustainability and new technologies related to the seafood industry. Ideally, this activity would follow previous nutrition and healthy eating education that situates seafood as part of a healthy diet. This assessment helps develop students' group skills and interaction.

The critical media review is the third activity in the resource package and is designed to develop students' critical thinking skills in evaluating information in the media. This is an important skill for students, particularly with the current advances in technology and the increasing use of the internet for health information. This assessment can facilitate the further development of students' critical literacy skills while providing an opportunity for demonstrating the four course outcomes.

The fourth activity and assessment involves the development of a health survey which enables students to actively engage with research principles in health; physically and mentally moving them beyond the classroom. This assessment involves research, group work, questionnaire development, and the incorporation of maths, science and epidemiology.

The final activity and assessment involves developing a fact sheet and delivering a presentation. This assessment demonstrates the four course outcomes and allows students to further develop their research skills and presentation skills. A peer evaluation element is incorporated into the assessment which helps to enhance students' meta-cognitive capacities as, through peer evaluation, students learn the tools for self evaluation.

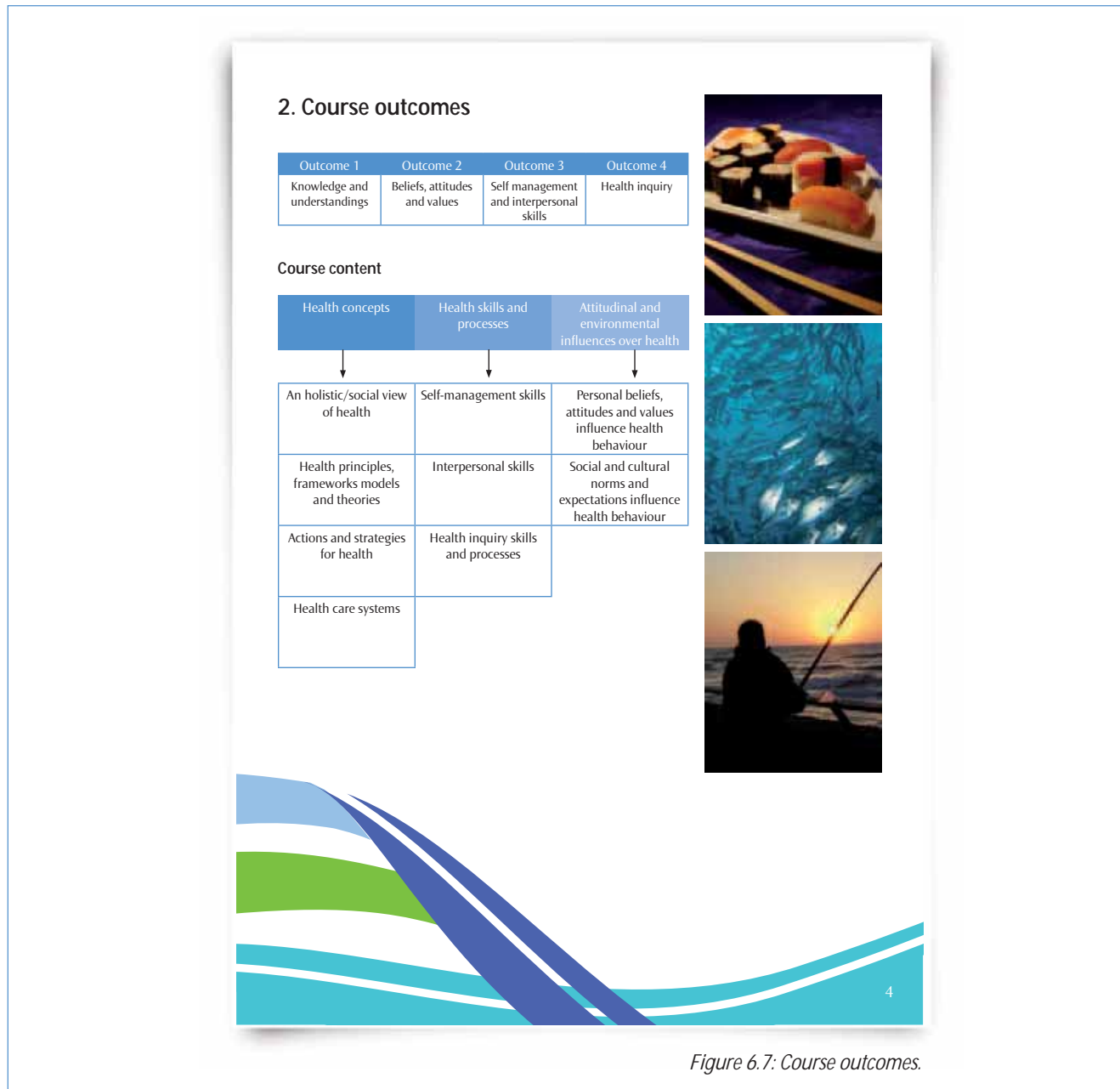


Figure 6.7: Course outcomes.

The resource activities can be utilised independently or sequentially, for use in diverse classroom contexts. The resource is designed to be easy to understand, factual and engaging, as well as meaningful and relevant to students and facilitate co-operative learning. It aims to raise awareness of the benefits of seafood consumption as part of a healthy diet through varied choices of topics, and allows students to work through concepts and processes supportive of health-promoting food choices. It also promotes meta-cognition so that students can continue to learn about food issues and behaviours in new life situations. The resource activities are based on Curriculum Council Sample Unit Package for easy adoption into the existing education framework for teachers.



## 6.4 Vocational Skills Set Training Resource

### 6.4.1 Introduction

The Principal Investigator met with staff involved in industry training from the major vocational training institution in Western Australia and conferred with key stakeholders across Australia, including Roy Palmer from Seafood Experiences Australia and Dr David Milne from the Australian Maritime College (AMC). A short scoping survey was also distributed through industry organisations and entities to gauge the vocational training needs of all sectors of the seafood industry. Current vocational curriculum material available across Australia and New Zealand (basis of AMC courses) were reviewed.

All information collected was synthesised and the core components for inclusion in a vocational training package were identified. A senior educational specialist with expertise in curriculum development and familiarity with the training needs of the seafood industry was employed to develop a vocational training skills package. The resource was developed in accordance with recognised methods used within the Australian Seafood CRC training projects as part of CRC Program 4.

### 6.4.2 Vocational Training Resource

The resultant training resource pack is entitled *Seafood and health: A vocational training resource* and includes:

- Instructor resource;
- 'Seafood and health' powerpoint (see Figure 6.8);
- 'Seafood and health' handout;
- Quick seafood quiz;
- Quick seafood quiz answer sheet;
- Student task handout; and
- Self assessment handout/peer assessment handout.



Figure 6.8: PowerPoint slide presentation.

The resource has been developed to provide instructors with everything required to administer the course to industry participants across all seafood sectors providing an overview of the relationship between seafood and health. The instructions also note that the assessment tasks can be modified depending upon the assessment requirements of the institutions or bodies administering the course.

#### 6.4.2.1 Rationale

The rationale for the Seafood and Health: A Vocational Training Resource are:

- To provide students with a brief introduction to the nutritional benefits of seafood, additionally making reference to current issues that may impact on seafood consumption;
- To provide a resource that is easy to understand, factual and engaging;
- To provide a basic introductory resource that can be utilised in multiple course contexts; and
- To raise awareness of the importance of regular seafood consumption in the diet as a nutritional imperative.

#### 6.4.2.3 Competencies assessed

The competencies assessed in the vocational resources are listed in Table 6.2. The suggested duration of the sessions is 1.5 hours however they may be readily adjusted to meet different time constraints. For example, if students are preparing foods on campus or at school an extended lesson is advised.

Table 6.2: 'Seafood and Health: A Vocational Training Resource' - competencies

Assessment type	Knowledge of nutritional values in seafood	Knowledge of current issues in seafood	Preparation of seafood product/ presentation	Budgeting/ planning skills	Evaluation skills
Recipe Sample	■		■	■	
Self- assessment	■			■	■
Peer assessment	■				■
Quiz	■	■			

The full resource - with the exception of the student assessments - is available on the CESSH website at [www.cessh.curtin.edu.au](http://www.cessh.curtin.edu.au). As the vocational resource is part of an accredited course, assessments have been provided to institutions on request.

## 6.5 Conclusion

CESSH developed two primary school resources, a secondary school resource and vocational training resources. These resources were produced in conjunction with educational experts and graphic designers to ensure optimal effectiveness.

# Section 7

## Community survey

## 7.0 Introduction to the CIISC intervention community

The community chosen to trial the CIISC community intervention was the City of Mandurah (CoM) which is situated on the Western Australian coast approximately 72 kilometres south of Perth. The population of CoM has remained around 70,000 for the past five years (see Table 7.1 and 7.2). According to the latest statistics available there are 18,724 families living in the CoM, with 5,580 comprising couples with children under 15 years of age and a further 1,959 one parent families with children aged under 15 years.<sup>217, 218</sup> Sixty-one percent of residents are aged 15 to 65 years. Their occupations include: trade persons (43%), clerks or sales persons (22%) and managers or professionals (21%).

Table 7.1: Statistical information about the City of Mandurah

Land area in square kilometres		173.5sq km
Coastline		50km
Population		70,413 (June 2010)
Number of Households		26,657 (June 2008)
Population per square kilometre		405/sq km (June 2010)
Households per square kilometre		153/sq km
Length of total roads		652km
Length of total canal waterways		22km approx
Conservation	City of Mandurah	46.6ha
	Other Agencies	3,956.58ha
Foreshore	Developed	78ha
	Natural State	497.7ha
Distance from Perth		72km

Source: City of Mandurah.<sup>217</sup>

Table 7.2: Population distribution of the City of Mandurah as at 30 June 2006

Population by sex	Number
Males	35,637
Females	35,374
Persons	71,011

Population by age group	% of Total
1-14 yrs	18.7
15-24 yrs	11.5
25-34 yrs	9.6
35-44 yrs	13.0
45-54 yrs	13.5
55-64 yrs	13.9
65-74 yrs	11.4
75-84 yrs	6.7
85 yrs and over	1.0

Source: ABS.<sup>218</sup>

The CoM was chosen as it is a very proactive local council that has shown a strong commitment to supporting the health of their residents and, of particular interest to this project, actively supports the long-term sustainability of local businesses. The CoM has also been a strong supporter of research and has been a long-term research partner of the Principal Investigator of CIISC (Professor Alexandra McManus).



## 7.1 Aim of the CIISC community survey

The aim of the CIISC Community Intervention was to increase seafood consumption in one locale using a whole of community approach. Ethics approval was received for the Curtin University Human Ethics Committee (SPH-03-2009).

The aim of the CIISC community survey was to gain an understanding of the seafood purchasing and consumption behaviours of the target community.

### 7.1.1 Limitations

There were several limitations to this study and all endeavours were made to minimise these during the planning stage. Firstly, as the entire community was involved in the study, no comparison community was required. This study design provides strong evidence if the sample size is large enough, with sufficient power to generalise results to the whole community. CIISC had sufficient power to extrapolate results to both the community and the seafood outlets. Secondly, although there were usual in-store and media seafood promotions, there was no whole-of-community seafood promotion during the intervention period other than those that were part of CIISC. This was achieved through close collaboration with the local council to coordinate all seafood promotional activities during the intervention period to maximise the opportunities to assess the effectiveness of the CIISC intervention. Thirdly, sales of seafood during 2009 and 2010 were collected from the food outlets involved in the study to assess average monthly sales across the two years previous to the intervention. Seafood sales during March, April and May 2010 were also collected to account for usual fluctuations prior to, during and following the intervention period in the previous year. These were compared to 2011 results which allowed the community to act as its own control; therefore a comparison community was not required.

## 7.2 Methods

### 7.2.1 Development of the CIISC community survey

A CIISC community survey was designed using rigorous methods previously used by the research team.<sup>219</sup> Information and consent forms were also developed.

A self-reported questionnaire was developed to collect basic demographic data and current knowledge, attitudes and beliefs associated with seafood. Questions centred around: the family composition and demographics; where the majority of household foods are purchased; location and type of food outlets within the immediate community; proximity to large supermarkets; accessibility and affordability of healthy foods in participants' immediate community; usual diet; number and type of foods usually cooked at home each week; composition of food eaten (e.g. frequency prepared from all raw, some raw and processed, all processed foods); frequency and type of fast foods regularly consumed and perceptions of healthy foods. The person in the household who regularly purchased and prepared most of the meals was asked to complete the survey. In instances where these duties were shared, respondents were asked to choose one person to complete the survey, preferably the person who purchased the majority of household foods.

### 7.2.2 Administration of the community survey

The community survey, information sheet, consent form and reply-paid envelopes were provided to the CoM in an envelope ready for mailing in early February 2011. Participants were advised on the consent form that their responses were confidential in accordance with the guidelines of the Curtin University Human Ethics Committee and completed questionnaires were to be mailed directly to Curtin University in the reply-paid envelope provided.

Local council staff added the address details to the envelope and mailed the survey to residents. A random sample of 1,800 residents was chosen by the CoM to receive the survey (due to privacy laws and confidentiality requirements of data held by the council relating to private residents). Unfortunately, the surveys were not sent out until the day that surveys were due to be returned. CESSH requested that stickers be placed on the surveys with a new due date by their own staff however the CoM decided to include a letter that clearly outlined a new due date. There is no doubt this affected the return rate, however, issues such as these are not uncommon in practice. It may have been better to instigate a new print run of surveys; however, funding and time constraints did not allow this. A follow-up letter was sent to residents by the CoM two weeks after the distribution of the surveys. Based on the number of households ( $n=18,724$ ), with 80% power at a confidence level of 95% and a  $p$ -value of 0.05, the sample size required was 243 (standard error 0.02; relative standard error 3.16). As 300 surveys were received, the sample is representative of the target group; therefore the findings can be generalised to all households across the City of Mandurah.

## 7.3 Results of the community survey

Completed surveys were received from 300 residents within the CoM. The main results of the survey are presented under the headings of the questions asked as outlined below. All frequency tables are listed in Section 7 - Appendices.

### 7.3.1 Demographics and household characteristics

#### *Q1. Participants' sex*

Approximately two thirds of respondents (65.7%) were female (n=197), and one third (32.7%) were male (n=98).

#### *Q2. Participants' age*

Participants of all age groups from 18-24 years to 75+ were represented, however, the majority of participants (60.7%) were aged 55 and over (n=182). Participants aged 60-64 were the most represented age group (15.3%, n=46), followed by those aged 65-69 (14.7%, n=44), 55-59 (12.7%, n=38), and 75+ (9.7%, n=29).

#### *Q3. Suburbs of residence*

Most participants (97.3%) lived in suburbs covered by the postcode WA 6210. Almost a quarter of participants (24.3%) lived in Halls Head (n=73), 17.0% in Dawesville (n=51), 15.0% in Mandurah (n=45), 12% in Greenfields (n=36), 9.3% in Coodanup (n=28), 9.0% in Madora Bay (n=27), 7.0% in Silver Sands (n=21) and the remaining 2.7% (n=16) resided in other suburbs within Mandurah.

#### *Q4. Number of adults and children living in the house*

The majority of participants (60.3%) lived in a household with two adults (n=181), and the average number of adults per household was 1.86.

More than one quarter of households (26.7%, n=80) said they did not have any children living at home. It should be noted that almost half of the respondents (n=145) did not answer this question. It is unclear if this is because they did not have any children under 18 years in their household or they chose not to answer this question. Therefore it is possible that the number of households without children living at home could be larger than one quarter of the sample.

#### *Q5. Household composition*

Almost half of all participants (44.3%, n=133) lived in a household consisting of a couple with no children, while 22.3% (n=67) lived alone, and 19.0% (n=57) lived in a household consisting of a couple with children. Only 5.3% (n=16) were single parents. The remainder of participants lived in households of related adults (4.0%, n=12), related adults with children (2.3%, n=7), and unrelated adults (1.7%, n=5).

#### *Q6. Participants' role in buying food for the household*

Almost three quarters of respondents (74.0%, n=222) did most or all of the food shopping for the household, while 21.7% (n=65) jointly shared the food shopping with someone else. Eleven respondents (3.7%) declared that someone else did most of the food shopping.

#### *Q7. Which outlets participants purchased food from*

Households purchased food from a variety of outlets: major supermarkets were the most commonly mentioned (93.3%, n=280), followed by independent supermarkets (74.3%, n=223), and specialty stores (35.7%, n=107). Restaurants, cafes and hotels, and take-away and fast food outlets were mentioned by over a third of the sample (31.7%, n=95, and 31.0%, n=93 respectively). Farmers' markets were accessed by 29.0% of respondents (n=87), local supermarkets by 24% (n=72), and local delis by 7.0% (n=21). Lite n'Easy was mentioned by two participants as an outlet, and service stations and local growers were mentioned by one respondent each.

#### *Q8. Which outlets participants' households purchased the majority of food from each week*

Over three quarters of participants (77.0%, n=231) bought the majority of the household weekly food at major supermarkets, while 16.7% (n=50) bought it at independent supermarkets. Only 2.3% (n=7) purchased the majority of food from a specialty store and 1.7% (n=5) from a local supermarket. Farmers' markets were mentioned by four respondents as their main food outlets, and local delis by only one participant.

### Q9. How often households usually went shopping for seafood/fish and meat

As shown in Table 7.3, almost half of the sample (48.7%, n=146) shopped for chicken weekly, and there were strong weekly shopping patterns for the rest of items, with beef purchased weekly by over 36% of participants (n=108), and similar weekly shopping patterns for lamb (27.0%, n=81), seafood/fish (26.3%, n=79), and pork/bacon (25.7%, n=77). Despite the weekly shopping trends, over a third of respondents reported buying seafood/fish monthly or less often, or not at all (28.7%, n=86, and 6.0%, n=18 respectively).

Table 7.3: Frequency of purchase of seafood and meat items

Item	Never (%(n))	Daily (%(n))	Weekly (%(n))	Weekly plus minor purchases (%(n))	Fortnightly (%(n))	Fortnightly plus minor purchases (%(n))	Monthly or less (%(n))
Seafood/fish	6.0 (18)	0.7 (2)	26.3 (79)	10.3 (31)	17.3 (52)	7.3 (22)	28.7 (86)
Chicken	2.0 (6)	2.3 (7)	48.7 (146)	11.3 (34)	15.0 (45)	7.7 (23)	8.0 (24)
Lamb	4.3 (13)	0.3 (1)	27.0 (81)	8.7 (26)	19.7 (59)	10.7 (32)	17.7 (53)
Beef	2.0 (6)	1.3 (4)	36.0 (108)	11.0 (33)	20.7 (62)	9.3 (28)	13.3 (40)
Pork/bacon	4.0 (12)	1.0 (3)	25.7 (77)	7.3 (22)	18.0 (54)	10.3 (31)	20.3 (61)

### Q10. Main component of breakfast

An average of 11.87 breakfasts had been eaten by each household in the previous seven days. Of those, breakfasts with a vegetarian main component were the most common, followed by breakfasts including pork/bacon, and breakfasts including seafood/fish.

### Q11. Main component of lunches

An average of 12.16 lunches had been eaten by each household in the previous seven days. Of those, lunches with a vegetarian component as the main component were the most common, followed by lunches containing chicken, and lunches containing beef.

### Q12. Main component of dinners

An average of 13.38 dinners had been eaten by each household in the previous seven days. Dinners with chicken as the main component were the most common, followed by dinners containing beef as the main component, and dinners with a vegetarian element as their main component.

### Q13. Attitudes towards healthy diets and the health benefits of fish

Participants were asked whether they agreed or disagreed with a series of statements relating to their attitudes toward healthy diets and the health benefits of fish. The majority (55.3%, n=166) agreed that they were careful to eat a healthy diet, and 61.3% (n=184) agreed that they were interested in knowing the health benefits of different foods. Over a third of participants indicated that they either agreed (20.3%, n=61) or tended to agree (14.7%, n=44) with the statement 'I am on a weight reduction diet'.

There was a perception that fish is a healthy alternative to meat products. Over three quarters of respondents either agreed (56.7%, n=170) or tended to agree (23.3%, n=70) that fish is a healthier meal than red meat, and a similar proportion either agreed (59.0%, n=177) or tended to agree (19.7%, n=59) that fish is a healthier meal than pork. Comparison with poultry was more nuanced, with only 43.3% of participants (n=130) agreeing that fish is a healthier alternative to poultry, and 23.3% (n=70) tending to agree.

Participants showed interest in new fish products. Almost half the sample (45.7%) agreed with the statement 'I am interested in trying new products, new ranges or new species of fish', and a further 25.3% (n=76) tended to agree.

## 7.3.2 Purchasing of seafood

### Q14. When the participant's household last ate fish, shellfish or crustaceans, and calamari or squid

Most households (93.3%) had eaten fish last within the last month (n=280), and 4.7% had eaten it last 2-6 months previously (n=4.7). Consumption of shellfish or crustaceans was also high, with over half the sample (56.3%) having eaten this type of seafood last within the last month (n=165). Consumption of calamari or squid was lower: less than half of households (44.7%, n=134) had eaten it last within the last month, and 8.3% of households (n=25) had never eaten it.

*Q15. Outlets from which households purchased seafood*

As shown in Table 7.4, major supermarkets were the most popular outlets for purchasing seafood, with 57.3% of households (n=172) purchasing seafood from them. Almost half of all households (46.7%, n=140) ate seafood which was caught by a household member or person known to the household. Independent supermarkets and fishmongers were also popular suppliers of seafood, as were restaurants and take-away outlets.

*Table 7.4: Outlets from which seafood was purchased*

Outlet	Households (%)	Households (n)
Major supermarket (e.g. Woolworths, Coles)	57.3	172
Caught by a household member or someone known to the household	46.7	140
Independent supermarket (e.g. IGA, SupaValue)	43.7	131
Fishmonger/specialist seafood shop	36.0	108
Restaurant/café/hotel	30.3	91
Take-away or fast food outlet	19.3	58
Local supermarket	6.7	20
Local deli	1.7	5

Other outlets mentioned by participants included: Senior Citizen's Centres (n=2, 0.7%), fish vans on the side of the road (n=4, 1.3%), direct suppliers (n=2, 0.7%), and professional fisherman's outlets (n=1, 0.3%).

*Q16. Attitudes towards availability of fish*

Participants were asked to indicate the extent to which they agreed or disagreed with a number of statements relating to the availability of fish. As shown in Table 7.5, participants' views on the availability of fish and seafood were mixed, however their responses suggested that availability was not a major concern. The majority of respondents either disagreed or tended to disagree with the statement 'fresh quality fish is not readily available', they thought that fish was readily available in correct portion sizes, and they also thought that pre-prepared fish was available. Over a third of respondents (34.0%, n=102) disagreed with the statement that 'fish is more difficult to find where I shop compared with red meat and poultry', and more respondents tended to disagree or disagreed with the statement 'I would serve more fish/seafood if it was more readily available' than they agreed or tended to agree with it.

*Table 7.5: Participants' views on the availability of fish*

Statement	Agree (%(n))	Tend to agree (%(n))	Tend to disagree (%(n))	Disagree (%(n))	Neither agree nor disagree (%(n))
Fresh quality fish is not readily available	16.7 (50)	17.3 (52)	18.3 (55)	36.3 (109)	6.0 (18)
Fish is more difficult to find where I shop compared with red meat and poultry	20.0 (60)	22.7 (68)	12.3 (37)	34.0 (102)	5.3 (16)
Fish is readily available in correct portion sizes	34.3 (103)	22.7 (68)	20.7 (62)	11.3 (34)	5.7 (17)
There is lack of pre-prepared fish available	9.3 (28)	18.3 (55)	21.3 (64)	34.7 (104)	8.7 (26)
I would serve more fish/seafood if it was more readily available	21.7 (64)	16.3 (49)	14.7 (44)	25.7 (77)	15.0 (45)

*Q17. Frequency of purchase of specific fish/seafood items*

As shown in Table 7.6, the most frequently purchased item was canned seafood/fish, which was purchased more than once a week by 14.0% of households (n=42) and weekly by 22.7% of households (n=68). Fresh fish fillets were purchased more than once a week by 4.7% of households (n=14) and weekly by 14.7% (n=44). The frequency of purchase of packaged seafood/fish meals (both fresh and frozen), and whole fish was generally low. With regard to cooked seafood from take-away outlets and from restaurants, cafes or hotels, a monthly purchasing trend was observed.

Table 7.6: Frequency of purchase of selected fish/seafood items (%(n))

Type of fish/seafood	>1/w	1/w	1/fn	1/m	1/ 2-3 ms	2-3/yr	1/yr	<1/yr	Never
Whole fish - fresh	0.7 (2)	2.7 (8)	3.0 (9)	6.0 (18)	7.3 (22)	11.7 (35)	9.3 (28)	9.0 (27)	39.0 (117)
Fish fillets - fresh	4.7 (14)	14.7 (44)	16.3 (49)	18.0 (54)	12.0 (36)	8.7 (26)	5.3 (16)	4.0 (12)	10.3 (31)
Fish fillets - frozen unpackaged	1.3 (4)	3.0 (9)	8.0 (24)	7.0 (21)	10.3 (31)	6.7 (20)	3.3 (10)	5.7 (17)	42.7 (128)
Fish fillets - frozen packaged	2.7 (8)	8.0 (24)	10.7 (32)	17.0 (51)	9.0 (27)	6.0 (18)	4.0 (12)	3.0 (9)	31.0 (93)
Seafood/fish meals - fresh packaged	0.7 (2)	2.0 (6)	4.3 (13)	5.3 (16)	6.3 (19)	5.3 (16)	4.0 (12)	6.7 (20)	51.7 (155)
Seafood/fish meals - frozen packaged	1.3 (4)	2.0 (6)	6.0 (18)	7.3 (22)	8.3 (25)	4.3 (13)	5.0 (15)	4.7 (14)	46.0 (138)
Seafood/fish canned	14.0 (42)	22.7 (68)	22.3 (67)	15.0 (45)	9.0 (27)	2.3 (7)	1.7 (5)	1.7 (5)	6.3 (19)
Seafood - cooked takeaway outlet	1.3 (4)	6.3 (19)	9.3 (28)	20.0 (60)	17.3 (52)	12.3 (37)	7.0 (21)	4.3 (13)	14.7 (44)
Seafood - cooked rest/ café/hotel	1.0 (3)	3.3 (10)	8.0 (24)	21.3 (64)	19.3 (58)	17.3 (52)	7.0 (21)	4.0 (12)	11.3 (34)

#### Q18. Purchasing and serving fish/seafood in the last 12 months

Respondents were asked to which extent they agreed or disagreed with a series of statements relating to purchasing and serving fish and seafood. As shown in Table 7.7, participants were more likely to purchase fish/seafood cooked and/or consumed outside the home than they were likely to purchase fish/seafood to cook and prepare at home. Over three quarters of the sample (76.3%, n=229) ordered fish/seafood when dining out, and 60.3% (n=181) ordered cooked fish from take-away outlets. By contrast, only 40.0% (n=120) served fish/seafood on special occasions or for dinner parties, 37.7% (n=113) served fish when they had a BBQ with family and/or friends, and less than a third of the sample (30.0%, n=90) served fish on a regular occasion each week.

Table 7.7: Agreement around fish/seafood purchasing and serving patterns

Statement	Agree %(n)	Disagree %(n)	Neither agree nor disagree %(n)
I order cooked fish from take-away shops	60.3 (181)	27.0 (81)	6.0 (18)
I order seafood (other than cooked fish) from takeaway shops	29.0 (87)	53.7 (161)	8.7 (26)
I order fish/seafood when dining out	76.3 (229)	11.7 (35)	7.0 (21)
I serve fish/seafood for traditional or religious occasions (e.g. Christmas or during Lent)	41.7 (125)	38.0 (114)	14.7 (44)
I serve fish/seafood on special occasions or for dinner parties	40.0 (120)	32.0 (96)	20.3 (61)
I serve fish/seafood when we have a BBQ with family and/or friends	37.7 (113)	36.3 (109)	20.0 (60)
I serve fish/seafood on a regular occasion each week (e.g. Fridays)	30.0 (90)	49.3 (148)	14.7 (44)
I serve fish/seafood for everyday meals	44.3 (133)	34.7 (104)	15.7 (47)

### 7.3.3 Seafood preparation in the household

#### Q19. Seafood preparation preference

Respondents were asked how they and members of their household preferred seafood to be prepared from a list of preparation methods. Pan-frying was the method of seafood preparation most preferred by the highest number of respondents (26%, n=78). Grilling was the second most preferred method (13.3%, n=40), 8.3% (n=25) preferred their seafood to be baked, and 7.7% (n=23) preferred it to be barbecued.

### Q20. Most likely seafood preparation

Respondents were asked how they and members of their household were most likely to prepare seafood at home. Consistent with their preferences (see responses to Q19), 34.3% of respondents (n=103) indicated that they were most likely to pan-fry seafood; 8.3% of the sample (n=25) were most likely to grill their seafood, while 7.0% (n=21) indicated that they would most likely barbecue it, and 6.0% (n=18) would bake it.

### Q21. Selecting, storing, preparing, cooking and serving seafood

Respondents were asked to indicate whether they agreed or disagreed with a number of statements relating to selecting, storing, preparing, cooking and serving seafood. As shown in Table 7.8, responses suggested a high level of confidence about storing, preparing, cooking and serving seafood. Almost three quarters of the sample (73.3%, n=220) thought that seafood was easy to prepare and serve, and a similar proportion (72.7%, n=218) thought that they knew how to store seafood safely. By contrast, respondents felt less sure about their ability to ascertain the quality of seafood. Although over half the sample (55.0%, n=165) agreed that they could tell if fish/seafood was recently caught, only one third of respondents (33.3%, n=100) could tell if seafood/fish had been previously frozen.

Table 7.8: Selecting, storing, preparing, cooking and serving seafood

Statement	Agree (%(n))	Disagree (%(n))	Not sure (%(n))
I do not know much about how to prepare and serve fish/seafood	21.3 (64)	65.7 (197)	7.3 (22)
I like to prepare and serve fish/seafood	73.0 (219)	10.3 (31)	12.7 (38)
I am not confident to prepare and serve fish/seafood	25.3 (76)	60.3 (181)	7.0 (21)
I always know what type of fish or seafood I am going to buy before going to the shop	37.7 (113)	40.3 (121)	17.7 (53)
I like to prepare the same types of seafood as I have before	59.3 (178)	23.7 (71)	11.7 (35)
Seafood is easy to prepare and serve	73.3 (220)	13.7 (41)	9.3 (28)
I do not know how long I can keep seafood before it needs to be cooked	20.7 (62)	63.3 (190)	11.7 (35)
I know how to store seafood safely	72.7 (218)	11.7 (35)	12.3 (37)
Fish is more difficult to assess for freshness and quality compared to red and white meats	41.7 (125)	45.3 (136)	9.3 (28)
I would buy more seafood if I was more confident in my ability to select good quality fish	33.7 (101)	50.0 (150)	10.7 (32)
I cannot recognise if fish and other seafood is fresh	29.0 (87)	52.7 (158)	13.7 (41)
If I knew more ways to prepare and serve seafood I would eat it more often	38.0 (114)	49.3 (148)	8.0 (24)
I can tell if seafood/fish has been previously frozen	33.3 (100)	40.0 (120)	22.3 (67)
I can tell if fish/seafood is fresh (recently caught)	55.0 (165)	30.0 (90)	12.0 (36)

### Q22. Meal preparation and convenience

Respondents were asked to indicate whether they agreed or disagreed with a series of statements relating to meal planning and preparation, and convenience. As shown in Table 7.9, respondents generally preferred meals that are easy and quick to plan, purchase, prepare and cook. Over two thirds of participants (67.3%, n=202) agreed that 'it takes very little effort to prepare fish/seafood', which is consistent with a similar proportion (67.7%, n=203) disagreeing that 'it takes a lot of time to prepare fish/seafood'. Views were generally more mixed with regard to factors which might encourage higher fish/seafood purchase: neither convenience nor availability of more varieties appeared to be major drivers, however, 44% of the sample (n=132) agreed that they 'would buy more fish/seafood if recipes or preparation details were available at the outlet'.

Table 7.9: Attitudes towards meal preparation and convenience

Statement	Agree (%(n))	Disagree (%(n))	Not sure (%(n))
I prefer meals that are easy to plan, purchase, prepare and cook	86.0 (258)	10.3 (31)	1.3 ( 4)
I prefer meals that are quick to plan, purchase, prepare and cook	78.7 (236)	13.7 (41)	4.0 (12)
I serve fish because it is quick and easy to prepare	51.0 (153)	33.0 (99)	13.0 (39)
It takes very little effort to prepare fish/seafood	67.3 (202)	19.3 (58)	11.0 (33)
It takes a lot of time to prepare fish/seafood	11.3 (34)	67.7 (203)	15.7 (47)
I would buy more fish/seafood, if it were more convenient to prepare and serve	22.3 (67)	58.3 (175)	14.7 (44)
I would buy more fish/seafood, if more varieties were available in stores	37.7 (113)	43.0 (129)	14.7 (44)
I would buy more fish/seafood, if recipes or preparation details were available at the outlet where I buy it	44.0 (132)	40.0 (120)	10.7 (32)

### 7.3.4 Attitudes towards seafood and fish

#### Q23. Attitudes towards the health benefits of seafood/fish

There were generally high levels of agreement about the health benefits of seafood/fish. Most respondents (93.7%, n=281) agreed that seafood/fish is an important part of a balanced diet, while 83.3% (n=250) agreed that they ate seafood/fish because it is healthy. A comparison with meat or poultry elicited lower levels of agreement: a lower proportion of respondents (60.7%, n=182) agreed that seafood/fish was a healthier option, while 10.7% (n=32) disagreed and over a quarter of respondents were unsure (25.3%, n=76).

#### Q24. Patterns and influences on seafood/fish consumption

Participants were asked whether they agreed or disagreed with a series of statements relating to patterns and influences on seafood/fish consumption. As shown in Table 7.10, only half the sample (n=150) ate seafood/fish on a regular basis as a child, while just over half (51.0%, n=153) ate it on special occasions. Most participants (86.7%, n=260) had had good experiences eating seafood/fish in the past, and the majority of the sample regularly included fish and seafood on their shopping list, although they were more likely to include fish than seafood (58.3%, n=175, and 51.3%, n=154).

Table 7.10: Attitudes and influences on seafood/fish consumption

Statement	Agree (%(n))	Disagree (%(n))	Not sure (%(n))
I ate seafood/fish on a regular basis as a child	50.0 (150)	36.7 (110)	11.0 (33)
Our family ate seafood/fish on special occasions when I was a child	51.0 (153)	35.3 (106)	10.0 (30)
I have had good experiences eating seafood/fish in the past	86.7 (260)	7.0 ( 21)	3.7 (11)
Seafood is regularly included on my shopping list	51.3 (154)	39.7 (119)	4.0 (12)
Fish is regularly included on my shopping list	58.3 (175)	32.0 (96)	5.3 (16)

#### Q25. Attitudes towards fish and its characteristics (taste, smell, texture, touch, price)

As shown in Table 7.11, most participants liked fish and felt satisfied after eating it. Participants' responses showed positive attitudes toward the touch and texture of fish, and almost three quarters of the sample (74.0%, n=234) thought that taste was the most important attribute of fish. Attitudes towards price were less positive, with the majority of the sample (59.0%, n=177) disagreeing with the statement that 'fish is an inexpensive meal option'.



Table 7.11: Attitudes towards fish and its characteristics

Statement	Agree (%(n))	Disagree (%(n))	Not sure (%(n))
I like fish	93.3 (280)	2.7 (8)	2.0 (6)
Fish usually tastes bad	2.7 (8)	90.3 (271)	2.3 (7)
I feel satisfied after eating fish	84.0 (252)	3.7 (11)	8.3 (25)
I do not like the smell of fish	29.3 (88)	57.0 (171)	9.0 (27)
I like the texture of fish	78.0 (234)	6.0 (18)	12.0 (36)
Fish is an inexpensive meal option	25.7 (77)	59.0 (177)	11.7 (35)
I do not like to touch fish	10.3 (31)	81.3 (244)	3.7 (11)
Taste is the most important attribute of fish	74.0 (222)	14.0 (42)	9.0 (27)

### 7.3.5 Factors impacting on the amount of seafood/fish eaten in the household

#### Q26. Attitudes towards information on seafood and fish

Respondents were asked to indicate whether they agreed or disagreed with a number of statements relating to information on seafood and fish. Their responses suggested a high level of awareness about food labelling generally and a desire for more detailed and accurate information on seafood/fish. Most respondents checked labels on food products to decide which one to buy (84.0%, n=252) and compared prices to ensure they received the best value for money (84.7%, n=254). Over half the sample (54.3%, n=163) agreed that they needed more accurate information on the labelling of seafood/fish to make an informed choice, and 44.3% (n=133) needed more information about seafood/fish in the outlets where they purchase them. Less than half the sample (49.0%, n=147) trusted the information provided in the stores where they bought seafood/fish (see Table 7.12).

#### 7.12: Attitudes towards information on seafood and fish

Statement	Agree (%(n))	Disagree (%(n))	Not sure (%(n))
I need more information about seafood/fish in the outlets where I purchase them to make an informed choice	44.3 (133)	39.7 (119)	11.0 (33)
Seafood/fish is poorly displayed in the stores we shop in	18.0 (54)	68.7 (206)	9.0 (27)
I need more accurate information on the labelling of seafood/fish to make an informed decision	54.3 (163)	33.3 (100)	8.0 (24)
I trust the information provided to me in the stores where I buy seafood/fish	49.0 (147)	25.7 (77)	21.0 (63)
I check labels on food products to decide which to buy	84.0 (252)	8.3 (25)	4.3 (13)
I compare prices of products to ensure I receive the best value for money	84.7 (254)	7.0 (21)	4.3 (13)

#### Q27. What would encourage households to eat more seafood/fish

Respondents were presented with an open-ended question asking what would encourage their households to eat more seafood/fish. Better price seafood was the most common response (41.7%, n=125), followed by more local produce (15.3%, n=46), and easy free recipes (10.7%, n=32). Other enabling factors mentioned by more than 10 respondents included: trusting information at the point of sale (7.7%, n=23), fresher seafood (5.3%, n=16), more recreational catches (4.7%, n=14), better variety (4.7%, n=14), and better quality (3.7%, n=11).



### *Q28. What information would encourage households to eat more seafood/fish*

Respondents were asked what type of information would encourage them and their household to eat more seafood/fish. Two thirds of respondents (66.7%, n=200) thought that healthy, low cost seafood recipes that are quick and easy to prepare would encourage them to eat more seafood/fish, and a similar proportion (63.3%, n=190) thought that information on price per serving at the point of sale would encourage seafood/fish consumption. Information on health benefits of various types of seafood and how to avoid potential risks were also seen as encouraging seafood consumption by the majority of respondents (58.7%, n=176, and 58.3%, n=175 respectively). By contrast, only a third of participants (34.3%, n=103) thought that information on how to store seafood would encourage them to eat more seafood/fish, while online cooking demonstrations received the lowest score, with less than a quarter of respondents (24.3%, n=73) considering that they would encourage them to eat more seafood/fish.

### **7.3.6 Additional questions**

#### *Q29. Household proximity to a large supermarket*

Proximity to a large supermarket ranged from close proximity (indicated as 0 km) to 20.0 km. A total of 81.7% of households (n=245) were located within 5.0 km of a large supermarket, and 22.7% (n=68) within 1.0 km. The average distance to a large supermarket was 3.7 km.

#### *Q30. Household proximity to the nearest food/grocery outlet*

The similarities between the responses to Q29 and Q30 suggest that for many respondents a large supermarket may be the nearest food/grocery outlet. The range for household proximity to the nearest food/grocery outlet was the same as that observed for household proximity to a large supermarket (0-20 km). A similar proportion of households (82.2%, n=247) were located within 5.0 km of the nearest food/grocery outlet. However, a larger proportion of households (39.4%, n=118) were located within 1.0 km. The average distance to the nearest food/grocery outlet was slightly shorter than that to the nearest large supermarket (3.1 km).

#### *Q31. Household proximity to a take-away/fast food outlet*

Despite the wider range observed for take-away and fast food outlets (0-35 km), the data indicate that households were located in closer proximity to a take-away or fast food outlet than they were to a large supermarket or any food/grocery outlet. A total of 82.5% of households (n=248) were located within 5.0 km of a take-away or fast food outlet, and 41.2% (n=124) were located within 1.0 km. The average distance to a take-away or fast food outlet was 3.0 km.

#### *Q32. Average number of meals per month purchased from a take-away or fast food outlet*

A wide range of responses was observed, and while a quarter of respondents (25.0%, n=75) did not purchase any meals from a take-away or fast food outlet, five respondents (1.7%) reported purchasing a monthly average of 20 meals from such outlets. Overall, however, the reported purchasing patterns were low. In addition to those who did not purchase any meals from a take-away or fast food outlet, 21.0% (n=63) reported an average of one meal per month, a further 15.0% (n=45) purchased two meals per month, 7.7% (n=23) three meals, and 13.7% (n=41) four meals. Only 14.7% of the sample (n=44) reported purchasing an average of five meals or more per month.

#### *Q33. Preferred types of fast food*

The analysis of the first, second and third preferred choices of take-away and fast food revealed that, overall, fish/seafood and chips was the most popular among participants. Fish/seafood and chips was the fast food or take-away food most preferred by almost a quarter of respondents (24%, n=72), chicken was the first choice for 9.3% of the sample (n=28), while *Subway*<sup>®</sup> was the first choice for 8.0% of respondents (n=24). Chicken was the second most preferred for 14.3% of respondents (n=43), while Chinese food was second preference for 12.7% (n=38), and fish/seafood and chips for 11.0% (n=33). Fish and chips, burger and pizza were the most popular third choices, with 6.3% (n=19), 6.0% (n=18) and 6.0% (n=18) of the sample respectively selecting them.

#### *Q34. Main types of meals usually cooked/consumed*

As shown in Table 7.13, the type of meal most commonly cooked or consumed at home was meat and vegetables/salad (52.0%, n=156). Fish and vegetables/salad came second, and was mentioned by almost a third of participants (32.3%, n=97), while chicken and vegetables/salad was mentioned by almost a quarter of participants (23.0%, n=69). Also commonly cooked or consumed were stir fries, pasta dishes, roasts, fresh salads, BBQs, casseroles and Indian meals.

Table 7.13: Ten most common meals usually cooked/consumed at home.

Meal	Households (%)	Households (n)
Meat and vegetables/salad	52.0	156
Fish and vegetables/salad	32.3	97
Chicken and vegetables/salad	23.0	69
Stir fry	16.7	50
Pasta	16.7	50
Roasts	15.0	45
Fresh salads	12.0	36
BBQ	11.3	34
Casseroles	10.0	30
Indian meals	8.0	24

*Q35. Proportion of ready-made meals as opposed to meals prepared from largely unprocessed ingredients*

Of those respondents who answered this question (n=184), on average across all households, meals purchased ready-made, or substantially ready-made represented approximately 10% of all meals consumed, and approximately 75% of all meals were self-prepared by people in the household, from largely unprocessed ingredients. The remainder of meals contained both ready-made and self-prepared components.

*Q36. Foods that are thought to be healthy*

Vegetables, fish and seafood, and fruit were the foods most commonly perceived as healthy. Over three quarters of respondents (80.0%, n=240) identified vegetables as healthy foods, while fish and seafood were perceived as healthy by a similar proportion of respondents (78.3%, n=235), and fruit was mentioned by a third of the sample (66.3%, n=199). Other foods perceived as healthy included: lean meat (40.3%, n=121), chicken (38.7%, n=116), salad (22.3%, n=67), wholemeal bread and cereals (16.7%, n=50), and nuts (14.3%, n=43).

*Q37. Factors enabling respondents and their households to eat a healthy diet*

Respondents were asked which, if any, factor would make it easier for them and their households to eat a healthy diet. As shown in Table 7.14, low cost was perceived as the main enabling factor, with a large proportion of the sample (81.0%, n=243) agreeing that cheaper healthy foods would make it easier to eat a healthy diet; in addition, almost two thirds of participants (65.3%, n=196) viewed more detailed and easy-to-understand information on food labels as enabling households to eat healthily. Factors relating to efficient ways of food preparation (both ease of preparation and fastness) were also perceived as enabling healthy diets. Knowing easier ways of preparing healthy food was considered as an enabling factor by 54.3% of participants (n=163), while 59.3% (n=178) agreed that knowing more quick ways of preparing healthy food would make things easier. In contrast, knowing more about cooking was not generally perceived as enabling households to eat a healthy diet.

Table 7.14: Factors enabling households to eat a healthy diet.

Statement	Yes, easier (%(n))	No, not easier (%(n))	Not sure (%(n))
If healthy foods were cheaper	81.0 (243)	7.3 (22)	5.3 (16)
If more take-away and fast food outlets provided healthy foods	35.7 (107)	32.3 (97)	19.3 (58)
If I knew more easy ways of preparing healthy foods	54.3 (163)	21.7 (65)	12.0 (36)
If I knew more quick ways of preparing healthy foods	59.3 (178)	21.7 (65)	6.7 (20)
If I had more information to help me decide which foods were healthy	47.0 (141)	25.3 (76)	14.3 (43)
If I knew more about cooking	33.7 (101)	38.0 (114)	14.7 (44)
If my family/partner enjoyed healthy foods	34.0 (102)	34.3 (103)	14.0 (42)
If I could buy more healthy Snack foods	49.0 (147)	27.7 (83)	9.7 (29)
If healthier foods were easier to find in supermarkets	53.0 (159)	22.3 (67)	11.3 (34)
If there was more detailed and easy to understand information on food labels	65.3 (196)	17.0 (51)	7.0 (21)

### Q38. Affordability and accessibility of healthy foods

Respondents were asked whether they agreed or disagreed with statements relating to the affordability and accessibility of healthy foods in their main food outlets. As shown in Table 7.15, availability of healthy food did not appear to be of concern for the majority of respondents, with two thirds of respondents (63.0%, n=189) agreeing that it was easy to find healthy food in their local area. Statements relating to cost and affordability, however, elicited different responses. A large proportion of respondents (60.3%, n=181) thought that healthy food is more expensive than unhealthy food in their local area, while almost two thirds of participants (65.3%, n=196) thought that, generally, healthy food is more expensive than unhealthy food. Their views on the affordability of healthy food in their local area were mixed, and less than half the sample (44.7%, n=134) agreed with the statement that 'healthy food is affordable in my local area'.

Table 7.15: Affordability and accessibility of healthy foods

Statement	Agree (%)(n)	Disagree (%)(n)	Not sure (%)(n)
Healthy food is affordable in my local area	44.7 (134)	36.3 (109)	14.0 (42)
Healthy food is more expensive than unhealthy food in my local area	60.3 (181)	22.3 (67)	12.3 (37)
It is easy to find healthy food in my local area	63.0 (189)	20.0 (60)	13.0 (39)
It is difficult to find healthy food that is affordable in my local area	34.3 (103)	42.3 (127)	17.3 (52)
Healthy food is more expensive than unhealthy food	65.3 (196)	19.3 (58)	10.3 (31)

### Q39. Highest level of formal education

The sample had a somewhat higher level of educational attainment compared with Census data for Mandurah.<sup>218</sup> Of the total sample, 43.0% of respondents (n=129) had completed Year 10 or less, 14.3% (n=43) had completed Year 12, 17.3% (n=52) had completed some technical training (either a trade or TAFE), and over a fifth of respondents (21.3%, n=64) had completed tertiary education (University or Advanced Continuing Education).

### Q40. Respondents' occupation

Respondents' occupation status varied; however, almost half the sample (45.6%, n=137) were either retired (24.3%, n=73) or receiving government benefits (21.3%, n=64). Less than a quarter of the sample (23.0%) were employed full-time (n=69), while 15.7% were employed part time (n=47), 2.3% were unemployed (n=7), and a further 2.3% were students (n=7).

### Q41. Aboriginal or Torres Strait Islander origin

Of all participants surveyed, 1.7% (n=5) identified themselves as being of Aboriginal or Torres Strait origin. This is consistent with Census data for Mandurah showing a proportion of 1.5% of Indigenous residents.<sup>218</sup>

### Q42. Health conditions with which respondents have been diagnosed

The four most commonly reported diagnosed health conditions were high blood pressure, arthritis, diabetes (including pre-diabetes and gestational diabetes), and cardiovascular disease (including heart disease, strokes and peripheral vascular disease). Over a third of respondents (34.0%, n=102) had been diagnosed with high blood pressure; 25 respondents (8.3%) had been diagnosed with diabetes, including two respondents who reported pre-diabetes and one who reported gestational diabetes; and 22 respondents (7.3%) reported having been diagnosed with cardiovascular disease. In addition, 13 respondents (4.3%) had been diagnosed with cancer.

### Q43. Household gross annual income

Data relating to household annual income must be interpreted with caution, as 16.3% of respondents (n=49) preferred not to answer this question, and a further 3.0% (n=9) declared that they did not know. As shown in Table 7.16, more than one third of respondents (36.3%, n=109) indicated that their annual household income was less than \$40,000. A total of 15.0% of respondents (n=45) stated that their household income was \$100,000 or over, a further 11.0% (n=33) declared a household income between \$60,000 and \$79,000, and 8.0% (n=24) declared an income between \$80,000 and \$99,000. As a comparison, Census data for Mandurah shows a median household income of \$42,120.<sup>218</sup>

Table 7.16: Household gross annual income.

Income bracket (\$)	Households (%)	Households (n)
Less than 20,000	17.3	52
20,000 - 39,999	19.0	57
40,000 - 59,999	7.7	23
60,000 - 79,999	11.0	33
80,000 - 99,999	8.0	24
100,000 - 119,999	5.7	17
120,000 - 139,999	4.3	13
140,000 - 159,999	1.7	5
160,000 or more	3.3	10
I prefer not to answer this question	16.3	49
Don't know	3.0	9

#### Q44. Respondents' country of birth

Data on respondents' country of birth were consistent with Census data for Mandurah.<sup>218</sup> Almost three quarters of respondents (71.3%, n=214) were born in Australia. The United Kingdom (Scotland, England, Wales, Britain) was the country of birth of a further 17.6% of respondents (n=53), while eight respondents were born in New Zealand (2.7%).

#### Q45. Respondents' ethnic background

Over a third of respondents (39.7%, n=119) described their ethnic background as Australian, and a further 31.3% (n=94) described their ethnic background as British, Caucasian, Anglo-saxon, Scottish, Celtic, Irish or Welsh. Eight per cent of the sample (n=24) described their ethnic background as European, and 1.7% (n=5) as Dutch, 1.3% (n=4).

## 7.4 Summary of findings of the consumer survey

The respondents were predominantly female (65.7%), with one person in the household (74%) purchasing most of the household food. The ages of respondents varied from 18 years to over 75 years, with the majority of ages 55 years or over (60.7%). Half of the participants (44.3%) lived in a household with two adults only, 22.3% lived alone, and 19% were couples living with children.

Respondents purchased food for consumption in the home from a variety of outlets, with the most popular being large supermarkets (93.3%) and independent supermarkets (74.3%). Almost one third (31.7%) of respondents regularly purchased foods from take-away food outlets or restaurants, 29% purchased food from farmers markets, and 24% from local supermarkets.

When asked about their current seafood purchasing behaviours, 26.3% of respondents purchased seafood weekly, 28.7% monthly or less and 6% never purchased seafood. Most households (93.3%) had consumed fish in the last month and over half (56.3%) had eaten shellfish or crustaceans in the past month. The most popular outlets for purchasing seafood were major supermarkets (57.5%), however almost half of the households (46.7%) had regularly eaten seafood caught recreationally.

Over half of respondents (55.3%) said they ate a healthy diet, 61.3% were interested in knowing more about the health benefits of foods, 80% agreed or tended to agree that fish was healthier than red meat, 78.7% agreed fish was healthier than pork and 66.6% agreed fish was healthier than chicken. Almost three quarters of the sample (71%) said they would be interested in trying new products, ranges or species of fish.

Availability of seafood was not a concern to the majority of the sample. This is to be expected, as the community selected was from a coastal town with a strong fishing industry. However, 21.7% said they would purchase more seafood or fish if it was more readily available.

When reviewing the most popular weekly purchases of seafood, canned seafood was purchased with the greatest frequency (36.7%), followed by fresh fillets (19.4%). Monthly purchasing behaviours were similar, with 74% of household purchasing canned seafood each month and 53.7% purchasing fresh fillets monthly. In addition, 73.5% purchased seafood from restaurants or take-away outlets each month.

In the past 12 months, 76.3% of households ordered seafood when dining out, 60.3% ordered seafood from take-away outlets, 40% served seafood at home on special occasions, 37.7% barbecued seafood at home, and 30% served seafood at home on a weekly basis.

Most respondents preferred to pan-fry or grill seafood (39.3%). Almost three quarters (73.3%) felt seafood was easy to prepare and a similar number (72.7%) said they knew how to store it safely. Over half of respondents (55.0%) said they could tell if it was recently caught and 33.3% said they could tell if it had been previously frozen.

Interestingly, a similar number of respondents (67.3%) said little effort or a lot of effort was required to prepare seafood. This apparent contradiction may be due to different preparation requirements for different types of seafood. For example, whole fish or freshly caught squid take more time to prepare than freshly purchased fish fillets. It is therefore interesting to note that 44.0% of households would buy more seafood or fish if recipes or preparation details were available at the point of sale.

Almost all households (93.7%) agreed seafood/fish was an important part of a balanced diet, 83.3% said they ate seafood because it was healthy, and 60.7% agreed seafood was healthier option than meat or poultry.

A number of key influences appeared to have a positive impact on regular seafood consumption. These included having a good experience when eating seafood (86.7%), taste (74.0%) and eating seafood regularly as a child (51.0%).

When purchasing seafood, 84.7% compared prices for best value, 84.0% checked food labels when deciding to buy and 54.3% wanted more accurate labelling on seafood. Better prices (41.7%), more local produce (15.3%), easy free recipes (10.7%) and trusted information at point of sale (7.7%) would encourage people to buy more seafood. In comparison: healthy low cost seafood recipes that were quick and easy to prepare (66.7%); information on price (63.6%) and health benefits (58.7%) at point of sale; information on how to store seafood (34.3%); and online cooking demonstrations (24.3%) would encourage respondents to eat more seafood. Half of the respondents (49.0%) said they trusted the information provided in store when buying seafood.

Healthy food choices noted by respondents were vegetables (80.0%), fish (78.3%), fruit (66.3%), lean meat (40.3%), chicken (38.7%) and salad (22.3%). The main enabling factors for eating healthy foods were low cost (81.0%) and easy to understand food labels (65.3%). Quick and easy ways to prepare foods (59.3%) and affordable healthy food at local outlets (44.7%) were also considered important. However, most respondents (65.3%) thought that healthy foods were more expensive than unhealthy options.

## 7.5 Conclusion



In conclusion, respondents in this survey purchased most of the foods from large supermarkets (93%) or independent supermarkets (74.35). Around half (55%) had purchased seafood in the past month and 93% had eaten seafood during that time. One fifth of respondents (21.7%) would buy more seafood if it was more readily available. Canned fish was the most popular purchase (36.7%) followed by fillets (19.4%). Grilled or pan fried seafood was the preferred preparation mode in the home (39.3%) and 67.3% felt that seafood was easy to prepare.

Interestingly, 84% of respondents checked food labels when making purchasing decisions and 54.3% wanted more accurate food labelling to aid their decision making process. Almost half (44%) of respondents wanted more recipes and preparation details at point of sale. Overall the main enablers to increased purchases of seafood were affordability, easy to understand food labels, quick and easy recipes and availability of seafood at local outlets.

# Section 8

## Communication strategies

## 8.0 Introduction

There were a number of communication strategies used to promote the CIISC community intervention from the inception of the idea of a multi-faceted approach to improve the health and well-being of an entire community in 2006, to the development of the concept plan in 2007 that focused on the regular consumption of seafood as part of a healthy diet, and finally culminating in the roll out of the full community intervention within the City of Mandurah in 2011.

The success of the project was due to the collaboration of a research team and key stakeholders that combined their expertise at various stages along the continuum of the project development, planning, implementation and evaluation. This project is an exemplar of an effective collaboration between the seafood industry, researchers, scientists and practitioners.

## 8.1 Media associated with the CIISC Project

### 8.1.1 Printed media (newspapers, magazines, newsletters)

- Three half-page advertisements in the *Mandurah Mail* (May 5, 12, 19, 2011).
- *The West Australian* (May 9, 2011). Chefs take a shine to 'fit' barra. Features CESSH's collaborative research with producers and chefs on barramundi, saddletail snapper and blue swimmer crab.
- *The West Australian* (Health+Medicine) (May 4, 2011). Fishy health help: Experts advise eating more fish for vital omega-3 benefits. Features the work of CESSH and advertises the Today Tonight three-part series on fish and health.
- *Tasmanian Seafood Industry News* (April/May 2011). Kids Zone: Seafood the Superfood. Features some of the resources for children developed by CESSH.
- *The Adelaide Advertiser* (November 24, 2010). Go fishing and net a healthier life. Features the benefits of eating seafood during childhood.
- *Canning Times* (August 31, 2010). Innovative garden wins. Features the aquaponics system implemented at Rossmoyne Primary School.
- *Fisheries Research & Development Corporation News* (March, 2010). Injection of science adds new seafood eating options. Features CESSH research on value-added production.
- *The West Australian* (Health+Medicine) (January 6, 2010). Seafood rules! Features seafood recipes and CESSH research.
- *Seafood News* (October 2009). The Centre of Excellence for Science, Seafood & Health: Translating research into practical outcomes for the seafood industry. Features the opening of CESSH and the centre's main research programs.
- *Seafood Stories* (August 2009). Open and ready for seafood business. Features the opening of CESSH; also features the appointment of Dr Janet Howieson as Seafood CRC post-doctoral research scientist.
- *The West Australian* (Fresh) (October 12, 2006). Ocean's harvest for your health. Features the results of the report Factors Influencing the Consumption of Seafood among Young Children in Perth.

### 8.1.2 Radio, television

- *Today Tonight* (May 4-6, 2011). Health and Seafood series - 16.9 minutes of air time over three days.
- *Curtin FM* radio interview with Jenny Seaton (August 16, 2011). What innovative research is the Centre of Excellence for Science, Seafood & Health doing to promote health?
- *Curtin FM* radio interview (November 2, 2009). Seafood, health and well-being.
- *Curtin FM* radio interview (October 31, 2008). Promoting the health benefits of seafood: translating research into action.
- McManus A. Consumption spikes after seafood assault. *ABC Rural* 26 October 2011 [www.abc.net.au/rural/qld/content/2011/10/s3348347.htm](http://www.abc.net.au/rural/qld/content/2011/10/s3348347.htm)
- McManus A. How to increase seafood consumption within a community to improve health. *ABC Southern Queensland*, Toowoomba, QLD Compere Neroli Roocke 26 October 2011
- McManus A. Fish is good for you. *ABC Kimberley Compare* Rob Mailer. 10 October 2011

### 8.1.3 Online media

- *Science Network Western Australia* ([www.sciencewa.net.au](http://www.sciencewa.net.au)) (March 31, 2011). Science is helping our seafood industry catch the attention of healthy conscious consumers.
- *The West Australian Online* ([www.thewest.com.au](http://www.thewest.com.au)) (January 7, 2010). Boost your diet with seafood.

### 8.1.4 Dissemination through Curtin University (magazines, newsletters)

- *Curtin Health - Highlights and Happenings* [magazine] (May 2011). Indigenous health issues boosted. Features the launch of a new radio show on Perth's only Indigenous radio station, Noongar Radio, and contains a reference to CESSH.
- Curtin University's Australian Sustainable Development Institute [newsletter] (March 2010). Launch of the Centre of Excellence for Science, Seafood and Health. Features the launch of CESSH.
- Curtin University *R&D Now* [magazine] (2010). A catchy message. Features current projects at CESSH.
- *Cite* [magazine] (Summer 2009/10). Fit for life. Features Curtin's Activity, Food and Attitudes Program (CAFAP).
- *Cite* [magazine] (Summer 2009/10). Seafood and eat it. Features the health benefits of seafood and the newly opened CESSH.
- *Curtin Health - Highlights and Happenings* [magazine] (November 2009). New research centre to benefit seafood industry and people's health. Features the launch of CESSH.

## 8.2 Community intervention - distribution of resources and promotion



### 8.2.1 Dissemination of resources and promotion

The following resources were disseminated during the intervention period:

- 'Seafood and Health: A Vocational Training Resource' - provided to Challenger Institute of Technology. The module includes an instructor resource; PowerPoint presentation; handouts; quick seafood quiz and answer sheet; student task handout and self/peer assessments.
- Consumer communication resources - 35 food outlets involved - four consumer information pamphlets, four easy and affordable seafood recipe cards and a series of six posters provided in both A4 and A3 sizes for display in food outlets.
- Education materials for primary schools - 15 primary school teachers involved - interactive online primary resources 'Kidzone'.
- 'Seafood and Health: Secondary School Resource' for Year 11/12 students - 17 secondary school teachers involved - group activity; media review; presentations; assignments; fact sheet; health survey and practical cooking lesson.
- 'Seafood and Health' GP/AHP Resource - 30 Medical Practices and 109 GPs involved - general practitioners and health professionals to assist with the management of patients/clients at high risk of developing nutrition-related health conditions plus a nutritional resource for pregnancy. The resource includes a user manual and a series of 'Seafood and Health' booklets.

### 8.2.2 Measurement instruments developed

Three measurement instruments were developed and validated by CESSH for the project: a food outlet audit survey; a community survey; and a survey for the assessment of the 'Seafood and Health' GP/AHP resource.

### 8.2.3 City of Mandurah involvement in the distribution of CIISC intervention material

Table 8.1 outlines the involvement of the City of Mandurah in the distribution of materials for the CIISC community intervention.



Table 8.1: City of Mandurah involvement in the CIISC Community intervention

Component	Curtin University tasks	City of Mandurah tasks
Food outlet audit	Surveys Reply paid envelopes Mailing envelopes	Attach address label and post Follow-up non respondents
Community survey	Surveys Reply paid envelopes Mailing envelopes	Attach address label and post Follow-up non respondents
School educational material	Explanatory letter Instruction on online feedback	Forward to primary schools
Vocational skill set package	Explanatory letter Vocational material Survey or interview	Contact Challenger Institute of Technology Mandurah re: use of 'Seafood and health: A vocational training resource'
'Seafood and health' resource	Explanatory letter Request to provide resource Survey or interview	Contact health professionals for support of resource and appointment to provide resource and survey.
Survey of retailers, restaurants, etc	Explanatory letter Survey - sales over intervention period compared to 2010	Contact local businesses promoting the CIISC Project

### 8.3 Conference presentations

- McManus A, Maycock BM. *City of Mandurah Food Security Project*. Public Health Association Australia (WA BRANCH) State Conference, Public Health in the 21st Century People, Places and Priorities Fremantle Western Australia, 31 October - 2 November 2007.
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## 8.6 Conclusion

In conclusion, the CIISC intervention was promoted through a diverse range of strategies. These included: editorials; advertisements in national newspapers, industry magazines and newsletters; radio interviews; television coverage; online media; articles in Curtin University magazines and newsletters; conference presentations; peer-reviewed journal articles; and research reports. In addition, resources were developed for schools, GPs and AHPs and TAFE.

The extensive communication associated with the project undoubtedly contributed to the overall support and success of the CIISC intervention.

# Section 9

## Evaluation of the CIISC community intervention

## 9.0 Introduction

The major outcome of interest used to assess the effectiveness of the CIISC project was the survey of food outlet sales prior, during and after the implementation of the community intervention. Sales of seafood in kilograms was used as the standardised measure of success.

Another measure of success was the process evaluation of the general practitioner and allied health professionals 'Seafood and Health' booklets for arthritis, nutrition-related cancers, coronary heart disease (males and females), diabetes, and during pregnancy.

## 9.1 Food Outlet Survey

### 9.1.1 Commercial-in-confidence issues

Due to commercial-in-confidence issues relating to business sales, food outlets involved were assured confidentiality of commercial information supplied. The implication of this requirement to the project is that results are reported in either summary form or as percentage change. Furthermore, no business is named within the report and assurances have been given that the presentation of results will be done in such a way to preclude individual businesses being identified.

### 9.1.2 Privacy laws and confidentiality

Due to privacy laws within Western Australia and confidentiality issues, the research staff were unable to gain contact details of businesses from the City of Mandurah (CoM) to gain their support for the project. Therefore CESSH provided the CoM with copies of the survey, information sheet, consent form and reply-paid envelopes in an envelope ready for mailing, and the CoM made the initial contact with prospective study participants noting that CESSH staff would be in contact with them. Following this initial contact, the CoM provided the Principal Investigator with the names of the businesses contacted for follow-up purposes.

### 9.1.3 Sample

The inclusion criteria for businesses were that they sold seafood, seafood products or meals containing seafood within the CoM. The primary owner or operator of each food outlet that sells seafood was asked to provide information about: the variety of seafood available in their outlet; the main types of seafood purchased for preparation and resale; their knowledge and availability of healthy food choices; and factors influencing the choice of seafood available to their clientele. Completed surveys were forwarded directly to Curtin University in reply-paid envelopes provided. A total of 57 businesses were eligible for inclusion in the intervention. Pre-intervention surveys were distributed in March 2011 and follow-up surveys were distributed in June/July 2011.

### 9.1.4 Results of the Food Outlet Survey - pre-intervention

Of the 57 food outlets contacted in the Mandurah area, 35 food outlet surveys were returned, representing a response rate of 61% (35/57). All results are provided in Section 9 - Appendices and summarised herein.

Over half of the respondents (52%, n=16) had been involved in their business for five years or less, 29% (n=9) for five and a half to 10 years, and 19% (n=6) had been involved for between 11 and 19 years. Four respondents did not answer this question. The most common type of business surveyed was take-away/fast food outlets representing 38% (n=13), followed by cafés (26.5%, n=9), restaurants (17.6%, n=6) and the remainder servicing seniors (12%, n=4). One respondent did not answer this question.

#### *Q1. Which days are the outlet open for business?*

The majority of the outlets were open weekdays with three closed on Monday, three closed on Saturday and seven closed on Sunday.

#### *Q2. Who are the outlets main clientele?*

The majority of the respondents noted that seniors (n=29), families (n=26) and tourists (n=23) were their main clientele, but they were also popular with business (n=19) and trades people (n=18).

#### *Q3. When is the busiest mealtime for the business?*

As shown in Table 9.1, 31% of the businesses surveyed were at their busiest during lunch time. Twenty-six per cent were busiest during dinner time with another 26% constantly busy during opening hours.

Table 9.1: Busiest mealtime for the business (n=35)

Busiest mealtimes	Businesses (n)	Businesses (%)
Breakfast	5	14
Lunch	9	26
Dinner	11	31
Constantly busy during opening hours	9	26
Other	1	3
Total	35	100

Q4. Do you pre-prepare food before the store opens for business each day?

Almost three quarters (74%, n=26) of the businesses pre-prepared some foods before the store opened each day (see Table 9.2). A variety of foods were pre-prepared including: salads (29%, n=10), fish/seafood (26%, n=9), pastries (23%, n=8) meat dishes (20%, n=7), sauces (11%, n=4), and soup (9%, n=3).

Table 9.2: Main foods usually pre-prepared (3 top choices)

Pre-prepared foods	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	Total
Salads/vegetables	6	4	2	12
Fried rice/noodles/pasta/sauce/curry/soup	2	4	5	11
Seafood/fish	4	2	3	9
Sandwiches/rolls	3	2	2	7
Meat	4	3	-	7
Sweets/cakes/muffins/croissants	2	3	2	7
Pies/quiche/burgers	3	-	1	4
Fruit salad	1	1	-	2
Fried food/chips	-	2	-	2
Specials	1	-	-	1

Q5. Where does the business display the perishable foods they have available for sale?

Sixty-three percent of the businesses (n=22) kept some of their perishable goods for display in various types of refrigerators, while 17% (n=6) kept theirs in a bain marie (see Table 9.3)

Table 9.3: Display of perishable foods (3 top choices)

Displaying options	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	Total
Refrigerated display cabinet	5	-	1	6
Cake fridge	2	-	-	2
Bain marie	4	1	1	6
Fridge	6	1	1	8
Walk-in fridge	1	-	-	1
Meat cabinet	1	-	-	1
Cake cabinet	-	1	-	1
Walk-in freezer	-	1	-	1
Frozen cabinet	-	1	-	1
Cookie rack	-	-	1	1
Cold bain marie	-	2	-	2

*Q6. Does the business offer seafood for sale?*

Almost all of the respondents (94%, n=33) stated they sold seafood direct to the public.

*Q7a. Does the business usually sell finfish?*

Around half of the businesses in the study usually sold finfish (57%, n=20), with average monthly sales of 3,660 kilograms per month.

*Q7b. Does the business usually sell crustaceans/molluscs?*

Around half of the businesses in the study usually sold crustaceans and/or molluscs (51%, n=18), with average monthly sales of 1,500 kilograms per month.

*Q7c. Does the business usually sell shellfish?*

Just over one third of the businesses in the study usually sold shellfish (37%, n=13), with average monthly sales of 988 kilograms per month.

*Q7d. Does the business usually sell calamari/squid?*

Over half of the businesses in the study usually sold calamari and/or squid (54%, n=19), with average monthly sales of 1,384 kilograms per month.

*Q7e. Does the business usually sell octopus?*

Fourteen percent of the businesses in the study usually sold octopus (14%, n=5), with average monthly sales of 121 kilograms per month.

*Q7f. Does the business usually sell canned seafood/fish?*

Twenty three percent of the businesses in the study usually sold canned seafood (23%, n=8), with average monthly sales of 201 kilograms per month.

*Q7g. Does the business usually sell packaged seafood meals/products?*

One third of the businesses in the study usually sold packaged seafood meals or products (34%, n=12), with average monthly sales of 331 kilograms per month.

*Q8. What type of fish did the business sell in 2009 (Q8a) and 2010 (Q8b)?*

Businesses were asked to nominate the five most popular types of fish sold in their business using kilograms as a measure, during 2009 and 2010.

Table 9.4 and 9.5 clearly show basa and 'generic' finfish as the most popular type of fish sold by kilogram (kg) in businesses surveyed during 2009 (23,730kg) and 2010 (24,174kg). Other popular sales were:

- Prawns (2009 - 5,810kg, 2010 - 4,645kg);
- Calamari (2009 - 5,600kg, 2010 - 5,600kg);
- Squid (2009 - 4,310kg, 2010 - 4,840kg);
- Shellfish (2009 - 4,200 kg, 2010 - 4,200kg); and
- Mussels (2009 - 2,500kg, 2010 - 2,500kg).

Table 9.4: Type of fish sold in 2009 by kilogram (5 most popular choices)

Type of fish	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	Total
Basa	12600	770	0	0	0	13370
Finfish	9900	360	0	0	100	10360
Prawns	4580	1060	70	100	0	5810
Calamari	0	5600	0	0	0	5600
Squid	0	280	360	3670	0	4310
Shellfish	0	0	4200	0	0	4200
Mussels	0	0	2500	0	0	2500
Crab	900	0	100	15	900	1915
Salmon	350	100	915	260	0	1625
Crustaceans	0	1200	0	0	0	1200
Flounder	1000	0	0	0	0	1000
Smoked cod	0	0	260	500	0	760
Hake	500	20	0	0	0	520
Red emperor	470	0	0	0	50	520
Snapper	0	0	20	500	0	520
Barramundi	15	0	0	0	500	515
Tuna	0	0	300	0	0	300
Whiting	250	0	0	0	0	250
Scallops	0	0	0	240	0	240
Frozen fillets	0	0	0	150	0	150
Canned tuna	0	0	100	0	0	100
Oysters	0	0	80	0	0	80
<b>Total</b>	<b>30565</b>	<b>9410</b>	<b>8885</b>	<b>5435</b>	<b>1550</b>	<b>55845</b>

Table 9.5: Type of fish sold in 2010 by kilogram (5 most popular choices)

Type of fish	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	Total
Basa	12600	354	0	260	0	13214
Finfish	10600	360	0	0	0	10960
Calamari	0	5600	0	0	0	5600
Squid	0	300	440	4100	0	4840
Prawns	3540	930	65	110	0	4645
Shellfish	0	0	4200	0	0	4200
Mussels	0	0	2500	0	0	2500
Salmon	350	100	1425	0	0	1875
Crustaceans	0	1200	0	0	0	1200
Flounder	1000	0	0	0	0	1000
Snapper	0	25	0	500	0	525
Barramundi	20	0	0	0	500	520
Hake	520	0	0	0	0	520
Red emperor	420	0	0	0	0	420
Tuna	0	0	350	0	0	350
Whiting	250	0	0	0	0	250
Scallops	0	0	0	240	0	240
Crab	0	0	110	15	0	125
Canned tuna	0	0	100	0	0	100
Oysters	0	0	0	50	0	50
Frozen fillets				150		150
<b>Total</b>	<b>29300</b>	<b>8869</b>	<b>9190</b>	<b>5425</b>	<b>500</b>	<b>53284</b>



*Q9. On average, what percent of seafood/fish the business was sold from various sources*

Businesses were asked to nominate the average percentage of seafood they sourced locally (Western Australia (WA)), from within Australia (excluding WA) and from imported sources. Half of the business surveyed (51%, n=18) sold locally produced seafood, 57% (n=20) sold Australian seafood, and 74% (n=26) sold imported produce (see Table 9.6).

*Table 9.6: Average percent of seafood/fish sold by source*

Average %	WA products/produce		Australian (not WA)		Imported	
	Number	% of businesses	Number	% of businesses	Number	% of businesses
0%	12	34	12	34	6	17
0 - 25%	10	29	12	34	5	14
26 - 50%	4	11	6	17	4	11
51 - 75%	4	11	-	-	5	14
76 - 100%	2	6	2	6	12	34

*Q10. On average, what percentage of seafood was sold as fresh, frozen or other*

Three quarters of the businesses (76%, n=27) sold frozen seafood, one third (31%, n=11) sold fresh seafood and one third (31%, n=11) sold seafood in forms other than fresh or frozen (see Table 9.7).

*Table 9.7: Percentage of seafood sold as fresh, frozen or other*

Average %	Fresh		Frozen		Other	
	Number	% of businesses	Number	% of businesses	Number	% of businesses
0%	21	60	5	14	20	57
0 - 25%	5	14	1	3	5	14
26 - 50%	4	11	4	11	3	9
51 - 75%	-	-	4	11	-	-
76 - 100%	2	6	18	51	4	11

*Q11. On average, what percentage of seafood produce was sold raw, ready to eat/takeaway and dine-in*

Almost three quarters of businesses (72%) offered dine-in options, 54% offered ready to eat or take-away options and 15% offered raw seafood for sale (see Table 9.8).

*Table 9.8: Percentage of seafood produce sold raw, ready to eat/takeaway and dine-in*

Average %	Raw		Ready to eat/take away		Dine-in	
	Number	% of businesses	Number	% of businesses	Number	% of businesses
0%	27	77	14	40	7	20
0 - 25%	2	6	6	17	2	6
26 - 50%	1	3	6	17	6	17
51 - 75%	2	6	1	3	1	3
76 - 100%	-	-	5	14	16	46

*Q12. What were the most popular ways to prepare seafood?*

Over two thirds of businesses (71%, n=25) sold deep-fried seafood. Other popular ways to prepare seafood were: grilled (57%, n=20), take-away (40%, n=14), seafood in a roll or sandwich (34%, n=12), seafood salad (31%, n=11) and pre-prepared meals/foods (26%, n=9).

*Q13. Did the business offer seafood-based meals*

Almost all the business surveyed (83%, n=29) offered seafood-based meals.

*Q14. Seafood-based meals offered by businesses*

Most businesses sold deep-fried seafood-based meals. In particular, 19 sold fish and chips, 12 sold seafood or fish salad, nine sold calamari or squid, nine prawn dishes, seven seafood baskets and six grilled fish. Other seafood-based meals sold by businesses included seafood patties, seafood, wraps, teriyaki fish, sweet and sour fish, oysters, mussels, and stir fry.

*Q15. How seafood meals compared in price to other meals the businesses sold*

Over half of the businesses (54%, n=19) surveyed sold seafood meals for the same price as other meals sold, 17% (n=6) sold seafood meals at a higher price than other meals sold and 11% sold seafood meals at a cheaper price than other meals sold.

*Q16a. Why seafood meals differ in price*

When asked why various seafood meals differed in price, businesses noted that price structures were charged based on the cost of the products sourced. For example, local or Australian seafood was often more expensive than imported products therefore the cost of the meals reflected these costs. Other factors that impacted on prices were cost of seafood stock (expensive), cost of special preparation and ability to provide value for money discounts.

*Q17. Is seafood a healthy meal option*

Almost all business owners surveyed (32/35) thought that seafood was a healthy meal option.

*Q18. Healthy seafood options sold by businesses*

Seafood options considered to be healthy by respondents included: grilled seafood; salads; sushi; stir fry; or seafood that took little preparation such as shellfish or molluscs.

*Q19. Total weekly contribution of seafood to business sales*

Seafood contributed to over 20% of weekly sales in one third of businesses surveyed (30%, n=11), between 11% and 20% in one fifth of businesses (23%, n=8), and 10% or less of the weekly sales contribution in 40% (n=14) of businesses.

*Q20. What would encourage businesses to offer more seafood*

Price was the overarching factor relating to the amount of seafood sold in outlets surveyed. Other factors that impacted on seafood sales were access to local produce, freshness, consistent quality, and consumer demand.

*Q21. Barriers to offering more seafood*

Over half of the businesses surveyed (54%, n=19) named price as the greatest barrier to offering more seafood. Other barriers were identified: 23% (n=8) felt it was difficult to store, 20% (n=7) found it difficult to source and 14% (n=5) cited lack of consumer demand (see Table 9.9).

*Table 9.9: Barriers to offering more seafood.*

Barrier	Businesses (n)	Businesses (%)
Too expensive	19	54
Difficult to store	8	23
Difficult to source	7	20
Lack of consumer demand	5	14
Franchise	4	11
Lack of knowledge of preparation	1	3
Local product too expensive	1	3
Competition from fish and chip shops	1	3

*Q22. Influences on decisions to stock (or not stock) seafood*

Consumer demand (71%, n=25) was by far the greatest influence on decisions to stock seafood in the businesses surveyed. Consistency of quality (34%, n=12) and shelf life or spoilage (31%, n=11) were also important influences in decisions to stock seafood (see Table 9.10).

Table 9.10: Influences on decisions to stock (or not stock) seafood.

Influence	Businesses (n)	Businesses (%)
Consumer demand	25	71
Consistency of quality	12	34
Shelf life/ spoilage	11	31
Seasonal availability	10	28
Transportation issues	3	8
Maintenance	2	6

### 9.1.5 Food Outlet Survey - post-intervention summary

As stated previously there were considerable commercial-in-confidence issues associated with the data collection pre and post intervention. Therefore results of the evaluation of the CIISC community intervention are presented in summary format.

### 9.1.6 Description of average monthly sales of seafood in food outlets in 2010

The following is a description of the average monthly sales of seafood in the food outlets involved in the study:

- 57% sold finfish - average monthly sales of 3,660kg;
- 54% sold calamari and/or squid - average monthly sales of 1,384kg;
- 51% sold crustaceans and/or molluscs - average monthly sales of 1,500kg;
- 37% sold shellfish - average monthly sales of 988kg;
- 34% sold package seafood meals/products - average monthly sales of 331kg;
- 23% sold canned seafood - average monthly sales of 201kg; and
- 14% sold octopus - average monthly sales of 201kg.

### 9.1.7 Outcome of the evaluation

The intervention was conducted during the month of April 2011 and the number of kilograms sold was used as a measure of success. The sales during April were compared with the previous month (March) to assess any increase in sales. Sales from the month following the intervention (May) was also used to assess if there was any residual increase in sales as a consequence of the study. As noted previously, the businesses involved provided the number of kilograms sold each month on the proviso that they would remain confidential and that sales would be reported as percentage change between monthly sales.

Trends in sales of seafood in the business involved during 2009 and 2010 varied by only 4.9% which indicated a relatively stable market. In particular sales from March 2010 to May 2010 were assessed to account for any spikes in sales in the year prior to the intervention. Over this period in 2010, sales remained relatively stable with a change of only 1.12% (see Table 9.11). Figure 9.11 illustrates the changes in sales over the study period (March 2011-May 2011) which included the intervention period of April 2011.

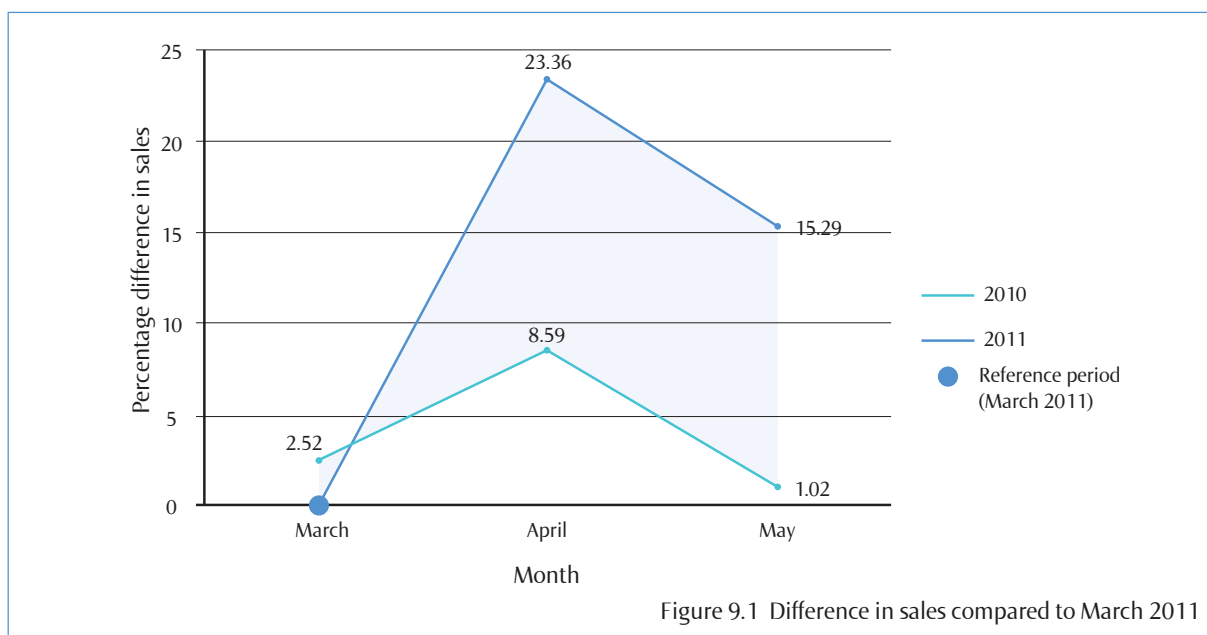


Figure 9.1 Difference in sales compared to March 2011

In Figure 9.1 March 2011 is used as the reference point (zero) with differences in sales expressed as either a percentage increase or decrease compared to the sales in March 2011. The figure clearly depicts the significant increase in sales of 23.36% during the month of April 2011. There was also an increase in 15.29% in May 2011 compared to sales in March 2011. Again using March 2011 sales as the reference point, Figure 9.1 shows that the sales in March 2010 were 2.52% higher than sales in March 2011. The shaded area shows the net percentage differences in sales between 2010 and 2011 which showed when taking into account trends in sales over the previous year, the intervention period produced a net increase in sales of 14.77%.

Table 9.11: Impact on sales

Monthly sales period	Percentage change in sales
Difference in sales between March 2010 and April 2010	6.07 ↑
Difference in sales between April 2010 and May 2010	6.68 ↓
Difference in sales between March 2010 and May 2010	1.02 ↓
Difference in sales between March 2011 and April 2011	23.36 ↑
Difference in sales between April 2011 and May 2011	8.07 ↓ (15.29% ↑ residual change)
Difference in sales between March 2011 and May 2011	13.40 ↑ increase evident
Difference in sales between March/April 2010 and March/April 2011	17.29 ↑
Difference in sales between March/April 2010 and March/April 2011	1.39 ↓ (15.90% ↑ residual change)
Difference in sales between March/April 2010 and March/April 2011	14.52 ↑ increase evident

Table 9.11 also show the impact on sales of seafood during the intervention period (April 2011) compared with the month prior to (March 2011) and immediately following the intervention (May 2011) in more detail. Sales during the same months on the previous year were factored into the model to account for any history effect. There was no significant change in sales (1.12%) change in sales from March 2010 to May 2010.

During the CIISC Project (bolded in Table 9.11), there was an absolute increase of 23.36% in sales over the intervention period (April 2011). There was a residual increase of 15.29% in the month following the intervention (May 2011). This significant residual increase may be due in part to the airing of our three-part series on Channel 7 Today Tonight, which screened from the 4th to the 6th of May 2011. The series highlighted the importance of regular consumption of seafood as part of a healthy diet.

As changes in sales usually occur between each month of the year, changes in sales of seafood during March, April and May 2010 were used as a net measure of change. When taking into account the difference between the sales of seafood during 2010 and 2011, there was a significant increase in sales over the intervention period of 17.29% and a residual of 15.90% in the month following the intervention.

### 9.1.8 Summary

The evaluation of the CIISC project showed an increase in fish and seafood sales of 23.36% over the intervention period with a residual increase of 15.29% over the month following the intervention. This is an excellent outcome and clearly shows the value of an integrated approach to improving seafood sales within the community.

## 9.2 Evaluation of 'Seafood and Health' booklets for General Practitioners and Allied Health Professionals

### 9.2.1 Review of GP/AHP Nutrition Resources - Process Evaluation

Thirty medical practices and 109 general practitioners agreed to be involved in the process evaluation of the 'Seafood and Health' booklets for GPs/AHPs and the user manual.

#### 9.2.1.1 Comments on usefulness

Overall the GPs who evaluated the 'Seafood and Health' booklets found them very useful, especially with patients interested in nutrition and good health. Results of the process evaluation are illustrated with a quote in italics that is indicative of responses from the 109 general practitioners involved in the study.

*"Very useful. Well laid out, colourful. Clear explanation."*

*"Useful as a guide to how much omega-3 is needed for heart disease, as an anti-inflammatory agent and for cancer."*

The resources also helped to keep patients motivated, particularly those who could control their condition through diet in conjunction with, or instead of, medication.

*"... it is well known that the larger the consumption of fish, the longer people live."*

*"The resources were very useful and help the patients to get motivated as well as compliant with seafood."*

Tailoring of nutrition advice to specific conditions was considered long overdue. GPs often struggle with the provision of nutritional advice as it is not core to their teaching. Furthermore, dietitians are highly sought after, thus can be difficult for patients to access in the short term. The provision of evidence-based nutrition advice that can be easily understood by patients and the provision of more in-depth information for health professionals was well appreciated.

*"(The resources were) useful for dietary education for patients."*

*"...very useful when dealing with patients, can refer to books for advice."*

*"Very useful, will always use them."*

#### 9.2.1.2 Suggestions for further booklets to add to the suite of resources

The health professionals involved in the evaluation were asked what other health conditions they thought should be considered for developing additional booklets to complement the existing suite of resources. A number of suggestions were mooted to fill existing gaps in patient nutrition education including:

- Vitamin D;
- What is a balanced diet;
- Minimising red meat in the diet;
- Dose of fish oil required for various conditions;
- A seniors nutrition resource that featured seafood;
- Omega-3 in diets from seafood other than finfish;
- An iron, vitamin B12 and seafood rich diet;
- Diet low in cholesterol and high in seafood; and
- Diets for specific conditions such as celiac disease and irritable bowel syndrome.

One comment made illustrates well the feelings raised by respondents:

*"I think stimulating the interest in seafood in paediatric populations will go a long way (to maintaining good health) into their later life."*

To summarise, all GPs who reviewed the 'Seafood and Health' GP/AHP resources found them very useful as a complementary therapy to traditional medical treatment. They were also very interested in supporting the development of addition booklets for general good health, specific populations (such as adolescents and seniors) and for a number of medical conditions that they felt would benefit greatly from evidence-based, tailored nutritional education.

# Section 10

## Conclusion

## 10.0 The CIISC project



The success of the CIISC Project was due, in a large part, to the involvement of a multi-disciplinary team of scientists, researchers, practitioners, key community stakeholders and members of the seafood industry in the extensive planning stage of the project. Their input from the onset of the project ensured that all resources developed were relevant to each of the end-users targeted. This collaborative approach allowed all parties direct input into the project and thus afforded them ownership of the research process.

The use of a participatory action research model where each stage informs the proceeding stage was also essential to the success of this project. This model assured currency and relevance of the intervention to the community.

Although the CIISC intervention was implemented and evaluated in Western Australia, all resources were developed with the aim to conform with Australian guidelines, curriculum and regulations to maximise dissemination and usability beyond the life of the project.

## 10.1 Objectives of CIISC Project achieved



The Community Intervention to Increase Seafood Consumption (CIISC) Project used a whole-of-community approach resulting in an increase in seafood consumption (as measured by sales) of 24% over the intervention period and a residual increase of 15% in the proceeding month.

All objectives of the project were achieved, being:

- A systematic review of all published evidence around the health benefits of seafood consumption;
- Industry guidelines around health messages and seafood (including a practical summary of food labelling laws and regulations);
- A series of targeted seafood health benefits communication resources for educational institutions, health professionals and their clients, seafood consumers and members of the seafood industry;
- A vocational education training resource; and
- To trial and evaluate the seafood health benefits communication resources developed in a single community to determine whether seafood consumption in that community can be increased.

## 10.2 Outcomes from the CIISC Project



A number of outcomes from the CIISC project have already been achieved:

- 30 national or international conference presentations;
- 7 peer reviewed journal articles;
- 11 research reports;
- 12 educational resources;
- 24 printed media stories;
- A three-part series on Today Tonight; and
- 3 radio interviews.

### 10.3 Planned outcomes from the CIISC project




A forum for investigators, researchers and key stakeholders within the City of Mandurah will be held to present the findings of the CIISC project. Key findings will be published on the CESSH Curtin University website plus the ASCRC website. Findings will also be published in relevant professional journals and presentations made at appropriate professional conferences.

A half-day forum will be held in Perth with members of the seafood industry to provide an outline of learnings from the CIISC Project that may be of benefit to the industry. Other forums can be presented across Australia if additional funding is provided. A summary of the outcomes presented at the forum will be available on the CESSH and ASCRC websites.

A number of additional outcomes will be achieved by early February 2012 including: 5 additional peer reviewed articles from the CIISC Project (currently in end stage preparation – making 12 in total); and promotion of educational resources through existing networks across Australia to maximise reach.

### 10.4 Further development



The CIISC Project could quite readily be implemented in any city or town across Australia using the methodology, resources and evaluation framework developed. It could be scaled up or down as required with minimal modification depending on the specific target groups involved in the target communities. It would also be suitable for use in urban regional or remote locations.

The cost of further implementation would be greatly reduced as the CIISC resources have national relevance and were developed in paper-based and electronic formats. Costs of production could be shared. The educational resources could also be extrapolated to the electronic whiteboard used in schools across Australia with minimal cost making it more accessible to teachers and students. Furthermore, considerable value could be added to any future interventions developing additional resources as requested in the evaluation of CIISC (e.g. additional GP resources); addressing recommendations herein and through the conduct of a more rigorous evaluation of impact on attitudes and behaviours over time.



# Section 11

## Recommendations and Legacy

## 11.0 Recommendations from the CIISC Project

A number of recommendations and suggestions for future research have arisen from the project. They include the vital role of planning in the success of a whole-of community intervention; recruitment of key stakeholders within the community; and strategies to maximise seafood purchasing through in store promotion.

### 11.0.1 Recommendation 1 - Planning for success

Interventions targeting food security, seafood supply and seafood consumption across a community must adopt a collaborative and multi-faceted approach that targets key stakeholder groups within that community. These include:

- A leading organisation with credibility and a reputation for excellence in seafood-based research and experience in the development, implementation and evaluation of community-based intervention research projects;
- A local council that is supportive of the initiative and has been well versed in all aspects of implementation prior to implementation;
- A team of researchers with expertise across all areas relevant to the project;
- Seafood business outlets that accept and support in-store point of sale materials;
- Educational institutions from primary schools through to vocational education organisations;
- Health professionals;
- Seafood industry partners;
- Media spokesperson/s that offer credibility and have an ability to communicate effectively with the general population; and
- Major funders that provide both cash and in kind support.

It is essential to form an Advisory Group representing key stakeholders that could assist to make the project successful. The CIISC Advisory Group was extensive; however, it is important to inform potential members on recruitment of their expected level of commitment and what it would entail. For example, some CIISC Advisory Group members were only called upon once whilst others were involved at various stages throughout the entire project.

A research team with expertise across all major areas involved in the project is essential for success. A whole-of-community project requires input from a large number of people with varying levels of expertise, input and commitment to the project. Planning is the most important element of any intervention of this nature. Detailed planning based on the most current available evidence and with input from representatives from all sectors involved in the proposed intervention is the key to success.

Planning for a whole-of-community intervention around increasing seafood consumption as part of a healthy diet should involve:

- Systematic reviews of published and unpublished literature (including reports);
- Recruitment of advisory and/or expert groups;
- Enlisting of support from key stakeholders within the study community including the local council;
- Needs assessment of the study community including a community audit;
- Audits of relevant seafood businesses and/or entities;
- An informed and detailed plan of how the intervention will be developed, implemented and evaluated;
- Development and validation of appropriate measurement instruments (or permission to use existing validated instruments if suitable) for data collection and evaluation of the effectiveness of the intervention;
- Development and trial of any resources required to support the intervention; and
- A dissemination plan that includes a variety of communication strategies.

### 11.0.2 Recommendation 2 - Considerations for interventions aimed at influencing local food supply

Although supermarkets and other food retail stores have state or national management, there is often potential for communities to influence local decisions regarding stock, promotion and pricing policies. This is particularly true when dealing with food stocks from local primary industries such as the seafood industry. Opportunities to improve the promotion of seafood food options at retail outlets in a localised area may involve: enlisting the support of a significant number of businesses in the area and auditing these businesses to build a picture of the sales profile of various types of seafood (using one or more indicative types as a measure/s) within that community. In addition to the paper-based food audit, an observation study of promotion of seafood within a large range of food outlets should be conducted.

Food audit and observational studies of seafood outlets provide the following baseline measures:

- A snapshot of the basic operations of the outlets including their hours of business, main clientele, peak operational times, most popular sales, usual in-store promotions, usual mode of food preparation (e.g. made to order and/or pre-prepared), barriers to increasing sales of seafood and the influences on decisions to stock various types of seafood;
- An understanding of the current availability and promotion of seafood;
- Identification of opportunities and support for change within and across outlets (critical mass);
- Current sales of seafood and sales over time by kilogram as standardized proxy measure of current local community consumption and trends in consumption over time;
- The willingness of local businesses to actively engage in a community intervention to increase seafood consumption; and
- The level of commitment to in-store promotion and provision of post-intervention measures to evaluate change during the intervention period.

### 11.0.3 Recommendation 3 - Involving restaurants and takeaways

Fast food and take-away outlets vary enormously in the quality and variety of the seafood served, and improvements in the range and nutritional quality of the seafood supply can have a big impact on the diet of a local community. Many people obtain a regular and significant proportion of their household seafood consumption from prepared food outlets therefore, it is important to consider the preparation methods, quality of ingredients, and the variety and relative price of the seafood served. There is often potential to improve the nutritional quality of seafood on these menus, as well as introducing identified healthy choices.

### 11.0.4 Recommendation 4 - Involving convenience stores and local shops

Small corner shops, general stores, and convenience stores are commonly used as 'top up' shops to supplement larger shopping trips to a supermarket. However, for many vulnerable people who are unable to access supermarkets on a regular basis, the small local shop can represent the primary seafood retail outlet. Those reliant on local stores include: people without cars; older people and people with a disability who find public transport difficult to negotiate; those living on the urban fringe where public transport is limited and where supermarkets do not exist yet; and people in remote areas with limited retail outlets. The key difficulties faced by those who rely on corner shops or general stores for their primary seafood supply are that the range of seafood available is usually quite limited and the prices are often higher than in most supermarkets.

Small seafood retailers are often unable to modify the range and price of their goods due to an insufficient volume to achieve wholesale prices; small margins and under-capitalisation in refrigerated storage facilities; customers with less to spend; and slow turnover and thus risk of spoilage of perishable goods. Although convenience stores continue to sell basic 'top up' items such as bread and milk, they are also more oriented to the sale of high profit Snack foods and drinks. Despite this, there is potential for motivated community organisations and consumer groups to negotiate with these stores to include the type and range of seafood that would benefit those who rely on them as their primary seafood source.

### 11.0.5 Recommendation 5 - Opportunities for local government and community involvement

The 1992 Australian Food and Nutrition Policy identified that local government action could significantly impact on the food system and nutrition. Opportunities exist for health professionals to work with local government to promote nutrition and to impact on the food and nutrition system. Responsibilities of local government that impact on the food system include information provision, monitoring and enforcement of food regulations, and community services.

Following are some key factors that should be considered by local government when aiming to improve seafood availability and accessibility within the community:

### 11.0.5.1 Location of supermarkets

Supermarkets are a key factor in determining the quality of seafood supply in a community (wider range of goods and/or able to offer lower retail prices than alternative outlets). Mapping the location of supermarkets and influencing decisions around access to healthy seafoods across all sectors of the community can significantly improve the food security of whole communities. For example, coordination of public transport routes with locations of healthy seafood outlets can significantly improve the quality of a food supply for those on limited incomes who do not own their own cars.

### 11.0.5.2 In-store price, availability and promotion

While supermarkets usually contain a wide variety of foods, the stock of healthier foods is often minimal, and the in-store prepared seafoods (deli and salad bars) offer a limited range of relatively high fat dishes. Local government entities, researchers and organised consumers working together can significantly improve the range and quality of fresh seafood stocked in food retail outlets; the price competitiveness of those foods; and the way healthy seafood options are displayed and promoted within stores. In-store promotion can assist consumers to locate the healthy choices; and the use of healthy catering practices for the prepared seafood lines in supermarkets has considerable scope for improving nutrition. These strategies can also be implemented as part of a holistic approach to improving community health through the promotion of seafood as part of a healthy diet.

Activities focussing on seafood promotion may include regular 'specials' offering healthy food/prepared dishes at a reduced price; product tasting and demonstrations on how to prepare seafood; more efficient displays of fresh seafood; in-store radio promotions and simple shelf-tags identifying cost effective and healthy seafood options.

Results from the CIISC Community Survey found that consumers are interested in:

- Easy to read and informative food labels to aid consumers when making purchasing decisions;
- Nutritional information panels for each type of seafood sold; and
- Quick and easy recipes for seafood at the point of sale.


### 11.0.5.3 Local government involvement in improving seafood consumption

The City of Mandurah (CoM) is a proactive local council that is vitally interested in improving the health of their residents and is committed to supporting the long term viability and commercial prosperity of local seafood businesses. The CoM was central to the success of the CIISC community intervention.

A number of recommendations are made for other councils who may wish to improve the health of their constituents whilst supporting local industries. These include:

- Provision of incentives for businesses to promote local seafood produce — including grants or reductions in business fees for businesses providing reasonably priced healthy food options;
- Provision of leadership in developing mixed-use retail 'clusters' in which small or independent seafood outlets can flourish;
- Streamlined applicable licence and permit processes;
- Provision of technical assistance to entrepreneurs and store owners who are interested in improving their communities' access to nutritious seafood;
- Improved transportation services to local seafood and fresh food markets;
- Nutrition education classes and activities including education on shopping, storage, freezing and preparation of a variety of cost effective and easy seafood meals;
- Public health campaigns promoting seafood consumption as part of a healthy diet; and
- Inclusion of small fresh food markets (including local seafood outlets) as a vital component of neighbourhood revitalisation projects.

## 11.1 Legacy of the CIISC Project



Legacies of the CIISC project include:

- Effective links between State/Territory Departments of Fisheries, Professional Industry Associations and social scientists/researchers;
- An understanding within the seafood industry of the benefits of working with research-active social scientists;
- Strong professional relationships between the seafood industry and seafood scientists and researchers that support proactive engagement;
- The seafood industry values the contribution of scientists and researchers to the promotion and profitability of the seafood industry;
- Institutionalisation of seafood as a core nutritional therapy that compliments existing best practice treatments for nutrition-related health conditions;
- Communication of seafood health messages to a range of end users;
- A suite of evidence-based nutritional education resources for specific target groups within the Australian population;
- A comprehensive intervention that can be scaled to fit any sized community within Australia with the potential to improve biomarkers for health through increased seafood consumption at a population level; and
- A significant number of scientists, researchers, educators and industry members with a clear understanding of the processes required to develop, implement and/or evaluate a community-based intervention to increase seafood consumption.

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# Industry Guidelines

for Seafood Health and Nutrition Messages  
January 2010



*Prepared by the Centre of Excellence for Science, Seafood and Health (CESSH)  
Curtin Health Innovation Research Institute, Curtin University of Technology.  
Funded as part of a project of the Australian Seafood Cooperative Research Centre*

# Industry Guidelines for Seafood Health and Nutrition Messages

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Government of Western Australia  
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# Forward

It is with great pleasure that I preface these guidelines.

We all know that ‘seafood is good for you’. Industry research as far back as 1995 showed that the general public had got that message, but when asked exactly what was “good” about it people were generally very vague. What these guidelines do is make it clear what can be said about the health benefits of seafood consumption and with what level of confidence a particular statement can be made.

This confidence is critical for labelling as new laws are very strict about what claims can be made, particularly in regard to health benefits. The Western Australian Fishing Industry Council (WAFIC) has been a strong supporter of truth in labelling, having led the drive for the standardisation of fish names and country-of-origin labelling so that the public can be confident that fish is properly described.

Using this guide will allow people in the industry to take that message one step further. The guide complements previous work such as the CSIRO publications ‘Seafood the Good Food’ and the Australian Seafood Handbook; and the Fisheries Research and Development Corporation publication ‘What’s so Healthy about Seafood’.

The Western Australian professional fishing industry has supported the Centre of Excellence for Science, Seafood and Health (CESSH) since its inception and is proud to be a partner in the Australian Seafood Co-operative Research Centre.

This is one of the first of what we hope will be a suite of informed and well-researched documents that will allow the discriminating consumer to make the best possible decisions when selecting and preparing their seafood.

This guide will be your opportunity to pass on the message that seafood IS good for you – please use it and help the eight out of ten people who buy their seafood to make the best possible choice.



Kim Colero  
Chairman WAFIC

*“ This guide will be your opportunity to pass on the message that seafood IS good for you ”*



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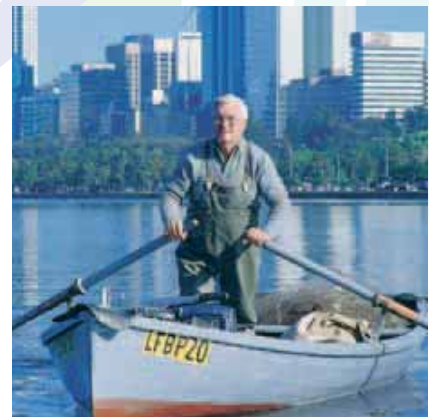
## How to use this guide

This guide has been written to assist the seafood industry to recognise and promote health and nutrition messages regarding seafood consumption and health.

The guide summarises relevant regulations, legislation and guidelines governing use of health and nutrition messages to promote seafood on food labels and in advertising material.

Although this guide provides the main points that should be considered when promoting the health benefits of seafood, it is recommended that the original documents are referred to when planning any labelling or advertising materials. A list of relevant websites and references are provided at the end of this guide

The guide also summarises scientific evidence regarding the health benefits of seafood consumption.





## Food labels

### 2.1 Food labelling and relevant legislation

- What can and can't be said on food labels and advertising is covered primarily by the Australia and New Zealand Food Standards Code (developed by Food Standards Australia & New Zealand - FSANZ). The Code applies to all food sold and prepared for sale in Australia, and food imported into Australia. The Code sets out the requirements for food and beverage labelling in Australia. Enforcement and Interpretation of the Code is the responsibility of State/Territory Health Departments within Australia. Food labelling compliance may also be monitored by the Australian Competition and Consumer Commission (ACCC), State/Territory Department of Health Food and Safety units and Local Government food inspectors and Environmental Health Officers.
- While FSANZ offers assistance navigating the Code, they do not provide approval of labels or food compliance of any type. FSANZ can only provide information about the Code and does not provide legal advice or interpretation of the Code.
- User Guides are available for the Code, however these have no legal power. The Code of Practice on Nutrient Claims in Food Labels and in Advertisements, developed by FSANZ, may also be a relevant useful document but is not legally enforceable.
- States and Territories do not have to accept every part of the Code, and each State and Territory has responsibility for regulating its own food matters (e.g. Western Australia: Food Act 2008, South Australia: Food Act 2001).
- As well as the Food Standards Code and the relevant State or Territory legislation, Part V of the Trade Practices Act (TPA) (Consumer Protection) covers misleading or deceptive conduct and false or misleading representations and should be considered when planning food labels or advertisements. The TPA is Commonwealth legislation which overrules State & Territory laws.
- View the Food Standards Code
  - [www.foodstandards.gov.au/foodstandards/foodstandardscode](http://www.foodstandards.gov.au/foodstandards/foodstandardscode)
- View the Trade Practices Act  
[www.comlaw.gov.au/comlaw/management.nsf/lookupindexpagesbyid/IP200401339?OpenDocument](http://www.comlaw.gov.au/comlaw/management.nsf/lookupindexpagesbyid/IP200401339?OpenDocument)



## 2.2 Health claims/messages

- Health claims can be described as claims, words or statements on food labels or advertising materials that refer to the potential for a component of a food or the food itself to assist in reducing the risk of, or improving existing cases of, a disease or health condition.
- Currently, health claims are not generally permitted on food labels or advertising in Australia (claims related to folate are the only current exception).
- Health claims on food labelling have been under review for several years, which will further delay any new outcomes for health claims. Therefore, the website should be accessed in conjunction with these guidelines.
- Health Claims are covered by Standard 1.1.A.2 of the Food Standards Code. According to Standard 1.1.A.2, food labels and advertisements for food must not:
  - make a claim or statement that the food is a slimming food or has intrinsic weight-reducing properties;
  - make a claim for therapeutic or prophylactic action or a claim described by words of similar import;
  - include the word 'health' or any word or words of similar import as a part of or in conjunction with the name of the food;
  - use any words, statement, claims, express or implied, or design that directly or by implication could be interpreted as advice of a medical nature from any person; or
  - contain the name of, or a reference to, any disease or physiological condition. There are exceptions to this rule prescribed by the Code (e.g. folate & neural tube defects in babies).
- Information on the omega-3 content of fish and seafood can be made available to the public. Pamphlets which include factual information on the benefits of omega-3 can also be made available to the public, but the information must not be linked to seafood (or any food). The consumer must make the link between omega-3 and seafood for themselves.

### Examples

#### Food labels:



#### Correct

This product contains 1500mg of omega-3 per serve.



#### Incorrect

Seafood contains omega-3 which prevents cardiovascular disease.

#### Informational pamphlets:

##### Pamphlet 1 (Health benefits of omega-3)

Omega-3 may:

- reduce the risk of heart disease
- reduce arthritis symptoms
- reduce the risk of some types of cancer



##### Pamphlet 2 (Foods containing omega-3)

Omega-3 is found in most fish and seafood, including Atlantic salmon, mussels and sardines.



##### Pamphlet 3 (Health benefits and foods containing omega-3)

Omega-3s are good for your health. They can prevent heart disease and are found in fish, other seafood and walnuts.



## Food labels

### 2.3 Nutrition information panels

- According to Standard 1.2.8 of the Food Standards Code, most packaged foods are required to display a nutrition information panel (NIP).
- Some exemptions include foods such as:
  - fish that comprise a single ingredient or category of ingredients;
  - unpackaged food;
  - food in a small package (smaller than 100 sq cm);
  - food made and packaged on the premises from which it is sold;
  - food that is packaged in the presence of the purchaser; and
  - food delivered packaged, and ready for consumption, at the express order of the purchaser.
- These exemptions do not apply if there is a nutrition claim being made in relation to the food (see section 2.4)
- NIPs must carry the following information:
  - the number of servings of the food in the package expressed as either:
    - the number of servings of the food, or;
    - the number of servings of the food per kg (or other units as appropriate)
  - the average quantity of the food in a serving (in grams for solids or millilitres for liquids);
  - the unit quantity of the food;
  - the average energy content (in kilojoules or kilojoules and kilocalories), of a serving of the food and of the unit quantity of the food;
  - the average quantity (in grams) of protein, fat, saturated fat, carbohydrate and sugars in a serving of the food and in a unit quantity of the food;
  - the average quantity of sodium (in milligrams or milligrams and millimoles) in a serving of the food and in the unit quantity of the food; and
  - the name and the average quantity of any other nutrient or biologically active substance in respect of which a nutrition claim is made, expressed in grams, milligrams or micrograms or other units as appropriate, that is in a serving of the food and in the unit quantity of the food.

#### When is an NIP required?



A package of frozen fish with added ingredients (such as crumbed fish) does require an NIP.



Frozen fish which comprises a single ingredient, such as frozen salmon, does not require an NIP.



Fish sold at a deli counter, packaged in the presence of the purchaser does not require an NIP.

# Food labels

## 2.3 Nutrition information panels (contd.)

- FSANZ can provide nutritional information for a wide number of foods, however laboratory testing can provide accurate results and protect against legal action. There are some private companies which offer assistance with NIP generation to comply with relevant codes and laws.
- Visit [www.foodstandards.gov.au/thecode/nutritionpanelcalculator](http://www.foodstandards.gov.au/thecode/nutritionpanelcalculator)
- The NIP should be set out as follows:

<b>NUTRITION INFORMATION</b>		
Servings per package: (insert number of servings)		
Serving size: g (or mL or other units as appropriate)		
	Quantity per Serving	Quantity per 100 g (or 100 mL)
Energy	kJ (Cal)	kJ (Cal)
Protein	g	g
Fat, total	g	g
- saturated	g	g
Carbohydrate	g	g
- sugars	g	g
Sodium	mg (mmol)	mg (mmol)
(insert any other nutrient or biologically active substance to be declared)	g, mg, µg (or other units as appropriate)	g, mg, µg (or other units as appropriate)



## Food labels

### 2.4 Nutrition claims

- Nutrition claims are covered by Standard 1.2.8 (Nutrition Information Requirements) of the Food Standards Code. This Standard covers the nutritional information that is required to be provided on food labels, and what specific conditions you must comply with when making claims.
- A nutrition claim refers to a representation that states, suggests or implies that a food has a nutritional property. This may be general or specific, and expressed affirmatively or negatively.
- If a nutrition claim is made in relation to a food, a NIP must be displayed on the label of the food. If the food is not required to carry a label (such as those exemptions listed in Section 2.3), a NIP must be displayed on or in connection with the display of the food or provided to the purchaser on request.
- If a nutrition claim is made, the NIP must include the name and the average quantity of the nutrient that is in a serving of the food. This quantity must be expressed in grams, milligrams or micrograms (or other units as appropriate).
- If an advertisement for food contains a nutrient claim the label on the food to which the advertisement applies must include a NIP.
- The claim must apply to the food in the form in which it is intended to be consumed. If the claim's accuracy depends on the consumer's method of preparation then the label must include information that will enable the consumer to prepare the food so that it meets the nutrition claim.
- If a nutrition claim is being made about a food which is naturally or intrinsically high or low in the nutrient about which the claim is being made then it must be clear that the claim refers to the class of food and not only the brand on which the claim appears.
- For more information see the User Guide to Standard 1.2.8 – Nutrition Information Requirements and the Code of Practice for Nutrient Claims in Food Labels and in Advertisements.

#### Example



As shown in Section 2.3, some foods do not require an NIP. However, if a nutrition claim is made, a NIP must be displayed.



For example, fish which comprises a single ingredient, such as frozen salmon, does not require a NIP. However, if a nutrition claim is made in regards to that item, a NIP must be available to the purchaser. A pamphlet containing a NIP would fulfil this requirement.

#### Example



Atlantic Salmon contains omega-3.



Brand X Atlantic Salmon contains omega-3.



\$15.99  
per lb  
Lake Argyle Wild Caught  
Fresh Fish  
PRODUCT OF AUSTRALIA

Brain food  
**FISH**  
Twice a week

Silver Col  
**\$31**  
Lake Argyle Wild Caught  
Fresh Fish  
PRODUCT OF AUSTRALIA



## Food labels

### 2.5 Nutrition claims and omega-3

- Nutrition claims regarding omega-3, and requirements for NIPS are covered by the Food Standards Code, Standard 1.2.8 clauses 5 and 13.
- A nutrition claim may be made in relation to the omega-3 fatty acid content of fish or fish products with no added saturated fatty acids if it contains:
  - 200 mg alpha-linolenic acid (ALA) per serving; or
  - 30 mg total eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) per serving.
- Products with added saturated fatty acids must also meet the following criteria:
  - the total of saturated fatty acids and trans fatty acids must be no more than 28 per cent of the total fatty acid content of the food; or
  - the food contains no more than 5 g of saturated fatty acids and trans fatty acids per 100 g of the food.
- A nutrition claim may be made that a food is a good source of omega-3 fatty acid if the food satisfies the requirements above and contains no less than 60 mg total EPA and DHA per serving.
- If the nutrition claim is made, the NIP must indicate the source of omega 3 fatty acids, namely, ALA, DHA and/or EPA.
- When a nutrition claim using the word 'omega' is made, the word 'omega' must be qualified by the type of omega fatty acid present. This qualification appears immediately after the word 'omega' (eg 'Omega-3', 'Omega-6' or 'Omega-9').
- A nutrition claim must not be made in relation to the omega-6 or omega-9 fatty acid content of a food, unless the:
  - total of saturated fatty acids and trans fatty acids content of the food is no more than 28 per cent of the total fatty acid content of the food; and
  - fatty acid in respect of which the nutrition claim is made comprises no less than 40 per cent of the total fatty acid content of the food

#### Example

Fish or seafood (with no added saturated fat) which contain more than 30mg total of EPA and DHA per 100g can make an omega-3 source claim.



This product is a source of omega-3.

Fish or seafood (with no added saturated fat) which contain more than 60mg total of EPA and DHA per 100g can make a good omega 3 source claim.



This product is a good source of omega-3.

The NIP on products with an omega-3 claim must be set out in accordance with the example opposite (nutrition information declaration).



## 2.5 Nutrition claims and omega-3 (contd.)

- For nutrition claims made regarding omega-3, omega-6 or omega-9 fatty acids the NIP must include declarations of all the trans, polyunsaturated and monounsaturated fatty acids as set out below:

NUTRITION INFORMATION		
Servings per package: (insert number of servings)		
Serving size: g (or mL or other units as appropriate)		
	Quantity per Serving	Quantity per 100 g (or 100 mL)
Energy	kJ (Cal)	kJ (Cal)
Protein	g	g
Fat, total	g	g
- saturated	g	g
- * - trans	g	g
- * - polyunsaturated	g	g
- * - monounsaturated	g	g
- *	g	g
Carbohydrate	g	g
- sugars	g	g
Sodium	mg (mmol)	mg (mmol)
(insert any other nutrient or biologically active substance to be declared)	g, mg, µg (or other units as appropriate)	g, mg, µg (or other units as appropriate)

\* sub-sub-group nutrient

## 2.6 Vitamin and mineral claims

- Standard 1.3.2 (Vitamins and Minerals) of the Food Standards Code covers claims regarding the presence of vitamins and minerals in a food.
- Claims can be made regarding the presence a vitamin or mineral in a food if certain conditions are met:
  - The claim must be specifically permitted in the Code; or
  - If the vitamin or mineral is listed\*, the food is a claimable food\*\*, and a reference quantity of the food contains at least 10% of the Recommended Daily Intake (RDI)\*\*\* or Estimated Safe and Adequate Daily Dietary Intake (ESADDI) for that vitamin or mineral.

\*\* Claimable foods include a food which is at least 90% by weight a primary food (which includes fish). Refer to the standard for processed seafood products.

\*\*\* Information on RDIs can be found on the NHMRC website [www.nrv.gov.au/nutrients](http://www.nrv.gov.au/nutrients)

### Example

Fish X contains 2 mg of Zinc per 150g serving size. For males, the RDI for Zinc is 14mg; for females it is 10mg. The 150g serving of fish contains more than 10% of the RDI for Zinc for both males and females, and Zinc is a listed mineral in the Code. A nutrient claim could be made for fish X.



Fish X is a source of zinc



## Food labels

### 2.6 Vitamin and mineral claims (contd.)

- To make a claim that a food is a good source of a vitamin or mineral, the reference quantity of the food must contain no less than 25% of the RDI or ESADDI for that vitamin or mineral.
- When a claim is made in relation to the presence of a vitamin or mineral in a food, the label or NIP must include a statement containing the following information:
  - serving size;
  - number of servings per package;
  - the vitamin or mineral in respect of which the claim is made;
  - the average quantity of the vitamin or mineral in 100g or 100mL of the food as the case may be; and
    - the proportion of the RDI, of that vitamin or mineral contributed by one serving of the food; or
    - the average quantity of the vitamin or mineral for which an ESADDI has been prescribed in the Food Standards Code in a serving of the food.
- Example:

NUTRITION INFORMATION		
Servings per package: 1		
Serving size: 150g		
	Quantity per Serving	Quantity per 100 g
Energy	kJ (Cal)	kJ (Cal)
Protein	g	g
Fat, total	g	g
- saturated	g	g
Carbohydrate	g	g
- sugars	g	g
Sodium	mg (mmol)	mg (mmol)
Zinc	2mg (16% of RDI)	1.33mg
* Percentage of Recommended Dietary Intake (RDI)		

- Vitamin and mineral claims cannot make comparison claims (with other foods), unless permitted by the Food Standards Code. A claim must not be made if such a claim is prohibited in the Code.
- Listed vitamins and minerals are vitamin A, thiamin (vitamin B1), Riboflavin (vitamin B2), Niacin, Folate, vitamin B6, vitamin B12, Biotin, Pantothenic Acid, vitamin C, vitamin D, vitamin E, vitamin K, calcium, chromium, copper, iron, iodine, magnesium, manganese, molybdenum, phosphorus, selenium, zinc.



## 2.7 Country of origin labelling

- Country of origin labelling provides consumers with information on the country/countries where food has been grown, manufactured, produced, or packaged. A country of origin claim is any words or pictures on labels, packages or advertising that makes or implies a statement or claim about origin of the goods.
- Country of origin food labelling is covered by both the Food Standards Code Standard 1.2.11 (Country of Origin Requirements), and the Trade Practices Act. Other pieces of legislation in different states/territories may also cover food labelling.
- Standard 1.2.11 does not apply to food sold to the public by restaurants, canteens, schools, caterers or self-catering institutions where the food is offered for immediate consumption.
- According to the Food Standards Code, all packaged and some unpackaged foods must be labelled with country of origin.
- Packaged food is required to be labelled with either:
  - a statement that identifies where the food was made or produced; or
  - that identifies the country where the food was made, manufactured or packaged for retail sale; and
  - a statement to the effect that the food is constituted from ingredients imported into that country or from local and imported ingredients as the case may be.
- If fish or seafood are sold unpackaged, a label must be displayed on or in connection with the food which:
  - identifies the country or countries of origin of the food; or
  - contains a statement indicating that the foods are a mix of local and/or imported foods.
- If fish and seafood is not sold in a package, and the label is in connection with the food (not on), the following conditions must be met:
  - the size of type on the label must be at least 9 mm; or
  - if the food is in a refrigerated assisted service display cabinet, the size of type on the label must be at least 5 mm.
- Refer to Standard 1.2.9 for further information on legibility requirements for food labels.
- While country of origin claims are not mandatory under the Trade Practices Act, those that are made must be accurate.
- The Trade Practices Act prohibits claims that may mislead or deceive, or making false representations about the origins of food.
- For products to make a 'Made in country of origin' claim, the following conditions must be met:
  - the goods were substantially transformed in the country claimed to be the origin; and
  - 50 per cent or more of the costs of production must have been carried out in that country.

## Food labels

### 2.7 Country of origin labelling (contd.)

- For goods to make to 'Product of country of origin' claim, the following conditions must be met:
  - the country of the claim must be the country of origin of each significant ingredient or significant component of the goods; and
  - all, or virtually all, processes involved in the production or manufacture of the goods must have happened in that country.
- If a product does not comply with the above criteria, other qualifying statements may be used, such as 'Packaged in Australia', 'Made/manufactured in Australia from imported ingredients' or 'Australian Owned'.

For more information visit:

- Food Standards Code: [www.foodstandards.gov.au/foodstandards/foodstandardscode](http://www.foodstandards.gov.au/foodstandards/foodstandardscode)
- Trade Practices Act: [www.comlaw.gov.au/comlaw/management.nsf/lookupindexpagesbyid/IP200401339?OpenDocument](http://www.comlaw.gov.au/comlaw/management.nsf/lookupindexpagesbyid/IP200401339?OpenDocument)

### 2.8 Australian Fish Names Standard AS SSA 5300-2009

The Australian Fish Names Standard was prepared by Seafood Services Australia's (SSA) Fish Names Committee. The Standard 'defines standard fish names for use in Australia and specifies when standard fish names are to be used.' It is intended to be used by those involved with fish or seafood in Australia.

To comply with the Standard, fish sold directly to consumers must be identified at the point of purchase by the Standard Fish Name (SFN) for that species. The scientific name also may be specified in addition to the SFN. When fish are not sold directly to consumers, the fish may be identified by either the SFN or the scientific name for that species. Publications written by scientists, recreational fishers, chefs, media, teachers, fisheries managers, and others must use either the SFN or the scientific name for that species to comply with the Standard.

A SFN 'may cover a single species or all species in a particular scientific family or group of fish'. According to the Standard it is recommended that fish are identified by the SFN for that particular species only.

## 2.8 Australian Fish Names Standard AS SSA 5300-2009 (contd.)

However there are some circumstances that the SFN for the scientific group or family to which a fish belongs may be used instead. These are:

- the fish does not have a SFN for that particular species; or
- the fish is in a batch of different species of fish, all of which are from the same scientific group or family; AND
- using the SFN for the scientific group or family to which a fish belongs does not mislead, misrepresent or confuse the identification of the fish.

The group name may be capitalised to indicate that it is a group name. If a group name in the Standard shows a pluralisation in brackets this indicates that the group name is shared with an individual species name.

If a species does not have an SFN specified in the Standard, it may be identified but a name that is in common use for that species in Australia or overseas. If an alternative fish name is used, SSA must be notified within 30 days. Obsolete fish names may be used if the correct SFN is displayed more prominently and in larger text above the obsolete name. The obsolete name must be contained in brackets.

Source: Australian Fish Names Standard AS SSA 5300,  
[www.seafood.net.au/fishnames/standard.php](http://www.seafood.net.au/fishnames/standard.php)

## 2.9 Glycaemic Index (GI)

- There is currently no reference in the Food Standards Code regulating Glycaemic Index (GI).
- GI ranks the extent to which blood sugar levels are raised after consumption of carbohydrates in a food. High GI foods are those which are digested faster and cause a spike in blood sugar levels.
- To be considered 'low GI,' the GI value of the food must be below 55.
- To be considered 'medium GI', the GI value of the food must be between 56 and 69.
- Foods with a GI value of 70 and above are considered 'high GI'.
- A GI claim is voluntary and currently requires no additional information for the NIP.
- The GI level of foods can be tested by a food laboratory.
- More information on GI and GI testing can be found at [www.glycemicindex.com](http://www.glycemicindex.com) or [www.gisymbol.com.au](http://www.gisymbol.com.au)



## Food labels

### 2.10 Other labeling considerations

#### 2.10.1 Trade Practices Act

There are several areas to consider for food labels and advertisements to comply with the Trade Practices Act. These can be summarised as:

- words, images and the overall impression;
- target audience; and
- qualifying claims, fine print and disclaimers.

For compliance with the Trade Practices Act, the ACCC considers that food and beverage labelling descriptors fall broadly under the following categories:

- **Food type assurance claims:** These claims refer to specific assurances about the quality or characteristics of particular foods (e.g. kosher, vegan);
- **Process/preparation/production claims** (similar to previous): Claims regarding the specific processes which the food has undergone must be represented accurately to the consumer. This may refer to production claims (e.g. organic), preparation claims (e.g. chilled), and process claims (e.g. non-sweetened).
- **Origin claims:** Food labels or advertisements which contain claims regarding the origin or source of food should be accurate (see section 2.7 of this guide). This includes claims that a food is a 'Product of', 'Made in', and 'locally grown' and also claims regarding the origin of a product from a geographical area. Consider what the consumer may decide when reading this claim. For more information when making an origin claim, read the *Food and Beverage Industry: Country of Origin Guidelines to the Trade Practices Act* guideline; and
- **Standard/style/select claims:** The ACCC describes these claims as those which imply a relationship with a particular standard, style or product selection. If there is an objective component to the claim it must be substantiated before it is made to consumers.

Claims that foods are pure, fresh or natural may be considered misleading or deceptive if the food is not what a consumer would understand to be 'pure', 'fresh', or 'natural'. For example, the word 'pure' implies that there are no added ingredients. This would apply to a single ingredient food. The word 'fresh' would imply that the food had not been canned, cured, dehydrated, frozen, processed or preserved. The term 'natural' (or similar words or combinations of words which include 'natural') may suggest to consumers that the product is made of natural ingredients, with no added chemical. The use of the words is still misleading if used as the brand name of a food that would not be considered 'pure', 'fresh' or 'natural'.



## 2.10 Other labelling considerations (contd.)

The ACCC also flags the use of the terms ‘real’, ‘true’ and ‘genuine’, as these terms may suggest that other similar foods or products may not have the same qualities as the one referred to in the advertisement/label.

- ‘Puffery’  
The ACCC describes a fifth category, ‘puffery’. This describes claims which may be fanciful, vague or exaggerated and would not reasonably be considered meaningful to consumers or their intentions to purchase.

### 2.10.2 Images and pictures

When using images and pictures on labels or in advertisements, consideration should be given to the impression that may be made on the consumer. Images which are considered to give a misleading impression of the product may breach the Trade Practices Act.

### 2.10.3 Checklist: To avoid breaching the Trade Practices Act

When designing or reviewing food labeling and advertisements, the following points should be considered:

- what impression is given to consumers about the predominant ingredients of the product? Is this impression accurate?
- are there any aspects of the labelling or packaging which need stronger emphasis to accurately reflect the product?
- what overall impression do the words and images used create? How will your target audience interpret this? What conclusions might consumers draw from your words and images?
- what might consumers miss or not understand?
- if your label uses a disclaimer or qualification, is it prominent and clear? Will it be sufficient to dispel any misleading impressions?
- how would a reasonable consumer react to your label/advertisement?

Source: ACCC Food Labelling Guide  
[www.accc.gov.au/content/index.phtml/itemId/877504](http://www.accc.gov.au/content/index.phtml/itemId/877504)





## Evidence relating to health conditions and seafood consumption

The following provides an overview of evidence from studies published in peer-reviewed journals associated with seafood consumption and health. The level of evidence supporting each health issue was estimated using the following criteria:

A	High	<ul style="list-style-type: none"> <li>Further research is very unlikely to change our confidence in the estimate of effect</li> <li>Several high-quality studies with consistent results</li> <li>In special cases: one large, high-quality multi-centre study</li> </ul>
B	Moderate	<ul style="list-style-type: none"> <li>Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate</li> <li>One high-quality study</li> <li>Several studies with some limitations</li> </ul>
C	Low	<ul style="list-style-type: none"> <li>Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate</li> <li>One or more studies with significant limitations</li> <li>Any estimate of effect is very uncertain</li> </ul>

### 3.1 Strongest evidence (A)

- Regular fish consumption is associated with a significantly reduced risk of total mortality for both men and women.
- 1-2 serves fish/wk, especially those high in n-3 polyunsaturated fatty acids (PUFAs), decreases the risk of total mortality by 17%.
- 20% decreased risk in total mortality associated with at least 1 serve fish/wk in men.
- Fish intake is beneficial to heart health.
- Adequate intake of n-3 PUFAs decreases the incidence of cardiovascular disease (CVD). Furthermore 2-3 fish meals/wk is protective against CVD.
- Good evidence that fish consumption is protective against CVD and chronic respiratory disease in males.
- 1 serve fish/wk (20gm/day) reduces the risk of coronary heart disease (CHD).
- Decreased risk of CHD by:
  - 31% if fish consumed 3-4 meals/wk; and
  - 32% decreased risk if consumed at least 5 /wk.
- 1-2 serves fish/wk (especially species high in n-3 PUFAs) reduces the risk of:
  - coronary death by 36%;
  - coronary heart failure by 20%;
  - arterial fibrillation (28% reduced risk for 1-4 serves/wk, 31% decreased risk for at least 5 serves /wk); and
  - myocardial infarction.
- Higher levels of fish consumption are associated with a lower risk of CHD in diabetic women.
- 1 serve fish/wk (white or oily fish) reduces the risk of stroke.

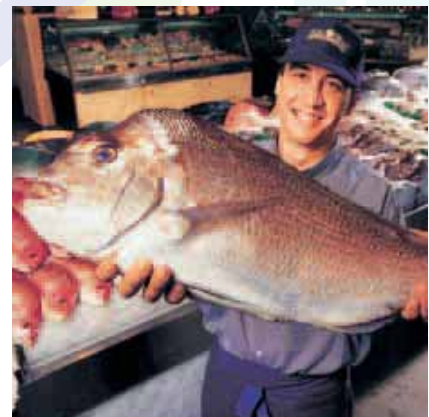




## Evidence relating to health conditions and seafood consumption

### 3.1 Strongest evidence (A) (contd.)

- Reduced risk of ischemic stroke:
  - 1-4 serves fish/wk decreases risk by 27%.
  - At least 5 serves fish/wk decreases risk by 30%.
- However, there is a 44% increased risk of ischemic stroke for more than 1 serve/wk of fried or sandwich fish.
- For women, oily fish intake was significantly lower in those who subsequently experienced a stroke.
- Evidence that fish consumption is protective against rheumatoid arthritis and ulcerative colitis in males.
- At 30yr follow-up, men who ate no fish had a 2-3 fold higher frequency of prostate cancer than those who ate moderate or high amounts of fish.
- At least 4 serves fish/wk associated with decreased risk of prostate cancer (with the strongest association with metastatic cancer - Relative Risk (RR) 0.56).
- Evidence that fish consumption is associated with a decreased risk of lung cancer mortality in men (independent of cigarettes, animal fat minus fish fat, vegetable and fruit consumption).
- Higher consumption of fish associated with lower risk of islet autoimmunity precursor for Type 1 diabetes in children at increased risk of Type 1 diabetes.
- Negative association between a diet rich in fruit, vegetables and fish, and the risk of Congestive Obstructive Pulmonary Disease (COPD).
- Women of childbearing age should consume at least 2 serves of fish /wk.
- Pregnant and lactating mothers should consume up to 12oz of a variety of fish each week (incl. shellfish low in mercury).
- Fish consumption does not adversely affect infant gestation and birth size at a population level.
- Evidence that at least 340 g/wk maternal seafood intake is beneficial to child cognitive development.
- Low maternal seafood intake during pregnancy could lead to adverse effects on neurodevelopment.
- Occurrence of preterm delivery varied from 7.1% in the group who never consumed fish, to 1.9% in those consuming fish at least 1/wk.
- Low maternal fish consumption was a strong risk factor for preterm delivery and low birth weight.
- Small amounts of n-3 PUFAs (provided as fish or fish oil) is protective against preterm delivery and low birth weight.
- Consumption of n-3 PUFAs during pregnancy is essential for optimum foetal neural development.



### 3.2 Moderate evidence (B)

- Strong evidence that increased consumption of n-3 PUFA's reduces risk of all-cause mortality.
- Ingestion of n-3 PUFA supplements has consistently shown a reduction in joint tenderness and the amount of morning stiffness in those with rheumatoid arthritis.
- Good evidence that regular fish intake is beneficial for management of inflammatory diseases.
- Moderate to high intake of fish appears to be protective against rheumatoid arthritis.
- Fish consumption in the first year of life lowers the risk of asthma and allergic rhinitis in childhood.
- Risk of allergic rhinitis substantially lower in children who had fish during the first year of life (RR 0.025) compared with children who had fish later in life (RR 0.060).
- Early introduction to fish shows consistent negative association with risk of allergic rhinitis.
- Results suggest that early intake of fish protects against airway disease in early life.
- Children born to mothers with a history of asthma had a reduced risk of developing asthma when mothers ate oily fish at least once month during pregnancy compared with no consumption.
- In contrast, fish sticks (source of trans fats) consumption during pregnancy increased asthma risk in children (OR 2.04).
- Traditional fish-based diets appear to be protective against CVD.
- Daily intake of marine fatty acids associated with 24% decreased risk in metastatic cancer.
- Men who consumed at least 1 serve fish/wk relative risk of sudden death reduced.
- Higher consumption of fish associated with decreased risk colorectal cancer for women.
- Maternal intake of very-long-chain-fatty-acids during pregnancy and lactation may be favourable for mental development of children.
- Compared with low intake (21mg/d), high intake (407mg/d) of n-3 PUFAs was associated with fewer depressive symptoms in adults (OR 0.46).
- The level of pollutants in seafood was, in general, very low.
- Benefits of seafood consumption far outweigh the risks associated with possible pollutants.
- Fish low in mercury and high in n-3 PUFAs are recommended.

## Evidence relating to health conditions and seafood consumption

### 3.3 Some evidence but more research required (C)

- Fish is more beneficial than fish oil in combating CVD and all cause mortality.
- Fish oil acids may reduce potentially fatal arrhythmias in people at high risk.
- The influence of dominant male (whether child or adult) within the family unit should be considered in any intervention to increase regular seafood consumption.
- Nutritional education for pregnant women required.
- Fish consumption associated with increased length of gestation in women with a low risk of adverse pregnancy outcomes.
- Higher maternal fish intake during pregnancy associated with longer gestation, increased birth weight, reduced risk of intrauterine growth retardation and lower prevalence of pregnancy-induced hypertension.
- An average intake of 400 mg/d of n-3 PUFAs may reduce depression.
- Fish consumption may be associated with slower cognitive decline with age.
- Greater seafood consumption predicted lower lifetime rates of bipolar disorders.
- There is limited evidence around seafood, fish oil or supplements in the management of attention disorders such as ADHD, however available evidence is promising.
- Brains of Alzheimer patients have lower DHA in gray matter. N-3 PUFAs retard the decline in cognition over time.
- National fish advisories overemphasis risks and undervalue benefits of fish consumption.
- Interventions seeking to promote seafood as an integral part of a healthy diet should address existing negative attitudes and beliefs around the storage and preparation of seafood.
- Strategies directed at parents and children should include experimental hands on components to encourage experimentation, particularly focusing on use of, preparation of and the variety of lower cost seafood available.
- Food involvement correlated positively with fish consumption intention and frequency.
- Dietary fish and weight loss had significant independent and additive effects on 24 hour ambulatory blood pressure and heart rate in overweight persons.

### 3.4 Consumer behaviour in relation to fish and seafood consumption

- Perceived cost, freshness, quality, availability, taste and easy preparation were considered to be the main influences in consumer choice of fish and seafood products. (B)
- The lowest income households had the lowest fish consumption. (B)
- The highly processed product varieties (battered and crumbed fish and fish in sauce dishes) were often popular among families and perceived as easy and convenient to cook. (B)
- Odours common to fish and seafood often a deterrent to consumption. (B)
- Fresh fish and seafood preferred to alternative products (processed, smoked, canned and frozen products). (C)
- Presence of bones and price influence purchase type but not intention to purchase. (C)
- The presence of children in the households led to lower fish consumption. (C)

### 3.5 Marketing and advertising

- Food advertising directed at children predominantly featured snack foods/fast foods and confectionery. (A)
- Modern marketing techniques had a strong influence on food choice. (B)
- Changing the food advertising environment during children's television viewing time to an environment where nutritious foods are promoted and less healthful foods unrepresented would lead to the normalisation and reinforcement of healthy eating. (B)





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Nichols PD, Virtue P, Mooney BD, Elliot NG & Yearsley GK (1998), Seafood the Good Food: The Oil Content and Composition of Australian Commercial Fishes, Shellfishes and Crustaceans, Collingwood, Fisheries Research and Development Corporation, CSIRO.

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### Websites

#### FSANZ

[www.foodstandards.gov.au](http://www.foodstandards.gov.au)

#### The Food Standards Code

[www.foodstandards.gov.au/thecode](http://www.foodstandards.gov.au/thecode)

#### The ACCC

[www.accc.gov.au/content/index.phtml/itemId/142](http://www.accc.gov.au/content/index.phtml/itemId/142)

#### The Trade Practices Act

[www.comlaw.gov.au/comlaw/Legislation/ActCompilation1.nsf/0/0769050E539E97DACA257678007F8AA2?OpenDocument](http://www.comlaw.gov.au/comlaw/Legislation/ActCompilation1.nsf/0/0769050E539E97DACA257678007F8AA2?OpenDocument)

#### Information on the review of food labelling

[www.health.gov.au/internet/main/publishing.nsf/Content/review-food-labelling-law-&-policy](http://www.health.gov.au/internet/main/publishing.nsf/Content/review-food-labelling-law-&-policy)

#### For information on RDI's

[www.nrv.gov.au/nutrients](http://www.nrv.gov.au/nutrients)

#### Australian Fish Names

[www.fishnames.net.au](http://www.fishnames.net.au)

#### For more information on Glycaemic Index

[www.glycemicindex.com](http://www.glycemicindex.com)  
or  
[www.gisymbol.com.au](http://www.gisymbol.com.au)

#### Food Legal – Food law experts

[www.foodlegal.com.au/resources/regulationoverview/FoodLabellingInformation/](http://www.foodlegal.com.au/resources/regulationoverview/FoodLabellingInformation/)



## Contacts

### Food Standards Code advice line

Phone: 1300 652 166  
e-mail: [advice@foodstandards.gov.au](mailto:advice@foodstandards.gov.au)

### Food Enforcement Contacts

#### ACT

Australian Capital Territory Health –  
Health Protection Service  
Phone: (02) 6205 1700  
Web: [www.health.act.gov.au/c/health](http://www.health.act.gov.au/c/health)  
Email: [hps@act.gov.au](mailto:hps@act.gov.au)

ACT Health and Community Care  
Locked Bag No. 5  
HOLDER ACT 2611  
Phone: (02) 6205 0956  
Fax: (02) 6205 1705

#### New South Wales

NSW Food Authority  
Phone: 1300 552 406  
Web: [www.foodauthority.nsw.gov.au](http://www.foodauthority.nsw.gov.au)  
Email: [contact@foodauthority.nsw.gov.au](mailto:contact@foodauthority.nsw.gov.au)

NSW Department of Primary Industries  
Phone: (02) 6391 3100  
Web: [www.dpi.nsw.gov.au](http://www.dpi.nsw.gov.au)

New South Wales Department of Health  
PO Box 798  
GLADESVILLE NSW 2113  
Phone: (02) 9887 5606  
Fax: (02) 9888 7210

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Northern Territory Health and Community  
Services – Environmental Health  
Phone: (08) 8922 7497  
Web: [www.health.nt.gov.au](http://www.health.nt.gov.au)  
Email: [envirohealth@nt.gov.au](mailto:envirohealth@nt.gov.au)

Territory Health Services, Northern  
Territory  
PO Box 40596  
CASUARINA NT 0811  
Phone: (08) 8999 2965  
Fax: (08) 8999 2526

#### Queensland

Safe Food Queensland  
Phone: (07) 3253 9800  
or: 1800 300 815  
Web: [www.safefood.qld.gov.au](http://www.safefood.qld.gov.au)  
Email: [info@safefood.qld.gov.au](mailto:info@safefood.qld.gov.au)

Queensland Health – Food Unit  
Phone: (07) 3234 0938  
Web: [www.health.qld.gov.au](http://www.health.qld.gov.au)

#### South Australia

South Australian Department of Health  
Phone: (08) 8226 7100  
Web: [www.health.sa.gov.au](http://www.health.sa.gov.au)

South Australia Department of Primary  
Industries and Resources (PIRSA)  
Phone: (08) 8226 0222  
Web: [www.pir.sa.gov.au](http://www.pir.sa.gov.au)

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PO Box 6  
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#### Tasmania

Tasmania Department of Health and  
Human Services – Food Unit  
Phone: (03) 6222 7703  
or: 1800 671 738  
Web: [www.dhhs.tas.gov.au](http://www.dhhs.tas.gov.au)  
Email: [public.health@dhhs.tas.gov.au](mailto:public.health@dhhs.tas.gov.au)

Tasmania Department of Primary  
Industries, Water and Environment  
Phone: (03) 6233 6439  
Web: [www.dpiw.tas.gov.au](http://www.dpiw.tas.gov.au)

#### Victoria

Food Safety Victoria  
Phone: 1300 364 352  
Web: [www.health.vic.gov.au/foodsafety](http://www.health.vic.gov.au/foodsafety)  
Email: [foodsafety@dhs.vic.gov.au](mailto:foodsafety@dhs.vic.gov.au)

Prime Safe Victoria  
Phone: (03) 9685 7333  
Web: [www.primesafe.vic.gov.au](http://www.primesafe.vic.gov.au)  
Email: [enquiries@primesafe.vic.au](mailto:enquiries@primesafe.vic.au)

Dairy Food Safety Victoria  
Phone: (03) 9810 5900  
Web: [www.dairysafe.vic.gov.au](http://www.dairysafe.vic.gov.au)  
Email: [info@dairysafe.vic.gov.au](mailto:info@dairysafe.vic.gov.au)

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Phone: (08) 9388 4999  
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Western Australia Department of  
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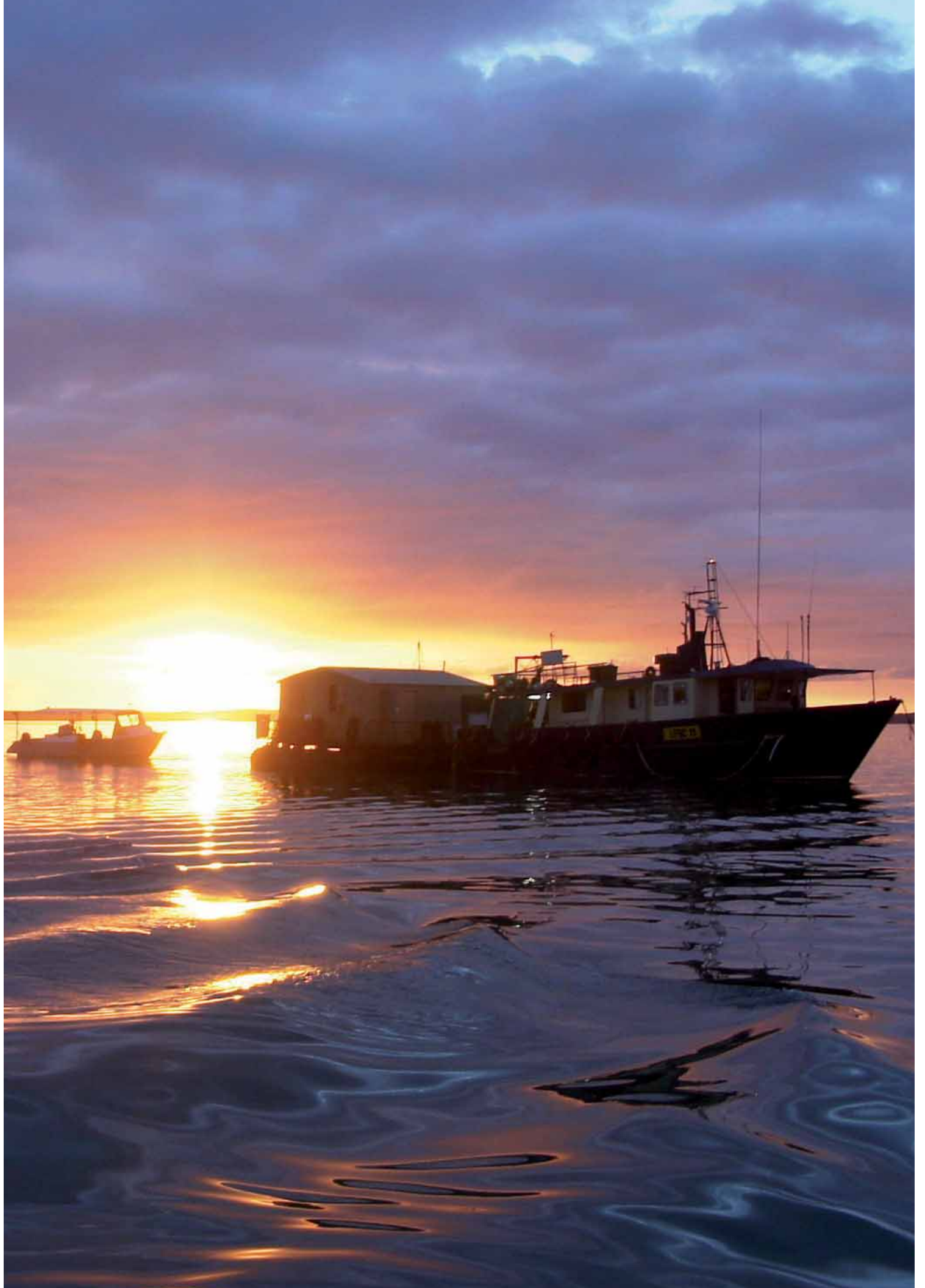


# Acknowledgements

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The contribution of the following groups to the development of these guidelines is acknowledged:

- Western Australian Fishing Industry Council (WAFIC);
- Curtin University;
- Seafood Services Australia (SSA); and
- Seafood Experience Australia (SEA)







**CESSH**  
CENTRE OF EXCELLENCE  
SCIENCE SEAFOOD HEALTH

Seafood and  
your health

**DIABETES**



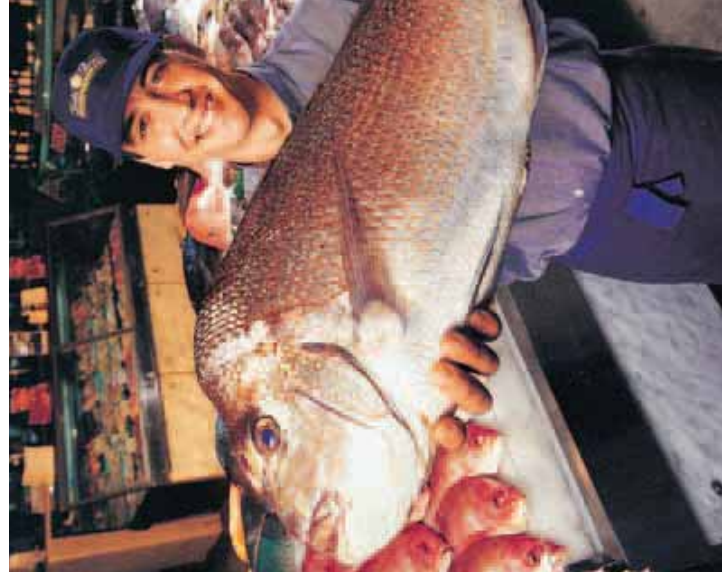
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## Seafood and your health

Evidence shows that eating a balanced diet high in seafood will reduce your risk of some chronic conditions, or help you manage your symptoms.

This booklet will help guide your food choices and includes a 14-day meal planner specifically designed for people who are at high risk, or who have diabetes that is related to diet (commonly called Type 2).

# How can seafood help with diabetes?

A healthy diet can help you manage your weight and may help prevent type 2 diabetes. If you already have diabetes, a healthy diet can help you manage your condition. Diabetes may also increase your risk of other chronic conditions such as heart disease.

fatty acids in oily fish can actually help to prevent coronary heart disease. In addition to omega-3s, seafood contains many other nutrients beneficial to health, including selenium, iodine, zinc, calcium and vitamin D.

It's also low in saturated fat, high in protein, and a good source of energy.

Selecting seafood is also a smart choice for lowering cholesterol, and the omega-3

<b>Iron</b>	Iron is important for maintaining energy levels and a strong immune system. Mussels, oysters and tinned sardines are good sources of iron.
<b>Iodine</b>	Iodine is important for growth and seafood is the best natural source of iodine. Oysters, mussels and scallops are good sources of iodine.
<b>Folate</b>	Folate aids the prevention of neural tube defects in growing babies. Oysters and mussels are sources of folate.
<b>Vitamin B12</b>	Vitamin B12 helps the brain to work normally. Sardines, mussels and tuna are good sources of vitamin B12.
<b>Vitamin D</b>	Vitamin D is good for the immune system and strong bones and muscles. Australian salmon, Atlantic salmon and tuna are good sources of vitamin D.
<b>Vitamins A and E</b>	Vitamins A and E are powerful antioxidants which help the immune system and eye health. Mussels are the richest seafood source of vitamin A. Atlantic salmon and sardines are good sources of vitamin E.
<b>Calcium</b>	Calcium is important for maintaining healthy teeth and bones. Australian salmon and sardines are rich sources of calcium.

# How much seafood do I need to stay healthy?

Evidence suggests that we should aim to consume 600mg of omega-3s per day for men, and 500mg for women.

Some types of seafood contain higher levels of omega-3s than others so the number of serves of seafood you need to eat each week to maintain good health depends on the type of seafood you eat. Generally, one serve of seafood is around 150g.





## Omega-3s

Omega-3 fatty acids (omega-3s) are essential to our health. Our bodies cannot produce these fatty acids and so we need to eat foods that contain them. The best source of omega-3s is seafood. In fact, the regular intake of omega-3s as part of a healthy diet provides health benefits for conditions such as diabetes, heart disease, arthritis and some cancers.

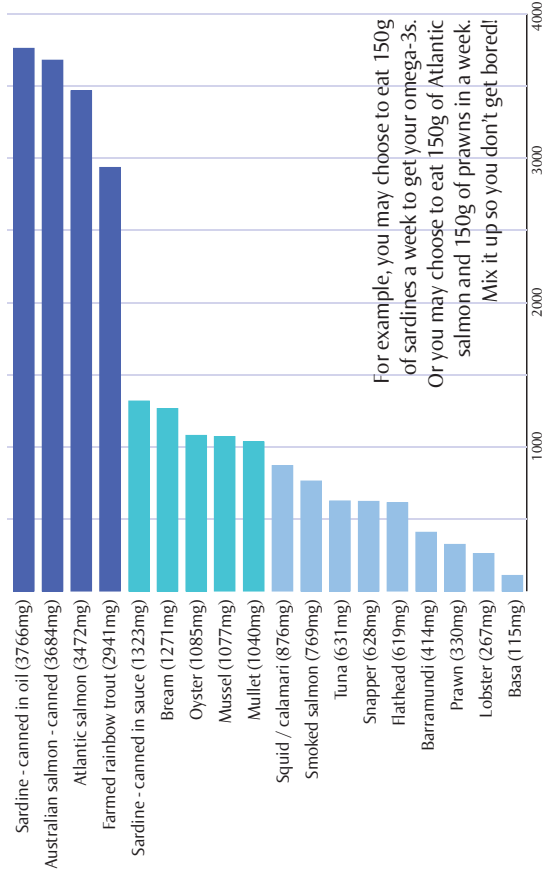
## Which fish to choose?

Examples of seafood that are excellent, very good, or good sources of omega-3s.

A	B	C
Excellent sources of omega-3s	Very good sources of omega-3s	Good sources of omega-3s
 Atlantic salmon   Trout	 Bream   Mussels	 Barramundi   Snapper
 Sardines   Canned salmon	 Oysters   Mullet	 Smoked salmon   Canned tuna

## How much omega-3?

Adults should aim to include 3500 - 4000mg of omega-3s in their diet each week. This table shows you how much omega-3 is in a 150g serve of a variety of fish and seafood:





# 14-day meal planner

This 14-day meal planner has been developed with a dietitian for people at high risk of developing diabetes or who already have diabetes that is related to diet.

## Menu suggestion: week one

(Choose one item for each meal)

### Breakfast

- Cereal and reduced fat milk
- Poached eggs on toast
- Egg white omelette with smoked salmon

### Lunch

- Tuna bean salad
- Canned salmon salad
- Tuna Caesar wraps
- Tuna and green bean sushi rolls

### Dinner

- Grilled tuna steak with parmesan potatoes and vegetables
- Grilled trout with BBQ vegetables
- Simple fish in green curry
- Garlic prawn skewers

### Dessert

- Fruit (2 pieces)
- Low fat yoghurt (200ml tub)
- Small bowl of low fat ice-cream
- A handful of nuts



## Menu suggestion: week two

(Choose one item for each meal)

### Breakfast

- Cereal and reduced fat milk
- Sardines on toast
- Boiled eggs and tomato slices on toast

### Lunch

- Tuna and salad roll
- Potato salad
- Coleslaw and bean salad
- Caesar salad (no dressing)
- Smoked salmon sushi rolls

### Dinner

- Baked barra fillets with chunky mushroom, tomato and basil sauce
- Steamed bream with honeyed vegetables
- Curried fish in foil with julienne vegetables
- Salmon pasta with fresh garden salad

### Dessert

- Fruit (2 pieces)
- Small bowl of low fat custard
- Low fat yoghurt (200ml tub)
- A handful of nuts

# Recipes

## Grilled tuna steak with parmesan potatoes and vegetables (Serves 4)

### Ingredients:

- 4 tuna steaks (150g each)
- Extra virgin olive oil, for brushing and to serve
- 2 tsp lemon juice
- Lemon wedges to serve
- Salt and pepper
- 750g potatoes, unpeeled
- 25g butter
- 1 bunch spring onions, trimmed and thinly sliced
- 40g fresh parmesan cheese, shaved
- 4 tbsp fresh basil, finely shredded
- 3 tbsp olive oil
- 4 florets of broccoli
- 2 large carrots, sliced julienne
- 16 green beans

### Method:

- Put the potatoes into a pan of salted water, bring to the boil and cook for 15 minutes until tender. Drain. When cool enough to handle, peel, return to the pan and crush against the sides with a fork until they burst. Cover to keep warm.
- Melt the butter in a small pan, add the onions and cook gently for 3–4 minutes. Stir into the potatoes with the parmesan, basil, olive oil and seasoning. Cover and keep warm.
- Place vegetables in a steamer.
- Brush the tuna with oil and season, then put on a smoking hot griddle, skinned-side down, and cook over a high heat for 2 minutes, pressing gently with a palette knife until it takes on golden bar marks. Sprinkle with lemon juice, cook for a few seconds, then turn and cook for 30 seconds. Turn off the heat and leave on the grill for 30 seconds. The tuna should be slightly rare inside.
- Spoon the potatoes onto 4 warm plates, steamed vegetables on the side and rest the fish on top. Drizzle with a little oil, sprinkle with pepper and sea salt and serve with lemon wedges.



# Recipes

## Grilled trout with BBQ vegetables (Serves 2)

### Ingredients:

- 2 trout fillets (150g each)
- 1 tbsp olive oil
- Juice of ½ lemon
- ½ large red onion, cut into 4 wedges
- 2 flat mushrooms, sliced thick
- 1 baby eggplant, halved lengthways
- 1 baby zucchini, halved lengthways
- ½ red capsicum, seeded and halved
- 1 yellow squash, halved
- 1 firm ripe tomato, halved
- Olive or canola oil spray

### Method:

- Combine oil and juice in a small bowl. Brush vegetables with the mixture. Heat barbecue and lightly spray with oil.
- Barbecue vegetables until tender (about 10 minutes depending on thickness), turning after 5 minutes.
- Once the vegetables have been turned, grill the trout fillets on the barbecue for about 2 minutes each side or until cooked through (thicker fish pieces may need a little extra time).

## Salmon pasta with fresh garden salad (Serves 2)

### Ingredients:

- 2 salmon fillets (150g each), cut into cubes
- Extra virgin olive oil
- 1 small onion, diced
- 1 x 400g tin of diced tomatoes
- ½ to 1 cup of chicken stock
- 2 cups of pasta (any sort)
- 1 packet of soup (French onion/pea and ham)

### Method:

- Add oil to frypan and cook onion until soft. Add salmon and cook.
- Add packet of soup and the tin of tomatoes. Stir. Add stock until sauce reaches desired consistency and simmer for about 10 minutes or until fish is cooked.
- While the sauce is simmering, cook pasta.
- Serve with a fresh green garden salad.

\*For a variation, leave out the stock and serve the sauce over rice.



# Recipes

## Baked barra fillets with chunky mushroom, tomato and basil sauce (Serves 4)

### Ingredients:

- 4 barramundi fillets (150g each)
- 1 to 2 tbsp butter, melted
- 1 lime, juiced
- 4 tbsp olive oil
- 2cm to 3cm ginger, grated
- 4 cloves of garlic, crushed
- 1 tbsp coriander, chopped
- 2 fresh truss tomatoes, finely chopped
- ½ brown onion, chopped
- 1 cup button mushrooms, finely chopped
- ½ cup basil, finely chopped
- Salt and pepper, to taste
- Fettuccine

### Method:

- Combine melted butter, lime juice and olive oil in a large bowl and stir together. Add grated ginger, crushed garlic, coriander, tomatoes, onion, mushrooms, basil, salt and pepper. Stir thoroughly. The result should be a thick combination, but still contain plenty of juice.
- Pour half of the marinade into a shallow baking dish, and place the fish fillets on top. Place the rest of the marinade over the top of the fish so it is completely covered. Cover with aluminium foil, and refrigerate for 2 hours.
- Preheat the oven, and cook fish for 20 minutes at 180°C, covered with aluminium foil (or until fish is cooked through).
- Meanwhile, cook pasta to al dente and serve fish on top of pasta.

\*As an alternative to pasta, serve on a bed of rice.



## Tuna and bean salad (Serves 2)

### Ingredients:

- 1 small tin tuna
- 1 small tin 4 bean mix
- 5 cherry tomatoes, quartered
- ¼ red capsicum, diced
- ¼ red onion, diced
- Low fat mayonnaise

### Method:

- Drain tuna and beans. Combine in a bowl and mix through diced vegetables. Add low-fat mayonnaise to taste.

# Recipes

## Simple fish in green curry (Serves 4)

### Ingredients:

- 500g bream, chopped into bite sized pieces
- 1 tbsp olive oil
- 2 tsp curry paste, either homemade or store bought
- 400ml can lite coconut milk
- ½ red capsicum, sliced finely
- ½ green capsicum, sliced finely
- 1 bunch bok choy, washed and cut in four
- Bean sprouts to garnish
- Cooked jasmine rice to serve

### Fresh curry paste:

- Ginger (4cm piece)
- 2 cloves garlic
- 3 green chillies
- 1 bunch fresh coriander, including the root, finely chopped
- 1 tsp salt
- 1 tbsp fish sauce
- 2 tbsp palm sugar

### Method:

- To make the curry paste, use a mortar and pestle to grind the ginger, garlic, and chilli to a paste. If you don't like it too hot, just use two chillies and remove the seeds before adding to the mortar and pestle.
- Add a few coriander roots (only use the main part and remove the finer hairy roots).
- Add coriander leaves. Add salt (it will help with grinding the ingredients).
- Once in paste form, add the fish sauce and palm sugar and mix through.
- Heat a large wok on the stove and add olive oil. When hot, add curry paste (about 2 large teaspoons). Reduce to a simmer and add coconut milk, then the capsicum, and simmer for a few minutes. Add the fish pieces and cook over low heat for a few minutes until fish is nearly cooked. Add the bok choy and simmer for a further 2 minutes or until bok choy has wilted.
- Serve over steamed jasmine rice and garnish with bean sprouts.





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please visit [www.cessh.curtin.edu.au](http://www.cessh.curtin.edu.au)

For more information on diabetes visit:

Diabetes Australia  
[www.diabetesaustralia.com.au](http://www.diabetesaustralia.com.au)

Diabetes WA  
[www.diabeteswa.com.au](http://www.diabeteswa.com.au)



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Seafood and  
your health

**ARTHRITIS**



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## Seafood and your health

Evidence shows that eating a balanced diet high in seafood will reduce your risk of some chronic conditions, or help you manage your symptoms.

This booklet will help guide your food choices and includes a 14-day meal planner specifically designed for people at high risk of developing arthritis.

# How can seafood help with arthritis?

A healthy diet high in seafood can help reduce symptoms of rheumatoid arthritis and help you to manage your condition. These benefits include reduced joint tenderness, a reduction in morning stiffness and reduced use of analgesic anti-inflammatory drugs. Rheumatoid arthritis may also increase your risk of heart disease. Research has shown that a diet high in seafood such as oily fish can help reduce the risk of heart disease.

Selecting seafood is also a smart choice for lowering cholesterol. In addition to omega-3s, seafood contains many other nutrients beneficial to health, including selenium, iodine, zinc, calcium and vitamin D.

It's also low in saturated fat, high in protein, and a good source of energy.

<b>Iron</b>	Iron is important for maintaining energy levels and a strong immune system. Mussels, oysters and tinned sardines are good sources of iron.
<b>Iodine</b>	Iodine is important for growth and seafood is the best natural source of iodine. Oysters, mussels and scallops are good sources of iodine.
<b>Folate</b>	Folate aids the prevention of neural tube defects in growing babies. Oysters and mussels are sources of folate.
<b>Vitamin B12</b>	Vitamin B12 helps the brain to work normally. Sardines, mussels and tuna are good sources of vitamin B12.
<b>Vitamin D</b>	Vitamin D is good for the immune system and strong bones and muscles. Australian salmon, Atlantic salmon and tuna are good sources of vitamin D.
<b>Vitamins A and E</b>	Vitamins A and E are powerful antioxidants which help the immune system and eye health. Mussels are the richest seafood source of vitamin A. Atlantic salmon and sardines are good sources of vitamin E.
<b>Calcium</b>	Calcium is important for maintaining healthy teeth and bones. Australian salmon and sardines are rich sources of calcium.

## How much seafood do I need to stay healthy?

Evidence suggests that we should aim to consume 600mg of omega-3s per day for men, and 500mg for women.

Some types of seafood contain higher levels of omega-3s than others so the number of serves of seafood you need to eat each week to maintain good health depends on the type of seafood you eat. Generally, one serve of seafood is around 150g.





## Omega-3s

Omega-3 fatty acids (omega-3s) are essential to our health. Our bodies cannot produce these fatty acids and so we need to eat foods that contain them. The best source of omega-3s is seafood. In fact, the regular intake of omega-3s as part of a healthy diet provides health benefits for conditions such as diabetes, heart disease, arthritis and some cancers.

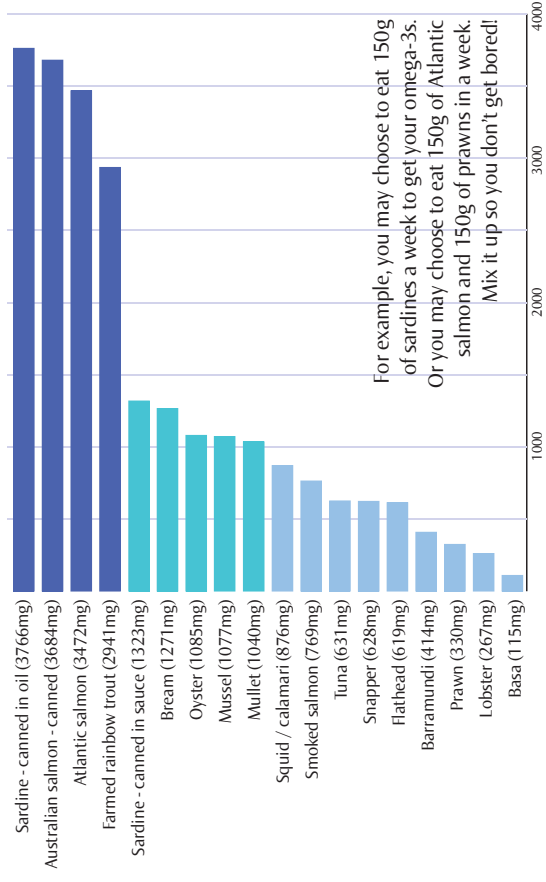
## Which fish to choose?

Examples of seafood that are excellent, very good, or good sources of omega-3s.

A	B	C
Excellent sources of omega-3s	Very good sources of omega-3s	Good sources of omega-3s
 Atlantic salmon   Trout	 Bream   Mussels	 Barramundi   Snapper
 Sardines   Canned salmon	 Oysters   Mullet	 Smoked salmon   Canned tuna

## How much omega-3?

Adults should aim to include 3500 - 4000mg of omega-3s in their diet each week. This table shows you how much omega-3 is in a 150g serve of a variety of fish and seafood:





# 14-day meal planner

This 14-day meal planner has been developed with a dietitian for people at high risk of developing arthritis.

## Menu suggestion: week one

(Choose one item for each meal)

### Breakfast

- Cereal and reduced fat milk
- Poached eggs on toast
- Egg white omelette with smoked salmon

### Lunch

- Tuna and bean salad
- Canned salmon salad
- Tuna Caesar wraps
- Smoked salmon wraps
- Tuna and green bean sushi rolls

### Dinner

- Grilled salmon with potato and green bean salad
- Salmon, leek and potato soup
- Steamed trout with spring vegetables and salsa verde
- Baked bream with spinach pasta and green salad

### Dessert

- Fruit (2 pieces)
- Low fat yoghurt (200ml tub)
- Small bowl of low fat ice-cream
- A handful of nuts



## Menu suggestion: week two

(Choose one item for each meal)

### Breakfast

- Cereal and reduced fat milk
- Sardines on toast
- Boiled eggs and tomato slices on toast

### Lunch

- Tuna and salad roll
- Potato salad
- Coleslaw and bean salad
- Caesar salad (no dressing)
- Smoked salmon sushi rolls

### Dinner

- Salmon pasta with fresh garden salad
- Grilled mullet with BBQ vegies
- Steamed bream with honeyed vegetables
- Garlic prawn skewers

### Dessert

- Fruit (2 pieces)
- Small bowl of low fat custard
- Low fat yoghurt (200ml tub)
- A handful of nuts

# Recipes

## Salmon, leek and potato soup (Serves 4)

### Ingredients:

- 150g smoked salmon, chopped
- 2 large potatoes, chopped
- 2 medium leeks, sliced finely
- 2 spring onions, sliced finely
- 3 cups chicken stock

### Method:

1. Heat oil in a large pan. Add leeks and cook over medium heat for 5 minutes or until soft. Add the potatoes and stock. Simmer for 20 minutes, or until the potatoes are tender. Stir in the milk and season with salt and pepper.
2. Allow the soup to cool slightly, then puree until smooth. Return the soup to the pan and stir through half the salmon, the spring onions and chives.
3. Toast the bread until golden and top with the remaining salmon. Cut the toast into fingers and serve with the soup.



# Recipes

## BBO garlic prawn skewers (Serves 2)

### Ingredients:

- 12 prawns
- 1 garlic clove, minced
- 1 tbsp olive oil
- ¼ zucchini, sliced

### Method:

Pre-heat the BBO. Soak prawns in garlic and olive oil while you chop vegetables. Thread prawns and vegetables onto skewers, and BBO until prawns turn pink.

- 4 small mushrooms, sliced
- 8 cherry tomatoes
- ¼ red capsicum



## Tuna and bean salad (Serves 2)

### Ingredients:

- 1 small tin tuna
- 1 small tin 4 bean mix
- 5 cherry tomatoes, quartered

### Method:

Drain tuna and beans. Combine in a bowl and mix through diced vegetables. Add low-fat mayonnaise to taste.

- 1 red capsicum, diced
- 1 red onion, diced
- Low fat mayonnaise

## Grilled mullet with BBQ vegies (Serves 2)

### Ingredients:

- 2 mullet fillets (150g each)
- 1 tbsp olive oil
- Juice of ½ lemon
- 1 large red onion, cut into 4 wedges
- 2 flat mushrooms, sliced thick
- 1 baby eggplant, halved lengthways
- 1 baby zucchini, halved lengthways
- 1 red capsicum, seeded and cut into two
- 1 yellow squash, halved
- 1 firm ripe tomato, halved
- Olive or canola oil spray

### Method:

1. Combine oil and juice in a small bowl. Brush vegetables with the mixture. Heat barbecue and lightly spray with oil.
2. Barbecue vegetables until tender (about 10 minutes depending on thickness), turning after 5 minutes.
3. Once the vegetables have been turned, grill the mullet fillets on the barbecue for about 2 minutes each side or until cooked through (thicker fish pieces may need a little extra time).



## Smoked salmon wraps (Serves 2 - 4)

### Ingredients:

- 100g smoked salmon
- 2 hard boiled eggs
- 2 slices wholemeal lavash bread
- 2 tbsp low fat mayonnaise

### Method:

1. Peel and mash the eggs. Add the mayonnaise, capers and chives and mix to combine.
2. Lay the lavash on a flat surface. Spread the egg mixture over the centre of the lavash and top with the spinach and smoked salmon.
3. Roll up to enclose the filling. Cut into thick slices to serve.

- 1 tbsp capers, chopped
- 1 tsp fresh chives, chopped
- 25g baby English spinach



# Recipes

## Steamed trout with spring vegetables and salsa verde (Serves 2)

### Ingredients:

- 4 x 150g pieces of trout
- Salt and pepper
- Sprigs of fresh dill
- 1 cup fresh basil leaves
- Sprigs of fresh rosemary
- 4 baby carrots
- 2 whole florets of broccolini
- 2 small spring onions, trimmed
- 4 small new potatoes
- 2 baby zucchinis
- Handful of snow peas or green beans

### Salsa Verde\*:

- 1 cup chopped fresh parsley (or use a mix of parsley and basil)
- 1 clove of garlic
- 2-3 anchovies in oil, drained
- 1 tbsp drained capers
- 1 tbsp white wine vinegar or freshly squeezed lemon juice
- 3-4 tbsp extra virgin olive oil

\*Place everything in a mortar or food processor and process to a chunky paste

### Method:

1. Place fish pieces in the centre of oiled cling wrap. Sprinkle with salt and pepper and place dill sprig on top. Roll up, pierce all over with the point of a sharp knife, and set aside.
2. Place the basil leaves and rosemary sprigs in the bottom of a steamer and add about 4cm of water. Bring to the boil. Then arrange the vegetables in the steamer. Cover and steam for about 6 minutes.
3. Make the salsa verde.
4. Push the vegetables aside and nestle the wrapped fish amongst them, then steam a further 6 minutes, or until the fish and vegetables are tender.
5. Unwrap the fish and serve surrounded by the steamed vegetables, and drizzle with salsa verde.

# Recipes

## Steamed bream with honeyed vegetables (Serves 2)

### Ingredients:

- 2 bream fillets (150g each)
- Oiled cling wrap
- Salt and pepper
- Sprigs of dill
- 1 cup broccoli, chopped
- 1 cup of carrots, chopped
- 1 cup of pumpkin, chopped

### Dressing:

- 1 tbsp of honey
- 1 tbsp of vinegar
- ½ tsp of olive oil
- ½ tsp of reduced salt soy sauce
- ¼ tsp of ginger, finely chopped
- ¼ tsp garlic, finely chopped

### Method:

1. Place fish pieces in the centre of oiled cling wrap. Sprinkle with salt and pepper and place dill sprig on top. Roll up, pierce all over with the point of a sharp knife, and set aside.
2. Slice vegetables to the same size for even cooking. Steam vegetables for 6-8 minutes or microwave on HIGH for 3-4 minutes until crisp but tender.
3. Place dressing ingredients in a saucepan and simmer over a low heat until honey dissolves, or microwave on HIGH for 1 minute.
4. Use a saucepan which fits metal or bamboo steamer comfortably. Fill saucepan half full with water, bring to the boil, then turn down to a steady bubble or fast simmer. Place fillets in steamer and cover. Steam for 5 minutes.
5. To serve, drain vegetables and toss through dressing. Unwrap fillets from cling wrap onto plates and serve with vegetables.





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please visit [www.cessh.curtin.edu.au](http://www.cessh.curtin.edu.au)

For more information on arthritis visit:

Arthritis Australia  
[www.arthritisaustralia.com.au](http://www.arthritisaustralia.com.au)

Arthritis Foundation WA  
[www.arthritiswa.org.au](http://www.arthritiswa.org.au)





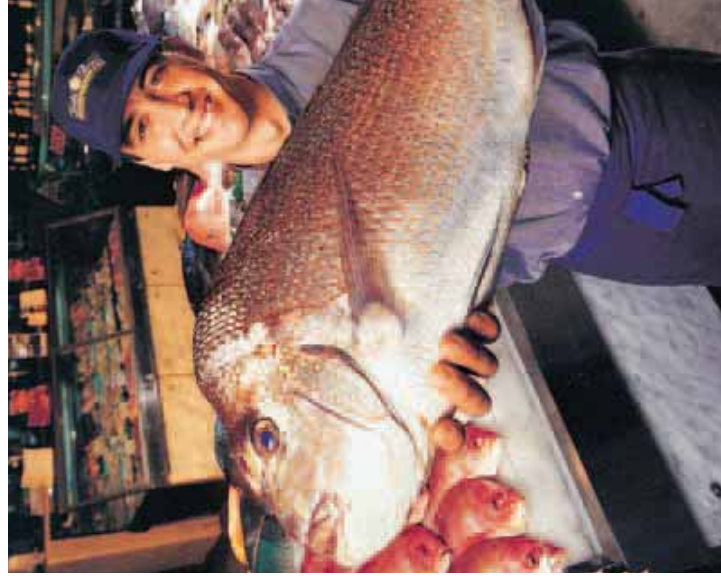
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Seafood and  
your health

**CANCER**

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## Seafood and your health

Evidence shows that eating a balanced diet high in seafood will reduce your risk of some chronic conditions, or help you manage your symptoms.

This booklet will help guide your food choices and includes a 14-day meal plan specifically designed for people at high risk of developing cancers that have been linked to diet.

# How can seafood help prevent cancer?

Including seafood in a balanced diet can improve and maintain your health. Research suggests that adequate levels of physical activity and a balanced, healthy diet have a significant preventative effect on the development of some cancers. In particular, consumption of oily fish has been linked with a reduced risk of prostate, breast, colon, oesophageal and lung cancers. When prepared in a healthy manner, fish is a valuable part of a healthy diet.

Selecting seafood is also a smart choice for lowering cholesterol, and the omega-3 fatty acids in oily fish can actually help to prevent coronary heart disease. In addition to omega-3s, seafood contains many other nutrients beneficial to health, including selenium, iodine, zinc, calcium and vitamin D.

It's also low in saturated fat, high in protein, and a good source of energy.

<b>Iron</b>	Iron is important for maintaining energy levels and a strong immune system. Mussels, oysters and tinned sardines are good sources of iron.
<b>Iodine</b>	Iodine is important for growth and seafood is the best natural source of iodine. Oysters, mussels and scallops are good sources of iodine.
<b>Folate</b>	Folate aids the prevention of neural tube defects in growing babies. Oysters and mussels are sources of folate.
<b>Vitamin B12</b>	Vitamin B12 helps the brain to work normally. Sardines, mussels and tuna are good sources of Vitamin B12.
<b>Vitamin D</b>	Vitamin D is good for the immune system and strong bones and muscles. Australian salmon, Atlantic salmon and tuna are good sources of Vitamin D.
<b>Vitamins A and E</b>	Vitamins A and E are powerful antioxidants which help the immune system and eye health. Mussels are the richest seafood source of vitamin A. Atlantic salmon and sardines are good sources of vitamin E.
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## How much seafood do I need to stay healthy?

Evidence suggests that we should aim to consume 600mg of omega-3s per day for men, and 500mg for women.

Some types of seafood contain higher levels of omega-3s than others so the number of serves of seafood you need to eat each week to maintain good health depends on the type of seafood you eat. Generally, one serve of seafood is around 150g.





## Omega-3s

Omega-3 fatty acids (omega-3s) are essential to our health. Our bodies cannot produce these fatty acids and so we need to eat foods that contain them. The best source of omega-3s is seafood. In fact, the regular intake of omega-3s as part of a healthy diet provides health benefits for conditions such as diabetes, heart disease, arthritis and some cancers.

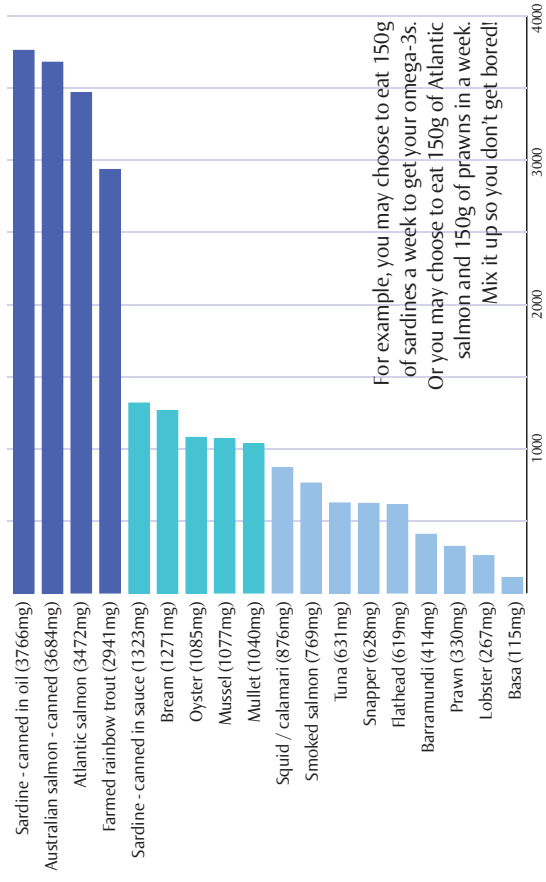
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 Sardines   Canned salmon	 Oysters   Mullet	 Smoked salmon   Canned tuna

## How much omega-3?

Adults should aim to include 3500 - 4000mg of omega-3s in their diet each week. This table shows you how much omega-3 is in a 150g serve of a variety of fish and seafood:





# 14-day meal planner

This 14-day meal planner has been developed with a dietitian for people at high risk of developing diet-related cancers.

## Menu suggestion: week one (Choose one item for each meal)

### Breakfast

- Cereal and reduced fat milk
- Poached eggs on toast
- Egg white omelette with smoked salmon

### Lunch

- Tuna bean salad
- Canned salmon salad
- Tuna Caesar wraps
- Smoked salmon wraps
- Tuna and green bean sushi rolls

### Dinner

- Grilled trout with honeyed vegetables
- Baked mullet with tasty rice noodles
- Garlic prawn skewers and potato salad
- Salmon risotto

### Dessert

- Fruit (2 pieces)
- Low fat yoghurt (200ml tub)
- Small bowl of low fat ice-cream
- A handful of nuts



## Menu suggestion: week two (Choose one item for each meal)

### Breakfast

- Cereal and reduced fat milk
- Sardines on toast
- Boiled eggs and tomato slices on toast

### Lunch

- Tuna and salad roll
- Potato salad
- Coleslaw and bean salad
- Caesar salad (no dressing)
- Smoked salmon sushi rolls

### Dinner

- Salmon pasta with fresh garden salad
- Grilled mullet with BBQ vegies
- Steamed bream with honeyed vegetables
- Garlic prawn skewers

### Dessert

- Fruit (2 pieces)
- Small bowl of low fat custard
- Low fat yoghurt (200ml tub)
- A handful of nuts

# Recipes

## Salmon pasta with fresh garden salad (Serves 2)

### Ingredients:

- 2 salmon fillets (150g each), cut into cubes
- ½ to 1 cup of chicken stock
- Extra virgin olive oil
- 2 cups of pasta (any sort)
- 1 small onion, diced
- 1 packet of soup (French onion/pea and ham)
- 400g tin of diced tomatoes

### Method:

1. Add oil to fry pan and cook onion until soft. Add salmon and cook.
2. Add packet of soup and the tin of tomatoes. Stir. Add stock till sauce reaches desired consistency and simmer for about 10 minutes or until fish is cooked.
3. While the sauce is simmering, cook pasta.
4. Serve with a fresh green garden salad.

\*For a variation, leave out the stock and serve the sauce over rice.



## Baked mullet with tasty rice noodles (Serves 2)

### Ingredients:

- 2 mullet fillets (150g each), skin on
- Handful of snow peas
- 3 lemons, juiced
- 200g rice stick noodles
- 4 green onions, thinly sliced
- ¾ cup rice milk
- 2 small carrots
- 2 tbsp chopped dill
- 1 zucchini
- 1 clove garlic, crushed

Cooking oil spray (canola or olive oil)

### Method:

1. Preheat oven to 180°C/160° fan-forced. Spray mullet fillets with oil.
2. Place skin-side down in a roasting pan. Drizzle with 2 tbsp lemon juice. Cover with foil and bake for 10-12 minutes or until cooked through. Sprinkle with half the onion.
3. Meanwhile, use a vegetable peeler to cut carrot and zucchini into long ribbons.
4. Put noodles in a heat proof bowl and cover with boiling water for 10 minutes to soften. Drain.
5. Spray a large non-stick frying pan with oil. Add vegetable ribbons and snow peas and cook over medium heat, stirring, for 1-2 minutes. Add noodles, remaining lemon juice, rice milk, dill, garlic and remaining onions. Toss to combine; do not boil.
6. Place noodles onto plates and top with mullet to serve.

# Recipes

## BBO garlic prawn skewers (Serves 2)

### Ingredients:

- 12 prawns
- 4 small mushrooms, sliced
- 1 garlic clove, minced
- 8 cherry tomatoes
- 1 tbsp olive oil
- ¼ red capsicum
- ¼ zucchini, sliced

### Method:

Pre-heat the BBO. Soak prawns in garlic and olive oil while you chop vegetables. Thread prawns and vegetables onto skewers, and BBO until prawns turn pink.



## Tuna and bean salad (Serves 2)

### Ingredients:

- 1 small tin tuna
- 1 red capsicum, diced
- 1 small tin 4 bean mix
- 1 red onion, diced
- 5 cherry tomatoes, quartered
- Low fat mayonnaise

### Method:

Drain tuna and beans. Combine in a bowl and mix through diced vegetables. Add low-fat mayonnaise to taste.

## Smoked salmon wraps (Serves 2 - 4)

### Ingredients:

- 100g smoked salmon
- 1 tbsp capers, chopped
- 2 hard boiled eggs
- 1 tsp fresh chives, chopped
- 2 slices wholemeal lavash bread
- 25g baby English spinach
- 2 tbsp low fat mayonnaise

### Method:

1. Peel and mash the eggs. Add the mayonnaise, capers and chives and mix to combine.
2. Lay the lavash on a flat surface. Spread the egg mixture over the centre of the lavash and top with the spinach and smoked salmon.
3. Roll up to enclose the filling. Cut into thick slices to serve.



# Recipes

## Salmon risotto (Serves 1)

### Ingredients:

- 1 salmon fillet (150g), chopped in bite sized pieces
- 1 clove garlic, chopped
- ½ cup Arborio rice
- 200ml chicken, fish, or vegetable stock (hot)
- Juice of ½ lemon
- 2 tsp chopped chives
- ½ cup frozen peas
- 1 tbsp grated parmesan cheese (optional)
- 1 tbsp olive oil
- ¼ onion, finely diced

### Method:

1. In a non-stick pan over a medium heat, gently cook onion and garlic together in olive oil until soft.
2. Add rice and peas, then hot stock gradually until absorbed. Keep stirring gently until rice is creamy but still has a bite to it – about 10 minutes (If you use hot stock, it keeps the rice cooking continually).
3. Add salmon and cook for a further 3 minutes. Stir in chives and lemon juice.
4. Serve in a deep bowl topped with parmesan cheese.



# Recipes

## Steamed bream with honeyed vegetables (Serves 2)

### Ingredients:

- 2 bream fillets (150g each)
- Oiled cling wrap
- Salt and pepper
- Sprigs of dill
- 1 cup broccoli, chopped
- 1 cup of carrots, chopped
- 1 cup of pumpkin, chopped

### Dressing:

- 1 tbsp of honey
- 1 tbsp of vinegar
- ½ tsp of olive oil
- ½ tsp of reduced salt soy sauce
- ¼ tsp of ginger, finely chopped
- ¼ tsp garlic, finely chopped

### Method:

1. Place fish pieces in the centre of oiled cling wrap. Sprinkle with salt and pepper and place dill sprig on top. Roll up, pierce all over with the point of a sharp knife, and set aside.
2. Slice vegetables to the same size for even cooking. Steam vegetables for 6-8 minutes or microwave on HIGH for 3-4 minutes until crisp but tender.
3. Place dressing ingredients in a saucepan and simmer over a low heat until honey dissolves, or microwave on HIGH for 1 minute.
4. Use a saucepan which fits a metal or bamboo steamer comfortably. Fill saucepan half full with water, bring to the boil, then turn down to a steady bubble or fast simmer. Place fillets in steamer and cover. Steam for 5 minutes.
5. To serve, drain vegetables and toss through dressing. Unwrap fillets from cling wrap onto plates and serve with vegetables.





For more information on seafood and health  
please visit [www.cessh.curtin.edu.au](http://www.cessh.curtin.edu.au)

For more information on cancer visit:

Cancer Council Australia  
[www.cancer.org.au](http://www.cancer.org.au)

Cancer Council WA  
[www.cancer.wa.asn.au](http://www.cancer.wa.asn.au)



Seafood and  
your health

**CORONARY  
HEART DISEASE**



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## Seafood and your health

Evidence shows that eating a balanced diet high in seafood will reduce your risk of some chronic conditions, or help you manage your symptoms.

This booklet will help guide your food choices and includes a 14-day meal planner specifically designed for people at high risk of developing coronary heart disease.

## How can seafood help my heart?

A healthy balanced diet including seafood and regular physical activity can help to reduce the risk of coronary heart disease. The benefits of eating seafood include:

- protection against cardiovascular diseases;
- protection against coronary mortality;
- lowered blood pressure;
- reduced heart rate; and
- protection for veins and arteries.

Selecting seafood is also a smart choice for lowering cholesterol, and the omega-3 fatty acids in oily fish can actually help to prevent coronary heart disease. In addition to omega-3s, seafood contains many other nutrients beneficial to health, including selenium, iodine, zinc, calcium and vitamin D.

It's also low in saturated fat, high in protein, and a good source of energy.

<b>Iron</b>	Iron is important for maintaining energy levels and a strong immune system. Mussels, oysters and tinned sardines are good sources of iron.
<b>Iodine</b>	Iodine is important for growth and seafood is the best natural source of iodine. Oysters, mussels and scallops are good sources of iodine.
<b>Folate</b>	Folate aids the prevention of neural tube defects in growing babies. Oysters and mussels are sources of folate.
<b>Vitamin B12</b>	Vitamin B12 helps the brain to work normally. Sardines, mussels and tuna are good sources of vitamin B12.
<b>Vitamin D</b>	Vitamin D is good for the immune system and strong bones and muscles. Australian salmon, Atlantic salmon and tuna are good sources of vitamin D.
<b>Vitamins A and E</b>	Vitamins A and E are powerful antioxidants which help the immune system and eye health. Mussels are the richest seafood source of vitamin A. Atlantic salmon and sardines are good sources of vitamin E.
<b>Calcium</b>	Calcium is important for maintaining healthy teeth and bones. Australian salmon and sardines are rich sources of calcium.

## How much seafood do I need to stay healthy?

Evidence suggests that we should aim to consume 600mg of omega-3s per day for men, and 500mg for women.

Some types of seafood contain higher levels of omega-3s than others so the number of serves of seafood you need to eat each week to maintain good health depends on the type of seafood you eat. Generally, one serve of seafood is around 150g.





## Omega-3s

Omega-3 fatty acids (omega-3s) are essential to our health. Our bodies cannot produce these fatty acids and so we need to eat foods that contain them. The best source of omega-3s is seafood. In fact, the regular intake of omega-3s as part of a healthy diet provides health benefit for conditions such as diabetes, heart disease, arthritis and some cancers.

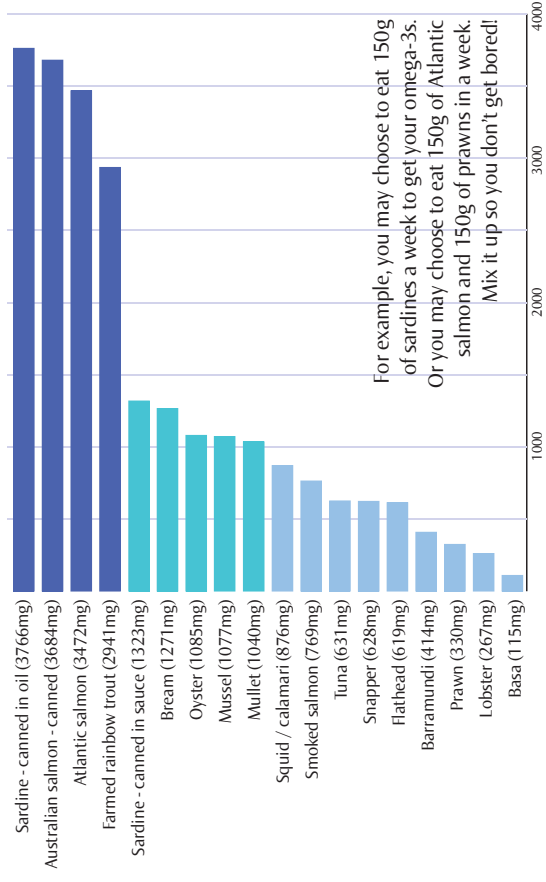
## Which fish to choose?

Examples of seafood that are excellent, very good, or good sources of omega-3s.

A	B	C
Excellent sources of omega-3s	Very good sources of omega-3s	Good sources of omega-3s
 Atlantic salmon   Trout	 Bream   Mussels	 Barramundi   Snapper
 Sardines   Canned salmon	 Oysters   Mullet	 Smoked salmon   Canned tuna

## How much omega-3?

Adults should aim to include 3500 - 4000mg of omega-3s in their diet each week. This table shows you how much omega-3 is in a 150g serve of a variety of fish and seafood:





# 14-day meal planner

This 14-day meal planner has been developed with a dietitian for people at high risk of developing coronary heart disease.

## Menu suggestion: week one

(Choose one item for each meal)

### Breakfast

- Cereal and reduced fat milk
- Poached eggs on toast
- Egg white omelette with smoked salmon

### Lunch

- Tuna bean salad
- Canned salmon salad
- Tuna Caesar wraps
- Smoked salmon wraps
- Tuna and green bean sushi rolls

### Dinner

- Grilled trout with BBQ vegetables
- Simple fish in green curry
- Linguine with smoked salmon and rocket
- Garlic prawn skewers

### Dessert

- Fruit (2 pieces)
- Low fat yoghurt (200ml tub)
- Small bowl of low fat ice-cream
- A handful of nuts



## Menu suggestion: week two

(Choose one item for each meal)

### Breakfast

- Cereal and reduced fat milk
- Sardines on toast
- Boiled eggs and tomato slices on toast

### Lunch

- Tuna and salad roll
- Potato salad
- Coleslaw and bean salad
- Caesar salad (no dressing)
- Smoked salmon sushi rolls

### Dinner

- Grilled mullet with parmesan potatoes and vegetables
- Salmon pasta with fresh garden salad
- Steamed trout with spring vegetables and salsa verde

### Dessert

- Fruit (2 pieces)
- Small bowl of low fat custard
- Low fat yoghurt (200ml tub)
- A handful of nuts

# Recipes

## Salmon pasta with fresh garden salad (Serves 2)

### Ingredients:

- 2 salmon fillets (150g each), cut into cubes
- Extra virgin olive oil
- 1 small onion, diced
- 400g tin of diced tomatoes
- ½ to 1 cup of chicken stock
- 2 cups of pasta (any sort)
- 1 packet of soup (French onion/pea and ham)

### Method:

1. Add oil to fry pan and cook onion until soft. Add salmon and cook.
2. Add packet of soup and the tin of tomatoes. Stir. Add stock till sauce reaches desired consistency and simmer for about 10 minutes or until fish is cooked.
3. While the sauce is simmering, cook pasta.
4. Serve with a fresh green garden salad.

\*For a variation, leave out the stock and serve the sauce over rice.



## Grilled trout with BBQ vegetables (Serves 2)

### Ingredients:

- 2 trout fillets (150g each)
- 1 tbsp olive oil
- Juice of ½ lemon
- 1 large red onion, cut into 4 wedges
- 2 flat mushrooms, sliced thick
- 1 baby eggplant, halved lengthways
- 1 baby zucchini, halved lengthways
- 1 red capsicum, seeded and cut into two
- 1 yellow squash, halved
- 1 firm ripe tomato, halved
- Olive or canola oil spray

### Method:

1. Combine oil and juice in a small bowl. Brush vegetables with the mixture. Heat barbecue and lightly spray with oil.
2. Barbecue vegetables until tender (about 10 minutes depending on thickness), turning after 5 minutes.
3. Once the vegetables have been turned, grill the trout fillets on the barbecue for about 2 minutes each side or until cooked through (thicker fish pieces may need a little extra time).



# Recipes

## BBO garlic prawn skewers (Serves 2)

### Ingredients:

- 12 prawns
- 1 garlic clove, minced
- 1 tbsp olive oil
- ¼ zucchini, sliced
- 4 small mushrooms, sliced
- 8 cherry tomatoes
- ¼ red capsicum

### Method:

Pre-heat the BBO. Soak prawns in garlic and olive oil while you chop vegetables. Thread prawns and vegetables onto skewers, and BBO until prawns turn pink.



## Tuna and bean salad (Serves 2)

### Ingredients:

- 1 small tin tuna
- 1 small tin 4 bean mix
- 5 cherry tomatoes, quartered
- ¼ red capsicum, diced
- ¼ red onion, diced
- Low fat mayonnaise

### Method:

Drain tuna and beans. Combine in a bowl and mix through diced vegetables. Add low-fat mayonnaise to taste.

## Smoked salmon wraps (Serves 2 - 4)

### Ingredients:

- 100g smoked salmon
- 2 hard boiled eggs
- 2 slices wholemeal lavash bread
- 2 tbsp low fat mayonnaise
- 1 tbsp capers, chopped
- 1 tsp fresh chives, chopped
- 25g baby English spinach

### Method:

1. Peel and mash the eggs. Add the mayonnaise, capers and chives and mix to combine.
2. Lay the lavash on a flat surface. Spread the egg mixture over the centre of the lavash and top with the spinach and smoked salmon.
3. Roll up to enclose the filling. Cut into thick slices to serve.



## Steamed trout with spring vegetables and salsa verde (Serves 2)

### Ingredients:

4 x 150g pieces of trout  
Salt and pepper  
Sprigs of fresh dill  
1 cup fresh basil leaves  
Sprigs of fresh rosemary  
4 baby carrots  
2 whole florets of broccolini  
2 small spring onions, trimmed  
4 small new potatoes  
2 baby zucchinis  
Handful of snow peas or green beans

### Salsa Verde\*:

1 cup chopped fresh parsley (or use a mix of parsley and basil)  
1 clove of garlic  
2-3 anchovies in oil, drained  
1 tbsp drained capers  
1 tbsp white wine vinegar or freshly squeezed lemon juice  
3-4 tbsp extra virgin olive oil

\*Place everything in a mortar or food processor and process to a chunky paste

### Method:

1. Place fish pieces in the centre of oiled cling wrap. Sprinkle with salt and pepper and place dill sprig on top. Roll up, pierce all over with the point of a sharp knife, and set aside.
2. Place the basil leaves and rosemary sprigs in the bottom of a steamer and add about 4cm of water. Bring to the boil. Then arrange the vegetables in the steamer. Cover and steam for about 6 minutes.
3. Make the salsa verde.
4. Push the vegetables aside and nestle the wrapped fish amongst them, then steam a further 6 minutes, or until the fish and vegetables are tender.
5. Unwrap the fish and serve surrounded by the steamed vegetables, and drizzle with salsa verde.



## Linguine with smoked salmon and rocket (Serves 4)

### Ingredients:

350g dried linguine  
2 tbsp olive oil  
1 garlic clove, finely chopped  
115g smoked salmon, cut into thin strips  
55g rocket  
Salt and pepper  
Lemon wedges, to garnish

### Method:

1. Bring a large saucepan of lightly salted water to the boil. Add the pasta, return to the boil and cook for 8-10 minutes, or until tender but still firm to the bite.
2. Just before the end of the cooking time, heat the olive oil in a heavy based frying pan. Add the garlic and cook over a low heat, stirring constantly, for 1 minute (do not allow the garlic to brown or it will taste bitter).
3. Add the salmon and rocket. Season with salt and pepper and cook, stirring constantly, for 1 minute. Remove the frying pan from the heat.
4. Drain the pasta and transfer to a warmed serving dish. Add the smoked salmon and rocket, toss lightly and serve, garnished with lemon wedges.





For more information on seafood and health  
please visit [www.cessh.curtin.edu.au](http://www.cessh.curtin.edu.au)

For more information on CHD visit:

Heart Foundation  
[www.heartfoundation.org.au](http://www.heartfoundation.org.au)

National Health and Medical Research Council  
[www.nhmrc.gov.au](http://www.nhmrc.gov.au)



**CESSH**  
CENTRE OF EXCELLENCE  
SCIENCE SEAFOOD HEALTH

Seafood and  
your health

**PREGNANCY**



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## Seafood and your health

Evidence shows that eating a balanced diet that is high in specific types of seafood has benefits for both you and your baby.

This booklet will help guide your food choices and includes a 14-day meal planner to help you to maintain your health during pregnancy and help the neurological development of your baby.

## How can seafood help during pregnancy?

Including seafood in a healthy diet can improve and maintain your health. A healthy diet with high levels of oily fish intake during pregnancy has been associated with longer gestation, increased birth weight and lower hypertension.

It also assists a baby's brain to develop during pregnancy. If you are pregnant or planning pregnancy, a diet including seafood is a healthy food choice.

Selecting seafood is also a smart choice for lowering cholesterol, and the omega-3 fatty acids in oily fish can actually help to prevent coronary heart disease. In addition to omega-3s, seafood contains many other nutrients beneficial to health, including selenium, iodine, zinc, calcium and vitamin D.

It's also low in saturated fat, high in protein, and a good source of energy.

<b>Iron</b>	Iron is important for maintaining energy levels and a strong immune system. Mussels, oysters and tinned sardines are good sources of iron.
<b>Iodine</b>	Iodine is important for growth and seafood is the best natural source of iodine. Oysters, mussels and scallops are good sources of iodine.
<b>Folate</b>	Folate aids the prevention of neural tube defects in growing babies. Oysters and mussels are sources of folate.
<b>Vitamin B12</b>	Vitamin B12 helps the brain to work normally. Sardines, mussels and tuna are good sources of vitamin B12.
<b>Vitamin D</b>	Vitamin D is good for the immune system and strong bones and muscles. Australian salmon, Atlantic salmon and tuna are good sources of vitamin D.
<b>Vitamins A and E</b>	Vitamins A and E are powerful antioxidants which help the immune system and eye health. Mussels are the richest seafood source of vitamin A. Atlantic salmon and sardines are good sources of vitamin E.
<b>Calcium</b>	Calcium is important for maintaining healthy teeth and bones. Australian salmon and sardines are rich sources of calcium.

## How much seafood do I need to stay healthy?

Evidence suggests that we should aim to consume 600mg of omega-3s per day for men, and 500mg for women.

Some types of seafood contain higher levels of omega-3s than others so the number of serves of seafood you need to eat each week to maintain good health depends on the type of seafood you eat. Generally, one serve of seafood is around 150g.



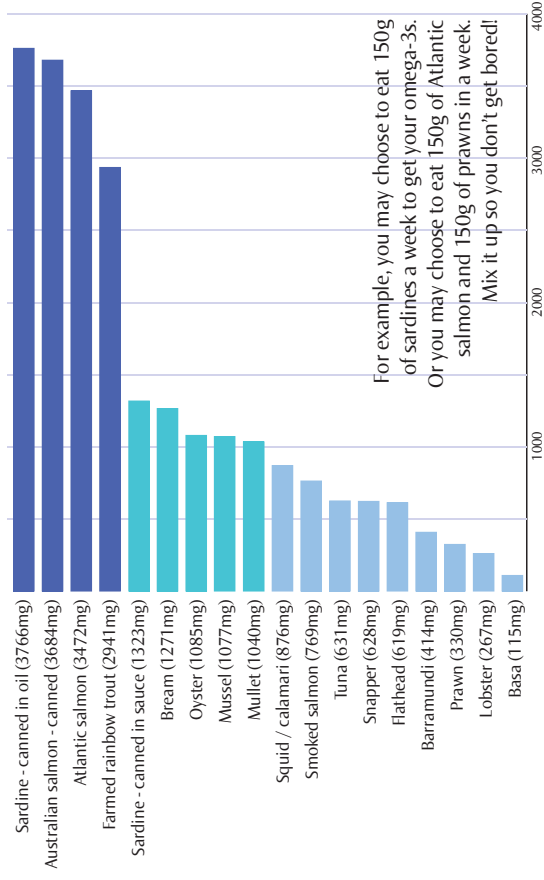


## Omega-3s

Omega-3 fatty acids (omega-3s) are essential to our health. Our bodies cannot produce these fatty acids and so we need to eat foods that contain them. The best source of omega-3s is seafood. In fact, the regular intake of omega-3s as part of a healthy diet provides health benefits for conditions such as diabetes, heart disease, arthritis and some cancers.

## How much omega-3?

Adults should aim to include 3500 - 4000mg of omega-3s in their diet each week. This table shows you how much omega-3 is in a 150g serve of a variety of fish and seafood:



## Which fish to choose?

Examples of seafood that are excellent, very good, or good sources of omega-3s.

A	B	C
Excellent sources of omega-3s	Very good sources of omega-3s	Good sources of omega-3s
 Atlantic salmon   Trout	 Bream   Mussels	 Barramundi   Snapper
 Sardines   Canned salmon	 Oysters   Mullet	 Smoked salmon   Canned tuna

## What about mercury?

The good news is that most common fish species available in Australia are perfectly safe to consume while pregnant or planning pregnancy. However, these are some recommendations during pregnancy and for children under six years (Note: a child's serving size is 75g, rather than the 150g recommended for adults).

2 – 3 serves/week of any fish/seafood <b>EXCEPT</b> orange roughy, catfish, shark or billfish (swordfish/broadbill/marin)	or	1 serve/week of orange roughy (sea perch) OR catfish THEN no other fish that week	or	1 serve/fortnight of shark (flake) OR billfish THEN no other fish that fortnight
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Mercury recommendations from Food Standards Australia New Zealand



# 14-day meal planner

This 14-day meal planner has been developed with a dietitian to help you to maintain your health during pregnancy and help the neurological development of your baby.

## Menu suggestion: week one

(Choose one item for each meal)

### Breakfast

- Cereal and reduced fat milk
- Poached eggs on toast
- Whipped eggs with pink salmon

### Lunch

- Tuna bean salad
- Canned salmon salad
- Tuna Caesar wraps
- Tuna and green bean sushi rolls

### Dinner

- Baked bream with tasty rice noodles
- Linguine with grilled trout and broccolini
- BBO garlic prawn skewers

### Dessert

- Fruit (2 pieces)
- Low fat yoghurt (200ml tub)
- Small bowl of low fat ice-cream
- A handful of nuts



## Menu suggestion: week two

(Choose one item for each meal)

### Breakfast

- Cereal and reduced fat milk
- Sardines on toast
- Boiled eggs and tomato slices on toast

### Lunch

- Tuna and salad roll
- Potato salad
- Coleslaw and bean salad
- Caesar salad (no dressing)

### Dinner

- Salmon with mushroom and asparagus pasta
- Baked bream with spinach pasta and green salad
- Barbecued trout with avocado and tomato salad

### Dessert

- Fruit (2 pieces)
- Small bowl of low fat custard
- Low fat yoghurt (200ml tub)
- A handful of nuts

# Recipes

## Tuna and bean salad (Serves 2)

### Ingredients:

- 1 small tin tuna
- 1 small tin 4 bean mix
- 5 cherry tomatoes, quartered

- ¼ red capsicum, diced
- ¼ red onion, diced
- Low fat mayonnaise

### Method:

Drain tuna and beans. Combine in a bowl and mix through diced vegetables. Add low-fat mayonnaise to taste.

## BBQ trout with avocado and tomato salad (Serves 2)

### Ingredients:

- 2 trout fillets (150g each)
- Olive oil
- Salt and black pepper

### Dressing

- 2 tbsp red wine vinegar
- 2 cloves garlic crushed
- ½ tsp extra virgin olive oil
- Sea salt and black pepper to taste

### Avocado and tomato salad

- 2 avocados, skin removed and chopped into chunks
- Juice of 1 lemon
- 3 tomatoes de-seeded and sliced
- ¼ cup of basil leaves roughly chopped
- 1 bunch of rocket leaves, rinsed

### Method:

- Combine dressing ingredients in a small jar with a lid and shake well.
- Salad: Place tomato and basil in a small bowl; add dressing and mix to combine. Pour lemon juice over the avocado and then toss the avocado through the tomato mixture. Garnish with rocket leaves and season with salt and pepper if desired.
- Heat the barbecue until it is very hot. Brush the salmon fillets with a little olive oil and season the skin liberally with salt. Place fish skin-side down on the barbecue and cook for about 5 minutes; turn over when crisp and cook another 5 minutes or until cooked through.
- Serve with salad.



# Recipes

## BBQ garlic prawn skewers (Serves 2)

### Ingredients:

- 12 prawns
- 1 garlic clove, minced
- 1 tbsp olive oil
- ¼ zucchini, sliced

- 4 small mushrooms, sliced
- 8 cherry tomatoes
- ¼ red capsicum

### Method:

Pre-heat the BBQ. Soak prawns in garlic and olive oil while you chop vegetables. Thread prawns and vegetables onto skewers, and BBQ until prawns turn pink.



## Baked bream with tasty rice noodles (Serves 2)

### Ingredients:

- 2 bream fillets (120g each), skin on
- 3 lemons, juiced
- 4 green onions, thinly sliced
- 2 small carrots
- 1 zucchini
- Cooking oil spray (canola or olive oil)

- Handful of snow peas
- 200g rice stick noodles
- ½ cup rice milk
- 2 tbsp chopped dill
- 1 clove garlic, crushed

### Method:

- Preheat oven to 180°C/160° fan-forced. Spray bream fillets with oil.
- Place skin-side down in a roasting pan. Drizzle with 2 tbsp lemon juice. Cover with foil and bake for 10-12 minutes or until cooked through. Sprinkle with half the onion.
- Meanwhile, use a vegetable peeler to cut carrot and zucchini into long ribbons.
- Put noodles in a heat proof bowl and cover with boiling water for 10 minutes to soften. Drain.
- Spray a large non-stick frying pan with oil. Add vegetable ribbons and snow peas and cook over medium heat, stirring, for 1-2 minutes. Add noodles, remaining lemon juice, rice milk, dill, garlic and remaining onions. Toss to combine; do not boil.
- Place noodles onto plates and top with bream to serve.



# Recipes

## Salmon with mushroom and asparagus pasta (Serves 2)

### Ingredients:

- 200g pasta, fresh e.g. fettuccine or spaghetti
- ½ cup (125ml) chicken stock
- 3 tbsp (60g) butter
- ¼ cup (60ml) low-fat cream
- 2 tsp extra virgin olive oil
- Salt flakes and freshly ground black pepper to taste
- 2 salmon fillets (150g each)
- 1 lime (or lemon)
- 1-2 spring onions
- 2 tbsp fresh tarragon leaves
- 150g button mushrooms, sliced
- 1 bunch asparagus

### Method:

1. Bring a large pan of salted water to the boil. Add pasta and cook according to directions. (Note for fresh pasta this may only take a few minutes).
2. Meanwhile, place two large frying pans on the cook-top and heat. Melt 1 tbsp of oil and 1 tsp of butter in one pan. Heat the remaining butter in the other pan.
3. When butter has foamed and melted, add fish fillets, skin-side down to the pan with both butter and oil. Cook until golden and half-cooked through, then turn over and cook the other side.
4. In the other pan, sauté spring onions and when soft, add mushrooms.
5. Meanwhile chop asparagus into 3-4cm lengths and add to pasta pan.
6. When mushrooms are softened, add chicken stock and cream to this pan and bring to the boil, simmer. Season to taste with salt and pepper. Drain pasta and asparagus and toss through mushroom sauce.
7. Squeeze lime over the fish. Place the pasta in a bowl, top with a piece of fish and sprinkle with tarragon leaves.

\*As an alternative to button mushrooms replace with 150g punnet exotic mushrooms (shiitake, white enoki, pink cloud's ear, gold oyster)



# Recipes

## Baked bream with spinach pasta and green salad (Serves 4)

### Ingredients:

- 4 bream fillets (150g each)
- ½ brown onion, chopped
- 1-2 tbsp butter, melted
- 1 cup of button mushroom, finely chopped
- 1 lime, juiced
- ½ cup basil, finely chopped
- 4 tsp olive oil
- Salt and pepper, to taste
- 2cm to 3cm ginger, grated
- 2 litres water
- 4 cloves of garlic, crushed
- Spinach pasta
- 1 tsp coriander, chopped
- Garden salad
- 2 tomatoes, chopped

### Method:

1. Combine melted butter, wine, lime juice and olive oil in a large bowl and stir together. Add grated ginger, crushed garlic, and chopped coriander, tomatoes, onion, button mushrooms, basil, salt and pepper. Stir thoroughly. The result should be a thick combination, but still contain plenty of juice.
2. Pour half of the marinade into a shallow baking dish, and place bream fillets on top. Place the rest of the marinade over the top of the fish so it is completely covered. Cover with aluminium foil, and refrigerate for 2 hours.
3. Preheat the oven, and cook for 20 minutes at 180°C, covered with aluminium foil.
4. Bring 2 litres of water to the boil. Cook spinach pasta for 12 minutes or until tender.
5. Drain water and serve 4 portions on a plate. Place a marinade covered fillet on pasta and serve with fresh garden salad.





For more information on seafood and health  
please visit [www.cessh.curtin.edu.au](http://www.cessh.curtin.edu.au)

For more information on health during pregnancy, visit:

Food Standards Australia and New Zealand  
[www.foodstandards.gov.au](http://www.foodstandards.gov.au)

National Health and Medical Research Council  
[www.nhmrc.gov.au](http://www.nhmrc.gov.au)





# Seafood and health

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A manual for GPs and AHPs

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## Guide to manual

This manual is designed to assist General Practitioners (GPs) and other health professionals when recommending healthy diets for patients with conditions that may be prevented, managed or treated through nutritional intervention.

The manual outlines evidence of the benefits of seafood consumption for general health and the management of certain conditions. Nutritionally modelled diets are included to support the maintenance of patients' overall health.

This manual is designed to be used with a suite of resources that GPs can use to help them assess and make health recommendations for patients.

A series of booklets for patients at risk of certain conditions has been developed. These resources are designed for patients to use at home to assist with making better dietary choices and include consumption of seafood in line with current recommendations for optimal health benefit. The diet modifications suggested in this manual can be used as an adjunct to other health interventions for patients.

## 1.0 Introduction

A critical review was conducted of all nutrition resources available to General Practitioners (GPs) and Allied Health Professionals (AHPs) in Australia including those that promoted seafood consumption within a healthy diet, as a preventative or treatment measure for common lifestyle or medical conditions. Resources were sourced through multiple avenues including: individual organisations, medical service networks, health information services and internet search engines. Assessment included critical review of: format; appropriateness for target groups; reference to seafood and supporting evidence; credibility; readability; and suitability for use by practitioners in a short consultation.

One hundred and twenty resources were identified. The majority (87.5%, n= 105) of the resources were associated with credible sources of information around the health benefits of regular consumption of seafood. The greater portion (88.4%, n= 106) of identified resources were also available electronically as either PDF files or websites. Just over half (57.5%, n=69) of the resources were targeted at specific audiences. All resources made reference to the health benefits of regular consumption of fish (100%, n=120) while only 22.5% (n=27) made reference to seafood and 5% (n=6) made reference to fish oil. The recommended reading level of health resources that is suitable for the health literacy levels of the general Australian population is the level recommended for a Year 8 school student. The majority of resources (85%, n= 102) available to health practitioners were higher than the recommended reading level and therefore not suitable for use with the general Australian population.

Whilst it is acknowledged that written health information alone cannot change health behaviours, with support from appropriate health care professionals, it can provide a credible source of information to support behaviour change.

The findings of the initial scoping exercise indicated the need to develop user-friendly nutritional resources across a number of key health conditions. The conditions chosen were based on the level of scientific evidence associated with regular seafood consumption and health. Conditions that have evidence of benefits from high seafood consumptions for prevention and/or treatment include:

- arthritis (particularly rheumatoid arthritis);
- cancer (nutrition related cancers);
- diabetes; and
- coronary heart disease.

Given the lack of clear nutritional direction during pregnancy, a nutritional resource was also developed for prenatal, antenatal and post natal women.

## 2.0 Summary of evidence by condition

This section contains evidence substantiating the benefits of seafood consumption for specific health conditions and recommendations for utilising seafood consumption as an adjuvant for these conditions.

It is recommended that health professionals encourage the consumption of seafood, rather than suggest patients aim to meet omega-3 polyunsaturated fatty acid (PUFA) requirements through supplement consumption alone. Supplements do not confer the whole food benefit and diverse nutritional profile of seafood.

Omega-3 PUFA recommendations are, unless otherwise stated, for marine sourced omega-3 PUFAs, and therefore consumption of the shorter chain alpha-linolenic acid (ALA) through plant sources is not an alternative that will deliver equal health outcomes due to the relative inefficacy of ALA in health trials (1-4). Therefore patients should be encouraged to increase seafood intake rather than supplement seafood intake with plant sources that fail to provide adequate eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) levels.

A full report detailing evidence is available on the CESSH website [www.cessh.curtin.edu.au](http://www.cessh.curtin.edu.au).

### 2.1 Arthritis (particularly rheumatoid arthritis)

#### Evidence

Evidence shows that omega-3 PUFA intake, either through the use of supplements or inclusion of oily fish in the diet, is beneficial in the management of rheumatoid arthritis (5, 6). Benefits observed include a reduction of symptoms, including improvements in joint tenderness, a reduction in morning stiffness and reduced use of analgesic anti-inflammatory drugs (5, 7). As those with rheumatoid arthritis may be at increased risk of cardiovascular events, the inclusion of omega-3 PUFAs in the diet could contribute further protective benefits beyond the relief of arthritic symptoms (6). Three to six grams of omega-3 PUFAs per day confer benefit for those with advanced rheumatoid arthritis (8). It is likely that benefits will be noted after 12 weeks of use. The omega-3 PUFA content of seafood may also assist with co-morbidities such as heart disease. In addition, sufficient omega-3 PUFA intake may reduce the likelihood of developing the disease in susceptible patients (7, 9, 10).

#### Recommendations

Patients with rheumatoid arthritis should aim to include at least 3g of omega-3 PUFAs in their daily diet (11). This can be achieved by consumption of omega-3 PUFA rich seafood (see Table 4, page 8). The use of supplements may be required to achieve this level of omega-3 PUFA. Patients should maintain their regime for at least 3 months as it may take this length of time to become efficacious in reducing symptoms (11).

### 2.2 Cancer

#### Evidence

Epidemiological studies evaluating the benefits of seafood consumption associated with the risk of cancer show promising results (12-18), with recent evidence strongly supporting a potential protective effect of fish consumption in colorectal, ovarian and post-menopausal breast cancer (19-21).

#### Recommendations

Patients at risk of cancer should aim to include 500mg of omega-3 PUFA in their daily diet. This can be achieved by consumption of omega-3 PUFA rich seafood (see Table 4, page 8).

### 2.3 Cardiovascular disease (coronary heart disease)

#### Evidence

Omega-3 PUFA intake is associated with a reduced risk of cardiovascular disease, cardiac events and mortality (22-24). Intake of omega-3 PUFAs from fish and fish oils can prevent new cases of coronary heart disease (2, 25-27), and also contribute to reduced coronary mortality for people with pre-existing coronary disease (25, 26, 28). Intake of omega-3 PUFAs is also linked to other protective factors which can reduce risk of cardiovascular disease and coronary mortality, such as lowered blood pressure, reduced heart rate, and beneficial structural changes in veins and arteries (2, 27, 29, 30). Evidence suggests that at least 2 serves of oily fish per week are required for health benefits.

#### Recommendations

Patients with cardiovascular disease should include 1000mg of omega-3 PUFA in their daily diet (31, 32). This can be achieved by consumption of omega-3 PUFA rich seafood (see Table 4, page 8), though additional supplementation may be required to consistently support this intake.

In addition, it is recommended that adults with 'elevated triglycerides' take protective measures starting with a dose of 1200mg per day of DHA and EPA; and if appropriate increasing the dose to 4000mg per day of DHA and EPA and checking their response every 3 to 4 weeks when the dose is changed, until target triglyceride levels are reached' (31, 32).

All Australian adults should consume 500mg of omega-3 PUFA in their daily diet to reduce their risk of cardiovascular disease (31, 32).



### Evidence

Seafood consumption has a role in both prevention and management of diabetes. There is emerging evidence that omega-3 PUFAs may decrease the risk of type 2 diabetes (33). Seafood is also important in the dietary prevention of type 2 diabetes, as part of a healthy diet to avoid overweight and obesity (33). Inclusion of omega-3 PUFAs in a diabetic diet can also reduce further morbidity risk from other conditions to which diabetics have increased susceptibility (34). Macrovascular disease, including coronary heart disease, is a major cause of death in diabetic patients; consumption of oily fish or supplements has been found to reduce mortality from these conditions (35). Higher fish consumption has been associated with decreased risk of fatal coronary heart disease and non fatal myocardial infarction in those with diabetes (34).

### Recommendations

In addition to a balanced diet, patients with diabetes should also aim for intake of two to three serves of oily fish per week (36); 500mg of omega-3 PUFA in the daily diet will minimise the risk of cardiovascular disease which potentially accompanies this condition. This can be achieved by consumption of omega-3 PUFA rich seafood (see Table 4, page 8).

### 2.5 Pregnancy

#### Evidence

Omega-3 PUFAs have been found to be essential for optimum foetal neural development (37). High levels of fish intake during pregnancy have been associated with longer gestation, increased birth weight and lower hypertension during pregnancy (38-40). Maternal nutrition is important for foetal brain development, and higher maternal fish consumption is linked to higher child developmental scores and improved performance on language and visual motor skills (10, 37, 41, 42). Low levels of omega-3 PUFA intake may also impact maternal health adversely, as insufficient omega-3 PUFA has recently been linked to a high risk of depressive symptoms during pregnancy (43).

#### Recommendations

Women who are currently pregnant, breastfeeding or planning pregnancy should aim to include at least 200mg of DHA omega-3 PUFA in their daily diet; as EPA/DHA ratios vary from fish to fish, aiming to consume at least 600mg of omega-3 PUFA in the daily diet from a variety of natural sources may be best for optimizing DHA intake (44). This can be achieved by consumption of omega-3 PUFA rich seafood (see Table 4, in section 4.0).

Most common fish species available in Australia are safe to consume while pregnant or planning pregnancy. However, there are some recommendations during pregnancy and for children under six years which are outlined in Table 1.

Table 1. Mercury recommendations from Food Standards Australia New Zealand

2 – 3 serves/week of any fish/seafood EXCEPT orange roughy, catfish, shark or billfish (swordfish/broadbill/marlin)	OR	1 serve/week of orange roughy (sea perch) OR catfish THEN no other fish that week	OR	1 serve/fortnight of shark (flake) OR billfish THEN no other fish that fortnight
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Serving size = adults: 150g; children under six: 75g

## 3.0 Australian healthy eating guidelines and seafood

Seafood is an integral part of a healthy, balanced diet. Seafood is a rich source of many nutrients, including essential marine source omega-3 PUFAs, as well as vitamins and minerals such as zinc, iron and iodine. This manual builds on the Australian healthy eating guidelines with a focus on seafood for better health (see Table 2). As a foundation diet, all adults should try to consume a wide variety of foods. For those living with certain conditions, the inclusion of seafood may help with the management of their symptoms. For those at risk of developing certain conditions, and the general population as a whole, seafood may have a protective effect. Women who are planning pregnancy or are currently pregnant also need seafood for optimum foetal development.

Table 2 provides a summary of the recommended daily food intake for adults aged 19 years and over. It is a useful tool to help patients to better understand serving sizes within a balanced diet at the macro level. Suggested 14-day meal planners detailed in this manual and accompanying resources have been developed to include a balanced diet that includes a variety of foods.

Serving size equivalents used in the Australian Guide to Health Eating are:

- <sup>i</sup>40g cereal; 40g bread; 1cup cooked rice, porridge
- <sup>ii</sup>200-250ml milk; 200g yoghurt; 40g cheese
- <sup>iii</sup>75g serve of vegetables
- <sup>iv</sup>65-100g cooked meat; 1/3 cup nuts; 75g legumes
- <sup>v</sup>150g medium piece fresh fruit; 200ml juice; 1 cup diced/canned fruit; 25g dried fruit
- <sup>vi</sup>1 serve ~600kj for extra foods

Table 2. The Australian Guide to Healthy Eating (36) recommends the following daily serves of these foods

	Breads & cereals <sup>i</sup>	Vegetables <sup>ii</sup>	Fruit <sup>iii</sup>	Milk, yoghurt, cheese <sup>iv</sup>	Fish, lean meat, poultry, nuts/legumes <sup>v</sup>	Extra foods <sup>vi</sup>
<b>19-60 years</b>	4-9	5	2	2	1	0-2.5
<b>60+ years</b>	4-7	5	2	2	1	0-2
<b>Pregnant</b>	4-6	5-6	4	2	1.5	0-2.5
<b>Breastfeeding</b>	5-7	7	5	2	2	0-2.5
<b>Women</b>						
<b>Men</b>						
<b>19-60 years</b>	6-12	5	2	2	1	0-3
<b>60+ years</b>	4-9	5	2	2	1	0-2.5

Evidence clearly supports seafood as an excellent source of omega-3s. However, seafood also provides many other nutritional benefits briefly detailed in Table 3. Furthermore some seafood, particularly fish, is an excellent source of protein that is highly bioavailable to those at risk of nutritional deficiency. This is important where impaired function impacts on a patient's ability to absorb sufficient nutrients. This may be due to medical regimes, disease or changes to physiological function through the ageing process. For example, seafood is the best nutritional source of vitamin D (and the second best overall source next to sunlight). A diet high in seafood for seniors can increase status of vitamin D which is essential for maintenance of bone health.

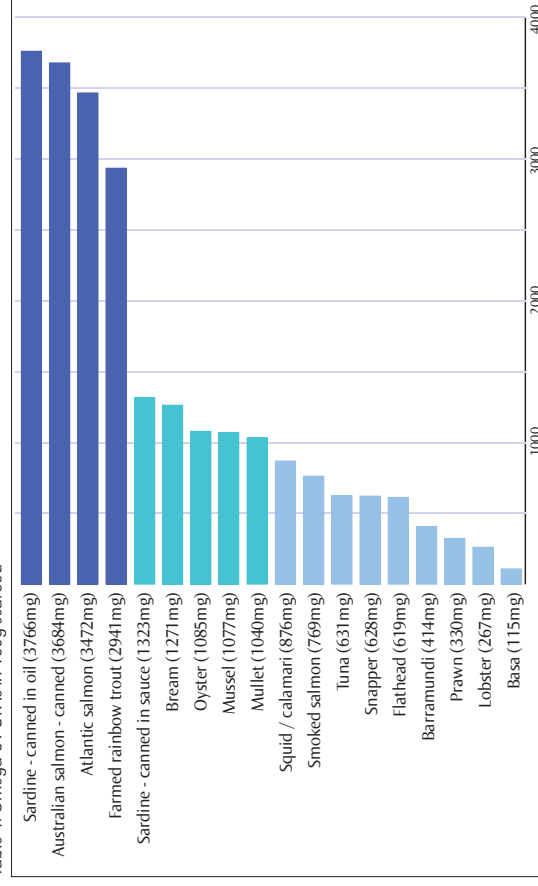
Table 3. Vitamin and mineral recommendations

The Australian Guide to Healthy Eating (36) recommends the following daily serves of these foods

<b>Iron</b>	Iron is important for maintaining energy levels and a strong immune system. Mussels, oysters and tinned sardines are good sources of iron.
<b>Iodine</b>	Iodine is important for growth and seafood is the best natural source of iodine. Oysters, mussels and scallops are good sources of iodine.
<b>Folate</b>	Folate aids the prevention of neural tube defects in growing babies. Oysters and mussels are sources of folate.
<b>Vitamin B12</b>	Vitamin B12 helps the brain to work normally. Sardines, mussels and tuna are good sources of vitamin B12.
<b>Vitamin D</b>	Vitamin D is good for the immune system and strong bones and muscles. Australian salmon, Atlantic salmon and tuna are good sources of vitamin D.
<b>Vitamins A &amp; E</b>	Vitamins A & E are powerful antioxidants which help the immune system and eye health. Mussels are the richest seafood source of vitamin A. Atlantic salmon and sardines are good sources of vitamin E.
<b>Calcium</b>	Calcium is important for maintaining healthy teeth and bones. Australian salmon and sardines are rich sources of calcium.

Table 4 provides examples of the omega-3 content of different types of seafood. Current dietary recommendations of omega-3s for adults are around 3500mg per week. As the table indicates, this can be achieved cheaply and easily through one 150g serve of sardines each week. Further information about the specific nutritional composition of common Australian seafood can be requested through the CESSH website [www.curtin.edu.au](http://www.curtin.edu.au).

Table 4. Omega-3 PUFAs in 150g seafood



## 4.0 Nutritional modelling for specific conditions

Dietary modelling of high seafood diets 14-day dietary cycles was conducted for conditions where sufficient evidence showed that a diet high in seafood provided health benefits. These included:

- arthritis (particularly rheumatoid arthritis);
- cardiovascular disease (specifically coronary heart disease);
- some cancers (prostate, breast and lung);
- nutrition-related diabetes; and
- pregnancy.

A total of 456 commonly consumed foods were chosen from the AUSTNUT database and their energy and nutrient content extracted using the FoodWorks program to model the 14-day diet cycles. Eighty seafood options (including various methods of cooking: e.g. steamed/poached; baked/cooked/grilled; raw) were categorised into very high, high, medium and low fatty acid levels. These categories enabled the target fatty acid intake to be met more effectively when running the optimisation model. A database was established to invoke the optimisation and simulation software was used to provide estimates of intakes over a fortnight with daily averages used to model diets against nutrient reference values.

The nutritional data were then used to develop 14-day diets for each of the five conditions. These diets were reviewed by a nutritionist and dietician for accuracy and compliance with nutritional recommendations and evidence to support the nutritional needs of individuals with arthritis, some cancers, diabetes or coronary heart disease. The nutritional plans were also developed for those people at high risk of developing the conditions under review. The resource developed for women of child bearing age, prenatally, is also based on current recommendations, particularly relating to health during pregnancy.

### 4.1 Seafood and your health booklets

The resources developed for general practitioners to date include five 'Seafood and Health' booklets designed to assist people to make the healthiest diet choices. The booklets can be used to guide food choices and include suggested 14-day meal plans. Over 50 health professionals reviewed the booklets for format, layout, content and usability. The booklets were modified based on feedback received before production and dissemination.



## 5.0 How to use resources

The user manual for the 'Seafood and Health GP/AHP Educational Resources' was designed to provide general practitioners and health professionals with more detailed information about the evidence on which the resources were developed and suggestions of how to use the resource effectively with patients or clients. A food frequency questionnaire plus a summary guide to interpret the results based on the Australian Dietary Guidelines may be used in conjunction with the resource.

### 5.1 Food frequency questionnaire

There are numerous instruments available to measure food intake with varying levels of credibility and useability. The Food Frequency Questionnaire (FFQ) developed by the Cancer Council of Victoria is recommended as it is a valid and reliable measurement instrument. The FFQ is supported by evidence and is easy to use and interpret. The latest version of the FFQ can be downloaded from the Cancer Council of Victoria's website ([www.cancerciv.org.au](http://www.cancerciv.org.au)) at no cost.

The FFQ is completed by the patient prior to or during a consultation. The FFQ assesses the current usual dietary intake of the patient and allows measurement of compliance with the Australian Guidelines for Healthy Eating. The FFQ also assesses current levels of seafood and marine sourced omega-3 PUFA consumption. This information will help inform you when completing the associated LifeScript.

Results should be evaluated with attention to detecting possible nutrient deficiencies in general and specific to risk associated with health conditions and applicable risk categories.

### 5.2 Seafood and your health booklets

The booklets provide follow up support at home for your patient. The booklets contain information on their condition, and the importance of seafood as part of a healthy diet. The booklet also include recipes to help your patient incorporate seafood as part of their daily diet and provides details of where further information can be accessed.

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## Appendix: nutritional requirements in detail

The 14 meal planners were devised from extensive nutritional modelling based on current evidence of the average nutritional requirements required for those at high risk of developing each condition. They are also relevant for those affected by each condition where a nutrition intervention is warranted.

The 14-day meal planner for pregnancy has been based on the average nutritional needs during pregnancy.

The raw nutrient data from the nutritional modelling were calculated by individual nutrient required for each condition. The enormous amount of specialised data produced was then deduced into recognisable meals and snacks for the 14-day meal planner. As such, the meals are suggestions only. However, any changes to the meal planners should be 'like for like' in nutrient value to maintain the integrity of the meal plans.

To date, 14-day meal planners have been modelled for:

- Arthritis;
- Coronary Heart Disease (women);
- Coronary Heart Disease (men);
- Cancer (nutrition related);
- Diabetes; and
- Pregnancy.

Note:

RF = reduced fat

LF = low fat

AS = artificially sweetened





Breakfast	Lunch	Dinner	Snacks
65g high-fibre breakfast cereal (bran flakes); ¼ C RF milk	2 slices mixed grain bread; 1 tsp margarine; 30g turkey slice; 2 slices LF cheddar cheese; 75g mixed salad; 1 medium fruit	<b>Salmon</b> (1 tin, 105g); potato (100g); 75g each: broccoli, carrots, beans; 1 medium fruit; 1 tub RF yoghurt	1 medium fruit <b>OR</b> ½ C brazil nuts
65g high-fibre breakfast cereal; ¼ C RF milk	Wholemeal bread roll (90g); 1 tsp margarine; 75g mixed salad; 2 slices RF cheese; 1 medium fruit	120g cooked <b>rainbow trout</b> ; 150g broccoli; 75g each: beans, carrot; 20g butter; 1C drained tinned fruit; 1C LF custard	Medium fruit <b>OR</b> 1 tub RF yoghurt
2 slices mixed grain bread; 2 boiled eggs; 2 rashers grilled bacon; 4 slices tomato	Roast beef salad (65g lean beef; 1C salad leaves; 2C mixed vegetables; 2 tsp low-fat dressing); 1C LF flavoured milk or 250ml nuts/seeds	Risotto (180g cooked rice; 1C spinach leaves; 75g each: beans, zucchini, carrot; 20ml olive oil); 1C LF custard; 1 medium fruit; 4 squares dark chocolate	1 tub RF yoghurt
65g 'own choice' cereal; ¼ C RF milk	2 slices wholegrain bread; 1 tsp margarine; 2 sardines (30g); 75g salad vegetables; 1 medium fruit; 1 tub RF yoghurt	130g lean, cooked, beef steak; 300g mixed vegetables; 1 small dinner roll (30g); 1 scoop LF ice-cream; 1 medium fruit	1 medium fruit <b>OR</b> 35g dried apricots
3 Weetbix; ¼ C RF milk; 5 prunes (40g)	Roast beef salad (65g lean, cooked beef; 150g vegetable salad; 1 tsp low-fat dressing); 1C LF flavoured milk or 250ml dairy dessert; 1 medium fruit	Mixed chicken and rice (100g lean chicken; 180g cooked rice; 150g pumpkin; 75g each: broccoli, carrot, 20g olive oil); 1 medium fruit; 4 squares dark chocolate	½ C walnuts <b>OR</b> 1 medium fruit
1 banana; 1 tub RF yoghurt	Soy bean and vegetable mix (170g soy beans (canned, drained); 100g cabbage/coleslaw; 5 cherry tomatoes; 20ml coleslaw dressing); 1 medium fruit	170g steamed <b>breem</b> ; 120g cooked, spinach pasta; 2C mixed salad vegetables; 1 scoop RF ice-cream; 1C drained tinned fruit	1 slice boiled, fruit cake (50g) <b>OR</b> 1 tub LF yoghurt <b>OR</b> 1 medium fruit;
¾ C dry oats; 1C RF iced-coffee/LF milk	2 <b>Sushi</b> rolls (vegetable, meat); 1 tub RF yoghurt; 1 medium fruit	Lamb and vegetable hot-pot (130g cooked, lean, lamb leg, 75g each: green beans, broccoli, carrot, 1 small potato; 1 tsp olive oil; stock; mixed herbs); 1 scoop RF ice-cream; 1C fruit salad	½ C peanuts <b>OR</b> 1 medium fruit
65g high-fibre breakfast cereal; ¼ C RF milk	2 slices whole grain bread; 1 tsp margarine; 30g beef slice; 75g mixed salad; 2 slices RF cheese; 1 medium fruit	Warm salmon salad (120g grilled <b>salmon</b> ; 120g cooked pasta; 1C salad leaves; 2C salad vegetables); 1C RF custard; 1C drained, tinned fruit	1 medium fruit <b>OR</b> 250ml RF dairy dessert
3 Weetbix; ¼ C RF milk; 5 prunes (40g)	Mixed grain roll; 1 tsp margarine; 75g mixed salad; 40g RF cheese; 1 medium fruit	120g grilled <b>mullet</b> ; 1 medium potato (140g); 75g each zucchini, carrot, beans, 20g butter; 1 tub RF yoghurt; 1 medium fruit	1 medium fruit <b>OR</b> muesli bar (32g)
2 slices mixed grain bread; 2 boiled eggs; 2 rashers, grilled, bacon, 4 slices tomato	Potato salad (150g potato; 1C salad leaves; 2C salad vegetables; 2 tsp low-fat mayonnaise); 1 medium fruit	120g lean, cooked lamb; 150g broccoli; 90g cooked rice; 75g carrots; 75g beans; 20ml olive oil; 1C drained, tinned fruit; 1C RF custard	1 tub RF yoghurt
65g high-fibre breakfast cereal; 5 prunes; ¼ C RF milk	2 slices wholegrain bread; 1 tsp margarine; 30g roast beef slice; 75g salad vegetables; 2 slices RF cheese; 1 medium fruit	170g steamed <b>breem</b> ; 150g pumpkin; 75g each: broccoli, carrots; 1 scoop RF ice-cream; 1 medium fruit	½ C walnuts <b>OR</b> 1 tub RF yoghurt
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C RF milk	Vegetable and bean soup (½ carrot; ½ stick celery; 3 cherry tomatoes; ½ onion; 75g beans; 250ml stock; mixed herbs); 1 slice bread with margarine; 1 tub RF yoghurt	Chicken bolognese (85g (½ C) cooked, premium minced chicken; 75g each: carrot, onion, beans, corn; ½ can tinned tomatoes); 1 medium fruit; 8 squares dark chocolate	½ C brazil nuts <b>OR</b> 1 medium fruit <b>OR</b> 250ml dairy dessert
2 wholemeal crumpets; 2tsp light margarine with jam/spread	Wholemeal pita; 1 tsp margarine; 30g ham; 4 slices tomato; 2 slices RF cheese; 1 medium fruit	130g grilled beef; ½ C (85g) drained soy beans; 2C mixed salad vegetables; 1C RF custard; 1C drained tinned fruit	1C LF, flavoured milk <b>OR</b> savoury crisp-bread (35g)
¾ C dry oats	3 rye crisp bread; 4 slices avocado (60g); 6 slices cucumber; 2 slices RF cheese; 1 medium fruit; 250ml RF dairy dessert	105g grilled lentil burger (75g each: green beans, broccoli, carrot; 1 medium potato); 1 scoop RF ice-cream; 2 small pieces of fruit	<b>OR</b> ½ C mixed nuts and raisins 1C RF flavoured milk <b>OR</b> 1 small slice cake (80g) <b>OR</b> 1 small fruit

Breakfast	Lunch	Dinner	Snacks
45g high-fibre breakfast cereal; ½ C LF milk	2 slices whole grain bread; 1tsp margarine; 30g turkey slice; 75g mixed salad; 1 medium fruit	120g Grilled/cooked <b>breem</b> ; 120g cooked pasta; 75g each: broccoli, carrots, beans; 1C drained, tinned fruit salad; 1C RF custard	1 tub RF yoghurt <b>OR</b> 1 medium fruit
45g high-fibre breakfast cereal; ½ C LF milk	Wholemeal bread roll; 75g mixed salad; 40g cottage cheese; 1 medium fruit	Stirfry (100g cooked chicken breast (no skin); 75g each: zucchini; beans; carrot, onion; 20g olive oil); 1C RF dairy dessert; 1C drained tinned fruit; 4 squares dark chocolate	1 tub RF yoghurt <b>OR</b> 1 medium fruit
2 slices mixed grain bread; 2 boiled egg, 50g lean, grilled ham; 4 slices grilled tomato	Roast beef salad (65g cooked, lean beef; 1C salad leaves; 1C mixed vegetables; 1 tsp low-fat dressing)	Risotto (180g cooked rice; 1C spinach leaves; 75g each: zucchini; carrot; beans; 20g olive oil); 1C LF custard; 1 medium fruit	1 tub RF yoghurt <b>OR</b> 1 medium fruit
45g 'own choice' cereal; ¼ C RF milk	2 slices wholegrain bread; 30g smoked salmon; 75 salad vegetables; 1 tub RF yoghurt	130g lean, cooked, beef steak; 300g mixed vegetable salad; 20g oil; 1 scoop LF ice-cream; 150g drained, tinned fruit	1 medium fruit
3 Weetbix; ½ C LF milk; 5 prunes (40g)	Mixed beans and salad (85g milk; 5 prunes (40g) vegetable salad; 1 tsp low-fat dressing); 1C LF flavoured milk	Fettuccini with pine nuts (180g cooked fettuccini pasta; 20g pine nuts; 15g olive oil; 75g spinach; 2 mushrooms); 1C RF custard; 4 squares dark chocolate	1 medium fruit
1 banana; 1 tub RF yoghurt; ½ C walnuts	Chicken salad (75g cooked, skinless chicken; 1C salad leaves; 2C mixed salad vegetables; 1 tsp LF dressing); 1 medium fruit	120g grilled <b>trout</b> ; 120g cooked rice; 2C mixed salad vegetables; 1 scoop ice-cream; 1C drained tinned fruit	1C RF custard <b>OR</b> 1 medium fruit
½ C dry oats; 1C LF milk	4 rye crispbread; 2tsp margarine; ½ avocado; 6 slices tomato; 1 tub RF yoghurt	Vegetable and bean stew: 1C mixed beans (drained); 2 mushrooms; 75g green beans; 1 small potato; 1 small carrot; 1tbsp olive oil; 1 scoop LF ice-cream; 1C drained tinned fruit	1 medium fruit
45g high-fibre breakfast cereal (eg. Bran flakes); ½ C LF milk	2 slices whole grain bread; 1tsp margarine; 30g beef slice; 75g mixed salad; 2 slices RF cheese; 1 medium fruit	Warm salmon salad (120g grilled <b>salmon</b> ; 120g cooked pasta; 2 mushrooms, 1C spinach, 75g each: carrots, snow peas); 1 slice home made banana cake (80g); 1 medium fruit	1 medium fruit <b>OR</b> 1 tub RF dairy dessert
3 Weetbix; ½ C RF milk; 5 prunes (40g)	Wholegrain bread roll; 1tsp margarine; 75g mixed salad; 2 slices RF cheddar cheese	100g cooked chicken (no skin); 1 medium potato; 150g pumpkin; 75g broccoli; 1 tub RF yoghurt; 1 medium fruit	1 medium fruit
2 slices mixed grain bread; 1 boiled egg; 4 slices tomato	Potato salad (1 large potato; 1C spinach, 1C salad vegetables; 2 tsp low-fat mayonnaise)	130g lean, cooked beef; 75g each: broccoli, corn, carrot, beans; 1C drained, tinned fruit; 1C LF custard	1 tub RF yoghurt <b>OR</b> 1 medium fruit
45g high-fibre breakfast cereal (eg. Bran flakes); ½ C LF milk	Wholemeal pita (70g); 1tsp margarine; 30g roast beef slice; 75g salad vegetables; 1 medium fruit	170g steamed <b>breem</b> ; 75g zucchini; 150g pumpkin; 75g broccoli; 1 scoop RF ice-cream; 1C drained tinned fruit; 4 squares dark chocolate	1 tub RF yoghurt
2 wholemeal crumpets; 2tsp light margarine and honey/jam/spread	Vegetable and bean soup (½ carrot; ½ stick celery; 3 cherry tomatoes; ½ onion; 85g beans; 250ml stock; mixed herbs); 1C LF flavoured milk	Vegetarian paella (180g cooked rice; 75g each: pumpkin, onion, zucchini, peas); scoop RF ice-cream; 1 medium fruit	1 medium fruit <b>OR</b> ½ C walnuts
1 banana; 1 tub RF yoghurt	Ham salad (30g lean, salt-reduced ham; 1C salad leaves; 2C mixed salad vegetables; 2 slices RF cheese)	170g steamed <b>breem</b> ; 120g cooked pasta; 2C mixed salad vegetables; 1C custard; 1 medium fruit; 35g dried fruit	½ C mixed nuts/seeds <b>OR</b> 1 medium fruit
½ C dry oats; 1C LF milk	2 rye crispbread; 4 slices avocado (60g); 4 slices tomato; 6 slices cucumber; 1 tub RF yoghurt; 1 medium fruit	130g cooked, lean beef; 75g each: green beans, broccoli, carrot; 1 small potato; 1 scoop RF ice-cream; 1 medium fruit	250ml LF dairy dessert <b>OR</b> 1 medium fruit

## Coronary heart disease (men) - days 1-14

Breakfast	Lunch	Dinner	Snacks
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C LF milk	2 slices whole grain bread; 1 tsp margarine; 30g turkey slice; 2 slices RF cheese; 75g mixed salad vegetables; 1 medium fruit	130g Grilled/cooked lamb leg; 120g cooked pasta; 75g each: broccoli, carrots, beans; 1 medium fruit; 1 tub yoghurt	1 medium fruit OR ½ C walnuts
65g high-fibre cereal; ¼ C RF milk	2 slices whole grain bread; 75g mixed salad; 2 slices RF cheese; 1 fruit; muesli bar (32g)	120g cooked rainbow trout; 1 small potato; 150g broccoli; 75g each: peas, carrot; 1C drained, tinned fruit; 1 scoop RF ice-cream;	1 medium fruit OR: 1 tub RF yoghurt
2 slices mixed grain bread; 2 boiled eggs; 2 small rashers, grilled bacon; 4 slices tomato	Roast beef salad (65g cooked, lean beef; 1C salad leaves; 2C mixed vegetables; 2 tbsp low-fat dressing); 1 medium fruit	Risotto (180g cooked rice; 1C spinach leaves; 75g each: beans, zucchini, carrot; 20g margarine); 1C LF custard; 1 medium fruit	1C LF, flavoured milk OR 250ml LF dairy dessert
65g 'own choice' cereal; ¼ C RF milk	2 slices whole grain bread; 1 tsp margarine; 30g smoked salmon; 75g salad vegetables; 1 medium fruit; 1 tub RF yoghurt	130g lean, cooked, beef steak; 300g cooked vegetables; 20g olive oil; scoop LF ice-cream; 1C drained, tinned fruit	1 medium fruit OR ½ C walnuts
3 Weetbix; ¼ C RF milk; 5 prunes (40g)	Mixed beans and salad (170g mixed, drained beans; 150g vegetable salad; 1 tbsp low-fat dressing); 2 rye biscuits with margarine; 1C LF flavoured milk; 1 medium fruit	Fettuccini with pine nuts (180g cooked fettuccini pasta; 20g pine nuts; 15g olive oil; 75g spinach; 75g zucchini; 2 mushrooms); 1 medium fruit; 4 squares dark chocolate	Yoghurt coated OR 1 medium fruit
1 banana; 1 tub yoghurt; 1 weebix	Chicken salad (100g cooked, skinless chicken; 1C salad leaves; 2C mixed salad vegetables; 2 tbsp LF dressing); 1 medium fruit	Chicken salad (100g cooked, skinless chicken; 1C salad leaves; 2C mixed salad vegetables; 2 scoop RF ice-cream; 1C drained tinned fruit	Slice boiled fruit cake (80g) OR 1 medium fruit
¼ C dry oats; 1C RF or LF milk	2 Sushi rolls (vegetable, meat)	Lamb and vegetable hot-pot (130g cooked, lean, lamb leg; 75g each: green beans, broccoli, carrot; 1 small potato; 1 tsp olive oil; 1 scoop LF ice-cream; 1C drained, tinned fruit	1 medium fruit
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C LF milk	2 slices whole grain bread; 1 tsp margarine; 30g beef slice; 75g mixed salad; 2 slices RF cheese; 1 medium fruit	Warm salmon salad (120g grilled salmon; 120g cooked pasta; 1C salad leaves; 2C salad vegetables); 1C RF custard; 1C drained, tinned fruit; 4 squares dark chocolate	1 medium fruit OR 1 tub RF yoghurt
3 Weetbix; ½ C RF milk; 5 prunes (40g)	Wholegrain bread roll; 75g mixed salad; 40g RF cottage cheese; 1 medium fruit; ½ C almonds	120g cooked mullet (no skin); 1 medium potato; 75g each: corn, carrot, beans; 20g canola oil; scoop LF ice-cream; 1 medium fruit	1 tub RF yoghurt OR 2 Anzac biscuits
2 slices mixed grain bread; 2 boiled eggs; 2 rashers grilled bacon; 4 slices tomato	Potato salad (150g potato; 1C salad leaves; 2C salad vegetables; 2 tbsp low-fat mayonnaise); 1 tub RF yoghurt	130g lean, cooked lamb; 150g broccoli; 75g each: corn; carrot; beans; 1C drained, tinned fruit; 1C RF custard	1C LF, flavoured milk OR 1 medium fruit
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C LF milk	2 slices whole grain bread; 1 tsp margarine; 30g roast beef slice; 75g salad vegetables; 2 slices RF cheese; 1 small fruit; 1 tub RF yoghurt	120g trout; 150g pumpkin; 75g each: broccoli; carrots; corn; 1 scoop LF ice-cream; 1C drained tinned fruit	1 small fruit biscuit (35g) OR 1 medium fruit
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C LF milk	Vegetable and bean soup (½ carrot; ½ stick celery; 3 cherry tomatoes; ½ onion; 75g beans; 250ml stock; mixed herbs); 1 tub RF yoghurt	Beef bolognese (85g (½ C) cooked, premium minced beef; 75g each: carrot, onion, zucchini, beans; 1 mushroom; ½ C (90g) tinned tomatoes; 20g oil; 1 medium fruit; 250ml RF dairy dessert	1C LF, flavoured milk OR 1 medium fruit
2 wholemeal crumpets; 2 tsp light margarine and honey/jam/spread	Wholemeal pita; 1 tsp margarine; 30g lean, leg ham; 75g mixed vegetables; 40g RF cottage cheese; 1 fruit; muesli bar (32g)	120g grilled salmon; 120g cooked pasta; 300g cooked vegetables; 1C RF custard; 1C drained tinned fruit	1 tub RF yoghurt OR 1 medium fruit
¼ C dry oats	3 rye crisp bread; 4 slices avocado (60g); 6 slices tomato; 8 slices cucumber; 2 slices RF potato; 1 medium fruit; ½ C walnuts	105g grilled lentil burger; 75g each: green beans; broccoli; carrot; 1 medium potato; 1 scoop ice-cream; 1 medium fruit	250ml RF dairy dessert OR carrot cake (80g)

## Cancer - days 1-14

Breakfast	Lunch	Dinner	Snacks
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C RF milk	2 slices mixed grain bread; 1 tsp margarine; 30g chicken slice; 2 slices LF cheddar cheese; 75g mixed salad; 4 dried apricot halves (15g)	Chicken stir-fry (100g lean, cooked chicken; 75g each: snow peas, carrots, beans; 1C capsicum/mushroom; 20ml peanut oil); 1 medium fruit; 1 tub RF yoghurt; 1 slice apple cake (80g)	1 medium fruit OR ½ C mixed nuts/seeds
65g high-fibre breakfast cereal; ¼ C RF milk	Wholemeal bread roll (90g); 1 tsp margarine; 75g mixed salad vegetables; 2 slices RF cheese; 1 medium fruit	120g cooked rainbow trout; 150g broccoli; 75g each: beans, carrot; 20ml olive oil; 1 scoop LF ice-cream; 1C drained tinned fruit	1 medium fruit OR 1 tub RF yoghurt
2 slices mixed grain bread; 2 boiled eggs; 2 rashers grilled bacon; 4 slices tomato	Roast beef salad (80g cooked, lean beef; 1C salad leaves; 2C mixed vegetables; 2 tbsp low-fat dressing); 1 medium fruit	Risotto (180g cooked rice; 1C spinach leaves; 75g each: capsicum; mushroom; carrot); 20g butter; 1C LF custard; 1 medium fruit	1 medium fruit OR 1 tub RF yoghurt
65g 'own choice' cereal; ¼ C RF milk	2 slices whole grain bread; 1 tsp margarine; 30g roast beef; 75g salad vegetables; 1 medium fruit; 1 tub RF yoghurt	100g oysters; 1 large potato (150g); 150g roast pumpkin; 75g each: broccoli; carrots; 1 scoop LF ice-cream; 1C drained tinned fruit	1 medium fruit OR ½ C walnuts OR 1 medium fruit
3 Weetbix; ¼ C RF milk; 5 prunes (40g)	Mixed beans and salad (85g mixed, drained beans; 150g vegetable salad; 2 tbsp low-fat dressing); 1C LF flavoured milk or dairy dessert; 1 medium fruit	Mixed chicken and rice (100g lean chicken; 180g cooked rice; 150g pumpkin; 75g each: broccoli, carrot); 1 medium fruit; 4 squares dark chocolate	1 small fruit OR 250ml RF dairy dessert OR savoury crackers (35g)
1 banana; 1 tub RF yoghurt; 2 Weetbix	Ham and vegetable frittata (2 egg whites; 2 cherry tomatoes; 1 mushroom; 1C diced vegetables; 70g lean ham; mixed herbs; dash milk); 1 medium fruit	120g grilled mullet; 120g cooked pasta; 2C mixed salad vegetables; 1 scoop RF ice-cream; 1C drained tinned fruit	Muesli bar OR 1 medium fruit OR 250ml RF dairy dessert
¼ C dry oats	2 Sushi rolls (vegetable, meat)	105g grilled lentil burger; 75g each: green beans, broccoli, carrot; 1 medium potato; 1 scoop RF ice-cream; 1C drained, tinned fruit	1C RF iced-coffee OR LF milk OR 1 medium fruit
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C RF milk	2 slices whole grain bread; 1 tsp margarine; 30g beef slice; 75g mixed salad; 2 slices RF cheese; 1 fruit-topped muesli bar (30g); 1 medium fruit	120g grilled trevally; 120g cooked pasta; 75g each: broccoli, pumpkin, carrot; 20ml olive oil 1C RF custard; 1 medium fruit	1 medium fruit OR 1 tub RF yoghurt
3 Weetbix; ¼ C RF milk; 5 prunes (40g)	Mixed grain roll (90g); 1 tsp margarine; 75g mixed salad; 2 slices RF cheese; ½ C almonds	120g grilled mullet; 1 medium potato (140g); 75g zucchini; 75g each: carrot, beans; 20ml olive oil; 1 tub RF yoghurt; 1 medium fruit	1 medium fruit OR 1 tub RF yoghurt
2 slices mixed grain bread; 2 boiled eggs; 2 rashers grilled bacon; 4 slices tomato	Potato salad (150g potato; 1C salad leaves; 2C salad vegetables; 2 tsp low-fat mayonnaise); 1 medium fruit	Lamb and vegetable hot-pot (120g lean lamb leg; 75g each: green beans, broccoli, carrot); 1 small potato; 1 tsp olive oil; 1C drained, tinned fruit; 1C RF custard	1 tub RF yoghurt
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C RF milk	2 slices whole grain bread; 1 tsp margarine; 30g roast beef slice; 75g salad vegetables; 40g RF cheese; 1 medium fruit	170g steamed bream; 150g pumpkin; 75g each: broccoli, carrots; 1 small potato; 1 scoop RF ice-cream; 1 medium fruit	½ C brazil nuts OR 1 tub RF yoghurt
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C RF milk	Vegetable and bean soup (½ carrot; ½ stick celery; 3 cherry tomatoes; ½ onion; 75g beans; 250ml stock; mixed herbs); 1 tub RF yoghurt	Beef bolognese (85g (½ C) cooked, premium minced beef; 75g each: carrot, onion, beans, corn; ½ can tinned tomatoes; 2 tsp oil; 1 medium fruit; 4 squares dark chocolate	Rye crisp-bread (35g) with avocado (30g) OR 1 medium fruit
2 wholemeal crumpets; 2 tsp light margarine with jam/spread	2 slices whole grain bread; 1 tsp margarine; 30g ham; 4 slices tomato; 2 slices RF cheese; 1 medium fruit	120g grilled salmon; 180g cooked wild rice; 2C mixed salad vegetables; 1C RF custard; 1C drained tinned fruit	250ml dairy dessert OR 1C LF flavoured milk OR 1 medium fruit
¼ C dry oats	3 rye crisp bread; 4 slices avocado (60g); tomato; cucumber; 1 medium fruit; 250ml RF dairy dessert or 1C RF, flavoured milk	105g grilled lentil burger; 75g each: green beans, carrots; 150g broccoli; 1 medium potato; scoop RF ice-cream; 1 medium fruit; 1 medium fruit	1 medium fruit OR 1 small slice cake (80g)



## Diabetes - days 1-14

Breakfast	Lunch	Dinner	Snacks
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C RF milk	2 slices mixed grain bread; 1 tsp margarine; 30g turkey slice; 40g LF salt-reduced cottage cheese; 75g mixed salad vegetables; 1 medium fruit	<b>Tuna</b> (1 tin, 95g), potato (100g); 75g each: broccoli, carrots, beans; 1 medium fruit; 1 tub AS yoghurt;	1 medium fruit OR ½ C walnuts OR 2 rye crispbread (35g)
65g high-fibre breakfast cereal; ¼ C RF milk	Wholemeal bread roll; 1 tsp margarine; 75g mixed salad; 2 slices RF cheese; 1 tub AS yoghurt; 1 medium fruit	120g cooked <b>rainbow trout</b> ; 150g broccoli; 75g each: beans, carrot, zucchini; 20ml canola oil	1 medium fruit
2 slices mixed grain bread; 2 boiled eggs; 2 rashers grilled bacon; 4 slices tomato	Roast beef salad (65g lean beef; 1C salad leaves; 2C mixed vegetables; 2 tsp low-fat dressing); 1 medium fruit	Risotto (180g cooked rice; 1C spinach leaves; 75g each: corn, zucchini, carrot; 20g butter; 1C LF custard; 1 medium fruit	1 tub AS yoghurt
65g 'own choice' cereal; ¼ C RF milk	2 slices wholegrain bread; 1 tsp margarine; 75g <b>smoked salmon</b> ; 2C mixed vegetables; 1 medium fruit; 1 tub AS yoghurt	130g lean, cooked, beef steak; 300g mixed vegetables; 20g butter; 1 scoop LF ice-cream; 1C drained, tinned fruit;	1 medium fruit
3 Weetbix; 125ml RF milk; 5 prunes (40g)	Mixed beans and salad (170g mixed, drained beans; 150g vegetable salad; 1 tsp low-fat dressing); 1C LF milk; 1 medium fruit	Fettuccini with pine nuts (180g cooked fettuccini pasta; 20g pine nuts; 15g olive oil; 75g spinach; 2 mushrooms); 1C drained, tinned fruit with 2 tsp unsweetened cream	1 medium fruit OR 3 SMO biscuits
1 banana; 1 tub AS yoghurt; 1 Weetbix	Chicken salad (100g cooked, skinless chicken; 1C salad leaves; 2C mixed salad vegetables; 1 tsp LF dressing); 1 medium fruit	170g steamed <b>bream</b> ; 120g cooked rice; 2C mixed salad vegetables; 1 scoop RF ice-cream; 1C drained, tinned fruit	Bran + fruit muffin (80g) OR 1C RF custard OR ½ C walnuts
¼ C dry oats; 250ml RF feed-coffee or LF milk	2 <b>Sushi</b> rolls (vegetable, meat); 1 tub AS yoghurt; 1 medium fruit	Lamb and vegetable hot-pot (130g cooked, lean lamb leg; 75g each: green beans, broccoli, carrot; 1 small potato; 1 tsp olive oil; stock; mixed herbs); 2 rye crispbread; unsweetened cream and jam	½ C peanuts OR 1 medium fruit
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C RF milk	2 slices whole grain bread; 1 tsp margarine; 30g beef slice; 75g mixed salad; 40g RF and salt reduced cottage cheese; 1 medium fruit	Warm barramundi salad (120g, grilled <b>barramundi</b> ); 120g cooked pasta; 1C salad leaves; 2C salad vegetables; 2 tsp AS dressing; 1C RF custard; 1C drained, tinned fruit	1 medium fruit OR 1 tub AS yoghurt
3 Weetbix; ¼ C RF milk; 5 prunes (40g)	2 slices rye bread; 1 tsp margarine; 75g mixed salad; 40g RF/salt reduced cottage cheese; 1 medium fruit; ¼ C walnuts	130g lean beef steak; 1 medium potato (140g); 75g each: zucchini, carrot, beans, 20ml olive oil; 1 tub AS yoghurt; 1 medium fruit	1 medium fruit OR 2 high fibre biscuits (35g)
2 slices mixed grain bread; 2 boiled eggs; 2 rashers grilled bacon; 4 slices tomato	Potato salad (150g potato; 1C salad leaves; 2C salad vegetables; 2 tsp low-fat mayonnaise); 1 medium fruit	130g lean, cooked lamb; 150g broccoli; 120g cooked rice; 75g each: carrots, beans; 20g butter	250ml RF dairy dessert
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C RF milk	2 slices wholegrain bread; 1 tsp margarine; 30g roast beef slice; 75g salad vegetables; 2 slices RF cheese; 1 medium fruit	170g steamed <b>bream</b> ; 150g pumpkin; 150g cauliflower; 75g each: broccoli, zucchini; 4 Vita-Wheat with unsweetened cream and jam	1 medium fruit OR 1 tub AS yoghurt OR ½ C mixed nuts/seeds
65g high-fibre breakfast cereal (eg. Bran flakes); ¼ C RF milk	Vegetable and bean soup (½ carrot; ½ stick celery; 3 cherry tomatoes; ½ onion; 75g beans; 250ml stock; mixed herbs); 1 slice bread with margarine; 1 tub AS yoghurt	Chicken bolognaise (85g (½ C) cooked, premium minced chicken; 75g each: carrot, onion, zucchini, corn; ½ can tinned tomatoes); 1 medium fruit; 250ml RF dairy dessert	1 medium fruit OR 2 rice cakes with rye (25g)
2 wholemeal crumpets; 2 tsp light margarine and low joule jam/spread	2 slices wholegrain bread; 1 tsp margarine; 2 slices ham; 75g salad vegetables; 2 slices RF/salt reduced cheese; 1 medium fruit	120g grilled <b>salmon</b> ; 120g cooked pasta; 2C mixed salad vegetables; 20g butter; 1C RF custard; 1C drained tinned fruit	1C RF flavoured milk OR ½ C nuts/seeds
¼ C dry oats	2 rye crisp bread; 4 slices avocado (60g); 1 medium fruit; Bran and fruit muffin (80g)	105g grilled lentil burger; 75g each: green beans, broccoli, carrot; 1 small potato; 1 scoop RF ice-cream; 2 small pieces of fruit	250ml RF dairy dessert OR 1C RF milk OR 1 medium fruit

## Pregnancy - days 1-14

Breakfast	Lunch	Dinner	Snacks
45g high-fibre breakfast cereal (eg. Bran flakes); ½ C LF milk	2 slices whole grain bread; 1 tsp margarine; 30g turkey slice; 2 slices LF cheese; 1C mixed salad vegetables; 1 medium fruit	120g grilled/cooked <b>bream</b> ; 120g cooked pasta; 75g each: broccoli, spinach, carrot; 1C LF custard; 1C drained, tinned fruit	1 medium fruit OR 1 tub yoghurt
45g high-fibre breakfast cereal; ½ C LF milk	Wholemeal bread roll; 1 tsp margarine; 1C mixed salad; 2 slices LF cheddar cheese; 1 medium fruit	Stir fry (120g cooked chicken breast (no skin); 150g broccoli; 75g each: beans, carrots); 4 squares dark chocolate (60g)	1 tub RF yoghurt OR 1 medium fruit
2 slices mixed grain bread; 2 boiled eggs; 4 slices tomato	Roast beef salad (65g cooked, lean beef; 1C salad leaves; 1C mixed vegetables; 2 tsp low-fat dressing); 1 medium fruit	Risotto (1C cooked rice; 1C spinach leaves; 75g each: zucchini, carrot, peas); 1 tub RF yoghurt OR 1C LF custard; 1 medium fruit	30g mixed nuts
45g 'own choice' cereal; ½ C LF milk	2 slices wholegrain bread; 30g <b>smoked salmon</b> ; 75g salad vegetables; 1 tub RF yoghurt	130g lean, cooked beef steak; 3C salad vegetables (include 1 serve of green vegetables- eg. 75g snow peas); 1C drained tinned fruit; 1 scoop LF ice cream	1 medium fruit OR 1C dairy dessert
3 Weetbix; 125ml LF milk; 5 prunes (40g)	Roast beef salad (65g cooked, lean beef; 1C salad leaves; 1C mixed vegetables; 2 tsp low-fat dressing); 1 tub RF yoghurt	Fettuccini with pine nuts (180g cooked fettuccini pasta; 20g pine nuts; 15g olive oil; 75g spinach; 2 mushrooms); 1 medium fruit; 1 scoop LF ice-cream	1 medium fruit
1 banana; 1 tub yoghurt; ½ C walnuts	Chicken salad (75g cooked, skinless chicken; 1C salad leaves; 1C mixed salad vegetables; 1 tsp LF dressing)	120g grilled <b>trout</b> ; 90g cooked pasta; 2C mixed salad; 75g broccoli; 1 scoop LF ice-cream; 1C drained, tinned fruit; 1C dairy dessert	Muesli bar (32g) OR 1 medium fruit
½ C dry oats; ¼ C milk	2 slices wholemeal bread; 1 tsp margarine; 30g roast beef; 75g mixed salad vegetables; 1 medium fresh fruit; ½ C almonds	Vegetable and bean stew (1C mixed beans/legumes (drained); 2 mushrooms; 75g green beans; 1 small potato; 1 small carrot; 1 tsp olive oil); 1 scoop LF ice-cream; 1C drained tinned fruit	1 tub RF yoghurt OR 1C LF flavoured milk
45g high-fibre breakfast cereal (eg. Bran flakes); ½ C LF milk	2 slices whole grain bread; 1 tsp margarine; 30g beef slice; 75g mixed salad; 2 slices RF cheese; 1 medium fruit	Warm salmon salad (120g grilled <b>salmon</b> ; 120g cooked pasta; 2 mushrooms; 1C spinach; 75g carrots; 75g snow peas); 1C LF custard; 1 medium fruit	1 medium fruit OR 1 tub RF yoghurt
3 Weetbix; ½ C LF milk; 5 prunes (40g)	Wholegrain bread roll; 1 tsp margarine; 75g mixed salad; 2 slices RF cheese; 1 medium fruit	100g cooked chicken (no skin); 75g corn; 150g pumpkin; 150g broccoli; 1 slice home-made banana cake (80g)	1 medium fruit OR 1C RF dairy dessert
2 slices mixed grain bread; 1 boiled egg; 50g grilled, lean bacon, 4 slices tomato	Potato salad (150g potato; 1C spinach; 2C salad vegetables; 2 tsp low-fat mayonnaise); 1 medium fruit	130g lean, cooked beef; 150g broccoli; 75g carrot; 75g green beans; 1 medium fruit; 1C RF custard	1 tub RF yoghurt OR 1C LF flavoured milk
45g un-toasted muesli; ½ C LF milk	Wholemeal pita; 1 tsp margarine; 30g roast beef slice; 75g salad vegetables; 2 slices RF cheese; 1 medium fruit	Pork stir fry (100g cooked pork; 2 mushrooms; 1C spinach; 75g each: zucchini, onion, carrot; 2 tsp marinade); 1 scoop RF ice-cream; 150g drained, tinned fruit	250ml RF dairy dessert
2 wholemeal crumpets; 2 tsp light margarine and honey/jam/spread	Vegetable and bean soup (½ carrot; ½ stick celery; 3 cherry tomatoes; ½ onion; 85g beans; 250ml stock; mixed herbs); 1C LF flavoured milk OR yoghurt	Vegetarian paella (180g cooked rice; 75g each: pumpkin, onion, zucchini, peas); 4 squares dark chocolate; 1 medium fruit	250ml RF dairy dessert OR 1 medium fruit
1 banana; 1 tub yoghurt; ½ C mixed nuts/seeds	Ham salad (30g lean, salt-reduced ham; 1C salad leaves; 2C mixed salad vegetables; 2 slices RF cheese; 1 medium fruit	170g steamed <b>bream</b> ; 120g cooked pasta; 150g broccoli; 75g green beans; 1 scoop RF ice-cream; 1C drained tinned fruit	1C RF flavoured milk
½ C dry oats; 1C LF milk	2 rye crispbread; 4 slices avocado; 4 slices tomato; 6 slices cucumber; 1 tub RF yoghurt; 1 medium fresh fruit	Lamb and vegetable hot-pot (130g lean, lamb leg; 150g broccoli; 75g each: green beans; carrot; 1 small potato; 1TB olive oil); scoop RF ice-cream; 1 medium fruit	1 medium fruit OR 250ml RF dairy dessert



For more information on seafood and health  
please visit [www.cessh.curtin.edu.au](http://www.cessh.curtin.edu.au)

Table 4.1: Arthritis

Resource Title	Format/Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
10 steps for living well with arthritis	HC/Arthritis Australia/ Apr 2007	Arthritis can be difficult to live with, but there are many simple measures that can help to manage the symptoms and cope with everyday life.	A healthy diet is important to help maintain good health and this includes eating fish. Including foods rich in omega-3 fatty acids as part of a healthy diet may help reduce inflammation. Foods that are high in omega-3s include fish and seafood.	Fish & seafood	Those with arthritis	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ Dietitian</li> <li>■ CHN</li> <li>■ Physio</li> <li>■ Osteopath</li> <li>■ Chiropractor</li> </ul>	5
Healthy eating and arthritis	PDF from web <sup>1</sup> /Arthritis Australia/ 2007	There is no diet that can cure arthritis. The best diet for someone with arthritis is a healthy balanced diet to maintain general health and prevent other medical problems developing.	A healthy diet is important to help maintain good health and this includes eating fish. Oily fish such as sardines and salmon have a greater amount of omega-3 fats. Try to eat them at least once a week.	Fish & fish oils	Those with arthritis	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ CHN</li> <li>■ Community health worker</li> <li>■ Dietitian</li> <li>■ Physio</li> <li>■ Osteopath</li> <li>■ Chiropractor</li> </ul>	5
Fish oils	PDF from web <sup>1</sup> /Arthritis Australia/ 2007	Foods rich in omega-3 fatty acids can help reduce inflammation.	Fish oil supplements are high in omega-3 fats.	Fish & fish oil (capsules and liquid)	Those with arthritis	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ Dietitian</li> <li>■ CHN</li> <li>■ Physio</li> <li>■ Osteopath</li> <li>■ Chiropractor</li> </ul>	5
Rheumatoid Arthritis	PDF from web <sup>2</sup> /Better Health Channel (Vic Govt)/ Oct 2007	Rheumatoid arthritis affects the joints, particularly the feet, hands and knees. Due to inflammation, the joints are painful, swollen and movement becomes restricted. The inflammation can cause damage to the joints.	Eating foods rich in omega-3 fats is good for general health. Eat oily fish such as sardines, salmon, herring and mackerel.  It is unlikely that you will get enough omega-3 fats from your diet alone to reduce inflammation without fish oil supplements.	Fish	Those with rheumatoid arthritis	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ Physio</li> <li>■ Osteopath</li> <li>■ Chiropractor</li> </ul>	4
Arthritis and Nutrition	Web <sup>3</sup> /My Dr site - MIMS consumer Health Group/ Aug 2006	There is little scientific evidence that taking expensive food supplements or eating elaborate diets is beneficial. The same results can be obtained by eating balanced meals that keep your weight down while providing all the vitamins and minerals you need.	There are benefits to eating fish as the omega-3 fatty acids found in them can help reduce the number of tender joints and the amount of morning stiffness for people with rheumatoid arthritis.	Fish & fish oil	Those with arthritis	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ CHN</li> <li>■ Dietitian</li> <li>■ Physio</li> <li>■ Osteopath</li> <li>■ Chiropractor</li> </ul>	3

Resource Title	Format/Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Arthritis – you can do something about it	PDF on web <sup>4</sup> /NSW Multicultural Health Communication Service/ Mar 2005	Arthritis that commonly affects older people is called osteoarthritis and the joints of the body become worn and damaged. There is no cure, but a lot can be done to relieve the symptoms.	Eat a variety of healthy foods including fish. Fish has omega-3 fat in it which may help to reduce inflammation.	Fish	Those with osteoarthritis	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ Dietitian</li> <li>■ CHN</li> <li>■ Physiotherapist</li> <li>■ Osteopath</li> <li>■ Chiropractor</li> </ul>	5
Rheumatoid arthritis	HC/Pharmaceutical Society of Australia/ Jan 2006	Rheumatoid arthritis is an immune system disorder which causes swelling, pain and stiffness in joints. It can lead to joint deformity and may also affect other body organs. Treatment started early can prevent or limit damage.	The omega-3 fatty acids found in fish oils can have an anti-inflammatory effect to reduce joint pain and stiffness.  Eating foods rich in omega-3 fatty acids as part of a healthy lifestyle may reduce inflammation.	Fish oils (capsules / liquid)	Those with rheumatoid arthritis	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ CHN</li> <li>■ Physiotherapist</li> <li>■ Osteopath</li> <li>■ Chiropractor</li> </ul>	3

**Key:**

**CHN:** Community health nurse

**Cred:** Credibility 1 (lowest) to 5 (highest).

Table 4.2: Cancer

Resource Title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Healthy eating and physical activity – to reduce your risk of cancer	HC, PDF on Web <sup>4</sup> / QLD Cancer Fund/ July 2006	Healthy eating, regular physical activity and achieving and maintaining a healthy body weight can lower your risk of cancer.	Foods with good fat are part of a healthy diet. This includes oily fish like salmon, mackerel, sardines and tuna. Eat one to two meals of fish (preferably oily) a week.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Healthy eating to reduce cancer risk	HC, PDF on web <sup>5</sup> / Cancer Council ACT/ July 2007	To reduce your risk of cancers The Cancer Council ACT recommends a healthy body weight, regular exercise and a healthy diet.	Fish is part of a healthy diet.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Healthy eating and physical activity	Web <sup>6</sup> / Cancer Council NSW/ Feb 2006	Healthy eating and regular physical activity can lower your risk of cancer.	Boost your intake of fish and omega-3 fats as they are associated with a range of health benefits. Eat fish at least twice a week.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Healthy eating and physical activity for adults: how to reduce your risk of cancer	HC/ Cancer Council SA/ unknown	People who eat fruits and vegetables, are active, keep their weight down and avoid drinking alcohol are less likely to get cancer.	Enjoy fish (fresh or canned) one to two times a week as part of a healthy diet.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Healthy eating and physical activity for children: how to reduce your child's risk of cancer in later life	HC/ Cancer Council SA/ unknown	People who eat fruits and vegetables, are active, keep their weight down and avoid drinking alcohol are less likely to get cancer.  Teaching children healthy lifestyle behaviours early helps them to adopt healthy habits that can lead to better health now and in the future.	Offer fish (fresh or canned) one to two times a week as part of a healthy diet.	Fish	Parents of children	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Child health nurse</li> <li>▪ Dietitian</li> </ul>	5
Healthy eating to reduce cancer risk	HC, PDF on web <sup>8</sup> / Cancer Council Vic/ July 2005	To reduce your risk of cancer The Cancer Council Victoria recommends a healthy body weight, regular exercise and a healthy diet.	Fish is part of a healthy diet.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5

Table 4.3: Dementia

Resource Title	Format/Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Dementia – risk reduction	PDF?/ Better Health Channel (Vic Govt)/ Sept 2006	Dementia cannot be prevented or ‘cured’ but the choices that you make in midlife can help you to keep your brain healthy as you age.	A healthy diet can help to keep your brain healthy. Fish (especially oily) is part of a healthy diet - aim to have one to two meals with fish a week.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> </ul>	5

Table 4.4: Dental Health

Resource Title	Format/Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Top tips	Web?/ Dental Health Service Vic/ unknown	Eating a wide variety of food is important for good oral health and overall wellbeing.	Fish is part of a healthy diet.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Dentist</li> <li>▪ Dental therapist</li> <li>▪ Dental hygienist</li> </ul>	5
Snack Ideas	HC/ Health Promotion, SA Dental Service/ June 2007	Snacking on sugary food can start tooth decay. Keep your teeth healthy and eat food with little or no sugar between meals.	Canned sardines or tuna make a healthy snack choice.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Dentist</li> <li>▪ Dental therapist</li> <li>▪ Dental hygienist</li> </ul>	5



Table 4.5: Diabetes

Resource Title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Food choices for people with diabetes	HC/ PDF on web <sup>10</sup> / Diabetes Australia/ Aug 2007	Healthy eating for people with diabetes is no different to that which is recommended for everyone. By choosing healthy food and being active blood glucose and weight can be managed.	The fats found in fish (polyunsaturated) are good for health – especially those in oily fish. Eat more fish - at least three times a week. Seafood is also part of a healthy diet and is a good source of protein.	Fish and seafood	Those with diabetes	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	4
Healthy food for healthy living	PDF on web <sup>11</sup> / International Diabetes Institute/ 2002	Healthy eating for people with diabetes is no different to that which is recommended for everyone. By choosing healthy food and being active blood glucose and weight can be managed.	Fish and seafood are a part of a healthy diet when eaten 'moderately'.	Fish and seafood	Those with or at risk of developing diabetes	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Healthy eating for diabetes	PDF on web <sup>12</sup> / QLD Health/ Feb 2005	Diabetes occurs when a hormone called insulin does not work properly. Healthy eating can help to control diabetes.	Fish is part of a healthy diet. The type of fat found in fish is healthy. Fish should be included at least twice a week.	Fish	People with diabetes	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5

Table 4.6: Heart Health

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Cholesterol explained	PDF on web <sup>2</sup> / Better Health Channel (Vic Govt)/ June 2006	There is no need to eat foods high in cholesterol. Too much cholesterol in your diet can lead to heart disease.	Fish (at least twice a week) is part of a healthy diet.  Seafood is a healthy food but is high in cholesterol – it is fine to eat in moderation as long as your overall diet is low in saturated fats.	Fish and seafood	People with or at risk of high cholesterol	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Cholesterol – healthy eating tips	PDF on web <sup>2</sup> / Better Health Channel (Vic Govt)/ July 2007	Cholesterol is a type of fat that is needed for many bodily functions. It is also an essential component of cell membranes. It is a problem only when there is too much of it in the blood.	Fish (at least twice a week) is part of a healthy diet that will help to reduce your cholesterol levels.	Fish	People with or at risk of high cholesterol	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Heart disease and food	PDF on web <sup>2</sup> / Better Health Channel (Vic Govt)/ July 2007	Heart disease is the leading cause of death in Australia.  Food is directly involved in many of the risk factors for coronary heart disease. Paying attention to what you eat is one of the most important preventative measures you can take.	Oily fish is part of a healthy diet and can help protect against heart disease as it lowers cholesterol, improves blood vessel elasticity and thins the blood.  Eat fish at least once a week.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Fish oils help keep the heart running smoothly	PDF on web <sup>13</sup> / CSIRO/ Nov 2007	The best source of omega-3 fatty acids is fish and fish oils. Omega-3 fatty acids protect against heart rhythm disorders and have benefits for blood clotting and blood vessel function.  Eat more fish for better health. Fish and seafood are good sources of omega-3 fatty acids.	Eat more fish for better health. Fish and seafood are good sources of omega-3 fatty acids.  The most beneficial amount of fish oil is currently unknown. It is better to eat fish meals than use supplements.	Fish, seafood and fish oil	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> </ul>	5
Cholesterol, Triglycerides and heart disease	HC/ Heart Foundation/ March 2007	Blood cholesterol and blood triglycerides are fatty substances found in the blood. People can lower their blood cholesterol levels by eating a healthy diet that is low in saturated fat.	Fish (at least twice a week) is part of a healthy diet.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Dietary Fat and Heart Disease	PDF on web <sup>14</sup> / Heart Foundation/ Feb 2004	Fats found in food are a mixture of saturated, polyunsaturated and monounsaturated. Saturated fats raise blood cholesterol, polyunsaturated and monounsaturated fats lower blood cholesterol.	Fish is part of a healthy diet and contains polyunsaturated fat. Eat fish at least twice a week.	Fish	Those at risk of developing heart disease	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Enjoy healthy eating. A guide to keeping your blood cholesterol in check (Pamphlet)	HC/ Heart Foundation/ Dec 2006	Eating a healthy diet is very important for reducing your cholesterol levels and improving your heart health.	Fish is part of a healthy diet and contains a high amount of healthy fat. Fish helps to reduce your risk of heart disease. Eat fish at least twice a week.  All types of fish are good choices.  Seafood is also a good choice as it is low in saturated fat.	Fish and seafood	Those at risk of high cholesterol	<ul style="list-style-type: none"> <li>GP</li> <li>Dietitian</li> <li>CHN</li> </ul>	5
Enjoy healthy eating. A guide to keeping your blood cholesterol in check (Magnet)	HC/Heart Foundation/ unknown	Eating a healthy diet is very important for keeping your cholesterol levels in check.	Fish is part of a healthy diet. Eat fish at least twice a week.	Fish	Those at risk of high cholesterol	<ul style="list-style-type: none"> <li>GP</li> <li>Dietitian</li> <li>CHN</li> </ul>	4
Healthy eating for the heart	PDF on web <sup>14</sup> / Heart Foundation/ Feb 2004	Nutrition plays a role in four of the risk factors for heart, stroke and blood vessel disease – high blood lipids (fats), blood pressure, diabetes and being overweight.	Fish is part of a healthy diet. Have it at least twice a week.	Fish	General population	<ul style="list-style-type: none"> <li>GP</li> <li>Dietitian</li> <li>CHN</li> </ul>	5
High blood pressure – the facts	HC/Heart Foundation/ June 2007	High blood pressure is one of the most common disorders affecting the heart and blood vessels. High blood pressure rarely gives warning signs and can be a silent killer.  Healthy eating is particularly important in controlling high blood pressure and reducing your risk of heart disease.	Fish is part of a healthy diet that may help to reduce high blood pressure.	Fish	Those with high blood pressure	<ul style="list-style-type: none"> <li>GP</li> <li>Dietitian</li> <li>CHN</li> </ul>	5
Live healthy to live longer – your guide	HC/ Heart Foundation/ 2005	Your heart needs care for life. A healthy heart is about enjoying a healthy lifestyle and making this a part of every day life. It is about living healthily to live longer. It's also about making positive steps to reduce risk factors.	Moderate amounts of fish as part of a healthy diet.	Fish	General population	<ul style="list-style-type: none"> <li>GP</li> <li>Dietitian</li> <li>CHN</li> </ul>	5

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Nourish your heart	Web <sup>15</sup> / Heart Foundation/ unknown	Enjoying a variety of foods from the different food groups is the key to healthy eating.	Fish is part of a healthy diet. Have fish at least twice a week.	Fish	General population – especially women due to location on website (women and heart disease)	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> <li>▪ CHN</li> </ul>	5
Questions and Answers – General Position Statement – Phytosterol/ stanol enriched foods	PDF <sup>14</sup> / Heart Foundation/ Aug 2007	Plant sterol enriched foods can be included in a healthy eating plan. For good health it is important to enjoy a variety of foods every day.	Fish is part of a healthy diet.	Fish	Those at risk of developing, or with, high cholesterol	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> <li>▪ CHN</li> </ul>	5
Women and heart disease	HC/ Heart Foundation/ 2006	Heart disease is the number one killer of women in Australia. The biggest risk to your heart is the gradual clogging of the arteries that supply blood to the heart.	Eating fish (at least twice a week) is part of a healthy diet which can help prevent heart disease.	Fish	Women	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> <li>▪ CHN</li> </ul>	5
Your blood pressure	PDF on web <sup>14</sup> / Heart Foundation/ Dec 2003	Blood pressure is the pressure of the blood in the arteries as the heart pumps it around the body. It does not stay the same all the time. There are things that you can do to prevent your blood pressure increasing and control the risk of heart disease.	Enjoy fish as part of a healthy diet to prevent your blood pressure increasing and control the risk of heart disease.	Fish	Those with, or at risk of high blood pressure	<ul style="list-style-type: none"> <li>▪ GP</li> </ul>	5
Eating for a healthy heart	Web <sup>16</sup> / My Dr website - MIMS consumer Health Group/ July 2006	You can make a huge difference to your heart and to your general health by just making a few simple changes to your way of eating.	Eat fish (fresh or canned and not fried) at least twice a week.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> <li>▪ CHN</li> </ul>	3
Heart Disease: Reduce the Risk	Web <sup>17</sup> / My Dr website - MIMS consumer Health Group/ July 2006	Heart disease is rarely caused by one thing. It is important to know the risk factors and to try and avoid them.	Fish is part of a healthy diet – eat it regularly (at least twice a week).	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> </ul>	3
Heart Health: Be Physically Active and Enjoy Healthy Eating	Web <sup>18</sup> / My Dr website - MIMS consumer Health Group/ April 2004	Small changes to your eating and physical activity habits can make a big difference to your heart health.	Fish is part of a healthy diet.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> <li>▪ CHN</li> </ul>	3

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Triglycerides	Web <sup>19</sup> / My Dr website - MIMS consumer Health Group/ March 2007	Triglycerides are a type of fat found in your blood and fat cells. Triglycerides are the main form of fat stored in the body. You can lower the amount of triglycerides that you have in your body by eating healthily.	Fish can help you to lower your triglycerides level and are part of a healthy diet.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> <li>▪ CHN</li> </ul>	3
The importance of lower cholesterol	PDF on web <sup>20</sup> / Northern Rivers Division of General Practice (Lismore NSW)/ unknown	Lowering cholesterol levels in the blood has significant health benefits. Reducing cholesterol through the diet is preferable.	Omega-3 fatty acids are good for you. Polyunsaturated fats found in seafood are recommended.	Seafood	Those with or at risk of high cholesterol	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> <li>▪ CHN</li> </ul>	4
Blood pressure	Web <sup>21</sup> /NSW Health/ unknown	Blood pressure is the pressure of the blood in the arteries as the heart pumps blood around the body. Blood pressure is normal. We all need it to stay alive.	Eating plenty of fish can help control blood pressure.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> </ul>	5
Cardiovascular disease	Web <sup>22</sup> /NSW Health/ unknown	Cardiovascular disease is a term used to describe a vascular condition that can affect the heart and blood vessels including: heart attack and angina, cerebrovascular disease (including stroke), high blood pressure, blood clotting and other heart or blood vessel diseases.	Eating plenty of fish can help control blood pressure and prevent cardiovascular disease.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> </ul>	5
Cholesterol: too much is dangerous. Asian foods	PDF on web <sup>23</sup> / NSW Multicultural Health Communication Service/ March 2005	Too much cholesterol in the blood increases the risk of heart attack or stroke. Knowing what foods to eat and enjoying regular physical activity can help to keep cholesterol under control.	Having fish (canned or fresh) at least twice a week can help keep your cholesterol at a healthy level. Shellfish is fine in moderation if your cholesterol is at a healthy level.	Fish and seafood	Asian people	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> <li>▪ CHN</li> </ul>	5
Cholesterol: too much is dangerous. European and Middle Eastern foods	PDF on web <sup>23</sup> / NSW Multicultural Health Communication Service/ March 2005	Too much cholesterol in the blood increases the risk of heart attack or stroke. Knowing what foods to eat and enjoying regular physical activity can help to keep cholesterol under control.	Having fish (canned or fresh) at least twice a week can help keep your cholesterol at a healthy level. Shellfish is fine in moderation if your cholesterol is at a healthy level.	Fish and seafood	European and Middle Eastern people	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> <li>▪ CHN</li> </ul>	5

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Cholesterol: too much is dangerous. Samoan and Tongan foods	PDF on web <sup>23</sup> / NSW Multicultural Health Communication Service/ March 2005	Too much cholesterol in the blood increases the risk of heart attack or stroke. Knowing what foods to eat and enjoying regular physical activity can help to keep cholesterol under control.	Having fish (canned or fresh) at least twice a week can help keep your cholesterol at a healthy level.  Shellfish is fine in moderation if your cholesterol is at a healthy level.	Fish and seafood	Samoan and Tongan people	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> <li>▪ CHN</li> </ul>	5
Eating well to prevent heart disease and stroke	PDF on web <sup>23</sup> / NSW Multicultural Health Communication Service/ May 2003	Any healthy changes that you make to your diet should be lifelong.	Fish have good unsaturated fats.  Eat fish that is fresh, frozen or canned (in spring water) at least twice a week	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> </ul>	5
How to keep your blood pressure healthy	PDF on web <sup>23</sup> / NSW Multicultural Health Communication Service/ Sept 1997	Blood pressure is the force that drives blood through your veins and arteries. If it becomes too high it can damage arteries making it easier for them to become blocked and cause heart attack or stroke. Healthy eating, reducing salt intake and regular exercise can help prevent high blood pressure.	Eating moderate amounts of fish can help to reduce high blood pressure.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> </ul>	5
Summary Cholesterol and Heart Health	Web <sup>24</sup> / Nutrition Australia/ May 2007	We need a certain amount of cholesterol in our bodies, but having more than the right amount is potentially harmful. A high level of LDL cholesterol is strongly associated with increased risk of heart disease.	Eating one to two fish meals per week reduces the risk of heart disease	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	4
Fats and cholesterol	HC/ Pharmaceutical Society of Australia/ July 2003	Our bodies need cholesterol and triglycerides (fat), but having too much cholesterol or fat in our blood can increase our chances of developing high blood pressure, heart disease and stroke. They can be lowered by healthy eating, lifestyle changes and medicines.	Fish is part of a healthy diet to help reduce bad cholesterol.  Fish oils are polyunsaturated fats.  Have fish at least twice a week as part of a healthy diet.	Fish and fish oil	General population	<ul style="list-style-type: none"> <li>▪ GP</li> </ul>	1
Helping Your Heart	Web <sup>25</sup> / Victor Chang Cardiac Research Institute/ unknown	Healthy eating means enjoying a wide variety of nutritious foods with the ultimate goal of reducing heart disease risk factors - high blood cholesterol levels, high blood pressure, excess weight and high blood sugar levels if diabetic. Healthy food for your heart is healthy for all the family, and it can be simple and tasty.	Seafood is a great alternative to meat and poultry. The fats in fish are known to be heart-healthy, and most experts would recommend that you eat fish at least two to three times a week. Canned fish is also suitable.	Fish and fish oil	General population	<ul style="list-style-type: none"> <li>▪ GP</li> </ul>	5



Table 4.7: Nutrition

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Antioxidants	PDF on web/ Better Health Channel (Vic Govt)/ Nov 2007	An overload of free radicals has been linked to certain diseases, including heart disease, liver disease and some cancers. A diet high in antioxidants may help reduce the risk of these diseases. Antioxidants are found in certain healthy foods and neutralise free radicals.	Seafood – contains copper, manganese, selenium and zinc which are good sources of antioxidants.  Fish – contains zoochemicals which is a good source of antioxidants.	Fish and seafood	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Calcium	PDF on web/ Better Health Channel (Vic Govt)/ Feb 2008	Calcium is vital for healthy teeth and bones.	Fish with edible bones are a good source of calcium.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> </ul>	5
Calcium – children	PDF on web/ Better Health Channel (Vic Govt)/ Nov 2006	Calcium is an important part of the daily diet, especially for children. It is essential for the growth of strong teeth and bones.	Fish with edible bones (sardines or salmon) are a good source of calcium for children that refuse to drink milk.	Fish	Parents of children	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Dietitian</li> <li>▪ CHN</li> <li>▪ Child Health Nurse</li> </ul>	5
Fats and oils	PDF on web/ Better Health Channel (Vic Govt)/ Feb 2008	Fat is important for many body processes and you need to eat some fat in your diet.	Fish contains omega-3 fats which are polyunsaturated fats. Have fish at least twice a week.  The benefits of omega-3 fats include: lower triglyceride levels; improved blood vessel elasticity; normal heart rhythm; thinner the blood, which is less sticky and less likely to clot; reduced inflammation; reduced blood pressure; preventing and treating depression; and contributing to the normal fetal brain development.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Fish	PDF on web/ Better Health Channel (Vic Govt)/ Nov 2007	Australians should eat more fish. Fish is low in fat, high in protein and an excellent source of omega-3 fatty acids. Eating fish regularly (once or twice a week) may reduce the risk of a range of diseases. The best source of omega-3 fatty acids is in fish, not fish oil capsules.	Eating fish regularly may reduce the risk of: Asthma; cardiovascular disease; dementia; depression; diabetes; poor eyesight; inflammatory conditions; and prematurity.	Fish and seafood	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Food variety and a healthy diet	PDF on web <sup>2</sup> / Better Health Channel (Vic Govt)/April 2006	Food variety means eating a wide variety of foods from each of the five food groups, in the amounts recommended. Eating many different foods helps maintain a healthy and interesting diet and provides adequate nutrition. Eating a mixture of foods can help prevent diseases such as diabetes, cancer and cardiovascular disease.	Fish are a part of a healthy and varied diet.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Iodine explained	PDF on web <sup>2</sup> / Better Health Channel (Vic Govt)/Feb 2008	Iodine is found in dairy products, seafood, kelp, eggs, some vegetables and iodised salt. It is important for essential hormone development in the human body.	Iodine is found in seafood. Any type of seafood is a rich source of iodine.  Eating seafood (including fish) once a week is enough to fulfill the average iodine requirement and eating it two to three times a week will give you benefit from the fish oils.	Fish and seafood	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Nutrition – women's extra needs	PDF on web <sup>2</sup> / Better Health Channel (Vic Govt)/Aug 2007	A woman's reproductive life means that her nutritional needs differ greatly from those of a man. Menstruation, pregnancy, breastfeeding and menopause are times of increased nutritional demand.	Seafood is a good source of zinc which is needed to maintain healthy cells.  Fatty fish are a good source of vitamin D.	Fish and seafood	Women	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Midwife</li> </ul>	5
Feeding your baby in the first year	HC, PDF on web <sup>26</sup> / Centre for Health Promotion, Children, Youth and Women's Health Service (SA)/ unknown	Babies need the right foods at the right times to grown, learn to eat and help them learn to talk. Breastmilk is the best food for babies for the first six months, then smooth foods at six to seven months and then lumpy foods until one year.	Fish is a good food to prepare for your baby.	Fish	Parents of children under 1 year old	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Community health worker</li> <li>▪ Child health nurse</li> </ul>	5

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Snacks for children aged 1 year and over	HC, PDF on web <sup>26/</sup> Centre for Health Promotion, Children, Youth and Women's Health Service (SA)/ unknown	Children need a range of healthy foods to learn and play.	Fish is a healthy snack for children.	Fish	Parents of children over one year	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Community health worker</li> <li>Child health nurse</li> </ul>	5
Healthy eating	Web <sup>27/</sup> Child and Youth Health, Children, Youth and Women's Health Service (SA)/April 2008	Eating healthily can make you look better and feel better, even small changes in the way you eat can make a difference.	Fish is part of a healthy diet.  Fish and seafood provide nutrients such as omega-3 fatty acids which are very necessary.	Fish and seafood	Youth	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	5
Healthy eating guidelines	Web <sup>28/</sup> Choice magazine – online/ Mar 2003	Healthy eating guidelines are: eat plenty of fruit and veggies, eat plenty of cereals, preferably wholegrain, include lean meat, fish, poultry and/or alternatives such as legumes and nuts, limit saturated (and trans) fat, include reduced-fat dairy foods and/or alternatives in your diet, drink plenty of water, choose foods low in salt, limit alcohol, don't eat too much sugary food.	Fish is a good source of iron. Two to three fish meals a week are recommended for omega-3 benefits.	Fish	General population	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Community health worker</li> <li>Dietitian</li> </ul>	5
Australian Guide to healthy eating – background information for consumers	HC/Dept of Health and Ageing/1998	Enjoy a variety of healthy foods every day including fruits, vegetables, legumes, milk, yoghurt, cheese, water, bread, cereals, rice, pasta and noodles.	As part of a healthy diet, fish provides some of the important nutrients the body needs. Canned fish is a nutritious substitute for fresh fish. Eat moderate amounts of fish.	Fish	General population	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	5
Australian Guide to healthy eating –summary information	HC/Dept of Health and Ageing/1998	Enjoy a variety of healthy foods every day including fruits, vegetables, legumes, milk, yoghurt, cheese, water, bread, cereals, rice, pasta and noodles.	As part of a healthy diet, fish provides some of the important nutrients the body needs. Canned fish is a nutritious substitute for fresh fish. Eat moderate amounts of fish.	Fish	General population	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	5

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Australian Guide to healthy eating - poster (A4 and A3)	HC/Dept of Health and Ageing/ 1998	Enjoy a variety of healthy foods every day including fruits, vegetables, legumes, milk, yoghurt, cheese, water, bread, cereals, rice, pasta and noodles.	Enjoy fish as part of a healthy diet.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5
Food for health – dietary guidelines for children and adolescents in Australia	HC/Dept of Health and Ageing/2003	<p>Enjoy a wide variety of nutritious food and drink plenty of water.</p> <p>Encourage and support breastfeeding. Children and adolescents need sufficient nutritious foods to grow and develop normally.</p> <p>Care for your child's food: prepare and store it safely.</p>	Enjoy fish as part of a varied diet.	Fish	Parents and carers of children and adolescents	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Child health nurse</li> <li>▪ Dietitian</li> </ul>	4
Food for health – dietary guidelines for Australian adults	HC/Dept of Health and Ageing/2003	<p>Enjoy a wide variety of nutritious food. Encourage and support breastfeeding.</p> <p>Prevent weight gain: be physically active and eat according to your energy needs.</p> <p>Care for your food: prepare and store it safely.</p>	Enjoy fish as part of a varied diet.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	4
Food for health – dietary guidelines for Australians	HC/Dept of Health and Ageing/2003	<p>Enjoy a wide variety of nutritious food and drink plenty of water.</p> <p>Encourage and support breastfeeding. Children and adolescents need sufficient nutritious foods to grow and develop normally.</p> <p>Care for your and your child's food: prepare and store it safely.</p>	<p>Enjoy fish as part of a varied diet. Try to eat one to two fish meals a week.</p> <p>Fish is an excellent source of omega-3 fats, iron and protein.</p>	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Child health nurse</li> <li>▪ Dietitian</li> </ul>	4
Indigenous Lifescripts – healthy eating action plan	PDF on web <sup>29</sup> / Dept of Health and Ageing/2008	Eating well will help to maintain health, increase energy and help with some medical conditions.	Eat more fish as part of your healthy eating plan.	Fish	General Indigenous population	<ul style="list-style-type: none"> <li>▪ GP</li> </ul>	5

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Eating fish	PDF on web <sup>30</sup> / Department of Health and Human Services Tas/ unknown	All fish and seafood are excellent sources of protein, vitamins and minerals. All fish are good for health with the higher fat varieties having extra benefits of omega-3 fatty acids. Aim to eat fish at least three times a week.	All fish and seafood are excellent sources of protein, vitamins and minerals. All fish are good for health with the higher fat varieties having extra benefits of omega-3 fatty acids. Aim to eat fish at least three times a week.	Fish and seafood	General population	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	5
Calcium	Web <sup>31</sup> / Dietitians Ass of Australia/ Jan 2008	Calcium is important for strong bones and healthy teeth.	Fish with edible bones are a good source of calcium as part of a healthy diet.	Fish	General population	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	5
Mercury in fish	Web <sup>32</sup> / Dietitians Ass of Australia/ Jan 2008	While there are many benefits of eating fish, if you are pregnant, planning on becoming pregnant or preparing meals for a young child, you need to be careful about the types of fish you eat. Some fish contain high levels of mercury which can be harmful to your developing baby and to young children.	Fish should be eaten as part of a healthy diet at least twice a week.  Fish is an excellent source of protein, low in saturated fat and contain omega-3 fatty acids. It is also a good source of vitamins (especially vitamin D) and iodine.	Fish	General population	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> <li>Midwife</li> <li>Child health nurse</li> </ul>	5
Advice on fish consumption – mercury in fish	HC/ Food Standards Australia and New Zealand/ unknown/	There are many nutritional benefits of eating fish. All fish contains small amounts of mercury, some more than others. Eating too much fish with 'high' mercury levels is bad for you especially for those planning pregnancy, those that are pregnant and children under six.	Fish is part of a varied and healthy diet it is low in saturated fat, an excellent source of protein, essential omega-3 fatty acids and iodine.	Fish	Those planning to become pregnant, those that are pregnant are parents of children under six	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> <li>Midwife</li> <li>Child health nurse</li> </ul>	5
Healthy eating	PDF on web <sup>33</sup> / Jean Hailes Foundation for Women/ Dec 2005	Poor eating has a direct impact on our health. Being overweight can stop us from being our best. It you're not eating well, your body struggles to stay in balance.	Eat one to three serves of fish a week; fish contain omega-3 fatty acids which are powerful protectors of the heart and blood vessels.	Fish	Women	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	5
Could you be iron deficient?	HC/ Meat and Livestock Australia/ Mar 2003	There are three easy steps to an iron-rich diet: choose foods high in absorbable iron at each meal, combine non-meat meals with good sources of vitamin C to increase absorption of non-haem iron, drink tea and coffee between meals.	Canned fish is a source of haem iron.	Fish	General population	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	2

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Fatty acids in the diet	Web <sup>34</sup> / My Dr website - MIMS consumer Health Group/ May 2002	Fats are made up of many different fatty acids. Fatty acids have an important role in preventing heart disease, skin conditions and inflammatory diseases. Fish are an excellent source of omega-3 fatty acids. Two to three meals of fish a week will provide sufficient amounts of fatty acids.	Fish are an excellent source of omega-3 fatty acids. Two to three meals of fish a week will provide sufficient amounts of fatty acids.	Fish	General population	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ CHN</li> <li>■ Dietitian</li> <li>■ Physio</li> </ul>	3
Nutrition: Benefits	Web <sup>35</sup> / Foundation 49 – Men's Health/ Sept 2006	A healthy diet can not only help reduce cancer risk, but also protect against heart disease, stroke and other health conditions.	Fish are a rich source of healthy unsaturated fats called omega-3 fatty acids.	Fish	Men	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ CHN</li> <li>■ Dietitian</li> <li>■ Physio</li> </ul>	3
Get the good eating habit	HC/Heart Foundation/ Mar 2004	For good heart health enjoy healthy eating, be active every day, be smoke free and achieve and maintain a healthy body weight.	Enjoy a wide variety of foods including fish. Have fish at least twice a week.	Fish	General population	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ CHN</li> <li>■ Dietitian</li> </ul>	5
Losing weight the healthy way	HC/Heart Foundation/ April 2006	Achieving a healthy weight is a balancing act between what goes in and what is used up.	Fish and seafood are part of a healthy diet that can contribute to maintaining or achieving a healthy weight.	Fish and seafood	General population	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ CHN</li> <li>■ Dietitian</li> </ul>	5
The Aboriginal and Torres Strait Islander Guide to Healthy Eating	HC/Northern Territory Government – Department of Health and Community Services/ unknown	Food is required every day from each of the five food groups for good nutrition and health. Healthy eating throughout life will help reduce the risk of health problems later in life such as diabetes, heart disease, cancer and obesity.	Fish and seafood are good sources of protein, iron and zinc.	Fish and seafood	Aboriginal and Torres Strait Islanders	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ CHN</li> <li>■ Dietitian</li> <li>■ Community health worker</li> <li>■ Aboriginal health worker</li> </ul>	4
Facts on fat	PDF on web <sup>36</sup> / NSW Multicultural Health Communication Service/ June 2005	All fats are very high in energy and will increase your weight if eaten in excess. Foods contain a combination of three types of fat: saturate, monounsaturated and polyunsaturated. The different fats have different effects on your blood cholesterol.	Omega-3 fatty acid is a polyunsaturated fat and is a healthy fat. It will help to reduce high blood triglycerides, reduce high blood pressure and reduce the risk of blood clots. Limit seafood that is high in cholesterol (prawns, calamari and octopus) to no more than once a week.	Fish and seafood	General population	<ul style="list-style-type: none"> <li>■ GP</li> <li>■ CHN</li> <li>■ Dietitian</li> </ul>	5



Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Good reasons to eat fish	PDF on web <sup>36</sup> / NSW Multicultural Health Communication Service/ Mar 2005	Eating fish at least twice a week is good for your health, it helps prevent heart disease and stroke, fish is low in fat and good for your bones.	The omega-3 fatty acids help prevent heart disease and stroke.  Fish is low in fat which helps maintain a healthy weight.  Some canned fish (salmon and sardines) contain edible bones which are a good source of calcium.  Fish is good for people with diabetes because it is low in fat and helps to prevent heart disease and stroke.	Fish	General population	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	5
What are omega-3 fats and what is the science behind the claims relating to foods high in omega-3 fats	Web <sup>37</sup> / Nutrition Australia/ Feb 1999	Omega-3 fats are polyunsaturated fats that are found in significant quantities in several plants and plant oils and in even greater quantities in many varieties of seafood. Omega-3 fats are beneficial in at least three areas of human health: heart disease, inflammatory disease, and development of vision and brain function in babies.	Eating fish regularly is associated with a reduced risk of heart disease.  Rheumatoid arthritis and other inflammatory diseases (eg psoriasis) generally respond positively to increased consumption of foods containing omega-3 fats.	Fish	General population	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> <li>Midwife</li> <li>Child health nurse</li> </ul>	5
Weight and health	HC/ Pharmaceutical Society of Australia/Oct 2006	The main way to lose weight and improve health is to change eating habits and increase physical activity.	To reach and maintain a healthy weight, eat a moderate amount of fish is recommended as part of a healthy diet.	Fish	General population	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	1
Choosing good food	Web <sup>38</sup> / Raising Children Network/ unknown	If your child eats a variety of healthy foods they will get the nutrients they need and develop healthy eating habits for life. Help your child make good food choices by offering them lots of different healthy foods.	Fish supplies vital iron, zinc and vitamin B12 as well as protein – these are things children need to grow. Fish is a good source of omega-3 fatty acids, which help the brain to develop.	Fish	Parents of children aged one to eight years old	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> <li>Child health nurse</li> </ul>	5
What's so healthy about seafood?	HC/ Seafood Services Australia/ Unknown	Seafood is an important part of a healthy diet and that includes whole fish, not just the fish oils. Fish is a good source of protein, iron, zinc and iodine.	Seafood is an important part of a healthy diet and that includes whole fish, not just the fish oils. Fish is a good source of protein, iron, zinc and iodine.	Fish and seafood	General population	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	1

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Checklist for the 45 – 49 year old health check Incorporating the Smoking, Nutrition and Physical Activity (SNAP) guide to behavioural risk factors in general practice.	PDF on web <sup>39/</sup> Royal Australian College of General Practitioners/ Oct 2004	Taking the time to identify potential and early problems can help to prevent chronic disease and allow for early intervention.	Fish is part of a healthy diet.	Fish	General population aged 45 – 49 years old	<ul style="list-style-type: none"> <li>▪ GP</li> </ul>	5
Health benefits	Web <sup>40/</sup> WA Fishing Industry Council	Substantial evidence suggests that people at risk from coronary heart diseases, heart arrhythmia, rheumatoid arthritis, diabetes, obesity and hypertension may benefit by making seafood a cornerstone of a healthy balanced diet.  Eat one to two serves of fish a week.	Substantial evidence suggests that people at risk from coronary heart diseases, heart arrhythmia, rheumatoid arthritis, diabetes, obesity and hypertension may benefit by making seafood a cornerstone of a healthy balanced diet.	Fish	General population	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	1
Women's Health in the Middle Years	HC/ Women's and Children's Hospital, Children, Youth and Women's Health Service (SA)/ Feb 2004	During the middle years, women experience many changes and face a number of issues related to lifestyle and health. You may be able to prevent some illnesses through making healthy lifestyles choices.	Fish is part of a healthy diet.	Fish	Women in the middle years (middle aged)	<ul style="list-style-type: none"> <li>▪ GP</li> </ul>	5
Nutrition – student fact sheet	Web <sup>41/</sup> Women's Health QLD Wide/ Nov 2007	During adolescence, young women's eating habits often change due to spending more time with friends, part-time work and a generally more independent lifestyle. They tend to have more meals outside of the home, thus making their own decisions regarding what to eat. Therefore, providing young women with information on the nutritional requirements for a person of their age may help them to make better food choices.	Fish is an important part of a healthy diet. It is a good source of iron, calcium and protein – all of which are important for adolescent girls.	Fish	Young women Parents of young women	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> </ul>	5

Table 4.8: Osteoporosis

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Osteoporosis	PDF on web <sup>3</sup> / Better Health Channel (Vic Govt)/ Sep 2006	With osteoporosis bones become less dense, lose strength and break more easily due to calcium loss. Breaks are most common in the spine, hip and wrist and often occur as the result of a minor fall. It is never too late to seek treatment.	Canned fish with small edible bones, like sardines, is a good source of calcium to help prevent osteoporosis.	Fish	Those at risk of osteoporosis	<ul style="list-style-type: none"> <li>GP</li> </ul>	5
Osteoporosis	Web <sup>2</sup> / Dietitians Ass of Australia/ Jan 2008	Osteoporosis is a condition of brittle bones affecting many Australians. Eating enough calcium rich foods throughout life can help to prevent osteoporosis.	Fish with edible bones contains calcium that can help to prevent osteoporosis.	Fish	Those at risk of developing osteoporosis	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	4
Calcium	Web <sup>3</sup> / Osteoporosis Australia/ unknown	Calcium is essential for building and maintaining bones. It combines with other minerals to form the hard crystals that give bone its strength. Almost all the body's calcium (about 99%) is found in the bones.	Eat canned fish with bones, particularly canned salmon and sardines (the fish bones contain calcium).	Fish	Those at risk of developing osteoporosis	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	5
Calcium, Vitamin D and osteoporosis	PDF on web <sup>4</sup> / Osteoporosis Australia/Mar 2006	Osteoporosis is a disease in which the bones become fragile and brittle. They fracture more easily than normal bone. Calcium is important for building strong bones in childhood and helping protect us from developing osteoporosis later in life.	Fish with edible bones are a source of calcium. Small amounts of vitamin D can be found in fatty fish like salmon, herring and mackerel.	Fish	Those at risk of developing osteoporosis	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	5
Osteoporosis	HC/ Pharmaceutical Society of Australia/ Aug 2006	Bones can become so weak that the fracture very easily. This is called osteoporosis and it is most common in postmenopausal women.	A healthy well balanced diet that includes fatty fish can help prevent osteoporosis.	Fish	Those at risk of developing osteoporosis	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	1
Osteoporosis	Web <sup>5</sup> / Women's Health QLD Wide/Nov 2007	Osteoporosis is a disease which affects the skeleton and is characterised by low bone mass, deterioration of bone tissue and a consequent increase in bone fragility and susceptibility to fracture. Many people unaware they suffer from it until they sustain a fracture.	Non-dairy sources of calcium include: canned fish with bones such as salmon and sardines. 100g canned salmon/sardines is equal to approximately 300mg of calcium	Fish	Women	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	4

Table 4.9: Preconception, pregnancy and breastfeeding

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Good Nutrition in pregnancy	HC/ACT Health/ June 2007	A healthy pregnancy is important for you and your baby. Even though you are eating for two there is no need to eat twice as much. It is the quality of the food not the quantity which matters most.	Fish is part of a healthy diet in pregnancy. Fish and seafood are good sources of iron, iodine, calcium, vitamin D and omega-3 fats.	Fish and seafood	Pregnant women	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Midwife</li> </ul>	5
Mercury in fish	PDF on web <sup>2</sup> / Better Health Channel (Vic Govt)/June 2006	Mercury is a naturally occurring element that is found in air, water and food. Most people are exposed to mercury via food. Unborn babies are at the greatest risk from too much mercury as too much in their system can slow their development in the early years of life.	Fish is an important part of a healthy diet. Some of the health benefits include high in protein, low in saturated fat, high in unsaturated fat and high in omega-3 oils.	Fish and seafood	Pregnant women	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Midwife</li> </ul>	5
Pregnancy and diet	PDF on web <sup>2</sup> / Better Health Channel (Vic Govt)/Nov 2007	Fish is still an important part of a healthy diet for pregnant women – just choose to eat fish and seafood with lower levels of mercury. Good nutrition during pregnancy keeps the mother and baby healthy. It is important to eat a wide variety of healthy foods to ensure that nutritional needs are being met.	Fish is part of a healthy diet for pregnant women. Pregnant women should eat two to three serves of low mercury fish a week for good health.	Fish	Pregnant women	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Midwife</li> </ul>	5
Pregnancy – risks	Web <sup>46</sup> / Child and Youth Health, Children, Youth and Women's Health Service (SA)/ Aug 2007	During your pregnancy it is very important to avoid some things that can harm your developing baby.	There are several nutritional benefits from eating fish, it is an excellent source of protein and is rich in important vitamins and minerals such as vitamin D and iodine and is high in unsaturated fat and omega-3 fatty acids. Pregnant women should eat two to three serves of fish a week, but ensure that the fish that you eat has low levels of mercury.	Fish	Pregnant women	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Midwife</li> </ul>	5
Healthy eating a various life stages – pregnant women	Web <sup>47</sup> / Dept of Health and Ageing/ Aug 2006	Healthy eating is important for pregnant women and their unborn babies.	Fish is a nutritious food that is part of a healthy diet for pregnant women. Seafood is a good source of zinc.	Fish and seafood	Pregnant women	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Midwife</li> </ul>	5

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Healthy eating your prescription for pre-pregnancy, pregnancy and breastfeeding Pregnancy Lifescripts (GP)	HC/Dept of Health & Ageing/Apr 2007	Healthy eating is especially important when a woman is planning a pregnancy, pregnant or breastfeeding	Fish is part of a healthy diet during preconception, pregnancy or breastfeeding.  Fish and seafood are good sources of iodine.	Fish and seafood	Women that are planning a pregnancy, pregnant or breastfeeding	<ul style="list-style-type: none"> <li>▪ GP</li> </ul>	5
Healthy eating your prescription for pre-pregnancy, pregnancy and breastfeeding Pregnancy Lifescripts (consumer)	HC/Dept of Health & Ageing/Apr 2007	Healthy eating is especially important when a woman is planning a pregnancy, pregnant or breastfeeding.	Fish is a good source of iron.  Seafood is a good source of iodine.	Fish and seafood	Women that are planning a pregnancy, pregnant or breastfeeding	<ul style="list-style-type: none"> <li>▪ GP</li> </ul>	4
SA Department of Health - Pregnancy website	Web <sup>48</sup> / Dept of Health (SA)/ unknown	If you are thinking about having a baby or are already pregnant, there are some things you can do to help. A healthy lifestyle may mean that it is easier to conceive (get pregnant) and it will also help your baby to develop.	Eating fish regularly is part of a healthy diet when you are trying to get pregnant or are already pregnant.  Fish is a good source of calcium, iron and protein.	Fish	Women preparing for pregnancy and those that are pregnant	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Midwife</li> </ul>	5
Having a baby in Victoria – website	Web <sup>49</sup> / Dept of Human Services (Vic) /unknown	Planning your pregnancy should include getting the best available information before you conceive. It is possible to improve your health before conception, minimise the risk to your baby and for some women increase the likelihood of conceiving. It is also important to get the best possible information once you are pregnant so that you can stay in the best possible condition for your baby.	Fish is part of a healthy diet when you are trying to conceive or are pregnant as it has a number of nutritional benefits. Where possible eat a variety of fish whenever you like, as long as the mercury levels of the fish are low.	Fish	Women preparing for pregnancy and those that are pregnant	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Midwife</li> </ul>	5

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Mercury in Fish	PDF on web <sup>50</sup> / Food Standards Australia and New Zealand/ Mar 2004	Fish is an excellent source of protein, is low in saturated fat and contains polyunsaturated fatty acids such as essential omega-3 polyunsaturates. It is also a good source of some vitamins, particularly vitamin D and iodine. It is recommended to eat one to two serves per week.  All fish contains small amounts of mercury, some more than others. Eating too much fish with 'high' mercury levels is bad, especially for those planning pregnancy, those that are pregnant and children under six because of the harmful effects.	Fish is part of a varied and healthy diet it is low in saturated fat, an excellent source of protein, essential omega-3 fatty acids and iodine.  Eat fish one to two times a week.	Fish	Those planning to become pregnant, those that are pregnant Parents of children under six	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Midwife</li> <li>▪ Child health nurse</li> </ul>	5
A healthy fish message for women planning pregnancy and mums to be	HC/ NSW Food Authority/ Mar 2005	Fish are full of many nutritional benefits for pregnant women and young children. Too much of a good thing can be bad – especially for fish with high levels of mercury.	Fish is a good source of protein, iodine, vitamin B12 and omega-3 fatty acids which are all good for a developing baby. Aim to eat two to three serves per week of fish or seafood with low mercury levels.	Fish and seafood	Women planning a pregnancy or already pregnant	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Midwife</li> </ul>	5
Fish and mercury FAQs	Web <sup>51</sup> / NSW Food Authority/ Jul 2006	Fish is part of a healthy diet – you just need to be careful with how much and what types you eat.  You need to be careful to only eat fish that have low levels of mercury when you are pregnant.	Fish is part of healthy diet and has many health benefits including that it is low in saturated fat and is an excellent source of protein, omega-3 fatty acids, iodine and some vitamins.	Fish	Pregnant or breastfeeding women Parents of young children	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Midwife</li> <li>▪ Child health nurse</li> </ul>	5
Pregnancy and food	PDF on web <sup>52</sup> / NSW Food Authority/ Mar 2005	It is important that you select a nutritious diet from a wide variety of foods. Food safety is also very important with the foods that you eat, especially in pregnancy.	Fish is rich in protein and minerals, low in saturated fat and contains omega-3 fatty acids. Be careful what fish you choose to eat as some have high levels of mercury.	Fish	Pregnant women	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ CHN</li> <li>▪ Dietitian</li> <li>▪ Midwife</li> </ul>	4



Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Having a baby	HC/NSW Health/2006	There are many questions that you have in pregnancy about the different stages of pregnancy – this book is here to help provide the answers.	Fish is a healthy food for you and your baby.	Fish	Pregnant women	<ul style="list-style-type: none"> <li>GP</li> <li>CHN</li> <li>Dietitian</li> </ul>	5
Best food choices for breastfeeding mothers	PDF on web <sup>52</sup> / OLD Health/ Jan 2007	Healthy eating is important when you are breastfeeding.	Fish is a healthy food choice in pregnancy.	Fish	Breastfeeding mothers	<ul style="list-style-type: none"> <li>GP</li> <li>Midwife</li> <li>Dietitian</li> </ul>	5
Iron for pregnant women	PDF on web <sup>53</sup> / OLD Health/ Jan 2007	When you are pregnant your body needs more blood because you and the baby are growing. Iron is needed to make the blood healthy.	Coloured flesh fish has higher levels of iron than light flesh fish. Fish is a good source of iron.	Fish	Pregnant women	<ul style="list-style-type: none"> <li>GP</li> <li>Midwife</li> <li>Dietitian</li> </ul>	5
Nutrition guidelines for pregnancy	PDF on web <sup>53</sup> / OLD Health/ Jan 2007	Nutrition requirements are increased in pregnancy, but you only need a small amount of extra energy. It is important that you and your baby get everything you need through good nutrition.	Fish is a healthy food choice in pregnancy. It is an excellent source of protein, low in saturated fat, high in omega-3 fish oils and an excellent source of iodine.	Fish	Pregnant women	<ul style="list-style-type: none"> <li>GP</li> <li>Midwife</li> <li>Dietitian</li> </ul>	4
Healthy eating for pregnancy and breastfeeding	Web <sup>54</sup> / QLD Govt – Townsville Health Service District /July 2007	Good nutrition is always essential for good health. It is particularly important during pregnancy.	Fish is part of a healthy diet. Seafood is an excellent food to eat regularly during pregnancy as it provides lots of nutrients, including omega-3 fats.	Fish and seafood	Pregnant and breastfeeding women	<ul style="list-style-type: none"> <li>GP</li> <li>Midwife</li> <li>Dietitian</li> </ul>	5
Eating fish during pregnancy	Web <sup>55</sup> / Royal Hospital for Women (NSW)/2006	In general, eating fish is an important part of a healthy diet and should continue to be part of your diet during pregnancy. However, some fish may contain high levels of mercury and it is important not to eat too much of these.	A typical serving of fish is between 80 and 170 grams and pregnant women can safely eat two serves a week of most fish and only 170 grams a week of large fish such as tuna.	Fish	Pregnant women	<ul style="list-style-type: none"> <li>GP</li> <li>Midwife</li> <li>Dietitian</li> <li>CHN</li> </ul>	5
Food safety in pregnancy	Web <sup>56</sup> / Women's Royal Hospital – Vic /Mar 2008	You need to be careful about the foods that you eat and what you drink during pregnancy to ensure that your baby has the best start in life.	Fish is a good source of omega-3 fatty acids, which are needed for brain and nervous tissue development in the baby. Only fish such as salmon, sardines, herring, mackerel and tuna are the best sources. In general one to three serves per week of fish are recommended for all members of the population. However due to possible higher mercury levels, certain types of fish should be limited during pregnancy and breastfeeding.	Fish	Pregnant women	<ul style="list-style-type: none"> <li>GP</li> <li>Midwife</li> <li>CHN</li> </ul>	5

Resource title	Format/ Source/Date	Key Message	Key information	Healthy diet description	Target audience	Likely to be used by	Cred.
Eating for two: Healthy eating and pregnancy	HC/WA Dept of Health/ 2004	Contrary to popular belief, eating for two is not an excuse to fill up on just any food that takes your fancy. You do have increased nutrition because your food must provide all the nutrients for the baby as well. It is important to eat the right amounts of healthy foods.	Fish is part of a healthy diet during pregnancy. Eat fish two to three times a week.	Fish	Pregnant women	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Midwife</li> <li>▪ Dietitian</li> </ul>	5
Eating well in pregnancy	HC/ Women's and Children's Hospital, Children, Youth and Women's Health Service (SA)/ Feb 2004	Healthy eating during pregnancy is important to give your baby a healthy start.	Fish is a good source of iron and fish with bones are a good source of calcium. Eating two to three serves of most types of fish a week is recommended.	Fish	Pregnant women	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Midwife</li> <li>▪ Dietitian</li> </ul>	5
Preparing for pregnancy	HC/ Women's and Children's Hospital, Children, Youth and Women's Health Service (SA)/ Dec 2002	There are things that you can do before and during pregnancy to give your baby a healthier start. The sooner you start the better.	Fish is part of a healthy diet when planning to get pregnant.	Fish	Women planning to get pregnant	<ul style="list-style-type: none"> <li>▪ GP</li> </ul>	5
Preconception Health	PDF on web <sup>57</sup> / Women's Health QLD Wide/May 2007	Pregnancy is a major life event and places many demands on a woman's body. The time before pregnancy is therefore, an ideal period to prepare for pregnancy and parenthood. Making changes to one's life at this time can help reduce problems during pregnancy and assist in recovery from birth.	While women planning a pregnancy can include fish as a part of a healthy diet they do need to limit their intake of fish types that may have higher levels of mercury. Fish is a good source of iron and calcium.	Fish	Women planning to get pregnant	<ul style="list-style-type: none"> <li>▪ GP</li> <li>▪ Midwife</li> <li>▪ Dietitian</li> <li>▪ CHN</li> </ul>	5

Table 4.10: Websites associated with resources reviewed

1. [www.arthritisaustralia.com.au](http://www.arthritisaustralia.com.au)
2. [www.betterhealthchannel.vic.gov.au](http://www.betterhealthchannel.vic.gov.au)
3. <http://www.mydr.com.au/default.asp?article=3105>
4. <http://www.mhcs.health.nsw.gov.au/mhcs/index.html>
5. [www.qldcancer.com.au](http://www.qldcancer.com.au)
6. [www.actcancer.org](http://www.actcancer.org)
7. <http://www.cancercouncil.com.au/editorial.asp?pageid=361>
8. [www.cancervic.org.au](http://www.cancervic.org.au)
9. <http://www.dhsv.org.au/content.asp?z=3&c=9&p=159>
10. [www.diabetesaustralia.com.au](http://www.diabetesaustralia.com.au)
11. [www.diabetes.com.au](http://www.diabetes.com.au)
12. <http://www.health.qld.gov.au/nutrition>
13. <http://www.csiro.au/resources/ps8k.html>
14. [www.heartfoundation.com.au](http://www.heartfoundation.com.au)
15. [http://www.goredforwomen.com.au/care\\_for\\_your\\_heart/nourish\\_your\\_heart.htm](http://www.goredforwomen.com.au/care_for_your_heart/nourish_your_heart.htm)
16. <http://www.mydr.com.au/default.asp?article=3105>
17. <http://www.mydr.com.au/default.asp?article=3102>
18. <http://www.mydr.com.au/default.asp?Article=4119>
19. <http://www.mydr.com.au/default.asp?article=2468>
20. <http://nrdgp.org.au/directory/documents/23/cholesterol.pdf>
21. <http://www.health.nsw.gov.au/topics/bloodpressure.html>
22. <http://www.health.nsw.gov.au/topics/cardiovascular.html>
23. <http://www.mhcs.health.nsw.gov.au/>
24. [http://www.nutritionaustralia.org/food\\_facts/faq/summary\\_cholesterol\\_faq.asp](http://www.nutritionaustralia.org/food_facts/faq/summary_cholesterol_faq.asp)
25. <http://www.victorchang.com.au/public/HelpingYourHeart.cfm?cid=34>
26. [www.chdf.org.au](http://www.chdf.org.au)
27. <http://www.cyh.com/HealthTopics/HealthTopicDetails.aspx?p=240&np=297&id=1998>
28. [http://www.choice.com.au/viewArticle.aspx?id=103594&catId=100406&tid=100008&p=1&title=Healthy+eating+guidelines+\(archived\)](http://www.choice.com.au/viewArticle.aspx?id=103594&catId=100406&tid=100008&p=1&title=Healthy+eating+guidelines+(archived))
29. [www.adgp.com.au](http://www.adgp.com.au)
30. <http://www.dhhs.tas.gov.au/healthyliving/nutrition/>
31. <http://www.daa.asn.au/index.asp?PageID=2145834407>
32. <http://www.daa.asn.au/index.asp?PageID=2145834482>
33. [www.jeanhailes.org.au](http://www.jeanhailes.org.au)
34. <http://www.mydr.com.au/default.asp?Article=382>
35. [http://www.49.com.au/index.php?option=com\\_content&task=view&id=66&Itemid=19](http://www.49.com.au/index.php?option=com_content&task=view&id=66&Itemid=19)
36. <http://www.mhcs.health.nsw.gov.au/>
37. [http://www.nutritionaustralia.org/Food\\_Facts/FAQ/omega3\\_faq.asp](http://www.nutritionaustralia.org/Food_Facts/FAQ/omega3_faq.asp)
38. [http://raisingchildren.net.au/articles/choosing\\_good\\_food.html](http://raisingchildren.net.au/articles/choosing_good_food.html)
39. [www.racgp.org.au](http://www.racgp.org.au)
40. [http://www.wafic.org.au/enjoy\\_seafood/health\\_benefits.phtml](http://www.wafic.org.au/enjoy_seafood/health_benefits.phtml)
41. <http://www.womhealth.org.au/studentfactsheets/nutrition.htm>
42. <http://www.daa.asn.au/index.asp?PageID=2145834416>
43. [http://www.osteoporosis.org.au/osteop\\_prevention\\_calcium.php](http://www.osteoporosis.org.au/osteop_prevention_calcium.php)
44. [www.osteoporosis.org.au](http://www.osteoporosis.org.au)
45. <http://www.womhealth.org.au/studentfactsheets/osteoporosis.htm>
46. <http://www.cyh.com/HealthTopics/HealthTopicDetails.aspx?p=114&np=304&id=1964>
47. <http://www.health.gov.au/internet/healthyactive/publishing.nsf/Content/pregnant-women>
48. <http://www.health.sa.gov.au/PREGNANCY/DesktopDefault.aspx?tabid=45>
49. <http://www.health.vic.gov.au/maternity/>
50. <http://www.foodstandards.gov.au/>
51. <http://www.foodauthority.nsw.gov.au/consumer/pregnancyanswers.asp>
52. <http://www.foodauthority.nsw.gov.au/>
53. <http://www.health.qld.gov.au/nutrition>
54. [http://www.health.qld.gov.au/townsville/tour\\_baby/pregnancy4.asp](http://www.health.qld.gov.au/townsville/tour_baby/pregnancy4.asp)
55. <http://www.sesiahhs.health.nsw.gov.au/rhw/default.asp?page=449&template=6&leftnav=54>
56. <http://www.thewomens.org.au/Foodsafetyduringpregnancy>
57. <http://www.womhealth.org.au/factsheets/preconception.htm>

Table 4.13: Nutritional composition of very high fat (>1.5%) seafood.

Very high fat seafood (>1.5%)		Serving size	EPA/DHA serving size	EPA/DHA	Hg	Mg	Zn	Se	Vit D	Ca
<b>Unprocessed</b>	Bream (raw)	150	1100	1100		49	1.0		1.54	37
	Bream (cooked in canola oil)	120	880	1100		39	0.8		1.54	37
	Bream (baked in foil, steamed)	170	1247	1100		55	1.1		1.54	37
	Finfish (baked, grilled, cooked in oil)	120	880	1100	0	44	0.7		4.46	42
	Mullet, yelloweye (baked, grilled)	120	800	1000		27	1.1		0.13	64
	Mussel, green (steamed or boiled)	170	1133	1000		56	4.0	86	0.12	260
	Oyster (baked, grilled)	100	667	1000		43	56.8		0.14	174
	Anchovy (canned in oil, drained)	30	231	1154		14	0.6		2.08	167
	Bream (battered, crumbed, fried in oil)	70	404	866		26	0.6		1.22	55
	Fish paste or spread	25	202	1211		7	0.3		0.18	660
	Fish, roe (caviar), black	25	377	2261		5	1.7		5.85	15
	<b>Processed</b>	Fish, roe (caviar), red	25	701	4206		41	2.1		
Mussel smoked (canned in oil, drained)		100	840	1260		98	3.7			102
Oyster smoked (canned in oil, drained)		100	1368	2052		80	14.7			63
Sardines (canned in tomato sauce)		100	882	1323		39	2.4		12.00	645
Silver perch (crumbed, fried in oil)		70	711	1523		23	0.6		8.24	60
Trout, rainbow (battered, crumbed, cooked in oil)		70	717	1536		21	0.5		7.65	69

Table 4.14: Nutritional composition of medium fat ( $\leq 0.6\%$ ) seafood.

Medium fat seafood ( $\leq 0.6\%$ )										
	Serving size	EPA/DHA serving size	EPA/DHA	Hg	Mg	Zn	Se	Vit D	Ca	
<b>Unprocessed</b>										
Bream (fried in peanut oil)	120	629	786		43	1.0			56	
Clam (boiled in unsalted water)	100	521	782		39	4.1		0.12	29	
Milkfish, aquacultured, steamed or poached	170	1061	936	554	46	1.6	1.2	11.93	56	
Mullet, yelloweye (raw)	150	596	596		52	1.8		0.18	56	
Mullet, yelloweye (steamed)	170	675	596		36	1.3	0.14	0.20	63	
Mullet, yelloweye (cooked in oil/fried)	120	476	596		34	1.3	0.14	45	28	
Mulloway (baked, grilled, cooked in oil)	120	405	507	0			0.7			
Oyster (raw)	100	549	824		49	64.8		0.12	132	
Salmon, smoked, sliced	12	62	770		3	0.0		0.81	1	
Scallop (raw)	150	539	539		64	5.1		0.18	45	
Scallop (boiled)	170	610	539		73	5.8	0.20	50	39	
Scallop (fried)	120	431	539		51	4.1	0.14	36	42	
Silverperch, aquacultured (baked, grilled, cooked in oil)	120	1510	1887		34	0.9	9.38		56	
Silverperch, aquacultured (raw)	150	1887	1887	948	36	0.9			12.68	
Silverperch, aquacultured (steamed, poached)	170	2139	1887	1265	43	1.2			13.52	
Snapper (steamed)	170	352	311		53	1.2	196	0.20	170	
Snapper (fried in olive or canola oil)	120	248	311		0	0.9	138	0.14	120	
Squid, calamari (steamed, baked, grilled, cooked in oil)	100	241	362		42	1.5		0.13	13	
Fish, battered, deep fried, purchased, ready to eat	70	193	413		16	0.3	24	0.12	14	
Fish, curry, creamy sauce, curry powder, tandoori style	200	780	585		61	1.2		4.53	118	
Finfish, battered, crumbed (baked, grilled, cooked in oil or butter)†	70	280	600		25	0.4		0.13	29	
Fish pasta bake, patty, cooked, grilled	200	536	402		49	1.9		1.54	136	
Flathead, not crumbed, flesh only (deep fried in solid frying fat)	100	413	620		25	0.5		0.47	39	
Marinara mix, with fish and shellfish (fresh, raw, poached, steamed)	100	517	776		37	1.0		1.58	50	
Mullet, yelloweye (crumbed/battered, fried)	70	303	650		26	0.8		0.09	42	
Salmon, smoked sliced	12	62	770		3	0.0			1	
Scallops, crumbed/battered, deep fried	100	406	609		47	2.1	1	0.12	37	
Snapper (battered, crumbed, fried in oil, baked, grilled)	70	167	359		27	0.5		0.48	67	
Squid, calamari (crumbed, fried, frozen, take-away)	100	248	372		42	1.4	23	4.17	24	
Tuna (flavoured, canned in water/brine/oil, drained)	95	246	389		26	0.8	51	1.36	7	

Table 4.15: Nutritional composition of low fat (<0.25%) seafood.

	Low Fat (<0.25%)	Serving size (g)	EPA/DHA serving size	EPA/DHA	Hg	Mg	Zn	Se	Vit D	Ca
<b>Unprocessed</b>										
Barramundi (raw)	150	320	320	67	53	0.8	0.8	1.15	67	
Barramundi (steamed, poached)	170	363	320	76	60	0.9	0.9	1.30	76	
Barramundi (baked, grilled, cooked in oil)	120	256	320	54	42	0.6	0.6	0.92	54	
Basa (raw)	150	100	100	53	53	0.7	0.7	1.19	68	
Basa (steamed, poached)	170	113	100	100	60	0.8	0.8	1.35	77	
Basa (baked, grilled, cooked in olive oil)	120	80	100	100	42	0.6	0.6	0.95	54	
Cod (smoked)	120	362	453	28	32	0.6	0.6	0.14	0	
Cod (steamed, poached)	170	513	453	39	46	0.9	0.9	0.20	0	
Crab (various types, fresh only, boiled or steamed)	100	112	168	100	25	4.7	4.7	0.12	120	
Flathead (raw)	150	340	340	340	52	1.1	1.1	2.50	96	
Flathead (steamed)	170	385	340	340	59	1.2	1.2	2.83	109	
Flathead (baked, grilled, cooked in oil)	120	272	340	340	41	0.8	0.8	2.00	77	
Lobster (purchased steamed or boiled)	170	303	267	68	68	5.4	5.4	0.20	77	
Prawns (garlic, king, baked, grilled, raw)	100	147	220	58	58	1.5	1.5	0.13	116	
Shark (raw)	150	66	66	88	43	0.5	0.5	0.19	11	
Shark (steamed)	170	74	66	100	49	0.6	0.6	0.21	13	
Shark (baked, grilled, cooked in oil)	120	53	66	70	35	0.4	0.4	0.15	9	
Snapper (fried in peanut oil)	120	248	310	40	40	0.8	0.8	154	34	
Tilapia (raw) †	150	170	170	170	37	0.9	0.9	13.05	46	
Tilapia (steamed, poached) †	170	192	170	170	42	1.1	1.1	14.79	52	
Trevally, dory, ling, flounder or sole (raw)	150	266	266	61	61	0.6	0.6	1.38	19	
Trevally, dory, ling, flounder or sole (steamed, poached)	170	301	266	69	69	0.6	0.6	1.56	21	
Trevally, dory, ling, flounder or sole (baked, grilled, cooked in oil)	120	212	266	120	49	0.4	0.4	1.10	15	
Tuna, yellowfin (raw)	150	365	365	81	81	0.8	0.8	4.97	26	
Tuna, yellowfin (grilled, cooked in oil)	120	292	365	65	65	0.7	0.7	3.97	20	
Whiting, king george (raw)	150	173	173	46	46	0.9	0.9	0.18	26	
Whiting, king george (steamed)	170	196	173	173	52	1.0	1.0	0.20	63	
Whiting, king george (cooked in oil)	120	138	173	37	37	0.7	0.7	0.14	45	
Basa (crumbed, baked, grilled, fried)	70	39	84	84	30	0.5	0.5	0.48	38	
Cod (smoked, raw)	100	180	270	270	27	0.3	0.3	0.00	0	
Crabmeat (canned in brine)	100	110	165	165	30	2.0	2.0	0.13	145	
Fishcake (crumbed, frozen, baked; take-away shop)	100	180	270	28	28	0.6	0.6	39	81	
Fishfingers (crumbed, frozen, fried, cooked, baked)	100	157	236	25	25	0.5	0.5	42	30	
Fish, crumbed, frozen (baked, fried, cooked in oil)	70	102	219	19	19	0.3	0.3	30	17	
Flathead, crumbed/floured (cooked in oil/butter)	70	111	237	26	26	0.6	0.6	0.61	48	
Prawn (toast, crumbed, curry, garlic, king, stir-fry)	100	82	123	44	44	1.4	1.4	0.11	107	
Seafood extender or fish sticks (frozen, cooked in oil, battered)	70	7	15	7	7	0.2	0.2	0.06	41	
Tuna, canned, with mayonnaise	95	176	278	6	6	0.2	0.2	0.49	5	
Tuna, canned, sandwich (shredded), undrained in oil	95	182	288	16	16	0.5	0.5	5	5	
Whiting, king george (flesh only, crumbed/floured, cooked in oil)	70	73	156	27	27	0.7	0.7	0.12	35	



Table 4.24: Average intake for the 14 day meal planners.

	Pregnancy	CHD-females	CHD-males	Diabetes	Arthritis	Cancer
Energy (kJ)	7512.9	7261.5	8180.8	7684.0	8247.6	8012.0
Protein (g)	89.3	83.6	99.6	95.5	101.5	93.2
Total fat (g)	50.8	48.2	54.8	55.1	58.6	51.7
Saturated fat (g)	16.7	14.3	17.9	18.5	20.4	16.5
Polyunsaturated fat (g)	9.2	10.2	11.5	11.2	11.7	10.4
Monounsaturated fat (g)	20.0	19.2	20.2	19.9	20.9	19.6
Cholesterol (mg)	200.1	189.2	250.3	252.7	263.5	241.8
Carbohydrate (g)	233.6	222.3	245.5	214.9	236.0	245.0
Sugars (g)	150.7	138.4	146.9	109.1	140.9	140.3
Starch (g)	78.4	97.9	93.9	99.2	90.8	100.3
Water (g)	1512.6	1473.6	1646.4	1574.0	1661.1	1643.3
Alcohol (g)	1.3	5.3	4.3	5.7	5.9	6.2
Dietary fibre (g)	28.6	28.5	33.7	34.2	34.5	33.6
Thiamin (mg)	1.4	1.3	1.6	1.6	1.6	1.6
Riboflavin (mg)	2.7	2.5	3.0	2.7	2.9	2.9
Niacin (mg)	18.0	18.3	22.1	21.3	21.7	21.6
Niacin equivalents (mg)	35.7	34.6	42.2	40.3	42.3	39.9
Vitamin C (mg)	139.1	122.2	147.9	142.6	156.2	177.2
Total folate (dietary folate equivalents) (µg)	374.6	348.6	399.4	381.9	400.6	413.2
Total vitamin A equivalents (µg)	1417.5	1400.7	1591.5	1345.6	1836.8	1985.1
Retinol (µg)	204.3	189.0	240.6	260.2	263.1	224.5
Beta carotene equivalents (µg)	7245.8	7294.8	8075.0	6487.9	9415.6	10534.7
Sodium (mg)	2425.0	2205.9	2590.8	2549.0	2604.1	2609.5
Potassium (mg)	3874.0	3875.0	4362.7	4162.0	4409.4	4376.9
Magnesium (mg)	363.5	357.4	420.8	416.4	439.2	406.1
Calcium (mg)	1247.3	1119.9	1294.2	1164.5	1387.7	1214.6
Phosphorus (mg)	1730.6	1646.0	1940.6	1824.0	1989.7	1849.1

Table 4.25: Suggested Dietary Targets for 14 day meal planners.

	Pregnancy	CHD-females	CHD-males	Diabetes	Arthritis	Cancer
Iron (mg)	12.2	11.7	13.9	13.5	14.0	13.8
Zinc (mg)	11.7	13.5	13.3	12.6	13.8	20.0
Trans fatty acids (g)	0.09	0.09	0.04	0.03	0.05	0.05
Omega-6s (g)	7.43	7.17	9.32	5.97	8.53	9.54
Omega-3s (g)	1.55	1.70	1.76	0.88	1.41	1.25
Very long chain omega-3s (g)	0.37	0.65	0.56	0.37	0.62	0.59
Linoleic acid	7.32	7.03	9.20	5.91	8.43	9.41
$\alpha$ -linolenic	1.17	1.05	1.21	0.51	0.79	0.66
EPA (g)	0.10	0.18	0.17	0.10	0.21	0.18
DPA (g)	0.09	0.15	0.10	0.07	0.10	0.10
DHA (g)	0.18	0.33	0.28	0.20	0.31	0.32
% Total Fat	25.44	25.00	25.21	27.00	26.71	24.29
% Saturated fat	8.35	7.41	8.22	9.07	9.31	7.75
% CHO	52.00	51.19	50.18	46.76	47.85	51.12
% Protein	19.86	19.25	20.36	20.79	20.57	19.45

Table 4.26: Recommendations of EPA+DHA serves by condition.

EPA+DHA recommendation	Number of serves			Total/fortnight (g)
	Very high fat	High fat	Medium fat	
CHD-females	1.4	0.9	1	430
Pregnancy	1	1	1	400
200mg DHA/day				
200mg DHA/day	2	0	0	200

Table 4.27: Number of serves of seafood required to meet EPA+DHA recommendations.

EPA+DHA recommendation	Total no. of serves			Total/fortnight (g)
	Very high fat	High fat	Medium fat	
CHD-females	3	0	0	0
	4	0	0	1
	5	3	0	0
	5	0	0	2
Pregnancy	4	1	0	0
	5	2	0	0

Table 4.28: Diabetes/Arthritis Males: Number of serves and % contribution for energy and nutrients for each of the food groups.

	Breads & cereals	Veg	Fruit	Milk, yoghurt, cheese	Seafood	Meat & alt	Nuts & seeds	Fats & oils	Extras
Serves/day	6	5	2.5	2.5	2.3 (70g)	2.5	0.5	1	1
% contribution: Energy	33	8	9	16	7	9	5	5	7
Protein	20	9	3	23	18	21	3	0	4
Saturated fat	13	1	0	34	11	11	6	9	14
Fibre	34	28	19	1	0	10	4	0	2
Iron	30	22	9	4	12	17	4	0	4
Zinc	25	12	5	18	12	20	5	0	4
Calcium	10	10	4	61	6	5	1	0	2

Table 4.29: Diabetes/Arthritis Males: Recommendations, average AMDR from simulation, and % of people who would meet the lowest AMDR recommendation.

	CHO	Protein	Fat	Saturated fat
AMDR recommendations	45-65%	10-35%	20-35%	
Average AMDR	48%	19%	27%	8.5%
% meeting lowest AMDR	77%	100%	96%	

Table 4.30: Diabetes/Arthritis Males: Average energy and nutrient intakes, and % of people who would meet nutrient recommendations.

	Energy (kJ)	Protein (g)	CHO (g)	Fat (g)	Sat fat (g)	PUFA (g)	MUFA (g)	Fibre (g)	Thiamine (mg)	Niacin equiv. (mg)	Vit A equiv. (ug)
Average intake	8398	99.6	242.8	61.1	18.9	14.3	22.3	40.1	1.4	40.0	1300.0
RDI		100%						94%	67%	100%	79%
EAR									98%	100%	92%

Table 4.31: Diabetes/Arthritis Males RDI: Recommended Dietary Intake; EAR: Estimated Average Requirement.

	Sodium (mg)	Calcium (mg)	Iron (mg)	Zinc (mg)	n-3	Long-chain fatty acids (EPA+DHA+DPA)	ALA (g)
Average intake	2014	1130	15.2	14.2	1.38	0.7	0.79
RDI		79%	100%	46%		69% (610mg/day)	16%
EAR		94%	100%	84%		89% (500mg/day)	

Table 4.32: Pregnancy Option 1. Number of serves and % contribution for energy and nutrients for each of the food groups.

Serves/day	Breads & cereals	Veg	Fruit	Milk, yoghurt, cheese	Seafood	Meat & alt	Fats & oils	Extras
	5	5	3	3.5	1.5	2.5	1	1
% contribution:								
Energy	26	8	9	23	4	16	5	10
Protein	16	8	2	31	10	20	0	12
Fat	5	1	1	17	5	37	15	20
Fibre	29	33	21	0	0	13	0	4
Folate	38	32	5	15	2	7	0	0
Iron	29	30	10	2	8	11	0	10
Zinc	26	13	4	22	3	15	0	16
Calcium	1	15	4	71	3	5	0	1

Table 4.33: Pregnancy Option 1: Recommendations, average AMDR from simulation, and % of people who would meet the lowest AMDR recommendation.

AMDR recommendations	CHO	Protein	Fat	Saturated fat
Average AMDR	45-65%	10-35%	20-35%	
% meeting lowest AMDR	48	18	29	10
	79%	100%	96%	

Table 4.34: Pregnancy Option 1: Average energy and nutrient intakes, and % of people who would meet nutrient recommendations.

Average intake	Energy (kj)	Protein (g)	CHO (g)	Fat (g)	Sat fat (g)	PUFA (g)	MUFA (g)	Fiber (g)	Thiamine (mg)	Niacin equiv. (mg)	Vit A equiv. (ug)
RDI	8454	90.1	245.2	66.3	21.5	14.9	24.3	38.7	1.5	2.5	1530.8
EAR		100%						90%	56%	99%	91%
		100%						95%	79%	99%	

Table 4.35: Pregnancy Option 1 : Recommended Dietary Intake (RDI): Estimated Average Requirement (EAR).

Average intake	Folate equiv. (ug)	Sodium (mg)	Calcium (mg)	Iron (mg)	Zinc (mg)	n-3 (g)	Long chain n3 (g)	ALA (g)	DHA (mg)
RDI	372.8	1831	1326	13.7	12.4	1.14	0.485	0.75	250
EAR	2%	94%	99%	0%	77%	100% (1150mg)	100% (NHMRC AI: 115mg/d)	99%	77% (200mg/d)
	35% (400ug)			4% (18mg)	98%				0.5% (400mg/d)

Table 4.36: Pregnancy Option 2: Number of serves and % contribution for energy and nutrients for each of the food groups.

Serves/d	Breads & cereals	Veg	Fruit	Milk, yoghurt, cheese	Seafood	Meat & alt	Fats & oils	Extras
	5	5	3	3	1.5	2.5	1	1
% contribution:								
Energy	27	8	9	21	5	15	5	10
Protein	16	8	2	31	10	20	0	12
Fat	4	1	1	16	7	35	15	20
Fiber	29	33	21	0	0	13	0	4
Folate	38	32	5	15	2	7	0	0
Iron	29	30	10	2	8	11	0	10
Zinc	26	13	4	21	4	15	0	16
Calcium	1	15	4	69	4	5	0	1

Table 4.37: Pregnancy Option 2: Recommendations, average AMDR from simulation, and % of people who would meet the lowest AMDR recommendation.

	CHO	Protein	Fat	Saturated fat
AMDR recommendations	45-65%	10-35%	20-35%	
Average AMDR	48%	18%	30%	9%
% meeting lowest AMDR	69%	100%	98%	

Table 4.38: Pregnancy Option 2 Average energy and nutrient intakes, and % of people who would meet nutrient recommendations.

Energy (kj)	Protein (g)	CHO (g)	Fat (g)	Sat fat (g)	PUFA (g)	MUFA (g)	Fiber (g)	Thiamine (mg)	Niacin equiv. (mg)	Vit A equiv. (ug)
Average intake	87.8	235.8	60.8	20.7	15.7	24.6	37.4	2.3	205.2	1488
RDI	100%									
EAR	100%									

Table 4.39: Pregnancy Option 2 : Recommended Dietary Intake (RDI); Estimated Average Requirement (EAR).

Folate equiv. (ug)	Sodium (mg)	Calcium (mg)	Iron (mg)	Zinc (mg)	n-3 (g)	Long chain n3 (g)	DHA (mg)	ALA (g)
Average intake	1768	1241	13.4	11.8	1.25	0.585	300	0.75
RDI	1%							
EAR	30% (400ug)							

Table 4.40: Females CHD Option 1: Number of serves and % contribution for energy and nutrients for each of the food groups.

Serves/d	Breads & cereals	Veg	Fruit	Milk, yoghurt, cheese	Seafood	Meat & alt	Nuts & seeds	Fats & oils	Extras
	4.5	5	2.5	2.5	1.5	2.0	0.5	1	1
% contribution:									
Energy	29	8	10	19	5	8	6	6	8
Protein	18	10	4	29	11	20	4	0	4
Saturated Fat	11	1	0	39	8	10	6	10	16
Fibre	30	29	22	1	0	8	4	0	2
Folate	17	43	7	13	2	14	3	0	2
Iron	27	24	10	5	10	16	4	0	5
Zinc	18	14	6	24	7	21	6	0	5
Calcium	7	10	5	66	5	4	1	0	2

Table 4.41: CHD Females Option 1: Recommendations, average AMDR from simulation, and % of people who would meet the lowest AMDR recommendation.

	CHO	Protein	Fat	Saturated fat
AMDR recommendations	45-65%	10-35%	20-35%	
Average AMDR	48%	19%	29%	8.8%
% meeting lowest AMDR	74%	100%	98%	

Table 4.42: CHD Females Option 1: Average energy and nutrient intakes, and % of people who would meet nutrient recommendations.

	Energy (kj)	Protein (g)	CHO (g)	Fat (g)	Sat fat (g)	PUFA (g)	MUFA (g)	Fiber (g)	Thiamine (mg)	Niacin equiv. (mg)	Vit A equiv. (ug)
Average intake	7528	84.2	216.4	57.7	17.6	14.0	21.1	36.3	1.4	33.3	1207
RDI	100%	100%						97% (25g AI)	79% (1.1mg)	100% (14mg)	81% (700ug)
EAR	100%	100%							96% (0.9mg)	100% (11mg)	96% (500ug)

Table 4.43: CHD Females Option 1: Recommended Dietary Intake (RDI); Estimated Average Requirement (EAR).

	Folate equiv. (ug)	Sodium (mg)	Calcium (mg)	Iron (mg)	Zinc (mg)	n-3 (g)	Long chain n3 (g)	ALA (g)
Average intake	353.9	1753	1114	13.1	11.3	1.22	0.55	0.74
RDI	27% (400ug)		73% (1000mg)	3% (18mg)	99% (8mg)	100% (1150mg)	79% (430mg/d CHD recom.)	28% (0.8g)
EAR	56% (320ug)		12% / 52% (1300; 1100)	99% (8mg)	100% (6mg)		100% (NHMRC AI: 90mg/d)	



Table 4.44: CHD Females Option 2: Number of serves and % contribution for energy and nutrients for each of the food groups.

Serves/d	Breads & cereals	Veg	Fruit	Milk, yoghurt, cheese	Seafood	Meat & alt	Nuts & seeds	Fats & oils	Extras
	4.5	5	2.5	2.5	1.9	1.5	0.5	1	1
% contribution:									
Energy	29	9	10	6	19	7	6	6	8
Protein	18	10	4	29	15	16	4	0	4
Saturated Fat	11	2	0	39	9	8	6	10	16
Fiber	30	29	22	1	0	7	4	0	2
Folate	17	44	7	13	2	11	3	0	2
Iron	28	25	11	5	9	14	4	0	5
Zinc	19	15	6	24	9	17	6	0	5
Calcium	7	10	5	66	5	4	1	0	2

Table 4.45: CHD Females Option 2: Recommendations, average AMDR from simulation, and % of people who would meet the lowest AMDR recommendation.

AMDR recommendations	CHO	Protein	Fat	Saturated fat
Average AMDR	45-65%	10-35%	20-35%	
% meeting lowest AMDR	48%	19%	29%	9%
	71%	100%	99%	

Table 4.46: CHD Females Option 2: Average energy and nutrient intakes, and % of people who would meet nutrient recommendations.

Energy (kJ)	Protein (g)	CHO (g)	Fat (g)	Sat fat (g)	PUFA (g)	MUFA (g)	Fibre (g)	Thiamine (mg)	Niacin equiv. (mg)	Vit A equiv. (ug)
Average intake	83.8	212.2	57.2	17.7	13.3	21.2	36.0	1.3	33.4	1193
RDI	100%					97% (25g AI)		76% (1.1mg)	100% (14mg)	77% (700ug)
EAR	100%							95% (0.9mg)	100% (11mg)	94% (500ug)

Table 4.47: Females CHD Option 2: Number of serves and % contribution for energy and nutrients for each of the food groups.

Folate equiv. (ug)	Sodium (mg)	Calcium (mg)	Iron (mg)	Zinc (mg)	n-3 (g)	Long chain n3 (g)	ALA (g)
Average intake	338.6	1674	1108	12.5	11.1	1.22	0.74
RDI	22% (400ug)		73% (1000mg)	3% (18mg)	99% (8mg)	100% (1150mg)	79% (430mg/d CHD recom.)
EAR	53% (320ug)		12% / 52% (1300; 1100)	99% (8mg)	100% (6mg)	100% (NHMRC AI: 90mg/d)	28% (0.8g)

Table 4.48: Other simulations of seafood options for 14 day menus for CHD females.

	Number of serves	Very high fat	High fat	Medium fat	Low fat	Long chain n-3 (430mg/d)	Serves/day	g/day
CHD-females	5	3 (x120g)	0	0	2 (90/120g)	59%	1.5	45g
CHD-females	6	2 (x120g)	2 (90/120)	1 (90)	1 (120g)	63%	1.6	48g
CHD-females	7	2 (x120g)	2 (x90g)	2 (90/120g)	1 (120g)	69%	1.8	54g
CHD-females	7	2 (x120g)	1 (90g)	3 (90/2x120)	1 (120g)	63%	1.9	57g

## Section 5 Appendices

### Point of sale consumer messages



Table 5.1. Health messages relating to fish/seafood - Specific benefits of fish (SBS)

Product	Source	Health Message	Format /Placement	Can be taken away	Locations	Rating
Basa Fish	Seafood Importers Association of Australia	Basa is high in protein and low in fat. In general, those who consume fish on a regular basis live longer and healthier lives. The Heart Foundation recommends two servings of fish per week.	Pamphlet (includes recipe)/Deli counter	Yes	1 (Major)	SBS

Table 5.2. Health messages relating to fish/seafood - General benefits of Fish (GBS)

Product	Source	Health Message	Format /Placement	Can be taken away	Locations	Rating
Tasmanian Pacific Oysters	TASEA	Oysters offer great nutritional value - less fat and calories than most other animal products. Compared to other protein sources oysters have high levels of essential minerals.	Pamphlet /Checkout	Yes	1 (Fish retailer)	GBS
Fish/ seafood	Retailer's own	'Healthy for you: Fresh Fish and Seafood'	Store Signage /Sausages	No	1 (Ind.)	GBS
Fish/ seafood	Handmade	'Healthy heart needs fish'	Handmade sign /On counter, near scales	No	1 (Fish retailer)	GBS
Fish/ seafood	WA Fishing Industry Council	'Live Longer Eat Seafood'	Poster /On wall, near counters	No	3 (Fish retailer)	GBS
Fish	Unknown	'Large serves of chicken, pork and fish are a great alternative to red meat'	Large sticker /Fish counter	No	1 (Ind.)	GBS
Fish	Retailer's own	Eat fish.... Stay healthy	Large sign /Outside shop	No	1 (Fish retailer)	GBS

Table 5.3. Health messages relating to fish/seafood - Specific benefits of Omega 3 (SBO)

Product	Source	Health Message	Format / Placement	Can be taken away	Locations	Rating
Salmon	Tasmanian Salmon	'Healthy Fast Food', 'Healthy meal ideas' - recipes. A circle with a tick inside states that Tasmanian Salmon is rich in Omega 3s.	Recipe card /Counter	Yes	1 (Fish retailer)	SBO
Salmon	Tasmanian Salmon	'Easy Does it Summer' - States that Omega 3 helps prevent coronary heart disease, arthritis and other disorders, and that salmon contains 10 to 100 times greater levels of Omega 3 than chicken or lamb.	Pamphlet /Counter	Yes	1 (Fish retailer)	SBO
Salmon	Huon Aquaculture Group	'Deliciously Healthy - Omega 3's': recipe pamphlet. The pamphlet states that salmon is full of Omega 3 which helps prevent high blood pressure.	Pamphlet /Counter	Yes	1 (Fish retailer)	SBO
Salmon	Huon Aquaculture Group	'Taste Tasmanian Salmon' - recipes. States that Omega 3 helps prevent coronary heart disease, rheumatoid arthritis and other disorders, and that salmon contains 10 to 100 times greater levels of Omega 3 than chicken or lamb.	Pamphlet /Counter	Yes	1 (Fish retailer)	SBO
Oily fish	The Master Fish Merchants Association of Australia	'Fresh oily fish is associated with reduced asthma risk in children' - reporting on findings from a study which shows that oily fish reduces asthma risk in children (however not canned or oily fish). The pamphlet gives some brief asthma statistics and describes which fish are oily fish.	Pamphlet /Checkout, wall	Yes	1 (Fish retailer)	SBO
Fish/ seafood	CSIRO, Fisheries Research and Development Corporation, The Master Fish Merchants Assn. of NSW	Health benefits of Omega 3 - help prevent coronary heart disease, high blood pressure and rheumatoid arthritis, may also be beneficial for the infant brain and retina function and development. List of levels of Omega 3 found in foods, with fish at the top of the list (no specific fish named).	Pamphlet /Checkout, wall	Yes	1 (Fish retailer)	SBO
Fish/ seafood	Australian Seafood Industry Council/ Australian Government Fisheries Research and Development Corporation	'What's so Healthy About Seafood?' - A number of seafood health benefits outlined. Seafood is low in kilojoules, saturated fats and cholesterol, and high in Omega fats, vitamins and minerals. Omega fats are described as being important for health and life. Omega 3 is described as being vital during pregnancy for foetal brain development and vision, as well as maintaining a healthy heart and immune system. Omega 3 has been shown to benefit conditions such as diabetes, some cancers, childhood asthma, obesity and arthritis. The Australian Dietary Guidelines advise the consumption of 1-2 fish based meals a week.	Pamphlet / Refrigerated fish/ Shop counter	Yes	4 (3 Fish retailer, 1 ind.)	SBO
Fish/ seafood	Retailer's own	Information on beneficial oils.	Touch scrn. info kiosk /Set in wall	No	1 (Fish retailer)	SBO
Fish/ seafood	The West Australian Newspaper	Newspaper article on health benefits of Omega 3. Research has shown that Australians are not eating enough. They are essential to keep the eyes, brain and heart in good health.	Article cut out from newspaper /Wall near checkout	No	1 (Fish retailer)	SBO

Table 5.4. Health messages relating to fish/seafood - General benefits of Omega (GBO)

Product	Source	Health Message	Format / Placement	Can be taken away	Locations	Rating
Salmon	Huon Aquaculture Group	'Summer recipes' no. 5 - 8. States that salmon and trout are a rich source of Omega 3, which make them a healthy choice.	Pamphlet /Refrigerated fish/Checkout	Yes	4 (3 fish retailers, 1 ind.)	GBO
Fish/ seafood	Australian Seafood Industry Council/ Australian Government Fisheries Research and Development Corporation	'What's so great about seafood?' - How to purchase and prepare seafood. Offers information on the best way to cook seafood to maintain health benefits and minimise Omega 3 losses. Also states that cooking seafood with herbs may also benefit health, as they may act as an antioxidant.	Pamphlet /Checkout	Yes	2 (2 fish retailer)	GBO
Fish/ seafood /Refrigerated fish/Checkout	Retailer's own	Omega 3 content of fish/seafood is contained in each fish's 'profile'.	Small laminated card /Refrigerated fish	No	3 (2 fish retailer, 1 ind.)	GBO
Fish/ seafood	Master Fish Merchant's Association of Australia	'Seafood! Eat your way to better health with Omega 3' - recipes.	Recipe cards /On wall, near fridges	Yes	1 (Fish retailer)	GBO

Table 5.5. Seafood Related Messages - Retailer Promotions

Product	Source	Message	Format /Placement	Can be taken away	Locations
Sealords tempura battered noki	Australian Good Taste Magazine (Woolworths)	Product of the Month - win a \$300 gift card	Shelf tag /Frozen fish	No	1 (Major)
Nannygai/ Rock lobster	Action	10 delicious ways to prepare....	Pamphlet /Near counter	Yes	1 (Ind.)
Salmon	Retailer's own	Did you know that 100% of our fresh Salmon is sourced from Tasmania	A4 placard /On counter	No	1 (Major)
Fish/seafood	Retailer's own	Specials - Advertising specific fish/ seafood items (5)/or general seafood (2)	Signage /Deli (5)/Frozen fish (2)	No	6 (Major)
Fish/seafood	Retailer's own	Australia Day & seafood	Banners and flags (2)/ Images on TV (1) /Smoked salmon(1)/Deli (1)/Middle of shop	No	3 (2 major, 1 ind.)
Fish/seafood	Retailer's own	Live Well Spend Less - Images of prawns (4)/Tuna and tomato salad (7)	Posters (4)/Shelf Tag (7)/ Wall, deli counter (4)/ Canned fish (7)	No	8 (major)
Fish service	Retailer's own	We clean, scale and fillet your fish free of charge	A4Poster /Fish counter, on wall	No	2 (Ind.)
Fish/seafood	Retailer's own	All whole fish and local prawns caught in Australian waters	A4 Poster /Fish counter, on wall	No	2 (Ind.)
Fish/seafood	Usually retailers' own	Signage/generic images of fish/seafood	Sign/Poster /Wall behind Deli counter/ Wall behind fish counter	No	16 (13 major, 3 ind., 2 fish retailer)
Seafood	Retailer's own	Generic signage - Seafood season (1)/'Salmon - Aussie seafood' (1)/ Seafood and salad with your BBQ (1)	Shelf tag/small sign /Smoked salmon (1)/ Deli counter (2)	No	3 (Major)
Seafood	Retailer's own	Generic signage - 'Live well spend less' (1)/'Seafood made simple'(2)	Sticker strip /Deli counter/Frozen seafood	No	3 (Major)
Fish	Retailer's own	Live Well Spend Less - Tangy fish salad recipe	Recipe card (2)/ placard with recipe (3) /Deli counter	Yes	5 (Major)

Table 5.6. Seafood Related Messages - Industry Promotions

Product	Source	Message	Format /Placement	Can be taken away	Locations
Fish/ seafood	WA Government Department of Agriculture and Food	Buy West Eat Best	Shelf tag /Fish counter	No	1 (Fish retailer)
Fish/ seafood	Catalano's Seafood Secrets	Promotional material: Meal Matrix - a better way to seafood/Now you will seafood in a different way	Booklet/pamphlet/Near refrigerated fish/Store counter	Yes	3 (1 fish retailer, 1 ind.)
n/a	Seafoodlovers.com.au - WA Fishing Industry Council	Join Seafood Lovers - win a Kailis pearl necklace competition	Comp./membership box & comp./ membership form / Fish counter	Yes	4 (4 ind.)
n/a	Australian Seafood Industry	Australian Seafood Industry 2005 Business of the Year	Poster /Wall behind counter	No	1 (1 ind.)
Crabs	Kimberley Crabs	Kimberley Crabs	Poster	No	1 (Fish retailer)
Prawns	Unknown	Prawn cooking tips/Why import prawns?	A4 placard /Deli counter	No	3 (Major)
Prawns	Wild Banana Prawns	Prawn Recipes	Recipe card (1)/Poster(1) / Counter (1)/Wall (1)	Yes	1 (Fish retailer)
Fish/ seafood	WA Fishing Industry Council	Recipes	Recipe Card (4)/Pamphlet (1) /Near counter/ Refrigerated fish/	Yes	5 (1 major, 1 ind., 3 fish retailer)
Fish/ seafood	Seafood Services Australia	Approved Fish Names - Fish Names Brand Scheme	Pamphlet (2)/Leaflet (2) / Near counter	Yes	2 (2 fish retailer)



Table 5.7. Seafood Related Messages - Fish/seafood products

Product	Source	Message	Format /Placement	Can be taken away	Locations
John West fish/ seafood products	John West	John West.... The Best	Shelf strip /Refrigerated fish	No	7 (Major)
I&J Seafood Platter	I&J	'Nibble on something different'	Small poster /Frozen fish	No	2 (Major)
Rock Lobster	Kailis/Buy West Eat Best	WA Rock Lobster - whole, fresh, cooked	A4 placard /On counter	No	1 (Major)
Salmon	Huon aquaculture group	Huon salmon sold here	Poster/Placard /Wall/Fish counter	No	1 (Fish retailer)
Smoked salmon	Huon aquaculture group	Huon smoked salmon - new pack	Shelf tag /Smoked salmon	No	1 (Fish retailer)
Trout	Retailer's own	Tasmanian Ocean Trout	A4 placard /Fish counter	No	1 (Ind.)
Blue Crabs	Unknown	True Blue Taste Crabs	Poster /Behind fish counter	No	1 (Fish retailer)
Canned salmon	John West	'New salmon tempters'	Shelf tag /Canned fish	No	1 (Major)
Seafood	Nor-West Seafoods Pty Ltd	Ocean caught sea foods info + recipes	Pamphlet /Near counter	Yes	1 (Ind.)

Table 5.8. Seafood Related Messages - Other

Product	Source	Message	Format /Placement	Can be taken away	Locations
Fish/seafood	PETA 2	Fish are friends not food: Go Veg!	Small sticker /On overhead signage	No	1 (Major)
Fish/seafood	The West Australian Newspaper	Fish and seafood recipes	Newspaper pages /Near counter	No	1 (Ind.)

Table 5.9. Non-Seafood Related

Product	Source	Message	Format /Placement	Can be taken away	Locations
Petrol	Retailer's own	Spend \$25 save 4c on petrol	Shelf tag /Canned fish	No	1 (Ind.)
Woolworths Credit Card	Woolworths	Advertisement	Shelf tag /Frozen fish (1)/Canned fish (3)/ Refrigerated Fish (1)	No	4 (Major)
Deli products	Retailer's own	'Easy entertaining' - recipes	Booklet /Deli counter	Yes	2 (Major)
Deli products	Retailer's own	Order platters here/platter order forms (2)/Entertain without lifting a finger	Deli /Poster (2)/Sign/ Booklet (2)	Booklets - yes	4 (Major)
n/a	Retailer's own	New - Give it a go	Shelf tag /Canned fish (4)/ Frozen fish (1)	No	4 (Major)
n/a	Probably retailer's own.	Shopper warnings: Stealing is a crime; offenders will be prosecuted (3)/ Please do not leave valuables unattended in your shopping trolley (1)	Shelf tag (3)/handmade sign (1) /Frozen fish (2)/ Canned fish (1)/ Refrigerated Fish (1)	No	4 (3 major, 1 ind.)
n/a	Retailer's own	200% Tablefresh quality guarantee	Sign /Near fish counter	No	1 (Ind.)

Table 5.10. Messages near other foods - Coles

Product	Source	Message	Materials used	Locations observed
Chicken	Mt Barker Free Range Chicken	'Taste the Difference'	Shelf strip, shelf tags and posters	10
BBQ chicken	Coles	Live well spend less	Shelf tag	1
Meat	Coles/Buy West Eat Best	Coles supports 'Buy West Eat Best' and so can you. Look for the Buy West Eat Best sticker on our meat products	Shelf tag	2
Pork	Australian Pork	Pork BBQ sizzle all summer long	A4 poster	1
Lamb	Unknown	Hottest summer BBQ sizzle with lamb BBQ lamb recipe	A4 poster, shelf tag, recipe card	1
Meat	Coles	Live Well Spend Less	Recipe cards	Chicken 3, Lamb 5, Steak 3
Meat	Coles	You'll love Coles Best Value Every Day You'll love Coles, love the quality, love the price tags	Shelf tags	2
Meat	Coles	Great Aussie BBQ	Shelf tags & shelf strip	5
Meat	Coles	Australia day	Flags, banners Merchandise	3 1
Meat	Coles	New, give it a go	Shelf tags	2
Deli	Coles	Live Well Spend Less	Posters	

Table 5.11. Messages near other foods - Woolworths

Product	Source	Message	Materials used	Locations observed
Chicken	Woolworths	Great range to choose from	Generic signage - laminated cardboard	1
Pork	Woolworths (Good Taste Magazine)	Australian Good Taste Product of the Month - Win a BBQ competition	Shelf tag & conditions of entry form	7
Lamb	Meat and Livestock Australia	Serve Lamb This Australia Day	Shelf tags	6
Lamb	Woolworths	Serve Lamb for Australia Day	Generic signage - laminated cardboard	1
Lamb	Woolworths	Lamb is in the air	Recipe card	1
Steak	Woolworths	Pan to plate in 60 seconds	Recipe Card	2
Meat	Woolworths/ Buy West Eat Best	Buy West Eat Best, Supporting WA Grown meat for over 20 years/ Woolworths supports WA Grown Meat	Shelf tags	7
Meat	Woolworths	BBQ Season, BBQ ideas, Webber ideas, don't forget your snags, Great for BBQ, 20% off mince	Generic signage - laminated cardboard	3
Meat	Woolworths	Low prices	Shelf tag	1
	Woolworths	Credit Card promotion	Shelf tags	2

Table 5.12. Messages near other foods - Independent

Product	Source	Message	Materials used	Locations observed
Chicken	Steggles	Chicken rules the roost Health Tasty Chicken	Poster & Pamphlet	2
			Shelving	3
Chicken	Mt Barker Free Range Chicken	'Taste the Difference'	Shelf strip, shelf tags and poster	1
Beef	Ind.	Kids love beef	Shelf tags and shelf strip	2
Lamb	WA Q Lamb	Lean, tender, tasty and succulent WA's best lamb all year round, guaranteed	Shelf tag & shelf strip	2
			Poster	1
Lamb	Meat and Livestock Australia	Be like Sam, Serve Lamb	Poster	1
Pork	Australian Pork	Select WA pork, taste the WA difference Pork the summer change your BBQ has been waiting for Easy peasy juicy tender pork Pork, as lean as skinless chicken - a lean choice (2) A guide to roast ham and pork this Christmas - recipes and cooking tips	Shelf tag	3
			Pamphlet	1
Meat	Generic Signage	Various meat messages	Various signage, shelf strip	2
Meat	Buy West Eat Best	Buy West Eat Best: Fresh from the Southwest	Shelf tag	1
Meat	Unknown	Large serves of chicken, pork and fish are a great alternative to red meat		
Deli	Ind.	Australia day	Flags and banners	1
Deli	Ind.	Win a fridge/gift voucher	Poster, banner, shelf tags	1
			Shelf tag	2
	Ind.	Spend \$25 save 4c on petrol	Shelf tag	1
	Ind.	200% Tablefresh guarantee	Sign	2
	Ind.	Buy me - contribute to the IGA community chest (5c from each purchase)	Shelf tag	1

## Section 7 Appendices

### Community survey

#### Frequencies

##### Q1 Sex of the participant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	98	32.7	33.2	33.2
	Female	197	65.7	66.8	100.0
	Total	295	98.3	100.0	
Missing	System	5	1.7		
	Total	300	100.0		

##### Q2 Age of the participant

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	4	1.3	1.3	1.3
	25-29	11	3.7	3.7	5.0
	30-34	6	2.0	2.0	7.0
	35-39	25	8.3	8.4	15.4
	40-44	21	7.0	7.0	22.5
	45-49	21	7.0	7.0	29.5
	50-54	28	9.3	9.4	38.9
	55-59	38	12.7	12.8	51.7
	60-64	46	15.3	15.4	67.1
	65-69	44	14.7	14.8	81.9
	70-74	25	8.3	8.4	90.3
	75+	29	9.7	9.7	100.0
	Total	298	99.3	100.0	
Missing	System	2	.7		
	Total	300	100.0		

##### Q3a The participant's suburb

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Coodanup	28	9.3	9.4	9.4
	Falcon	1	.3	.3	9.8
	Halls Head	73	24.3	24.6	34.3
	Silver Sands	21	7.0	7.1	41.4
	Mandurah	43	14.3	14.5	55.9
	Furnissdale	1	.3	.3	56.2
	Wannanup	1	.3	.3	56.6
	Dawesville	51	17.0	17.2	73.7
	Central Mandurah	2	.7	.7	74.4
	Madora Bay	27	9.0	9.1	83.5
	Melros	5	1.7	1.7	85.2
	Dudley Park	2	.7	.7	85.9
	Secret Harbour	1	.3	.3	86.2
	Meadow Springs	1	.3	.3	86.5
	Greenfields	36	12.0	12.1	98.7
	Florida	1	.3	.3	99.0
	Manberna	1	.3	.3	99.3
	Mosman Park	1	.3	.3	99.7
	Old Coodanup	1	.3	.3	100.0
	Total	297	99.0	100.0	
Missing	System	3	1.0		
	Total	300	100.0		

*Q3b The participant's post code*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6210	240	80.0	80.8	80.8
	6211	54	18.0	18.2	99.0
	6209	1	.3	.3	99.3
	6173	1	.3	.3	99.7
	6102	1	.3	.3	100.0
	Total	297	99.0	100.0	
Missing	System	3	1.0		
	Total	300	100.0		

*Q4a The number of adults in the participant's household*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	4	1.3	1.4	1.4
	1	73	24.3	25.3	26.7
	2	181	60.3	62.8	89.6
	3	23	7.7	8.0	97.6
	4	4	1.3	1.4	99.0
	5	3	1.0	1.0	100.0
	Total	288	96.0	100.0	
Missing	System	12	4.0		
	Total	300	100.0		

*Q4b The number of children in the participant's household*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	80	26.7	51.6	51.6
	1	30	10.0	19.4	71.0
	2	28	9.3	18.1	89.0
	3	13	4.3	8.4	97.4
	4	3	1.0	1.9	99.4
	5	1	.3	.6	100.0
	Total	155	51.7	100.0	
Missing	System	145	48.3		
	Total	300	100.0		

*Q5 Description of the participant's household*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I live alone	67	22.3	22.6	22.6
	Couple	133	44.3	44.8	67.3
	Couple with children	57	19.0	19.2	86.5
	Single parent	16	5.3	5.4	91.9
	Related adults	12	4.0	4.0	96.0
	Related adults with children	7	2.3	2.4	98.3
	Unrelated adults	5	1.7	1.7	100.0
	Total	297	99.0	100.0	
Missing	System	3	1.0		
	Total	300	100.0		

*Q6 The participant's role in buying food for the household*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I do most or all of the food shopping	222	74.0	74.5	74.5
	I jointly share the food shopping with someone else	65	21.7	21.8	96.3
	Someone else does most of the food shopping	11	3.7	3.7	100.0
	Total	298	99.3	100.0	
Missing	System	2	.7		
	Total	300	100.0		

*Q7a Whether the participant's household purchase their food from a major supermarket*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	280	93.3	100.0	100.0
Missing	System	20	6.7		
Total		300	100.0		

*Q7b Whether the participant's household purchase their food from an independant supermarket*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	223	74.3	100.0	100.0
Missing	System	77	25.7		
Total		300	100.0		

*Q7c Whether the participant's household purchase their food from a local supermarket*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	72	24.0	100.0	100.0
Missing	System	228	76.0		
Total		300	100.0		

*Q7d Whether the participant's household purchase their food from a local deli*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	21	7.0	100.0	100.0
Missing	System	279	93.0		
Total		300	100.0		

*Q7e Whether the participant's household purchase their food from a specialty store*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	107	35.7	100.0	100.0
Missing	System	193	64.3		
Total		300	100.0		

*Q7f Whether the participant's household purchase their food from a farmers market*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	84	28.0	100.0	100.0
Missing	System	216	72.0		
Total		300	100.0		

*Q7g Whether the participant's household purchase their food from take-away or fast food outlets*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	93	31.0	100.0	100.0
Missing	System	207	69.0		
	Total	300	100.0		

*Q7h Whether the participant's household purchase their food from a restaurant/cafe/hotel*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	95	31.7	100.0	100.0
Missing	System	205	68.3		
	Total	300	100.0		

*Q7i Whether the participant's household purchase their food from other*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Local Grower	1	.3	11.1	11.1
	Service Station	1	.3	11.1	22.2
	Vegie Garden	2	.7	22.2	44.4
	Spud Shed	3	1.0	33.3	77.8
	Light and Easy	2	.7	22.2	100.0
	Total	9	3.0	100.0	
Missing	System	291	97.0		
	Total	300	100.0		

*Q8 Where the participant's household buys the majority of its food*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Major supermarket	231	77.0	78.3	78.3
	Independent supermarket	50	16.7	16.9	95.3
	Local supermarket	5	1.7	1.7	96.9
	Local deli	1	.3	.3	97.3
	Specialty store	7	2.3	2.4	99.7
	Farmers market	1	.3	.3	100.0
	Total	295	98.3	100.0	
Missing	System	5	1.7		
	Total	300	100.0		

*Q8a Where the participant's household buys the majority of its food other*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Vegie Garden	1	.3	25.0	25.0
	Spud Shed	3	1.0	75.0	100.0
	Total	4	1.3	100.0	
Missing	System	296	98.7		
	Total	300	100.0		



*Q9a How often the participant's household shops for seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	18	6.0	6.2	6.2
	Daily	2	.7	.7	6.9
	Weekly	79	26.3	27.2	34.1
	Weekly plus minor purchases	31	10.3	10.7	44.8
	Fortnightly	52	17.3	17.9	62.8
	Fortnightly plus minor purchases	22	7.3	7.6	70.3
	Monthly or less frequently	86	28.7	29.7	100.0
	Total	290	96.7	100.0	
Missing	System	10	3.3		
	Total	300	100.0		

*Q9b How often the participant's household shops for chicken*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	6	2.0	2.1	2.1
	Daily	7	2.3	2.5	4.6
	Weekly	146	48.7	51.2	55.8
	Weekly plus minor purchases	34	11.3	11.9	67.7
	Fortnightly	45	15.0	15.8	83.5
	Fortnightly plus minor purchases	23	7.7	8.1	91.6
	Monthly or less frequently	24	8.0	8.4	100.0
	Total	285	95.0	100.0	
Missing	System	15	5.0		
	Total	300	100.0		

*Q9c How often the participant's household shops for lamb*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	13	4.3	4.9	4.9
	Daily	1	.3	.4	5.3
	Weekly	81	27.0	30.6	35.8
	Weekly plus minor purchases	26	8.7	9.8	45.7
	Fortnightly	59	19.7	22.3	67.9
	Fortnightly plus minor purchases	32	10.7	12.1	80.0
	Monthly or less frequently	53	17.7	20.0	100.0
	Total	265	88.3	100.0	
Missing	System	35	11.7		
	Total	300	100.0		

*Q9d How often the participant's household shops for beef*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	6	2.0	2.1	2.1
	Daily	4	1.3	1.4	3.6
	Weekly	108	36.0	38.4	42.0
	Weekly plus minor purchases	33	11.0	11.7	53.7
	Fortnightly	62	20.7	22.1	75.8
	Fortnightly plus minor purchases	28	9.3	10.0	85.8
	Monthly or less frequently	40	13.3	14.2	100.0
	Total	281	93.7	100.0	
Missing	System	19	6.3		
	Total	300	100.0		

*Q9e How often the participant's household shops for pork/bacon*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	12	4.0	4.6	4.6
	Daily	3	1.0	1.2	5.8
	Weekly	77	25.7	29.6	35.4
	Weekly plus minor purchases	22	7.3	8.5	43.8
	Fortnightly	54	18.0	20.8	64.6
	Fortnightly plus minor purchases	31	10.3	11.9	76.5
	Monthly or less frequently	61	20.3	23.5	100.0
	Total	260	86.7	100.0	
Missing	System	40	13.3		
	Total	300	100.0		

*Q10 The number of breakfasts eaten in the participant's household in the last 7 days*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	8	2.7	2.8	2.8
	1	2	.7	.7	3.6
	2	7	2.3	2.5	6.0
	3	2	.7	.7	6.8
	4	7	2.3	2.5	9.3
	5	1	.3	.4	9.6
	6	3	1.0	1.1	10.7
	7	114	38.0	40.6	51.2
	8	1	.3	.4	51.6
	9	3	1.0	1.1	52.7
	10	4	1.3	1.4	54.1
	12	4	1.3	1.4	55.5
	14	75	25.0	26.7	82.2
	15	1	.3	.4	82.6
	16	1	.3	.4	82.9
	17	2	.7	.7	83.6
	18	1	.3	.4	84.0
	19	2	.7	.7	84.7
	20	3	1.0	1.1	85.8
	21	9	3.0	3.2	89.0
	22	2	.7	.7	89.7
	23	1	.3	.4	90.0
	24	2	.7	.7	90.7
	25	3	1.0	1.1	91.8
	27	2	.7	.7	92.5
	28	12	4.0	4.3	96.8
	29	1	.3	.4	97.2
	35	4	1.3	1.4	98.6
	38	1	.3	.4	98.9
	42	1	.3	.4	99.3
44	1	.3	.4	99.6	
49	1	.3	.4	100.0	
	Total	281	93.7	100.0	
Missing	System	19	6.3		
	Total	300	100.0		

*Q10aa Number of breakfasts containing chicken*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	244	81.3	96.8	96.8
	1	3	1.0	1.2	98.0
	2	1	.3	.4	98.4
	3	1	.3	.4	98.8
	4	3	1.0	1.2	100.0
	Total	252	84.0	100.0	
Missing	System	48	16.0		
	Total	300	100.0		

*Q10ab Number of breakfasts containing seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	236	78.7	92.5	92.5
	1	7	2.3	2.7	95.3
	2	4	1.3	1.6	96.9
	3	6	2.0	2.4	99.2
	5	2	.7	.8	100.0
	Total	255	85.0	100.0	
Missing	System	45	15.0		
	Total	300	100.0		

*Q10ac Number of breakfasts containing pork*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	218	72.7	84.5	84.5
	1	16	5.3	6.2	90.7
	2	13	4.3	5.0	95.7
	3	3	1.0	1.2	96.9
	4	4	1.3	1.6	98.4
	5	1	.3	.4	98.8
	6	1	.3	.4	99.2
	7	1	.3	.4	99.6
	8 or more	1	.3	.4	100.0
	Total	258	86.0	100.0	
Missing	System	42	14.0		
	Total	300	100.0		

*Q10ad Number of breakfasts containing lamb*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	243	81.0	98.4	98.4
	1	2	.7	.8	99.2
	2	1	.3	.4	99.6
	3	1	.3	.4	100.0
	Total	247	82.3	100.0	
Missing	System	53	17.7		
	Total	300	100.0		

*Q10ae Number of breakfasts containing beef*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	241	80.3	96.8	96.8
	1	5	1.7	2.0	98.8
	2	2	.7	.8	99.6
	3	1	.3	.4	100.0
	Total	249	83.0	100.0	
Missing	System	51	17.0		
	Total	300	100.0		

*Q10af Number of breakfasts that were vegetarian*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	183	61.0	69.1	69.1
	1	5	1.7	1.9	70.9
	2	10	3.3	3.8	74.7
	3	5	1.7	1.9	76.6
	4	2	.7	.8	77.4
	5	3	1.0	1.1	78.5
	6	3	1.0	1.1	79.6
	7	25	8.3	9.4	89.1
	8 or more	29	9.7	10.9	100.0
	Total	265	88.3	100.0	
Missing	System	35	11.7		
	Total	300	100.0		

*Q11 The number of lunches eaten in the participant's household in the last 7 days*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	3	1.0	1.1	1.1
	1	2	.7	.7	1.8
	2	8	2.7	2.9	4.7
	3	3	1.0	1.1	5.7
	4	6	2.0	2.2	7.9
	5	11	3.7	3.9	11.8
	6	5	1.7	1.8	13.6
	7	106	35.3	38.0	51.6
	9	2	.7	.7	52.3
	10	11	3.7	3.9	56.3
	12	3	1.0	1.1	57.3
	14	71	23.7	25.4	82.8
	16	1	.3	.4	83.2
	18	1	.3	.4	83.5
	19	1	.3	.4	83.9
	20	4	1.3	1.4	85.3
	21	11	3.7	3.9	89.2
	25	1	.3	.4	89.6
	28	15	5.0	5.4	95.0
	30	1	.3	.4	95.3
	35	6	2.0	2.2	97.5
	42	6	2.0	2.2	99.6
	56	1	.3	.4	100.0
Total	279	93.0	100.0		
Missing	System	21	7.0		
	Total	300	100.0		

*Q11aa Number of lunches containing chicken*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	52	17.3	20.6	20.6
	1	57	19.0	22.6	43.3
	2	62	20.7	24.6	67.9
	3	31	10.3	12.3	80.2
	4	14	4.7	5.6	85.7
	5	17	5.7	6.7	92.5
	6	6	2.0	2.4	94.8
	7	3	1.0	1.2	96.0
	8 or more	10	3.3	4.0	100.0
	Total	252	84.0	100.0	
Missing	System	48	16.0		
	Total	300	100.0		

*Q11ab Number of lunches containing seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	71	23.7	30.5	30.5
	1	42	14.0	18.0	48.5
	2	54	18.0	23.2	71.7
	3	25	8.3	10.7	82.4
	4	20	6.7	8.6	91.0
	5	10	3.3	4.3	95.3
	6	5	1.7	2.1	97.4
	7	4	1.3	1.7	99.1
	8 or more	2	.7	.9	100.0
	Total	233	77.7	100.0	
Missing	System	67	22.3		
	Total	300	100.0		

*Q11ac Number of lunches containing pork*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	104	34.7	54.7	54.7
	1	18	6.0	9.5	64.2
	2	25	8.3	13.2	77.4
	3	12	4.0	6.3	83.7
	4	17	5.7	8.9	92.6
	5	5	1.7	2.6	95.3
	7	5	1.7	2.6	97.9
	8 or more	4	1.3	2.1	100.0
	Total	190	63.3	100.0	
	Missing	System	110	36.7	
Total		300	100.0		

*Q11ad Number of lunches containing lamb*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	116	38.7	67.4	67.4
	1	23	7.7	13.4	80.8
	2	18	6.0	10.5	91.3
	3	7	2.3	4.1	95.3
	4	5	1.7	2.9	98.3
	5	1	.3	.6	98.8
	6	2	.7	1.2	100.0
	Total	172	57.3	100.0	
Missing	System	128	42.7		
	Total	300	100.0		

*Q11ae Number of lunches containing beef*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	86	28.7	41.5	41.5
	1	36	12.0	17.4	58.9
	2	41	13.7	19.8	78.7
	3	17	5.7	8.2	87.0
	4	11	3.7	5.3	92.3
	5	7	2.3	3.4	95.7
	6	4	1.3	1.9	97.6
	7	2	.7	1.0	98.6
	8 or more	3	1.0	1.4	100.0
	Total	207	69.0	100.0	
Missing	System	93	31.0		
	Total	300	100.0		

*Q11af Number of lunches that were vegetarian*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	65	21.7	29.7	29.7
	1	29	9.7	13.2	42.9
	2	28	9.3	12.8	55.7
	3	16	5.3	7.3	63.0
	4	23	7.7	10.5	73.5
	5	6	2.0	2.7	76.3
	6	13	4.3	5.9	82.2
	7	12	4.0	5.5	87.7
	8 or more	27	9.0	12.3	100.0
	Total	219	73.0	100.0	
	Missing	System	81	27.0	
Total		300	100.0		

*Q12 The number of dinners eaten in the participant's household in the last 7 days*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	3	1.0	1.1	1.1
	3	1	.3	.4	1.4
	4	1	.3	.4	1.8
	5	6	2.0	2.2	4.0
	6	8	2.7	2.9	6.8
	7	117	39.0	42.1	48.9
	9	1	.3	.4	49.3
	10	1	.3	.4	49.6
	12	1	.3	.4	50.0
	13	1	.3	.4	50.4
	14	79	26.3	28.4	78.8
	17	1	.3	.4	79.1
	18	2	.7	.7	79.9
	20	1	.3	.4	80.2
	21	15	5.0	5.4	85.6
	24	1	.3	.4	86.0
	25	1	.3	.4	86.3
	26	2	.7	.7	87.1
	27	1	.3	.4	87.4
	28	18	6.0	6.5	93.9
	30	3	1.0	1.1	95.0
35	8	2.7	2.9	97.8	
42	3	1.0	1.1	98.9	
45	1	.3	.4	99.3	
49	1	.3	.4	99.6	
56	1	.3	.4	100.0	
	Total	278	92.7	100.0	
Missing	System	22	7.3		
	Total	300	100.0		

*Q12aa Number of dinners containing chicken*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	14	4.7	5.1	5.1
	1	59	19.7	21.5	26.5
	2	80	26.7	29.1	55.6
	3	37	12.3	13.5	69.1
	4	35	11.7	12.7	81.8
	5	9	3.0	3.3	85.1
	6	9	3.0	3.3	88.4
	7	8	2.7	2.9	91.3
	8 or more	24	8.0	8.7	100.0
		Total	275	91.7	100.0
Missing	System	25	8.3		
	Total	300	100.0		



*Q12ab Number of dinners containing seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	40	13.3	15.4	15.4
	1	86	28.7	33.1	48.5
	2	61	20.3	23.5	71.9
	3	24	8.0	9.2	81.2
	4	22	7.3	8.5	89.6
	5	9	3.0	3.5	93.1
	6	11	3.7	4.2	97.3
	7	3	1.0	1.2	98.5
	8 or more	4	1.3	1.5	100.0
	Total	260	86.7	100.0	
Missing	System	40	13.3		
	Total	300	100.0		

*Q12ac Number of dinners containing pork*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	71	23.7	34.6	34.6
	1	63	21.0	30.7	65.4
	2	38	12.7	18.5	83.9
	3	9	3.0	4.4	88.3
	4	10	3.3	4.9	93.2
	5	4	1.3	2.0	95.1
	6	5	1.7	2.4	97.6
	7	1	.3	.5	98.0
	8 or more	4	1.3	2.0	100.0
	Total	205	68.3	100.0	
Missing	System	95	31.7		
	Total	300	100.0		

*Q12ad Number of dinners containing lamb*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	64	21.3	28.7	28.7
	1	66	22.0	29.6	58.3
	2	54	18.0	24.2	82.5
	3	11	3.7	4.9	87.4
	4	16	5.3	7.2	94.6
	5	4	1.3	1.8	96.4
	6	3	1.0	1.3	97.8
	7	1	.3	.4	98.2
	8 or more	4	1.3	1.8	100.0
	Total	223	74.3	100.0	
Missing	System	77	25.7		
	Total	300	100.0		

*Q12ae Number of dinners containing beef*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	28	9.3	11.0	11.0
	1	66	22.0	26.0	37.0
	2	67	22.3	26.4	63.4
	3	30	10.0	11.8	75.2
	4	24	8.0	9.4	84.6
	5	10	3.3	3.9	88.6
	6	7	2.3	2.8	91.3
	7	5	1.7	2.0	93.3
	8 or more	17	5.7	6.7	100.0
	Total	254	84.7	100.0	
Missing	System	46	15.3		
	Total	300	100.0		

*Q12af Number of dinners that were vegetarian*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	59	19.7	28.9	28.9
	1	45	15.0	22.1	51.0
	2	32	10.7	15.7	66.7
	3	11	3.7	5.4	72.1
	4	20	6.7	9.8	81.9
	5	6	2.0	2.9	84.8
	6	3	1.0	1.5	86.3
	7	14	4.7	6.9	93.1
	8 or more	14	4.7	6.9	100.0
	Total	204	68.0	100.0	
Missing	System	96	32.0		
	Total	300	100.0		

*Q13a Whether the participant is careful to eat a healthy diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	166	55.3	56.3	56.3
	Tend to agree	107	35.7	36.3	92.5
	Tend to disagree	11	3.7	3.7	96.3
	Disagree	5	1.7	1.7	98.0
	Neither agree or disagree	6	2.0	2.0	100.0
	Total	295	98.3	100.0	
Missing	System	5	1.7		
	Total	300	100.0		

*Q13b Whether the participant is interested in knowing the different health benefits of different foods*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	184	61.3	64.6	64.6
	Tend to agree	80	26.7	28.1	92.6
	Tend to disagree	6	2.0	2.1	94.7
	Disagree	6	2.0	2.1	96.8
	Neither agree or disagree	9	3.0	3.2	100.0
	Total	285	95.0	100.0	
Missing	System	15	5.0		
	Total	300	100.0		

*Q13c Whether the participant is on a weight reduction diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	61	20.3	23.1	23.1
	Tend to agree	44	14.7	16.7	39.8
	Tend to disagree	19	6.3	7.2	47.0
	Disagree	96	32.0	36.4	83.3
	Neither agree or disagree	44	14.7	16.7	100.0
	Total	264	88.0	100.0	
Missing	System	36	12.0		
Total		300	100.0		

*Q13d Whether the participant is interested in trying new products, ranges or species of fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	137	45.7	48.6	48.6
	Tend to agree	76	25.3	27.0	75.5
	Tend to disagree	21	7.0	7.4	83.0
	Disagree	22	7.3	7.8	90.8
	Neither agree or disagree	26	8.7	9.2	100.0
	Total	282	94.0	100.0	
Missing	System	18	6.0		
Total		300	100.0		

*Q13e Whether the participant considers fish to be a healthier meal option than red meat*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	170	56.7	59.0	59.0
	Tend to agree	70	23.3	24.3	83.3
	Tend to disagree	16	5.3	5.6	88.9
	Disagree	11	3.7	3.8	92.7
	Neither agree or disagree	21	7.0	7.3	100.0
	Total	288	96.0	100.0	
Missing	System	12	4.0		
Total		300	100.0		

*Q13f Whether the participant considers fish to be a healthier meal option than poultry*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	130	43.3	44.8	44.8
	Tend to agree	70	23.3	24.1	69.0
	Tend to disagree	41	13.7	14.1	83.1
	Disagree	13	4.3	4.5	87.6
	Neither agree or disagree	36	12.0	12.4	100.0
	Total	290	96.7	100.0	
Missing	System	10	3.3		
Total		300	100.0		

*Q13g Whether the participant considers fish to be a healthier meal option than pork*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	177	59.0	61.5	61.5
	Tend to agree	59	19.7	20.5	81.9
	Tend to disagree	20	6.7	6.9	88.9

	Disagree	11	3.7	3.8	92.7
	Neither agree or disagree	21	7.0	7.3	100.0
	Total	288	96.0	100.0	
Missing	System	12	4.0		
	Total	300	100.0		

*Q14a When the participant's household last ate fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Within the last month	280	93.3	94.3	94.3
	2-6 months ago	14	4.7	4.7	99.0
	More than 12 months ago	2	.7	.7	99.7
	Never eaten	1	.3	.3	100.0
	Total	297	99.0	100.0	
Missing	System	3	1.0		
	Total	300	100.0		

*Q14b When the participant's household last ate shellfish or crustaceans*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	1	.3	.4	.4
	Within the last month	165	56.3	69.0	69.5
	2-6 months ago	43	14.7	18.0	87.4
	7-12 months ago	8	2.7	3.3	90.8
	More than 12 months ago	9	3.1	3.8	94.6
	Never eaten	12	4.1	5.0	99.6
	6	1	.3	.4	100.0
	Total	239	81.6	100.0	
Missing	System	54	18.4		
Total		293	100.0		

*Q14c When the participant's household last ate calamari or squid*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Within the last month	134	44.7	48.0	48.0
	2-6 months ago	75	25.0	26.9	74.9
	7-12 months ago	29	9.7	10.4	85.3
	More than 12 months ago	16	5.3	5.7	91.0
	Never eaten	25	8.3	9.0	100.0
	Total	279	93.0	100.0	
Missing	System	21	7.0		
	Total	300	100.0		

*Q15a Whether the participant's household purchase their seafood from a major supermarket*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	172	57.3	100.0	100.0
Missing	System	128	42.7		
	Total	300	100.0		

*Q15b Whether the participant's household purchase their seafood from an independent supermarket*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	131	43.7	100.0	100.0
Missing	System	169	56.3		
	Total	300	100.0		

*Q15c Whether the participant's household purchase their seafood from a local supermarket*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	20	6.7	100.0	100.0
Missing	System	280	93.3		
	Total	300	100.0		

*Q15d Whether the participant's household purchase their seafood from a local deli*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	1.7	100.0	100.0
Missing	System	295	98.3		
	Total	300	100.0		

*Q15e Whether the participant's household purchase their seafood from take-away or fast food outlets*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	58	19.3	100.0	100.0
Missing	System	242	80.7		
	Total	300	100.0		

*Q15f Whether the participant's household purchase their seafood from a restaurant/cafe/hotel*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	91	30.3	100.0	100.0
Missing	System	209	69.7		
	Total	300	100.0		

*Q15g Whether the participant's household purchase their seafood from a fish monger/specialist seafood shop*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	108	36.0	100.0	100.0
Missing	System	192	64.0		
	Total	300	100.0		

*Q15h Whether the participant's households seafood is caught by a household member or someone they know*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	140	46.7	100.0	100.0
Missing	System	160	53.3		
	Total	300	100.0		

*Q15i Whether the participant's household purchase their seafood from other*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Senior Citizens Centre	2	.7	13.3	13.3
	Fish van on the side of the road	4	1.3	26.7	40.0
	Spud Shed	6	2.0	40.0	80.0
	Direct Suppliers	2	.7	13.3	93.3
	Professional Fisherman's Outlet	1	.3	6.7	100.0
	Total	15	5.0	100.0	
Missing	System	285	95.0		
	Total	300	100.0		

*Q16a Whether the participant thinks fish is not readily available where they shop*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	50	16.7	17.6	17.6
	Tend to agree	52	17.3	18.3	35.9
	Tend to disagree	55	18.3	19.4	55.3
	Disagree	109	36.3	38.4	93.7
	Neither agree nor disagree	18	6.0	6.3	100.0
	Total	284	94.7	100.0	
Missing	System	16	5.3		
	Total	300	100.0		

*Q16b Whether the participant thinks fish is more difficult to find where they shop compared with red meat and poultry*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	60	20.0	21.2	21.2
	Tend to agree	68	22.7	24.0	45.2
	Tend to disagree	37	12.3	13.1	58.3
	Disagree	102	34.0	36.0	94.3
	Neither agree nor disagree	16	5.3	5.7	100.0
	Total	283	94.3	100.0	
Missing	System	17	5.7		
	Total	300	100.0		

*Q16c Whether the participant thinks fish is readily available in correct portion sizes*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	103	34.3	36.3	36.3
	Tend to agree	68	22.7	23.9	60.2
	Tend to disagree	62	20.7	21.8	82.0
	Disagree	34	11.3	12.0	94.0
	Neither agree nor disagree	17	5.7	6.0	100.0
	Total	284	94.7	100.0	
Missing	System	16	5.3		
	Total	300	100.0		

*Q16d Whether the participant thinks there is a lack of pre-prepared fish available*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	28	9.3	10.1	10.1
	Tend to agree	55	18.3	19.9	30.0
	Tend to disagree	64	21.3	23.1	53.1
	Disagree	104	34.7	37.5	90.6
	Neither agree nor disagree	26	8.7	9.4	100.0
	Total	277	92.3	100.0	
Missing	System	23	7.7		
	Total	300	100.0		

*Q16e Whether the participant would serve more fish/seafood if it was more readily available*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	65	21.7	23.2	23.2
	Tend to agree	49	16.3	17.5	40.7
	Tend to disagree	44	14.7	15.7	56.4
	Disagree	77	25.7	27.5	83.9
	Neither agree nor disagree	45	15.0	16.1	100.0
	Total	280	93.3	100.0	
Missing	System	20	6.7		
	Total	300	100.0		

*Q17a The frequency that the participant's household purchases whole fresh fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than once a week	2	.7	.8	.8
	Once a week	8	2.7	3.0	3.8
	Once a fortnight	9	3.0	3.4	7.1
	Once a month	18	6.0	6.8	13.9
	Every 2-3 months	22	7.3	8.3	22.2
	2-3 times a year	35	11.7	13.2	35.3
	Once a year	28	9.3	10.5	45.9
	Less than once a year	27	9.0	10.2	56.0
	Never	117	39.0	44.0	100.0
	Total	266	88.7	100.0	
Missing	System	34	11.3		
	Total	300	100.0		

*Q17b The frequency that the participant's household purchases fresh fish fillets*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than once a week	14	4.7	5.0	5.0
	Once a week	44	14.7	15.6	20.6
	Once a fortnight	49	16.3	17.4	37.9
	Once a month	54	18.0	19.1	57.1
	Every 2-3 months	36	12.0	12.8	69.9
	2-3 times a year	26	8.7	9.2	79.1
	Once a year	16	5.3	5.7	84.8
	Less than once a year	12	4.0	4.3	89.0
	Never	31	10.3	11.0	100.0
	Total	282	94.0	100.0	
Missing	System	18	6.0		
	Total	300	100.0		



*Q17c The frequency that the participant's household purchases frozen unpackaged fish fillets*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than once a week	4	1.3	1.5	1.5
	Once a week	9	3.0	3.4	4.9
	Once a fortnight	24	8.0	9.1	14.0
	Once a month	21	7.0	8.0	22.0
	Every 2-3 months	31	10.3	11.7	33.7
	2-3 times a year	20	6.7	7.6	41.3
	Once a year	10	3.3	3.8	45.1
	Less than once a year	17	5.7	6.4	51.5
	Never	128	42.7	48.5	100.0
	Total	264	88.0	100.0	
Missing	System	36	12.0		
Total		300	100.0		

*Q17d The frequency that the participant's household purchases frozen, packaged fish fillets*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than once a week	8	2.7	2.9	2.9
	Once a week	24	8.0	8.8	11.7
	Once a fortnight	32	10.7	11.7	23.4
	Once a month	51	17.0	18.6	42.0
	Every 2-3 months	27	9.0	9.9	51.8
	2-3 times a year	18	6.0	6.6	58.4
	Once a year	12	4.0	4.4	62.8
	Less than once a year	9	3.0	3.3	66.1
	Never	93	31.0	33.9	100.0
	Total	274	91.3	100.0	
Missing	System	26	8.7		
Total		300	100.0		

*Q17e The frequency that the participant's household purchases fresh, packaged seafood/fish meals*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than once a week	2	.7	.8	.8
	Once a week	6	2.0	2.3	3.1
	Once a fortnight	13	4.3	5.0	8.1
	Once a month	16	5.3	6.2	14.3
	Every 2-3 months	19	6.3	7.3	21.6
	2-3 times a year	16	5.3	6.2	27.8
	Once a year	12	4.0	4.6	32.4
	Less than once a year	20	6.7	7.7	40.2
	Never	155	51.7	59.8	100.0
	Total	259	86.3	100.0	
Missing	System	41	13.7		
Total		300	100.0		

*Q17f The frequency that the participant's household purchases frozen, packaged seafood/fish meals*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than once a week	4	1.3	1.6	1.6
	Once a week	6	2.0	2.4	3.9
	Once a fortnight	18	6.0	7.1	11.0
	Once a month	22	7.3	8.6	19.6
	Every 2-3 months	25	8.3	9.8	29.4
	2-3 times a year	13	4.3	5.1	34.5
	Once a year	15	5.0	5.9	40.4
	Less than once a year	14	4.7	5.5	45.9
	Never	138	46.0	54.1	100.0
	Total	255	85.0	100.0	
Missing	System	45	15.0		
	Total	300	100.0		

*Q17g The frequency that the participant's household purchases canned seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than once a week	42	14.0	14.7	14.7
	Once a week	68	22.7	23.9	38.6
	Once a fortnight	67	22.3	23.5	62.1
	Once a month	45	15.0	15.8	77.9
	Every 2-3 months	27	9.0	9.5	87.4
	2-3 times a year	7	2.3	2.5	89.8
	Once a year	5	1.7	1.8	91.6
	Less than once a year	5	1.7	1.8	93.3
	Never	19	6.3	6.7	100.0
	Total	285	95.0	100.0	
Missing	System	15	5.0		
	Total	300	100.0		

*Q17h The frequency that the participant's household purchases cooked seafood from a takeaway outlet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than once a week	4	1.3	1.4	1.4
	Once a week	19	6.3	6.8	8.3
	Once a fortnight	28	9.3	10.1	18.3
	Once a month	60	20.0	21.6	39.9
	Every 2-3 months	52	17.3	18.7	58.6
	2-3 times a year	37	12.3	13.3	71.9
	Less than once a month	21	7.0	7.6	79.5
	Less than once a year	13	4.3	4.7	84.2
	Never	44	14.7	15.8	100.0
	Total	278	92.7	100.0	
Missing	System	22	7.3		
	Total	300	100.0		

*Q17i The frequency that the participant's household purchases cooked seafood from a restaurant/cafe/hotel*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than once a week	3	1.0	1.1	1.1
	Once a week	10	3.3	3.6	4.7
	Once a fortnight	24	8.0	8.6	13.3
	Once a month	64	21.3	23.0	36.3
	Every 2-3 months	58	19.3	20.9	57.2
	2-3 times a year	52	17.3	18.7	75.9
	Once a year	21	7.0	7.6	83.5
	Less than once a year	12	4.0	4.3	87.8
	Never	34	11.3	12.2	100.0
	Total	278	92.7	100.0	
Missing	System	22	7.3		
	Total	300	100.0		

*Q18a Whether the participant orders cooked fish from take-away shops*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	181	60.3	64.6	64.6
	Disagree	81	27.0	28.9	93.6
	Neither agree nor disagree	18	6.0	6.4	100.0
	Total	280	93.3	100.0	
Missing	System	20	6.7		
	Total	300	100.0		

*Q18b Whether the participant orders seafood from take-away shops*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	87	29.0	31.8	31.8
	Disagree	161	53.7	58.8	90.5
	Neither agree nor disagree	26	8.7	9.5	100.0
	Total	274	91.3	100.0	
Missing	System	26	8.7		
	Total	300	100.0		

*Q18c Whether the participant orders fish/seafood when dining out*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	229	76.3	80.4	80.4
	Disagree	35	11.7	12.3	92.6
	Neither agree nor disagree	21	7.0	7.4	100.0
	Total	285	95.0	100.0	
Missing	System	15	5.0		
	Total	300	100.0		

*Q18d Whether the participant serves fish/seafood for traditional or religious occasions*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	125	41.7	44.2	44.2
	Disagree	114	38.0	40.3	84.5
	Neither agree nor disagree	44	14.7	15.5	100.0
	Total	283	94.3	100.0	
Missing	System	17	5.7		
	Total	300	100.0		

*Q18e Whether the participant serves fish/seafood on special occasions or for dinner parties*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	120	40.0	43.3	43.3
	Disagree	96	32.0	34.7	78.0
	Neither agree nor disagree	61	20.3	22.0	100.0
	Total	277	92.3	100.0	
Missing	System	23	7.7		
	Total	300	100.0		

*Q18f Whether the participant serves fish/seafood when they have a BBQ with family and/or friends*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	113	37.7	40.1	40.1
	Disagree	109	36.3	38.7	78.7
	Neither agree nor disagree	60	20.0	21.3	100.0
	Total	282	94.0	100.0	
Missing	System	18	6.0		
	Total	300	100.0		

*Q18g Whether the participant serves fish/seafood on a regular occasion each week*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	90	30.0	31.9	31.9
	Disagree	148	49.3	52.5	84.4
	Neither agree nor disagree	44	14.7	15.6	100.0
	Total	282	94.0	100.0	
Missing	System	18	6.0		
	Total	300	100.0		

*Q18h Whether the participant serves fish/seafood for everyday meals*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	133	44.3	46.8	46.8
	Disagree	104	34.7	36.6	83.5
	Neither agree nor disagree	47	15.7	16.5	100.0
	Total	284	94.7	100.0	
Missing	System	16	5.3		
	Total	300	100.0		

*Q19a Whether the Participant and their household like their seafood to be baked*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	131	43.7	100.0	100.0
Missing	System	169	56.3		
	Total	300	100.0		

*Q19b Whether the Participant and their household like their seafood to be barbecued*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	137	45.7	100.0	100.0
Missing	System	163	54.3		
	Total	300	100.0		

*Q19c Whether the Participant and their household like their seafood to be deep fried*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	95	31.7	100.0	100.0
Missing	System	205	68.3		
	Total	300	100.0		

*Q19d Whether the Participant and their household like their seafood to be grilled*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	183	61.0	100.0	100.0
Missing	System	117	39.0		
	Total	300	100.0		

*Q19e Whether the Participant and their household like their seafood to be pan fried*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	220	73.3	100.0	100.0
Missing	System	80	26.7		
	Total	300	100.0		

*Q19f Whether the Participant and their household like their seafood to be raw*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	32	10.7	100.0	100.0
Missing	System	268	89.3		
	Total	300	100.0		

*Q19g Whether the Participant and their household like their seafood to be from a can*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	184	61.3	100.0	100.0
Missing	System	116	38.7		
	Total	300	100.0		

*Q19h Whether the Participant and their household like their seafood to be other*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sushi	1	.3	9.1	9.1
	Pickled	2	.7	18.2	27.3
	Steamed	4	1.3	36.4	63.6
	Poached	3	1.0	27.3	90.9
	Microwaved	1	.3	9.1	100.0
	Total	11	3.7	100.0	
Missing	System	289	96.3		
	Total	300	100.0		

*Q19i The way in which the participant's household most prefer their seafood to be prepared*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Baked	25	8.3	13.6	13.6
	Barbecued	23	7.7	12.5	26.1
	Deep fried	10	3.3	5.4	31.5
	Grilled	40	13.3	21.7	53.3
	Pan fried	78	26.0	42.4	95.7
	Raw	1	.3	.5	96.2
	From a can	7	2.3	3.8	100.0
	Total	184	61.3	100.0	
Missing	System	116	38.7		
	Total	300	100.0		

*Q19ia Other ways in which the participant's household most prefer their seafood to be prepared*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sushi	1	.3	12.5	12.5
	Pickled	2	.7	25.0	37.5
	Steamed	3	1.0	37.5	75.0
	Poached	2	.7	25.0	100.0
	Total	8	2.7	100.0	
Missing	System	292	97.3		
	Total	300	100.0		

*Q20a Whether the participant is likely to bake seafood in their home*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	103	34.3	100.0	100.0
Missing	System	197	65.7		
	Total	300	100.0		

*Q20b Whether the participant is likely to barbecue seafood in their home*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	94	31.3	100.0	100.0
Missing	System	206	68.7		
	Total	300	100.0		

*Q20c Whether the participant is likely to deep fry seafood in their home*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	49	16.3	100.0	100.0
Missing	System	251	83.7		
	Total	300	100.0		

*Q20d Whether the participant is likely to grill seafood in their home*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	155	51.7	100.0	100.0
Missing	System	145	48.3		
	Total	300	100.0		

*Q20e Whether the participant is likely to pan fry seafood in their home*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	197	65.7	100.0	100.0
Missing	System	103	34.3		
	Total	300	100.0		

*Q20f Whether the participant is likely to serve seafood raw in their home*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	19	6.3	100.0	100.0
Missing	System	281	93.7		
	Total	300	100.0		

*Q20g Whether the participant is likely to serve seafood from a can in their home*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	149	49.7	100.0	100.0
Missing	System	151	50.3		
	Total	300	100.0		

*Q20h Whether the participant is likely to serve seafood other*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Microwaved	2	.7	16.7	16.7
	Steamed	4	1.3	33.3	50.0
	Poached	4	1.3	33.3	83.3
	Curried	1	.3	8.3	91.7
	Pickled	1	.3	8.3	100.0
	Total	12	4.0	100.0	
Missing	System	288	96.0		
	Total	300	100.0		

*Q20i The way in which the participant is most likely to prepare seafood in their home*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bake	18	6.0	10.0	10.0
	Barbecue	21	7.0	11.7	21.7
	Deep fry	2	.7	1.1	22.8
	Grill	25	8.3	13.9	36.7
	Pan fry	103	34.3	57.2	93.9
	Raw	1	.3	.6	94.4
	From can	10	3.3	5.6	100.0
	Total	180	60.0	100.0	
Missing	System	120	40.0		
	Total	300	100.0		

*Q20ia The way in which the participant is most likely to prepare seafood in their home other*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Steamed	1	.3	16.7	16.7
	Poached	4	1.3	66.7	83.3
	Pickled	1	.3	16.7	100.0
	Total	6	2.0	100.0	
Missing	System	294	98.0		
	Total	300	100.0		



*Q21a Whether the participant knows much about preparing and serving fish/seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	64	21.3	22.6	22.6
	Disagree	197	65.7	69.6	92.2
	Neither agree nor disagree	22	7.3	7.8	100.0
	Total	283	94.3	100.0	
Missing	System	17	5.7		
	Total	300	100.0		

*Q21b Whether the participant likes to prepare and serve fish/seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	219	73.0	76.0	76.0
	Disagree	31	10.3	10.8	86.8
	Neither agree nor disagree	38	12.7	13.2	100.0
	Total	288	96.0	100.0	
Missing	System	12	4.0		
	Total	300	100.0		

*Q21c Whether the participant is not confident to prepare and serve fish/seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	76	25.3	27.3	27.3
	Disagree	181	60.3	65.1	92.4
	Neither agree nor disagree	21	7.0	7.6	100.0
	Total	278	92.7	100.0	
Missing	System	22	7.3		
	Total	300	100.0		

*Q21d Whether the participant always knows what type of fish/seafood they are going to buy before going to the shop*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	113	37.7	39.4	39.4
	Disagree	121	40.3	42.2	81.5
	Neither agree nor disagree	53	17.7	18.5	100.0
	Total	287	95.7	100.0	
Missing	System	13	4.3		
	Total	300	100.0		

*Q21e Whether the participant likes to prepare the same types of seafood as they have before*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	178	59.3	62.7	62.7
	Disagree	71	23.7	25.0	87.7
	Neither agree nor disagree	35	11.7	12.3	100.0
	Total	284	94.7	100.0	
Missing	System	16	5.3		
	Total	300	100.0		

*Q21f Whether the participant thinks seafood is easy to prepare and serve*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	220	73.3	76.1	76.1
	Disagree	41	13.7	14.2	90.3
	Neither agree nor disagree	28	9.3	9.7	100.0
	Total	289	96.3	100.0	
Missing	System	11	3.7		
	Total	300	100.0		

*Q21g Whether the participant does not know how long they can keep seafood before it needs to be cooked*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	62	20.7	21.6	21.6
	Disagree	190	63.3	66.2	87.8
	Neither agree nor disagree	35	11.7	12.2	100.0
	Total	287	95.7	100.0	
Missing	System	13	4.3		
	Total	300	100.0		

*Q21h Whether the participant knows how to store seafood safely*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	218	72.7	75.2	75.2
	Disagree	35	11.7	12.1	87.2
	Neither agree nor disagree	37	12.3	12.8	100.0
	Total	290	96.7	100.0	
Missing	System	10	3.3		
	Total	300	100.0		

*Q21i Whether the participant thinks fish is more difficult to assess for freshness and quality compared to red and white meats*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	125	41.7	43.3	43.3
	Disagree	136	45.3	47.1	90.3
	Neither agree nor disagree	28	9.3	9.7	100.0
	Total	289	96.3	100.0	
Missing	System	11	3.7		
	Total	300	100.0		

*Q21j Whether the participant would buy more seafood if they were more confident in their ability to select good quality fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	101	33.7	35.7	35.7
	Disagree	150	50.0	53.0	88.7
	Neither agree nor disagree	32	10.7	11.3	100.0
	Total	283	94.3	100.0	
Missing	System	17	5.7		
	Total	300	100.0		

*Q21k Whether the participant cannot recognise if fish and other seafood is fresh*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	87	29.0	30.4	30.4
	Disagree	158	52.7	55.2	85.7
	Neither agree nor disagree	41	13.7	14.3	100.0
	Total	286	95.3	100.0	
Missing	System	14	4.7		
	Total	300	100.0		

*Q21l Whether if the participant knew more ways to prepare and serve seafood they would eat it more often*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	114	38.0	39.9	39.9
	Disagree	148	49.3	51.7	91.6
	Neither agree nor disagree	24	8.0	8.4	100.0
	Total	286	95.3	100.0	
Missing	System	14	4.7		
	Total	300	100.0		

*Q21m Whether the participant can tell if fish/seafood has been previously frozen*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	100	33.3	34.8	34.8
	Disagree	120	40.0	41.8	76.7
	Neither agree nor disagree	67	22.3	23.3	100.0
	Total	287	95.7	100.0	
Missing	System	13	4.3		
	Total	300	100.0		

*Q21n Whether the participant can tell if fish/seafood is fresh (recently caught)*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	165	55.0	56.7	56.7
	Disagree	90	30.0	30.9	87.6
	Neither agree nor disagree	36	12.0	12.4	100.0
	Total	291	97.0	100.0	
Missing	System	9	3.0		
	Total	300	100.0		

*Q22a Whether the participant prefers meals that are easy to plan, purchase, prepare and cook*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	258	86.0	88.1	88.1
	Disagree	31	10.3	10.6	98.6
	Not sure	4	1.3	1.4	100.0
	Total	293	97.7	100.0	
Missing	System	7	2.3		
	Total	300	100.0		

*Q22b Whether the participant prefers meals than are quick to plan, purchase, prepare and cook*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	236	78.7	81.7	81.7
	Disagree	41	13.7	14.2	95.8
	Not sure	12	4.0	4.2	100.0
	Total	289	96.3	100.0	
Missing	System	11	3.7		
	Total	300	100.0		

*Q22c Whether the participant serves fish because it is quick and easy to prepare*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	153	51.0	52.6	52.6
	Disagree	99	33.0	34.0	86.6
	Not sure	39	13.0	13.4	100.0
	Total	291	97.0	100.0	
Missing	System	9	3.0		
	Total	300	100.0		

*Q22d Whether the participant thinks it takes very little effort to prepare fish/seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	202	67.3	68.9	68.9
	Disagree	58	19.3	19.8	88.7
	Not sure	33	11.0	11.3	100.0
	Total	293	97.7	100.0	
Missing	System	7	2.3		
	Total	300	100.0		

*Q22e Whether the participant thinks it takes a lot of time to prepare fish/seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	34	11.3	12.0	12.0
	Disagree	203	67.7	71.5	83.5
	Not sure	47	15.7	16.5	100.0
	Total	284	94.7	100.0	
Missing	System	16	5.3		
	Total	300	100.0		

*Q22f Whether the participant would buy more fish/seafood, if it were more convenient to prepare and serve*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	67	22.3	23.4	23.4
	Disagree	175	58.3	61.2	84.6
	Not sure	44	14.7	15.4	100.0
	Total	286	95.3	100.0	
Missing	System	14	4.7		
	Total	300	100.0		

*Q22g Whether the participant would buy more fish/seafood, if more varieties were available in stores*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	113	37.7	39.5	39.5
	Disagree	129	43.0	45.1	84.6
	Not sure	44	14.7	15.4	100.0
	Total	286	95.3	100.0	
Missing	System	14	4.7		
	Total	300	100.0		

*Q22h Whether the participant would buy more fish/seafood, if recipes or preparation details were available at the outlet where they buy it*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	132	44.0	46.5	46.5
	Disagree	120	40.0	42.3	88.7
	Not sure	32	10.7	11.3	100.0
	Total	284	94.7	100.0	
Missing	System	16	5.3		
	Total	300	100.0		

*Q23a Whether the participant thinks seafood/fish is an important part of a balanced diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	281	93.7	95.9	95.9
	Disagree	3	1.0	1.0	96.9
	Neither agree nor disagree	9	3.0	3.1	100.0
	Total	293	97.7	100.0	
Missing	System	7	2.3		
	Total	300	100.0		

*Q23b Whether the participant eats seafood/fish because it is healthy*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	250	83.3	85.9	85.9
	Disagree	15	5.0	5.2	91.1
	Neither agree nor disagree	26	8.7	8.9	100.0
	Total	291	97.0	100.0	
Missing	System	9	3.0		
	Total	300	100.0		

*Q23c Whether the participant considers seafood/fish to be a healthier meal option than meat or poultry*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	182	60.7	62.8	62.8
	Disagree	32	10.7	11.0	73.8
	Neither agree nor disagree	76	25.3	26.2	100.0
	Total	290	96.7	100.0	
Missing	System	10	3.3		
	Total	300	100.0		

*Q24a Whether the participant ate seafood/fish on a regular basis as a child*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	150	50.0	51.2	51.2
	Disagree	110	36.7	37.5	88.7
	Neither agree nor disagree	33	11.0	11.3	100.0
	Total	293	97.7	100.0	
Missing	System	7	2.3		
	Total	300	100.0		

*Q24b Whether the participant's family ate seafood/fish on special occasions when they were a child*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	153	51.0	52.9	52.9
	Disagree	106	35.3	36.7	89.6
	Neither agree nor disagree	30	10.0	10.4	100.0
	Total	289	96.3	100.0	
Missing	System	11	3.7		
	Total	300	100.0		

*Q24c Whether the participant has had good experiences eating seafood/fish in the past*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	260	86.7	89.0	89.0
	Disagree	21	7.0	7.2	96.2
	Neither agree nor disagree	11	3.7	3.8	100.0
	Total	292	97.3	100.0	
Missing	System	8	2.7		
	Total	300	100.0		

*Q24d Whether the participant regularly includes seafood on their shopping list*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	154	51.3	54.0	54.0
	Disagree	119	39.7	41.8	95.8
	Neither agree nor disagree	12	4.0	4.2	100.0
	Total	285	95.0	100.0	
Missing	System	15	5.0		
	Total	300	100.0		

*Q24e Whether the participant regularly includes fish on their shopping list*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	175	58.3	61.0	61.0
	Disagree	96	32.0	33.4	94.4
	Neither agree nor disagree	16	5.3	5.6	100.0
	Total	287	95.7	100.0	
Missing	System	13	4.3		
	Total	300	100.0		

*Q25a Whether the participant likes fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	280	93.3	95.2	95.2
	Disagree	8	2.7	2.7	98.0
	Not sure	6	2.0	2.0	100.0
	Total	294	98.0	100.0	
Missing	System	6	2.0		
	Total	300	100.0		

*Q25b Whether the participant thinks fish usually tastes bad*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	8	2.7	2.8	2.8
	Disagree	271	90.3	94.8	97.6
	Not sure	7	2.3	2.4	100.0
	Total	286	95.3	100.0	
Missing	System	14	4.7		
	Total	300	100.0		

*Q25c Whether the participant feels satisfied after eating fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	252	84.0	87.5	87.5
	Disagree	11	3.7	3.8	91.3
	Not sure	25	8.3	8.7	100.0
	Total	288	96.0	100.0	
Missing	System	12	4.0		
	Total	300	100.0		

*Q25d Whether the participant does not like the smell of fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	88	29.3	30.8	30.8
	Disagree	171	57.0	59.8	90.6
	Not sure	27	9.0	9.4	100.0
	Total	286	95.3	100.0	
Missing	System	14	4.7		
	Total	300	100.0		

*Q25e Whether the participant likes the texture of fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	234	78.0	81.3	81.3
	Disagree	18	6.0	6.3	87.5
	Not sure	36	12.0	12.5	100.0
	Total	288	96.0	100.0	
Missing	System	12	4.0		
	Total	300	100.0		



*Q25f Whether the participant thinks that fish in an inexpensive meal*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	77	25.7	26.6	26.6
	Disagree	177	59.0	61.2	87.9
	Not sure	35	11.7	12.1	100.0
	Total	289	96.3	100.0	
Missing	System	11	3.7		
	Total	300	100.0		

*Q25g Whether the participant does not like to touch fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	31	10.3	10.8	10.8
	Disagree	244	81.3	85.3	96.2
	Not sure	11	3.7	3.8	100.0
	Total	286	95.3	100.0	
Missing	System	14	4.7		
	Total	300	100.0		

*Q25h Whether the participant thinks taste is the most important attribute of fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	222	74.0	76.3	76.3
	Disagree	42	14.0	14.4	90.7
	Not sure	27	9.0	9.3	100.0
	Total	291	97.0	100.0	
Missing	System	9	3.0		
	Total	300	100.0		

*Q26a Whether the participant needs more information about seafood/fish in the outlets where they purchase them to make an informed choice*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	133	44.3	46.7	46.7
	Disagree	119	39.7	41.8	88.4
	Not sure	33	11.0	11.6	100.0
	Total	285	95.0	100.0	
Missing	System	15	5.0		
	Total	300	100.0		

*Q26b Whether the participant thinks the seafood/fish is displayed poorly in the stores they shop in*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	54	18.0	18.8	18.8
	Disagree	206	68.7	71.8	90.6
	Not sure	27	9.0	9.4	100.0
	Total	287	95.7	100.0	
Missing	System	13	4.3		
	Total	300	100.0		

*Q26c Whether the participant needs more accurate information on the labelling of seafood/fish to make an informed decision*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	163	54.3	56.8	56.8
	Disagree	100	33.3	34.8	91.6
	Not sure	24	8.0	8.4	100.0
	Total	287	95.7	100.0	
Missing	System	13	4.3		
	Total	300	100.0		

*Q26d Whether the participant trusts the information provided to them in the stores where they buy seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	147	49.0	51.2	51.2
	Disagree	77	25.7	26.8	78.0
	Not sure	63	21.0	22.0	100.0
	Total	287	95.7	100.0	
Missing	System	13	4.3		
	Total	300	100.0		

*Q26e Whether the participant checks labels on food products to decide which products to buy*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	252	84.0	86.9	86.9
	Disagree	25	8.3	8.6	95.5
	Not sure	13	4.3	4.5	100.0
	Total	290	96.7	100.0	
Missing	System	10	3.3		
	Total	300	100.0		

*Q26f Whether the participant compares prices of products to ensure they receive the best value for money*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	254	84.7	88.2	88.2
	Disagree	21	7.0	7.3	95.5
	Not sure	13	4.3	4.5	100.0
	Total	288	96.0	100.0	
Missing	System	12	4.0		
	Total	300	100.0		

Q27a What would encourage the participant and the members of their household to eat more seafood/fish

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Trusting information at point of sale	13	4.3	6.2	6.2
	More local produce	24	8.0	11.4	17.6
	Better priced seafood	95	31.7	45.2	62.9
	More recreational catches	10	3.3	4.8	67.6
	Being more familiar with seafood	1	.3	.5	68.1
	Easy free recipes	20	6.7	9.5	77.6
	Fresher seafood	7	2.3	3.3	81.0
	Pre-boned fish	2	.7	1.0	81.9
	Better variety	7	2.3	3.3	85.2
	Partner not being allergic to seafood	1	.3	.5	85.7
	Better advertising	1	.3	.5	86.2
	Better quality	3	1.0	1.4	87.6
	Not having to be licensed to drive a boat	1	.3	.5	88.1
	If the main shopper liked the taste	3	1.0	1.4	89.5
	Fresher seafood	4	1.3	1.9	91.4
	Better availability	3	1.0	1.4	92.9
	More informative labels	3	1.0	1.4	94.3
	If partner/family liked seafood	2	.7	1.0	95.2
	Single pack fillets	1	.3	.5	95.7
	Better choice of outlets	5	1.7	2.4	98.1
If it was more convenient to get fresh seafood	1	.3	.5	98.6	
Pre-packaged meals	2	.7	1.0	99.5	
Knowing the origins of the seafood	1	.3	.5	100.0	
	Total	210	70.0	100.0	
Missing	System	90	30.0		
	Total	300	100.0		

Q27b What would encourage the participant and the members of their household to eat more seafood/fish

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Trusting information at point of sale	5	1.7	5.2	5.2
	More local produce	17	5.7	17.5	22.7
	Better priced seafood	28	9.3	28.9	51.5
	More recreational catches	2	.7	2.1	53.6
	More information on buying seafood	5	1.7	5.2	58.8
	Easy free recipes	7	2.3	7.2	66.0
	More sustainable fish	1	.3	1.0	67.0
	Fresher seafood	4	1.3	4.1	71.1
	Pre-boned fish	1	.3	1.0	72.2
	Better variety	7	2.3	7.2	79.4
	Free samples/taste testing	1	.3	1.0	80.4
	Better quality	4	1.3	4.1	84.5
	Fresher seafood	2	.7	2.1	86.6
	Knowing how to tell if the seafood is fresh	1	.3	1.0	87.6
	A mercury free guarantee	2	.7	2.1	89.7
	Better availability	5	1.7	5.2	94.8
	If partner/family liked seafood	2	.7	2.1	96.9
	Single pack fillets	1	.3	1.0	97.9
	Outlet not smelling pungent	1	.3	1.0	99.0
	Pre-packaged meals	1	.3	1.0	100.0
Total		97	32.3	100.0	
Missing	System	203	67.7		
	Total	300	100.0		

Q27c What would encourage the participant and the members of their household to eat more seafood/fish

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Trusting information at point of sale	4	1.3	10.5	10.5
	More local produce	2	.7	5.3	15.8
	Better priced seafood	2	.7	5.3	21.1
	More recreational catches	2	.7	5.3	26.3
	More information on buying seafood	2	.7	5.3	31.6
	Easy free recipes	4	1.3	10.5	42.1
	More sustainable fish	1	.3	2.6	44.7
	Fresher seafood	5	1.7	13.2	57.9
	Buying direct from the fisherman	1	.3	2.6	60.5
	Free samples/taste testing	1	.3	2.6	63.2
	Better advertising	1	.3	2.6	65.8
	Better quality	2	.7	5.3	71.1
	Fresher seafood	2	.7	5.3	76.3
	Easier access	1	.3	2.6	78.9
	Better availability	1	.3	2.6	81.6
	More informative labels	3	1.0	7.9	89.5
	Outlet not smelling pungent	2	.7	5.3	94.7
	Knowing the origins of the seafood	1	.3	2.6	97.4
	More knowledgeable staff	1	.3	2.6	100.0
	Total		38	12.7	100.0
Missing	System	262	87.3		
	Total	300	100.0		

*Q27d What would encourage the participant and the members of their household to eat more seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Trusting information at point of sale	1	.3	10.0	10.0
	More local produce	3	1.0	30.0	40.0
	More information on buying seafood	1	.3	10.0	50.0
	Easy free recipes	1	.3	10.0	60.0
	Better advertising	1	.3	10.0	70.0
	More informative labels	1	.3	10.0	80.0
	If partner/family liked seafood	1	.3	10.0	90.0
	Information on how to cook leftovers	1	.3	10.0	100.0
	Total	10	3.3	100.0	
Missing	System	290	96.7		
	Total	300	100.0		

*Q28a Whether information on health benefits of various seafood would encourage the participant and their household to eat more seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	176	58.7	100.0	100.0
Missing	System	124	41.3		
	Total	300	100.0		

*Q28b Whether nutritional information would encourage the participant and their household to eat more seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	148	49.3	100.0	100.0
Missing	System	152	50.7		
	Total	300	100.0		

*Q28c Whether information on how to choose seafood would encourage the participant and their household to eat more seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	143	47.7	100.0	100.0
Missing	System	157	52.3		
	Total	300	100.0		

*Q28d Whether information on how to store seafood would encourage the participant and their household to eat more seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	103	34.3	100.0	100.0
Missing	System	197	65.7		
	Total	300	100.0		

*Q28e Whether information on how to prepare seafood would encourage the participant and their household to eat more seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	131	43.7	100.0	100.0
Missing	System	169	56.3		
	Total	300	100.0		

*Q28f Whether information on how to cook/serve seafood would encourage the participant and their household to eat more seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	153	51.0	100.0	100.0
Missing	System	147	49.0		
	Total	300	100.0		

*Q28g Whether information on how to avoid potential risks would encourage the participant and their household to eat more seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	175	58.3	100.0	100.0
Missing	System	125	41.7		
	Total	300	100.0		

*Q28h Whether information on healthy/low cost seafood recipes that are quick and easy to prepare would encourage the participant and their household to eat more seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	200	66.7	100.0	100.0
Missing	System	100	33.3		
	Total	300	100.0		

*Q28i Whether information on how to prevent or manage common health conditions would encourage the participant and their household to eat more seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	156	52.0	100.0	100.0
Missing	System	144	48.0		
	Total	300	100.0		

*Q28k Whether online cooking demonstrations would encourage the participant and their household to eat more seafood/fish*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	73	24.3	100.0	100.0
Missing	System	227	75.7		
	Total	300	100.0		

Q29 How close the participant lives to a large supermarket

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	1	.3	.3	.3
	.25	2	.7	.7	1.0
	.30	1	.3	.3	1.4
	.50	14	4.7	4.8	6.1
	1.00	50	16.7	17.1	23.2
	1.50	6	2.0	2.0	25.3
	2.00	49	16.3	16.7	42.0
	2.50	5	1.7	1.7	43.7
	3.00	32	10.7	10.9	54.6
	3.40	1	.3	.3	54.9
	4.00	29	9.7	9.9	64.8
	4.50	1	.3	.3	65.2
	5.00	54	18.0	18.4	83.6
	6.00	10	3.3	3.4	87.0
	6.50	1	.3	.3	87.4
	7.00	11	3.7	3.8	91.1
	8.00	8	2.7	2.7	93.9
	10.00	15	5.0	5.1	99.0
	12.00	1	.3	.3	99.3
	15.00	1	.3	.3	99.7
20.00	1	.3	.3	100.0	
Total		293	97.7	100.0	
Missing	System	7	2.3		
	Total	300	100.0		

Q30 How close the participant lives to the nearest food/grocery outlet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	1	.3	.3	.3
	.20	2	.7	.7	1.0
	.25	5	1.7	1.7	2.7
	.30	3	1.0	1.0	3.8
	.40	2	.7	.7	4.5
	.50	23	7.7	7.9	12.4
	.75	1	.3	.3	12.7
	1.00	81	27.0	27.8	40.5
	1.20	1	.3	.3	40.9
	1.50	9	3.0	3.1	44.0
	2.00	40	13.3	13.7	57.7
	2.50	1	.3	.3	58.1
	3.00	22	7.3	7.6	65.6
	4.00	21	7.0	7.2	72.9
	4.50	1	.3	.3	73.2
	5.00	34	11.3	11.7	84.9
	6.00	10	3.3	3.4	88.3
	6.50	1	.3	.3	88.7
	7.00	9	3.0	3.1	91.8
	8.00	7	2.3	2.4	94.2
	10.00	12	4.0	4.1	98.3
	12.00	1	.3	.3	98.6
	15.00	2	.7	.7	99.3
18.00	1	.3	.3	99.7	



	20.00	1	.3	.3	100.0
	Total	291	97.0	100.0	
Missing	System	9	3.0		
	Total	300	100.0		

*Q31 How close the participant lives to a take-away/fast food outlet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	1	.3	.3	.3
	.20	2	.7	.7	1.0
	.25	4	1.3	1.4	2.4
	.30	1	.3	.3	2.7
	.40	3	1.0	1.0	3.8
	.50	22	7.3	7.6	11.3
	.75	1	.3	.3	11.7
	1.00	90	30.0	30.9	42.6
	1.20	1	.3	.3	43.0
	1.50	7	2.3	2.4	45.4
	2.00	41	13.7	14.1	59.5
	2.50	1	.3	.3	59.8
	3.00	24	8.0	8.2	68.0
	4.00	20	6.7	6.9	74.9
	5.00	30	10.0	10.3	85.2
	6.00	7	2.3	2.4	87.6
	6.50	1	.3	.3	88.0
	7.00	11	3.7	3.8	91.8
	8.00	6	2.0	2.1	93.8
	9.00	1	.3	.3	94.2
	10.00	14	4.7	4.8	99.0
	12.00	1	.3	.3	99.3
	15.00	1	.3	.3	99.7
	35.00	1	.3	.3	100.0
	Total	291	97.0	100.0	
Missing	System	9	3.0		
	Total	300	100.0		

*Q32 How many meals per month on average the participant and their household purchase take-away or fast food*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	71	23.7	24.4	24.4
	0	1	.3	.3	24.7
	0	3	1.0	1.0	25.8
	1	63	21.0	21.6	47.4
	2	45	15.0	15.5	62.9
	3	23	7.7	7.9	70.8
	4	41	13.7	14.1	84.9
	5	8	2.7	2.7	87.6
	6	12	4.0	4.1	91.8
	8	8	2.7	2.7	94.5
	10	4	1.3	1.4	95.9
	11	1	.3	.3	96.2
	12	2	.7	.7	96.9
	15	1	.3	.3	97.3
	16	3	1.0	1.0	98.3

	20	5	1.7	1.7	100.0
	Total	291	97.0	100.0	
Missing	System	9	3.0		
	Total	300	100.0		

*Q33a What type of fast food the participant and their household prefer most*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cicerello's	5	1.7	1.9	1.9
	Chinese	23	7.7	8.9	10.8
	Subway	24	8.0	9.3	20.1
	Chicken	28	9.3	10.8	30.9
	Hot chips	1	.3	.4	31.3
	Fish/seafood and chips	72	24.0	27.8	59.1
	Fish	12	4.0	4.6	63.7
	Burger	12	4.0	4.6	68.3
	Chicken Treat	1	.3	.4	68.7
	Red Rooster	8	2.7	3.1	71.8
	Fish/Seafood	5	1.7	1.9	73.7
	Pizza	15	5.0	5.8	79.5
	Thai	4	1.3	1.5	81.1
	KFC	6	2.0	2.3	83.4
	Japanese	3	1.0	1.2	84.6
	McDonalds	4	1.3	1.5	86.1
	Hungry Jacks	14	4.7	5.4	91.5
	Chicken and chips	1	.3	.4	91.9
	Noodle Box	1	.3	.4	92.3
	Asian	10	3.3	3.9	96.1
	Vegetarian	2	.7	.8	96.9
	Sandwich	1	.3	.4	97.3
	Indian	3	1.0	1.2	98.5
	Kebabs	1	.3	.4	98.8
	Stir Fry	1	.3	.4	99.2
	Vietnamese	1	.3	.4	99.6
	Sushi	1	.3	.4	100.0
	Total	259	86.3	100.0	
Missing	System	41	13.7		
	Total	300	100.0		

*Q33b The second preference of fast food of the participant and their household*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cicerello's	2	.7	.9	.9
	Chinese	38	12.7	16.7	17.5
	Subway	10	3.3	4.4	21.9
	Chicken	43	14.3	18.9	40.8
	Fish/seafood and chips	33	11.0	14.5	55.3
	Fish	11	3.7	4.8	60.1
	Burger	7	2.3	3.1	63.2
	Chicken Treat	5	1.7	2.2	65.4
	Red Rooster	9	3.0	3.9	69.3
	Fish/Seafood	3	1.0	1.3	70.6
	Bacon and eggs	1	.3	.4	71.1
	Salad	2	.7	.9	71.9

	Pizza	21	7.0	9.2	81.1
	KFC	6	2.0	2.6	83.8
	Japanese	3	1.0	1.3	85.1
	McDonalds	4	1.3	1.8	86.8
	Hungry Jacks	5	1.7	2.2	89.0
	Chicken and chips	3	1.0	1.3	90.4
	Pasta	3	1.0	1.3	91.7
	Asian	7	2.3	3.1	94.7
	Mr Chooks	2	.7	.9	95.6
	Vegetarian	1	.3	.4	96.1
	Indian	4	1.3	1.8	97.8
	Poast	1	.3	.4	98.2
	Kebabs	1	.3	.4	98.7
	Beef	1	.3	.4	99.1
	Sushi	1	.3	.4	99.6
	Malaysian	1	.3	.4	100.0
	Total	228	76.0	100.0	
Missing	System	72	24.0		
	Total	300	100.0		

*Q33c: The third preference of fast food of the participant and their household*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chinese	15	5.0	11.4	11.4
	Subway	10	3.3	7.6	18.9
	Chicken	6	2.0	4.5	23.5
	Fish/seafood and chips	19	6.3	14.4	37.9
	Fish	4	1.3	3.0	40.9
	Burger	18	6.0	13.6	54.5
	Chicken Treat	1	.3	.8	55.3
	Red Rooster	5	1.7	3.8	59.1
	BBQ	1	.3	.8	59.8
	Fish/Seafood	1	.3	.8	60.6
	Pizza	18	6.0	13.6	74.2
	Thai	3	1.0	2.3	76.5
	KFC	5	1.7	3.8	80.3
	McDonalds	4	1.3	3.0	83.3
	Hungry Jacks	6	2.0	4.5	87.9
	Chicken and chips	1	.3	.8	88.6
	Pasta	3	1.0	2.3	90.9
	Lamb	1	.3	.8	91.7
	Asian	4	1.3	3.0	94.7
	Sumo Salad	2	.7	1.5	96.2
	Sandwich	1	.3	.8	97.0
	Indian	1	.3	.8	97.7
	Beef	2	.7	1.5	99.2
	Sushi	1	.3	.8	100.0
	Total	132	44.0	100.0	
Missing	System	168	56.0		
	Total	300	100.0		

Q34a The main types of meals usually cooked/consumed in the participant's home

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Spaghetti bolognaise	5	1.7	1.8	1.8
	Protein and vegetables	3	1.0	1.1	2.9
	Egg on toast	1	.3	.4	3.3
	Fresh home-made	2	.7	.7	4.0
	Meat and vegetables/salad	89	29.7	32.5	36.5
	Fish and vegetables/salad	24	8.0	8.8	45.3
	Pork and vegetables/salad	4	1.3	1.5	46.7
	Chicken and vegetables/salad	26	8.7	9.5	56.2
	Tv dinners	1	.3	.4	56.6
	Roasts	20	6.7	7.3	63.9
	Seafood	4	1.3	1.5	65.3
	Soup	4	1.3	1.5	66.8
	Mexican	1	.3	.4	67.2
	Traditional foods	1	.3	.4	67.5
	Stir fry	19	6.3	6.9	74.5
	Tofu	5	1.7	1.8	76.3
	Stews	2	.7	.7	77.0
	Casseroles	4	1.3	1.5	78.5
	Pasta	7	2.3	2.6	81.0
	Sandwiches/rolls	2	.7	.7	81.8
	Slow cooked	3	1.0	1.1	82.8
	Indian	3	1.0	1.1	83.9
	Fresh salads	5	1.7	1.8	85.8
	Vegetarian	5	1.7	1.8	87.6
	Baked	1	.3	.4	88.0
	BBQ	11	3.7	4.0	92.0
	Pan fried	1	.3	.4	92.3
	Quick and easy	3	1.0	1.1	93.4
	Kangaroo	1	.3	.4	93.8
	Noodles	1	.3	.4	94.2
	Vegetables	3	1.0	1.1	95.3
Burgers	1	.3	.4	95.6	
Philippino	1	.3	.4	96.0	
South American	1	.3	.4	96.4	
Lentils	1	.3	.4	96.7	
Moroccan	1	.3	.4	97.1	
Lamb	2	.7	.7	97.8	
Healthy	3	1.0	1.1	98.9	
Asian	2	.7	.7	99.6	
Turkey and vegetables	1	.3	.4	100.0	
Total		274	91.3	100.0	
Missing	System	26	8.7		
	Total	300	100.0		

Q34b The main types of meals usually cooked/consumed in the participant's home

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Spaghetti bolognaise	4	1.3	1.7	1.7
	Egg on toast	1	.3	.4	2.1
	Fresh home-made	1	.3	.4	2.6
	Meat and vegetables/salad	39	13.0	16.6	19.1
	Fish and vegetables/salad	43	14.3	18.3	37.4
	Pork and vegetables/salad	2	.7	.9	38.3

Chicken and vegetables/salad	18	6.0	7.7	46.0
Steamed	1	.3	.4	46.4
Roasts	13	4.3	5.5	51.9
Seafood	1	.3	.4	52.3
Soup	1	.3	.4	52.8
Stir fry	12	4.0	5.1	57.9
Tofu	1	.3	.4	58.3
Stews	10	3.3	4.3	62.6
Casseroles	11	3.7	4.7	67.2
Pasta	17	5.7	7.2	74.5
Sandwiches/rolls	1	.3	.4	74.9
Indian	7	2.3	3.0	77.9
Fresh salads	14	4.7	6.0	83.8
Vegetarian	3	1.0	1.3	85.1
Baked	3	1.0	1.3	86.4
BBQ	13	4.3	5.5	91.9
Noodles	1	.3	.4	92.3
Vegetables	3	1.0	1.3	93.6
Frozen meals	1	.3	.4	94.0
Fresh fruit	1	.3	.4	94.5
Rice	3	1.0	1.3	95.7
Chinese	1	.3	.4	96.2
Lentils	1	.3	.4	96.6
Moroccan	3	1.0	1.3	97.9
Lamb	4	1.3	1.7	99.6
Quiche	1	.3	.4	100.0
Total	235	78.3	100.0	
Missing	System	65	21.7	
Total		300	100.0	

*Q34c The main types of meals usually cooked/consumed in the participant's home*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Spaghetti bolognese	3	1.0	1.6	1.6
	Shepherd's pie	1	.3	.5	2.1
	Egg on toast	1	.3	.5	2.7
	Meat and vegetables/salad	21	7.0	11.2	13.9
	Fish and vegetables/salad	22	7.3	11.8	25.7
	Chicken and vegetables/salad	22	7.3	11.8	37.4
	Steamed	1	.3	.5	38.0
	Roasts	9	3.0	4.8	42.8
	Seafood	3	1.0	1.6	44.4
	Soup	6	2.0	3.2	47.6
	Mexican	1	.3	.5	48.1
	Stir fry	11	3.7	5.9	54.0
	Tofu	1	.3	.5	54.5
	Stews	4	1.3	2.1	56.7
	Sushi	1	.3	.5	57.2
	Casseroles	13	4.3	7.0	64.2
	Pasta	15	5.0	8.0	72.2
	Sandwiches/rolls	1	.3	.5	72.7
	Indian	8	2.7	4.3	77.0
	Fresh salads	6	2.0	3.2	80.2
	Low GI grains	1	.3	.5	80.7
	Vegetarian	2	.7	1.1	81.8

Baked		2	.7	1.1	82.9
BBQ		4	1.3	2.1	85.0
Noodles		2	.7	1.1	86.1
Vegetables		3	1.0	1.6	87.7
Risotto		2	.7	1.1	88.8
Fresh fruit		1	.3	.5	89.3
Rice		8	2.7	4.3	93.6
Chinese		1	.3	.5	94.1
Omelettes		1	.3	.5	94.7
Moroccan		1	.3	.5	95.2
Lamb		4	1.3	2.1	97.3
Italian		3	1.0	1.6	98.9
Asian		1	.3	.5	99.5
Pizzas		1	.3	.5	100.0
Total		187	62.3	100.0	
Missing	System	113	37.7		
Total		300	100.0		

*Q34d The main types of meals usually cooked/consumed in the participant's home*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Shepherd's pie	1	.3	1.0	1.0
	Egg on toast	1	.3	1.0	2.0
	Meat and vegetables/salad	7	2.3	7.1	9.2
	Fish and vegetables/salad	8	2.7	8.2	17.3
	Chicken and vegetables/salad	3	1.0	3.1	20.4
	Roasts	3	1.0	3.1	23.5
	Seafood	2	.7	2.0	25.5
	Soup	4	1.3	4.1	29.6
	Stir fry	8	2.7	8.2	37.8
	Stews	4	1.3	4.1	41.8
	Casseroles	2	.7	2.0	43.9
	Pasta	11	3.7	11.2	55.1
	Indian	6	2.0	6.1	61.2
	Fresh salads	11	3.7	11.2	72.4
	Vegetarian	1	.3	1.0	73.5
	BBQ	6	2.0	6.1	79.6
	Pan fried	1	.3	1.0	80.6
	Noodles	1	.3	1.0	81.6
	Vegetables	1	.3	1.0	82.7
	Pasties/pies	1	.3	1.0	83.7
	Rice	4	1.3	4.1	87.8
	Omelettes	1	.3	1.0	88.8
	Moroccan	1	.3	1.0	89.8
	Lamb	4	1.3	4.1	93.9
	Asian	2	.7	2.0	95.9
	Turkey and vegetables	1	.3	1.0	96.9
	Cheese dishes	1	.3	1.0	98.0
	Kebabs	1	.3	1.0	99.0
	Quiche	1	.3	1.0	100.0
	Total	98	32.7	100.0	
Missing	System	202	67.3		
Total		300	100.0		

Q35a The extent to which the participant's household consumes meals purchased ready-made, or substantially ready-made

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.0	25	8.3	12.0	12.0
	.5	2	.7	1.0	12.9
	1.0	17	5.7	8.1	21.1
	2.0	15	5.0	7.2	28.2
	3.0	1	.3	.5	28.7
	4.0	2	.7	1.0	29.7
	5.0	51	17.0	24.4	54.1
	10.0	58	19.3	27.8	81.8
	15.0	4	1.3	1.9	83.7
	17.0	1	.3	.5	84.2
	20.0	9	3.0	4.3	88.5
	25.0	7	2.3	3.3	91.9
	30.0	4	1.3	1.9	93.8
	40.0	5	1.7	2.4	96.2
	50.0	3	1.0	1.4	97.6
	60.0	1	.3	.5	98.1
	80.0	2	.7	1.0	99.0
	100.0	2	.7	1.0	100.0
	Total		209	69.7	100.0
Missing	System	91	30.3		
	Total	300	100.0		

Q35b The extent to which the participant's household consumes meals self-prepared by people in the household, from largely unprocessed ingredients

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	3	1.0	1.1	1.1
	1	1	.3	.4	1.5
	5	1	.3	.4	1.8
	10	6	2.0	2.2	4.0
	15	1	.3	.4	4.4
	20	8	2.7	2.9	7.3
	25	1	.3	.4	7.7
	30	4	1.3	1.5	9.1
	35	1	.3	.4	9.5
	40	8	2.7	2.9	12.4
	48	1	.3	.4	12.8
	50	20	6.7	7.3	20.1
	58	1	.3	.4	20.4
	60	7	2.3	2.6	23.0
	65	1	.3	.4	23.4
	70	25	8.3	9.1	32.5
	75	13	4.3	4.7	37.2
	80	44	14.7	16.1	53.3
	85	9	3.0	3.3	56.6
	88	1	.3	.4	56.9
	89	1	.3	.4	57.3
	90	46	15.3	16.8	74.1
	93	1	.3	.4	74.5
	94	1	.3	.4	74.8
	95	16	5.3	5.8	80.7



	96	2	.7	.7	81.4
	97	1	.3	.4	81.8
	98	7	2.3	2.6	84.3
	99	6	2.0	2.2	86.5
	100	37	12.3	13.5	100.0
	Total	274	91.3	100.0	
Missing	System	26	8.7		
	Total	300	100.0		

*Q35c The extent to which the participant's household consumes meals containing both ready-made and self-prepared components*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.0	7	2.3	3.1	3.1
	.5	1	.3	.4	3.6
	1.0	7	2.3	3.1	6.7
	2.0	5	1.7	2.2	8.9
	3.0	3	1.0	1.3	10.3
	4.0	3	1.0	1.3	11.6
	5.0	29	9.7	12.9	24.6
	6.0	1	.3	.4	25.0
	7.0	1	.3	.4	25.4
	8.0	2	.7	.9	26.3
	9.0	3	1.0	1.3	27.7
	10.0	51	17.0	22.8	50.4
	13.0	1	.3	.4	50.9
	15.0	11	3.7	4.9	55.8
	16.0	1	.3	.4	56.3
	18.0	1	.3	.4	56.7
	19.0	1	.3	.4	57.1
	20.0	33	11.0	14.7	71.9
	24.0	1	.3	.4	72.3
	25.0	5	1.7	2.2	74.6
	30.0	14	4.7	6.3	80.8
	35.0	1	.3	.4	81.3
	40.0	8	2.7	3.6	84.8
	45.0	1	.3	.4	85.3
	50.0	12	4.0	5.4	90.6
	60.0	5	1.7	2.2	92.9
	70.0	3	1.0	1.3	94.2
	75.0	3	1.0	1.3	95.5
	80.0	5	1.7	2.2	97.8
	90.0	1	.3	.4	98.2
	100.0	4	1.3	1.8	100.0
	Total	224	74.7	100.0	
Missing	System	76	25.3		
	Total	300	100.0		

*Q36a Some foods the participant thinks are healthy*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fish	77	25.7	27.0	27.0
	Vegetables	70	23.3	24.6	51.6
	Fruit	56	18.7	19.6	71.2
	Fresh/lean meat	17	5.7	6.0	77.2
	Dairy	1	.3	.4	77.5
	Chicken	11	3.7	3.9	81.4
	Beef	3	1.0	1.1	82.5
	Salad	23	7.7	8.1	90.5
	Rice	2	.7	.7	91.2
	Cereals	1	.3	.4	91.6
	Fish/seafood	7	2.3	2.5	94.0
	Eggs	2	.7	.7	94.7
	Wholemeal bread/cereal	5	1.7	1.8	96.5
	Lamb	1	.3	.4	96.8
	Steak	1	.3	.4	97.2
	Porridge	2	.7	.7	97.9
	Mediterranean	1	.3	.4	98.2
	Seeds	1	.3	.4	98.6
	Protein	1	.3	.4	98.9
	Avocado	1	.3	.4	99.3
Curries	1	.3	.4	99.6	
All in moderation	1	.3	.4	100.0	
Total	285	95.0	100.0		
Missing	System	15	5.0		
	Total	300	100.0		

*Q36b Some foods the participant thinks are healthy*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fish	31	10.3	11.0	11.0
	Vegetables	79	26.3	28.1	39.1
	Fruit	60	20.0	21.4	60.5
	Fresh/lean meat	13	4.3	4.6	65.1
	Dairy	3	1.0	1.1	66.2
	Chicken	37	12.3	13.2	79.4
	Beef	4	1.3	1.4	80.8
	Salad	14	4.7	5.0	85.8
	Rice	1	.3	.4	86.1
	Cereals	1	.3	.4	86.5
	Fish/seafood	8	2.7	2.8	89.3
	Pork	3	1.0	1.1	90.4
	Greens	1	.3	.4	90.7
	Eggs	2	.7	.7	91.5
	Wholemeal bread/cereal	3	1.0	1.1	92.5
	Lamb	1	.3	.4	92.9
	Soup	1	.3	.4	93.2
	Steak	2	.7	.7	94.0
	Nuts	3	1.0	1.1	95.0
	Yoghurt	5	1.7	1.8	96.8
	Olive oil	1	.3	.4	97.2
	Grains	1	.3	.4	97.5
	Avocado	1	.3	.4	97.9
	Curries	1	.3	.4	98.2
	Cheese	1	.3	.4	98.6

	Poultry	2	.7	.7	99.3
	Bran	1	.3	.4	99.6
	Muesli	1	.3	.4	100.0
	Total	281	93.7	100.0	
Missing	System	19	6.3		
	Total	300	100.0		

*Q36c Some foods the participant thinks are healthy*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fish	48	16.0	18.0	18.0
	Vegetables	41	13.7	15.4	33.5
	Fruit	19	6.3	7.1	40.6
	Fresh/lean meat	34	11.3	12.8	53.4
	Dairy	8	2.7	3.0	56.4
	Chicken	21	7.0	7.9	64.3
	Beef	7	2.3	2.6	66.9
	Pasta	5	1.7	1.9	68.8
	Salad	10	3.3	3.8	72.6
	Stirfry	3	1.0	1.1	73.7
	Rice	3	1.0	1.1	74.8
	Cereals	3	1.0	1.1	75.9
	Fish/seafood	6	2.0	2.3	78.2
	Pork	7	2.3	2.6	80.8
	Eggs	6	2.0	2.3	83.1
	Wholemeal bread/cereal	14	4.7	5.3	88.3
	Lamb	4	1.3	1.5	89.8
	Soup	2	.7	.8	90.6
	Steak	1	.3	.4	91.0
	Stews	1	.3	.4	91.4
	Legumeas	7	2.3	2.6	94.0
	Nuts	9	3.0	3.4	97.4
	Yoghurt	2	.7	.8	98.1
	Tofu	1	.3	.4	98.5
	Mutton	1	.3	.4	98.9
	Avocado	1	.3	.4	99.2
	Poultry	1	.3	.4	99.6
	Liver	1	.3	.4	100.0
	Total	266	88.7	100.0	
Missing	System	34	11.3		
	Total	300	100.0		

*Q36d Some foods the participant thinks are healthy*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fish	19	6.3	7.9	7.9
	Vegetables	30	10.0	12.6	20.5
	Fruit	35	11.7	14.6	35.1
	Fresh/lean meat	24	8.0	10.0	45.2
	Dairy	11	3.7	4.6	49.8
	Chicken	27	9.0	11.3	61.1
	Beef	13	4.3	5.4	66.5
	Pasta	2	.7	.8	67.4
	Salad	11	3.7	4.6	72.0

	Rice	9	3.0	3.8	75.7
	Cereals	1	.3	.4	76.2
	Fish/seafood	5	1.7	2.1	78.2
	Pork	3	1.0	1.3	79.5
	Eggs	3	1.0	1.3	80.8
	Wholemeal bread/cereal	6	2.0	2.5	83.3
	Lamb	3	1.0	1.3	84.5
	Soup	1	.3	.4	84.9
	Steak	5	1.7	2.1	87.0
	Legumeas	9	3.0	3.8	90.8
	Porridge	1	.3	.4	91.2
	Nuts	7	2.3	2.9	94.1
	Yoghurt	1	.3	.4	94.6
	Organic	1	.3	.4	95.0
	Offal	1	.3	.4	95.4
	Carbs	1	.3	.4	95.8
	Butter	1	.3	.4	96.2
	Low-fat	1	.3	.4	96.7
	Grains	3	1.0	1.3	97.9
	Omega 3 oils	1	.3	.4	98.3
	Cheese	1	.3	.4	98.7
	Poultry	3	1.0	1.3	100.0
	Total	239	79.7	100.0	
Missing	System	61	20.3		
	Total	300	100.0		

*Q36e Some foods the participant thinks are healthy*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fish	21	7.0	10.9	10.9
	Vegetables	16	5.3	8.3	19.2
	Fruit	19	6.3	9.8	29.0
	Fresh/lean meat	19	6.3	9.8	38.9
	Dairy	9	3.0	4.7	43.5
	Chicken	15	5.0	7.8	51.3
	Beef	8	2.7	4.1	55.4
	Pasta	7	2.3	3.6	59.1
	Salad	5	1.7	2.6	61.7
	Stirfry	1	.3	.5	62.2
	Thai	1	.3	.5	62.7
	Rice	9	3.0	4.7	67.4
	Cereals	3	1.0	1.6	68.9
	Fish/seafood	3	1.0	1.6	70.5
	Pork	3	1.0	1.6	72.0
	Greens	1	.3	.5	72.5
	Eggs	8	2.7	4.1	76.7
	Wholemeal bread/cereal	9	3.0	4.7	81.3
	Lamb	5	1.7	2.6	83.9
	Stews	1	.3	.5	84.5
	Legumeas	6	2.0	3.1	87.6
	Nuts	9	3.0	4.7	92.2
	Yoghurt	6	2.0	3.1	95.3
	Organic	1	.3	.5	95.9
	Biodynamic	1	.3	.5	96.4

	Baked beans	1	.3	.5	96.9
	Olive oil	1	.3	.5	97.4
	Low-fat	1	.3	.5	97.9
	Grains	2	.7	1.0	99.0
	Cheese	1	.3	.5	99.5
	Low sugar	1	.3	.5	100.0
	Total	193	64.3	100.0	
Missing	System	107	35.7		
	Total	300	100.0		

*Q36f Some foods the participant thinks are healthy*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fish	9	3.0	6.5	6.5
	Vegetables	4	1.3	2.9	9.4
	Fruit	10	3.3	7.2	16.5
	Fresh/lean meat	14	4.7	10.1	26.6
	Dairy	8	2.7	5.8	32.4
	Chicken	5	1.7	3.6	36.0
	Beef	4	1.3	2.9	38.8
	Pasta	7	2.3	5.0	43.9
	Salad	4	1.3	2.9	46.8
	Rice	5	1.7	3.6	50.4
	Cereals	1	.3	.7	51.1
	Fish/seafood	1	.3	.7	51.8
	Pork	3	1.0	2.2	54.0
	Eggs	9	3.0	6.5	60.4
	Wholemeal bread/cereal	13	4.3	9.4	69.8
	Lamb	6	2.0	4.3	74.1
	Steak	1	.3	.7	74.8
	Legumeas	4	1.3	2.9	77.7
	Nuts	15	5.0	10.8	88.5
	Yoghurt	2	.7	1.4	89.9
	Ham	1	.3	.7	90.6
	Garlic	1	.3	.7	91.4
	Soy milk	1	.3	.7	92.1
	Vegetable oil	1	.3	.7	92.8
	Unprocessed	1	.3	.7	93.5
	Grains	1	.3	.7	94.2
	Flaxseed oil	1	.3	.7	95.0
	Cheese	1	.3	.7	95.7
	Red wine	2	.7	1.4	97.1
	Poultry	2	.7	1.4	98.6
	Beans	1	.3	.7	99.3
	Juice	1	.3	.7	100.0
	Total	139	46.3	100.0	
Missing	System	161	53.7		
	Total	300	100.0		

*Q37a If healthy foods were cheaper it would make it easier for the participant and their household to eat a healthy diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, easier	243	81.0	86.5	86.5
	No, not easier	22	7.3	7.8	94.3
	Not sure	16	5.3	5.7	100.0
	Total	281	93.7	100.0	
Missing	System	19	6.3		
	Total	300	100.0		

*Q37b If more take-away and fast food outlets provided healthy foods it would make it easier for the participant and their household to eat a healthy diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, easier	107	35.7	40.8	40.8
	No, not easier	97	32.3	37.0	77.9
	Not sure	58	19.3	22.1	100.0
	Total	262	87.3	100.0	
Missing	System	38	12.7		
	Total	300	100.0		

*Q37c If the participant knew more easy ways of preparing healthy foods it would make it easier for them and their household to eat a healthy diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, easier	163	54.3	61.7	61.7
	No, not easier	65	21.7	24.6	86.4
	Not sure	36	12.0	13.6	100.0
	Total	264	88.0	100.0	
Missing	System	36	12.0		
	Total	300	100.0		

*Q37d If the participant knew more quick ways of preparing healthy foods it would make it easier for them and their household to eat a healthy diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, easier	178	59.3	67.7	67.7
	No, not easier	65	21.7	24.7	92.4
	Not sure	20	6.7	7.6	100.0
	Total	263	87.7	100.0	
Missing	System	37	12.3		
	Total	300	100.0		

*Q37e If the participant had more information to help them decide which foods were healthy it would make it easier for them and their household to eat a healthy diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, easier	141	47.0	54.2	54.2
	No, not easier	76	25.3	29.2	83.5
	Not sure	43	14.3	16.5	100.0
	Total	260	86.7	100.0	
Missing	System	40	13.3		
	Total	300	100.0		

*Q37f If the participant knew more about cooking it would make it easier for them and their household to eat a healthy diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, easier	101	33.7	39.0	39.0
	No, not easier	114	38.0	44.0	83.0
	Not sure	44	14.7	17.0	100.0
	Total	259	86.3	100.0	
Missing	System	41	13.7		
	Total	300	100.0		

*Q37g If the participant's family/partner enjoyed healthy foods it would make it easier for them to eat a healthy diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, easier	102	34.0	41.3	41.3
	No, not easier	103	34.3	41.7	83.0
	Not sure	42	14.0	17.0	100.0
	Total	247	82.3	100.0	
Missing	System	53	17.7		
	Total	300	100.0		

*Q37h If the participant could buy more healthy snack foods, it would make it easier for them and their household to eat a healthy diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, easier	147	49.0	56.8	56.8
	No, not easier	83	27.7	32.0	88.8
	Not sure	29	9.7	11.2	100.0
	Total	259	86.3	100.0	
Missing	System	41	13.7		
	Total	300	100.0		

*Q37i If healthier foods were easier to find in supermarkets, it would make it easier for the participant and their household to eat a healthy diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, easier	159	53.0	61.2	61.2
	No, not easier	67	22.3	25.8	86.9
	Not sure	34	11.3	13.1	100.0
	Total	260	86.7	100.0	
Missing	System	40	13.3		
	Total	300	100.0		

*Q37j If there was more detailed and easy to understand information on food labels it would make it easier for the participant and their household to eat a healthy diet*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, easier	196	65.3	73.1	73.1
	No, not easier	51	17.0	19.0	92.2
	Not sure	21	7.0	7.8	100.0
	Total	268	89.3	100.0	
Missing	System	32	10.7		
	Total	300	100.0		



*Q38a Whether the participant thinks healthy food is affordable in their local area*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	134	44.7	47.0	47.0
	Disagree	109	36.3	38.2	85.3
	Not sure	42	14.0	14.7	100.0
	Total	285	95.0	100.0	
Missing	System	15	5.0		
	Total	300	100.0		

*Q38b Whether the participant thinks healthy food is more expensive than unhealthy food in their area*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	181	60.3	63.5	63.5
	Disagree	67	22.3	23.5	87.0
	Not sure	37	12.3	13.0	100.0
	Total	285	95.0	100.0	
Missing	System	15	5.0		
	Total	300	100.0		

*Q38c Whether the participant thinks it is easy to find healthy food in their local area*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	189	63.0	65.6	65.6
	Disagree	60	20.0	20.8	86.5
	Not sure	39	13.0	13.5	100.0
	Total	288	96.0	100.0	
Missing	System	12	4.0		
	Total	300	100.0		

*Q38d Whether the participant thinks it is difficult to find healthy food that is affordable in their local area*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	103	34.3	36.5	36.5
	Disagree	127	42.3	45.0	81.6
	Not sure	52	17.3	18.4	100.0
	Total	282	94.0	100.0	
Missing	System	18	6.0		
	Total	300	100.0		

*Q38e Whether the participant thinks healthy food is more expensive than unhealthy food*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	196	65.3	68.8	68.8
	Disagree	58	19.3	20.4	89.1
	Not sure	31	10.3	10.9	100.0
	Total	285	95.0	100.0	
Missing	System	15	5.0		
	Total	300	100.0		

*Q39. Highest level of formal education completed*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than year 10	31	10.3	10.8	10.8
	Year 10	98	32.7	34.0	44.8
	Year 12/TEE	43	14.3	14.9	59.7
	Technical training (trade, TAFE)	52	17.3	18.1	77.8
	Tertiary education (University or CAE)	64	21.3	22.2	100.0
	Total	288	96.0	100.0	
Missing	System	12	4.0		
	Total	300	100.0		

*Q40 The participant's job status*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed full time	69	23.0	25.6	25.6
	Employed part time	47	15.7	17.4	43.0
	Unemployed	7	2.3	2.6	45.6
	A student	7	2.3	2.6	48.1
	A pensioner/on social security	64	21.3	23.7	71.9
	Retired	73	24.3	27.0	98.9
	Other	3	1.0	1.1	100.0
	Total	270	90.0	100.0	
Missing	System	30	10.0		
	Total	300	100.0		

*Q40a The participant's job status other*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Home duties	9	3.0	34.6	34.6
	Own a business	7	2.3	26.9	61.5
	Casual work	3	1.0	11.5	73.1
	Looking for work	1	.3	3.8	76.9
	Long term illness	1	.3	3.8	80.8
	Carer	1	.3	3.8	84.6
	Full time parent	4	1.3	15.4	100.0
	Total	26	8.7	100.0	
Missing	System	274	91.3		
	Total	300	100.0		

*Q41 Whether the participant considers themselves Aboriginal or Torres Strait Islander*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	1.7	1.7	1.7
	No	285	95.0	98.3	100.0
	Total	290	96.7	100.0	
Missing	System	10	3.3		
	Total	300	100.0		

Q42a All the health conditions the participant has been diagnosed with

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hypothyroidism	3	1.0	1.7	1.7
	Arthritis	42	14.0	23.9	25.6
	Ulcers	1	.3	.6	26.1
	Diabetes	17	5.7	9.7	35.8
	Pre-diabetic type 2	2	.7	1.1	36.9
	High Blood Pressure	54	18.0	30.7	67.6
	Haemochromotis	2	.7	1.1	68.8
	Bletharitis	1	.3	.6	69.3
	Gout	1	.3	.6	69.9
	High cholesterol	5	1.7	2.8	72.7
	Cardiovascular disease	2	.7	1.1	73.9
	Heart condition	2	.7	1.1	75.0
	Asthma	3	1.0	1.7	76.7
	Cancer	12	4.0	6.8	83.5
	Heart attack	1	.3	.6	84.1
	Low blood pressure	1	.3	.6	84.7
	Asbestosis	1	.3	.6	85.2
	Depression	3	1.0	1.7	86.9
	Gallstones	2	.7	1.1	88.1
	Heart disease	7	2.3	4.0	92.0
	Mental illness	1	.3	.6	92.6
	Kidney disease	1	.3	.6	93.2
	Underactive thyroid	1	.3	.6	93.8
	Crohn's disease	2	.7	1.1	94.9
	Obesity	1	.3	.6	95.5
	Triple bypass	1	.3	.6	96.0
	Coeliac	1	.3	.6	96.6
Rosacea	1	.3	.6	97.2	
Stroke	2	.7	1.1	98.3	
Hepatitis A	1	.3	.6	98.9	
Osteoporosis	2	.7	1.1	100.0	
Total	176	58.7	100.0		
Missing	System	124	41.3		
	Total	300	100.0		

Q42b All the health conditions the participant has been diagnosed with

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hypothyroidism	2	.7	2.0	2.0
	Arthritis	17	5.7	17.2	19.2
	Benign prostate	1	.3	1.0	20.2
	Diabetes	4	1.3	4.0	24.2
	High Blood Pressure	39	13.0	39.4	63.6
	Spinal problems	1	.3	1.0	64.6
	Hypertremia	1	.3	1.0	65.7
	High cholesterol	4	1.3	4.0	69.7
	Heart condition	2	.7	2.0	71.7
	Asthma	1	.3	1.0	72.7
	Cancer	1	.3	1.0	73.7
	Heart attack	1	.3	1.0	74.7
	Emphysema	2	.7	2.0	76.8
	Depression	3	1.0	3.0	79.8
	Heart disease	1	.3	1.0	80.8

	Poor circulation	1	.3	1.0	81.8
	Mental illness	1	.3	1.0	82.8
	White coat syndrome	1	.3	1.0	83.8
	Fibromyalgia	1	.3	1.0	84.8
	AAA	1	.3	1.0	85.9
	Reflux	1	.3	1.0	86.9
	COI	1	.3	1.0	87.9
	Allergies	2	.7	2.0	89.9
	Low blood platelets (ITP)	1	.3	1.0	90.9
	GERD	1	.3	1.0	91.9
	GORD	1	.3	1.0	92.9
	Deafness	1	.3	1.0	93.9
	Psoriasis	1	.3	1.0	94.9
	Overweight	1	.3	1.0	96.0
	Chronic non-specific dizziness/nausea	1	.3	1.0	97.0
	Migraines	1	.3	1.0	98.0
	Enlarged prostate	1	.3	1.0	99.0
	Chronic fatigue	1	.3	1.0	100.0
	Total	99	33.0	100.0	
Missing	System	201	67.0		
	Total	300	100.0		

*Q42c All the health conditions the participant has been diagnosed with*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Arthritis	7	2.3	17.5	17.5
	Ulcers	1	.3	2.5	20.0
	Diabetes	1	.3	2.5	22.5
	Menopause	1	.3	2.5	25.0
	High Blood Pressure	9	3.0	22.5	47.5
	Haemochromotitis	1	.3	2.5	50.0
	Gout	1	.3	2.5	52.5
	Gestational diabetes	1	.3	2.5	55.0
	PTSD	1	.3	2.5	57.5
	Low blood pressure	1	.3	2.5	60.0
	Stress	1	.3	2.5	62.5
	Depression	1	.3	2.5	65.0
	Raynoulds disease	1	.3	2.5	67.5
	Heart disease	2	.7	5.0	72.5
	Kidney disease	1	.3	2.5	75.0
	Reflux	1	.3	2.5	77.5
	Obesity	1	.3	2.5	80.0
	Nutcracker oesophagus	1	.3	2.5	82.5
	Nueropenia	1	.3	2.5	85.0
	Psoriasis	1	.3	2.5	87.5
	Overweight	1	.3	2.5	90.0
	Bad back	1	.3	2.5	92.5
	Migraines	1	.3	2.5	95.0
	IBS	1	.3	2.5	97.5
	Sleep apnea	1	.3	2.5	100.0
	Total	40	13.3	100.0	
Missing	System	260	86.7		
	Total	300	100.0		

*Q43 The participant's households annual income before tax*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than \$20,000	52	17.3	17.8	17.8
	\$20,000 - \$39,999	57	19.0	19.5	37.3
	\$40,000 - \$59,999	23	7.7	7.9	45.2
	\$60,000 - \$79,999	33	11.0	11.3	56.5
	\$80,000 - \$99,999	24	8.0	8.2	64.7
	\$100,000 - \$119,999	17	5.7	5.8	70.5
	\$120,000 - \$139,999	13	4.3	4.5	75.0
	\$140,000 - \$159,999	5	1.7	1.7	76.7
	\$160,000 or more	10	3.3	3.4	80.1
	I prefer not to answer this question	49	16.3	16.8	96.9
	Don't know	9	3.0	3.1	100.0
Total	292	97.3	100.0		
Missing	System	8	2.7		
	Total	300	100.0		

*Q44 The country the participant was born in*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Australia	214	71.3	72.8	72.8
	Scotland	11	3.7	3.7	76.5
	United Kingdom	10	3.3	3.4	79.9
	England	28	9.3	9.5	89.5
	Wales	3	1.0	1.0	90.5
	Canada	2	.7	.7	91.2
	Yugoslavian	1	.3	.3	91.5
	New Zealand	8	2.7	2.7	94.2
	Germany	1	.3	.3	94.6
	Bahrain	1	.3	.3	94.9
	Britain	1	.3	.3	95.2
	Zimbabwe	1	.3	.3	95.6
	Netherlands	2	.7	.7	96.3
	Ireland	1	.3	.3	96.6
	China	1	.3	.3	96.9
	Philippines	2	.7	.7	97.6
	Holland	1	.3	.3	98.0
	Thailand	1	.3	.3	98.3
	Croatia	1	.3	.3	98.6
	South Africa	1	.3	.3	99.0
	Malaysia	1	.3	.3	99.3
	Singapore	1	.3	.3	99.7
	Israel	1	.3	.3	100.0
	Total	294	98.0	100.0	
Missing	System	6	2.0		
	Total	300	100.0		

*Q45 The participant's ethnic background*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Australian	119	39.7	45.9	45.9
	British	59	19.7	22.8	68.7
	European	24	8.0	9.3	78.0
	Caucasian	19	6.3	7.3	85.3
	Anglo-saxon	7	2.3	2.7	88.0
	French	3	1.0	1.2	89.2
	South Asian	1	.3	.4	89.6
	Croatian	4	1.3	1.5	91.1
	Italian	1	.3	.4	91.5
	Scottish	5	1.7	1.9	93.4
	Celtic	1	.3	.4	93.8
	Catholic	1	.3	.4	94.2
	Maori	1	.3	.4	94.6
	Aboriginal	1	.3	.4	95.0
	Dutch	5	1.7	1.9	96.9
	Irish	2	.7	.8	97.7
	Welsh	1	.3	.4	98.1
	Chinese	3	1.0	1.2	99.2
	Asian	1	.3	.4	99.6
	Thai	1	.3	.4	100.0
	Total	259	86.3	100.0	
Missing	System	41	13.7		
	Total	300	100.0		

## Section 9 Appendices

### Evaluation of the CIISC community intervention

Q1. How long have you been involved in the food outlet?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.50	1	2.9	3.2	3.2
	1.00	1	2.9	3.2	6.5
	2.00	2	5.7	6.5	12.9
	2.50	1	2.9	3.2	16.1
	3.00	4	11.4	12.9	29.0
	4.00	6	17.1	19.4	48.4
	5.00	1	2.9	3.2	51.6
	5.50	1	2.9	3.2	54.8
	6.00	2	5.7	6.5	61.3
	7.00	1	2.9	3.2	64.5
	8.00	1	2.9	3.2	67.7
	9.00	2	5.7	6.5	74.2
	10.00	2	5.7	6.5	80.6
	11.00	2	5.7	6.5	87.1
	17.00	1	2.9	3.2	90.3
	18.00	2	5.7	6.5	96.8
	19.00	1	2.9	3.2	100.0
	Total	31	88.6	100.0	
Missing	System	4	11.4		
Total		35	100.0		

Q2. What type of business is the food outlet?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cafe	9	25.7	26.5	26.5
	Take-Away	12	34.3	35.3	61.8
	Restaurant	6	17.1	17.6	79.4
	Seniors Centre	2	5.7	5.9	85.3
	Aged Care Facility	2	5.7	5.9	91.2
	Supermarket	2	5.7	5.9	97.1
	Fast Food	1	2.9	2.9	100.0
		Total	34	97.1	100.0
Missing	System	1	2.9		
Total		35	100.0		

Q3 When is the busiest mealtime for the business?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Breakfast	5	14.3	14.3	14.3
	Lunch	9	25.7	25.7	40.0
	Dinner	11	31.4	31.4	71.4
	Constantly busy during opening hours	9	25.7	25.7	97.1
	Other	1	2.9	2.9	100.0
	Total	35	100.0	100.0	



Q8a1i The type of seafood/fish that sold the most in 2009

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Prawns	8	22.9	28.6	28.6
	Shellfish	1	2.9	3.6	32.1
	Whiting	1	2.9	3.6	35.7
	Snapper	1	2.9	3.6	39.3
	Crab	1	2.9	3.6	42.9
	Fin Fish	4	11.4	14.3	57.1
	Barramundi	1	2.9	3.6	60.7
	Salmon	2	5.7	7.1	67.9
	Hake	1	2.9	3.6	71.4
	Red Emperor	2	5.7	7.1	78.6
	Canned Fish	1	2.9	3.6	82.1
	Basa	2	5.7	7.1	89.3
	Snapper	1	2.9	3.6	92.9
	Flounder	1	2.9	3.6	96.4
	Fresh Fillets	1	2.9	3.6	100.0
	Total	28	80.0	100.0	
Missing	System	7	20.0		
Total		35	100.0		

Q8a1ii How many kilograms were sold

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15.00	1	2.9	5.3	5.3
	50.00	2	5.7	10.5	15.8
	100.00	2	5.7	10.5	26.3
	250.00	1	2.9	5.3	31.6
	300.00	1	2.9	5.3	36.8
	420.00	1	2.9	5.3	42.1
	500.00	1	2.9	5.3	47.4
	600.00	1	2.9	5.3	52.6
	720.00	1	2.9	5.3	57.9
	900.00	1	2.9	5.3	63.2
	1000.00	2	5.7	10.5	73.7
	1200.00	1	2.9	5.3	78.9
	1560.00	1	2.9	5.3	84.2
	4800.00	1	2.9	5.3	89.5
	5000.00	1	2.9	5.3	94.7
	12000.00	1	2.9	5.3	100.0
		Total	19	54.3	100.0
Missing	System	16	45.7		
Total		35	100.0		

*Q8a2i The type of seafood/fish that sold the second most in 2009 in kilograms*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Prawns	3	8.6	15.8	15.8
	Shellfish	1	2.9	5.3	21.1
	Whiting	2	5.7	10.5	31.6
	Snapper	1	2.9	5.3	36.8
	Fin Fish	1	2.9	5.3	42.1
	Crustaceans	1	2.9	5.3	47.4
	Salmon	1	2.9	5.3	52.6
	Hake	1	2.9	5.3	57.9
	Calamari	3	8.6	15.8	73.7
	Frozen Fillets	1	2.9	5.3	78.9
	Basa	2	5.7	10.5	89.5
	Squid	1	2.9	5.3	94.7
	Mussels	1	2.9	5.3	100.0
	Total		19	54.3	100.0
Missing	System	16	45.7		
Total		35	100.0		

*Q8a2ii How many kilograms were sold*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20.00	2	5.7	14.3	14.3
	100.00	2	5.7	14.3	28.6
	120.00	1	2.9	7.1	35.7
	140.00	1	2.9	7.1	42.9
	250.00	1	2.9	7.1	50.0
	280.00	1	2.9	7.1	57.1
	360.00	1	2.9	7.1	64.3
	520.00	1	2.9	7.1	71.4
	800.00	1	2.9	7.1	78.6
	1200.00	2	5.7	14.3	92.9
	4300.00	1	2.9	7.1	100.0
	Total		14	40.0	100.0
	Missing	System	21	60.0	
Total		35	100.0		

*Q8a3i The type of seafood/fish that sold the third most in 2009 in kilograms*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Prawns	3	8.6	17.6	17.6
	Shellfish	1	2.9	5.9	23.5
	Whiting	1	2.9	5.9	29.4
	Crab	1	2.9	5.9	35.3
	Crustaceans	1	2.9	5.9	41.2
	Salmon	2	5.7	11.8	52.9
	Red Emperor	1	2.9	5.9	58.8
	Canned Tuna	1	2.9	5.9	64.7
	Smoked Cod	1	2.9	5.9	70.6
	Squid	1	2.9	5.9	76.5
	Oysters	1	2.9	5.9	82.4
	Mussels	2	5.7	11.8	94.1
	Tuna	1	2.9	5.9	100.0
	Total		17	48.6	100.0
	Missing	System	18	51.4	
Total		35	100.0		

Q8a3ii How many kilograms were sold

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10.00	1	2.9	7.7	7.7
	15.00	1	2.9	7.7	15.4
	60.00	1	2.9	7.7	23.1
	80.00	1	2.9	7.7	30.8
	100.00	2	5.7	15.4	46.2
	260.00	1	2.9	7.7	53.8
	300.00	1	2.9	7.7	61.5
	360.00	1	2.9	7.7	69.2
	900.00	1	2.9	7.7	76.9
	1000.00	1	2.9	7.7	84.6
	1500.00	1	2.9	7.7	92.3
	4200.00	1	2.9	7.7	100.0
	Total		13	37.1	100.0
Missing	System	22	62.9		
Total		35	100.0		

Q8a4i The type of seafood/fish that sold the fourth most in 2009 in kilograms

		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Prawns	1	2.9	9.1	9.1	
	Crab	1	2.9	9.1	18.2	
	Salmon	1	2.9	9.1	27.3	
	Hake	1	2.9	9.1	36.4	
	Frozen Fillets	1	2.9	9.1	45.5	
	Snapper	1	2.9	9.1	54.5	
	Squid	4	11.4	36.4	90.9	
	Scallops	1	2.9	9.1	100.0	
	Total		11	31.4	100.0	
	Missing	System	24	68.6		
Total		35	100.0			

Q8a4ii How many kilograms were sold

		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	15.00	1	2.9	11.1	11.1	
	70.00	1	2.9	11.1	22.2	
	100.00	1	2.9	11.1	33.3	
	150.00	1	2.9	11.1	44.4	
	240.00	1	2.9	11.1	55.6	
	260.00	1	2.9	11.1	66.7	
	500.00	2	5.7	22.2	88.9	
	3600.00	1	2.9	11.1	100.0	
	Total		9	25.7	100.0	
	Missing	System	26	74.3		
Total		35	100.0			

*Q8a5i The type of seafood/fish that sold the fifth most in 2009 in kilograms*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Crab	1	2.9	16.7	16.7
	Fin Fish	1	2.9	16.7	33.3
	Barramundi	2	5.7	33.3	66.7
	Salmon	1	2.9	16.7	83.3
	Red Emperor	1	2.9	16.7	100.0
	Total	6	17.1	100.0	
Missing	System	29	82.9		
Total		35	100.0		

*Q8a5ii How many kilograms were sold*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50.00	1	2.9	25.0	25.0
	100.00	1	2.9	25.0	50.0
	500.00	1	2.9	25.0	75.0
	900.00	1	2.9	25.0	100.0
	Total	4	11.4	100.0	
Missing	System	31	88.6		
Total		35	100.0		

*Q8b1i The type of seafood/fish that sold the most in 2010 in kilograms*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Prawns	8	22.9	30.8	30.8
	Shellfish	1	2.9	3.8	34.6
	Whiting	1	2.9	3.8	38.5
	Snapper	1	2.9	3.8	42.3
	Fin Fish	3	8.6	11.5	53.8
	Barramundi	1	2.9	3.8	57.7
	Salmon	2	5.7	7.7	65.4
	Hake	2	5.7	7.7	73.1
	Red Emperor	1	2.9	3.8	76.9
	Canned Fish	1	2.9	3.8	80.8
	Basa	2	5.7	7.7	88.5
	Snapper	1	2.9	3.8	92.3
	Flounder	1	2.9	3.8	96.2
	Fresh Fillets	1	2.9	3.8	100.0
	Total	26	74.3	100.0	
	Missing	System	9	25.7	
Total		35	100.0		

Q8b1ii How many kilograms were sold

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20.00	3	8.6	16.7	16.7
	50.00	1	2.9	5.6	22.2
	100.00	1	2.9	5.6	27.8
	140.00	1	2.9	5.6	33.3
	250.00	1	2.9	5.6	38.9
	300.00	1	2.9	5.6	44.4
	420.00	1	2.9	5.6	50.0
	500.00	1	2.9	5.6	55.6
	600.00	1	2.9	5.6	61.1
	720.00	1	2.9	5.6	66.7
	1000.00	2	5.7	11.1	77.8
	1560.00	1	2.9	5.6	83.3
	4800.00	1	2.9	5.6	88.9
	5800.00	1	2.9	5.6	94.4
	12000.00	1	2.9	5.6	100.0
Total	18	51.4	100.0		
Missing	System	17	48.6		
Total		35	100.0		

Q8b2i The type of seafood/fish that sold the second most in 2010

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Prawns	3	8.6	16.7	16.7
	Shellfish	1	2.9	5.6	22.2
	Whiting	1	2.9	5.6	27.8
	Snapper	2	5.7	11.1	38.9
	Fin Fish	1	2.9	5.6	44.4
	Crustaceans	1	2.9	5.6	50.0
	Salmon	1	2.9	5.6	55.6
	Calamari	3	8.6	16.7	72.2
	Frozen Fillets	1	2.9	5.6	77.8
	Basa	2	5.7	11.1	88.9
	Squid	1	2.9	5.6	94.4
	Mussels	1	2.9	5.6	100.0
	Total	18	51.4	100.0	
Missing	System	17	48.6		
Total		35	100.0		

Q8b2ii How many kilograms were sold

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10.00	1	2.9	7.7	7.7
	25.00	1	2.9	7.7	15.4
	100.00	2	5.7	15.4	30.8
	104.00	1	2.9	7.7	38.5
	120.00	1	2.9	7.7	46.2
	250.00	1	2.9	7.7	53.8
	300.00	1	2.9	7.7	61.5
	360.00	1	2.9	7.7	69.2
	800.00	1	2.9	7.7	76.9
	1200.00	2	5.7	15.4	92.3
	4300.00	1	2.9	7.7	100.0
	Total	13	37.1	100.0	
Missing	System	22	62.9		
Total		35	100.0		

*Q8b3i The type of seafood/fish that sold the third most in 2010 in kilograms*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Prawns	2	5.7	11.8	11.8
	Shellfish	1	2.9	5.9	17.6
	Whiting	1	2.9	5.9	23.5
	Crab	2	5.7	11.8	35.3
	Crustaceans	1	2.9	5.9	41.2
	Salmon	3	8.6	17.6	58.8
	Red Emperor	1	2.9	5.9	64.7
	Canned Tuna	1	2.9	5.9	70.6
	Squid	2	5.7	11.8	82.4
	Mussels	2	5.7	11.8	94.1
	Tuna	1	2.9	5.9	100.0
	Total		17	48.6	100.0
Missing	System	18	51.4		
Total		35	100.0		

*Q8b3ii How many kilograms were sold*

		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	5.00	1	2.9	8.3	8.3	
	65.00	1	2.9	8.3	16.7	
	80.00	1	2.9	8.3	25.0	
	100.00	1	2.9	8.3	33.3	
	110.00	1	2.9	8.3	41.7	
	350.00	1	2.9	8.3	50.0	
	360.00	1	2.9	8.3	58.3	
	520.00	1	2.9	8.3	66.7	
	900.00	1	2.9	8.3	75.0	
	1000.00	1	2.9	8.3	83.3	
	1500.00	1	2.9	8.3	91.7	
	4200.00	1	2.9	8.3	100.0	
	Total		12	34.3	100.0	
	Missing	System	23	65.7		
Total		35	100.0			

*Q8b4i The type of seafood/fish that sold the fourth most in 2010 in kilograms*

		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Prawns	1	2.9	9.1	9.1	
	Crab	1	2.9	9.1	18.2	
	Hake	1	2.9	9.1	27.3	
	Frozen Fillets	1	2.9	9.1	36.4	
	Smoked Cod	1	2.9	9.1	45.5	
	Snapper	1	2.9	9.1	54.5	
	Squid	3	8.6	27.3	81.8	
	Scallops	1	2.9	9.1	90.9	
	Oysters	1	2.9	9.1	100.0	
	Total		11	31.4	100.0	
	Missing	System	24	68.6		
Total		35	100.0			

*Q8b4ii How many kilograms were sold*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15.00	1	2.9	11.1	11.1
	50.00	1	2.9	11.1	22.2
	110.00	1	2.9	11.1	33.3
	150.00	1	2.9	11.1	44.4
	240.00	1	2.9	11.1	55.6
	260.00	1	2.9	11.1	66.7
	500.00	2	5.7	22.2	88.9
	3600.00	1	2.9	11.1	100.0
	Total	9	25.7	100.0	
Missing	System	26	74.3		
Total		35	100.0		

*Q8b5 The type of seafood/fish that sold the fifth most in 2010 in kilograms*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Barramundi	1	2.9	33.3	33.3
	Salmon	1	2.9	33.3	66.7
	Hoki	1	2.9	33.3	100.0
	Total	3	8.6	100.0	
Missing	System	32	91.4		
Total		35	100.0		

*Q8b5ii How many kilograms were sold*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	500.00	1	2.9	100.0	100.0
Missing	System	34	97.1		
Total		35	100.0		

*Q9a On average the percent of seafood/fish the business sells that is sourced locally (WA products/produce)*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	12	34.3	37.5	37.5
	2	1	2.9	3.1	40.6
	5	1	2.9	3.1	43.8
	10	4	11.4	12.5	56.3
	20	3	8.6	9.4	65.6
	25	1	2.9	3.1	68.8
	30	1	2.9	3.1	71.9
	50	3	8.6	9.4	81.3
	60	1	2.9	3.1	84.4
	70	2	5.7	6.3	90.6
	75	1	2.9	3.1	93.8
	80	1	2.9	3.1	96.9
	100	1	2.9	3.1	100.0
	Total	32	91.4	100.0	
	Missing	System	3	8.6	
Total		35	100.0		



*Q9b On average the percent of seafood/fish the business sells that is Australian (other than WA)*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	12	34.3	37.5	37.5
	3	1	2.9	3.1	40.6
	10	6	17.1	18.8	59.4
	15	2	5.7	6.3	65.6
	20	3	8.6	9.4	75.0
	30	3	8.6	9.4	84.4
	40	1	2.9	3.1	87.5
	50	2	5.7	6.3	93.8
	100	2	5.7	6.3	100.0
	Total		32	91.4	100.0
Missing	System	3	8.6		
Total		35	100.0		

*Q9c On average the percent of seafood/fish the business sells that is imported*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	6	17.1	18.8	18.8
	10	3	8.6	9.4	28.1
	20	2	5.7	6.3	34.4
	30	1	2.9	3.1	37.5
	50	3	8.6	9.4	46.9
	60	3	8.6	9.4	56.3
	70	1	2.9	3.1	59.4
	75	1	2.9	3.1	62.5
	80	6	17.1	18.8	81.3
	95	1	2.9	3.1	84.4
	100	5	14.3	15.6	100.0
	Total		32	91.4	100.0
Missing	System	3	8.6		
Total		35	100.0		

*Q10a On average the percent of seafood/fish the business sells that is fresh*

		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	0	21	60	65.6	65.6	
	2	1	2.9	3.1	68.8	
	15	1	2.9	3.1	71.9	
	20	1	2.9	3.1	75.1	
	25	2	5.7	6.3	81.3	
	30	3	8.6	9.4	90.6	
	50	1	2.9	3.1	93.8	
	85	1	2.9	3.1	96.9	
	100	1	2.9	3.1	100.0	
	Total		32	91.4	100.0	
	Missing	System	3	8.6		
Total		35	100.0			

*Q10b On average the percent of seafood/fish the business sells that is frozen*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	5	14.3	15.6	15.6
	15	1	2.9	3.1	18.8
	30	1	2.9	3.1	21.9
	50	3	8.6	9.4	31.3
	70	2	5.7	6.3	37.5
	75	2	5.7	6.3	43.8
	80	2	5.7	6.3	50.0
	85	1	2.9	3.1	53.1
	90	1	2.9	3.1	56.3
	95	2	5.7	6.3	62.5
	98	1	2.9	3.1	65.6
	100	11	31.4	34.4	100.0
	Total	32	91.4	100.0	
Missing	System	3	8.6		
Total		35	100.0		

*Q10c On average the percent of seafood/fish the business sells that is other*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	20	57.1	62.5	62.5
	5	3	8.6	9.4	71.9
	10	1	2.9	3.1	75.0
	20	1	2.9	3.1	78.1
	40	1	2.9	3.1	81.3
	50	2	5.7	6.3	87.5
	80	1	2.9	3.1	90.6
	100	3	8.6	9.4	100.0
		Total	32	91.4	100.0
Missing	System	3	8.6		
Total		35	100.0		

*Q11a On average the percent of seafood/fish the business sells that is raw*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	27	77.1	84.4	84.4
	10	2	5.7	6.3	90.6
	30	1	2.9	3.1	93.8
	70	1	2.9	3.1	96.9
	75	1	2.9	3.1	100.0
		Total	32	91.4	100.0
Missing	System	3	8.6		
Total		35	100.0		

*Q11b On average the percent of seafood/fish the business sells that is ready to eat-take-away*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	14	40.0	43.8	43.8
	2	1	2.9	3.1	46.9
	5	1	2.9	3.1	50.0
	10	1	2.9	3.1	53.1
	20	2	5.7	6.3	59.4
	25	1	2.9	3.1	62.5
	30	1	2.9	3.1	65.6
	40	1	2.9	3.1	68.8
	50	4	11.4	12.5	81.3
	65	1	2.9	3.1	84.4
	85	1	2.9	3.1	87.5
	100	4	11.4	12.5	100.0
		Total	32	91.4	100.0
Missing	System	3	8.6		
Total		35	100.0		

*Q11c On average the percent of seafood/fish the business sells that is ready to eat-dine in*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	7	20.0	21.9	21.9
	5	1	2.9	3.1	25.0
	10	1	2.9	3.1	28.1
	30	1	2.9	3.1	31.3
	35	1	2.9	3.1	34.4
	50	4	11.4	12.5	46.9
	70	1	2.9	3.1	50.0
	75	1	2.9	3.1	53.1
	88	1	2.9	3.1	56.3
	90	1	2.9	3.1	59.4
	95	1	2.9	3.1	62.5
	100	12	34.3	37.5	100.0
	Total		32	91.4	100.0
Missing	System	3	8.6		
Total		35	100.0		

*Q12a Whether the business deep fry's the seafood they sell*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	25	71.4	100.0	100.0
Missing	System	10	28.6		
Total		35	100.0		

*Q12b Whether the business grills the seafood they sell*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	20	57.1	100.0	100.0
Missing	System	15	42.9		
Total		35	100.0		

*Q12c Whether the business sells take-away meals*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	40.0	100.0	100.0
Missing	System	21	60.0		
Total		35	100.0		

*Q12d Whether the business sells seafood in a salad*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	11	31.4	100.0	100.0
Missing	System	24	68.6		
Total		35	100.0		

*Q12e Whether the business sells seafood in a sandwich/roll*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	12	34.3	100.0	100.0
Missing	System	23	65.7		
Total		35	100.0		

*Q12f Whether the business only sells pre-prepared seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	3	8.6	100.0	100.0
Missing	System	32	91.4		
Total		35	100.0		

Q12g Other ways the business sells their seafood

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Prepared Dsih	2	5.7	25.0	25.0
	Cooked	1	2.9	12.5	37.5
	Stirfry	3	8.6	37.5	75.0
	Pies	1	2.9	12.5	87.5
	Panfried	1	2.9	12.5	100.0
	Total	8	22.9	100.0	
Missing	System	27	77.1		
Total		35	100.0		

Table Q13 Whether the business offers any seafood-based meals

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	29	82.9	87.9	87.9
	No	4	11.4	12.1	100.0
	Total	33	94.3	100.0	
Missing	System	2	5.7		
Total		35	100.0		

Q14a Seafood meals offered by the business

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Seafood Patties/Cakes	2	5.7	6.9	6.9
	Grilled fish	1	2.9	3.4	10.3
	Battered Fish	1	2.9	3.4	13.8
	Fish and Chips	12	34.3	41.4	55.2
	Seafood Wrap	1	2.9	3.4	58.6
	Fish/Seafood Salad	3	8.6	10.3	69.0
	Teriyaki Fish	1	2.9	3.4	72.4
	Sweet and Sour Fish	3	8.6	10.3	82.8
	Seafood Basket	1	2.9	3.4	86.2
	Family Feast	1	2.9	3.4	89.7
	Asian Seafood Dishes	1	2.9	3.4	93.1
	Seafood Grill	1	2.9	3.4	96.6
	Pasta	1	2.9	3.4	100.0
	Total	29	82.9	100.0	
Missing	System	6	17.1		
Total		35	100.0		

Q14b Seafood meals offered by the business

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Seafood Frittata	1	2.9	4.0	4.0
	Calamari/Squid	6	17.1	24.0	28.0
	Grilled fish	1	2.9	4.0	32.0
	Battered Fish	1	2.9	4.0	36.0
	Fish and Chips	2	5.7	8.0	44.0
	Seafood Omelette	1	2.9	4.0	48.0
	Fish/Seafood Salad	2	5.7	8.0	56.0
	Fish/Seafood Burger	1	2.9	4.0	60.0
	Prawn Dishes	3	8.6	12.0	72.0
	Seafood Basket	2	5.7	8.0	80.0
	Fish/Seafood Rolls/Sandwiches	2	5.7	8.0	88.0
	Family Feast	1	2.9	4.0	92.0
	Stir Fry	1	2.9	4.0	96.0
	Pasta	1	2.9	4.0	100.0
	Total	25	71.4	100.0	
Missing	System	10	28.6		
Total		35	100.0		

*Q14c Seafood meals offered by the business*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Calamari/Squid	1	2.9	5.6	5.6
	Grilled fish	3	8.6	16.7	22.2
	Fish/Seafood Salad	5	14.3	27.8	50.0
	Fish/Seafood Burger	1	2.9	5.6	55.6
	Prawn Dishes	5	14.3	27.8	83.3
	Seafood Basket	1	2.9	5.6	88.9
	Fish/Seafood Rolls/Sandwiches	1	2.9	5.6	94.4
	Fish Kebab	1	2.9	5.6	100.0
	Total	18	51.4	100.0	
Missing	System	17	48.6		
Total		35	100.0		

*Q14d Seafood meals offered by the business*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Calamari/Squid	2	5.7	18.2	18.2
	Battered Fish	1	2.9	9.1	27.3
	Oysters	1	2.9	9.1	36.4
	Fish and Chips	2	5.7	18.2	54.5
	Seafood Basket	1	2.9	9.1	63.6
	Fish/Seafood Rolls/Sandwiches	2	5.7	18.2	81.8
	Oven Baked Finfish	1	2.9	9.1	90.9
	Prawn Brushetta	1	2.9	9.1	100.0
	Total	11	31.4	100.0	
Missing	System	24	68.6		
Total		35	100.0		

*Q14e Seafood meals offered by the business*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Oysters	1	2.9	20.0	20.0
	Fish/Seafood Salad	2	5.7	40.0	60.0
	Fish/Seafood Rolls/Sandwiches	1	2.9	20.0	80.0
	Mussels	1	2.9	20.0	100.0
	Total	5	14.3	100.0	
Missing	System	30	85.7		
Total		35	100.0		

*Q15 How the seafood meals compare in price to other meals the business sells*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Same	19	54.3	65.5	65.5
	Cheaper	4	11.4	13.8	79.3
	More expensive	6	17.1	20.7	100.0
	Total	29	82.9	100.0	
Missing	System	6	17.1		
Total		35	100.0		

*Q16a Why the seafood meals differ in price*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exmouth prawns cost more	1	2.9	12.5	12.5
	Imported is inexpensive	1	2.9	12.5	25.0
	Local is more expensive	1	2.9	12.5	37.5
	Value for money discounts	1	2.9	12.5	50.0
	Seafood more expensive	2	5.7	25.0	75.0
	Larger serves	1	2.9	12.5	87.5
	Stock is more expensive	1	2.9	12.5	100.0
	Total	8	22.9	100.0	
Missing	System	27	77.1		
Total		35	100.0		

*Q16b Why the seafood meals differ in price*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Larger serves	1	2.9	50.0	50.0
	Preparation of dish	1	2.9	50.0	100.0
	Total	2	5.7	100.0	
Missing	System	33	94.3		
Total		35	100.0		

*Q17 Whether the owner of the business thinks that seafood is a healthy meal option*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	32	91.4	97.0	97.0
	No	1	2.9	3.0	100.0
	Total	33	94.3	100.0	
Missing	System	2	5.7		
Total		35	100.0		

*Q18a A healthy seafood option the business sells*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Seafood Patties/Cakes	2	5.7	6.5	6.5
	Grilled Fish	11	31.4	35.5	41.9
	Fresh Fish Fillets	2	5.7	6.5	48.4
	Seafood Sandwiches/Rolls	2	5.7	6.5	54.8
	Salads	5	14.3	16.1	71.0
	Prawns	1	2.9	3.2	74.2
	Oven Baked Finfish	1	2.9	3.2	77.4
	Seafood Stirfry	3	8.6	9.7	87.1
	Tuna	1	2.9	3.2	90.3
	Grilled Seafood	1	2.9	3.2	93.5
	Seafood Pasta	1	2.9	3.2	96.8
	Sashimi	1	2.9	3.2	100.0
	Total	31	88.6	100.0	
	Missing	System	4	11.4	
Total		35	100.0		

*Q18b A healthy seafood option the business sells*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Seafood Frittata	1	2.9	5.3	5.3
	Grilled Fish	2	5.7	10.5	15.8
	Calamari	1	2.9	5.3	21.1
	Seafood Sandwiches/Rolls	1	2.9	5.3	26.3
	Seafood Wraps	1	2.9	5.3	31.6
	Prawns	2	5.7	10.5	42.1
	Oven Baked Finfish	1	2.9	5.3	47.4
	Salmon Portions	1	2.9	5.3	52.6
	Squid	1	2.9	5.3	57.9
	Seafood Stirfry	1	2.9	5.3	63.2
	Seafood and Sauce	1	2.9	5.3	68.4
	Fresh Salmon	1	2.9	5.3	73.7
	Deep Fried	1	2.9	5.3	78.9
	Grilled Seafood	2	5.7	10.5	89.5
	Sushi	1	2.9	5.3	94.7
	Teriyaki Fish	1	2.9	5.3	100.0
	Total	19	54.3	100.0	
Missing	System	16	45.7		
Total		35	100.0		

*Q18c A healthy seafood option the business sells*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Oysters	1	2.9	11.1	11.1
	Salads	3	8.6	33.3	44.4
	Prawns	1	2.9	11.1	55.6
	Tuna	1	2.9	11.1	66.7
	Marinated Octopus	1	2.9	11.1	77.8
	Shrimp Dumplings	1	2.9	11.1	88.9
	Poached Seafood	1	2.9	11.1	100.0
		Total	9	25.7	100.0
Missing	System	26	74.3		
Total		35	100.0		

*Q19 The total weekly contribution of seafood to business sales*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5%	11	31.4	33.3	33.3
	6-10%	3	8.6	9.1	42.4
	11-15%	5	14.3	15.2	57.6
	16-20%	3	8.6	9.1	66.7
	21-25%	4	11.4	12.1	78.8
	Over 25%	7	20.0	21.2	100.0
		Total	33	94.3	100.0
Missing	System	2	5.7		
Total		35	100.0		

*Q20a Something that would encourage the business to offer more/any seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More variety	1	2.9	4.3	4.3
	More availability	1	2.9	4.3	8.7
	Price	10	28.6	43.5	52.2
	Freshness	1	2.9	4.3	56.5
	Local	3	8.6	13.0	69.6
	Consumer demand	2	5.7	8.7	78.3
	Consistent quality	2	5.7	8.7	87.0
	Franchise controlled	1	2.9	4.3	91.3
	Customers knowledge	1	2.9	4.3	95.7
	Longer shelf life	1	2.9	4.3	100.0
Total	23	65.7	100.0		
Missing	System	12	34.3		
Total		35	100.0		

*Q20b Something that would encourage the business to offer more/any seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More availability	1	2.9	11.1	11.1
	Price	3	8.6	33.3	44.4
	Freshness	2	5.7	22.2	66.7
	Local	3	8.6	33.3	100.0
	Total	9	25.7	100.0	
Missing	System	26	74.3		
Total		35	100.0		

*Q20c Something that would encourage the business to offer more/any seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More availability	1	2.9	25.0	25.0
	Price	1	2.9	25.0	50.0
	Consumer demand	1	2.9	25.0	75.0
	Consistent quality	1	2.9	25.0	100.0
	Total	4	11.4	100.0	
Missing	System	31	88.6		
Total		35	100.0		

*Q21a Whether a barrier preventing the business offering more seafood is that it's too expensive*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	19	54.3	100.0	100.0
Missing	System	16	45.7		
Total		35	100.0		

*Q21b Whether a barrier preventing the business offering more seafood is that it's difficult to store*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	8	22.9	100.0	100.0
Missing	System	27	77.1		
Total		35	100.0		

*Q21c Whether a barrier preventing the business offering more seafood is that customers are not interested*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	14.3	100.0	100.0
Missing	System	30	85.7		
Total		35	100.0		



*Q21d Whether a barrier preventing the business offering more seafood is that they don't know how to prepare it*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	1	2.9	100.0	100.0
Missing	System	34	97.1		
Total		35	100.0		

*Q21f Whether a barrier preventing the business offering more seafood is that it's difficult to source*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	7	20.0	100.0	100.0
Missing	System	28	80.0		
Total		35	100.0		

*Q21g Other barriers preventing the business offering more seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Franchise	4	11.4	66.7	66.7
	Local is too expensive	1	2.9	16.7	83.3
	Competition from fish and chip shops	1	2.9	16.7	100.0
	Total	6	17.1	100.0	
Missing	System	29	82.9		
Total		35	100.0		

*Q22a Whether consistency of quality influences the business decision to stock/not stock seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	12	34.3	100.0	100.0
Missing	System	23	65.7		
Total		35	100.0		

*Q22b Whether consumer demand influences the business decision to stock/not stock seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	25	71.4	100.0	100.0
Missing	System	10	28.6		
Total		35	100.0		

*Q22b Whether seasonal availability influences the business decision to stock/not stock seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	10	28.6	100.0	100.0
Missing	System	25	71.4		
Total		35	100.0		

*Q22d Whether shelf life/spoilage influences the business decision to stock/not stock seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	11	31.4	100.0	100.0
Missing	System	24	68.6		
Total		35	100.0		

*Q22e Whether maintenance influences the business decision to stock/not stock seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	2	5.7	100.0	100.0
Missing	System	33	94.3		
Total		35	100.0		

*Q22f Whether transportation issues influences the business decision to stock/not stock seafood*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	3	8.6	100.0	100.0
Missing	System	32	91.4		
Total		35	100.0		