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Possibility of exporting halal-certificated food in Hokkaido, Japan: acceptance by Malaysian consumers

RESEARCH ARTICLE

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Abstract

Expectations of exporting food and agricultural product to Malaysia have been substantially growing in Japan. Although Japan has two halal certification bodies recognized by Jabatan Kemajuan Islam Malaysia (JAKIM), it is unclear whether Malaysian consumers trust its certified processed foods. Thus, this study aims to clarify Malaysian consumers' preference for Hokkaido ice cream by conducting a conjoint analysis. The results show no significant difference in the level of consumer trust in halal certifications, indicating a distribution based on both Malaysian and Japanese certification bodies. Therefore, it is possible that Malaysian consumers would accept Japanese products with a halal certification approved by JAKIM. In addition, the willingness to pay for Hokkaido ice cream reported a high satisfaction value. However, there is no significant effect on food functionality possibly because Malaysian consumers' awareness of the health benefits remains low.

Keywords: export possibility, halal certification, food functionality, conjoint analysis, Malaysia
JEL code: D10, D11, D18

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1. Introduction

Globalization has significantly advanced in recent years, leading to not only technological and economic progress but also a constantly changing food, agriculture, and food safety and security environment. While efforts to establish trade rules led by the World Trade Organization and further progress in global free trade (e.g. Free Trade Agreement, Economic Partnership Agreement, and Trans-Pacific Strategic Economic Partnership Agreement) are advantageous to create new business opportunities, such developments have highlighted the several risks associated with food and agriculture, which were originally characterized by an unclear food chain (Huynen *et al.,* 2005).

In Japan, the food self-sufficiency rate based on calorie supply remains low at less than 40% owing to its shrinking domestic markets for production lands and the shortage of successors in the agricultural sector (Yoshii and Oyama, 2011). Agricultural and livestock product exports have attracted much attention in Japan as a strategy to increase the competitiveness of its agricultural sector, which serves as a foundation for the local economy and promotes the concept of 'strong agriculture' aimed at improving the food self-sufficiency rate. The strategy gained further momentum in August 2013, when the Ministry of Agriculture, Forestry and Fisheries (MAFF) set a goal to increase the exports of agricultural and marine products to 9.7 billion dollars (1 trillion yen) by 2020 (MAFF, 2016). In addition, the global Japanese food boom and the expansion of markets in developing countries as a result of population growth and economic progress have become factors underlying increased exports. This situation has been particularly observed in Hokkaido, Japan, where many public and private industries are engaging in foreign export businesses.

Among several identified foreign core markets, the halal market mainly operating in Asia is an emerging and prospective market viewed with high expectations. According to Thomson Reuters (2014), the global halal market was estimated at 2,001 billion dollars and the halal food market at 1,292 billion dollars in 2013, of which the halal food market in Asia accounted for 49.7% (642 billion dollars). The halal market is, thus, considered a key target market for Japan, a country with close geographical and economic ties with other Asian regions. As part of the Third National Agricultural Policy enacted in 1998, Malaysia developed systems and infrastructure to become a halal hub in the Muslim world (Othman *et al.,* 2009), thus increasing Japan's expectations to become a halal exporting partner.

However, manufacturing halal products and guaranteeing that they meet the halal standards is difficult in Japan given that Islamic customs are rarely practiced by its population. Although obtaining a halal certification can serve as an entry into the halal market, the trustworthiness of halal certified-products in Japan and consumers' willingness to pay (WTP) for such products are unclear.

Thus, this study aims to quantitatively estimate consumer preferences for Japanese agricultural and livestock products from Hokkaido to discuss the possibility of exporting them to Malaysia and obtaining a mutual halal certification from the Malaysian government's only halal certification agency, Jabatan Kemajuan Islam Malaysia (JAKIM), Department of Islamic Development Malaysia. To do so, a conjoint analysis is conducted of responses by Malaysia's general consumers to surveys comparing the various characteristics of agricultural and livestock products. The article 'The strategies for the export of agricultural products and foods by country and item,' issued in 2013 by MAFF, Japan, identifies six types of core items exported to Malaysia: beef[1], fruits and vegetables, confectioneries, condiments, marine products, and milk and dairy products (MAFF, 2013). This study focuses on milk and dairy products, particularly ice cream, given their potential for product expansion due to the relatively high processability.

[1] Although beef exports have been currently banned owing to bovine spongiform encephalopathy, interviews with the Department of Veterinary Services revealed that discussions are underway to resume exports.

2. Literature review

Research on halal history has been conducted within the area of Islamic studies, with particular emphasis on humanistic elements, such as Islamic jurisprudence and folklore. However, the scope of research rapidly expanded to the social and natural sciences as a result of improvements made to the halal certification system, mainly in Malaysia during the 2000s. The underlying reason for this development was the need to understand social conformity and validity as the halal designation became institutionalized and documented as halal certification. Abdul *et al.* (2009) identified differences in the levels of awareness about halal logos and food ingredients on the basis of individual religious beliefs. Rezai *et al.* (2012) conducted studies on the degree of consumer trust in processed foods with a halal logo and social factors comprising trust and showed that products manufactured in non-Muslim countries or without JAKIM's halal logo received lower ratings of trust. Mohayidin and Kamarulzaman (2014) investigated processed food traits preferred by consumers and clarified that JAKIM's halal logo had a more significant impact on consumer purchasing behavior than those by other countries. Akbiyik and Eroglu (2016) conducted a factor analysis in Turkey and found that six factors promoted halal-certified product awareness: promotion, location, attractiveness and quality, halal certification, price, and market demand. Ismoyowati (2015) found that while a halal certification was important, taste and nutrition still received highest priority in chicken-based food consumption in Indonesia. In their study on an organic product market in Switzerland, Janssen and Hamm (2011a) showed that WTP was significantly higher for almost all products with certification logos than those without one, suggesting that certification logos enhance credibility. Further, consumer perceptions significantly change when a logo exists, although in many cases, this is not based on the objective knowledge of organic labeling schemes (Janssen and Hamm, 2011b). Kamaruddin *et al.* (2012) examined consumers' demand and WTP for the additional costs of halal logistics (certification requirements). These studies suggest that consumers in Malaysia consider products from non-Muslim countries and a halal certification (logos) from bodies other than JAKIM unfavorable from a credibility perspective. However, it is noteworthy that Japan has two organizations that have been certified by Malaysia's JAKIM but consumers' attitudes toward these bodies are yet to be clarified.

Discussing non-Muslims' views of halal designations, Rezai *et al.* (2010) explored the halal concept and consumer perceptions and attitudes toward halal food products and demonstrated that the perception of halal is influenced by factors such as the environment, sustainability, animal welfare, and food safety. Mathew *et al.* (2014) adopted a consumer psychological perspective and showed that non-Muslims also view the halal designation favorably by linking it to cleanliness and quality. It appears that the halal designation has gained a certain level of acceptance from non-Muslims, even in Malaysia, and therefore, obtaining a halal certification could increase a product's market share. The evaluations in this study target the Muslim population as well as all Malaysian consumers.

As Lever and Miele (2012) mentioned, the halal market has transcended Muslim countries to various European ones in the past 15 years, resulting in a significant growth in research findings (Ahmed, 2008; Bonne and Verbeke, 2008; Verbeke *et al.*, 2013). Yusof and Shutto (2014) also examined the current status of halal markets in Japan. However, these studies focus on domestic consumption and do not investigate consumer preferences or markets from the perspective of an export partner country.

3. Halal concept and Malaysian halal system

Shariah law, the Islamic customary law, views every 'good thing' in daily Muslim life as 'halal'. It is appropriate to define 'halal' as 'positive, good, or yes' in the English language. Shariah law defines dietary customs (criteria) for Muslims and specifies foods that can be labeled as halal. On the other hand, 'haram' refers to forbidden acts, for example, the consumption of pork or alcohol. 'Syubhah' is a condition that does not clearly fall into either category. Halal foods cannot be contaminated with haram ingredients; more specifically, they must be free from all haram ingredients and not produced using haram-contaminated equipment, and thus, haram should be spatially separated from halal at every stage, that is, from production and processing to sales distribution. In addition, the term 'halalan toyyiban' refers to products that are not

harmful and safe to be consumed as underlined by the Syariah law (Omar *et al.*, 2013). As Allah says in the Quran, 'O mankind! Eat of that which is lawful and good on the earth' (Surah Al Baqarah 2: 172). They ask you (O Muhammad SAW) what is lawful for them (as food) ... Lawful unto you are at Tayyibaat (all kind of halal foods) (Surah Al Maidah 5: 4). As explained, Islam requires that Muslims find *rizk* (sustenance) and consume food that is halal and toyyiban because it ensures a healthy living that reflects good attitudes and behaviors (Yousef, 2010). It constitutes the concept of wholesomeness, which includes quality, cleanliness, and safety (Omar *et al.*, 2013).

The Malaysia Standard (MS) for 'Halal Food -Production, Preparation, Handling and Storage- General Guidelines (MS1500: 2009)' is used as a basis for halal certification in Malaysia. Halal certifications are currently given to not only food products but also various goods and services such as cosmetics and pharmaceutical drugs and those in the financial and tourist industries. Halal standards have also been recently established in the logistics area (MS2400: 2010). These developments suggest the continuous expansion of areas subject to halal certification requirements. JAKIM is the only certification agency under the direct authority of the Malaysian Prime Minister's Office. The Halal Industry Development Corporation (HDC) was established in September 2006 by the Malaysian government to facilitate Malaysia's halal hub project and assist in tasks related to halal businesses. The government's intention is to not only view halal from a religious perspective but also promote Malaysia as a major player in the global halal industry (Zakaria, 2008). HDC coordinates the overall development of the halal industry in Malaysia, focusing on the development of halal standards, audit and certification, and capacity building for halal products and services. It promotes the participation and facilitates the growth of Malaysian companies in the global halal market (HDC, 2013). The Malaysian government's intentional establishment of the certification agency separate from the business promotion agency is a unique step. JAKIM also assesses and audits halal certification bodies in other countries. The agency then approves of them as mutual certification bodies if they meet the requirements. In principle, obtaining a certification from a mutual certification body is necessary to export products with halal-certified labels. Japan has two mutual certification bodies: Japan Halal Association (JHA) and Japan Muslim Association (JMA) (JAKIM, 2015).

4. Methodology

Questionnaire surveys

This study proposes the following hypotheses to explore the possibility of exporting Hokkaido ice cream from Japan to Malaysia.

First, consumer preferences do not differ by the halal certification body that grants the certification, provided the products are mutually certified by JAKIM. Past studies have shown that JAKIM's halal certification or logo is highly effective in gaining consumer acceptance. JAKIM acknowledges that Malaysian consumers accept products as long as they are certified by mutual certification bodies. Therefore, this study hypothesizes that a halal logo issued by a mutual certification body will gain the same level of acceptance as one by JAKIM.

Second, Hokkaido ice cream will be well-received by Malaysians. 'Hokkaido' as a brand is favorably viewed by Malaysian consumers who harbor desires for 'snow.' The Hokkaido Fair held frequently in Malaysia is also a factor contributing to Malaysian consumers' familiarity with Hokkaido (Japan External Trade Organization, 2012). Thus, it is likely that Hokkaido ice cream will be positively perceived by consumers in Malaysia.

Third, Malaysian consumers are concerned with the functional attributes of ice cream. Diabetes has become widespread in Malaysia (Mafauzy, 2005). Moreover, with Japan now facing a similar situation and given the rising demand for healthy food in recent years, many related technologies and research findings have become available. Therefore, it is possible to earn a good reputation among Malaysian consumers by using Japanese technology and adding diabetes-related functional properties.

Muslims and non-Muslims in multiethnic Malaysia are likely to express differing views on halal certifications. However, contrasting views on halal certifications can be expected even among Muslims given the varying degrees of religious devotion. This study analyzes the proposed hypotheses by examining consumer characteristics, which are broadly divided into three categories: (1) a certification requesting group that always requests for halal certifications; (2) a voluntary certification requesting group that only requests for the exclusion of pork and alcohol in food products; and (3) an indifferent group that is indifferent to the halal designation.

To test the abovementioned hypotheses, questionnaire surveys were conducted targeting Malaysian consumers. Since the Kuala Lumpur Metropolitan Area (Klang Valley) is the most significant and a large economic area and can serve as a basis for exporting Hokkaido products, this study targeted only those consumers who frequented supermarkets in Kuala Lumpur and adjacent areas. We conducted interview surveys in front of AEON Malaysia stores (Bandar Utama Store and Mid Valley Store) during November 3-8, 2014. Consumers were given the questionnaires at the store and randomly selected (haphazard sampling). A total of 205 consumers responded to the surveys. This way, the collected samples reflected consumers' characteristics, data for which were gathered from the store officer.

Design of conjoint analysis and model

Since almost no agricultural and livestock product has been imported by Malaysia, it was not possible to conduct an analysis using actual market data. From this viewpoint, Hokkaido agricultural and livestock products can be viewed as goods that are not sold through monetary transactions in general society or with an assigned price (non-market goods). According to Bateman *et al.* (2002), the following two types of analysis can be performed for such non-market goods: a revealed preference analysis based on individuals' actual behavior and a stated preference analysis of individual's responses to expected outcomes if they were to take a certain action in the future. This study utilized one of the stated preference methods, a conjoint analysis.

In a conjoint analysis, respondents are shown various profiles comprising combinations of attributes and levels and asked their preferences for each one. A conventional conjoint analysis uses an assessment method based on ranking or rating. Choice-based conjoint analysis has been adopted more frequently in recent years since it allows respondents to select a product they would consider purchasing and the option 'will not purchase any product' (e.g. Mohayidin and Kamarulzaman, 2014). Using the method, Hu *et al.* (2005) evaluated foods with genetically modified ingredient information and Iwamoto *et al.* (2012) examined the influence of hazard analysis and critical control point (HACCP) and eco-labeling on consumer preferences. Grunert *et al.* (2014) studied consumer preferences for foods with sustainability labeling that offered a sense of environmental awareness and morality. Studies have also evaluated consumer preferences on the basis of the characteristics of foods such as their appearance (Jervis *et al.*, 2014; Oltman *et al.*, 2014).

Attributes and level of ice cream (Table 1) include country of origin, halal logo, functionality, and price. For a comparative analysis, this study includes Thailand as a level for the 'country of origin' attribute since Thai ice cream imports have a successful track record in Malaysia. In addition, unlike meat products, meeting halal requirements is not mandatory for ice cream products under customs regulations. Therefore, 'without logo' is added as a level for the 'halal logo' attribute. 'Addition of oligosaccharides' is used as a level for 'functionality' since oligosaccharides are believed to help inhibit diabetes. The three countries of origin are fixed. A total of eight pages comprising four choices, including 'will not purchase any product,' were prepared. However, two questionnaires each consisting of four pages were finally utilized since presenting eight pages to each respondent was too overwhelming.

Table 1. Attributes and levels of ice cream.

Attributes	Levels
Country of origin	Malaysia, Japan (Hokkaido), and Thailand
Halal logo	JAKIM (Malaysia), JMA (Japan), CICOT[1] (Thailand), and None
Functionality	Addition of oligosaccharides, no addition of oligosaccharides
Price (RM/90 ml)[2,3]	3, 6, 9, and 12

[1] The Central Islamic Committee of Thailand (CICOT) is a halal certification body in Thailand and has been certified as a mutual certification body by JAKIM.

[2] During the study period, 1 RM=0.2994 USD (Mitsubishi FUJI Research and Consulting Co. Ltd, 2016).

[3] 90 ml is the volume of an ice cream cup per person.

A choice-based conjoint analysis is a discrete choice model based on random utility theory. It assumes that respondent i gains utility U_{ij}; accordingly, the following equation is formulated for four choices j including 'will not purchase any product'.

$$U_{ij} = V_{ij} + \varepsilon_{ij} \quad (j = 1, 2, 3, 4) \tag{1}$$

where V_{ij} is the observable and deterministic part of indirect utility determined by product and respondent attributes. ε_{ij} is the error term that cannot be measured. Here, we assume that the respondent selects a choice with the highest utility. Probability $p_i(j)$ is defined such that respondent i's utility from choice j is higher than that from other choices, q:

$$P_i(j) = Prob\ \{(V_{ij} + \varepsilon_{ij} > V_{iq} + \varepsilon_{iq}) \quad for\ all\ q \in C\ (j \neq q)\} \tag{2}$$

when a set of choices is designated as C, which is assumed to be identical for all respondents. Here, we assumed that error term ε_{ij} follows the Gumbel distribution with a location parameter of 0 and scale parameter of 1 and the independence of irrelevant alternatives. The probability that respondent i selects choice j is:

$$P_i(j) = \frac{\exp(V_{ij})}{\sum_{q \in C} \exp(V_{iq})} \tag{3}$$

Equation 3 is a conditional logit model and the function parameter V can be estimated using maximum-likelihood estimation. In this study, measurable V of the utility function is set to be linear and the model is expressed as follows:

$$\begin{aligned} V_{ij} &= \beta^{ASCm}\, ASC_{ij}^{ASCm} + \textstyle\sum_n \beta^n \chi_{ij}^n + \beta^{price}\, Price_{ij} \\ &= \beta^{ASCM}\, ASC_{ij}^{ASCM} + \beta^{ASCH}\, ASC_{ij}^{ASCH} + \beta^{ASCT}\, ASC_{ij}^{ASCT} + \beta^{Halal\_M}\, Halal\_M_{ij} \\ &\quad + \beta^{Halal\_J}\, Halal\_J_{ij} + \beta^{Halal\_T}\, Halal\_T_{ij} + \beta^{Func}\, Func_{ij} + \beta^{price}\, Price_{ij} \end{aligned} \tag{4}$$

where ASC_{ij}^{ASCm} is the alternative-specific constant (m=M,H,T), χ_{ij}^n are attributes other than price, and $Price_{ij}$ is the price of choice j selected by respondent i. An explanation of the estimation variables is provided in Table 2. Marginal willingness to pay (MWTP) can be obtained from the following equation. The total differentiation of Equation 4 is:

$$\sum_n \frac{\partial V}{\partial \chi^n}\, d\chi^n + \frac{\partial V}{\partial Price}\, dPrice = dV \tag{5}$$

where the utility level is assumed to be fixed as an initial level (dV=0) and attributes other than focused attribute χ^l are fixed as initial levels ($d\chi^n$=$0, n \neq l$). MWTP, $MWTP_{\chi^l}$, for attribute χ^l is calculated using:

Table 2. Estimation variables.

Variable	Explanation
ASC_{ij}^{ASCM}	= 1 if the option is Malaysian ice cream
ASC_{ij}^{ASCH}	= 1 if the option is Japan (Hokkaido) ice cream
ASC_{ij}^{ASCT}	= 1 if the option is Thailand ice cream
$Halal\_M_{ij}$	= 1 if the option is JAKIM (Malaysia) halal logo
$Halal\_J_{ij}$	= 1 if the option is JMA (Japan) halal logo
$Halal\_T_{ij}$	= 1 if the option is CICOT (Thailand) halal logo
$Func_{ij}$	= 1 if the option is functionality (oligosaccharides)
$Price_{ij}$	= price of choice

$$MWTP_{\chi^l} = \frac{dPrice}{d\chi^l} = -\frac{\frac{\partial V}{\partial \chi^l}}{\frac{\partial V}{\partial Price}} = -\frac{\beta^l}{\beta^{Price}} \quad (6)$$

where β^l corresponds to attribute χ^l. The value for which the coefficient of ASC^{ASCm} is divided by $-\beta^{Price}$ is the WTP when the attribute variables are valued at 0.

5. Results

Respondents' attributes

Since children could not be included in the surveys, a majority of the respondents were in their 20s as opposed to the population statistics for Kuala Lumpur (Table 3) compiled by the Department of Statistics, Malaysia (2011). Respondents were then classified as per responses based on individual religious beliefs: of the 203 respondents, 43 (21.2%) were categorized in the halal certification requesting group, 58 respondents (28.6%) in the voluntary certification requesting group, and 102 (50.2%) in the indifferent group. The mean monthly income for the sample data was 3,858 RM[2], whereas that as per the Department of Statistics, Malaysia (2016) was 4,585 RM in 2014. In addition, while the mean monthly income for urban areas was 5,156 RM as per statistical data, our sample data showed a lower value. This can be attributed to responses primarily by students in their teenagers and 20s, who tend to have lower income earnings than other Mid Valley Store visitors. The average volume of ice cream purchased by respondents was 369 ml per month and the average price paid was 15.6 RM/90 ml. These figures are similar to those obtained through interviews held with retail store staff and buyers.

Assessment of halal certification

As per the halal certification system based on JAKIM's MS1500:2009, a certification requires compliance with the International Organization for Standardization 9001, HACCP, good manufacturing practices, and good hygiene practice management systems along with related MS standards. These food safety management systems are believed to increase the safety of halal-certified products and strengthen consumer trust. Thus, the following two questions were presented regarding halal labeling and food cleanliness: 'What is your impression of the halal certification?' and 'How much do you understand about the foreign halal certifications and do you check whether a product is halal certified before purchasing it?' A cross-tabulation was performed to assess consumers' view of halal certifications and the importance of a product being halal certified.

[2] Participants were asked to choose from four household income categories: 1 for 0-15,000 RM, 2 for 15,001-45,000 RM, 3 for 45,001-105,000 RM, and 4 for greater than 105,001 RM. Then, the mean income was calculated by multiplying the average value of each category by each category's sample size and dividing it by the entire sample size. Next, we estimated the mean monthly income. In the case of categories 1 and 4, we used values 15,000 RM and 105,001 RM.

Table 3. Comparisons of respondent attributes and statistical data (adapted from the Department of Statistics, Malaysia (2011) and supplemented with survey data).

		Sample	Sample (%)	Statistics (%)[1]
Sex (n=205)	Male	64	31.2	50.9
	Female	141	68.8	49.1
Age (n=205)	10-19	14	6.8	30.7
	20-29	78	38.1	22.5
	30-39	49	23.9	16.7
	40-49	28	13.7	13.4
	50-59	22	10.7	9.0
	Over 60	14	6.8	7.6
Religion (n=201)	Muslim	61	30.3	46.4
	Christian	37	18.4	5.8
	Buddhist	89	44.3	35.7
	Hindu	4	2.0	8.5
	Others	10	5.0	3.6

[1] 2010 statistical data for Kuala Lumpur.

As per the results, the number of respondents who believed that a halal certification included the 'cleanliness' aspect was the highest, followed by those referencing 'Shariah law', in the certification requesting and voluntary certification requesting groups. In the indifferent group, on the other hand, the most common response was 'nothing in particular'. Nevertheless, about 20% respondents from the indifferent group believed that the halal certification included the 'cleanliness' aspect. However, it appears that consumers from all groups had an insufficient understanding of the halal certification system, including traceability (Figure 1).

As for foreign halal certifications, the results show that most respondents do not check whether a product is certified, despite them being aware of the certification. As mentioned, halal-certified products entering Malaysia must be certified by a JAKIM-recognized entity. However, since Malaysian consumers possibly place a high level of trust in JAKIM, they do not always check if the product has a foreign halal certification. Thus, it is reasonable to assume that halal-certified products distributed within Malaysia will not be treated differently by consumers on the basis of a domestic or foreign halal certification (Figure 2).

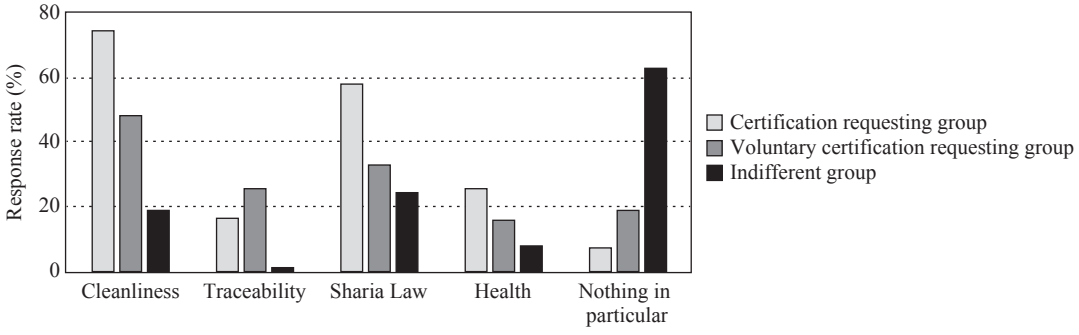

Figure 1. Respondent impressions of halal certification. The respondents were allowed to provide multiple answers. Each response rate indicates the percentage in relation to the total number of responses from each group. Certification requesting group (n=43), voluntary certification requesting group (n=58), and indifferent group (n=102).

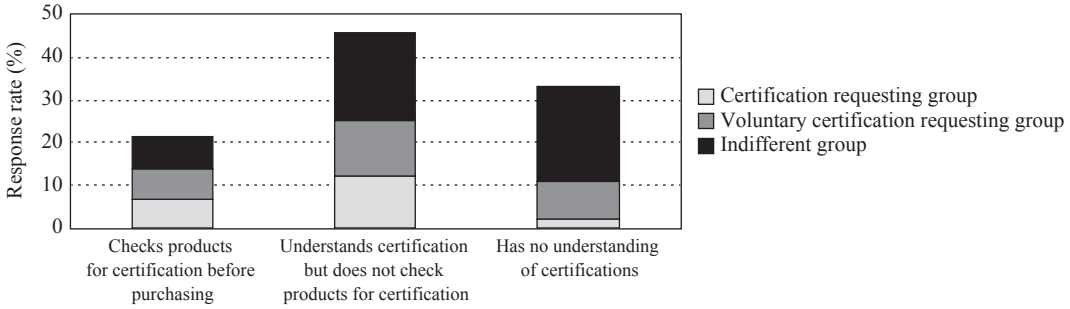

Figure 2. Degree of understanding of foreign halal certification and whether consumers check products for certification.

Assessments of Hokkaido agricultural and livestock products

Respondents were asked multiple choice questions on the type of Hokkaido agricultural and livestock products they would be interested in purchasing. The results show that, in general, most respondents were interested in purchasing marine products, particularly those from Japan, given the popularity of sushi. Next were confectioneries and dairy products (Table 4), indicating the potential for dairy products, such as ice cream, as a core export product from Hokkaido. In addition, 61.8% respondents from the indifferent group were interested in purchasing Hokkaido dairy products. This is higher than the 53.4 and 51.2% respondents from the voluntary certification and certification requesting groups.

The results for respondents' impression of Hokkaido agricultural and livestock products show that those in the certification requesting group perceive the products less favorably (Table 5). A possible reason is that Malaysian consumers do not have much access to Hokkaido agricultural and livestock products. In the indifferent group, on the other hand, a larger percentage considers the products to be palatable and safe and about 28% considered them to be expensive, which is the highest compared to the other two groups. About 46% respondents from the certification requesting group viewed the products as healthy, which is higher than those considering the products as palatable. Importantly, the results show that unfavorable opinions regarding safety are higher, which can be attributed to concerns about damages due to the Fukushima Daiichi nuclear plant disaster in 2011. Many countries have imposed import restrictions on foods from Japan and to this effect, the Malaysian government has increased the stringency of quarantine tests and reports on foods imported from Japan (Johnson, 2011). Given this situation, even if foods are tested for radioactive material in Japan (Bachev and Ito, 2014), the spread of damaging rumors across overseas markets are beyond one's control.

Table 4. Percentage of purchase interest in Hokkaido agricultural and livestock products (%).[1,2]

	Beef	Chicken	Other meat products	Milk	Dairy products	Vegetables and fruits	Marine products	Confectioneries
Certification requesting group	32.6	23.3	9.3	32.6	51.2	39.5	41.9	65.1
Voluntary certification requesting group	29.3	24.1	8.6	31.0	53.4	41.4	63.8	48.3
Indifferent group	30.4	17.6	11.8	36.3	61.8	43.1	58.8	55.9

[1] Respondents were allowed to provide multiple answers. Each response rate indicates the percentage in relation to the total number of responses from each group.

[2] Certification requesting group (n=43), voluntary certification requesting group (n=58), and indifferent group (n=102).

Table 5. Impressions of Hokkaido agricultural and livestock products (%).[1,2]

	Palatable	Expensive	Healthy	Safe
Certification requesting group	34.9	18.6	37.2	18.6
Voluntary certification requesting group	34.5	24.1	46.6	17.2
Indifferent group	48.0	28.4	35.3	21.6

[1] Respondents were allowed to provide multiple answers. Each response rate indicates the percentage in relation to the total number of responses from each group.

[2] Certification requesting group (n=43), voluntary certification requesting group (n=58), and indifferent group (n=102).

Willingness to pay for ice cream

The results for the first hypothesis – consumer preferences do not differ by the halal certification body that grants the certification – show no significant difference in the utility value of the three logos between the certification requesting and voluntary certification requesting groups (Table 6). However, a comparison of the two groups indicates that the utility value of each logo is higher for the certification requesting group, which is an expected outcome since the group has a higher demand for certifications. On the other hand, statistical significance was found only for the JAKIM logo in the indifferent group, suggesting low awareness of foreign halal certification (Figure 2) and that trends appear to lead to the statistical outcome.

The second hypothesis – consumer preferences for Hokkaido ice cream are high – was supported for the voluntary certification requesting and indifferent groups. However, no statistically significant result was found for the certification requesting group.

For the third hypothesis – consumers are concerned with the functional attributes of ice cream – no statistically significant difference was found for functionality in any group. This is possibly because consumers do not have a sufficient understanding of oligosaccharides and 'functional' food products.

Table 6. Conjoint analysis results for ice cream.[1]

Variable names	Certification requesting group	Voluntary certification requesting group	Indifferent group
ASC^{ASCM}	-0.23 (0.704)	2.183 (0.680)***	1.148 (0.403)***
ASC^{ASCH}	-0.804 (0.760)	3.137 (0.713)***	2.400 (0.420)***
ASC^{ASCT}	-2.239 (0.956)**	1.127 (0.887)	-0.555 (0.646)
Halal_M	2.586 (0.492)***	1.258 (0.356)***	0.530 (0.241)**
Halal_J	2.714 (0.638)***	1.360 (0.442)***	0.384 (0.289)
Halal_T	2.713 (0.846)***	1.377 (0.699)**	-1.129 (1.139)
Func	0.386 (0.375)	0.112 (0.359)	-0.439 (0.277)
Price	-0.048 (0.044)	-0.141 (0.047)***	-0.099 (0.032)***
Number of samples	114	137	240
Log likelihood	-105.827	-117.115	-221.856
AIC[2]	227.658	250.162	459.600
AIC/N	1.997	1.826	1.915
ρ^2	0.229	0.139	0.051
Adj-ρ^2	0.211	0.122	0.040

[1] *** and ** denote statistical significance at the 1% and 5% level; the figures in parentheses indicate standard errors.

[2] AIC = Akaike information criterion.

Next, MWTP for ice cream was calculated for each consumer category. The findings indicate that MWTP for the halal logo is considerably high in the certification requesting group; however, that for the halal certification of Thai ice cream is negative. Although under the system, obtaining a halal certification is not necessary for ice cream products, the results appear to indicate that the certification requesting group requires that products meet halal requirements. It is noteworthy that the reliability of price variables after measuring the certification requesting group's MWTP is low since no statistically significant results were obtained.

MWTP for Hokkaido ice cream is 22.2 RM/90 ml and 24.2 RM/90 ml for the voluntary certification requesting and indifferent groups, which is higher than that for Malaysian ice cream. Since the average price a respondent pays for ice cream is 15.6 RM/90 ml, it is reasonable to assume a higher WTP for Hokkaido ice cream and that it can be sold to these groups at a higher price even without a halal logo, although the logo may further increase their WTP for the product. Nevertheless, it is necessary to emphasize the Japanese halal certification and halal logo for the indifferent group.

Possibility of exporting Hokkaido ice cream

Next, we conduct a simple estimation of the expected retail price of ice cream exported to Malaysia and examine the possibility of exporting Hokkaido ice cream. Shojikiya, a retailer in Malaysia, sells ice milk manufactured by a major Japanese confectionery company at 7 RM/100 ml (price in Japan: 3 RM/100 ml). Accordingly, Hokkaido ice cream is expected to be sold at a retail price that is about twice that of the price in Japan when exported to Malaysia. Thus, since Hokkaido ice cream is sold at around 10 RM/90 ml in Japan, the retail price in Malaysia is expected to be 20 RM/90 ml. Consequently, it can be sufficiently competitive as MWTP for the voluntary certification requesting and indifferent groups is expected to be 22-24 RM/90 ml. MWTP further increases if the halal logo is placed on the product. Although it is possible to obtain a JAKIM certification by exporting Hokkaido raw milk ice cream liquid to Malaysia and processing it locally, a company must be able to first source and partner with a local company, which is rather labor and time intensive. In other words, placing a JAKIM logo on Hokkaido raw milk-based ice cream products may not be a realistic option.

More than 50% Malaysian consumers stated that they would be interested in purchasing Hokkaido dairy products and it is essential to provide palatable ice cream products with emphasis on health factors (Table 4 and 5). Hokkaido produces a large amount of high quality beet sugar and raw milk used as ice cream ingredients. As for concerns over safety issues, companies have been actively implementing HACCP owing to encouragement from the Hokkaido Government Office and each municipality. In addition, the Japanese government has been conducting regular tests for radioactive material. Therefore, it is possible to convince Malaysian consumers that Hokkaido dairy products are safe.

6. Conclusions

This study explored the possibility of exporting Hokkaido products and obtaining a halal certification with focus on ice cream products. The results showed no significant difference in the level of consumer trust in halal certification, which supports distribution based on both domestic and foreign halal certification bodies. In other words, it is possible that Malaysian consumers will accept Japanese products with a halal certification approved by JAKIM. In addition, Hokkaido ice cream products would be positively perceived on a satisfaction level. Since Malaysia imports various agricultural, livestock, and food products from various countries, it is likely that Malaysian consumers will view such products favorably. Further, since the level of health consciousness, including the functional attributes of ice cream products, is yet to develop in Malaysia, low demand for such products can be expected.

Drawing on these findings, export strategies for Hokkaido's agricultural and livestock products were considered and MWTP for Hokkaido ice cream products was estimated to be higher than the expected retail price of imported ice cream products. However, the characteristics of our sample do not necessarily match

those of the Kuala Lumpur statistics. As explained in the Methodology section, our questionnaire survey was conducted in AEON Malaysia to ensure a realistic trade situation. The female sample is larger than that of the statistical data, although most of women live with their family (93.6%) and often, the opinions at home are reflected in the results. Therefore, it is possible to say that the results do not significantly differ from reality. In addition, the income level is lower than that in the statistical data, possibly because AEON Malaysia does not target consumers with high income levels. Despite these limitations, the results indicate that even those with low income levels are willing to pay a higher price for Hokkaido ice cream. As for the number of participants by religion, Muslims are fewer in number since the store is believed to be frequented by Chinese consumers. Therefore, an overestimation of the results is possible. However, individual's religious devotion tends to differ: Muslims were categorized under the voluntary certification requesting group (32.8%) and indifferent group (13.1%) and Christians and Buddhists requested for the halal certification (2.7 and 6.7%).

In sum, high positive opinions regarding Hokkaido ice cream suggest the possibility of exporting other processed food products as well. In recent years, halal certification has been largely sensationalized because of the rapidly increasing interest in halal in Japan. The quantitative assessments in this study can serve as a reference when making objective decisions regarding the exports of processed food products with the premise of obtaining a halal certification. At the same time, the most important task for future Japanese export promotion is helping local residents gain a sufficient understanding of halal logos by JHA and JMA, both of which are certified by JAKIM as mutual certification bodies, and emphasizing the safety of Hokkaido agricultural and livestock products and processed products.

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