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Determinants of Malaysian Household Purchase Decisions of Shellfish Products

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Abstract

The dichotomous choice Logit model is applied on the Malaysian Household Expenditure Survey (1998/99) data to identify the socio-demographic determinants of household purchase decisions of shellfish. Results indicate that decisions to purchase shellfish are significantly determined by age, race, education, and the levels of household size and income. In other words, while older households have a higher propensity to consume shellfish, all three major races in Malaysia demonstrate high probability levels to purchase shellfish. Furthermore, households with higher income levels and larger family sizes are more likely to purchase shellfish, while those who are more educated are less likely to expend on it. Based on these results, several observations are noted.

Introduction

Shellfish products have long been enjoyed as a staple food item in the Malaysian household diet. In this study, shellfish products include crustaceans and mollusks such as cockles, crabs, prawns/shrimp, cuttlefish, octopus, oysters, lobsters, clams, scallops and mussels. Its popularity is reflected by its import trade values that increased by more than 1383% between 1976 (US$7.2 million) and 2003 (US$106.8 million) (Figure 1). As import and production quantities increased by about 92% and 207%

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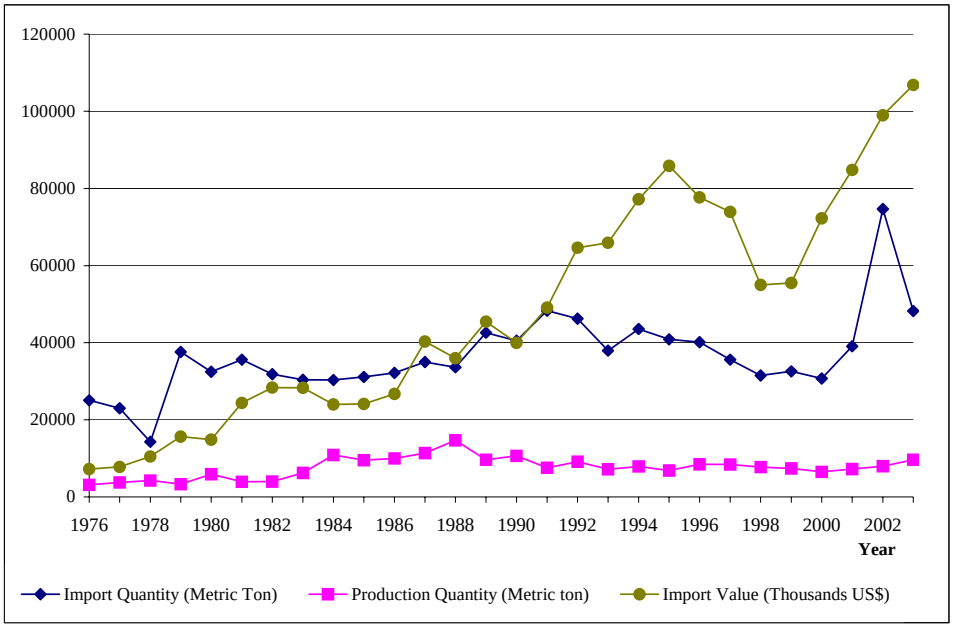
respectively during the same period, reports from various Malaysian Household Expenditure surveys indicate that the average monthly household expenditures for shellfish increased by 342% between 1973 (Malaysian Ringgit, RM3.16) and 1998/99 (RM13.97) (Department of Statistics Malaysia 2000) (approximately US$1.00 = RM3.64; RM1.00 = US$0.27, as of 25 November 2006).



Source: FAO Fisheries Department 2000

Figure 1. Import quantity, production quantity, and import value of shellfish, Malaysia (1976 - 2003)

From a dietary standpoint, certain types of shellfish have also had to endure negative publicity due to its supposed high cholesterol and sodium content (Childs et al. 1987). Besides causing severe allergy, shellfish products are also prone to contamination because they often reside in estuaries where sewage runoffs often pollute the water bodies (Hackney and Dicharry 1988; Wallace et al. 1999; Sicherer 2004). However, recent reports have also surfaced that, contrary to popular beliefs, certain shellfish products may in fact be a healthy source of vitamins and minerals, whilst having very low fat contents (De Oliveira 1996).

Despite its upward economic and consumption trend and possible health effects, certain aspects of the Malaysian shellfish industry have been neglected over the years. While micro-level demand studies of shellfish in Western cultures have been broadly conducted using household consump-

tion data (Cheng and Capps Jr 1988; Degner et al. 1994; Nayga Jr and Capps Jr 1995), an extensive review of the literature revealed that little or no research attention has been devoted to examining the demand for shellfish and its consumption patterns in the local region.

As such, this study aims to fill this gap by examining how socio-demographic determinants affect household purchase decisions of shellfish products in Malaysia. Understanding how socio-demographic factors determine the probability to consume shellfish is important to marketers who may want to target marketing campaigns to specific household or consumer groups. In addition, a better understanding of these factors enables the government authorities to formulate sound public policies vis-à-vis the shellfish industry in Malaysia.

Model Development and Data

Variable Definition

Given the lack of domestic empirical research on Malaysian fisheries products, the selection of variables likely to affect household purchase decisions of shellfish relies on previous fisheries studies by Cheng and Capps Jr (1988), Gempesaw et al. (1995), Nauman et al. (1995), Nayga Jr and Capps Jr (1995), Myrland et al. (2000) and Manrique and Jensen (2001). The following socio-demographic characteristics are therefore hypothesized to influence the probability of household purchases of shellfish: (1) age of household head, (2) ethnicity/race, (3) educational level, (4) gender, (5) household size, (6) total monthly household income, and (7) location.

Age of the household head is used in the current model with the assumption that differences in age lead to differences in preferences and expenditure patterns of shellfish (Nayga Jr. and Capps Jr. 1995; Myrland et al. 2000). In this study, the household head's age range is classified into dummy variables that consist of those between 16-30 years old (Age1), 31-45 (Age2) (base), 46-56 (Age3), and 57 years old and above (Age4). The Age2 range was chosen as the omitted base group because the majority of the household heads are categorized into this age-group (Table 1). This classification characterizes the younger, middle-aged, mature, and retired household heads respectively. It is therefore hypothesized that the likelihood for matured (Age3) and retired (Age4) households to spend on shell-

Table 1. Descriptive statistics of variables in the statistical model

Variables	Those who purchased (n_1=6104)			Those who did not purchase (n_2=3080)			Total Sample (N=9184)		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Age (years)	46.0	17	96	42.3	17	98	44.8	16	98
Age1 (dummy)	0.11	17	30	0.26	17	30	0.16	16	30
Age2 (dummy)*	0.42	31	45	0.37	31	45	0.40	31	45
Age3 (dummy)	0.25	46	56	0.17	46	56	0.23	46	56
Age4 (dummy)	0.22	57	96	0.20	57	98	0.21	57	98
Race1 (dummy)	0.55	0	1	0.39	0	1	0.49	0	1
Race2 (dummy)	0.27	0	1	0.32	0	1	0.28	0	1
Race3 (dummy)	0.07	0	1	0.07	0	1	0.07	0	1
Race4 (dummy)*	0.11	0	1	0.22	0	1	0.14	0	1
Education Level (dummy)	0.08	0	1	0.12	0	1	0.09	0	1
Gender (dummy)	0.85	0	1	0.81	0	1	0.83	0	1
Household Size (no. occupants)	4.78	1	23	3.58	1	17	4.40	1	23
Household Income	2420.86	30	55000	2159.97	1	56638	2333.36	1	56638
Location (dummy)	0.56	0	1	0.60	0	1	0.57	0	1

* Refers to omitted category

fish is expected to be lower compared to younger (Age1) households due to increasing health and dietary concerns. In general, shellfish products are believed to contain higher cholesterol, sodium, and allergy contents. As such, those in the older age groups who are more health conscious would typically avoid these items.

Previous studies by Cheng and Capps Jr (1988) and Nauman et al. (1995) suggest that a dummy variable based on ethnicity be included in household demand studies to allow for the possibility of cultural and ethnic differences to influence food expenditure patterns. Studies have also shown that Asians, in particular, have a higher penchant for seafood (Degner et al. 1994). The Malaysian scenario is unique as its citizens comprise three major races (Malay, Chinese and Indian) and a small proportion consisting those of various other races. Given that each of these races may have a distinct preference for shellfish products, respondents are segregated into Malay (Race1), Chinese (Race2), Indian (Race3) and others (Race4) (base group) to examine the possibility of cultural, ethnic, and religious differences to influence shellfish consumption patterns amongst Malaysian households. Even so, it is the hypothesis of the current study that all three races would have a positive effect on the probability of household purchases of shellfish products as it is observed that Malaysians of all races are generally not averse to consuming shellfish products.

In the current model, a dummy variable is assigned a value of 1 for household heads with tertiary education and a value of 0 for household heads without tertiary education. Similar to results from other studies (Cheng and Capps Jr 1988; Nauman et al. 1995; Manrique and Jensen 2001), it is hypothesized that household heads with higher education levels will purchase less shellfish due to their better awareness of food substitutes and healthy lifestyle as shellfish products are reputed to be relatively less healthy compared to other types of seafood products such as fresh fish.

Gempesaw et al. (1995), Nauman et al. (1995) and Manrique and Jensen (2001) suggested the inclusion of a gender variable to account for gender preferences among consumers of seafood products. Previous studies have also shown that males tend to be higher consumers of fish and shellfish (in terms of grams per day or per meal) than females (Degner et al. 1994). However, like most Asian countries, while males in Malaysia have a greater degree of decision-making power and responsibilities in socio-economic aspects, females play a very integral role in household food preparation and family decisions as well. Therefore, the direction of this

variable on household purchase decisions on shellfish could yet be either positive or negative.

Cheng and Capps Jr (1988) provide evidence to suggest that household size, represented by the number of individuals living in the household, determines decision making on seafood consumption. If shellfish were considered a normal or even a necessary good in the Malaysian diet, increases in household size would also result in proportional increases in its probability to consume shellfish. However, if shellfish is not considered a necessity or even an inferior food item instead, an inverse relationship between the probability to purchase shellfish and household size may result. Given its customary nature in the Malaysian household diet, it is hypothesized that a positive relationship between household size and probability of shellfish purchases would result.

Total monthly household income in Malaysian Ringgit (RM) at US$1 = RM3.80 is included in the model to account for spending patterns of the households. Previous researchers have found consumption of shellfish to be positively related to household income (Cheng and Capps Jr 1988; Degner et al. 1994; Manrique and Jensen 2001). Given these possibilities, the direction of influence of this variable on shellfish purchases is also expected to be positively correlated as Malaysian households are able to move on to higher priced calories food items once basic food necessities are fulfilled.

Location or regional differences may be an important factor in determining seafood consumption patterns. In the current study, a dummy variable is assigned a value of 1 for households classified as urban and a value of 0 for those in the rural regions. As noted by Huang and Bouis (1996), urbanization induces increased seafood consumption through changing preferences (as cited by Delgado et al. 2003). This phenomenon could perhaps be due to the ease of availability of such products in the urban areas compared to the more remote or central regions. However, given the geographical pattern of Malaysia, it is conceivable that some of the more rural areas may in fact be located in closer proximity to coastal and fishing villages. As such, the availability of shellfish products in such rural areas would not be a major factor. Therefore, its relationship with household purchase decisions on shellfish would have to be further ascertained as the direction may be either positively or negatively related.

The regressand in the model is defined as household decisions to purchase shellfish during the month of survey. The model regressors range in nature from continuous/integers (household size, total monthly house-

hold income) to binary/dummy variables (age range of household head, race, education level, gender, location).

Data

The data used in this study is the Malaysian Household Expenditure Survey 1998/1999 from the Department of Statistics of Malaysia. This data set is the most updated of the national household food consumption survey. Data collection commenced in July 1998 and continued through June 1999. The sample was designed using a stratified multi-stage, area probability sampling method, thus ensuring that socio-demographic and geographical considerations are taken into account to reflect the Malaysian population.

In the survey, respondents were asked to record their monthly expenditures on shellfish products. These responses are then coded as households that made purchases on shellfish (value = 1) or no purchases (value = 0) during the survey period. In addition, socio-demographic characteristics of the respondents were also recorded. While a total of 9198 households responded to this survey, 9184 observations were subsequently retained after deleting those with incomplete or suspect relevant information.

Characteristics of survey respondents

In the interest of brevity, only a succinct discussion of the characteristics of the survey respondents is provided. A more comprehensive discussion can be obtained from the authors upon request.

Descriptive statistics of variables in the statistical model are presented in table 1. For the total sample, while the average age of the household head is 44.8 years, approximately 16% of the total sample consists of those in the 16-30 age group; 40% between 31-45; 23% between 46-56; and 21% who are 57 years and above (Table 1). Ethnically, 49% of the entire sample household heads are Malay; 28% Chinese; 7% Indian; and 14% other races. Within the entire sample, 9% of the household heads possess tertiary education. The whole sample consists of about 83% male and 17% female household heads, with an average household size of approximately 4 persons. These households have an average monthly income of about RM 2333, with about 57% of the total sample residing in urban areas (Table 1).

From the subsample, whereby respondents are categorized into shellfish purchasers or nonpurchasers, 6104 (66.46%) respondents reported that they purchased shellfish while 3080 (33.53%) respondents reported that they did not make any purchases during the survey period (Table 1).

The average age of household heads that purchased shellfish is 46.0 years old, while the average age for those who did not purchase shellfish is relatively younger at 42.3 years old. Amongst shellfish purchasers, 11% are between 16-30 years old; 42% between 31-45 years old, 25% between 46-56 years old; and 22% who are 57 years old and above (Table 1). These preliminary results suggest that age may indeed be an important factor in affecting monthly purchases since those who expend on the products tend to be those from the older age range.

The Logit Model

The dichotomous choice Logit model is applied in this study to analyze the socio-demographic factors that influence household decisions to purchase shellfish. This model is appropriate given that households will either have made purchases on shellfish (value = 1) or no purchases (value = 0) during the survey period.

The Logit model is generally written as:

$$\text{Log}\ [P / (1 - P)] = \beta_0 + \beta_1 X_1 + \ldots + \beta_n X_n + \varepsilon$$

where,

P = the probability of the consumer to purchase shellfish during the survey period;
X = explanatory variables hypothesized to influence this probability as discussed above;
β = coefficients for the explanatory variables;
ε = stochastic disturbance term of the regression.

Results

Summary statistics of the Logit model are presented in table 2. The explanatory variables that are statistically significant in explaining household decisions to purchase shellfish include *age1, age3, age4, race1, race2, race3, education level, household size,* and *household income*. In other words, out of the eleven explanatory variables, only *gender* and *location* are not statistically significant in affecting the likelihood of households to purchase shellfish. In addition, the model fits the data well as indicated by the Likelihood Ratio statistic (LR) = 974.7695 and the probability value is almost zero.

The model is also found to correctly predict 71.77% of the outcomes in the sample. Impacts of the socio-demographic variables on the probability of purchasing shellfish are further discussed below. Since Logit parameter estimates do not have a straightforward interpretation, the discussion of the regression results will focus on the log of odds ratio.

Table 2. Summary statistics for logit analysis of household decisions to purchase shellfish

Independent Variables	Coefficients (β)	Odds Ratio (e^{β})	Z-statistics
Constant	-0.8982	0.4073	-8.9095
Age1	-0.5011	0.6058	-7.1938*
Age3	0.2615	1.2989	4.0699*
Age4	0.1407	1.1511	2.1460*
Race1	1.0220	2.7789	14.9758*
Race2	0.4989	1.6470	6.5597*
Race3	0.5998	1.8217	5.7201*
Education Level	-0.3025	0.7390	-3.4787*
Gender	0.0193	1.0195	0.3052
Household Size	0.2054	1.2281	16.5835*
Household Income	0.00003	1.0000	2.7937*
Location	-0.0116	0.9885	-0.2285

Likelihood Ratio (11df) = 974.7695; Probability (LR stat) = 0.0000; Percent Correct Predictions = 71.77%; * at 5% of significance

Age (Age1, Age3, Age4)

Growing older significantly increases the likelihood to purchase shellfish, as the effects of all three age groups (Age1, Age3 and Age4) are statistically significant (Table 2). In fact, the results reveal that the odds of younger households (Age1) to purchase shellfish are 0.6058 as high as those of the middle age group (Age2), other things being equal. In comparison, the odds of matured and retired household heads are respectively 1.2989 and 1.1511 as high as those in the base group, *ceteris paribus*. Furthermore, younger households expend less on per capita shellfish expenditures (RM6.75) compared to the matured (RM16.78) and retired (RM16.46) households (Table 3).

This unexpected result appears to contradict the notion that older households are less likely to purchase shellfish compared to their younger cohorts. The likely explanation for this is that older households may not be fully aware of the health effects in consuming shellfish as even those in the higher health risk age groups are found to be more likely to purchase shellfish.

Table 3. Per capita expenditures of shellfish (by age group and ethnicity)

	Per Capita Expenditures (RM)
Age1 (16-30)	6.75
Age2 (31-45)	13.76
Age3 (46-56)	16.78
Age4 (≥ 57)	16.46
Race1 - Malay	13.09
Race2 - Chinese	18.42
Race3 - Indian	12.42
Race4 - Others	8.32

Race (Race1, Race2, Race3)

The effects of being Malay (Race1), Chinese (Race2), or Indian (Race3) on decisions to purchase shellfish are statistically significant and positive (Table 2). The odds of Malay, Chinese, and Indian household heads to purchase shellfish are, respectively, 2.7789, 1.6470, and 1.8217 times as high as households of other races. In addition, the per capita expenditures of Malay (RM13.09), Chinese (RM18.42) and Indian (RM12.42) are comparatively higher than those of other races (RM8.32) (Table 3). As expected, these results suggest that the three main races in Malaysia are not particularly averse to consuming shellfish. A likely rationalization is that shellfish, as in other types of seafood, may be common in the diets of Malaysian households regardless of their ethnicity. In general, shellfish products such as prawns and shrimps, crabs, and cuttlefish are considered as popular seafood dishes as they add varieties to the diets and food preparation menus of the multi-racial community.

Education Level

Being more educated significantly decreases the likelihood to purchase shellfish. The odds of household heads with tertiary education to purchase shellfish are 0.7390 as high as those without tertiary education, *ceteris paribus* (Table 2). The negative effect of education level on the probability of purchasing shellfish might be explained by the fact that those with higher education levels are more aware of the health effects of shellfish products compared to those with lower levels of education. Hence, they may be more conscious of their daily intake of the seafood item.

Gender

Whether a household head is male or female does not have a statistically significant effect on household decisions to purchase shellfish (Ta-

ble 2). This can be rationalized by the fact that the whole family typically consumes shellfish products at home. Thus, gender having no influence on shellfish expenditures may simply reflect the fact that when households dine together, they consume the same type of shellfish products.

Household Size

The number of persons in a household also appears to have a significant influence on household decisions to purchase shellfish (Table 2). As the number of persons in the household increases by one person, the odds of purchasing shellfish increases by 22.8%, all else constant. This is probably because shellfish products, such as prawns/shrimps, crabs, and cuttlefish, are ingrained as staple items in the Malaysian diet. Thus, despite the fact that increasing family size induces higher financial burden in terms of total cost, the nature of shellfish as staple items in the Malaysian household menu justifies its increased expenditures, even as family size increases.

Household Income

Total gross monthly household income is statistically significant and positively related to decisions to purchase shellfish. The odds of purchasing shellfish increases by 1.000 when household income increases by RM1, other things being equal (Table 2). This finding complies with the results of other studies that the probability of purchasing shellfish is greater for households with higher income. In this regard, a positive income elasticity of demand is noted as both consumption and income levels increase at the same time. Thus, shellfish can be considered as a normal good in Malaysia.

Location

Being located in urban or rural areas does not significantly affect household decisions to purchase shellfish (Table 2). This may be attributed to the ease of availability of shellfish products in the urban and even the rural areas in Malaysia. As such, regional differences, at least in the case of Malaysia, do not have any variations on shellfish consumption patterns.

Predicting the Probability of Purchasing Shellfish

Given a set of values in the explanatory variables, the probability of purchasing shellfish can be predicted. Examples of the predicted probability of purchasing shellfish for selected respondents with certain socio-demographic characteristics are listed in table 4. Based on the calculated mean values for all the explanatory variables as listed in table 1, the “typi-

cal" respondent used is assumed to be a Malay, male, between the age of 31-45, residing in an urban area, without any tertiary education, has total gross monthly household income of RM2333, and has 4 household members. By inserting the values of the typical respondent into the estimated Logit equation, the log of odds of purchasing shellfish is derived as 1.03. The calculation for the log of odds is as follows:

$$\text{Log}\ [\hat{P}/(1-P)] = -0.8982 - 0.5011(0) + 0.2615(0) + 0.1407(0) + 1.0220(1) + 0.4989(0) + 0.5998(0) - 0.3025(0) + 0.0193(1) + 0.2054(4) + 0.0000332(2333) - 0.0116(1) = 1.03$$

The probability of purchasing shellfish is thus calculated as 0.74 (P(Y=1) = exp (1.03)/1 + exp (1.03) = 0.74) which indicates that the typical respondent with those socio-demographic characteristics mentioned earlier has a 74% chance of purchasing shellfish (Example 1). Other selected examples listed in table 4 show the predictions of the probability of purchasing shellfish for different changes in one of the respondent's characteristics with other variables held constant.

For instance, if the typical household head as described earlier is younger (say in the 16-30 age group) with other factors held constant, the probability of purchasing shellfish falls from 0.74 to 0.63 (Example 2). On the other hand, if the respondent is older (46-56 age group or 57 years old and above), with other factors remaining constant, the probability of purchasing shellfish increases only slightly from 0.74 to 0.78 and 0.76 respectively (Examples 3 and 4). Family size also has a strong positive impact on decisions to purchase shellfish. For instance, the typical respondent possessing the characteristics as defined earlier, but with 8 family members instead, will have a 0.86 probability to purchase shellfish (Example 8). If the typical respondent only has another partner living together instead, the probability to purchase shellfish falls to 0.65 (Example 9).

Household income also prompts shellfish purchases although the effect seems minimal. If the typical respondent has total gross household income of RM1000 or RM4000 instead, *ceteris paribus*, the probability to purchase shellfish changes minimally to 0.73 and 0.75 respectively (Examples 10 and 11). The negative impact of education on the probability of purchasing shellfish is also evident. If the typical respondent described earlier possesses tertiary education instead, the probability of purchasing shellfish falls to 0.67 (Example 12).

Table 4 Predicted probability of purchasing shellfish for selected respondents

Example	Characteristics	Predicted Probability
1	Age 31-45, Malay, without tertiary education, male, 4 family members, total gross household income of RM2333, urban location	0.74
2	Age 16-30, Malay, without tertiary education, male, 4 family members, total gross household income of RM2333, urban location	0.63
3	Age 46-56, Malay, without tertiary education, male, 4 family members, total gross household income of RM2333, urban location	0.78
4	Age 57 and above, Malay, without tertiary education, male, 4 family members, total gross household income of RM2333, urban location	0.76
5	Age 31-45, Chinese, without tertiary education, male, 4 family members, total gross household income of RM2333, urban location	0.62
6	Age 31-45, Indian, without tertiary education, male, 4 family members, total gross household income of RM2333, urban location	0.65
7	Age 31-45, Malay, without tertiary education, female, 4 family members, total gross household income of RM2333, urban location	0.73
8	Age 31-45, Malay, without tertiary education, male, 6 family members, total gross household income of RM2333, urban location	0.86
9	Age 31-45, Malay, without tertiary education, male, 2 family members, total gross household income of RM2333, urban location	0.65
10	Age 31-45, Malay, without tertiary education, male, 4 family members, total gross household income of RM1000, urban location	0.73
11	Age 31-45, Malay, without tertiary education, male, 4 family members, total gross household income of RM4000, urban location	0.75
12	Age 31-45, Malay, with tertiary education, male, 4 family members, total gross household income of RM2333, urban location	0.67

Conclusions

The findings of this study may have important implications for the seafood industry in Malaysia as it indicates that the potential market for shellfish products is made up of older (matured and retired), larger family size, and higher income households, but not amongst those with higher education levels. At the same time, all three major races in Malaysia are equally likely to include shellfish in their daily meal intakes. Based on these results, several observations are noted.

Age of household head appears to be an important factor in explaining household purchase decisions of shellfish. Contrary to *a priori* expectations, older (matured and retired) households have a higher tendency to purchase shellfish compared to their younger cohorts. This result implies that older households may not yet be fully aware of the health conse-

quences in consuming shellfish, although this type of seafood may generally have higher cholesterol, sodium, and allergy content. As such, coupled with the fact that education levels significantly decreases the likelihood of shellfish purchases, the Health Ministry of Malaysia should consider educating the general public, especially the older households, about the health effects of consuming shellfish. On the other hand, the shellfish market amongst younger households appears to be untapped. Thus, shellfish marketers may want to consider targeting younger households in future promotional strategies. For example, given that convenience and time factor may be an important consideration for younger households, ready cooked or even peeled shellfish items may be considered in supermarket wet-sections.

Another interesting observation from this study is that larger households tend to spend significantly more on shellfish than their smaller sized household counterparts. Despite the fact that increasing family size induces higher financial burden, the nature of shellfish as staple items in the Malaysian household menu justifies its increased expenditures. This suggests that small changes in future shellfish prices may not precipitate substantial long-term changes in the eating habits of consumers, as households would still purchase their daily requirements. Even adverse events such as the tsunami related or other coastal contamination seafood scare would not dampen the long-term outlook for the shellfish market, as consumers are expected to resume consumption after a short adjustment period.

Results of this study also indicate that while Malaysians of all races are not averse to consuming shellfish, higher income households are more inclined to include shellfish in the household diet compared to their less wealthy counterparts. This suggests that shellfish are considered as normal goods to Malaysians as consumption levels and income increases in tandem. However, since lower income households will also have a lower propensity to purchase shellfish, the Malaysian government authorities should consider investing more in the relatively infant shellfish aquaculture industry so as to control the prices and supply of these (generally more expensive) shellfish products. As poorer households consume mainly smaller or less expensive types of shellfish, technological improvements in the culture of these types of shellfish products can be expected to increase the welfare of these poorer consumers and to ensure equitable distribution.

Finally, in order to better understand the dynamics of consumer demand for shellfish, it is important to have an initial understanding of the factors that motivate the demand for the products. While this study acts as

a catalyst to further research on shellfish expenditure patterns in Malaysia, several inherent limitations are acknowledged. First, this study incorporates data based on at-home consumption decisions only. Various studies have shown that the percentage of food-away-from-home consumption has been rising over the years. This effect could carry over to shellfish consumed in restaurants, food outlets, and other eateries. As such, total at-home consumption of shellfish may be understated in the current study. Second, complete information about the surveyed households is important in order to enhance the statistical findings. However, pricing information and other variables such as marital status, number of working adults, number of children and their ages, types of restaurants and eateries frequented, working hours, health status, and reasons for consumption or non-consumption are not available due to the nature of the data.

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