

Goat and meat consumption by Makassar consumers

*Report prepared as part of the ACIAR
SMAR/2007/201 project*

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October 2010

Executive summary

One of the activities of the ACIAR SMAR/2007/201 project was to survey consumers in Makassar regarding their perceptions of goat meat and current sources of supply. The objectives of the consumer survey were:

1. To assess the criteria used by Makassar consumers when purchasing meat and in particular attitudes towards goat meat.
2. To investigate levels of consumption, and purchase and consumption patterns for consumers of goat.
3. To identify and characterise market segments in the goat market.

Some hypotheses derived from anecdotal evidence and discussions were:

1. Goat is mainly consumed for religious and cultural reasons.
2. There are some negative perceptions held by a large proportion of the population about goat, which include: cause hypertension and has an unpleasant smell when cooked and that these factors will affect consumption.

Personal interviews were conducted in April and May 2009 using a survey instrument including purchase characteristics of meat, purchase frequency and seller, questions on attitudes to goat, goat meat purchases, usage and consumption, and demographics of the respondents. The population of interest were the purchasers and preparers of meat for household consumption in the 14 subdistricts in Makassar. The initial 388 questionnaires were reduced to 374 usable questionnaires; although some questionnaires did not have all questions answered and 19 (5%) of the respondents were vegetarians. Exploratory factor analyses were undertaken of the 35 meat purchase items to identify any underlying patterns or relationships in these variables. Cluster analyses were conducted to see if it was possible to identify major groups of consumers based on the attitudinal items remaining after removing variables excluded by the factor analyses. The final cluster solutions were saved and cluster membership was cross-tabulated with meat and goat purchase decisions and demographic variables to see if the clusters could be differentiated further.

In Indonesia, fish and seafood appear to be the most widely eaten source of animal protein and the findings of this study are consistent with this as 92% of Makassar consumers said they cooked fish and seafood in a month. Chicken is the other main source of animal protein (91%), while beef was the third most common source (49%). Apart from goat (19%) and duck (15%), other sources of animal protein form only a minor portion of the diet.

Unprompted, consumers suggested the *price of meat* was the most important criterion, while *good value for money* was ranked highest of the 35 items provided to consumers. Apart from price, *perceptions of quality* appears to be the next most important factor considered by consumers in Makassar. Consumers in Makassar are similar to consumers elsewhere, with at least some of them concerned about the effect of meat consumption on their health. The areas of concern are mostly related to the effect of fat and cholesterol and a particular concern in Indonesia relating to some meats causing hypertension and high blood pressure.

While supermarkets are becoming more common in Indonesia, this study suggests they have not replaced traditional markets and suppliers as the main sources for meat with more than half of consumers never purchasing meat from them. Meat sellers in traditional wet markets remain the main source of supply.

Cluster analysis based on meat purchase criteria identified four main clusters. The largest cluster (37% of respondents) seemed to be concerned about health but not culture/prestige, while the second largest (27%) was almost the polar opposite, focussing on culture/prestige items but not health or value. Another large cluster (24%) was health and culture focussed with the smallest cluster (11%) mainly concerned about value and quality. The clusters are mainly delineated demographically by their ethno-religious background, rather than other factors. As expected the lowest income segment were less likely to buy from a supermarket, but the highest income

segment were not the most likely to do so, however, they tended to be older. The segment with the highest level of younger, unmarried people were more likely to purchase from a supermarket.

Because of the predominance of the Moslem religion in Indonesia, goats are important for religious festivities, in particular *Idul Adha* (the feast of sacrifice) and for birth ceremonies. The findings of this study are consistent with this; around three-quarters of those interviewed eat goat meat on these two occasions at least once per year. Generally, consumers do not buy goat for the family or visitors at other times and rarely eat it at restaurants. The evidence supports the hypothesis that goat meat is eaten mostly for religious and cultural reasons. Most people purchase most of their goat from traditional sources and 71% of those interviewed never purchasing goat meat from a supermarket.

Consumers have similar rankings for goat and meat on the key meat purchasing criteria. However, as expected, goat ranked significantly higher on the criterion of *important for birth ceremony*. The biggest differences in rankings of other types of meat over goat meat were *low in cholesterol, low in calories, low in fat, good value for money* and *healthy* suggesting consumers have negative perceptions of goat meat in comparison to other meats. It appears that there are two different groups in the population, one that has negative perceptions that eating goat meat causes hypertension and a smaller group who do not believe it causes hypertension. Perhaps even more surprising and emphasising this point is that 60% of respondents would make little change to their consumption of goat meat even if its price were to decrease to the same price as chicken. The two key reasons for this were they believe it to be less healthy than chicken and has a less desirable smell or flavour. The evidence supports the hypothesis that goat meat has negative perceptions in a large proportion of the population, mostly because of concerns about its bad effects on health and to a lesser extent due to its smell, flavour and toughness.

Further research is required into aspects of these findings and a program of consumer education may be appropriate to overcome some of the negative perceptions of goat meat in the Indonesian population.

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Acknowledgements

Thanks to Peter Batt and Christine Storer of Curtin University for help with analysis and design of the survey.

1. Introduction

The ACIAR SMAR/2007/201 project 'Improving goat production in integrated estate cropping systems in South Sulawesi' had as one of its objectives to 'Improve understanding of existing markets and supply chains and assess alternative markets and supply chains'. As part of this objective, one of the activities was to survey consumers in Makassar regarding their perceptions of goat meat and current sources of supply.

This report outlines the results of a survey undertaken of consumers in Makassar to meet this objective.

2. Research design

This section contains an outline of the design of the survey of Makassar consumers, which had the objectives of:

1. To assess the criteria used by Makassar consumers when purchasing meat and in particular attitudes towards goat meat.
2. To investigate levels of consumption, and purchase and consumption patterns for consumers of goat.
3. To identify and characterise market segments in the goat market.

Some hypotheses derived from anecdotal evidence and discussions were:

1. Goat is mainly consumed for religious and cultural reasons.
2. There are some negative perceptions held by a large proportion of the population about goat, which include: cause hypertension and has an unpleasant smell when cooked and that these factors will affect consumption.

2.1 Population of interest

The population of interest were the purchasers and preparers of meat for household consumption in the city of Makassar. Makassar was chosen because it is the biggest city in South Sulawesi and was also the city in which the BPTP and Hasanuddin University researchers were located. This meant we could use the students of the university to conduct the survey. However, given the budget it was difficult to conduct a survey of sufficient size in the cities of West Sulawesi and East Kalimantan, which is where much of the Enrekang goat is sold. One limitation is that very little goat eaten in Makassar, if any, comes from the focus district of Enrekang.

2.2 Choice and design of survey instrument

Initial questions for the survey were based on surveys conducted by Dr Christine Storer; a Western Australian lamb consumer survey (Storer 1993) and a Western Australian in-store Q Lamb consumer survey (Storer 1997), with most of the questions being based on the former. There was an initial question that eliminated vegetarian households and the remainder of the questionnaire was divided into four main sections (see Appendix 1):

1. Purchase characteristics of meat
2. Meat usage & occasions used
3. Attitudes to goat
4. Demographics.

2.2.1 Purchase characteristics of meat

A set of 35 items was developed to identify the important characteristics used by consumers when purchasing meat. These were used later for goat. The research team discussed the

relevance of the items from the WA lamb consumer survey, which were translated into Indonesian, and either accepted, adapted or rejected items. In addition an exercise was conducted with Indonesian staff asking them to compare triads of meat choices and identify ways in which 2 were the same and different from the other. From this additional items such as: rubbery, causes hypertension and important for birth ceremonies were introduced. Wording of some items were also changed following a pretest. The items were rated on a 5 point scale with 1 (not at all important) and 5 (very important).

2.2.2 Meat usage & where purchased

Questions on meat usage and occasions used were also adapted to Indonesian conditions from the WA consumer surveys. Questions were asked about issues such as:

- Times each meat was cooked
- Where meat was purchased

2.2.3 Goat purchases and how cooked and consumed

Similarly questions on goat purchases and consumptions were adapted from the WA consumer surveys. Questions included:

- Whether goat was purchased and for what purpose
- How much goat was purchased
- What cuts of goat was purchased for different purposes and how it was cooked
- Where the goat was purchased
- Whether goat was purchased outside the home and how it was prepared
- Differences in goat consumption at different seasons and cultural occasions during the year
- Whether they have changed their goat consumption and why.

2.2.4 Attitudes to goat

The questions on attitudes to goat were also taken from the WA lamb consumer surveys and adapted for Indonesian conditions. Consumers were asked to rank goat on a 5 point scale (1 – strongly disagree; 5 – strongly agree) using the items for meat purchase. Consumers were also asked:

- If their attitude to goat had change if so how
- If goat were the same price as chicken would they increase their consumption and if so why.

2.2.5 Demographics

A series of demographic questions were asked: age, employment status, education level, ethnic background, religion, people living in household, household status and income.

An initial version of the survey was pretested on around 15 staff at BPTP and 20 staff from Hasannudin University and revised.

2.3 Sample selection

Initially we planned to conduct interviews in 200 homes of Makassar. These were to be selected from the 14 subdistricts in Makassar with a similar number in each subdistrict. Households were chosen on the basis of availability and willingness to participate until the required number of interviews were conducted. A total of 388 questionnaires were submitted, of which 374 were suitable for analysis.

2.4 Conduct of survey

The survey was conducted by students from the Animal Science Faculty of Hasanuddin University enrolled in the Research Methodology course. They were trained by Dr Muslim Salam, an agricultural economist at the University, in how to conduct a survey and to conduct interviews, using the survey questionnaire.

Interviews were conducted in April and May of 2009 at times chosen by the student surveyors. Questionnaires were checked by staff and students asked to verify or conduct new interviews if they were incomplete.

2.5 Data analysis

2.5.1 Descriptive analysis

Data was initially entered into an Excel spreadsheet for initial cleaning and then transferred into SPSS where initial descriptive statistics were run. Errors identified in this process were then corrected and the descriptive statistics run again. As a result the initial 388 questionnaires were reduced to 374 usable questionnaires, although some questionnaires did not have all questions answered and 19 (5%) were vegetarians.

2.5.2 Clarification of underlying structure using factor analysis

The questions used to assess the criteria Makassar consumers use in making their meat purchasing decisions and their perceptions of goat meat were developed from scales used in other countries and preliminary investigations in Makassar. Because the 35 items had not been previously tested in Indonesia exploratory factor analysis was undertaken (in SPSS v 17) to identify any underlying patterns or relationships in these variables and to reduce the number of variables to be used in future studies. It was also used to identify if particular variables loaded on to the factors they had been designed for.

The approach used for factor analysis was that consumers' responses to the items were analysed using principal component analysis with varimax rotation. Items were excluded if they cross-loadings greater than 0.4 or had factor loadings below 0.4 for the meat analysis and 0.5 for the goat analysis based on the sample size (Hair et al. 2010). Selection of number of factors was made based on an Eigen value of greater than 1.0 although Scree plots were also examined. Items contributing to each factor were tested by applying the reliability coefficient and where the Cronbach's Alpha Coefficient was below 0.5, in most cases the factor was excluded from further analysis.

2.5.3 Identification of consumer groups using cluster analysis

Cluster analysis was conducted (in SPSS v 17) to see if it was possible to identify major groups of consumers based on the meat purchasing criteria they used and their perceptions of goat on these criteria. It is expected that this might provide a better understanding of the influences on their purchases of goat meat.

Initially, hierarchical cluster analysis procedures based on Hair et al. (2001) were used to identify a potential number of solutions. The Ward's cluster method was used based on the squared Euclidean distance measure. Variables excluded by the factor analysis were excluded from the cluster analysis. The number of potential clusters was then determined based on percentage increase in the agglomeration coefficient. When this was much larger than the previous change, the solution with the lower number of clusters was chosen. When a cluster contained a small number of cases, these cases were removed and the hierarchical analysis was rerun.

This number of clusters and the same variables were then specified in a K-means cluster function using iterate and classify method. This identified the composition of the clusters and the number of respondents within each cluster. An ANOVA was run as part of the procedure to

identify if any variables were redundant or did not adequately differentiate between the clusters. These variables were subsequently deleted and the process repeated to assess the stability of the resultant clusters. The final cluster solution was saved and later utilised to identify any significant differences in response between the various clusters.

Cluster membership was cross-tabulated with meat and goat purchase decisions and demographic variables to see if the clusters could be differentiated further. Pearson chi-square tests were conducted and a result was regarded as significant if the probability was less than five percent. Categories were combined or deleted as appropriate and the tests re-run when:

- 20 percent or more of the cells for the Chi-square test had an expected value of less than five or a cell had an expected frequency of less than one; and
- the result was significant or close to significant at the five percent level.

3. Results

The results are divided into: characteristics of the sample; purchase characteristics of the meat; meat usage and the occasions used; goat purchases and how cooked and consumed; changes in goat consumption; attitudes of consumers to goat meat; analysis of factors underlying meat and kambing purchase criteria; and identification of consumer groups in Makassar based on criteria used in the purchase of meat and goat.

3.1 Characteristics of sample

3.1.1 Age and gender

Around 60% of respondents were between 30 and 50 years of age (Table 1).

Table 1: Ages of respondents

	Frequency	Percent	Cumulative Percent
<20	12	3%	3%
10-29	68	18%	21%
30-39	102	27%	49%
40-49	125	33%	82%
50-59	44	12%	94%
60-69	19	5%	99%
>70	4	1%	100%
Total	374	100%	

3.1.2 Employment status

One third of respondents were housewives, one quarter had their own business and about one fifth were government employees (Table 2).

Table 2: Employment of respondents

	N	Percent
Housewife	125	33.4%
Own business	84	22.5%
Government employee	68	18.2%
Private company	35	9.4%

Studying/student	21	5.6%
Retired Ps, army, police	14	3.7%
Day labourer	10	2.7%
Not working	6	1.6%
Army or Police	5	1.3%
Other	6	1.6%
Total	374	

3.1.3 Education

Forty-four percent had received an upper secondary education and around forty percent a tertiary level education (Table 3).

Table 3: Education level of respondents

Education category	N	Percent	Cumulative Percent
Elementary school	37	10%	10%
Lower secondary	28	7%	17%
Upper secondary	165	44%	61%
Bachelor/diploma	26	7%	68%
Bachelor (S1)	108	29%	97%
Masters (S2)	10	3%	100%
Total	374	100%	

3.1.4 Ethnicity

The largest ethnic groupings were Bugis (46%) and Makassar (33%) (Table 4)

Table 4: Ethnic background of respondents

Ethnicity	N	Percent
Bugis	173	46%
Makassar	124	33%
Toraja	24	6%
Mandar	9	2%
Duri	3	1%
Other	41	11%
Total	374	100%

3.1.5 Religion

Almost all respondents were Muslim (91%) with the next most common being Christians (8%) (Table 5).

Table 5: Religion of respondents

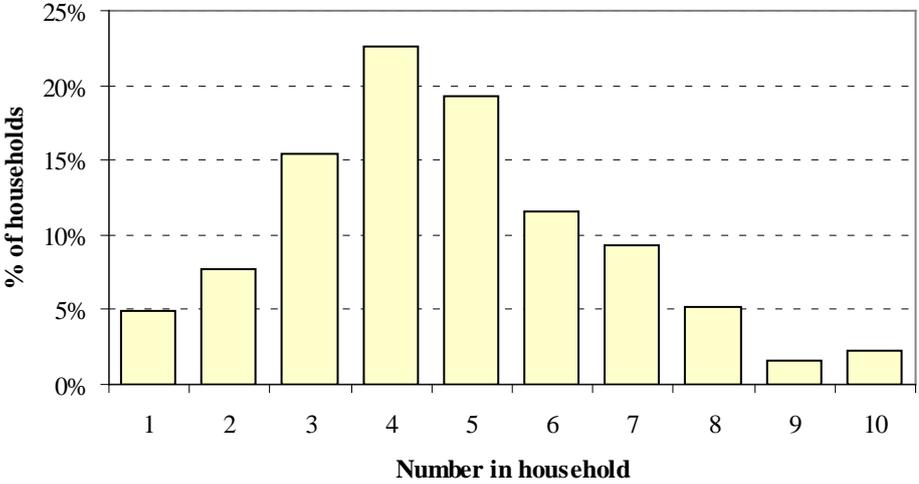
Religion	N	Percent
Islam	339	90.6%
Protestan	17	4.5%
Katolik	12	3.2%
Hindu	2	0.5%
Budha	1	0.3%
Other	2	0.5%
Total	373	99.7%

1 missing; N = 374

3.1.6 Size of household

The average number of people living in the respondent households was 4.7, with 4 people (23%) and 5 people (19%) being the most common number (Figure 1).

Figure 1. Proportions of households of different sizes



See Appendix Table ?? for numbers

3.1.7 Marital status

Three quarters of respondent households had a married couple with children, with 16% classified as not yet married (Table 6).

Table 6: Marital status of household

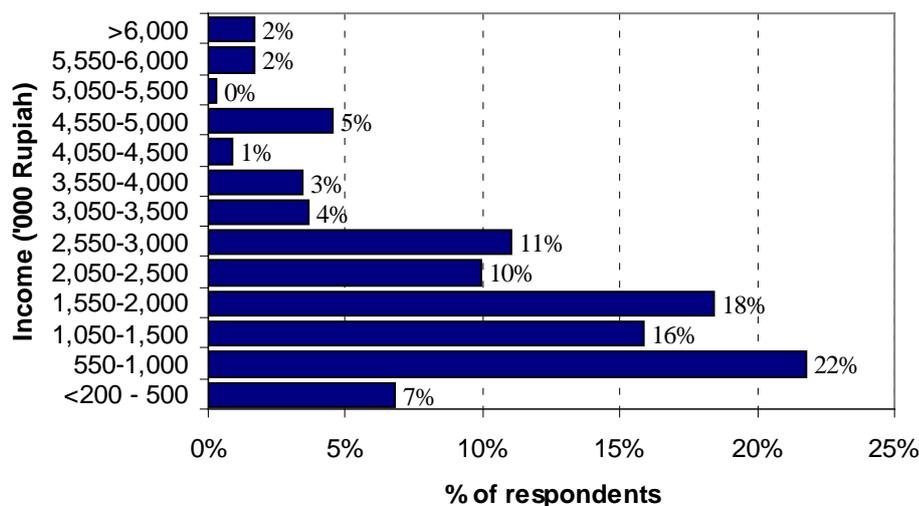
Marital status	N	Percent
Not yet married	61	16%
Married without children	16	4%
Married with children	271	73%
Widowed without children	5	1%
Widowed with children	19	5%
Total	372	100%

N = 374; 2 missing

3.1.8 Income of respondents

While the average income was Rp2.16 million, the distribution was highly skewed (see Figure 2). Over 60% have an income of less than Rp 2 million and the modal income category was Rp550 thousand to Rp1 million.

Figure 2: Household income per month of respondents



3.1.9 Percentage of respondents who are vegetarians

Nineteen of the 374 respondents (5%) classified themselves as vegetarian.

3.2 Purchase characteristics of meat

The four main characteristics considered by respondents when purchasing meat were: price of meat (56%), meat quality (35%), colour of meat (33%) and freshness of meat (30%). A complete list of characteristics is in Table A ?? with the others being considered by 12% or less of respondents.

Respondents were also asked to rank the importance when purchasing meat of 35 items on a 5 point scale with 1 being not at all important and 5 being very important. When the mean of each items was calculated, the 7 highest ranked characteristics were: good value for money (4.51), consistent quality (4.50), has good colour (4.49), nutritional (4.41), healthy (4.40), important for birth ceremony (4.40) and looks good/fresh (4.38). A complete list of the rankings is in Table ?, with the counts for each item on each point in the scale given in Table A??.

Table 7: Highest 15 items in ranking of meat characteristic criteria

Item	Mean*	S.D.	N
Good value for money	4.51	0.69	344
Consistent quality	4.50	0.65	326
Has good colour	4.49	0.64	352
Nutritional	4.41	0.73	337
Healthy	4.40	0.75	340
Important for birth ceremony	4.40	0.98	336
Looks good/fresh	4.38	0.74	345
Flavoursome	4.34	0.76	329
Tender	4.33	0.75	335
Rubbery	4.22	0.80	323
Free of artificial additives	4.21	1.05	272
Appetizing	4.13	0.77	327
Low in cholesterol	4.05	0.98	321
Important for religious ceremonies	4.02	0.97	330

Plenty of meat	3.94	0.94	335
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* Rating out of 5 with 5 being 'very important' and 1 'not at all important'

3.3 Meat usage and occasions used

The most commonly cooked meat types in terms of the percentage of respondents who cook it in a month and the mean number of times it is cooked are: fish/seafood (92%, 12.6), chicken (91%, 4.4) and beef (49%, 2.4). Goat (19%), duck (15%) and caribou (4%) are cooked by a lower percentage of people but they are cooked by these people 2.4, 2.0 and 2.6 times respectively (see Table ?).

Table 8: Number of respondents who cook various meat types in a month and the mean number of times cooked per month (if cook)

Meat type	# cooking	% cooking	# not cooking	Mean	Range
Fish/seafood	326	92%	29	12.6	0-30
Chicken	323	91%	32	4.4	0-30
Beef	174	49%	181	2.4	0-15
Goat	68	19%	287	2.0	0-15
Duck	54	15%	301	2.6	0-5
Caribou	13	4%	342	2.1	0-5
Pork	12	3%	343	1.7	0-4
Horse	10	3%	345	1.6	0-4
Other birds	5	1%	350	2.4	0-5
Other meat	3	1%	352	2.3	0-5

N = 355 who are not vegetarian.

Most people purchase their meat from a traditional butcher (91%) and trader/butcher (66%), with less than half purchasing any meat from a supermarket (Table 14).

Table 9: Sources for purchase of meat

Source		All	Most	About half	Some	Never
Traditional market	N	55	130	110	29	31
	%	15%	37%	31%	8%	9%
Trader/butcher	N	27	101	61	45	121
	%	8%	28%	17%	13%	34%
Supermarket	N	18	37	64	48	188
	%	5%	10%	18%	14%	53%
Family	N	13	21	31	68	222
	%	4%	6%	9%	19%	63%
Animal market	N	15	14	10	27	289
	%	4%	4%	3%	8%	81%
Mosque	N	11	13	14	57	260
	%	3%	4%	4%	16%	73%
Other sources	N	6	4	4	6	335
	%	2%	1%	1%	2%	94%

N = 355

3.4 Goat purchases and how cooked and consumed

Overall, 58% of respondents purchase goat (Table A 2.6). Of these 75% bought one of more whole goats in the last year, with most buying one (33%) or two (31%) goats (Table A 2.7). In the three months before the survey, a period which did not include major religious festivals,

45% bought a part of a goat, with the most common amounts for that period being 2 kg (10%) and 3 kg (17%) (Table A 2.8).

As for meat, goat is mostly purchased or obtained from traditional markets and trader/butchers, with 46% getting most or all from trader/butchers and 30% getting most or all from traditional markets. On the other hand only 4% got most of their goat from supermarkets while 71% never get goat from supermarkets (Table A 2.9).

Of the people who buy goat, 67% never buy it for their family and 85% never buy it for visitors (Table 10). Only 9% buy it a number of times per year or routinely for their family and 7% for visitors. Similarly it is never bought for special occasions (71%), gifts (93%) and other occasions (96%). By way of contrast 57% buy it once a year for Kurban and 55% buying it once a year and 33% buying it more than that for birth ceremonies.

Table 10: How often buy goat for family and other occasions

		Never	Once/year	Number times/year	Routinely
How often buy goat for family	N	138	49	16	2
	%	67%	24%	8%	1%
How often buy goat for visitors	N	175	15	13	2
	%	85%	7%	6%	1%
How often buy goat for Kurban	N	54	117	10	24
	%	26%	57%	5%	12%
How often buy goat for birth	N	28	112	20	45
	%	14%	55%	10%	22%
How often buy goat for special occasions	N	145	44	11	5
	%	71%	22%	5%	2%
How often buy goat for gifts	N	190	12	2	1
	%	93%	6%	1%	1%
How often buy goat for other	N	197	8	0	0
	%	96%	4%	0%	0%

n - 205

Whole goat is the most common form bought for visitors (89%), Kurban (77%), other reasons (67%) and Births (45%). Thigh is the other main cut bought and this is mainly bought for family (71%), special occasions (54%) and births (32%) (see Table 11). Curry and sate are the most commonly used methods for cooking goat for a range of uses with the percentages of respondents using these for particular uses being: family (64%, 57%); visitors (45%, 36%); Kurban (73%, 41%); births (75%, 41%); and special occasions (41%, 39%) (Table A 2.10). Other common ways of cooking are stew and soup.

Table 11: Cuts of goat bought for various uses

		Whole animal	Leg	Thigh	Ribs	Intestine s	Lung etc	Head	Bone	Other	Total
Family	n	15	5	90	13	1	5	5	7	0	135
	%	12%	4%	71%	10%	1%	4%	4%	6%	0%	100%
Visitors	n	154	4	10	13	1	4	1	3	0	50
	%	89%	2%	6%	7%	1%	2%	1%	2%	0%	100%
Kurban	n	112	6	17	17	2	2	1	2	0	151
	%	77%	4%	12%	12%	1%	1%	1%	1%	0%	100%
Births	n	29	5	21	4	4	1	3	7	3	181

	%	45%	8%	32%	6%	6%	2%	5%	11%	5%	100%
Special occasions	n	7	6	27	8	1	0	1	0	4	71
	%	14%	12%	54%	16%	2%	0%	2%	0%	8%	100%
Gifts	n	7	1	3	0	0	0	4	0	4	17
	%	39%	6%	17%	0%	0%	0%	22%	0%	22%	100%
Other reasons	n	6	1	1	0	0	0	0	0	1	8
	%	67%	11%	11%	0%	0%	0%	0%	0%	11%	100%

n = no of mentions; % = % of mentions

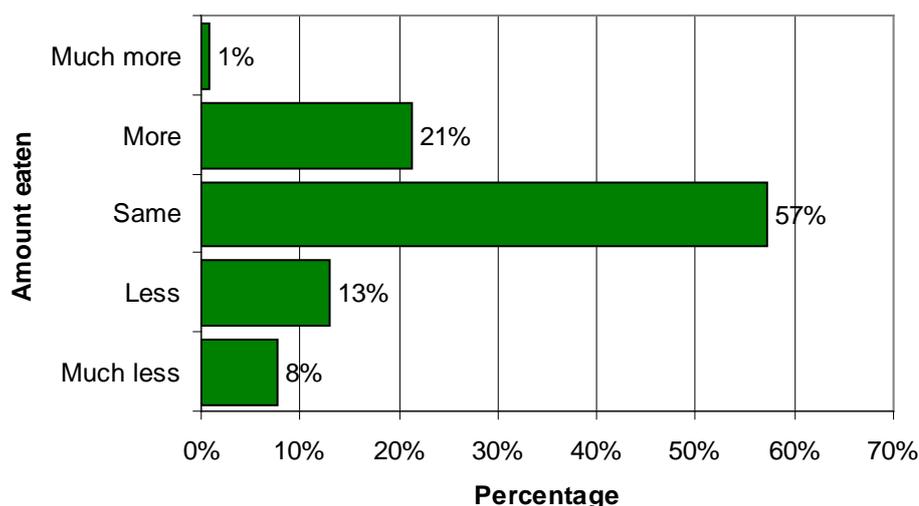
Goat is rarely eaten by most of the population at locations outside the house with the proportion who never eat it being: 76% at restaurants, 61% on special occasions, 92% at picnics and 94% for other occasions (Table A 2.11). People are most likely to eat it for Kurban or birth ceremonies with 74% and 77% eating it on these occasions more than once a year. Apart from restaurants where sate is the most common dish (72%), curry and stew are the most common ways it is eaten (Table A 2.12).

3.5 Changes in goat consumption

About two thirds say the amount of goat they eat changes with the time of year, but Kurban appear to be the only occasions where they eat more (55%), while at other times they say they are eat less: Ramadan, Independence celebration, rainy season and dry season (Table A 2.14).

Most people (57%) say they have not changed the amount of goat they eat in the last 5 years, but 22% say they eat more and 21% say they eat less (Figure 3). The main reasons for an increase in the quantity of goat consumed (in terms of percent of respondents) were: Increased availability at a reasonable price (57%); Attended more occasions where served (53%); and Diet and nutrition is improved with more meat and variety of food (24%) (Table 12). Reasons given for a decrease in goat consumption were: Increased price, more expensive than chicken (32%); Negative health effects of goat meat (25%); Attended fewer occasions when served (22%); and No healthy because of hypertension or cholesterol (14%) (Table 13).

Figure 3: Change in the amount of goat eaten in the last 5 years



See Table A 2.15

Table 12: Reasons for increased goat consumption

Reason	N	Percent respondents*	Percent responses
Now available in shops in suitable quantities and at	40	57%	41%

reasonable price			
Attended more occasions (e.g. Kurban, births) where serve goat	37	53%	38%
Diet is improved with more meat & variety of food improves nutrition	17	24%	17%
Begun to like eating goat	4	6%	4%
Total	98	140%	100%

* More than one answer allowed.

Table 13: Reasons for decrease in goat consumption

Reason	N	Percent respondents*	Percent responses
Increased price/ more expensive than chicken	21	32%	30%
Reduce consumption for health because negative effects goat	16	25%	23%
Person attended fewer special occasions (e.g. Kurban, births) which serve goat	14	22%	20%
Not healthy (hypertension, cholesterol) so must eat less meat	9	14%	13%
Poor economic conditions so decrease purchases meat	5	8%	7%
Limited availability of goat meat	4	6%	6%
Total	69	106%	100%

* More than one answer allowed.

3.6 Attitudes of consumers to goat meat

Respondents were asked to rank their level of agreement or disagreement for goat on the same 35 items used as criteria for purchasing meat using a 5 point scale with 1 being strongly disagree and 5 being strongly agree. When the mean of each items was calculated, the 7 highest ranked characteristics were: important for birth ceremony (4.53), has good colour (4.26), consistent quality (4.22), nutritional (4.19), looks good/fresh (4.17), flavoursome (4.12), and tender (4.08). Healthy came next with 4.06 in comparison to its rating for meat purchases of 4.40. A shortened list of the rankings is in Table 14, with the complete list in Table A 2.16 and counts for each item on each point in the scale given in

Table 14: Highest 15 items in rating of goat on meat purchase characteristics

Item	Mean*	S.D.	N
Important for birth ceremony	4.53	0.82	339
Has good colour	4.26	0.73	314
Consistent quality	4.22	0.84	290
Nutritional	4.19	0.77	323
Looks good/fresh	4.17	0.79	313
Flavoursome	4.12	0.78	317
Tender	4.08	0.85	311
Healthy	4.06	0.87	323
Good value for money	4.03	1.09	312
Rubbery	4.03	0.89	298
Free of artificial additives	3.97	1.02	235
Appetizing	3.94	0.88	303
Important for religious ceremonies	3.94	0.97	318
Easy to store	3.88	0.89	292
Causes hypertension	3.86	1.41	314

* Rating out of 5 with 5 being ‘strongly agree’ and 1 ‘strongly disagree’

The differences in ratings for meat purchases and goat were compared using a paired samples t-test. Table 15 contains the items with significant differences in the means. The five greatest differences for meat over goat were: low in cholesterol, low in calories, low in fat, good value for money and healthy, all significantly different at the 0.01% level. As expected, goat ranked higher than meat for important for birth ceremony, but was only significantly different at the 5% level, while it also ranked higher for easy to store and appeals to friends at the 10% level. It was expected that goat would also perform poorly on the causes hypertension item, but in fact it rated higher than meat by 0.075, and was not significantly different. However, the standard deviation for this item for meat was 1.24 compared with the average of all items of 0.93 for meat and 1.41 for goats compared with the average of 0.99 for all items. It also had the highest standard deviation of any item on both occasions.

Table 15: Significant differences in paired samples t-test of differences in ratings on purchase items for Meat - Goat

Item	Mean	t	df	Sig. (2-tailed)	
Low in cholesterol	0.970	11.025	302	0.000000	****
Low in calories	0.807	10.677	274	0.000000	****
Low in fat	0.571	6.535	295	0.000000	****
Good value for money	0.481	7.380	307	0.000000	****
Healthy	0.355	7.697	317	0.000000	****
Tender	0.259	5.100	308	0.000001	****
Consistent quality	0.255	4.801	285	0.000003	****
Nutritional	0.230	5.075	317	0.000001	****
Has good colour	0.226	5.623	313	0.000000	****
Free of artificial additives	0.222	3.480	215	0.000606	****
Flavoursome	0.214	4.327	308	0.000020	****
Rubbery	0.203	3.926	290	0.000108	****
Looks good/fresh	0.193	4.053	310	0.000064	****
Important for cultural occasions	0.193	3.207	242	0.001523	***
Appetizing	0.162	2.883	295	0.004225	***
Appeals to children	0.128	2.563	296	0.010882	*
Plenty of meat	0.107	2.022	307	0.044032	*
Important for birth ceremony	-0.107	-2.568	325	0.010687	*
Appeals to friends	-0.150	-2.696	293	0.007419	**
Easy to store	-0.197	-3.087	288	0.002219	**

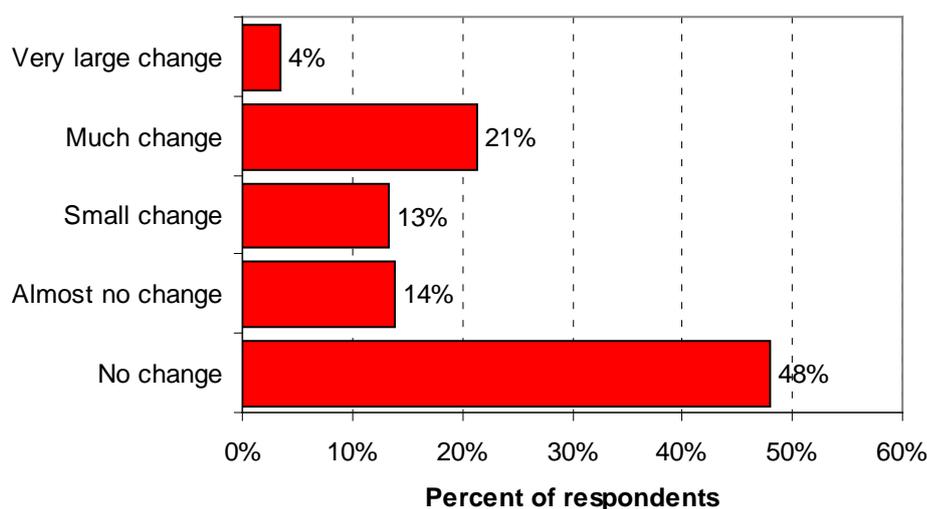
* 5%; ** 1%; *** 0.1%; **** 0.01%

Slightly over half have not changed their attitude to kambing over the last five years, while about one fifth perceived they have made a small change in their attitudes (Table A 2.19). Respondents were not asked whether the change in attitude was positive or negative, they can be inferred from the reasons given for the responses, with 53 respondents giving 93 positive responses and 27 giving 30 negative responses (Table A 2.20 & Table A 2.21). The most common positive reasons given for the change were: Learned way of preparing that is delicious and has less aroma (37 respondents) and now available in kilogram forms (26 respondents). Conversely, the most common negative reasons were: change in diet because of cholesterol (10 respondents) and contaminations in meat (7 respondents).

About half of all respondents said they would not increase their consumption of goat if it were the same price as chicken, with about a quarter indicating they would make a small change and another quarter saying they would make a large change (Figure 4). The main reason given for

not changing were: Because goat is less healthy than chicken (cholesterol and blood pressure) by 94 or 31%; Goat has a less delicious smell or flavour than chicken by 71 or 24%; and normally consume chicken or fish, don't know how to prepare goat by 52 or 14% of respondents. The main reasons given by those who said they would increasing the amount eaten were: Because goat is more nutritious and has a stronger flavour by 71 or 19% and because the price is cheaper and so will be on the menu more often by 36 or 10% of respondents.

Figure 4: Percentage of respondents likely to increase consumption of goat if same price as chicken



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Table 16: Reasons for change or no change in consumption if price if is same as chicken

Reason	N	Percent of responses	Percent of respondents
*Because goat is less healthy than chicken (cholesterol & blood pressure)	94	26%	31%
+ Because goat is more nutritious & stronger flavour & portions are larger	71	19%	24%
*My experience is that goat has a less delicious smell or flavour than chicken	63	17%	21%
*Normally consume chicken or fish, don't know how to prepare goat	52	14%	17%
+Because price cheaper & so will be on menu more often	36	10%	12%
Because already prefer goat & consume it	19	5%	6%
*To diversify the menu and improve nutrition	13	4%	4%
*Because is chicken is more delicious	10	3%	3%
+Because it looks the same as all meat	7	2%	2%
*Because only consume at special occasions	1	0%	0%
Total	366	100%	122%

* Reasons for no change; + Reasons for increase

3.7 Analysis of factors underlying meat and kambing purchase criteria

In order to test the items used in purchasing meat and goat and to define the underlying structure of the variables used in these decisions, exploratory factor analyses were carried out on the purchase criteria when they were applied to meat and goat.

3.7.1 Factors associated with meat purchase decisions

Initially there were 35 items for analysis. However, some items, such as Free of artificial additives had a high number of don't knows which meant it had only 272 usable responses. When this was combined with non responses from other items, the ratio of observations to variables was less than the 8:1 recommended by Hair et al. (2001). In initial runs three items with the lowest number of responses were removed. However, it was decided to remove items based on their factor loadings, whether they were cross loading and the reliability coefficient of their factor. The initial run produced 9 factors. After applying the rules for exclusion the following items were excluded over a number of runs: Free of artificial additives, important for cultural occasions, appetising, adds variety, quick to cook, low in calories, available in good size portions, plenty of meat, and healthy. The final solution resulted in 7 factors based on 26 items as shown in Table 17. These factors explained 68% of the variance.

After discussion of the meanings of the items in Indonesian the factors were given the following names:

- Factor 1: Meat quality
- Factor 2: Social status
- Factor 3: Suits most people
- Factor 4: Visual and sensory appearance
- Factor 5: Easy to use
- Factor 6: Health concerns
- Factor 7: Hypertension concerns

Table 17: Rotated component matrix of consumer meat purchase ratings

Item	Factor						
	1	2	3	4	5	6	7
Tender	0.759						
Has good colour	0.714						
Flavoursome	0.712						
Good value for money	0.707						
Nutritional	0.680						
Looks good/fresh	0.673						
Important for religious ceremonies	0.665						
Rubbery	0.659						
Important for birth ceremony	0.628						
Consistent quality	0.555						
Special food		0.872					
Prestigious to serve		0.842					
Luxury food		0.791					
Appeals to friends			0.861				
Appeals to special guests			0.765				
Appeals to children			0.602				
Appeals to adults			0.591				
Fashionable to serve				0.808			
Well presented				0.705			
Pleasant aroma when cooked				0.594			
Easy to cook					0.838		
Easy to store					0.706		
Low in fat						0.827	
Low in cholesterol						0.783	
Causes hypertension							0.817
Juicy							0.690

Eigen value	5.11	2.75	2.42	2.17	1.79	1.75	1.70
% Variance explained	19.6	10.6	9.3	8.4	6.9	6.7	6.5
Cronbach's alpha	0.854	0.887	0.771	0.730	0.663	0.686	0.567

1 = Meat quality; 2 = Social status; 3 = Suits most people; 4 = Visual and sensory appearance; 5 = Easy to use; 6 = Health issues; 7 = Hypertension

3.7.2 Factors associated with goat purchase decisions

Once again there were 35 items for analysis, but the number of useable questionnaires was even less than for the meat analysis. However, some items, such as Free of artificial additives and Important for cultural occasions had a high number of don't knows which meant they had only 235 and 256 usable responses respectively. However, once again, it was decided to remove items based on factor loadings, cross loadings and the reliability coefficient of their factor. The initial run produced 10 factors. After applying the rules for exclusion the following variables were excluded over a number of runs: Free of artificial additives, important for cultural occasions, tender, appeals to special guests, fashionable to serve, low in calories, pleasant aroma when cooked, plenty of meat, luxury food, good value for money, available in good sized portions, and prestigious to serve. Because of the negative correlation between low in cholesterol, low in fat and causes hypertension, juicy/oily, the latter two variables were reversed for the reliability test. The final solution resulted in 6 factors based on 24 items as shown in Table 18. These factors explained 67% of the variance.

After discussion of the meanings of the items in Indonesian the factors were given the following names:

- Factor 1: Easy to use
- Factor 2: Suits most people
- Factor 3: Meat quality
- Factor 4: Negative health
- Factor 5: Nutritional health
- Factor 6: Religious importance

Table 18: Rotated component matrix of goat meat ratings on meat purchase criteria

Items	Component					
	1	2	3	4	5	6
Easy to cook	0.834					
Rubbery	0.756					
Quick to cook	0.692					
Easy to store	0.687					
Has good colour	0.677					
Flavoursome	0.574					
Appeals to special guests		0.844				
Appeals to friends		0.836				
Appeals to adults		0.767				
Appeals to children		0.646				
Adds variety			0.782			
Well presented			0.718			
Consistent quality			0.667			
Looks good/fresh			0.645			
Appetizing			0.575			
Low in cholesterol				0.824		
Low in fat				0.768		
Causes hypertension				-0.684		
Juicy/oily				-0.519		
Nutritional					0.872	

Healthy	0.802					
Important for birth ceremony	0.789					
Important for religious ceremonies	0.650					
Eigen value	3.79	3.06	3.01	2.34	1.76	1.50
% Variance explained	16.5	13.31	13.1	10.3	7.7	6.5
Cronbach's alpha	0.873	0.819	0.779	0.795	0.861	0.555

1 = Easy to use; 2 = Suits most people; 3 = Negative health issues; 4 = Negative health issues; 5 = Nutritional health; 6 = Religious importance

3.8 Identification of consumer groups in Makassar based on criteria used in the purchase of meat and goat

In order to improve understanding of the consumer markets for meat and goat in Makassar, consumers were segmented using cluster analysis of their responses to the meat purchase criteria. Cross-tabulations were then conducted of the clusters with the various demographic and purchase variables to help identify and clarify the characteristics of each of the clusters.

3.8.1 Groupings of consumers based on meat purchase decisions

The meat purchase criteria remaining in the final factor analysis in Table 17 were the basis for the cluster analysis. After some outlier cases were removed, the hierarchical cluster analysis led to the selection of four clusters. Analysis by the K-means cluster method confirmed this. An ANOVA of cluster membership on the clustering variables found the clusters were significantly different on all variables except 'important for birth ceremony' (Table A 2.23). The highest number of members of a cluster was 74 and the lowest number was 23 (Table 19).

Table 19: Number of cases in each cluster for meat purchases

Case	# Cases
1	74
2	55
3	23
4	48
Valid	200
Missing	171

The average values of clusters for each of the meat purchase criteria were calculated and sorted into the factors identified previously. The average score for each cluster on each factor is shown in Table 20, while the scores on each clustering variable are shown in Table A 2.23. Possible interpretations of these clusters are:

- Cluster 1: Not prestige focussed - some concern about health but not culture/prestige.
- Cluster 2: Culture and prestige focussed - focussing on culture/prestige items but not health or value.
- Cluster 3: Quality focussed – focussed on value, but not prestige or health.
- Cluster 4: Health and status – most concerned about health but also status.

Table 20: Mean values of clusters on factors associated with meat purchases decisions

Factor	Mean values					Mean-centred values				
	1	2	3	4	Av	1	2	3	4	
1 Meat quality	4.02	4.68	4.54	4.54	4.39	-0.37	0.30	0.15	0.15	
2 Social status	2.77	3.83	2.00	3.67	3.19	-0.42	0.64	-1.19	0.49	
3 Suits most people	3.35	3.93	2.92	4.10	3.64	-0.29	0.29	-0.72	0.46	
4 Visual & sensory appearance	3.67	4.33	3.29	3.30	3.72	-0.05	0.61	-0.43	-0.42	
5 Easy to use	3.77	4.00	2.96	3.40	3.65	0.12	0.35	-0.69	-0.25	
6 Health concerns	4.00	4.01	2.54	4.36	3.92	0.08	0.09	-1.38	0.44	

7	Hypertension concerns	3.51	3.12	3.09	3.91	3.45	0.06	-0.33	-0.36	0.46
Number of cases		74	55	23	48	200				

1 =

3.8.2 Association between groupings based on meat purchases and demographic and meat purchase variables

Chi-square tests were undertaken of cross tabulations between nominal and ordinal demographic and meat purchase variables and membership of a cluster grouping. The main variables to show significant differences between cluster groups were (see Table 21): ethnicity (p=0.003), religion (p=0.007) and proportion bought from a supermarket and the proportion bought from a meat seller (p=0.000). However, some other tendencies were apparent, which may have been significant with a larger number of respondents and fewer errors in questionnaires (see ???). Group 2 were mostly Bugis and Makassans, while Torajans were mostly in groups 1 and 3 and other cultures in group 1. Similarly most people from religions other than Islam were in groups 1 and 3. Around 2/3 of group 1 were likely to buy at least some meat from a supermarket, while greater than 3/4 of group 4 did not. Similarly a greater proportion of respondents from group 1 were less likely to purchase meat from a traditional market seller, while group 4 mostly used traditional market sellers.

Table 21: Cross tabulation and chi-square test between groupings based on meat purchases and demographic and meat purchase variables

Variable	Sig.	Comments
Age	0.333	2 = more older; 3 = middle aged
Employment	0.278	2, 3 => govt; 1 > own business; 4 private
Education level	0.293	1 > second < tert; 2, 3 > tert
Ethnicity	0.003	2 mainly Bugis & Makassans; Torajans in 1 & 3; Other in 1
Religion	0.007	Most other religions in 1 & 3
Number of people in house	0.420	
Marital status	0.247	1 & 4 > not married; most in 2 married; 3 > widowed
Income per month	0.370	3 > middle income
Buy goat	0.220	4 > buy goat
Proportion bought from supermarket	0.002	1 > 2/3; 4 < 3/4
Proportion bought from meat seller	0.000	1 > never
Proportion bought from trader	0.131	4 > plus meat seller

The relationships between income per month and the number of times the key meat sources were cooked with group membership were analysed using ANOVA. Both income (p=0.019) and times cook beef per month (p. 0.009) returned significant differences between the groups. Groups 2 and 3 had higher than average incomes and also cooked chicken and seafood more often. Group 4 had lower income and were less likely to cook chicken, fish or seafood and beef. Group 2 were the highest beef consumers.

Table 22: ANOVA of selected scalar variables by grouping membership for meat purchases

Variable	Mean values					Mean-centred values				Sig.
	1	2	3	4	Total	1	2	3	4	
Income (Million Rp/month)	2.21	2.65	2.68	1.80	2.29	-0.07	0.36	0.39	-0.49	0.019
Times cook chicken/month	3.97	4.31	4.78	3.56	4.06	-0.09	0.25	0.72	-0.50	0.700
Times cook fish or seafood/month	10.18	12.89	12.17	10.38	11.20	-1.02	1.69	0.97	-0.82	0.557
Times cook beef/month	1.22	1.84	0.61	0.73	1.20	0.02	0.64	-0.59	-0.47	0.009
Times cook goat/month	0.28	0.51	0.35	0.44	0.39	-0.11	0.12	-0.04	0.05	0.580
Number of respondents	74	55	23	48	200					

3.8.3 Groupings of consumers based on attitudes to goat meat

The meat purchase criteria remaining in the final factor analysis for goat preferences in Table 18 were the basis for the cluster analysis. The hierarchical cluster analysis led to the selection of four clusters. Analysis by the K-means cluster method confirmed this and an ANOVA of cluster membership on the clustering variables found the clusters were significantly different on all variables (Table A 2.24). The highest number of members of a cluster was 54 and the lowest number was 26 (Table 23).

Table 23: Number of cases in each cluster based on attitudes to kambing

Case	# Cases
1	46
2	44
3	54
4	26
Valid	170
Missing	204

The average values of clusters for each of the meat purchase criteria were calculated and sorted into the factors identified previously. The average score for each cluster on each factor is shown in Table 24, while the scores on each clustering variable are shown in Table A 2.24. Possible interpretations of these clusters are:

- Cluster 1: Negative about goat except for religious purposes
- Cluster 2: Negative about goat, but indifferent on hypertension effects
- Cluster 3: Generally positive about goat
- Cluster 4: Enthusiastic about goat

Table 24: Mean values of clusters on factors associated with goat purchases decisions

Factor	Mean values					Mean-centred values			
	1	2	3	4	Total	1	2	3	4
1 Easy to use	3.57	3.24	4.16	4.67	3.84	-0.27	-0.60	0.32	0.83
2 Suits most people	3.24	3.28	3.43	4.84	3.56	-0.32	-0.27	-0.13	1.28
3 Meat quality	3.80	3.31	4.06	4.75	3.90	-0.10	-0.59	0.16	0.85
4 Negative health	1.44	2.82	2.75	3.51	2.52	-1.08	0.30	0.23	0.99
5 Nutritional health	3.84	3.45	4.24	4.71	4.00	-0.16	-0.55	0.24	0.71
6 Religious importance	4.20	3.51	4.22	4.71	4.11	0.09	-0.59	0.12	0.61
Number of cases	46	44	54	26	170				

3.8.4 Association between groupings based on kambing purchases and demographic and meat purchase variables

While there was not a significant difference between clusters in buying goat meat when analysed using a χ^2 test, the percentages were consistent with the names given to the clusters based on the attitude variables. However, there were significant differences between the clusters based on an ANOVA test for purchases of whole goat in the previous year, kilograms of goat meat bought in the last three months, and times goat meat was cooked in a month (Table 25). Cluster 4, which was interpreted as 'enthusiastic about goat' had the highest averages on all these variables. A Scheffe test found it was significantly higher than all other clusters on number of goats bought and significantly higher than Cluster 2 on kilograms of goat meat bought. Cluster 2, which had the lowest scores on these variables was interpreted as being negative about goat, but indifferent on hypertension effects. It also had the lowest scores on all the factors (apart from negative health).

There were no significant differences on the demographic variables between the clusters. However, there were significant differences between clusters on some of the attitude variables (Table 26). For instance, using a χ^2 test there was a significant difference between groups ($p=0.000$) in the likelihood of changing the consumptions of goat meat eaten if its price was equal to chicken. Nearly 63% of cluster 4 (enthusiastic about goat meat) indicated a willingness to make more than a small change while nearly three quarters of cluster 1 indicated they would make no change. Similar differences were apparent between the two clusters in terms of the change in the amount of goat meat they had eaten in the last five years and the change in their attitude to goat meat.

Table 25: Associations between clusters and consumption of goat meat

Purchase variable	1	2	3	4	Av	p	Test
Percentage buying goat	65%	57%	67%	69%	64%	0.684	χ^2
Number of goats bought last year	0.85 ^a	0.45 ^a	0.83 ^a	1.69 ^b	0.86	0.000	F
Kilogram of goat meat bought in last 3 months	0.65	0.43 ^a	1.02	1.81 ^b	0.89	0.019	F
Times/month cooked goat meat	0.28	0.25	0.43	1.19	0.46	0.046	F

1: Negative about goat except for religious purposes; 2: Negative about goat meat, but indifferent on hypertension effects; 3: Generally positive about goat meat; 4: Enthusiastic about goat meat
Scheffe test: Different subscripts are significantly different at $p>0.05$

Table 26: Cross tabulation and chi-square test between groupings based on goat purchase and meat purchase variables

Variable	p	Comments
Change in goat eaten last 5 years	0.000	More: 1 = 4%; 2 = 2%; 3 = 14%; 4 = 58%
Attitude to goat changed in last 5 years	0.000	No change: 1 = 73%; 2 = 48%; 3 = 56%; 4 = 8%
Consumption if price = chicken price	0.000	No change: 1 = 73%; 2 = 37%; 3 = 40%; 4 = 13%
Proportion from supermarket	0.001	Never: 1 = 63%; 2 = 32%; 3 = 58%; 4 = 100%
Proportion from market meat seller	0.146	Most: 1 = 23%; 2 = 56%; 3 = 39%; 4 = 33%
Proportion from trader	0.007	Most: 1 = 20%; 2 = 56%; 3 = 47%; 4 = 50%

1: Negative about goat meat except for religious purposes; 2: Negative about goat meat, but indifferent on hypertension effects; 3: Generally positive about goat meat; 4: Enthusiastic about goat meat

4. Discussion

The objectives of this report were to:

1. To assess the criteria used by Makassar consumers when purchasing meat and in particular attitudes towards goat meat.
2. To investigate levels of consumption, and purchase and consumption patterns for consumers of goat.
3. To identify and characterise market segments in the goat market.

It also aimed to assess some hypotheses derived from anecdotal evidence and discussions including:

1. Goat is mainly consumed for religious and cultural reasons.
2. There are some negative perceptions held by a large proportion of the population about goat, which include: cause hypertension and has an unpleasant smell when cooked and that these factors will affect consumption.

4.1 Purchase of meat by Makassar consumers

4.1.1 Consumption of different types of animal protein

In Indonesia, fish and seafood appear to be the most widely eaten source of animal protein (Fabiosa 2005; Suryana et al. 2008). Findings of this study are consistent with this as 92% of Makassar consumers said they cooked fish and seafood in a month and those who cooked it did so on average 12.6 times in a month. The latter figure is similar, although measuring slightly different things, with the Nielsen survey finding that Indonesians eat fish slightly more than 2.5 times per week (Banks 2008). This study also found a negative correlation between income and number of times fish is consumed per month, which is also consistent with the direction found by Fabiosa (2005) and Suryana et al. (2008).

Chicken is the other main source of animal protein (91%), while beef was the third most common source (49%). Apart from goat (19%) and duck (15%), other sources of animal protein form only a minor portion of the diet. While most people consume chicken, they only cook it about 1/3 as often as fish (4.4 times per month). Of note is that the number of times beef is cooked is highly correlated with the number of times goat is consumed (0.619; $p=0.000$). This may reflect similar attitudes to red meat consumption.

4.1.2 Where meat was purchased

While supermarkets are becoming more common in Indonesia (Suryana et al. 2008), this study suggests they have not replaced traditional markets and suppliers as the main sources for meat with more than half of consumers never purchasing meat from them. Meat sellers in traditional wet markets remain the main source of supply, with over 80% of consumers obtaining about 50% or more of their meat from them. The other traditional source of traders/butchers was used, as a major source, by slightly more than 50%. Chamhuri and Batt (2009) also found that in Kuala Lumpur, Malaysia traditional markets were the preferred source to buy meat.

4.1.3 Criteria used when purchasing meat

Unprompted, consumers suggested the *price of meat* was the most important criterion used when purchasing meat, while *good value for money* was ranked highest of the 35 items provided to consumers. Banks (2008) also found both *low price* and *good value for money* were important for meat consumers worldwide, although *good value for money* appeared to have a greater effect than just straight price. It is apparent therefore, that Makassar consumers are price and value conscious, perhaps more so than Western Australian consumers, for instance, where the *value for money* item

was ranked much lower (Storer 1993). While *competitive price* was also a factor identified by Chamhuri and Batt (2009) for Malaysian consumers, they did not rank it against other factors.

Apart from price, *perceptions of quality* appears to be the next most important factor considered by consumers in Makassar. This was the most important factor in the factor analysis accounting for 20% of the variance and included items such as *consistent quality, has good colour, nutritional, looks good/fresh*, which also scored high on the list of meat characteristics criteria. Issues relating to meat quality also received the second, third and fourth highest number of mentions in the unprompted question. Meat quality is a consistent factor considered by consumers in other countries as well (Storer 1993; Verbeke & Viaene 1999; Chamhuri & Batt 2009).

The next most important factors were those associated with *social status* and *appeal to people's social circle*. While the factors *social status* and *suits most people* ranked second and third in terms of proportion of variance explained in the factor analysis, they ranked lower in terms of the average factor score than all other factors except *hypertension concerns*. Storer (1999) had a similar factor for WA consumers, where it also had the lowest factor score. Obviously, consumers use these factors, but their use may be situation specific and therefore not considered in all purchase decisions. It is an area for further research and analysis.

Consumers in Makassar are similar to consumers elsewhere, with at least some of them concerned about the effect of meat consumption on their health. The areas of concern are mostly related to the affect of fat and cholesterol and a particular concern in Indonesia relating to some meats causing hypertension and high blood pressure. These factors are linked to heart attacks and strokes. While this is also a concern of consumers in European countries (Verbeke & Viaene 1999; Verbeke & Vackier 2004) unlike them Makassar consumers do not appear to be concerned about additives such as hormones, antibiotics, dioxin, BSE or animal welfare issues.

4.1.4 Characteristics of market segments.

Cluster analysis (using the K-Means procedure) identified four main clusters. The largest cluster (37% of respondents) seemed to be concerned about health but not culture/prestige. This cluster had higher proportions of people who were: from other ethnic groups and religions, not married, owned their own business, likely to buy from supermarkets (2/3), but less likely from a market seller. The second largest (27%) was almost the polar opposite, focussing on culture/prestige items but not health or value. This cluster were more likely to cook seafood, beef and goat and were mainly Bugis and Makassans. It also had higher proportions who were: older, married, employed by the government, and had tertiary education. Another large cluster (24%) was health and culture focussed with higher average scores on these factors. They were the most concerned about fat, cholesterol and the link between meat consumption and hypertension/heart attack. People from this cluster had the lowest average incomes and had higher proportions of people who were: employed in the private sector, not married, bought from traditional traders and meat sellers but not from supermarkets, and bought goat. The smallest cluster (11%) was mainly concerned about value and quality. This group had the highest average incomes, a higher proportion who were: from middle income levels, middle aged, widowed, Torajans, from other religions, and had tertiary education.

The segments derived from the responses to meat purchase criteria are mainly delineated demographically by their ethno-religious background, rather than other factors. As expected the lowest income segment were less likely to buy from a supermarket, but the highest income segment were not the most likely to do so, however, they tended to be older. The segment with the highest level of younger, unmarried people were more likely to purchase from a supermarket.

4.2 Goat meat consumption and attitudes of Makassar consumers

4.2.1 Purchase and consumption behaviour of Makassar goat meat consumers

Budisatria et al. (2008) suggested that because of the predominance of the Moslem religion in Indonesia, goats are important for religious festivities, in particular *Idul Adha* (the feast of sacrifice) and for birth ceremonies. During *Idul Adha*, which occurs once a year and coincides with pilgrims making sacrifices at Mina in Saudi Arabia, richer families are obliged to slaughter a goat (or sheep) or join with seven others in the slaughter of a cow. In Makassar because sheep are rare, Moslems slaughter goats or cattle. People also celebrate the birth of children with the slaughter of two goats for a male child or one goat for a female child. The findings of this study are consistent with this; around three-quarters of those interviewed eat goat meat on these two occasions at least once per year. For Kurban, people are most likely to buy whole goat (77% of those who bought goat in the last year), which is consistent with religious expectations. Similarly, for births people are most likely to buy whole goat (45%), but also buy thigh (32%). However, generally consumers do not buy goat for the family or visitors at other times and rarely eat it at restaurants. Possible reasons for this will be discussed later in the paper. The most common way that goat meat is cooked is curry, stew and sate. If people eat goat meat outside, they are more likely to eat sate.

Despite the trend to purchasing in supermarkets (Suryana et al. 2008), this trend has a long way to go for goat in Makassar, with most people purchasing most of their goat from traditional sources and 71% of those interviewed never purchasing goat meat from a supermarket. This is a logical outcome since people generally only purchase goat for religious festivities, where whole goat (or at the very least thigh) is what is expected and purchased, and very few people purchase goat for their families.

4.2.2 Consumer attitudes to eating goat meat

Consumers have similar rankings for goat and meat on the key meat purchasing criteria. However, as expected, goat ranked significantly higher on the criterion of *important for birth ceremony*. The biggest differences in rankings of other types of meat over goat meat were low in cholesterol, low in calories, low in fat, good value for money and healthy suggesting consumers have negative perceptions of goat meat in comparison to other meats. The differences of low in cholesterol, calories and fat are interesting since studies comparing nutrient composition of goat meat with other red meats generally find it compares well on these items (e.g. Webb et al. 2005; Werdi Pratiwi et al. 2006). It was expected that goat meat would be significantly higher than other types of meat on the hypertension item because many people with say that goat meat cause hypertension and heart problems. However, the standard deviation on this item was much higher at 1.41 when compared to the average of all items at 0.99. In addition, this item had a bimodal distribution with over 13% strongly disagreeing with the view that it causes hypertension and 47% strongly agreeing. The distribution for other types of meat did not show this effect, which probably mitigated against a significantly different finding. It appears that there are two different groups in the population, one that has negative perceptions that it causes hypertension and a smaller group who do not believe it causes hypertension.

Support for this split in views and the reasons comes from the questions about changes in goat meat consumption and whether respondents would change their consumption if the price of goat meat was decreased to the price of chicken; currently the price of goat meat is nearly double the price of chicken. Similar percentages have either increased or decreased their consumption, but those who have increased have done so partly because they perceive it as improving nutrition whereas those who have decreased have done so because of perceptions of negative health effects and hypertension or cholesterol. Of greater import is the finding that 60% of respondents would make little change to their consumption of goat meat even if its price were to decrease to the same price as chicken. The two key reasons for this were they believe it to be less healthy than chicken and has a less desirable smell or flavour. In contrast, the nearly 20% who said they would said it was more nutritious and had a stronger flavour. Part of the reason for the perception of health problems

could be that most people do not consume much meat and consume goat meat in large amounts at particular occasions. Consequently, their gut will be overloaded with meat, which can cause indigestion and related negative health effects. In addition, many of the goats slaughtered for religious festivals are larger entire males, more than one year old (Budisatria et al. 2008), which are likely to have a stronger smell. Goats also tend to be slaughtered under stressful conditions, which will make their meat tougher.

The authors are not aware of any research that indicates goat causes hypertension more than other red meats and it does not appear to be the view in other parts of the Moslem world (apart from Malaysia). One factor that appears to be encouraging people to consume more goat meat is that they have learned ways to prepare it and it is more readily available (perhaps in supermarkets). Ozawa et al. (2005) suggested similar remedies such as combining the sale of goat meat with recipes for cooking goat meat might increase its acceptance by Okinawa goat consumers. Obviously, this topic should be investigated further and may be an area for a public education program if the perceptions of its health problems prove to be incorrect.

4.2.3 Segmentation of the Makassar goat market

The differences in perceptions of goat discussed above were reflected in the consumer segments derived from the cluster analysis. At the two extremes were two large segments of consumers described as negative about goat meat and another segment who we described as enthusiastic about goat meat. While there were no distinguishing differences between the segments on the demographic variables, the names given to the segments were reflected in the amounts of goat meat purchased and consumed. The cluster described as enthusiastic about goat meat were also more likely to have increased their consumption of goat meat over the last five years and about two-thirds indicated a willingness to increase their consumption of goat meat if the price was the same as chicken. It appears this segment views towards goat meat are consistent with taste tests and nutrition tests for goat meat in other parts of the world (Nelson et al. 2004; Webb et al. 2005; Pratiwi 2004, 2006), but they are obviously a minority in Indonesia.

5. Conclusions

The findings are consistent with other findings that, in Indonesia, as income increases the quantity of meat purchased increases relative to the quantity of seafood purchased. Similarly, most still purchase their meat from traditional markets, but the younger seem to be moving towards supermarkets. As in other countries, consumers are price and value conscious, are after quality and some are concerned about health effects. However, unlike people from developed economies, consumers do not appear to be as concerned about the presence of additives or animal welfare issues. Consumers can be divided into segments with different levels of concern about quality, value for money, health concerns and prestige and status. These segments also are more likely to purchase their meat in different locations and to purchase different amounts of the various meat protein sources. The segments tend also to be different in terms of the ethno religious background.

Makassar consumers, and perhaps Indonesian consumers, appear to have a love/hate relationship with goat meat. Many eat it and buy it for religious reasons, but many do not appear to like to eat it otherwise. Many people appear to believe it causes heart attacks, hypertension and is high in cholesterol. Others do not like its smell. Further research is required into aspects of this finding and a program of consumer education may be appropriate.

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Appendices

Appendix 1: Makassar Goat Consumer Questionnaire

Survey Number [| |] Interviewer Name:

Survey Location: Date & Time:

“Good afternoon/evening, my name is and I am calling on behalf of Hassanudin University and Balai Penkajian Teknologi Pertanian. We are carrying out research into people's meat purchasing patterns and opinions. May I speak to the person who PURCHASES OR PREPARES most of the household food? The survey will take approximately 20 minutes. Anything that you say will remain confidential and you will remain anonymous. Results of the interviews will not identify any individuals. Are you willing to participate?”

REINTRODUCE if necessary.

“Is your household vegetarian i.e. no meat is cooked in the household?” [CIRCLE RESPONSE]

[IF YES, GO TO SECTION 5 - DEMOGRAPHICS, QUESTION 23] Yes 1; No 2

[IF NO, CONTINUE]

Section 1 – Benefit sought from consuming meat

1. “What are the main factors or concerns you have when you purchase meat?”

2. “Could you tell me on a scale of 1 to 5 how important the following characteristics are when purchasing MEAT? 1 represents NOT AT ALL IMPORTANT and 5 is VERY IMPORTANT. You can use all of the scale between 1 and 5.”

[Show card with scale & then read & circle response]

	Not at all Important 1	Unimportant 2	Neutral 3	Important 4	Very Important 5
Nutritional	1	2	3	4	5
Healthy	1	2	3	4	5
Low in cholesterol	1	2	3	4	5
Low in calories	1	2	3	4	5
Low in fat	1	2	3	4	5
Causes hypertension	1	2	3	4	5
Free of artificial additives	1	2	3	4	5
Has good colour	1	2	3	4	5
Rubbery	1	2	3	4	5
Easy to store	1	2	3	4	5
Easy to cook	1	2	3	4	5
Tender	1	2	3	4	5
Quick to cook	1	2	3	4	5
Juicy	1	2	3	4	5
Flavoursome	1	2	3	4	5
Pleasant aroma when cooked	1	2	3	4	5
Appetizing	1	2	3	4	5
Well presented	1	2	3	4	5

Adds variety	1	2	3	4	5
Available in good size portions	1	2	3	4	5
Plenty of meat	1	2	3	4	5
Looks good/fresh	1	2	3	4	5
Good value for money	1	2	3	4	5
Consistent quality	1	2	3	4	5
Important for birth ceremony	1	2	3	4	5
Important for religious ceremonies	1	2	3	4	5
Important for cultural occasions	1	2	3	4	5
Prestigious to serve	1	2	3	4	5
Special food	1	2	3	4	5
Luxury food	1	2	3	4	5
Fashionable to serve	1	2	3	4	5
Appeals to adults	1	2	3	4	5
Appeals to children	1	2	3	4	5
Appeals to friends	1	2	3	4	5
Appeals to special guests	1	2	3	4	5

Section 2 - Meat usage & occasions used

3. "How many times a month would you usually cook for the main meal?"

	# Meals
Chicken	[ | ]
Fish/Seafood	[ | ]
Beef	[ | ]
Goat	[ | ]
Duck	[ | ]
Horse	[ | ]
Caribou	[ | ]
Pork	[ | ]
Other birds	[ | ]
Other meat (_____)	[ | ]

4. "What proportion of meat is normally purchased or obtained from Use the following categories: all (1), most (2), about half (3), some (4), never (5)."

Supermarkets	1	2	3	4	5
Butcher in traditional market	1	2	3	4	5
Trader/butcher	1	2	3	4	5
Family/friends/neighbours	1	2	3	4	5
Animal market	1	2	3	4	5
Mosque	1	2	3	4	5
Other (_____)	1	2	3	4	5

5. "Do you purchase goat?" Yes 1; No 2

If Yes (1), Continue; If answer No (2), Go to Section 3 No. 12

6. "Do you normally purchase goat for?"

[Circle response]

	Tdk pernah	1 x /thn	bbrp x /thn	Rutin
Consumption by family	1	2	3	4
Consumption when have visitors	1	2	3	4
Consumption for Kurban	1	2	3	4
Consumption for birth of baby	1	2	3	4
Consumption for other special occasions	1	2	3	4
Gift to others	1	2	3	4

- Other (_____)
- 1 2 3 4
7. "How many whole goat did you purchase in the last year?" [|]
8. "How many kg daging goat did you purchase in the last three months?" [|] kg

For Questions 9 & 10, use the table below (can be more than 1 answer)

9. "What categories of goat do you most commonly buy for?"
10. "How do you normally cook goat for"

	Q 9			Q 10	
Consumption by family	[ | ]	[ | ]	[ | ]	[ | ]	[ | ]
Consumption when have visitors	[ | ]	[ | ]	[ | ]	[ | ]	[ | ]
Consumption for Kurban	[ | ]	[ | ]	[ | ]	[ | ]	[ | ]
Consumption for birth of baby	[ | ]	[ | ]	[ | ]	[ | ]	[ | ]
Consumption for other special occasions	[ | ]	[ | ]	[ | ]	[ | ]	[ | ]
Gift to others	[ | ]	[ | ]	[ | ]	[ | ]	[ | ]
Other (_____)	[ | ]	[ | ]	[ | ]	[ | ]	[ | ]
01 whole animal			01 sate		
02 leg			02 stew		
03 thigh			03 soup		
04 ribs			04 curry		
05 intestines			05 roast/baked		
06 lung, liver, heart			06 kebab		
07 head			07 fried rice		
08 bone			08 other		
09 other					

11. "What proportion of goat is normally purchased or obtained from.."

	Never	Some	Half	Most	All
Supermarket	1	2	3	4	5
Wet market butcher	1	2	3	4	5
Trader/butcher	1	2	3	4	5
Relatives, friends, neighbours	1	2	3	4	5
Live market	1	2	3	4	5
Mosque	1	2	3	4	5
Other (_____)	1	2	3	4	5

12. "How often do you eat goat outside the home at?" [Put answers in table below]
13. "How is this goat normally prepared?" [Answers in table below see prompts below]

Q 12		Q 13			
Never 1/year	# times/year	Often			
Restaurant	1	2	3	4	[ | ]
Rites of Idul Adha	1	2	3	4	[ | ]
Birth ceremony	1	2	3	4	[ | ]
Special occasions	1	2	3	4	[ | ]
Picnic	1	2	3	4	[ | ]
Other (_____)	1	2	3	4	[ | ]

- 01 sate
02 stew
03 soup
04 curry
05 roast/baked
06 kebab

Juicy	1	2	3	4	5
Flavoursome	1	2	3	4	5
Pleasant aroma when cooked	1	2	3	4	5
Appetizing	1	2	3	4	5
Well presented	1	2	3	4	5
Adds variety	1	2	3	4	5
Available in good size portions	1	2	3	4	5
Plenty of meat	1	2	3	4	5
Looks good/fresh	1	2	3	4	5
Good value for money	1	2	3	4	5
Consistent quality	1	2	3	4	5
Important for birth ceremony	1	2	3	4	5
Important for religious ceremonies	1	2	3	4	5
Important for cultural occasions	1	2	3	4	5
Prestigious to serve	1	2	3	4	5
Special food	1	2	3	4	5
Luxury food	1	2	3	4	5
Fashionable to serve	1	2	3	4	5
Appeals to adults	1	2	3	4	5
Appeals to children	1	2	3	4	5
Appeals to friends	1	2	3	4	5
Appeals to special guests	1	2	3	4	5

19. “Do you perceive that your attitudes to goat have changed over the last five years?
[Circle answer below]

no change	almost no change	small change	much change	very large change
1	2	3	4	5

If no change (1 or 2) go to section 4 (q 23) else ask:

20. “How have your attitudes to goat changed?”

21. “If goat was the same price as chicken would you be likely to include more in your diet?”

No change			Substantially more
1	2	3	4 5

22. “Why?” OR “Why not?” AS APPROPRIATE.

Section 4 – Demographics

23. “I am going to read a list of broad age groups. Please tell me to stop when I get to yours.”

Less than 20	.....	1
20 - 29	.....	2
30 - 39	.....	3

40 - 49	.....	4
50 - 59	.....	5
60 - 69	.....	6
70 or more	.....	7

24. "Which of the following BEST describes your current employment status?"

[Read list Circle response]

Government employee	1
Army or Police	2
Private company	3
Own business	4
Day labourer	5
Farmer/Fisherman	6
Retired public servant, army, police	7
Studying/student	8
House wife	9
No working	10
Other (.....)	11

25. "Which of the following best describes the highest educational qualification you have achieved to date?"

Elementary school or equivalent	1
Lower secondary school or equivalent	2
Upper secondary school or equivalent	3
Bachelors/diploma	4
Bachelor (S1)	5
Masters (S2)	6
Doktor (S3)	7

26. "Which of the following best describes your ethnic background?"

Bugis 1	
Makassar	2
Mandar	3
Toraja	4
Duri 5	
Lainnya (.....)	6

27. "Which of the following best describes your religion?"

Islam	1
Katolik	2
Protestan	3
Hindu4	
Budha	5
Lainnya (.....)	6

28. "How many people normally live in your house?" [|]

29. "Which of the following best describes your household?"

Not yet married yet	1
Married but not yet had children	2
Married with children	3
Widowed without children	4
Widowed with children	5

30. "In terms of the following broad categories what would you estimate your total HOUSEHOLD income per month?"

< 1 million rupiah	1
1 - 2 million rupiah	2
2.1 - 3 million rupiah	3
3.1 - 4 million rupiah	4
4.1 - 5 million rupiah	5
5.1 - 6 million rupiah	6
> 6 rupiah	7

“Thank you for your participation in this survey. Your time and cooperation are greatly appreciated.”

Sex of Respondent Male 1 Female 2 []

Appendix 2: Summary tables for consumer survey

Table A 2.1: Number of people living in house

Number	N	Percent
1	18	5.0%
2	28	7.7%
3	56	15.4%
4	82	22.6%
5	70	19.3%
6	42	11.6%
7	34	9.4%
8	19	5.2%
9	6	1.7%
10+	8	2.2%
Total	363	100.0%

N = 374; 11 missing

Table A 2.2: Percentage of respondents who are vegetarian

	Frequency	Percent
Vegetarian	19	5
Not vegetarian	355	95
Total	374	100

Table A 2.3: Main characteristics mentioned by respondents for purchasing meat

Meat characteristic	First	Second	Third	Fourth	Fifth	Total	Respondents*	Responses
	N	N	N	N	N	N	%	%
Price of meat	97	58	37			196	55.7%	24.8%
Meat quality	58	53	7	2	3	123	34.9%	15.6%
Colour of meat	51	51	12	1		115	32.7%	14.6%
Freshness of meat	63	31	9	4		107	30.4%	13.5%
If there is a special occasion	15	8	7	12		42	11.9%	5.3%
Kind or part of carcass/meat	12	15	11	2	2	42	11.9%	5.3%
Flavour of meat	8	14	13	2		37	10.5%	4.7%
Healthiness	9	10	10	1		30	8.5%	3.8%
Quantity of meat	13	9	3	3		28	8.0%	3.5%
Halal	11	7	1			19	5.4%	2.4%
Tenderness of meat	2	7	6	4		17	4.8%	2.2%
Cleanliness of butcher/place	2	4	8	2		16	4.5%	2.0%
Texture of meat	8	2	2	2		12	3.4%	1.5%
Hobby	1	3				4	1.1%	0.5%
Source of local or imported meat	2					2	0.6%	0.3%
	352	272	126	35	5	790	224.4%	100.0%

* Total of 388 respondents of which 22 (5.7%) did not give an answer.

Table A 2.4: Ranking of meat purchase criteria

Item	Mean*	S.D.	N
Good value for money	4.51	0.69	344
Consistent quality	4.50	0.65	326
Has good colour	4.49	0.64	352
Nutritional	4.41	0.73	337
Healthy	4.40	0.75	340
Important for birth ceremony	4.40	0.98	336
Looks good/fresh	4.38	0.74	345
Flavoursome	4.34	0.76	329
Tender	4.33	0.75	335
Rubbery	4.22	0.80	323
Free of artificial additives	4.21	1.05	272
Appetizing	4.13	0.77	327
Low in cholesterol	4.05	0.98	321
Important for religious ceremonies	4.02	0.97	330
Plenty of meat	3.94	0.94	335
Pleasant aroma when cooked	3.84	0.98	326
Appeals to adults	3.83	0.89	323
Well presented	3.80	0.82	326
Low in fat	3.76	1.01	319
Causes hypertension	3.74	1.24	308
Quick to cook	3.73	1.05	329
Easy to cook	3.71	0.97	330
Appeals to children	3.70	1.09	322
Easy to store	3.67	0.88	329
Available in good size portions	3.66	0.85	330
Fashionable to serve	3.56	1.05	324
Adds variety	3.56	0.88	317
Appeals to special guests	3.53	1.05	319
Appeals to friends	3.44	1.06	320
Low in calories	3.44	1.12	295
Important for cultural occasions	3.34	0.98	306
Special food	3.24	1.08	316
Luxury food	3.22	1.11	320
Prestigious to serve	3.12	1.07	310
Juicy	3.08	1.12	309

* Rating out of 5 with 5 being 'very important' and 1 'not at all important'

Table A 2.5: Counts for meat criteria

Item	Not at all important	Un-important	Neutral	Important	Very important	Sub Total	Don't know	Total
Nutritional	3	5	16	140	173	337	18	355
Healthy	3	4	25	129	179	340	15	355
Low in cholesterol	8	17	48	125	123	321	34	355
Low in calories	24	31	77	118	45	295	60	355
Low in fat	15	20	59	158	67	319	36	355
Causes hypertension	24	35	38	111	100	308	47	355
Free of artificial additives	10	16	19	88	139	272	83	355
Has good colour	2	0	16	138	196	352	3	355
Rubbery	3	6	39	145	130	323	32	355
Easy to store	3	26	104	141	55	329	26	355

Easy to cook	7	26	96	128	73	330	25	355
Tender	3	6	20	156	150	335	20	355
Quick to cook	8	39	71	126	85	329	26	355
Juicy	29	66	94	92	28	309	46	355
Flavoursome	3	3	30	137	156	329	26	355
Pleasant aroma when cooked	8	24	67	139	88	326	29	355
Appetizing	3	8	37	176	103	327	28	355
Well presented	3	15	86	163	59	326	29	355
Adds variety	7	33	82	166	29	317	38	355
Available in good size portions?	3	30	86	169	42	330	25	355
Plenty of meat	3	22	73	130	107	335	20	355
Looks good/fresh	2	5	27	138	173	345	10	355
Good value for money	2	2	21	114	205	344	11	355
Consistent quality	2	1	12	127	184	326	29	355
Important for birth ceremony	12	7	26	81	210	336	19	355
Important for religious ceremonies	7	16	63	122	122	330	25	355
Important for cultural occasions	10	43	125	88	40	306	49	355
Prestigious to serve	20	68	107	84	31	310	45	355
Special food	18	57	115	83	43	316	39	355
Luxury food	20	64	108	82	46	320	35	355
Fashionable to serve	12	46	71	138	57	324	31	355
Appeals to adults	7	17	66	168	65	323	32	355
Appeals to children	13	37	66	125	81	322	33	355
Appeals to friends	17	38	102	112	51	320	35	355
Appeals to special guests	16	35	82	135	51	319	36	355

Table A 2.6: Numbers who buy goat

	Number	Percent
Yes	205	58%
No	150	42%
Total	355	100%

Table A 2.7: Numbers of head of goat bought in last year

# Goats bought	# buying	% buying
0	51	25%
1	67	33%
2	63	31%
3	20	10%
4	4	2%
Total	205	

Table A 2.8: Kilograms of goat bought in last 3 months by respondents who buy goat

Kg bought	#	%
0	113	55%

1	10	5%
2	21	10%
3	35	17%
4	11	5%
5	11	5%
>5	4	2%
Total	205	

Table A 2.9: Where normally purchase or obtain goat

Source		Never	Some	Half	Most	All
Traditional market	N	49	39	54	42	21
	%	24%	19%	26%	20%	10%
Trader/butcher	N	53	29	29	61	33
	%	26%	14%	14%	30%	16%
Supermarket	N	145	31	19	9	1
	%	71%	15%	9%	4%	0%
Family	N	155	41	6	1	2
	%	76%	20%	3%	0%	1%
Animal market	N	151	12	4	22	16
	%	74%	6%	2%	11%	8%
Mosque	N	160	34	5	3	3
	%	78%	17%	2%	1%	1%
Other sources	N	199	1	0	1	4
	%	97%	0%	0%	0%	2%

N = 205

Table A 2.10: Ways goat cooked for different uses

Occasion		Sate	Stew	Soup	Curry	Roast	Kebab	Fried rice	Other	N
Family	n	71	35	22	79	2	0	2	8	124
	%	57%	28%	18%	64%	2%	0%	2%	6%	
Visitors	n	17	10	11	21	0	0	5	2	47
	%	36%	21%	23%	45%	0%	0%	11%	4%	
Kurban	n	55	21	17	97	4	1	4	6	133
	%	41%	16%	13%	73%	3%	1%	3%	5%	
Births	n	67	33	28	123	3	0	5	7	165
	%	41%	20%	17%	75%	2%	0%	3%	4%	
Special occasions	n	24	11	14	25	4	0	2	6	61
	%	39%	18%	23%	41%	7%	0%	3%	10%	
Gifts	n	4	4	3	1	1	0	2	2	15
	%	27%	27%	20%	7%	7%	0%	13%	13%	
Other reasons	n	1	2	1	2	0	0	0	2	8
	%	13%	25%	13%	25%	0%	0%	0%	25%	

n = Number of respondents; % of respondents

Table A 2.11: How often eat goat at various locations and ceremonies

Location/Ceremony		Never	Once/year	Number times/year	Routinely
Restaurant	n	254	39	35	7
	%	76%	12%	10%	2%
Kurban	n	87	211	12	25
	%	26%	63%	4%	7%
Birth ceremonies	n	76	125	89	45
	%	23%	37%	27%	13%
Special occasions	n	203	62	66	4
	%	61%	19%	20%	1%
Picnics	n	307	15	11	2
	%	92%	4%	3%	1%
Other occasions	n	315	10	5	5
	%	94%	3%	1%	1%

N = 335

Table A 2.12: Goat dishes normally eaten at various locations and ceremonies

Location/ceremony		Sate	Stew	Soup	Curry	Roast	Kebab	Fried rice	Other	N
Restaurant	n	60	21	15	9	8	0	5	1	83
	%	72%	25%	18%	11%	10%	0%	6%	1%	
Kurban	n	110	49	41	142	4	1	7	11	247
	%	45%	20%	17%	57%	2%	0%	3%	4%	
Birth ceremonies	n	121	42	53	169	4	0	3	7	259
	%	47%	16%	20%	65%	2%	0%	1%	3%	
Special occasions	n	51	20	24	68	5	1	4	5	132
	%	39%	15%	18%	52%	4%	1%	3%	4%	
Picnics	n	18	4	2	10	2	2	2	1	28
	%	64%	14%	7%	36%	7%	7%	7%	4%	
Other occasions	n	11	6	1	12	2	0	3	2	20
	%	55%	30%	5%	60%	10%	0%	15%	10%	

n = number of respondents eating at locations. % - multiple responses so is percentage of respondents who eat the dishes at the various locations and ceremonies

Table A 2.13: Does the amount of goat eaten differ with the time of the year

	N	%
Yes	220	67%
No	109	33%
Total	329	

Table A 2.14: Eat more or less goat at certain times of year

Ceremony/Time		Much less	Less	Same	More	Much more	Total
Kurban	N	24	22	98	133	45	322
	%	8%	7%	30%	41%	14%	
Beginning Ramadan	N	128	42	111	14	3	298
	%	43%	14%	37%	5%	1%	
Middle Ramadan	N	124	50	115	10	0	299
	%	42%	17%	39%	3%	0%	
End Ramadan	N	116	45	119	17	3	300
	%	39%	15%	40%	6%	1%	
Independence celebration	N	183	30	78	3	0	294
	%	62%	10%	27%	1%	0%	
Religious celebration	N	151	38	89	22	0	300
	%	50%	13%	30%	7%	0%	
Rainy season	N	184	22	92	2	0	300
	%	61%	7%	31%	1%	0%	
Dry season	N	180	20	94	2	0	296
	%	61%	7%	32%	1%	0%	
Other times	N	22	6	32	5	1	66
	%	33%	9%	49%	8%	2%	

Table A 2.15: Change in amount of goat eaten in last 5 years

Amount	N	Percent
Much less	28	8%
Less	45	13%
Same	198	57%
More	73	21%
Much more	3	1%
Total	347	100%

Table A 2.16: Rating of goat on meat purchase criteria - mean

Item	Mean*	S.D.	N
Important for birth ceremony	4.53	0.82	339
Has good colour	4.26	0.73	314
Consistent quality	4.22	0.84	290
Nutritional	4.19	0.77	323
Looks good/fresh	4.17	0.79	313
Flavoursome	4.12	0.78	317
Tender	4.08	0.85	311
Healthy	4.06	0.87	323
Good value for money	4.03	1.09	312
Rubbery	4.03	0.89	298
Free of artificial additives	3.97	1.02	235
Appetizing	3.94	0.88	303
Important for religious ceremonies	3.94	0.97	318
Easy to store	3.88	0.89	292
Causes hypertension	3.86	1.41	314
Plenty of meat	3.84	0.91	311
Appeals to adults	3.81	0.90	309
Well presented	3.80	0.90	302
Pleasant aroma when cooked	3.73	1.03	304
Easy to cook	3.72	1.09	301
Fashionable to serve	3.72	0.96	294
Available in good size portions?	3.66	0.86	284
Adds variety	3.64	0.92	280
Quick to cook	3.63	1.08	303
Appeals to friends	3.60	1.03	303
Appeals to children	3.59	1.07	304
Appeals to special guests	3.49	1.06	288
Juicy	3.24	1.16	274
Luxury food	3.22	1.15	304
Important for cultural occasions	3.19	0.95	256
Low in fat	3.17	1.37	309
Special food	3.16	1.11	298
Prestigious to serve	3.07	1.04	262
Low in cholesterol	3.05	1.40	324
Low in calories	2.64	1.18	294

* Rating out of 5 with 5 being 'strongly agree' and 1 'strongly disagree'

Table A 2.17: Ratings of goat on meat purchase criteria – counts

Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Sub total	Don't know	Total
Nutritional	0	10	41	149	123	323	32	355
Healthy	0	20	52	141	110	323	32	355
Low in cholesterol	50	88	51	65	70	324	31	355
Low in calories	63	75	74	69	13	294	61	355
Low in fat	42	72	53	75	67	309	46	355
Causes hypertension	42	18	31	75	148	314	41	355
Free of artificial additives	5	14	53	73	90	235	120	355
Has good colour	0	4	41	138	131	314	41	355
Rubbery	0	18	59	118	103	298	57	355
Easy to store	1	15	85	108	83	292	63	355

Easy to cook	14	28	63	118	78	301	54	355
Tender	1	17	44	142	107	311	44	355
Quick to cook	6	47	77	96	77	303	52	355
Juicy	27	46	66	104	31	274	81	355
Flavoursome	1	6	55	146	109	317	38	355
Pleasant aroma when cooked	10	29	66	127	72	304	51	355
Appetizing	4	11	69	134	85	303	52	355
Well presented	4	17	84	127	70	302	53	355
Adds variety	3	27	88	111	51	280	75	355
Available in good size portions?	8	5	106	122	43	284	71	355
Plenty of meat	5	13	90	123	80	311	44	355
Looks good/fresh	0	7	54	130	122	313	42	355
Good value for money	6	29	56	80	141	312	43	355
Consistent quality	1	5	56	95	133	290	65	355
Important for birth ceremony	8	1	21	84	225	339	16	355
Important for religious ceremonies	5	17	78	111	107	318	37	355
Important for cultural occasions	9	45	114	65	23	256	99	355
Prestigious to serve	21	43	119	54	25	262	93	355
Special food	29	43	109	84	33	298	57	355
Luxury food	22	58	106	67	51	304	51	355
Fashionable to serve	4	23	94	104	69	294	61	355
Appeals to adults	2	20	88	123	76	309	46	355
Appeals to children	10	35	95	93	71	304	51	355
Appeals to friends	7	34	103	89	70	303	52	355
Appeals to special guests	12	38	85	102	51	288	67	355

Table A 2.18: Paired Samples Test (Daging - Goat)

	Mean	t	df	Sig. (2-tailed)	
Low in cholesterol	0.970	11.025	302	0.000000	****
Low in calories	0.807	10.677	274	0.000000	****
Low in fat	0.571	6.535	295	0.000000	****
Good value for money	0.481	7.380	307	0.000000	****
Healthy	0.355	7.697	317	0.000000	****
Tender	0.259	5.100	308	0.000001	****
Consistent quality	0.255	4.801	285	0.000003	****
Nutritional	0.230	5.075	317	0.000001	****
Has good colour	0.226	5.623	313	0.000000	****
Free of artificial additives	0.222	3.480	215	0.000606	****
Flavoursome	0.214	4.327	308	0.000020	****
Rubbery	0.203	3.926	290	0.000108	****
Looks good/fresh	0.193	4.053	310	0.000064	****
Important for cultural occasions	0.193	3.207	242	0.001523	***
Appetizing	0.162	2.883	295	0.004225	***
Appeals to children	0.128	2.563	296	0.010882	*
Plenty of meat	0.107	2.022	307	0.044032	*
Important for religious ceremonies	0.103	1.907	309	0.057460	
Pleasant aroma when cooked	0.099	1.444	291	0.149901	
Quick to cook	0.083	1.243	300	0.214696	
Special food	0.056	0.736	284	0.462419	
Prestigious to serve	0.052	0.848	251	0.397495	
Appeals to special guests	0.051	0.739	276	0.460343	
Luxury food	0.020	0.275	297	0.783828	
Well presented	0.010	0.167	295	0.867760	
Appeals to adults	0.007	0.119	299	0.905433	
Easy to cook	-0.017	-0.224	296	0.822621	
Available in good size portions?	-0.039	-0.615	281	0.538919	
Causes hypertension	-0.075	-0.879	291	0.380151	
Juicy	-0.099	-1.235	262	0.217886	
Important for birth ceremony	-0.107	-2.568	325	0.010687	*
Fashionable to serve	-0.108	-1.507	286	0.132902	
Adds variety	-0.122	-1.905	269	0.057845	
Appeals to friends	-0.150	-2.696	293	0.007419	**
Easy to store	-0.197	-3.087	288	0.002219	**

* - 5%; ** - 1%; *** - 0.1%; **** - 0.01%

Table A 2.19: Change in attitudes to goat over the last 5 years

	N	Percent	Cumulative Percent
No change	186	53.4%	53.4%
Almost no change	74	21.3%	74.7%
Small change	54	15.5%	90.2%
Much change	33	9.5%	99.7%
Very large change	1	0.3%	100.0%
Total	348	100.0%	

Table A 2.20: Positive reasons for change in attitude to kambing

Reason	N	Percent responses	Percent of respondents
Learn way of preparing that is delicious & has less aroma	37	40%	70%
Now available in kilogram forms	26	28%	49%
Available in a variety of dishes	10	11%	19%
Kambing meat cheaper	8	9%	15%
Delicious & tender taste of kambing	6	7%	11%
Many activities & parties	5	5%	9%
Increased awareness of better nutrition of Kambing	1	1%	2%
Total	93	100%	176%

Table A 2.21: Negative reasons for change in attitude to kambing

Reason	N	Percent of responses	Percent of respondents
Change in diet because of cholesterol	10	33%	37%
Contaminations in meat	7	23%	26%
Not as available in warungs	7	23%	26%
Price is not stable - up & down	5	17%	19%
Expensive - Price risen	1	3%	4%
Total	30	100%	111%

Table A 2.22: Likely increase in consumption of goat if same price as chicken

	N	Percent	Cumulative Percent
No change	166	48%	48%
Almost no change	48	14%	62%
Small change	46	13%	75%
Much change	74	21%	97%
Very large change	12	4%	100%
Total	346	100%	

Table A 2.23: Mean scores of clusters on clustering variables and results of ANOVA of difference between clusters for meat purchase decision

Item	Mean values					Mean-centred values				Sig.
	1	2	3	4	Av.	1	2	3	4	
Important for religious ceremonies	3.45	4.47	4.39	4.56	4.11	-0.66	0.37	0.29	0.46	0.002
Important for birth ceremony	3.85	4.85	4.61	4.88	4.46	-0.61	0.39	0.15	0.42	0.121
Rubbery	3.91	4.53	4.17	4.52	4.26	-0.35	0.27	-0.08	0.27	0.000
Nutritional	4.16	4.78	4.52	4.67	4.50	-0.33	0.29	0.03	0.17	0.003
Flavoursome	4.03	4.65	4.43	4.50	4.36	-0.33	0.29	0.07	0.14	0.000
Has good colour	4.16	4.73	4.52	4.58	4.46	-0.30	0.27	0.06	0.12	0.000
Good value for money	4.27	4.67	4.96	4.63	4.55	-0.27	0.13	0.41	0.08	0.000
Tender	4.03	4.71	4.52	4.38	4.36	-0.33	0.35	0.17	0.02	0.000
Consistent quality	4.31	4.75	4.61	4.44	4.50	-0.18	0.25	0.11	-0.06	0.000
Looks good/fresh	4.04	4.69	4.65	4.23	4.34	-0.29	0.36	0.32	-0.11	0.000
Average Factor 1	4.02	4.68	4.54	4.54	4.39	-0.37	0.30	0.15	0.15	
Luxury food	2.74	3.85	1.96	3.96	3.25	-0.51	0.60	-1.29	0.71	0.000
Prestigious to serve	2.68	3.65	1.91	3.73	3.11	-0.43	0.54	-1.20	0.62	0.000
Special food	2.88	3.98	2.13	3.33	3.21	-0.33	0.78	-1.07	0.13	0.000
Average Factor 2	2.77	3.83	2.00	3.67	3.19	-0.42	0.64	-1.19	0.49	
Appeals to children	3.34	4.11	3.09	4.44	3.79	-0.45	0.32	-0.70	0.65	0.000
Appeals to friends	3.23	3.69	2.61	4.02	3.48	-0.25	0.22	-0.87	0.55	0.000
Appeals to special guests	3.36	3.82	2.61	3.88	3.53	-0.16	0.29	-0.92	0.35	0.000
Appeals to adults	3.47	4.11	3.39	4.08	3.79	-0.31	0.32	-0.39	0.30	0.000
Average Factor 3	3.35	3.93	2.92	4.10	3.64	-0.29	0.29	-0.72	0.46	
Well presented	3.70	4.24	3.83	3.52	3.82	-0.12	0.42	0.01	-0.30	0.000
Pleasant aroma when cooked	3.77	4.38	3.13	3.35	3.77	0.01	0.62	-0.63	-0.41	0.000
Fashionable to serve	3.53	4.36	2.91	3.02	3.57	-0.04	0.80	-0.65	-0.54	0.000
Average Factor 4	3.67	4.33	3.29	3.30	3.72	-0.05	0.61	-0.43	-0.42	
Easy to cook	3.70	4.16	2.52	3.40	3.62	0.08	0.54	-1.10	-0.22	0.000
Easy to store	3.84	3.84	3.39	3.40	3.68	0.16	0.16	-0.29	-0.28	0.000
Average Factor 5	3.77	4.00	2.96	3.40	3.65	0.12	0.35	-0.69	-0.25	
Low in cholesterol	4.03	4.16	3.04	4.63	4.10	-0.07	0.07	-1.05	0.53	0.000
Low in fat	3.97	3.85	2.04	4.10	3.75	0.22	0.10	-1.71	0.35	0.000
Average Factor 6	4.00	4.01	2.54	4.36	3.92	0.08	0.09	-1.38	0.44	
Causes hypertension	3.78	3.22	3.78	4.38	3.77	0.01	-0.55	0.01	0.61	0.000
Juicy/oily	3.24	3.02	2.39	3.44	3.13	0.11	-0.11	-0.74	0.31	0.014
Average Factor 7	3.51	3.12	3.09	3.91	3.45	0.06	-0.33	-0.36	0.46	
Number of cases	74	55	23	48	200					

Table A 2.24: Mean scores of clusters on clustering variables and results of ANOVA of difference between clusters for goat meat purchase

Clustering Variable	Mean values					Mean-centred values				Sig.
	1	2	3	4	Total	1	2	3	4	
Quick to cook	3.00	2.66	3.81	4.46	3.39	-0.39	-0.74	0.42	1.07	.000
Easy to store	3.52	3.23	4.17	4.65	3.82	-0.30	-0.60	0.34	0.83	.000
Has good colour	3.83	3.68	4.46	4.85	4.15	-0.32	-0.47	0.32	0.70	.000
Flavoursome	3.93	3.39	4.20	4.73	4.00	-0.07	-0.61	0.20	0.73	.000
Average Factor 1										
Appeals to special guests	3.04	3.39	3.35	4.73	3.49	-0.44	-0.10	-0.14	1.24	.000
Appeals to friends	3.24	3.18	3.30	4.88	3.49	-0.25	-0.31	-0.20	1.39	.000
Appeals to adults	3.61	3.23	3.69	4.77	3.71	-0.10	-0.48	-0.03	1.06	.000
Appeals to children	3.07	3.34	3.39	4.96	3.53	-0.46	-0.19	-0.14	1.43	.000
Average Factor 2										
Adds variety	3.63	3.23	3.70	4.65	3.71	-0.08	-0.48	-0.00	0.95	.000
Well presented	3.74	3.20	4.00	4.54	3.81	-0.07	-0.60	0.19	0.73	.000
Consistent quality	3.89	3.45	4.26	4.92	4.05	-0.16	-0.60	0.21	0.87	.000
Looks good/fresh	3.91	3.45	4.24	4.96	4.06	-0.15	-0.60	0.18	0.90	.000
Appetizing	3.85	3.23	4.11	4.69	3.90	-0.05	-0.67	0.21	0.79	.000
Average Factor 3										
Low in cholesterol	1.37	3.34	3.46	4.15	2.97	-1.60	0.37	0.49	1.18	.000
Low in fat	1.46	3.41	3.67	3.77	3.02	-1.56	0.39	0.65	0.75	.000
Causes hypertension (reversed)	1.09	1.93	1.63	3.21	1.78	-0.69	0.15	-0.15	1.43	.000
Juicy/oily (reversed)	1.83	2.60	2.23	2.91	2.31	-0.48	0.29	-0.08	0.61	.003
Average Factor 4										
Nutritional	4.20	3.45	4.30	4.73	4.12	0.08	-0.66	0.18	0.61	.000
Healthy	3.48	3.45	4.19	4.69	3.88	-0.40	-0.43	0.30	0.81	.000
Average Factor 5										
Important for birth ceremony	4.65	3.82	4.56	4.85	4.44	0.22	-0.62	0.12	0.41	.000
Important for religious ceremony	3.74	3.20	3.89	4.58	3.78	-0.04	-0.57	0.11	0.80	.000
Average Factor 5										
Number of cases	46	44	54	26	170					