Consumer preferences in developing and developed country markets of relevance to New Zealand exporters

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Abstract

Understanding international consumer preferences and attitudes towards food is important particularly for countries like New Zealand (NZ) that depend heavily on food exports. Moreover, the focus of NZ exporters has evolved from almost all exports going to Europe, to more going to Asian markets, particularly China. It is important that different cultures and preferences in these markets are considered and understood. This study aims to assess preferences and attitudes towards a number of food attributes, alongside willingness to pay (WTP) for food certified for these attributes. These include basic attributes such as price and quality, but also extend to food safety, health benefits, environmental attributes and animal welfare. The study initially focuses on China, India and the UK, being three important food export markets for New Zealand. Further surveying then expanded the research to include Indonesia, Japan and Korea and to examine in more detail the importance of factors affecting the key attributes of environmental quality, animal welfare, human health and food safety and the relationships between attributes. The survey also assessed the different uses of digital media and smart technology to convey information into market. The results highlight the importance of food safety and health foods in these markets. In general, developing countries valued attributes more than developed countries. This included environmental quality in food which was also seen as key for underpinning food safety.

Keywords: Food Sustainability, developing countries, consumer preferences, cross country comparison, choice experiments

Topic: Consumer behaviour: preference analysis

Introduction

The value that consumers place on different attributes in food products is likely to vary across different countries and commodities. Credence attributes are qualities believed by a consumer to be present in a product even though they cannot be identified, experienced and inspected by consumers whether before or after purchase (e.g. food safety, animal welfare, environmental protection and cultural authenticity). The values and consumers' attitudes and preferences towards credence attributes in food have been investigated in several studies worldwide (Saunders *et al.*, 2011; Eurobarometer, 2009; Synovate, 2007). However, the literature has tended to be concentrated on consumer preferences in developed country markets such as the United Kingdom (UK), and a few studies have been published on how consumers in emerging markets such as India, China and Indonesia evaluate different attributes of food products.

New Zealand is a developed country which is heavily dependent on agricultural exports. Historically, New Zealand's main export market has been the UK but in recent years, particularly Asian countries such as China have gained in importance for New Zealand. It is therefore important that New Zealand exporters understand different cultures and preferences in these markets and how they differ from other markets in order to gain a premium for their exports but also how these can be communicated using digital media and smart technology.

This study aims to assess preferences and attitudes towards a number of food attributes, alongside willingness to pay (WTP) for food certified for these attributes. These include basic attributes such as price and quality, but also extend to food safety, health benefits, environmental attributes and animal welfare. The study initially focuses on China, India and the UK, being three important food export markets for New Zealand. Further surveying then expanded the research to include Indonesia, Japan and Korea and to examine in more detail the importance of factors affecting the key attributes of environmental quality, animal welfare, human health and food safety and the relationships between attributes. The survey also assessed the different uses of digital media and smart technology to convey information into market.

The paper is structured as follows. The next section gives a brief history of New Zealand's agricultural trade and particularly the rise in importance of emerging markets. This is followed by a literature review of consumer preferences for food attributes, especially in the countries of interest, as well as a review of the use of smart technology for obtaining information and purchasing food. Then the methodology of the study is outlined. The design of the surveys

including choice experiments and its implementation are then described, followed by the presentation and discussion of survey results. Finally, conclusions are made.

The importance of emerging markets and consumer preferences

Historically, the UK was New Zealand's largest export market taking almost all exports until 1960. However, the focus of New Zealand exporters has changed over the last few decades with a growth in exports to Asian markets, in particular to China. Since 2010, China has been New Zealand's key export market for agricultural commodities, facilitated through the signing of a Free Trade Agreement between both countries in 2008. In 2014, the export value of New Zealand's agricultural exports to China was valued at NZ$8.4 billion – a 64 per cent increase from the previous year (Statistics New Zealand, 2014). In contrast, New Zealand's agricultural exports to India have fluctuated but in 2010 India started negotiations towards a Free Trade Agreement with New Zealand which has the potential for India to become an important export market (MFAT, 2013). While other Asian markets like Japan and Korea are already well established trading partners for New Zealand, countries like Indonesia has some trade with New Zealand but has been identified as a potential growth market for the future. In particular, New Zealand's trade relationship with Indonesia has been given impetus by the Association of Southeast Asian Nations (ASEAN), Australia and New Zealand Free Trade Agreement (AANZFTA), into which Indonesia became a member in January 2012 (MFAT, 2014).

With growing exports into emerging markets in Asia, it is important for New Zealand exporters to understand consumer preferences and attitudes towards food in these markets. There is some literature on consumer preference in these markets of interest but this varies, and there are few if any studies which compare across countries. For China, studies have shown that food safety is the most important credence attribute for consumers (Zheng *et al.*, 2013; Pan, 2012). A study, using choice experiments, assessed Chinese consumers' willingness to pay for food safety attributes in pork. Results showed that Chinese consumers were willing to pay more for food safety certified pork. They were willing to pay double the price for government certified pork, 70 per cent more for privately certified pork and 50 per cent more for pork certified by assurance schemes (Ortega *et al*., 2011). "Safe food" is argued to be also related to the idea of "green food" in China, with a study finding that consumers associating organics with being safer and healthier because of the lack of pesticide and other residues on food (Thøgersen & Zhou, 2010). It is therefore argued that the high interest in organic products is often driven by concerns for health rather than concern for the environment (Miller *et al.*, 2014). Cross- country comparisons (including China) conducted in 2008 examined consumers WTP for attributes of onions. This

showed that Chinese participants placed a higher value on pesticide-free production than on either GM content or country of origin information. They were willing to pay more than double (+ 120 per cent) for pesticide-free products and 40 per cent more for GM-free products (Ehmke *et al.,* 2008). Another study found that there is a strong preference by Chinese consumer's foods with a health/functional attribute with women's health and children's health segments indicated being the strongest (HKTDC, 2013).

Food safety is also a key attribute in food for Indian consumers. However, there are few studies that have quantified this, Birol *et al.* (2009) assessed Indians WTP for food safety and organics in grapes. Results showed that Indians would be willing to pay an extra 56 per cent for higher quality and safer food.

Some studies have also shown that there is a growing number of Indian consumers who show a preference for environmental attributes associated with food products (Ishaswini & Datta, 2011; Mahapatra, 2013; Saxena & Khadelwal, 2010). Eco-labelling and eco-friendly packaging has been shown to affect the purchasing decisions of urban middle class Indians (Vernekar & Wadhwa, 2011). Similar to China, a study has found that Indian consumer regard organics as a healthier alternative to conventionally produced food due to the lack of pesticide residues rather than environmental concerns (Kumar & Ali, 2011; Finzer *et al.,* 2013; Chakrabarti 2010). A study by Krishna & Qaim (2008) who found that Indians were willing to pay 57 per cent more for residue-free vegetables.

Similarly, food safety is an important attribute in food for UK consumers (The Consumer Council, 2013; Which?, 2013), and this has grown in importance after food safety scares such as the 2013 Horsemeat adulteration scandal (The Consumer Council, 2013) and the 2011 German sprouts E. coli outbreak (EFSA, 2012). Some argue that it is for this reason that country of origin labelling has increased in importance (Font i Furnols *et al.,* 2011; Mintel, 2013a; Mintel, 2013b). UK consumers show a preference for local food which is often argued to be associated with other attributes, including freshness, support for local producers, environmental concerns, better taste, safety, quality and gourmet status (Edwards-Jones *et al.,* 2008; Loureiro & Umberger, 2007). Other credence attributes that are influencing purchase decisions of UK consumers included organic. Similar to China and India, the interest in organics is for reasons in addition to the concern for the environment, such as health (no pesticide use) and as an extension of a healthy lifestyle (Garcia *et al.,* 2010). UK consumers are concerned about animal welfare in food production with studies showing consumers would be willing to pay extra for products which production followed animal welfare standards (Ellis *et al.,* 2009; Napolitano *et*

al., 2007; Nocella *et al.*, 2010). Some studies found other attributes are important to UK consumers when food shopping and influence their purchase decisions, these include ethical production such as Fair Trade and carbon labelling (Nandonde, 2012; Guenther *et al*., 2012; Gadema & Oglethorpe, 2011).

Only a few studies have assessed consumer preferences for credence attributes in Indonesia and even fewer with the in-depth analysis see in those from the UK, China and India. Some inferences can be made with the information that does exist. Some studies suggest that consumer demand for environmental and ethical attributes in food products do exist and maybe increasing in the Indonesian food market (Wulandari *et al.,* 2012), there is particular demand for organic products as part of an increasing interest in healthy lifestyles (Kurnia *et al.,* 2013; Hermawan & Yusran, 2013).

The review of studies on preferences for credence attributes does show consumers value these. However, given their very nature this means they have to be communicated and verified in market. An issue is how to communicate the particular attributes in market and then to ensure that the food products are authentic. However, recent technological advances and their use by consumers are changing the way in which people obtain knowledge and awareness of, and ultimately purchase, food products. Such new technological developments include the use of mobile devices and their integration with the internet (Web 2.0), particularly within the processes of online marketplaces and social media (Miller *et al.,* 2014). In recent years, online shopping has grown in importance amongst consumers internationally. While food still retains a low share of total goods purchased online (around 7 per cent at its maximum in some international markets), some studies suggested that over 50 per cent of consumers have purchased food and grocery items online at least once in the past (Harding & Tager, 2013).

New technology is also used by retailers as a tool for food marketing and communicating credence attributes. In recent years the use of social media sites (e.g. Facebook, Twitter, LinkedIn, Google+ among others) as marketing tools has grown significantly. Experian (2013) indicated that, for internet users in the US, UK and Australia, 27 per cent of time spent online is spent on social media sites (16 minutes of every hour). Also, the uptake of new mobile technologies has been significant in recent years and the type of mobile device used by consumers may be of high relevance when considering a mobile marketing strategy, as a different operating system may imply a differing functionality and use between devices (Miller *et al.,* 2014). The willingness of consumers to accept marketing communications via mobile technologies has the potential to be important for exporters. Gao *et al.* (2013) showed that US,

Chinese and Western European consumers had similar attitudes towards mobile marketing, with the perceived ease of use indicated as the highest influencing factor in consumers' perceived usefulness of mobile marketing. Persaud & Azhar (2012) suggest that brand trust is key determinant for consumers' willingness to accept mobile marketing and consumers prefer to have some control over marketing interactions as far as when and how they would participate.

To summarise, while the reviewed studies indicate a certain level of importance for credence attributes in food products amongst consumers in overseas markets, there is still little known about consumers' attitudes and preferences for credence attributes of food products in some emerging markets in Asia and also between those countries. There have also not been many studies of cross country comparison of the use of digital media and smart technology for obtaining information and conducting purchases of food. These are particularly important to New Zealand exporters who then can differentiate and target their messages using valued credence attributes to the different markets.

Methodology

This study used a three - staged survey process. The first stage included a structured and self-administered pilot survey which was conducted in the UK, China and India in August 2012. The survey was administered through a web-based survey system, and had a sample size of 100 consumers in each country. It was comprised of a range of questions constructed to assess consumers' attitudes and preferences towards a number of attributes and origins of generic food products from New Zealand. The attributes rated by consumers in the survey consisted of basic food attributes followed by environmental and social attributes. This survey then evaluated the amount consumers would be willing to pay, using an open-ended contingent valuation method, in addition to the cost of their usual grocery bill for food products certified for food safety, farm animal welfare and environmental quality. This was to establish bounds for the choice experiment in the second survey.

The pilot survey also informed the attribute selection for the discrete choice experiment in the second survey. The choice experiment was conducted in China, India and UK in November 2012 with a sample size of 2,067 participants which was comprised of 686 participants in China, 695 participants in India and 686 participants in the UK. The choice experiment was to assess consumers' willingness to pay (WTP) for the certification of certain food attributes in both, lamb and dairy products. The completed choice experiment yielded data on preferred choice outcomes conditional on different combinations of attribute levels. The WTP results of the choice experiment were analysed using stated preference method (Tait *et al.*, 2013).

In a third survey, the research was expanded to firstly include further countries such as Indonesia, Japan and Korea and secondly to assess in more detail the importance of factors affecting the key attributes and the relationships between them because the first two stages of this study identified four key attributes as well as price and quality as key factors informing consumer choices and it also indicated that the factors influencing these key credence attributes differed across markets. Thus, the third survey firstly identified the importance of these key attributes and then further assessed in detail the importance of factors that influenced consumers' attitudes towards four key attributes; these were food safety, environmental quality, animal welfare and health foods. These factors are listed in Appendix I. Following this, respondents were asked about what factors they associate with New Zealand. Finally, the survey then had a series of questions on the attitude towards and use of digital media and smart technologies for both obtaining information on and in the actual purchasing of food.

Six surveys were conducted in June 2014. The surveys involved three developed countries (Japan, Korea and the UK) and three developing countries (China, India and Indonesia). As previously, the survey was administered through a web-based survey system, and had a sample size of 100 consumers in each country.

The sampling strategy of the three surveys involved the purchase of a non-random/non-probabilistic survey panel of consumers in the countries of interest from an international market research company. Potential respondents were recruited by email. The email included a short description of the study, a link to start the online survey and instructions to run the survey. In order to target the population of interest in each country, i.e. consumers of middle and upper class consumers who are expected to be more likely to pay a premium for credence attributes in food and beverages, two screening questions and quotas were used at the start of the questionnaire allowing researchers to be in control of the screening process (Callegaro *et al.*, 2014). Participants were screened by

1) Frequency of grocery shopping (Respondents were screened out *if they do not go grocery shopping at least once per month*); and
2) Awareness of New Zealand as a country (Respondents were screened out *if they are not aware of New Zealand*).

The quota sampling was particularly used to target the middle and upper class in each country. This is a common method to ensure a maximum number of respondents from the population of interest was received (Callegaro *et al.*, 2014). Quotas were set for

1) Household income; and
2) The main occupation of the chief income earner of the household. (This was based on the British National Readership Survey (NRS) system to classify respondents' social grade based on occupation).

In analysis, the income and occupational information can be used as an auxiliary weighting variable, if there is difference between the population of the interest and sample (subject to data availability), to adjust the sample to be representative of the population of interest.

Respondents were excluded from the final sample if they had completed the survey in a time that is considered insufficient to allow for adequate consideration of questions (i.e., respondents are just clicking through the survey). This protocol attempted to maintain data quality by removing respondents who may have completed the surveys solely aiming for the compensation.

The original survey was in English. For the Chinese, Japanese, Indonesian and Korean surveys the questionnaire was translated into the respective language by a professional translation service and cross-checked by another translation service.

Results

In this section, the results of the three stages of the study are presented. Firstly, the results of the pilot survey are shown. They describe attitudes and preferences of consumers in the UK, China and India towards a number of attributes and origins of generic food products from New Zealand. Then, WTP results for the certification of certain food attributes in both, lamb and dairy product obtained from the choice experiment in the second survey are described. The results from these two stages identify four key attributes as well as price and quality as key factors informing consumer choices, they also identify that the factors influencing these credence attributes differed across markets, therefore results from the third survey are highlighting the importance of these key attributes to consumers as well as factors influencing these key credence attributes and how they differ across markets. In addition, results about what factors respondents' associate with New Zealand are presented. Finally, attitudes towards and use of digital media and smart technologies for both obtaining information on and in the actual purchasing of food.

Consumer preferences for food attributes in the UK, China and India

The results of the pilot survey provided information on the attitudes and preferences of consumers in the UK, China and India towards attributes of New Zealand food products. As stated above, the sample size of the pilot was 100 in each country.

Based on a five-point Likert scale varying from *very important* to *not important at all*, participants were asked about the importance of the following attributes in New Zealand food products. These attributes were: Freshness; Taste; Quality; Price; and Brand.

The majority of consumers in all countries rated freshness, taste and quality as very important as shown in Figure 1. Interestingly, Indian and Chinese participants rated freshness and quality greater than the respondents from the UK, however this may not be surprising given that the UK has a well-established, generally safe, supply chain and therefore consumers are at less risk of obtaining poor quality produce. Participants in all countries rated taste similarly, with an average of 80 per cent of participants across all countries indicating that taste is very important in a New Zealand food product. Most respondents rated the product's price as *important* or *very important* (an average of 87 per cent across all countries selected *important* or *very important* for the price) but fewer selected price as very important compared with the importance of other attributes. The brand was the least important attribute in New Zealand food products compared with the other attributes. UK consumers rated this lower (19 per cent indicating the brand is very important) than consumers from India and China with 48 per cent and 42 per cent, respectively, indicating the brand is very important.

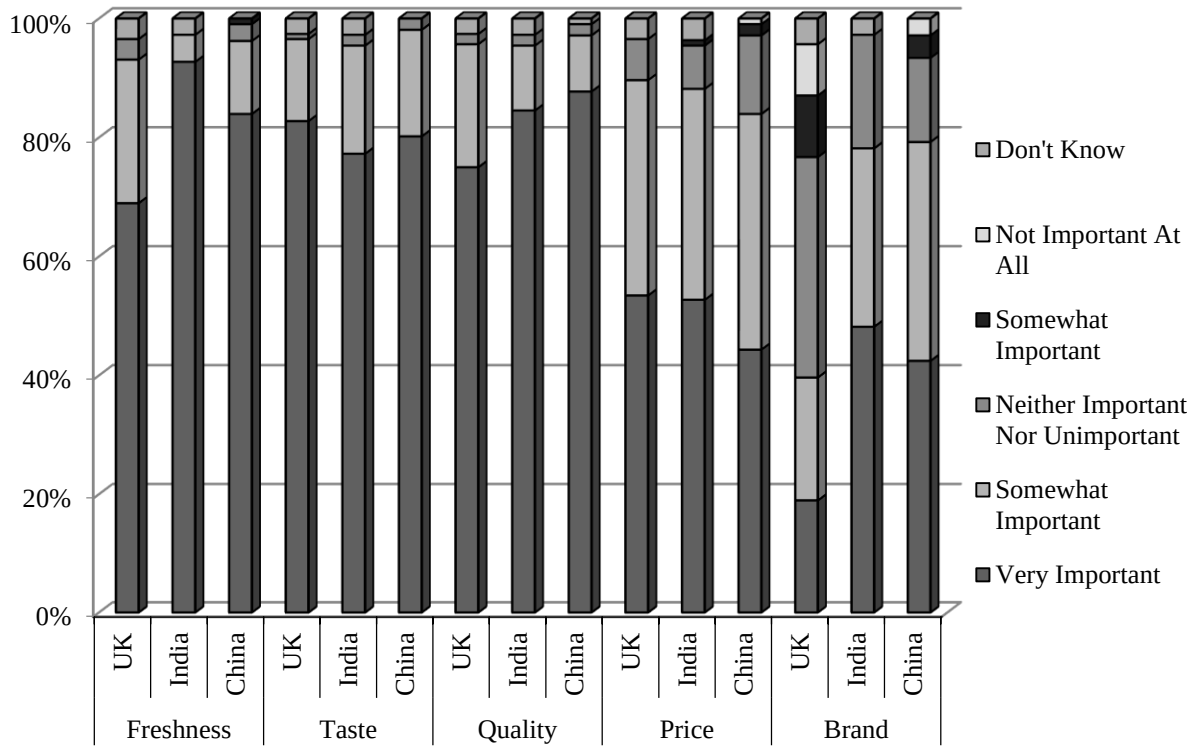

Figure 1: Importance of attributes in New Zealand food products (in per cent)

Figure 2 and Figure 3 show the respondents' importance towards ethical, environmental and other attributes in New Zealand food products. These attributes included: Certified for food safety standards; Country of origin; Recyclable/re-usable packaging; Certified for animal welfare standards; Certified for environmental quality standards; Traceability; Organic; GM-free; and Fair Trade.

Results showed respondents in India and China rated food safety certification as more important than respondents from the UK, with 75 per cent of Chinese and 65 per cent of Indians stating food safety is very important while only 41 per cent of UK respondents find this attribute very important in New Zealand food products. Again this is not surprising given the relatively safe value chain in the UK and recent food scares in China. Similarly, country of origin was rated more important in China (54 per cent indicating very important) and India (40 per cent indicating very important) than in the UK (29 per cent indicating very important) which may be for similar reasons. However, more surprising is that both Indian and Chinese respondents rated the product's recyclability much more important than the UK with 27 per cent of Chinese and 45 per cent of Indian respondents rating it very important compared with only 22 per cent from the UK. Even more surprising is the rating for animal welfare and environmental quality certification with UK respondents reporting this was less important than those from India and

China. For animal welfare and environmental quality, in the UK 34 per cent and 29 per cent of respondents, respectively rated them as very important; these numbers were much higher for China and India, with 42 per cent and 58 per cent in China, and 50 per cent and 55 per cent in India rated them as very important.

The results for environmental quality were perhaps the least expected with twice as many respondents in India and China finding this very important than in the UK. The survey did ask about the interpretation of the terms used in the description of the attributes, particularly animal welfare and environmental quality and what represented good and bad practice. Most respondents did state they understood the terms especially those from India and China. When describing good environmental quality related to food production respondents in all countries described it predominantly as an activity that does not harm the environment. In 'not harming the environment', Indian respondents frequently referred to environmentally-friendly, eco-friendly and pollution-free production methods. Similarly, Chinese respondents commonly commented that the activity should be non-polluting, and they made more references to organic as indicator for good environmental quality than India or UK respondents.

With regards to describing good animal welfare Indian and Chinese respondents mainly referred to good quality of life for the animals including not being mistreated and being well cared for. Indian respondents also commented on animals being well fed as indicator for good animal welfare. In contrast, UK respondents predominantly described good farm animal welfare as free and natural treatment meaning animals are entitled to behave naturally, and free range was a term commonly used in this regard.

The results from the questions about the interpretation of the terms of the attributes informed the third survey of this study when factors relating to the key attributes were developed in order to assess consumer preferences for those.

Furthermore, Figure 3 shows that the majority of consumers in the UK did not value traceability, organic, GM-free and fair trade as very important, especially compared to Indian and Chinese respondents. This is perhaps not surprising for traceability given the UK supply chain, especially with New Zealand, is relatively safe. However, this is more surprising for the other attributes. Organic in particular was the lowest rated of all attributes in the UK, with only 16 per cent of respondents indicating it is very important in a food product, and two thirds of respondents not thinking of it as important. In contrast, 56 per cent of Indians and 45 per cent of Chinese stated organic was very important in a New Zealand food product. The results for GM free and fair

trade were similar. Fifty four per cent of Chinese, 51 per cent of Chinese and 16 per cent of UK respondents indicated that GM-free is a very important attribute in New Zealand food products. Fair trade was seen as very important by 50 per cent of Indian respondents, 42 per cent of Chinese and 21 per cent of UK respondents.

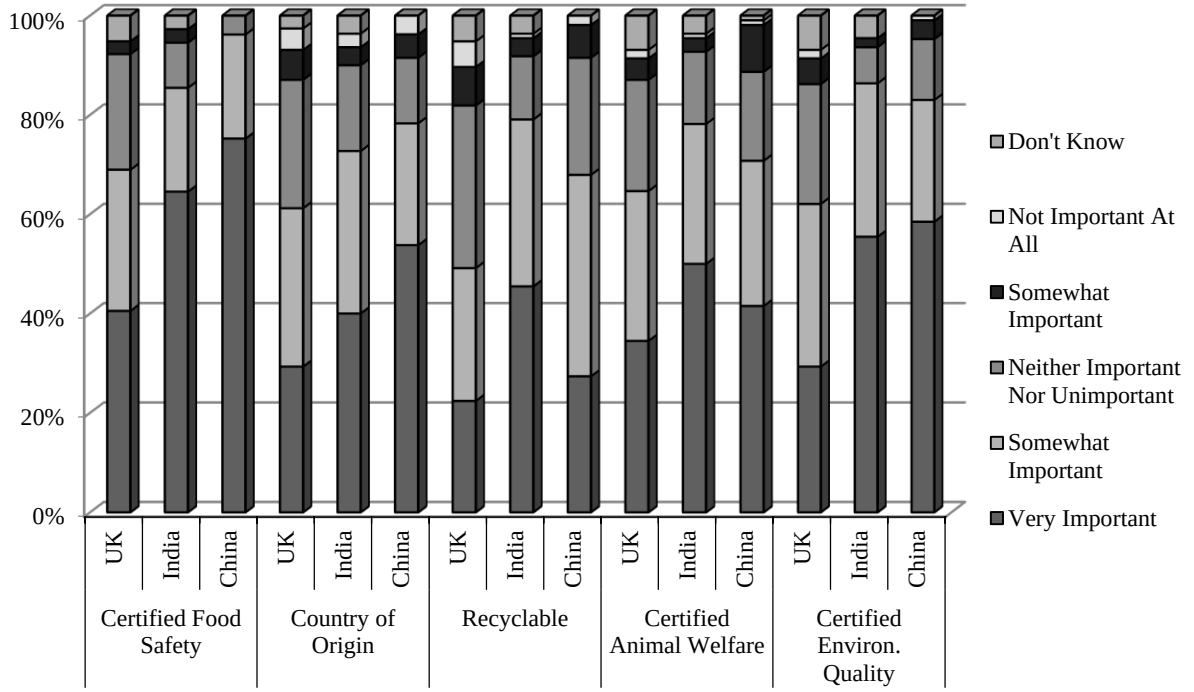

Figure 2: Importance of ethical and environmental attributes in New Zealand food products (in per cent)

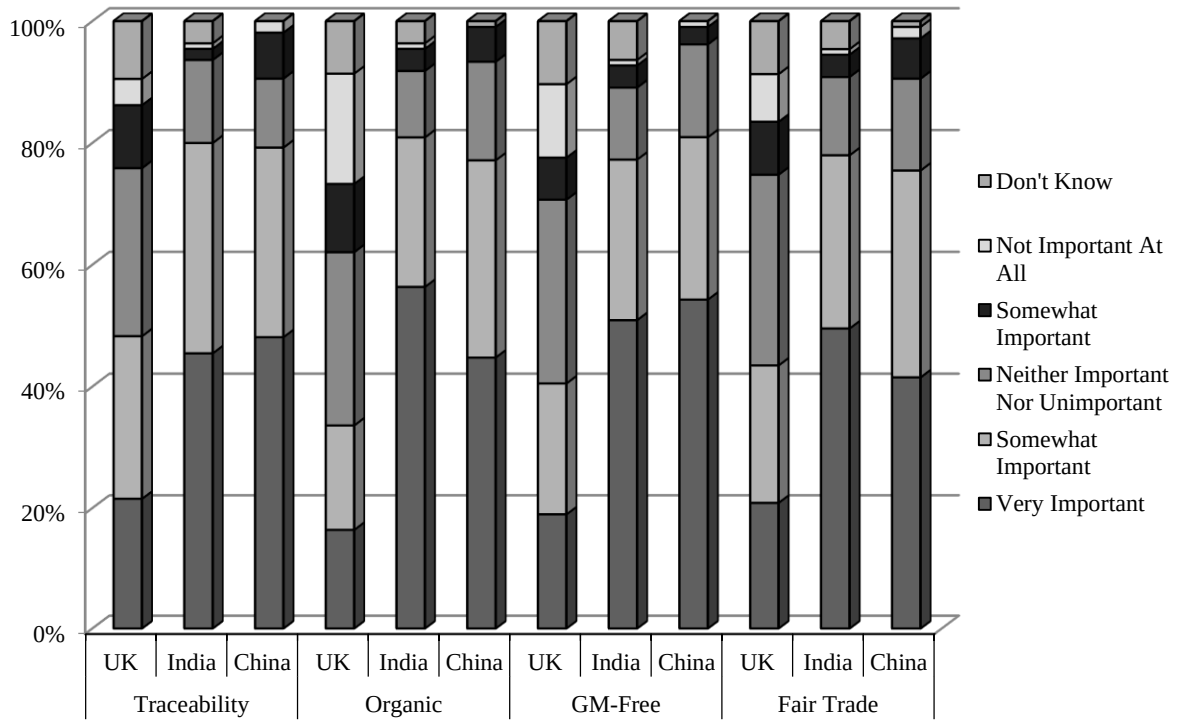

Figure 3: Importance of environmental and ethical attributes in New Zealand food products (in per cent)

Willingness to pay for food attribute certification in the UK, China and India

In order to assess consumers' willingness to pay (WTP) for the certification of certain food attributes in both, lamb and dairy products, the second survey included a choice experiment based on the discrete choice modelling approach. The choice experiment included eight choice sets with seven attributes each made up of a paired comparison of three alternatives. Respondents were asked "*Compared to the lamb you normally buy which of the three types of lamb below would you prefer at the price indicated?"* The attributes included the certification for: Food safety; Farm animal welfare; Water pollution minimisation; Greenhouse gas minimisation; Biodiversity enhancement; Foreign country of origin; and NZ origin.

The WTP results are presented in percentages for all countries in Table 1. Overall, UK participants were less willing to pay extra for product certification than Chinese or Indian respondents; this again may be due to current standards already in place in the food available to UK consumers. If they do not see these issues as in question currently, they may be less willing to pay extra to assure it. UK participants showed highest willingness to pay for animal welfare

certification in lamb products. They would pay 22 per cent more than the normal price for the lamb product with such certification. Chinese respondents' showed highest willingness to pay for food safety certification in dairy products. Respondents were willing to pay 74 per cent more than the normal price. In contrast, Indians showed highest willingness to pay for food safety certification in lamb products for which they would be willing to pay an extra 77 per cent. Chinese had the lowest willingness to pay for lamb products that were certified of not being from China, they were only willing to pay an additional 10 per cent. In comparison, Indian respondents require a 20 per cent price reduction for dairy products that are certified of being from other countries than India. Similarly, UK respondents require a 5 per cent price discount for lamb products that were not produced in the UK.

	China		**India**		**UK**	
	Dairy	**Lamb**	**Dairy**	**Lamb**	**Dairy**	**Lamb**
Safety	74%	44%	73%	77%	16%	18%
Animal Welfare	26%	13%	42%	41%	17%	22%
Water	16%	12%	19%	26%	3%	7%
GHG	25%	14%	38%	39%	7%	7%
Biodiversity	22%	15%	27%	42%	6%	6%
Foreign Origin	26%	10%	-20%	-	-4%	-5%
NZ Origin	49%	24%	10%	21%	3%	6%
Notes:	WTP derived using Krinsky and Robb (1986; 1990) method.					

Table 1: Food attribute willingness to pay as a percentage of product price in China, India and the UK

Consumer preferences in the UK, China, India, Japan, Korea and Indonesia

The previous two stages of this study identified four key attributes as well as price and quality as key factors informing consumer choices. They also indicated that the factors influencing these key credence attributes differed across markets. The third survey included more countries (namely UK, China, India, Indonesia, Korea and Japan), identified the importance of the key attributes and then further assessed the importance of factors that influenced consumers' attitudes towards the key attributes. Following this respondents were asked about what factors

they associate with New Zealand. The survey then had a series of questions on the attitude towards and use of digital media and smart technologies for both obtaining information on and in the actual purchasing of food. As stated above, the sample size of the survey was 100 in each country.

Based on a five-point Likert scale varying from *very important* to *not important at all*, participants were asked about the importance of the following attributes in food products. These attributes were: quality, price, fair trade, animal welfare, environmental quality, health food and food safety when shopping. Figure 4 shows the percentage of replies in each country that responded *important* or *very important* to those seven attributes.

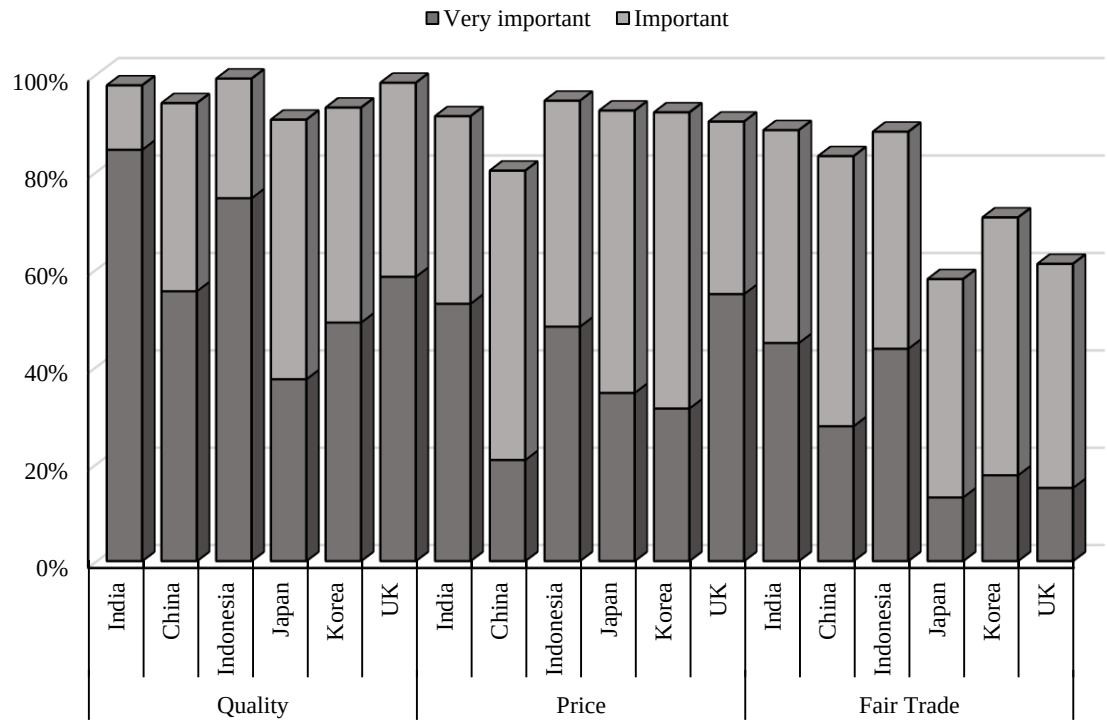

Figure 4: Importance of credence attributes in food products (in per cent)

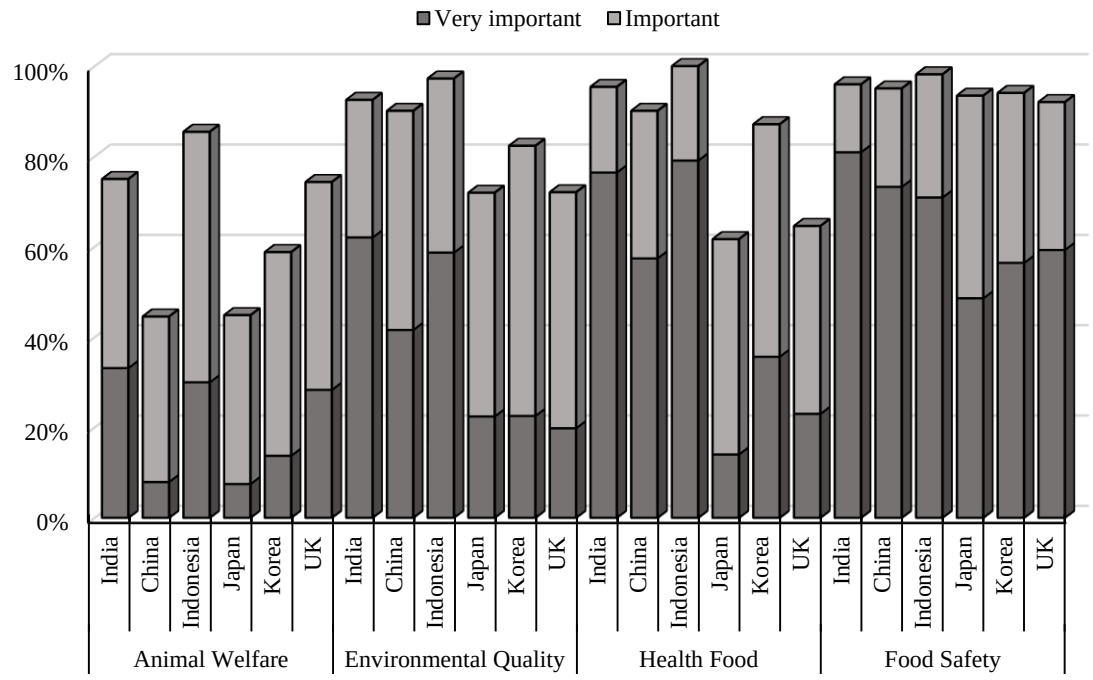

Figure 4 (continued): Importance of credence attributes in food products (in per cent)

As shown in Figure 4, a higher percentage of the respondents from developing countries compared to developed countries stated that quality was an *important* or *very important* attribute. This may reflect the different supply chains in these countries and the controls over these. Price had mixed importance across the respondents in the different countries but was lowest in China. Of all the attributes, fair trade was the least important, particularly among Japanese respondents of whom only 13 per cent rated fair trade as *very important*.

As expected, the results showed that overall food safety is the most important of the four attributes in all countries, with an average of 95 per cent of respondents across all countries indicating food safety to be either *very important* or *important* when food shopping (see Figure 4). This was highest in Indonesia at 98 per cent and lowest in the UK at 92 per cent which again is as expected given the relatively safe supply chain in the UK. The next most important attribute in general was health food with all Indonesian respondents stating this was *very important* or *important*. A high percentage of Indian and Chinese respondents also thought this was *very important* or *important* at 95 and 90 per cent, whereas the percentage was lower in Korea, the UK and Japan at 87 65, and 62 per cent respectively.

Environmental quality was considered *important* or *very important* across all markets with highest per cent from respondents in Indonesia (97 per cent), followed by India (92 per cent), China, (90 per cent), Korea (82 per cent), and Japan and the UK at 72 per cent, each. Animal welfare was considered most important by respondents from Indonesia, then India and the UK with 85, 75 and

74 per cent, respectively stating it was *important* or *very important.* Only 45 per cent of Chinese and Japanese respondents thought this was *very important* or *important* and 59 per cent if Korean. In general, the results showed the importance of the attributes. Animal welfare, environmental quality and health food, were higher among the developing countries than in the developed countries. This is in line with results from the first two stages of this study where Indian and Chinese consumers valued credence attributes in food products more than consumers in the UK, especially for organic, environmental quality, animal welfare and recyclability.

In the next set of questions, participants were asked to rate on a five-point Likert scale varying from *very important* to *not important at all* the importance of a range of factors influencing attitudes towards each of the four key attributes. The key attributes were food safety, animal welfare, environmental quality and health food. The factors of these attributes are listed in Appendix I.

The key factors of importance for food safety were all rated highly in importance by Indian and Indonesian consumers with hygiene standards, rates of contamination, use by date labelling and freshness the most important. In China, the results were similar to those in India and Indonesia but private certification, barn raised animals, animal welfare and low input agriculture were not seen as important. In the developed markets, the percentage of respondents who considered the factors *important* or *very important* were lower although the highest importance was placed on similar factors to the developing countries. Interestingly, a key factor relating to food safety was environmental quality. Results further showed that in all countries government certification was more important to participants than private certification; particularly in the developing countries. Animal welfare as a factor of food safety was an important factor, particularly to Indonesian, Indian and UK respondents but of less importance in the other markets.

The survey also asked participants to consider the importance of factors as they relate to environmental quality. Almost consistently, the developing countries considered all factors to be more important to environmental quality than the developed countries, with the most important factors being; water and air quality; protecting sea life and endangered animals; organic production; and recycling. Recycling was particularly seen as an important factor in Indonesia with 95 per cent of respondents rating it as an important factor in environmental quality. Respondents in India and Indonesia indicated organic production as an important factor affecting environmental quality.

When asked about the importance of factors related to animal welfare, participants in all markets considered good quality of life; shelter and well fed as most important. In contrast, the least important factors related to animal welfare were free range and barn raised. These were of low importance for Japanese respondents with only 17 per cent and 25 per cent considering these factors as important. Interestingly, participants in Indonesia, India and China rated type of feed relatively highly in its importance for animal welfare.

With regards to the importance of factors related to health foods, results were more varied and different factors related to health foods were important to participants in different countries. Child health; bone health; digestive and immune system were most important across the six markets. However, the least important factors related to health foods were country of origin and brand. Interestingly, in India and Indonesia memory was considered highly important while in Korea, India and Indonesia beauty and skin benefits were rated as highly important in health foods.

The next set of questions included queries about what factors respondents associated with New Zealand. Respondents were asked to indicate on a five point Likert scale what factors they consider to be important related to New Zealand. Figure 5 presents the results for each country that responded *important* or *very important* to the attributes. Clean environment was considered most important across all countries, particularly 80 per cent of Indonesians considered it as very important. Open spaces and wilderness were also important in relation to New Zealand, followed by the aspect that New Zealand is not crowded. Other attributes associated with New Zealand included in the survey were innovative, friendly, safe and integrity. Among these, safe was considered most important while innovative was seen as least important in relation to New Zealand.

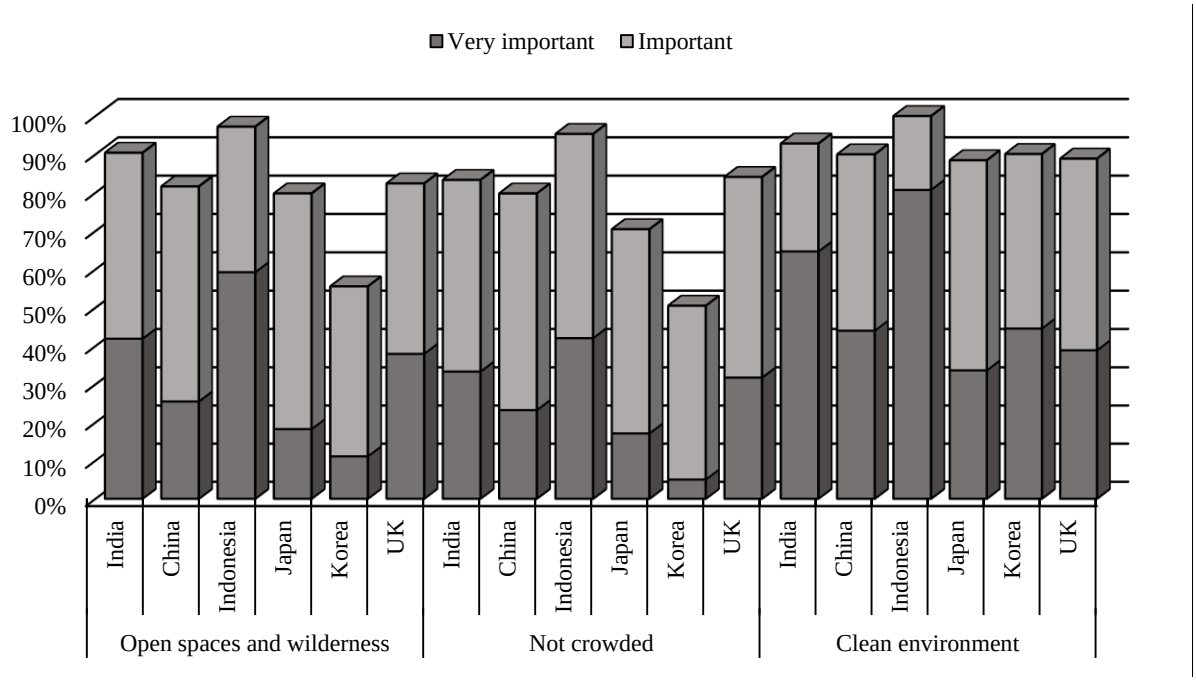

Figure 5: Importance of factors in relation to New Zealand (in per cent)

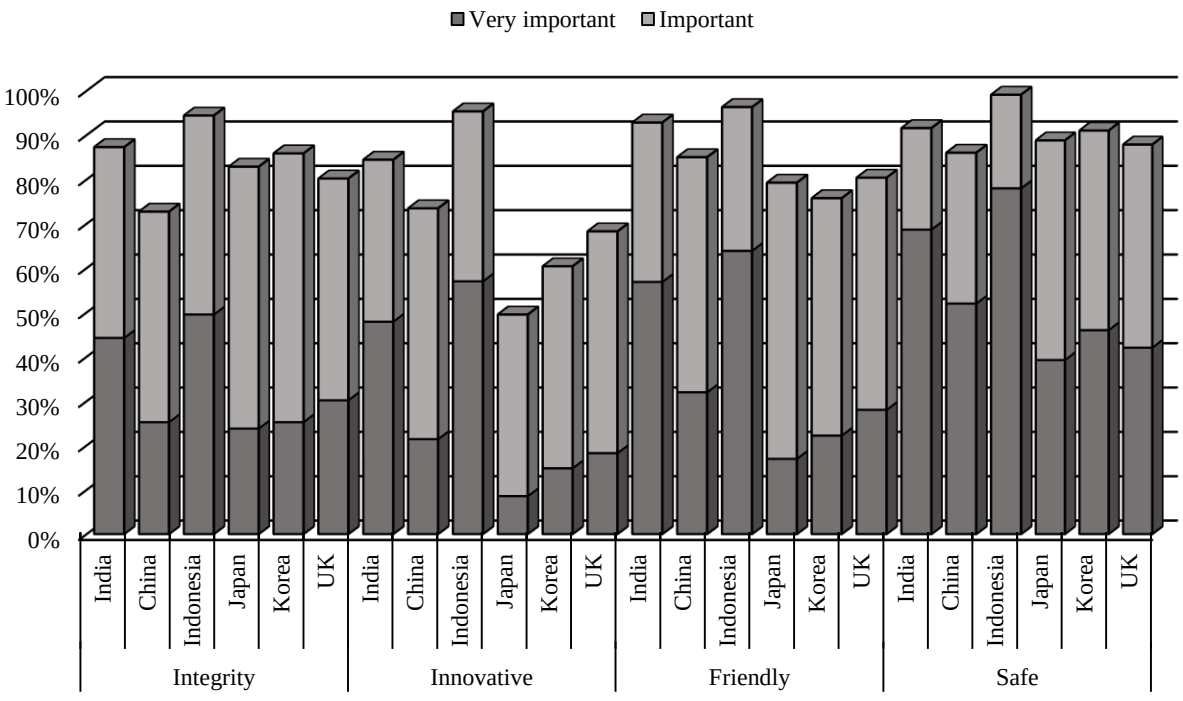

Figure 5 (continued): Importance of factors in relation to New Zealand (in per cent)

The use of digital media and smart technology in shopping and information gathering of food

This study also examined methods by which product information may be communicated within these markets. This specifically referred to digital media and smart technology that are currently used internationally for communication or information sharing purposes. The questionnaire included several questions on consumers' use of these technologies both for obtaining information and conducting purchase of food products within the six markets. When asked what percentage of food shopping and what percentage of other shopping took place online, participants in most countries indicated that they shop for other products online more frequently than for food products (see Figure 6). This is consistent with other studies which found food shopping online was lower (see Harding & Tager, 2013).

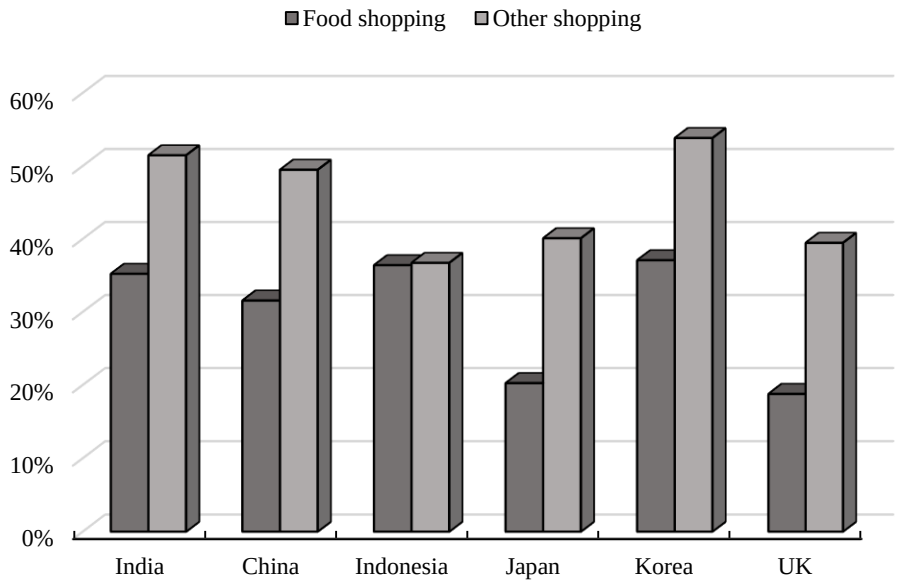

Figure 6: Consumers share of online shopping by type (in per cent)

As shown in Figure 7, the highest overall percentage of online shopping for food products was reported by Korean respondents, with 37 per cent of shopping for food products online, followed by Indonesian respondents (36 per cent), then Indian respondents (35 per cent). The lowest percentage of food shopping carried out online was reported by respondents from the UK, with 19 per cent of food shopping done online.

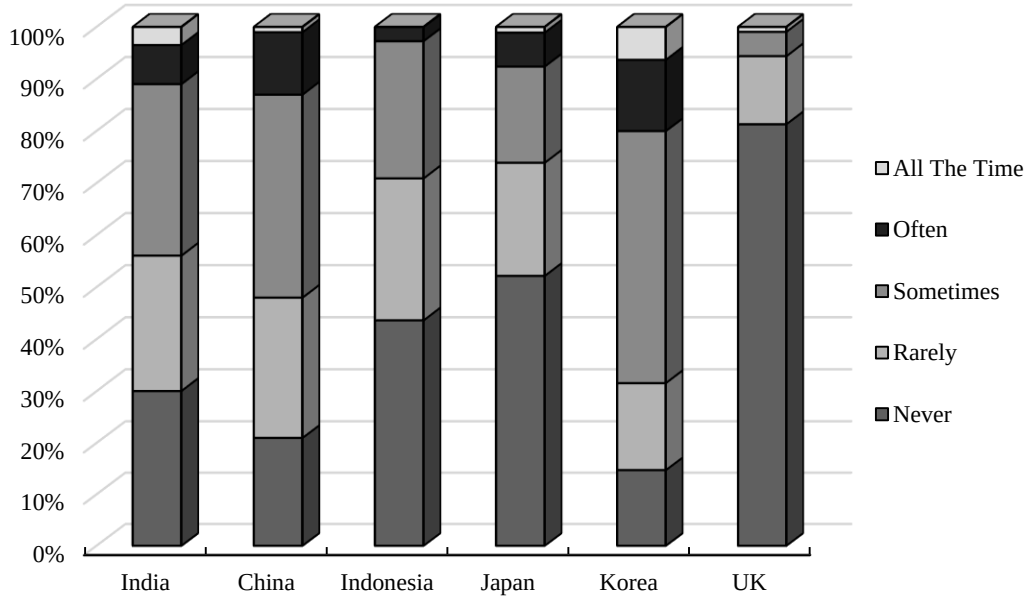

Figure 7: Online shopping behaviour using mobile device (in per cent)

When asked for reasons for shopping online, the majority of participants in each country (excluding Korea) specified that they liked the convenience of having products delivered to their homes, particularly within the UK (59 per cent). In contrast, the majority of Korean participants (53 per cent) indicated their reason for shopping online is that prices are generally lower online. Interestingly, the other main reason for shopping online was to order products from overseas that are better or not available at home. This was particularly indicated by Chinese, Indian, Indonesian and Japanese respondents at 23, 19, 18 and 17 per cent, respectively.

The majority of survey respondents owned a mobile device. When asked how often they use this device for online food purchases, only 5 per cent of the UK respondents stated they used it *often* or *sometimes* for online food shopping with 87 per cent stated they had never used it at all for food purchases. This was much lower than in Japan (18 per cent), Indonesia (26 per cent), China (40 per cent), Korea (49 per cent) and India (58 per cent) as shown in Figure 6.

When respondents were then further asked about their use of a mobile app to obtaining more information about food products, it was shown that more than half of Chinese and Korean respondents have used mobile apps to find out more about food product information. This was in contrast to UK and Japanese respondents of which only 13 per cent and 25 per cent used mobile apps to gather information about food products.

Conclusion

Several studies have investigated consumers' attitudes and preferences towards different food attributes across countries. However, there are only a few studies that assessed consumer attitudes towards basic food attributes and the product's environmental and social performance in some emerging markets in Asia and also across those countries. These emerging markets are gaining in importance for New Zealand and therefore, information on consumers' preferences towards food attributes in these markets, how they differ from other markets and how these attributes can be communicated using digital media and smart technology is important information for New Zealand producers and exporters.

In a three-staged survey process, this study surveyed consumers in India, China and the UK to assess their attitudes towards several food attributes of New Zealand products, their WTP for these attributes, and the impact of this on New Zealand producer returns. The research was then expanded to include Indonesia, Japan and Korea in a third survey and to examine in more detail the importance of factors affecting the key attributes of environmental quality, animal welfare, human health and food safety and the relationships between attributes particularly because the first two stages indicated that the factors influencing these key attributes differed across markets. The third survey also assessed the different uses of digital media and smart technology to convey information into market.

Overall, this study found that consumers valued the credence attributes positively. In many cases, developing countries valued attributes more than developed countries. However, the relationship between the attributes and important factors underpinning the attributes showed differences across the markets. For example, a key factor in food safety was environmental quality being one of the top five for developing countries, but not for the developed countries. The use of digital media in market by consumers also varied considerably with the UK the least likely to use these for food purchases or obtaining further information while consumers in the developing markets such as China, India and Indonesia indicated to use digital media more often.

Differences were observed for consumers' willingness to pay for the certification of different food attributes in lamb and dairy products. While UK participants showed highest willingness to pay for animal welfare certification in lamb products, Chinese and Indian respondents showed highest willingness to pay for food safety certification in both, dairy and lamb products.

These findings will inform a larger survey that will be conducted in April 2015 to elicit WTP for attributes in different markets using choice experiments. In a further step, these results will then be used to calculate the impact of this on New Zealand producer returns using the Lincoln Trade and Environment Model (LTEM); this partial equilibrium trade model forecasts international trade, production and consumption of agricultural commodities.

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Appendix I

Food Safety
Hygiene standards
Rates of contamination
Traceability
Private certification
Government certification
Country of origin
Barn-raised animals
Type of feed
Animal welfare
Reduced use of pesticides
Organic production
GM-free
Number of additives
Environmental quality
Low input agriculture
Freshness
Brand
Labelling of "Use by date"
Environmental Quality
Water quality
Protecting wetlands
Protecting coastal and sea-life
Protecting endangered animals and plants
Protecting native biodiversity
Protecting non-native biodiversity
Air quality
GHG emissions
Organic production
Low input agriculture
Recycling
Open spaces
Wilderness

Animal Welfare
Good quality of life
Good shelter and living conditions
Certification
Animals are well-fed
Type of feed
No cruelty
Humane slaughter
Free range
Natural conditions
Barn raised
Health Food
Digestive health
Detoxification
Beauty benefits
Skin benefits
Heart health
Blood health
Bone and joint health
Pregnancy
Child health
Baby health
Energy and endurance
Weight management
Cholesterol
Memory
Immune system
Country of origin
Brand