

## A STUDY ON CONSUMER PREFERENCE AND CONSUMPTION OF FRESH LOCAL BEEF AND FROZEN IMPORTED BUFFALO MEAT

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**ABSTRACT.** The survey was conducted to determine the consumer preference on fresh local beef and imported frozen buffalo meat, and to investigate the affordable and preferable price for fresh local beef by consumer. A total of 727 respondents participated in the survey from July 2018 to January 2019. The findings show that 90.3% of the consumers bought not more than 2 kg of fresh local beef and frozen imported buffalo meat in a month and 48.2% consumed 1 kg to 2 kg monthly per household. 78.5% of the consumers preferred fresh local beef compared to frozen imported buffalo meat and only 66.0% frequently bought the meat. The study also reveals that 61.3% of the consumers agreed that the current retail prices for fresh local beef are within their affordable range. However, 93.9% of the consumers prefer the price of fresh local beef be reduced to less than RM30 per kg. 91.0% will choose to buy fresh local beef rather than frozen imported buffalo meat if the price were similar.

**Keywords:** fresh local beef, imported frozen buffalo meat, market size, preference, consumers

### INTRODUCTION

In Malaysia, cattle beef and buffalo meats are the primary source of red meat for animal protein intake. According to Livestock Statistics 2016/2017, Malaysia produced 47,956 metric tons of beef (combination of cattle beef and buffalo meat) in 2016 from a population of 621,074 beef cattle and 59,740 buffalo. The self-sufficiency level in 2016 for a combination of both types of meat was 23.04% (DVS, 2018). Hence, Malaysia had imported between 75% and 80% of its requirement from different countries to fulfil the domestic demand (Mohamed *et al.*, 2013; Tey *et al.*, 2008).

In the Global Agriculture Information Network Report in 2016, Malaysia's supply of red meat was dominated by India, importing a total of 219,008 metric tons of buffalo meat worth USD381 million (USDA, 2017). The high importation of the meat has become an issue with local cattle beef producers in Malaysia where they had claimed that it may suppress the growth of the local beef industry. According to industry players, the high availability of imported frozen buffalo meat and its lower selling price may reduce the demand of fresh local beef. However, there has been no scientific publication

about the claim. There is a probability that consumer preference of either fresh local beef or imported frozen meat might also influence demand. Therefore, this study is aimed to determine consumer preference of fresh local beef or imported frozen buffalo meat, and to investigate the affordable and preferable price of fresh local beef by consumers.

## MATERIALS AND METHOD

A set of questionnaire was developed according to the aims of the study and divided into four sections, namely (i) demographic profile of respondents, (ii) consumer purchase and consumption details, (iii) consumer awareness, knowledge and preference, and (iv) price of fresh local beef and frozen imported buffalo meat. Non-probability sampling technique, specifically convenience approach, was used as described by Elfil and Negida (2017). The method was selected due to the specific criteria of targeted respondents, which are fresh local beef and imported frozen buffalo meat consumer, easy accessibility, nearby functional distance, availability at a given time and willingness to participate in the survey. The online survey was also available online at <http://research.dvs.gov.my/survey/index.php?sid=64433>. The data was collected from a total of 727 respondents in a seven-month period from July 2018 to January 2019. Statistical analysis was by using Microsoft Excel ver. 3.2013 (Microsoft Corp., Washington, USA) and SPSS software ver.18.0 (IBM Corp., Armonk, NY, USA).

## RESULTS AND DISCUSSIONS

### Demographic Profile of Respondents

The location details of participating respondents are shown in Figure 1, spread out in 13 states and 2 federal territories. Based on the results, the highest number was from Selangor with 232 (31.3%) respondents and the lowest were from Perlis, Sabah and Sarawak with 2 (0.3%) respondents each per state. The demographic characteristics of the respondents are shown in Table 1. Briefly, 72.7% of the respondents were above 30 years old, 77.0% married and 42.3% male. Majority were Malays (94.3%), 2.9% were Chinese and 1.0% were Indians. The data on educational level shows 67.6% with University or college background followed by 29.9% with secondary school. Almost 60.0% of the respondents were from the government sector, with household income above RM3,000 per month and were urban residents. The findings also showed that in 80.6% of the respondents' household were at least three persons.

### Consumer Purchase and Consumption Details

The purchasing information gathered shows that most of the respondents bought the meat from wet markets or 'pasar awam' (38.5%), followed by hyper/supermarkets (26.3%), farmers' markets or 'pasar tani' (11.6%), wholesale markets or 'pasar borong' (8.5%), night markets or 'pasar malam' (7.2%), retail stores (4.4%) and others (3.5%) such as self-supply and road-side sellers. 97.2% bought the meat for self-consumption and,

the rest for business and other purposes. The concern regarding the availability of fresh local beef compared to the frozen imported buffalo meat was also answered by 724 respondents where 48.9% agreed with the statement, 30.4% disagreed and 21.0% uncertain. From the cross tabulation analysis, among those who agreed, 58.3% (102 out of 175) were village residents, 53.5% (61 out of

114) were town residents and 43.8% (188 out of 429) were urban residents.

The results for average buying frequency, buying quantity and monthly consumption per household are shown in Figures 2, 3 and 4, respectively. 61.9% bought either the fresh local beef or imported buffalo meat one or twice a month, and 90.3% bought less than the average of 2 kg monthly. In terms of average monthly

**Table 1:** Demographic characteristics of respondents in the study of market structure of fresh local beef and frozen imported buffalo meat\*.

Characteristic	Frequency	%	Characteristic	Frequency	%
<b>Sex</b>			<b>Type of employment</b>		
Male	303	42.3	Government	424	59.1
Female	413	57.7	Private	114	15.9
<b>Age (years)</b>			Self-employed	120	16.7
< 20	14	2.0	Others	60	8.3
21-30	182	25.3	<b>Household income (RM)</b>		
31-40	285	39.6	> 4,000	274	38.2
> 40	238	33.1	3,001-4,000	151	21.0
<b>Race</b>			2,001-3,000	154	21.4
Malay	681	94.3	1,001-2,000	89	12.4
Chinese	21	2.9	≤ 1,000	50	7.0
Indian	7	1.0	<b>Number in household</b>		
Others	13	1.8	1-2	138	19.4
<b>Educational level</b>			3-4	242	34.0
University/College	487	67.6	5-6	260	36.6
Secondary school	215	29.9	> 6	71	10.0
Primary school	16	2.2	<b>Residential area</b>		
Others	2	0.3	Urban	429	59.3
<b>Marital status</b>			Town	114	15.7
Married	555	77.0	Village	175	24.2
Single	158	21.9	Others	6	0.8
Others	8	1.1			

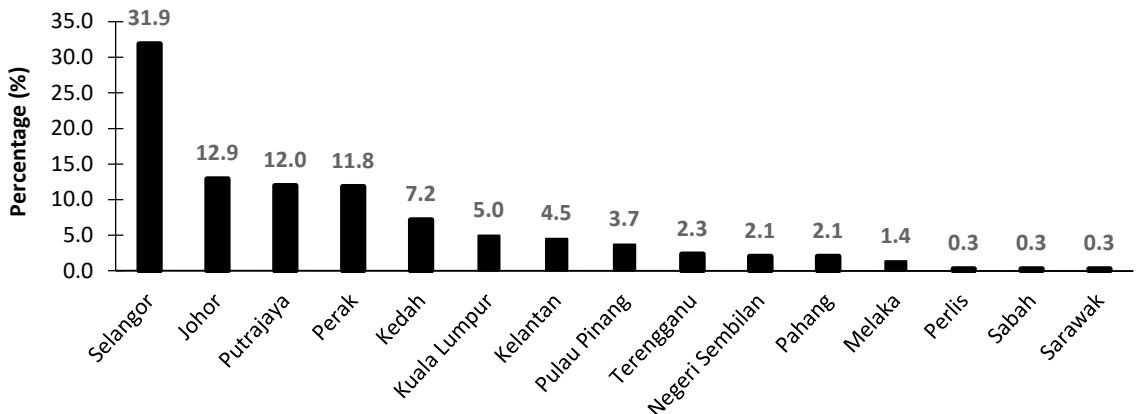
\*The total number of respondents were 727. The figures in the table omit missing data.

**Table 2.** Respondent assumptions on the quality, palatability and price of the fresh local beef against frozen imported buffalo meat.

Respondent assumptions	Respondents, n (%)				
	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Fresh local beef has better quality than frozen imported buffalo meat.	296 (41.1)	324 (45.0)	82 (11.4)	16 (2.2)	2 (0.3)
Fresh local beef is more palatable than frozen imported buffalo meat.	318 (43.9)	303 (41.8)	87 (12.0)	16 (2.2)	1 (0.1)
Fresh local beef is more expensive than frozen imported buffalo meat because it has better quality and more palatable.	254 (35.2)	337 (46.7)	105 (14.6)	22 (3.1)	3 (0.4)

**Table 3.** Respondents buying price for fresh local beef and frozen imported buffalo meat, and the affordable buying price for fresh local beef.

Price (RM/kg)	Respondents, n (%)		
	Buying price for frozen imported buffalo meat	Buying price for fresh local beef	Affordable buying price for fresh local beef
≤ 20	216 (30.2)	nil	255 (35.6)
21-25	210 (29.3)	68 (9.5)	254 (35.5)
26-30	85 (11.9)	225 (31.3)	163 (22.8)
31-35	41 (5.7)	253 (35.2)	44 (6.1)
36-40	nil	91 (12.7)	nil
Not sure	164 (22.9)	81 (11.3)	nil



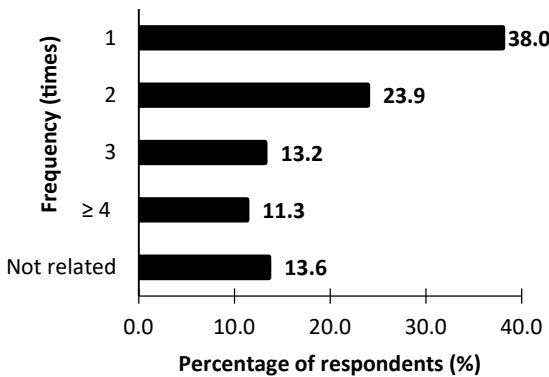
**Figure 1.** Percentage of respondents in the study of market structure of fresh local beef and frozen imported buffalo meat according to location (n727).

consumption, only 40.9% (297 out of 727) responded to the question, from which 48.2% consumed 1 kg to 2 kg per household. 9.4% answered 'others' with reasons that the meat was not consumed every month or consumed only 4 to 10 times in a year. These findings show that the consumption for both types of meat was similar to the

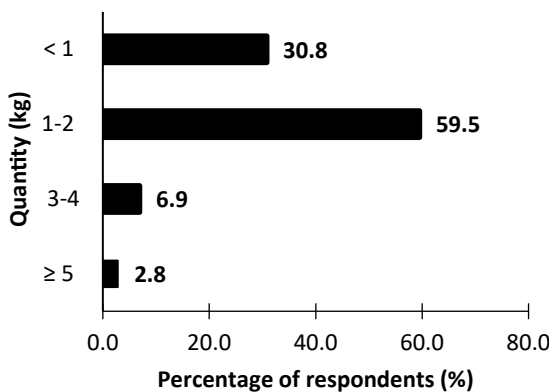
data of 6.5 kg per person annually per capita consumption for beef and buffalo meat in Malaysia in 2017 (DVS, 2018). According to OECD (2019), the per capita consumption of beef and veal in neighbouring countries were reported as 9.9 kg (Vietnam), 3.1 kg (Philippines), 1.8 kg (Indonesia) and 1.7 kg (Thailand) per person in 2017.

**Consumer Awareness, Knowledge and Preference**

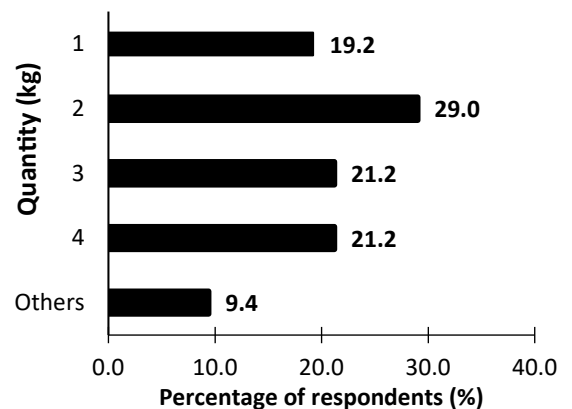
The section of the survey was to identify the awareness, knowledge and preference of respondents regarding the type of meat consumed and to confirm some of their assumptions concerning both types of meat. The findings show that 43.7% of the respondents were unaware that imported frozen meat was buffalo meat and 30.3% do not know how to differentiate between fresh local beef and imported frozen buffalo meat. Based on interviews with some respondents, buffalo meat was said to be darker in colour



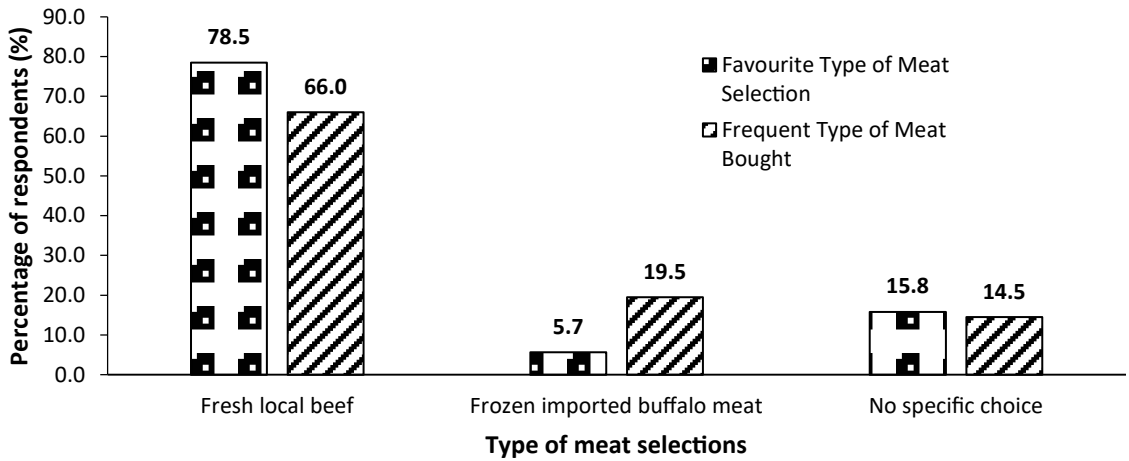
**Figure 2.** Percentage of respondents according to the average buying frequency of fresh local beef or frozen imported buffalo meat in a month (n714).



**Figure 3.** Percentage of respondents according to the average buying quantity of fresh local beef or frozen imported buffalo meat bought in a month (n711).



**Figure 4.** Percentage of respondents according to the average consumption per household of fresh local beef or frozen imported buffalo meat in a month (n=297).



**Figure 5.** Percentage of respondents according to the type of favourite meat selection and frequent type of meat bought (n717).

and coarser in texture compared to cattle beef. According to several studies, the myoglobin content which contributes to the redness of the buffalo meat depends on the type of muscle and age of the animals during slaughter, and the meat becomes darker with increasing age (Dosi *et al.*, 2006).

Based on general observation, frozen-thawed imported buffalo meat looks similar to fresh local beef at retailing outlets. The concern is whether the imported frozen meat has been thawed and mixed with fresh local beef and sold at fresh local beef price. According to MOH (2019), prescribed in Food Regulations 1985, Regulation 143 states that “the frozen meat shall be meat that for one continuous period from the time of preparation for sale has been maintained at a temperature below minus 18 °C and shall not have been thawed before sale”. For minced or ground meat, as stated in Regulation 144 (2) (a), “the meat shall not contain meat of different animal origin”. Based on the survey, only 37.0% of

the respondents were confident that fresh local beef and imported frozen buffalo meat were not mixed. However, 48.7% were unsure and 14.3% were not confident. In order to test and identify the meat species, DNA detection methods by species-specific PCR assay is recommended and has been widely applied (Rahmati *et al.*, 2016; Haider *et al.*, 2012).

The respondents’ assumptions on the quality, palatability and price of fresh local beef against frozen imported buffalo meat are shown in Table 2. Based on the findings, the majority responded that fresh local beef is of better quality (86.1%) and more palatable (85.7%) than frozen imported buffalo meat. 81.1% responded that the price of fresh local beef is more expensive because it has better quality and more palatable than frozen imported buffalo meat. According to Naveena and Kiran (2014), the organoleptic characteristics of buffalo meat were reported to be similar to beef. However, in terms of nutritional characteristics, Murthy and

Devadason (2003) reported that buffalo meat contain higher protein, lower cholesterol and less calories compared to beef. Buffalo meat also has lower fat and saturated fat content than beef (Rao and Kowale, 1991). Another study by Lapitan *et al.* (2007) found that the tenderness and sensory characteristic of buffalo meat is superior to beef when slaughtered at the same young age of 18 to 24 months. For palatability, Naveena and Kiran (2014) reported that buffalo meat and beef obtained from identical age groups were found to be either almost similar or that buffalo meat had better scores on many points.

The preference of meat and the type of meat frequently bought by respondents are shown in Figure 5. 78.5% of the respondents preferred to consume fresh local beef compared to frozen imported buffalo meat. Even though only 5.7% of the respondents favoured frozen imported buffalo meat, a higher percentage (19.5%) chose to buy the meat. This could most probably be due to the lower selling price for frozen imported buffalo meat compared to fresh local beef. Based on the feedback, 91.0% would choose to buy fresh local beef if the price were similar to frozen imported buffalo meat.

### **Price of Fresh Local Beef and Frozen Imported Buffalo Meat**

The buying price for frozen imported buffalo meat, fresh local beef and affordable buying price for fresh local beef were captured from the survey and the results are shown in Table 3. From the table, 59.5% of respondents bought frozen imported buffalo meat at less than RM26 per kg. This is in line with

the monthly average retail price per kg of frozen imported buffalo meat from India determined by the Ministry of Domestic Trade and Consumer Affairs (KPDNHEP), Malaysia, which were RM19.95 (topside), RM19.00 (silverside), RM18.51 (rump), RM18.95 (blade) and RM19.53 (chuck), for January 2019. For fresh local beef the average retail price was determined within the range of RM26.50 and RM40.12 per kg (KPDNHEP, 2019). From the survey, 79.2% of the respondents stated that the buying price of fresh local beef was within the range of RM26 and RM40 per kg.

The survey also showed 61.3% agreed that the retail price for fresh local beef was within their affordable range. In cross tabulating this group, 58.0% (29 out of 50), 57.3% (51 out of 89) and 48.1% (74 out of 154) were of household monthly incomes less than RM1,000, between RM1,001 to RM2,000, and between RM2,001 to RM3,000, respectively. In terms of numbers in a household, 63.4% (45 out of 71), 59.6% (155 out of 260) and 59.1% (143 out of 242) had more than 6 persons, between 5 to 6 persons and between 3 to 4 persons per household, respectively. The findings revealed that retail prices for fresh local beef were affordable according to household incomes and numbers per household. That is, more lower income households (58%) agree that its affordable compared to higher household income (48.1%). Bigger households (63.4%) agree that it is affordable compared to smaller households (59.1%). However, when the respondents were asked regarding the preferred price for fresh local beef, 93.9% chose the price of RM30 per kg and below.

## CONCLUSION

In conclusion, majority of the respondents consumed not more than 2 kg monthly per household of both fresh local beef and frozen imported buffalo meat. The preference was towards fresh local beef where most of them thought that local beef is of higher quality than imported frozen buffalo meat. The study also revealed that the retail prices for fresh local beef were within an affordable range. However, the majority of respondents preferred the price of fresh local beef to be less than RM30 per kg, and most of them would choose to buy fresh local beef rather than frozen imported buffalo meat if the prices were similar.

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