

Consumers' Demand for Red Meat Attributes in Malaysia

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ABSTRACT

The growth of Malaysians' per capita income has generally empowered consumers to have wider choices of food, greater purchasing power and as they become more health conscious, they begin to demand for more nutritional food in their daily intake. Motivated by the changes in Malaysian consumer's food choice, a conjoint analysis was performed to investigate the Malaysian consumers' demands for red meat attributes and how much they are willing to pay for their demanded attributes. Two hundred and five respondents from fourteen states in Malaysia were interviewed to rate the combinations of red meat attributes in the range of one to ten, with one as the least preferred, and ten as the most preferred. The findings suggested that the most important attributes for red meat products were texture, followed by freshness, packaging and point of purchase. Consumers were also willing to pay premium prices for the demanded attributes. The results would have positive implications on the agro-food industry if market responds effectively by translating these changes into business opportunities.

Keywords: Attribute, conjoint analysis (CA), preference, red meat and willingness to pay (WTP).

INTRODUCTION

The consumption of greater variety and volume of food with higher protein content such as meat, fish and milk in Malaysia has escalated over the past decades. The role of meat in supplying protein to Malaysians is increasingly important where the Malaysian per capita consumption of red meat and poultry has been rising rapidly over the past forty years. In the history of economics development, economists explained such changes in the food consumption patterns are primarily as a result from the increase in income and changes in food prices (McDowel *et al.*, 1997).

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The growth in per capita income generally empowers consumers to have wider choices of food, to possess greater purchasing power, to be more health conscious which lead them to demand food with higher nutritional values in their daily food intake. Better-off, consumers move beyond meeting the basic dietary needs towards keen interest in the attributes of the food selected, such as its freshness, quality and healthfulness. To date, with respect to the important role of food attributes in influencing consumers' decision when buying food, the demand for food attributes have been studied in various countries, such as by Prescott *et al.* (2002), Murphy *et al.* (2004), De Souza *et al.* (2007), Schnettler *et al.* (2008) and Jang *et al.* (2009). Parallel to this development, the study attempts to investigate the Malaysian consumers' demand for red meat attributes and how much they are willing to pay for the demanded attributes. This study employs the conjoint analysis.

METHODOLOGY

Establishing Relevant Attributes and Level of Attributes

The first stage in conjoint analysis (CA) study is to establish the attributes and level of attributes to be included in the actual questionnaires survey. There are a number of methods available to identify the demanded attributes for red meat products. These include literature review, focus group discussions, and individual interviews. Amongst those techniques, this study has selected the focus group session. Thirty three adult respondents participated in the focus group session, comprising various ages, gender, ethnics, and education levels in order to reflect the actual characteristics of Malaysian consumers. The advantages of focus group research include the increased interaction between all participants and the researcher, where during interaction, visual aids and tangible products can be circulated and areas of specific interest can be covered in greater depth. The aims of the interactive session are both, to establish the factors that influence the purchases of red meat and to gather information on the most commonly consumed red meat, and the suitable information will be used in the main CA study. CA-type questions were also included to ensure that individuals understood them and completed them in a meaningful way. The data for the study was gathered directly from face-to-face interviews with respondents based on a set of prepared questionnaires.

Package of Attributes and Levels of Attributes

Primarily, in the focus group session, there were six potential attributes to be selected, namely; freshness, texture, colour, packaging, point of purchase and price. Respondents were asked to rank these six potential attributes based on their

preferences. Based on the mean score for each attributes, five attributes were selected as the most important attributes for red meat which are; freshness, texture, packaging, point of purchase and price. The package of attributes used in the study is as shown in Table 1.

Table 1 Package of attributes and respective levels used in the study

Attribute	Levels	Description
Freshness	Frozen or thawed	Frozen and could be imported meat
	Fresh	Unfrozen and direct from the farm
Texture	Fat marble	Mixture of fat within the meat
	Tough	Mixture of meat and ' <i>urat</i> ' (veins) in one piece of meat
	Lean	Soft, usually from spine (sirloin)
Packaging	Unpacked	No physical or barrier or contamination protection.
		No protection from among other things such as touch, shock, vibration, and compression.
	Packed Specialty and packed	Meat is packed. Such as sirloin (<i>daging pinang</i>), blade, tenderloins and ribs, and the meat is packed.
Point of purchase	Wet market	Sells red meat out in the open, generally stored for short periods of time and are always expected to be fresh.
	Supermarket	Often using chemicals and other preservatives to mass produce and package for longer shelf life.
Price	0% increase	No increase in price.
	10% increase	Increase 10% from the current price.
	20% increase	Increase 20% from the current price.

Experimental Design

Having established the relevant attributes and their levels, hypothetical red meat profile with different combinations of attributes were presented to respondents. The combinations of attributes contained one level of attributes from each of the five attributes (freshness, texture, packaging, point of purchase and price) of this study. The study gave rise to 108 possible profiles of red meat attributes ($2 \times 3 \times 3 \times 2 \times 3$). However, it was unrealistic to ask individuals on their intentions to

purchase in too many scenarios, and in addition, it could also be very tiring and time consuming for them (Murphy *et al.*, 2000). To reduce the number of profiles to a manageable size, while at the same time maintaining randomness, a fractional factorial design, the statistical tool SPSS was used. This reduced the number of profiles to be evaluated to 12. The red meat profiles used in this study is as illustrated in Table 2. The respondents were asked to choose from a rating scale of one to ten, with one being not preferred and ten being the most preferred. They rated the combinations of attributes according to their preferences.

Data Collection Procedures

Using convenience sampling, a total of 205 respondents from the capital cities of all states in Malaysia were selected and interviewed during this study. The CA questions were then presented to respondents and they were asked to rate the profiles of red meat in the range of one to ten with one as the least preferred, and ten as the most preferred. In terms of sampling, Hair *et al.* (1998) suggested that traditional conjoint analysis has no sample size requirements and could be utilized for single respondent but a larger sample size enhances the reliability of the results and allows the researcher to make some generalizations. To provide reliable estimates, Green and Srinivasan (1978) proposed a minimum sample of 100 respondents, which is considered adequate. For accurate predictions of consumer preferences at individual level, it is important not only to ask the respondents the right questions, but also to ask them sufficient number of questions. The number of conjoint tasks or questions depends on the conjoint method used in a study. Based on rating score for each combination, the conjoint analysis procedure calculates the contribution of each attributes to the respondent's preference. The contribution of the attribute level is termed as "part-worth utility". The part-worth was estimated using OLS (Ordinary Least Squared) analysis. OLS analysis assumes independent product attributes.

RESULTS AND DISCUSSION

Demographic Profile of Respondents

The distribution of the respondents' demographic profiles is shown in Table 3. In terms of gender, the respondents comprised 49.8% male and 50.2% female. The age of respondents were grouped into five categories; below 17 years old, 18 to 30 years old, 31-40, 41-50, 51-60, and more than 61 years old. From the five categories, 29.8% were from 18-30 years old, 26.3% from 31-40 years old, and 31.2% from 41-50, 10.7% from 51-60 years old and only about 2% were above 61 years old. Respondents' range of income were grouped into six categories; below RM 1,000,

Table 2 Profiles of red meat evaluated by consumers

Profile*	Freshness	Texture	Packaging	Point of purchase	Price
1	Fresh	Fat marble	Specialty and packed	Supermarket	No increase
2	Fresh	Fat marble	Packed	Supermarket	10% increase
3	Fresh	Fat marble	Unpacked	Supermarket	20% increase
4	Fresh	Fat marble	Unpacked	Supermarket	No increase
5	Fresh	Tough	Unpacked	Wet market	No increase
6	Fresh	Lean	Unpacked	Wet market	10% increase
7	Frozen/ thawed	Fat marble	Unpacked	Wet market	10% increase
8	Frozen/ thawed	Fat marble	Unpacked	Wet market	No increase
9	Frozen/ thawed	Tough	Specialty and packed	Supermarket	10% increase
10	Frozen/ thawed	Tough	Unpacked	Supermarket	No increase
11	Frozen/ thawed	Lean	Packed	Supermarket	No increase
12	Frozen/ thawed	Lean	Unpacked	Supermarket	20% increase

*Combinations of attributes for red meat to be scored by respondents according to their preferences.

RM 1,000-RM 1,999, RM 2,000-RM 2,999, RM 3,000-RM 3,999, RM 4,000-RM 4,999 and more than RM 5,000. 6.3% of the respondents were from income below RM 999, 17.1% from RM 1,000-RM 1,999, 22.4% from RM 2,000-RM 2,999, 16.1% from RM 3,000-RM 3,999, 16.1% from RM 4,000-RM 4,999 and 22.0% from above RM 5,000. In terms of ethnic, 72.2% were Malay, 10.7% were Chinese, 3.4% were Indian, 10.2% were Sabah and Sarawak Bumiputera and 3.4% were from other ethnics. The respondents' employments were divided into five categories; government sector employees, private sector employees, unemployed individuals, retirees and others. From the total respondents, 68.3% were working with the government, 12.2% were from private sector, 8.8% were unemployed, 1.0% was retirees and 9.8% were others. Respondents' education levels were categorized into; never been to school, primary school, secondary school and university or college. Respondents stated their highest level of education obtained at the point of answering the questionnaires. The results showed that 3.4% attended primary school, 62.0% studied up to secondary school and 34.6% had university or college education.

Table 3 Profile of respondents (in percentage)

Demographic Factors		Percentage (n = 205)
Gender	Male	49.8
	Female	50.2
Age (years old)	18-30	29.8
	31-40	26.3
	41-50	31.2
	51-60	10.7
	> 61	2.0
Income (RM)	< 1000	6.3
	1000-1999	17.1
	2000-2999	22.4
	3000-3999	16.1
	4000-4999	16.1
	≥ 5000	22.0
Ethnic	Malay	72.2
	Chinese	10.7
	Indian	3.4
	Bumiputera Sabah and Sarawak	10.2
	Others	3.4

Table 3 (Cont'd)

Employment	Government Sector	68.3
	Private Sector	12.2
	Unemployed	8.8
	Retiree	1.0
	Others	9.8
Education	Primary School	3.4
	Secondary School	62.0
	University/ College	34.6

Relative Importance of Attribute

The study found that texture was the most important attribute for red meat as it contributed 48.12% in relative importance as compared to freshness and packaging. Freshness was ranked second (20.65%) and packaging was ranked third, with 19.39% in its relative importance. Location was ranked fourth as it only contributed 11.84%. The demand for red meat attributes is illustrated in Table 4.

Table 4 Utility and relative importance of attribute for red meat

Attribute	Utility/ Part-worth
Freshness	
● Frozen	-0.1378***
● Fresh	0.1378***
● Relative Importance	20.65%
Texture	
● Fat marble	-0.3211***
● Tough	-0.1009**
● Lean	0.4220***
● Relative Importance	48.12%
● Packaging	19.39%
● Unpacked	-0.1294
● Packed	0.0096**
● Specialty and packed	0.1198**
● Relative Importance	11.84%
Point of Purchase	
● Wet market	0.0790
● Supermarket	-0.0790*
Price	

Std. error = 2.4683, F = 30.8061, Adjusted R² = 0.078, Durbin-Watson = 1.110
 Note: Significance levels are denoted by *** for 1%, ** for 5%, and * for 10%.
 Negative signal indicates negative impact on the preferences of attributes.

Referring to the texture of red meat, as expected, fat marble red meat was less preferred (utility = -0.3211). The results also indicated that tough red meat was also less preferred since the utility was -0.2491. In contrast, the lean red meat conferred the highest utility score compared to other level of attributes, which indicated that consumers mostly preferred lean meat when it comes to the texture of red meat. This result may be explained by the fact that fat marble texture is known to have negative effects on health. Consumer's interest in buying frozen red meat was low as the utility value was -0.1378. Inversely, the utility for fresh red meat was 0.1378, which suggested that consumers prefer fresh red meat. These results are as expected, and the probable explanation may have been due to the fact that fresh red meat provide high-quality red meat. Another possible reason for this may be because fresh red meat is more palatable.

In the context of packaging, consumers will buy packed meat (utility = 0.1294) rather than unpacked red meat (utility = -0.1294). Possibly, consumers prefer packed meat which is protected from physical touch and contamination, and this helps reduce any side effects especially health-related. In addition, these results are consistent with those of other studies which suggest that packaging is an important attribute which should be considered according to food choice (Kerry *et al.*, 2006 and Zakrys *et al.*, 2008). For point of purchase, the utility of supermarket was -0.0790 and for wet market, it was 0.0790. Such result indicates that consumers prefer buying red meat at wet market. The finding may be related to the price of red meat at wet market. In some occasions, consumers may prefer to buy from wet market, where the price of the products can be negotiated, rather than supermarket fixed prices. Besides that, products in wet markets are always expected to be fresh as they come directly from farm, whereas the distribution process of the supermarket products normally takes longer time which may affect the quality of the products.

Willingness to Pay (WTP) for Attributes Demanded

With better understanding on the relative importance of meat attributes and their impact of specific levels of consumers, it is then possible to conduct further analysis by predicting the WTP for each demanded attribute. The demanded red meat must be priced correctly so as to be economically viable. It may not be possible to market high-quality red meat at a low price level. WTP is also known as consumer surplus, which gives an indication of the economic feasibility of changes in attributes. Consumer surplus is defined as the difference between the monetary values of

the benefit derived from consuming the commodity (Hausman, 1993). WTP is calculated by using the formula stated as follows:

$$WTP = \beta_0 / -\beta_{price}$$

Where: β_0 = Coefficients value of non-price attributes
 β_{price} = Coefficients value of price attributes

Table 5 illustrates the WTP for each attribute and level of attributes for red meat. The WTP calculated were based on the current average price of red meat which was RM15.00 per kilogram. In terms of attributes, the result indicated that packaging fetched the highest WTP, which was RM 24.80 per kilogram. Texture was ranked second, with RM 24.77 per kilogram, and followed by location and freshness, which were RM 24.73 per kilogram and RM 24.71 per kilogram respectively. For the level of attributes, the highest WTP was packed red meat, at RM 24.89 per kilogram. The WTP for specialty and packed and unpacked red meat were RM 24.88 and RM 24.62 per kilogram. The calculation of the WTP revealed that in describing the texture of red meat, the WTP for lean and tough red meat had the same value which was RM 24.84/kg. The WTP for fat marble texture of red meat was RM 24.62 per kilogram. When it comes to location, consumers are willing to pay more for meat in supermarkets rather than the meat in wet markets. The WTP for both were RM 24.83 and RM 24.62 respectively. On the level of freshness for red meat, as predicted, consumers tended to spend more on fresh red meat relative to frozen red meat. The WTP for both levels, fresh and frozen were RM 24.79 per kilogram and RM 24.62 per kilogram, respectively.

Table 5 Willingness to pay for attribute

Attribute	WTP (RM)
Freshness	24.71
• Frozen	24.62
• Fresh	24.79
Texture	24.77
• Fat marble	24.62
• Tough	24.84
• Lean	24.84
Packaging	24.80
• Unpacked	24.62
• Packed	24.89
• Specialty and packed	24.88

Table 5 (Cont'd)

Point of purchase	24.73
• Wet market	24.62
• Supermarket	24.83

Std. error = 2.4683, F = 30.8061, $\beta_0 = 5.8037$, Coefficients of price = -0.0905
 Note: Significance levels are denoted by *** for 1%, ** for 5%, and * for 10%.
 WTP* calculated based on the current price of red meat; RM15.00/kg

CONCLUSION

The food supply chain in Malaysia is increasingly market-led oriented, with the end consumers being one of the main drivers for change. Changes in the demands for red meat attributes have brought forth new issues and challenges in the agricultural sector, particularly, in avoiding the mismatch between both market forces of supply and demand. Faced with such situation, this requires a new orientation in agricultural development to serve these markets needs. It seems like a market-based approach is the winning point in order to fulfil the consumers' needs and wants. In this approach, key products and markets are identified based on market demands, preferences and potentials. These market demand and preferences can be translated into business opportunities for existing or new-comers such as farmers, food manufacturers, retailers and others to venture into the industry.

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