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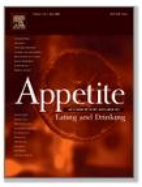

Drivers and barriers toward reducing meat consumption

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Abstract

The purpose of this paper is to explore the consumers' attitude and intention toward reducing meat consumption. In exploring such, the influence of social norm, perceived benefits, perceived barrier and environmental concern are examined. A self-administered online survey was employed for data collection. A sample of 298 Australians was analysed through structural equation modelling with SPSS AMOS 25. Social norm, perceived benefits and barriers as well as environmental concerns had significant impact on the consumers' attitude toward reducing meat consumption. The findings of this paper validate and extend the theoretical framework on dietary behaviour change in particular one that involves reducing the consumption of meat. The findings provide valuable insights to food producers and the food industry, as well as health professionals as it highlights the linkages between meat consumption reduction and a broad array of motivations such as health and care for the environment. The study provides insights into the motivations of individuals to limit their meat consumption. More importantly, it also systematically examines the perceived benefits and barriers of meat consumption thus shedding insights on the opportunities for dietary behaviour change and public health.

Keywords Meat, Consumption, Diet, Environmental concern, Attitude, Food choices
Paper type Research paper

1. INTRODUCTION

Food is increasingly in the day to day consciousness of Australians (Lucio, 2018). Consumers are hearing more about food in the media and in broader conversation. More specifically, consumers are seeking information about their food, including where it comes from and how it is produced. As consumers are learning more about food, different attributes are becoming more important for various individuals – which suggest that food is becoming less a commodity and more a specialized individual choice (von Massow et al., 2018). On this front, there is an increasing global interest in alternate sources of protein. The phenomenon is driven by increasing health concerns about eating too much meat as well as the environmental impact of meat production. As a result, studies (e.g., de Boer & Aiking, 2017; Lea and Worsley, 2003; Lea et al., 2006a; 2006b) have cited an increasing social pressure to reduce meat consumption, resulting in more plant-based diets. Moreover, this has fuelled a new generation of social start-up groups, businesses and brands such as 'Green Monday', 'Beyond Meat' and 'Impossible Foods' that aim to tackle climate change and global food insecurity through initiatives that offer sustainable, innovative and responsible food choices (Lanting, 2019).

The growth of meat consumption has been linked to negative health and environmental outcomes (Malek, Umberger & Gooddard, 2019; Bogueva et al. 2017; Kleemann & Schmidt, 2016; Zur & Klöckner, 2014; Jungbluth et al., 2000). Undertaking substantial changes from meat-based to plant-based diets will nevertheless require a profound societal transition (Dagevos & Voordouw, 2013; de Boer & Aiking, 2017). Furthermore, the current trends, drivers and consequences suggest that meat consumption has become a fundamental role in social representations of food and meals, particularly in western societies (Fiddes, 1991; Graça, 2016; Hartmann & Siegrist, 2017). This reinforces concerns that shaping consumer demand towards reduced meat consumption and increasingly plant-based diets will likely be a strenuous challenge.

Food practices are, no doubt, complex and influenced by numerous interacting factors (Springmann et al., 2016). Features such as the social context, the food provisioning system and its organizational and logistical structure, taste, familiarity and preference for particular foods and distaste for others, play a fundamental role in what and how we eat (Köster, 2009; Warde, 2016). Thus, a transition towards healthier and more sustainable food systems should be strengthened by the coordinated efforts of civil society, governmental bodies, health and environmental organizations, as well as market actors. This process will need to be informed

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by a coherent research program supported by an integrated body of knowledge on how to reduce meat consumption and to potentially follow more plant-based diets (Godfray et al., 2018; Stoll-Kleemann & O'Riordan, 2015).

1.1 Background

Australia presents an interesting case study for the examination of changing meat consumption patterns. Meat products play an important role in Australia's food intake as Australians currently allocate 40% of their food expenditure on meat (Kleemann & Schmidt, 2016). For instance, despite beef's price premium to many other proteins, it remains a very popular meat choice with Australians, who are the sixth largest per capita consumers of beef in the world (MLA, 2018). However, statistics also shows that the number of people who avoid meat in preference of a plant-based diet have been steadily increasing in recent years (Bogueva et al., 2017; Lea & Worsley, 2003; Lea et al., 2006a; 2006b). Research by Roy Morgan into Australian Food Attitudes from 2006 to 2016 highlighted that nearly 2.5 million Australians (12.1% of the population) have diets of which the food is all, or almost all, vegetarian, up from under 2.2 million (11.2%) four years ago in 2014 (Roy Morgan Research, 2019). Interestingly, between 2012 and 2016, 12.4% of Australian adults are self-identified vegetarians, up from 9.5% in 2012 (Roy Morgan Research, 2016). Studies have assessed motivations among those who have reduced or eliminated meat consumption; however a recent systematic literature review of experimental studies by Harguess, Crespo and Hong (2019) notes the limited research on the strategies to reduce meat consumption among those who consume meat. Furthermore, the specific factors motivating the growth of vegetarianism and vegan diets in Australia is still not well understood (e.g. Malek, Umberger & Gooddard, 2019; Bogueva et al. 2017; Bouvard et al., 2015; Lea & Worsley, 2003; Lea et al., 2006a; 2006b). Therefore, the key objective of this research is to explore the consumers' attitude and intention toward reducing meat consumption in Australia.

Relevant studies conducted in Australia have explored consumers' perceived benefits from and barriers to vegetarian diets (Lea & Worsley, 2003; Lea et al., 2006a; 2006b) and motivations for teenage vegetarianism (Worsley & Skrzypiec, 1998) but these data were collected over a decade ago. A more recent Australian study by Bogueva et al. (2017) found that consumers primarily avoid red meat because of animal welfare and health concerns. However, the Bogueva et al. (2017) study was a relatively small exploratory study limited to red meat. Similarly, another recent study by Malek, Umberger and Gooddard (2019) found that the

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Australian's main reasons motivating meat-avoidance were concerns regarding animal welfare, health and environmental protection. More importantly, they also found that changes in meat consumption are acts of anti-consumption (Lee et al., 2009; Cherrier et al., 2011; Richetin et al., 2011). Thus, investigating the influential factors for changes in meat consumption patterns in Australia in order to move towards more sustainable consumption is needed. The rest of this paper is organized into several sections; it begins with a review of the relevant literature and the justification of research hypotheses. Then, the research method and results are discussed. Finally, the theoretical and practical implications of the findings are presented with the limitations and future research directions.

2. RELEVANT LITERATURE REVIEW

Consumers reduce meat consumption for different reasons (Dagevos & Voordouw, 2013; de Boer & Aiking, 2017). In the current study, three different motivations were considered: social influences, health aspects and environmental impacts. An individuals' food choice decisions are known to be influenced by a complex set of physiological (e.g. hunger, appetite, taste/sensory characteristics), psychological (e.g. values, perceptions/beliefs, personality, mood, stress, guilt), physical (e.g. skills, access, time), cognitive (e.g. nutrition knowledge, food labelling), economic, religious and sociocultural (e.g. traditions, meal-patterns, peer-pressure, social norms, social image, marketing) factors (e.g. Nasir & Karakaya, 2014; Perrea et al., 2014; Tan & Cadeaux, 2012). However, consumption is not always an individual phenomenon, but includes social aspects such as shared social cognition and feelings, influences from social norms, social identity, social situations or group influences (e.g. Higgs, 2015; Kallgren, Reno, & Cialdini, 2000). In particular, food consumption is viewed as a social marker to construct social identities and lifestyles (Verain et al., 2015).

2.1 Social norms

According to Higgs (2015), people follow a particular type of eating norm because doing so "enhances affiliation with a social group and being liked" and apparently confirms that one is behaving correctly. Furthermore, people will be motivated to create distinction by adjusting their eating behaviour to manage their public image and create a certain impression on others (Higgs, 2015). The social identity theory is derived from the cognitive and motivational basis of intergroup differentiation (Tajfel & Turner, 1986). The theory suggests that individuals will

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tend to engage in in-group vs. out-group comparison, thus creating social boundaries to distinct intergroup differences (Hogg & Abraham, 1988). This supports the notion that the differences in food consumption patterns may distinguish one social group from another. Furthermore, it also suggests that the variation in consumption patterns may be expected among individuals in different social categories. Therefore, meat avoidance as a dietary behaviour, which is related to perceptions of normative behaviour by socially connected peers, can be a barrier as well as an opportunity. Therefore, the following is hypothesised:

H_1: Social norms will have a positive influence on consumer attitudes towards reducing meat consumption.

2.2 Perceived benefits

Meat is still highly valued by consumers for its nutritional value (Van Wezemael, Caputo, Nayga, Chryssochoidis, & Verbeke, 2014), taste and other sensory aspects (Verbeke, Perez-Cueto, de Barcellos, Krystallis, & Grunert, 2010) as well as an important component of the traditional Western meal (Scholderer, Kügler, Olsen, & Verbeke, 2013). However, from a health perspective, the affiliation of excessive meat intake has been linked to various diseases, such as cancer (McMichael & Bambrick, 2005), heart diseases (Bernstein et al., 2010), diabetes (Micha, Wallace, & Mozaffarian, 2010), rheumatism (Fraser, 1999), Crohn disease (Shoda, Matsueda, Yamato, & Umeda, 1996), and nutritional deficiency (Barnard, Nicholson, & Howard, 1995). On the other hand, the many benefits consumers acknowledge from eating vegetarian foods are most often related to health issues (Lea & Worsley, 2003; Lea et al., 2006a; Bogueva et al. 2017). According to Lea and Worsley (2003), the perceived barriers to following a vegetarian diet include the aspect of good taste. Also, the refusal to change one's eating habits, the nutritional necessity of meat, the effect of the social environment, the lack of knowledge about vegetarian diets and the limited option of vegetarian foods outside the home have been acknowledged as major barriers (Salonen & Helne, 2012; Lea & Worsley, 2003). Studies have argued that while in the past it was common to relate to meat-free diets as putting one at risk of nutritional deficiencies, the benefits of such diet are now acknowledged (Micha, Michas, Lajous, & Mozaffarian, 2013; Kleemann & Schmidt, 2016; Jungbluth et al., 2000; Bouvard et al., 2015). Therefore, the following is hypothesised:

H_2: Perceived benefit from reducing meat consumption will have a positive influence on consumer attitudes towards reducing meat consumption.

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2.3 Environmental awareness

As the environmental, personal, and ethical arguments for vegetarianism become more pronounced and visible (Lea & Worsley, 2003; Lea et al., 2006a; 2006b), there is evidence over the last few decades to suggest that a portion of the meat-eating public has become sympathetic to the cause (de Boer & Aiking, 2011; Allen & Ng, 2003). A report titled 'Livestock's Long Shadow' published by the Food and Agriculture Organisation of the United Nations (FAO) (FAO, 2006) and a study by Zur and Klöckner (2014) outlined the vast impact of the livestock industry (including the meat industry) on environmental degradation. These ecological problems include climate change and atmospheric emissions (Verain et al., 2015), water depletion and pollution (Steinfeld et al., 2006), and biodiversity loss which includes several consequences such as the resources overexploitation as well as the spread of invasive species and diseases (Kleemann & Schmidt, 2016; Jungbluth et al., 2000). According to Schwartz's (1977) norm activation theory, pro-environmental behaviour often focus on personal norms and on two situational activators, i.e., awareness of need and situational responsibility (Zur & Klöckner, 2014; Steinfeld et al., 2006). Studies show that there is a connection between the "self-enhancement" values (of authority and hierarchy) and positive meat attitudes and meat consumption (Allen & Ng, 2003). Furthermore, the "self-transcendence" values such as altruism, social justice, equality and environmental protection, has an evident negative connection to positive meat attitudes and meat consumption (de Boer & Aiking, 2011). Some studies have also found the value domain of "conservation" to be connected to meat appreciation and consumption (e.g., Allen & Ng, 2003). Therefore, the following is hypothesised:

H3: Environmental awareness will have a positive influence on consumer attitudes towards reducing meat consumption.

2.4 Perceived barrier

A number of studies have identified habits as an important additional variable to the theory of reasoned action when predicting repeated behaviours (e.g. Ajzen & Fishbein, 1980), which applies to meat consumption as well (Klöckner, 2011; Verplanken & Aarts 1999). Jacobsen and Dulsrud (2007) point out that not all consumers are active, conscious consumers who make deliberate, considered choices once fully informed. Rather, food purchase is a process that is strongly influenced by habit and other forces (Verbeke et al., 2010; Hoek et al., 2011).

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Furthermore, Jackson (2005) identifies that consumer motivations are embedded in a variety of ordinary, routine and habitualised behaviours that are influenced by social norms and practices and constrained by institutional contexts. Consequently, consumers often find themselves 'locked in' to specific consumption patterns. Hence, it is assumed that meat eating behaviour is directly predicted by meat eating habits, because eating patterns are highly repetitive and thus most likely a routine. Therefore, the following is hypothesised:

H_4: Perceived barrier towards reducing meat consumption will have a negative influence on consumer attitudes towards reducing meat consumption.

2.5 Attitude and intention

According to the theory of planned behaviour (Ajzen & Fishbein, 1980), an individual's positive attitude toward a particular behaviour often leads to engage in that behaviour. The positive relationship between attitude and intention has been evident within the context of food consumption research (e.g., Beardsworth & Bryman, 2004; Macdiarmid et al., 2016). In a study on individual motivations for limiting meat consumption in Norway, Zur and Klockner (2014) find the positive relationship between consumers' attitude and intention. The attitude-intention relationship has further been apparent in consumers' willingness to adopt low meat diet in France (Gavelle et al., 2019). Based on the aforementioned empirical support and underpinned with the theory of planned behaviour, the following is hypothesised:

H_5: There is a significant positive relationship between consumers' attitude and intention toward reducing meat consumption.

The hypothesised relationships are presented in the figure 1.

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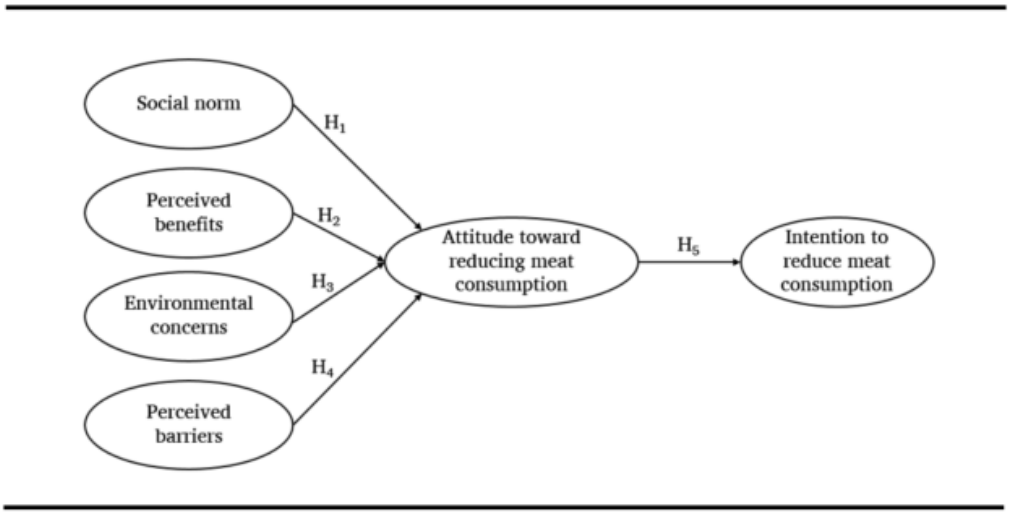
Figure 1: Research framework



3. METHODOLOGY

3.1 Data collection

Data were collected from an Australia wide consumer panel through Qualtrics. The survey instruments were adapted from established scales to fit the context of this research (Table 2). For example, to measure subjective norm, the item "My friends think that I should reduce my consumption of meat to once a week (SN1)" in this research was adapted from Povey et al.'s (2001, pp. 19) item "My friends think I should eat a vegetarian diet". The survey questionnaire consists of eight sections. The first section of the survey employed a filtering question asking how many times the participant eats red meat per week. Only the participants eating red meat on average three times or more per week were allowed to proceed with the survey questionnaire. The next sections included scale items for **perceived benefits from reducing meat consumption** (Lea & Worsley, 2003), **environmental concern** (Salonen & Helne, 2012), **perceived barrier in reducing meat consumption** (Lea & Worsley, 2003), **social norm** (Povey et al., 2001), **attitudes toward reducing meat consumption** (Povey et al., 2001), and **intention to reduce meat consumption** (Povey et al., 2001). All items were measured with a seven point Likert scale with 1 representing "strongly disagree" and 7 representing "strongly agree". The final section enquired the demographic profile of the respondents.

3.2 Sample profile

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A total of 350 responses were collected of which 298 were considered valid and useable. Of the respondents – 53% were male, 76.8% aged between 18 and 35 and 55% had or in the process of completing a university degree. Furthermore, majority of the respondents (73.9%) consume meat as a staple for three times a week. 11.3% of the respondents consume meat four to five times a week and the rest do so for more than 5 times a week. A summary of the respondents' demographic profile is presented in Table 1.

Table 1: Respondents' profile

	Frequency	Percent
Gender		
Female	140	47
Male	158	53
Age (years)		
18-25	92	30.9
26-35	137	46.0
36-45	59	19.8
45-55	10	3.4
Education		
Year 10	5	1.7
Year 12	78	26.2
TAFE (Technical and further education)	8	2.7
Diploma	40	13.4
Bachelor Degree	156	52.3
Honours Degree	2	0.7
Master/PhD	9	3.0
Occupation		
Student	37	12.4
Self-employed	47	15.8
Professional	45	15.1
Unemployed	6	2.0
Skilled Worker	76	25.5
Homemaker	12	4.0
Other	75	25.2
Annual income (AUD)		
0 - 20,000	7	2.3
20,001 - 40,000	17	5.7
40,001 - 60,000	86	28.9
60,001 - 80,000	57	19.1
80,001 - 100,000	45	15.1
100,001 - 120,000	48	16.1
120,001 - 140,000	25	8.4
140000+	13	4.4

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4. RESULTS

An Exploratory Factor Analysis (EFA) was conducted to test the unidimensionality of each scale. Based on the exploratory factor analysis, each scale item had a factor loading score above 0.5 and there were no double-barrelled items. As shown in Table 2, the composite reliability of the constructs were above 0.70 for each scale (Nunnally, 1978).

Table 2: Measurement items with factor loading and reliability

Measurement constructs and items	Mean	Loading	CR
Social norm (Povey et al., 2001)			0.91
My friends think that I should reduce my consumption of meat to once a week. (SN1)	4.04	0.83	
My family members think that I should reduce my consumption of meat to once a week. (SN2)	4.26	0.86	
My health experts think that I should reduce my consumption of meat to once a week. (SN3)	4.60	0.71	
My colleagues think that I should reduce my consumption of meat to once a week. (SN4)	3.93	0.86	
My partner thinks that I should reduce my consumption of meat to once a week. (SN5)	4.38	0.83	
Perceived barrier in reducing meat consumption (Lea & Worsley, 2003)			0.85
Reducing meat consumption to once a week is difficult for me because I like eating meat. (Barrier1)	3.93	0.82	
Reducing meat consumption to once a week is difficult for me because I do not want to change my eating habit or routine. (Barrier2)	3.47	0.84	
Reducing meat consumption to once a week is difficult for me because I think humans are meant to eat meat. (Barrier3)	3.19	0.66	
Reducing meat consumption to once a week is difficult for me because my family eats meat. (Barrier4)	3.64	0.73	
Environmental concern (Salonen & Helne, 2012)			0.92
By reducing my meat consumption once a week, it will foster environmentally friendly sustainable food production methods. (Env2)	4.95	0.75	
By reducing my meat consumption once a week, it will reduce the prices of sustainable food. (Env3)	4.62	0.61	
By reducing my meat consumption once a week, it will create employment opportunities for sustainable farming. (Env4)	5.18	0.80	
By reducing my meat consumption once a week, it will change my consumption patterns towards sustainable food. (Env5)	5.06	0.78	
By reducing my meat consumption once a week, it will increase my awareness of sustainable consumption of food. (Env6)	5.10	0.81	
By reducing my meat consumption once a week, it will increase the social effect of sustainable consumption of food. (Env7)	4.82	0.83	
By reducing my meat consumption once a week, it will increase community power towards sustainable consumption of food. (Env8)	4.73	0.78	
By reducing my meat consumption once a week, it will increase security and safety of sustainable food supply. (Env9)	4.87	0.78	
Perceived benefits from reducing meat consumption (Lea & Worsley, 2003)			0.84
I believe reducing meat consumption to once a week could help me decrease saturated fat intake in my diet. (Benefit2)	5.79	0.57	
I believe reducing meat consumption to once a week could help me control my weight. (Benefit3)	5.60	0.58	
I believe reducing meat consumption to once a week could help me prevent disease in general (e.g. heart disease, cancer) (Benefit5)	5.59	0.82	
I believe reducing meat consumption to once a week could help me stay healthy. (Benefit7)	5.41	0.78	
I believe reducing meat consumption to once a week could help me be fit. (Benefit12)	5.29	0.77	
Attitude toward reducing meat consumption (Povey et al., 2001)			0.83

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Please rate your attitudes towards limiting meat consumption to once a week			
Bad – Good (Attitude1)	5.61	0.60	
Harmful – Beneficial (Attitude2)	5.61	0.52	
Unpleasant – Pleasant (Attitude3)	4.66	0.90	
Unenjoyable – Enjoyable (Attitude4)	4.66	0.90	
Intention to reduce meat consumption (Povey et al., 2001)			0.87
I intend to reduce my meat consumption to once a week. (Intention1)	5.17	0.86	
It is likely that I will only eat premium (i.e. no fat; high quality of meat) types of meat once a week. (Intention2)	5.00	0.54	
I expect to reduce meat consumption once a week in the future. (Intention3)	5.47	0.84	
I am willing to reduce my meat consumption to once a week. (Intention4)	5.41	0.89	

*CR = Composite reliability

To determine the validity of the exploratory factor analysis and estimate the measurement model of each scale, a confirmatory factor analysis was conducted. Furthermore, this is also an essential pre-condition for the validity of subsequent structural model estimation. All direct effect estimate were positive and squared multiple correlations were at least 0.30. Few items were removed due to high modification indices and low loadings. Then all the constructs were added into a measurement model. Utilised with AMOS 25.0, the measurement model achieved an excellent fit: χ^2 = 703.606, degrees of freedom (df) = 382, χ^2/df = 1.842, Root Mean Square Error of Approximation (RMSEA) = 0.05, Standardised Root Mean Squared Residual (SRMR) = 0.053, Comparative Fit Index (CFI) = 0.945, and Tucker-Lewis Index (TLI) = 0.938 (Hu and Bentler, 1999). The convergent validity was achieved with all the Average Variance Extracted (AVE) above 0.50. Furthermore, the correlation between the constructs were lower than the square root of the AVE values that indicated the discriminant validity. A summary of the convergent and discriminant validities for the constructs is presented in the Table 3.

Table 3: Convergent and discriminant validity

	AVE	1	2	3	4	5	6
1. Intention	0.63	**0.793**					
2. Attitude	0.57	0.730***	**0.753**				
3. Perceived benefits	0.51	0.601***	0.587***	**0.712**			
4. Environmental concern	0.60	0.529***	0.525***	0.630***	**0.770**		
5. Perceived barriers	0.59	-0.432***	-0.417***	-0.267***	-0.069	**0.766**	
6. Social influence	0.68	0.605***	0.532***	0.355***	0.477***	-0.130†	**0.822**

Note: Figures in the diagonal (values given in bold) are the square root of the Average Variance Extracted (AVE); those below the diagonal are the correlations between the constructs.
The significance level: † p < 0.100, * p < 0.050, ** p < 0.010, *** p < 0.001

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Thereafter, the hypothesised relationships were tested within a structural model. The structural model provided strong fit as well: $\chi^2 = 754.196$, df = 386, $\chi^2/df = 1.952$, RMSEA = 0.05, SRMR = 0.062, CFI = 0.938, and TLI = 0.930. All the five hypothesised relationships were supported (Table 4). The majority of the results mirror past research findings (e.g. Lea et al., 2006a; 2006b; Zur & Klöckner, 2014).

Table 4: Summary of the hypothesis testing

Hypothesis	Relationship			β	t-value	p-value
H_1	Social norm	→	Attitude	.321	6.275	***
H_2	Perceived benefits	→	Attitude	.375	4.486	***
H_3	Environmental concern	→	Attitude	.216	2.662	.008
H_4	Perceived barrier	→	Attitude	-.274	-5.925	***
H_5	Attitude	→	Intention	.728	13.415	***

The significance level: † p < 0.100, * p < 0.050, ** p < 0.010, *** p < 0.001

To test the direct impact of the antecedents of attitudes toward reducing meat consumption (i.e., social norm, perceived barrier, perceived benefits and environmental concern) on the behavioural intention, a rival model was tested next (Figure 2). The model achieved good fit ($\chi^2 = 703.606$, df = 382, $\chi^2/df = 1.842$, RMSEA = 0.05, SRMR = 0.057, CFI = 0.945, and TLI = 0.938) and H_1 to H_5 were supported. The analysis of the alternative model suggests that social norm (t = 5.279, p<0.000), perceived barrier (t = -3.722, p<0.000), and perceived benefits (t = 2.947, p<.05) have significant impact on the intention toward reducing meat consumption. However, environmental concern does not have any significant impact on the intention (t = 1.105, p = 0.269).

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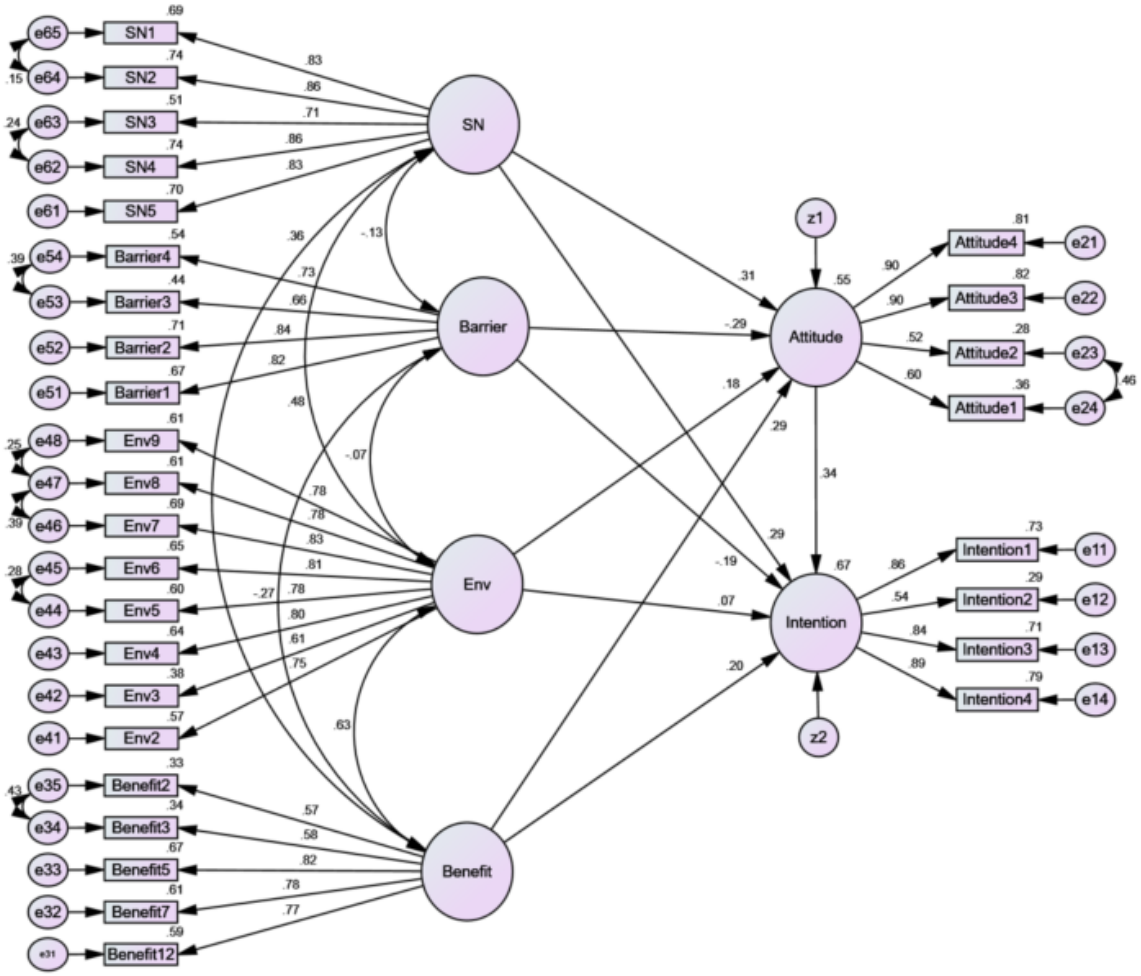
Figure 2: SEM analysis for the rival model



5. DISCUSSION

The results from H_1 show that social norms have a significant and positive relationship with both consumer attitudes and intention towards reducing their meat consumption. Past literature suggested that food consumption is not always an individual phenomenon, but includes social aspects (Kleemann & Schmidt, 2016). In this case, social norms as a type of interpersonal influence are interesting in that it acknowledges that individuals do not make decisions in a bubble. It is likely that the social leanings of friends and family will influence how individuals feel about their own eating habits, meal-patterns and diet routines (Nasir & Karakaya, 2014; Perrea et al., 2014; Tan & Cadeaux, 2012). Therefore, meat avoidance as a dietary behaviour,

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which is related to perceptions of normative behaviour by socially connected peers, can be a perceived as a barrier as well as an opportunity.

The results suggest that perceived benefits from reducing meat consumption have a significant positive relationship with attitudes and intention towards reducing meat consumption (H_2). Thus, the respondents strongly believe that reducing meat consumption can enable them to have more control over their weight, decrease the saturated fat intakes, prevent diseases, which ultimately put them in better health. Furthermore, this result also supports the findings from past research on the expectation of healthier outcomes by reducing meat consumption (Schösler et al., 2012; Lea et al., 2006a). In particular, concerns regarding health have been found of the key motivators behind meat avoidance in Australia and Scotland (Malek et al., 2019; Bogueva et al., 2016; Macdiarmid et al., 2016). Perhaps, the increased risk for colorectal carcinoma, cancers and cardiovascular diseases associated with meat consumption also leads to reduced meat consumption (Boada et al., 2016).

The results suggest that consumers tend to hold positive attitudes toward reducing their meat consumption especially when there are environmental implications (H_3). Studies show that there is a connection between the "self-enhancement" values (of authority and hierarchy) and positive eating behaviours which involves reducing one's meat consumption (Macdiarmid et al., 2016; Allen & Ng, 2003). Furthermore, the "self-transcendence" values such as altruism, social justice, equality and environmental protection, have an evident negative connection to meat consumption (de Boer & Aiking, 2011). This is in line with Schwartz's (1977) norm activation theory and explains that individuals are more inclined to reflect on their meat consumption and make changes to limit meat consumption in light of environmental issues and sustainable impact (Zur & Klöckner, 2014; Steinfeld et al., 2006). While a portion of the meat-eating public have become sympathetic to the cause (Allen & Ng, 2003), it is noted that environmental, personal, and ethical concerns alone may not be persuasive enough to shape one's diet entirely (Lea & Worsley, 2003).

The results further show that the consumers' perceived barrier in the form of 'meat eating habits' has a significant and negative effect on both consumer attitudes and intention towards reducing their meat consumption (H_4). According to the theory of reasoned action (e.g. Ajzen & Fishbein, 1980), an individual's eating behaviour is directly predicted by the eating habits, because eating patterns are highly repetitive and thus most likely a routine behaviour (Verbeke

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et al., 2010; Hoek et al., 2011). This would mean that refusal to change one's eating habits such as reducing one's meat consumption as a dietary behaviour is extremely challenging despite the nutritional benefits in adopting a vegetarian diet (Salonen & Helne, 2012; Lea & Worsley, 2003) or the environmental, personal, and ethical arguments (Zur & Klöckner, 2014; Steinfeld et al., 2006) to do so.

The result indicates attitude towards reducing meat consumption has a significant positive influence upon intention toward reducing meat consumption (H_5). This finding reflects the concept of theory reasoned action model (Ajzen & Fishbein, 1980), in which attitude has been argued as a strong predictor of the behavioural intention. It clarifies that enhancing consumers' positive attitudes towards reducing meat consumption is a compulsory element in any consideration of increasing the likelihood of engaging the act of reducing meat consumption in their eating habit. This outcome also has strengthened the indications from past research (Latvala et al., 2012; Verplanken & Aarts 1999; Klöckner, 2011).

6. IMPLICATIONS

6.1 Conceptual implications

Conceptually, applying four established theories (norm activation theory, social identity theory, protection motivation theory, and theory of reasoned action) in this empirical study provides a strong contribution in the marketing literature. More specifically, the findings validate and extend the current theoretical framework on dietary behaviour change in particular one that involves reducing or reducing the consumption of meat. For example, Rogers's (1975) protection motivation theory explains that the cognitive appraisal of threatening and harmful health information or events can lead to suggested attitude or behavioural change as a prevention mechanism. Hence meat avoidance can lead to specific health benefits or a healthier lifestyle. Furthermore, social norms were found to significantly predict behavioural intentions to limit meat consumption. This finding demonstrates strong influence of the normative component for dietary change behaviours as well as highlighting the importance of one's "self-identity" (Tajfel & Turner, 1986) in improving the predictive power of peers and social norm influences especially when such dietary decisions places the individual in a wider social context. While social norms are important in understanding the motivations behind behavioural change, Schwartz's (1977) norm activation theory confirms the need to limit one's meat consumption as a means of "pro-environmental" behaviour, hence to address one's own

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expectations and feeling of moral obligation (e.g. personal or injunctive norms) towards an environmental issue. Finally, Ajzen and Fishbein's (1980) theory of reasoned action supported the notion of a negative or inconsistent behavioural change due to repeated past behaviours or consumption habits. As individuals are often "locked in" to specific and highly repetitive consumption patterns, the intention to behaviour component that is to initiate a dietary change is often hindered. Overall, the study has confirmed that personal and social factors play an important role in the formation and alteration of dietary decisions. More specifically, the study has successfully integrated three social psychological theories to help better understand these dietary decisions based on individual's motivations to limit meat consumption.

6.2 Managerial implications

These findings should be of importance for food producers and the food industry, as well as health professionals. The results have identified health beliefs, environmental benefits, social aspects, consumption habits and attitudes as significant factors in the consumer decision making process and by understanding how these motivators interact with each other, a comprehensive intervention package can be designed and implemented (e.g. Verplanken & Wood, 2006; Klöckner & Verplanken, 2012; Zur & Klöckner, 2014). The main managerial implications presented in this study are twofold.

First, the findings of this study suggest that perceived health benefits are a strong motivator for reducing meat consumption amongst Australians. Apart from health benefits, the results also show that environmental concern is linked to consumer attitudes toward reducing meat consumption. Hence there are important synergies between the goals of reducing food greenhouse gas emissions and improving nutritional health (Eshel et al., 2019). However, it must be noted that intervention programs to reduce meat consumption need to be broad (rather than focussing on one or two aspects) in order to capture the entire target group as suggested by Zur and Klöckner (2014). For example, when looking to increase the average consumer's awareness of health and environmental benefits associated with dietary change (e.g. meatless diet, vegetarianism or a diet with less meat), it is important to stress the strong relationships between personal norms and environmental behaviour identified in this and other studies (Harland et al., 2007). This suggests a focus on prevention, that is, on things one is obliged to do in order to save the environment. Therefore, the challenge towards achieving environmental protection would be to create situations in which sustainable environmental improvement could be achieved through goals that imply a prevention focus.

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Further managerial implications suggests that campaign messages can be facilitated through educational and health programs that ultimately aim to improve the overall food literacy relevant to consuming meat and meat products, whether in smaller portions or less frequently. Current marketing examples include “Meat Free Monday” (also called Meatless Monday). This is a social campaign that invites people to give up meat at least one day per week in light of health and environmental goals.

Second, the findings also highlight that societal norms are important because meat still has an important social status for many people as an essential part of a meal and its consumption or avoidance can be regarded as a choice that is part of a lifestyle decision. Furthermore, in the current study, “enjoyment of eating meat” as well as a number of meat eating habits were identified as the strongest barrier to adopting a meatless diet (Verain et al., 2015). This particular study finding implies that the greater part of everyday food consumption is mundane, heavily habitualised, time-pressed, information-overloaded and dominated by practicality (De Jonge & Van Trijp, 2013; Jacobsen & Dulsrud, 2007). Therefore, opportunities and strategies need to be tailored in a target group-specific manner and approaches such as consumer profiling and segmentation should be considered. For example, the promotion of new social and cultural norms by means of stressing the role of vegan or vegetarian opinion leaders as role models (such as high profile celebrities or a famous nutritionist on a similar diet) as well as community-based social marketing or emotional and symbolic messages. Kleemann and Schmidt (2016) put forward several applications of effective societal norms transference and influence within a community from governments in countries such as China running a large-scale campaign employing well-known Hollywood actors and actresses such as Dwayne Johnson and Scarlett Johansson, to companies such as IKEA, which is promoting vegan food, to local, national and global NGOs and private foundations such as WWF.

6.3 Limitations and future research

The study is not without its limitations. The current sampling frameworks targeted a broad selection of people living in Australia who consume meat and as such participants from varying cultural background were included. However, the study was based on a relatively small convenience sample only due to budget restrictions. Therefore, responses might have been biased by the selection of the sample. Thus, replicating this study with a different sample (maybe even in several countries or cultures) and stronger measures are of importance for

future research. For example, the research could be furthered by including cultural factors, such as the social and cultural significance of various foods to different social groups and societies. The addition of cultural factors could further illuminate the centrality of meat in Australia. It is also noted that the perceived benefits from reducing meat consumption were primarily related to the respondents' health benefits. Future research may consider environmental, financial and social benefits in this regard. Furthermore, in order to move meat consumption in a more sustainable direction it will be necessary to understand current forces that influence meat consumption in Australian meat-eaters. While understanding the motives behind meat consumption is important, further interdisciplinary and integrative research is necessary to learn more about the interconnectedness of factors and the appropriate strategies that it entails. Therefore, in order to move meat consumption in a more sustainable direction it will be necessary to understand current forces that influence meat consumption in Australian meat-eaters. Consumers' gender and education appear to be important moderators of attitudes toward vegetarianism, animal rights, and the eating of animals (Rothgerber, 2012; Gossard and York, 2003). Therefore, further research is warranted to examine whether consumers' demographic characteristics have any impact on their attitude and intention toward reducing meat consumption. To date, only a small body of research has focused on influences on the amount of meat consumed by meat-eaters and on consumer willingness to eat a more plant-based diet (e.g. De Boer & Aiking, 2011; Elzerman et al., 2011; Latvala et al., 2012; Lea et al., 2006a; 2006b; Schösler et al., 2012; Wansink, 2002). Hence, future research should not only focus on why some people choose to eat meat and others choose to be vegetarian, rather it is important to understand what influences the type and amount of meat consumed by meat-eaters. Other emerging dietary forms such as "flexitarianism" and "pescetarianism" could also be examined. Moreover, the influence of political and economic factors and the food environment such as food literacy, food safety, human ethics and animal welfare needs to be researched in much greater depth and breadth.

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