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Maximising Export Returns (MER): Consumer behaviour and trends for credence attributes in key markets and a review of how these may be communicated

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Research Report No. 332
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Lincoln University
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List of Acronyms

ASEAN	Association of Southeast Asian Nations
B2B	Business-to-business
B2C	Business-to-consumer
BSE	Bovine Spongiform Encephalopathy
Bt	Bacillus thuringiensis
C2C	Consumer-to-consumer
CAGR	Compound annual growth rate
CE	Choice experiment
CGM	Consumer-generated media
CO2	Carbon dioxide
ECB	Ecologically-conscious behaviour
EPC	Electronic product code
eWOM	Electronic word of mouth
FDI	Foreign direct investment
FMCG	Fast moving consumer goods
FSA	Food Standards Agency
FSC	Forest Stewardship Council
FTS	Food traceability system
GAP	Good agricultural practices
GDP	Gross domestic product
GHG	Greenhouse gases
GM	Genetically-modified
GMO	Genetically-modified organism
GPS	Global positioning system
HACCP	Hazard analysis and critical control point
NFC	Near field communication
NGO	Non-governmental organisation
QR	Quick response
rbST	Recombinant bovine somatotropin
RFID	Radio frequency identification device
RSS	Really simple syndication
SMS	Short message service
UGC	User-generated content
UHT	Ultra-high temperature
WOM	Word of mouth
WTA	Willingness to accept
WTP	Willingness to pay

Executive Summary

This report builds upon earlier work conducted by the Agribusiness and Economics Research Unit (AERU), and examines trends in consumer attitudes toward credence attributes concentrating on key markets (United Kingdom, China, India, Singapore and Indonesia) that are important or have potential for New Zealand exporters.

This report is part of a wider research project 'Maximising Export Returns (MER)', an MBIE funded three year project undertaken by the AERU at Lincoln University. This project aims to explore how export firms can capture price premiums by including credence attributes in products for overseas markets. The purpose of this report is to provide an initial literature review to identify types of credence attributes, explore consumer preferences for them as well as provide an overview of "smart" technologies being used by consumers internationally.

Credence attributes are features of a product that are not directly determinable via product experience (Wirth et al. 2011). Thus they are often expressed by some type of labelling or certification scheme. Examples of credence attributes include those relating to food safety, animal welfare, environmental protection, country-of-origin, functional (or healthy) foods and the use of organic production methods.

Aspects of this work builds on former research work undertaken by AERU (Driver et al. 2011; Saunders et al. 2010, 2013), showing that overseas consumers (including those in the UK, China, and India) value different food attributes in New Zealand products. Food safety was the most important food attribute, not surprisingly India and China rated food safety certification as more important than respondents from the UK. However, more surprising was that in most cases Indian and Chinese consumers valued other credence attributes more than in the UK, especially for organic, environmental quality, animal welfare and recyclability. This indicated that consumers in all markets value credence attributes, and their willingness to pay for different food attributes differ across countries.

Therefore, this study explores these preference for credence attributes further in developing countries. Based on the study briefs, the following markets will be included:

- The United Kingdom (UK), which is an established market that still accounts for a sizable share of New Zealand's export trade.
- China, one of New Zealand's most valuable trade partners (via New Zealand's Free Trade Agreement with China).
- India, a fast-growing market with which New Zealand is negotiating a Free Trade Agreement.
- Other countries like Singapore or Indonesia that have current trade with New Zealand, and have been identified as growing export markets in the future.

The present report includes three parts. Firstly, a background of the selected key markets and their relevance to New Zealand, as well as consumer attitudes towards selected credence attributes in these markets, are discussed. Secondly, choice modelling literature is reviewed to indicate the range of premiums that consumers are willing to pay for these attributes internationally. Thirdly,

recent technological developments focusing on online and mobile phone technology use trends are examined with specific relation to the use of these technologies by firms for direct communication with consumers.

Demand for certain credence attributes were examined in the consumer markets of United Kingdom, China, India, Singapore and Indonesia. Research exists for the United Kingdom, China, and India, fewer studies are available for Singapore and Indonesia. The main credence attribute across all markets (in terms of importance) is food safety.

Amongst UK consumers, the major themes include food safety, traceability, and country of origin labelling (for example, "Buy British"), especially after such food safety scares as the January 2013 Horsemeat adulteration scandal and the 2011 German sprouts E. coli outbreak. Other credence attributes that are relevant for British consumers are organic, fair trade, animal welfare, carbon labelling and local food.

The Chinese market is undergoing rapid change as more people move into urban areas. The most important credence attribute for Chinese consumers is food safety, with a high consumer demand for some form of food safety certification rather than none at all, as well as traceability information. "Safe food" is also related to the idea of "green food" in China, with consumers associating organics with being safer and healthier because of the lack of pesticide and other residues on food.

India is another market of increasing economic importance, with growing urbanisation. Indian consumers are showing an increase in interest for green consumption. Eco-labelling and eco-friendly packaging has been shown to strongly influence the purchasing decisions of urban Indians. Similar to China, Indian consumers also regard organics as a healthier alternative to conventionally produced food due, for example, to the lack of pesticide residues.

Countries like Singapore and Indonesia lack the in-depth credence attributes studies relative to those of the UK, China, and India, though some inferences can be made with the information that does exist. Singapore's affluent consumer class is on the rise, and with national events such as the "Green Singapore Sale" which encouraged consumers to purchase eco-friendly products, there is indication that there is some interest in environmental credence attributes amongst Singaporean consumers. In Indonesia, research on the demand for organic products exists, organic products being a part of an increasing interest in healthy lifestyles.

Choice modelling, also known as choice experiments, is the main tool that economists use to estimate people's willingness to pay for the attributes of products and services. This involves survey processes through which respondents choose their preferred option from a given set of options. This choice-making process involves respondents making "trade-offs", as each option is described with multiple credence (or other) attributes. The choice experiment literature review herein extends beyond the selected key markets (UK, China, India, Singapore and Indonesia) to such markets as Europe and the US in order to provide a wider review of consumer preferences for credence attributes.

Past choice modelling research has shown that consumers value credence attributes. Food safety, in particular, has been valued in many countries. For example, UK and Chinese consumers have

high concerns for the safety of food products following contamination outbreaks (e.g. “Horsegate” in the UK and the melamine scare of 2008 in China). This resulted in an overall lowering of consumer trust in food safety mechanisms and supermarkets. The value of food safety attribute can be measured through choice modelling experiments which show that consumers are willing to pay, on average:

- In China, 69-106 per cent more for certified pork safety and 98-203 per cent for certified milk safety
- In UK, China and India, 18-77 per cent more for lamb and dairy food safety
- In USA, 18-46 per cent more for milk food safety labelling
- In Japan, 110 per cent more for food safety labelled milk and 97-264 per cent more for BSE-tested meat
- In Denmark, 19-105 per cent more for food safety labelling in chicken and pork
- In Japan, Denmark and USA, 26-165 per cent of reduced use of antibiotics in meat and/or milk production

Quality is another credence attribute that has been included in food choice experiments. Some examples of consumer willingness to pay for food quality include:

- In Japan, 103 per cent more for milk products with an extended expiration date of one day
- In China, 37 per cent less for milk been sold after a three month time period
- In Finland and Denmark, 7-111 per cent more for meat products with lower fat content
- In USA, 14-16 per cent more for enhanced quality of pork and beef steak with guaranteed tenderness

In addition, a cross-country comparison indicated that people in Japan and Mexico were willing to pay more for enhanced food safety than for steak tenderness - the opposite was found in US and Canadian studies.

Many countries overseas also have certification schemes for different food attributes such as food safety. For example, the Chinese government introduced food product safety certification in response to recent food safety scares. Choice modelling studies indicate that Chinese consumers prefer government certified products, though other studies (i.e. not choice modelling) show that there is some distrust of these. Similar results have been found across other markets such as the US, but results are not always consistent. For a range of products, consumers were willing to pay:

- In China, 64-140 per cent more for traceability, organic and GM-free for Government certifications; and 46-113 per cent more for foreign or private certifications of traceability, organic and GM-free food
- In USA, 44-74 per cent more for USDA certified (all claims) milk and 11-34 per cent less for privately certified milk
- In USA, 37-120 per cent more for pork and beef food safety with USDA certification, and 5-16 per cent less for private certification

- In USA, 43-96 per cent for variety of animal welfare attributes certified by USDA but with inconsistent willingness to pay (premiums and discounts) for consumer group and third-party certifications

Another credence attribute is local food and country-of-origin. In UK, for example, consumers are marginally more willing to demand local or British made food as a result of food safety scares, with UK consumers willing to pay between 5 per cent less and 6 per cent more for imported lamb and dairy products. The choice modelling studies found similar results across a range of markets, with consumers indicating a willingness to pay premiums for products originating from a particular location, such as:

- In China, 10-49 per cent more for imported lamb and dairy
- In USA, 4-11 per cent more for local milk
- In Denmark, 96-145 per cent for domestically-produced pork and chicken products
- In China, France, USA and Niger, 50-130 per cent more for domestically-produced onions
- In Finland, 30-92 per cent less for imported chicken

Organic production is also a common credence attribute. Interestingly, this was a product attribute found within the limited range of literature on the Indonesian food market. Consumers had knowledge about organics, with health-conscious consumers willing to pay more for these products. This is linked to a common association of organic products as having health (rather than environmental) benefits, including a limited use of pesticides, as indicated by Chinese and Indian consumers. Regarding the estimated values of these attributes, the choice modelling studies indicate that consumers are willing to pay, on average:

- In China, 56-113 per cent more for certified organic soymilk
- In Japan, 140-156 per cent more for organic milk and 32 per cent more for organic oil
- In Spain, 15 per cent more for organic wine
- In various markets, 36-121 per cent more for pesticide-free onions (USA, France and China), bananas (India) and flour (Sweden)

Studies have also explored how consumers perceive genetically modified (GM) food production. Mixed consumer preferences have been found, as while GM can be beneficial (for example, in reducing the need for pesticide use), consumers have indicated concern regarding the direct or indirect effects of consumption of genetically modified organisms (GMOs). In general, evidence from China and India has been mixed. Furthermore, the choice modelling review show that people were willing to pay:

- In China, France, USA and Niger, 40-312 per cent more for GM-free onions
- In China, 61-78 per cent more for GM-free soymilk
- In Japan, 192-219 per cent more for avoiding GM-ingredients
- In Canada, 49 per cent more for GM-free bison steak
- In Sweden, 8-49 per cent more for informing consumers if GM-fodder is used, and 18-95 per cent more if GM-fodder is banned in agricultural production

Functional foods are those that offer health benefits beyond basic nutrition (also referred to as "health foods") and this can be considered as another type of credence attribute. In China and Singapore, for example, there is growing interest on these type of functional/health foods including products designed to enhance the immune system or brain function in children, supplement basic nutrition, or assist with aspects of beauty, among others. Functional foods have also been included in some choice experiment studies, for products such for oil, bread, eggs and wine. The range of premiums that consumers were willing to pay included:

- In Japan, 75 per cent more for certification of functional oil products
- In UK, 19 per cent more for functional ingredients and 19-62 per cent for added health benefits in bread
- In Sweden, 19 per cent more for omega-3 enriched eggs
- In Spain, 58 per cent more for functional wine products

There is evidence that consumers are concerned with environmental issues, particularly with regards to food production processes. The general public's increased awareness of and interest in environmental issues has been also noted by producers and manufacturers who include environmentally friendly and/or recyclable packaging, as well as eco-labels (which identify the environmental friendliness of a product in relation to production and distribution methods), in their products. Regarding environmental attributes, choice modelling studies indicate that people are willing to pay:

- In India, 27 per cent more for low, 10 per cent for medium, but 28 per cent less for high, environmental impact in production processes
- In China and India, 12-42 per cent for reduced water pollution, reduced GHG emissions and improved biodiversity in agricultural production
- In UK, 3-7 per cent for reduced water pollution, reduced GHG emissions, and improved biodiversity, in agricultural production
- In USA, 73-113 per cent more for paper towels certified for "no clear cutting" and sustainable forest management
- In USA, 93-189 per cent more for paper towels certified for enhanced fish and wildlife stewardship and/or reduced environmental pollution

Research from the European Union indicates that many people are concerned about the welfare of animals, with this potentially influencing their purchase decisions. In addition, comparative research between the UK, India and China has shown similar results. The reviewed choice modelling studies indicate that, for selected attributes, people are willing to pay:

- In China, India, and the UK, 13-41 per cent for animal welfare certified lamb
- In Sweden and Denmark, 4 per cent (beef), 32-96 per cent (pork) and 36-112 per cent (chicken) more for outdoor housing/access
- In Sweden:
    - 110-165 per cent more for the limitation of stock density or cessation of the mixing of unfamiliar animal species
    - 21-124 per cent less for the cessation of pig castration

- 38 per cent more for free-range beef, and 122-183 per cent more for free-range eggs

Other concerns for animal welfare include the use of gestation crates, fixation, low stress feeding, tail docking, castration, transporting and feed-types.

Overall, this review indicates that there exists research on credence attributes in many international markets, and that consumers place value on these product attributes. However, the review also shows a gap in the literature regarding the credence attributes in some countries, namely in Singapore and Indonesia, of interest the present wider research project.

A further element of this research project is also to develop an understanding of how firms and producers can use technology to communicate with consumers. Recent advances in online and mobile phone technologies, as well as significant increases in their use and availability to the consumers in both developing and developed countries, have highlighted their importance. Overall, global internet usage has increased between by approximately 33 per cent in the developing world, and approximately 55.5 per cent in the developed world between 2005 and 2013. In 2014, this included approximately 641.6 million users in China (46 per cent of the population), 243.2 million users in India (20 per cent), 57.0 million users in the United Kingdom (89 per cent), 42.3 million users in Indonesia (17 per cent), and 4.5 million users in Singapore (85 per cent). These methods of communication may be useful for exporters as often consumers are unaware of credence attributes in the products that they buy.

The development of new internet-based services and tools within the last decade has expanded the potential of internet use and communication, such as blogs, wikis, online marketplaces, multimedia sharing and streaming services, podcasts, Really Simple Syndication (RSS) and social media.

Online shopping (via online marketplaces) has increased in its importance to consumers internationally, with a high number of consumers claiming the regular use of these services. Fifty per cent of consumers internationally have purchased food products online. However, up to 7 per cent of total food purchases are made online in some countries. For example, online retail is increasing in Indonesia, with expected online sales increasing by 14 per cent between 2012 and 2017. Examples of online marketplaces include online auction sites (e.g. eBay or TradeMe) and large online shopping services (e.g. Amazon.com). Amazon are also increasing their offering of food products in the US, UK and Germany.

Perhaps the most significant development within the Web 2.0 framework is social media. For consumers, this has provided a platform in which they can share content, interact and communicate, and is constantly changing and adapting. In 2013, an estimated 1.73 billion users of social media were identified internationally, which is project to increase to approximately 2.55 billion users by 2017. The Asia-Pacific region currently has the largest user base with approximately 777 million users identified in 2013.

Many major markets are using the same Social Media channels, such as Facebook, Twitter, YouTube, Google+ and similar services, with daily use of these services increasing rapidly. While Chinese consumers are currently unable to access social media services such as Facebook, Twitter

and YouTube around 91 per cent of Chinese internet users are accessing China-specific social media services such as WeChat, Sina Weibo, Tencent QQ and Tencent Weibo for an average of 47 minutes per day. In addition, Indonesia represented the world's largest per capita user base for Twitter in 2013, with 29 million active Twitter accounts registered in Indonesia. Overall, internet users in the US, UK and Australia spent 27 per cent of total time online using social media in 2013, with Facebook indicated as the most popular social media service internationally, with approximately 1.23 billion active users in 2013. For firms and producers, social media provides a way to directly interact and communicate with consumers in a more in-depth way than previously available. In New Zealand examples of companies using social media for communicating with customers include Silver Fern Farms, Fonterra, Zespri and ENZA.

Most common social media sites are Facebook pages or Twitter that companies can use passive communication (i.e. advertising) or active communication (one-on-one public communication) to directly engage with consumers. These forums can provide some indication of brand popularity to businesses by allowing consumers to "like" or "follow" brands and products. The top brands indicated by Facebook likes and Twitter followers are Amazon and Nando's in UK, Tata Docomo and Rendezvous Sports World in India, Batik and XL Axiata in Indonesia, and Samsung mobile and TigerAir in Singapore.

Increases in the popularity of "smartphones" have brought about a new means for consumers to interact with, generate information regarding and purchase food products globally. Integration of mobile technologies with Web 2.0 applications, "The Internet Things", such as social media, is rapidly increasing. Current examples in New Zealand include STQRY that uses global positioning system (GPS) technology to assist the user in finding places of interest in a particular city, Fast, Fresh and Tasty cooking app, and FoodSwitch app aimed at encouraging New Zealand consumers to eat a more nutritionally-balanced diet.

The integration of "real-world" items with internet-accessing mobile devices (otherwise known as "the Internet of Things") has shown future potential as an effective means of marketing New Zealand's food products. This allows marketers to establish a type of participative marketing, through which the consumer is "pulled" rather than "pushed" to the information. An example of this type of interaction is the QR code, which is "scanned" by the consumer via their mobile device in order to receive further information or participate in an interactive process regarding a product or brand. Research has shown that consumers prefer to scan QR codes (and similar points of interactivity) over other forms of interaction with mobile technology including more traditional bar codes.

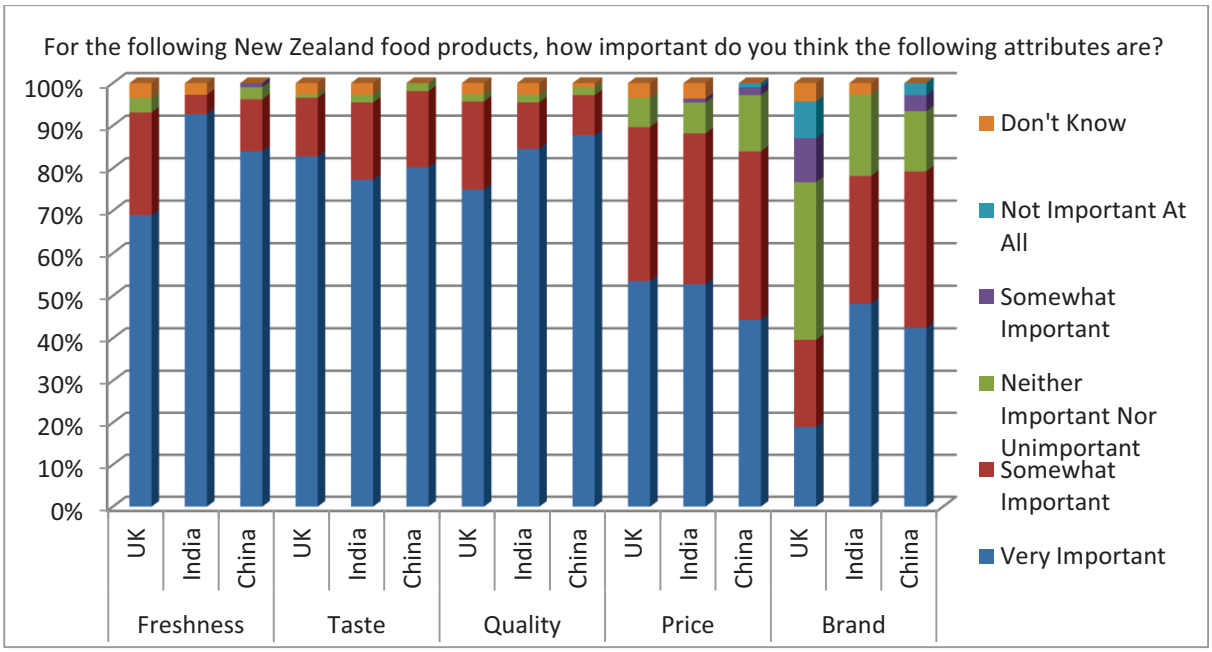
However, there are issues in relation to trust and validity that both firms and consumers need to be aware of. One such issue has been privacy. Despite these issues, these platforms currently provide marketing channels that firms can adopt - the popularity of these tools in the key markets examined in this report may be of future interest to New Zealand exporters. Finally, it is important to note that the trends examined in this report are adapting rapidly, and are thus the information herein is subject to change.

Chapter 1
Introduction

Credence attributes of food are important to many consumers. The value that consumers place on different attributes, such as the product's environmental and social performance and its country of origin, is likely to vary across different countries and commodities. Therefore it is important to explore consumer preferences in different markets. The literature on these values, attitudes and preferences towards different food attributes has tended to be concentrated on consumer preferences in developed country markets, and with few studies from emerging markets. New Zealand is a developed country which is heavily dependent on agricultural exports. Historically, New Zealand's main export market has been the United Kingdom (UK) but in recent years, also China and India have gained in importance for New Zealand.

Previous research by Saunders et al. (2013) assessed consumer preferences and willingness to pay (WTP) for different attributes in New Zealand food products in the UK, India and China. The below is an extract of this 2013 paper. Firstly, Figure 1.1 below, shows the results for importance of freshness, taste, quality, price and brand attributes. A pilot survey with 100 respondents in each country found that the majority of consumers in all countries rated freshness, taste and quality as *very important*. Interestingly, Indian and Chinese participants rated freshness and quality greater than the respondents from the UK where it is likely that to exists a well-established, generally safe supply chain. 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.*

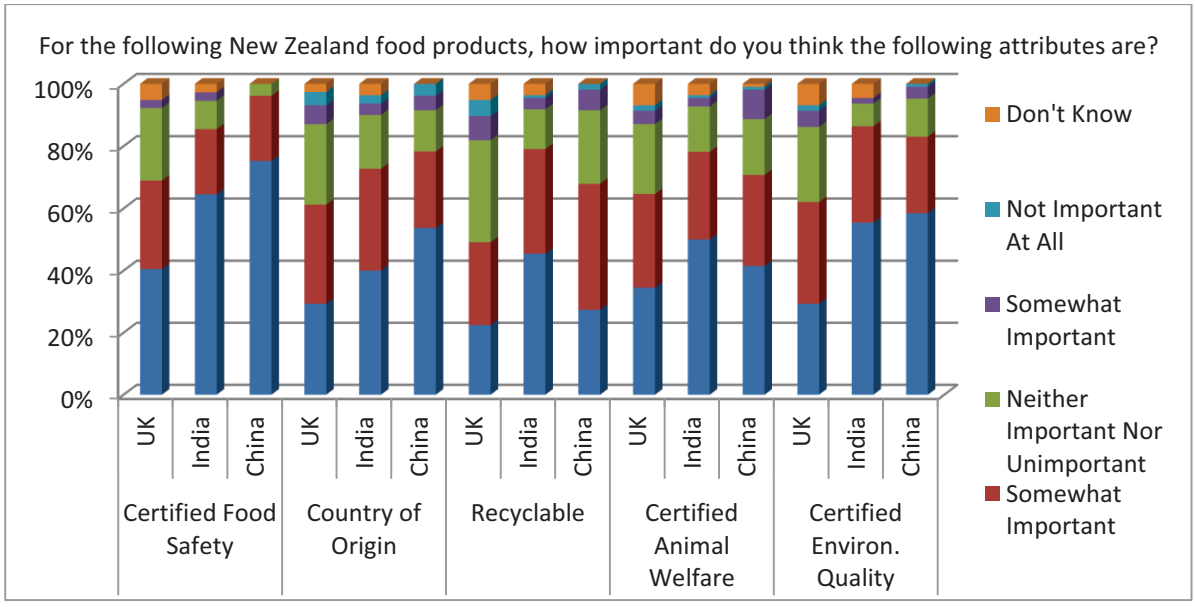
Figure 1.1: Importance of attributes in New Zealand food products



Secondly, Figures 1.2 and 1.3 below show the results for importance of ethical and environmental attributes in New Zealand food products. 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*.

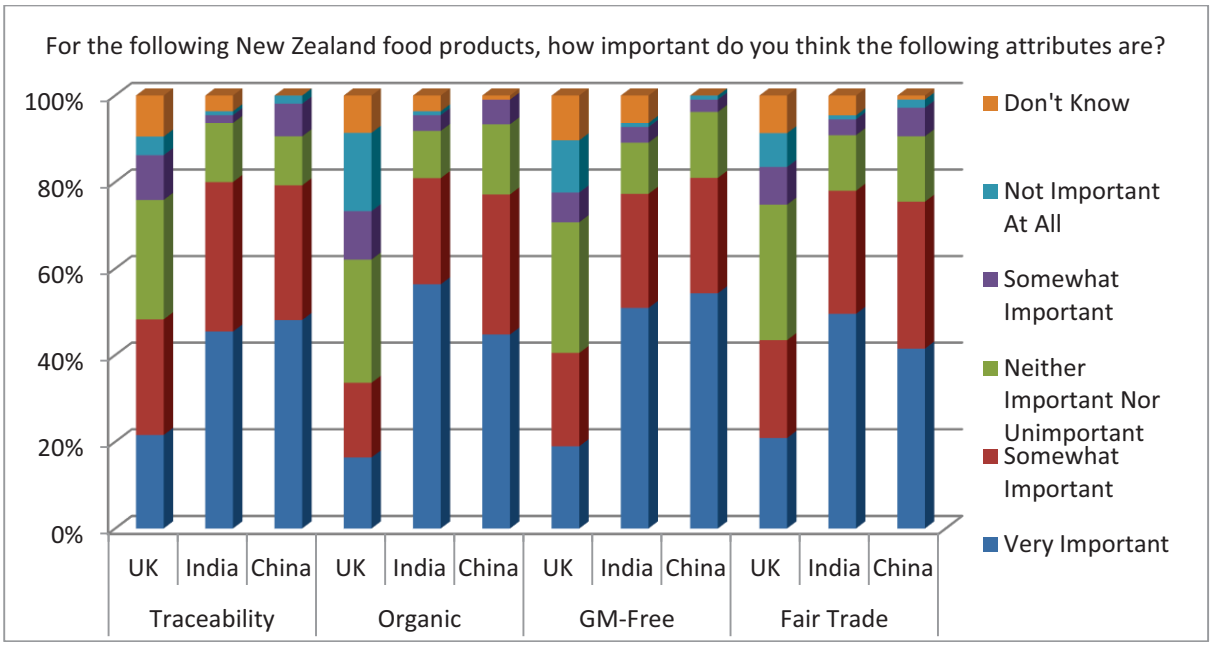
Respondents from all countries described environmental quality related to food production as predominantly as an activity that does not harm the environment. Moreover, Indian respondents frequently referred to *environmentally friendly, eco-friendly* and *pollution-free* production methods; and Chinese 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.

Figure 1.2: Importance of ethical and environmental attributes in New Zealand food products



Thirdly, Figure 1.2 shows that the majority of consumers in the UK did not value traceability, organic, genetically modified (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 1.3: Importance of ethical and environmental attributes in New Zealand food products



Finally, consumers' willingness to pay for food safety, farm animal welfare, water pollution minimisation, greenhouse gas (GHG) minimisation, biodiversity enhancement and country of origin attributes were assessed using choice modelling method.

The WTP results are presented in percentages for all countries in Table 1.1. 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 WTP 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.

Overall, the results of this study find evidence that consumers in the UK, China and India value different food attributes in New Zealand products. It was shown that consumers in the UK, India and China have similar preferences for quality, taste and freshness in a New Zealand product. With regards to attributes for the product's environmental and social performance, among all countries food safety was the most important food attribute, however India and China rated food safety certification as more important than respondents from the UK. The least important food attribute for consumers in all countries was the product's brand. An important finding was that in many cases Indian and Chinese consumers valued attributes more than in the UK, especially for environmental quality, animal welfare and recyclability.

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 WTP for animal welfare certification in lamb products, Chinese and Indian respondents showed highest WTP for food safety certification in both, dairy and lamb products. To conclude, consumer preferences and their willingness to pay for different food attributes differ across countries.

Table 1.1: Consumers WTP for food attributes in lamb and dairy in China, India and UK

	China		India		UK	
	Dairy	Lamb	Dairy	Lamb	Dairy	Lamb
	% of product price		% of product price		% of product price	
Food 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

The development of a thorough understanding of consumer demands for food products in key export markets could be crucial for New Zealand's economy, and for the maintenance and improvement of New Zealand producer returns. This report is part of a wider project, which motivated from this research reported above, extends the research on credence attributes to the other Asian markets that may be off interest to New Zealand exports, including Singapore and Indonesia. Within the current international environment, it is not only important for any parties involved with the export of New Zealand food products to understand consumer demands and methods to quantify this, but also current technologies, which are increasingly opening consumers to a wider spectrum of information, interaction and connectivity with the world at large. These technologies assist in informing consumer attitudes and expectations, both of which are changing rapidly, and prone to constant adaptation and change.

The following report is part of a wider Maximising Export Returns (MER) research project undertaken by the AERU at Lincoln University, and funded by the Ministry of Business, Innovation and Employment. The purpose of this report is to provide a detailed international literature review on consumer preferences towards credence attributes in food products in different markets, as well as modern technology use trends in order to determine methods of effective communication with consumers. The attributes identified in this report will be used in the subsequent parts of this research project.

As stated above, this report examines trends in consumer demands for credence attributes. The credence attribute is defined as product features that that are not directly determinable via product experience (Wirth et al. 2011); hence they may not be directly observed in the physical appearance of the product or at the point of consumption. Examples of credence attributes include food safety, country of origin labelling, traceability, local food, recyclability and eco-packaging, eco-labelling, environmental quality, carbon labelling and reduction, organic, GM-free products, animal welfare, biodiversity and fair trade. Food safety is discussed first in each chapter due to its importance amongst consumers in each market. Food safety is also often associated with a product's origin. Furthermore, a product's origin may pertain to either country of origin or local food labelling.

In this report, consumer demand for these attributes were examined in selected key consumer markets including United Kingdom, China, India, Singapore and Indonesia. These markets were chosen due to their economic significance to New Zealand. The review included general consumer preference literature as well as literature specific to choice modelling. While extensive research exists in the consumer markets of the United Kingdom, China, and India, little research on consumer preferences toward credence attributes in Singapore and Indonesia was found. However, information sourced pertaining to these countries provides insight about their changing market dynamics, which could be of potential future interest to New Zealand. The above markets are not exclusively studied in this report. In some cases, the review was expanded to allow for the inclusion of important recent market developments within other markets and geographical regions. These were particularly those pertaining to cross-country studies and other events that shaped consumer preferences and attitudes towards, and willingness to pay for, credence attributes in food and related products. Finally, this report reviewed a number of technologies which consumers are using in everyday life. The authors would also like to acknowledge the contribution of Beef + Lamb New Zealand in providing information for Chapter 4 of this report.

This report is organised as follows. Chapter 2 provides a description of market developments in the above selected markets, comprising an overview of consumer attitudes and behaviour towards the purchase of food products with associated credence attributes. This is followed by Chapter 3, which presents a focus on the methodology of discrete choice modelling, a survey based tool used in economic analyses to assess a consumer's willingness to pay for different product attributes wherein trade-offs must be made between attributes. This method can be applied to the goods and services familiar in the markets, but also for those products that do not currently exist in markets. Chapter 4 extends this discussion to the context of consumer preferences in relation to technological development, providing a review of different online and mobile phone tools used by consumers in their purchase decisions, and what advantages these tools provide for the companies selling the goods. Chapter 5 provides a summary of all key findings of this report, with particular

reference to consumer preferences towards selected credence attributes, their willingness to pay for these attributes and how technology is currently being used by consumers.

Chapter 2
Market Developments

This section provides an overview of market outlooks and consumer trends in selected countries, including the United Kingdom, China, India, Singapore and Indonesia. For each country, a review of consumer preferences towards food attributes (including credence attributes) is included. "Credence attributes" are defined as features of a product that are not directly determinable via product experience (Wirth et al. 2011). Numerous studies suggest that presence of credence attributes have an impact on consumers' buying intentions, particularly the amount they are willing to pay for a product (Dentoni et al. 2009). Alongside analyses of demand for credence attributes, these markets were chosen because of their economic significance to New Zealand. Extensive research exists in the consumer markets of the United Kingdom, China, and India, though in depth credence attribute research is lacking in Singapore and Indonesia. Country profiles of these changing markets provide insight into how these markets are developing and may be of interest to New Zealand in the future.

2.1 United Kingdom

2.1.1 Background

The United Kingdom (UK) remains an important market for New Zealand exports. The UK has an estimated population of nearly 64 million. The UK currently has the ninth-highest gross domestic product (GDP) in the world, estimated at US$2.39 trillion in 2013, with a real growth rate of 1.8 per cent (per annum). In addition, GDP per capita was estimated at approximately US$37,300 in 2013 (CIA 2014a). Historically, the UK was New Zealand's greatest export market taking almost all exports until 1960. In 2013, New Zealand total exports to the UK was valued at NZ$1.4 billion, comprising 3 per cent of total export value. Exports of specific agricultural products to the UK in 2013, as well as the overall are shown in Table 2.1 below. Agricultural exports in 2013 in particular were valued at NZ$1.08 billion, with the UK representing our fifth-largest export market for agricultural products. The main commodities were meat products (NZ$578 million) and sheep meat (NZ$521 million). In addition, the UK was indicated as New Zealand's second-largest export market for sheep meat products, as well as New Zealand's third-largest market for meat products in general in 2013 (Statistics New Zealand 2014). The overall ranking of this market in total value of exports for the specified commodity groups are also shown in Column 3 (Export Share Rank), with the number 1 representing the highest total export value.

Table 2.1: Exports of New Zealand agricultural commodities to the United Kingdom (2013)

Commodity (or Commodity Group)	Total Export Value (NZ$000)	Export Share Rank
Meat or Meat Products (Total)	578,290	3
Beef, fresh and chilled*	9,744	9
Beef, frozen products*	17,047	14
Sheep meat*	521,974	2
Cheese and curd products	18,314	15
Fruit and vegetables	70,661	8
Wine	279,351	3
TOTAL AGRICULTURAL	**1,083,109**	**5**

Source: Statistics New Zealand 2014.

*Values for commodity type are included in Meat and Meat Products (Total) and do not contribute to the total value of total agricultural exports to this market.

2.1.2 Credence attributes

The first attribute to be discussed is food safety. Concerns have been highlighted by recent food safety scares, including the incidence of horsemeat found in consumer beef products in Europe in 2013. Colloquially known as "Horsegate", this event occurred when traces of horse meat DNA was found in beef products stocked at major UK retailers, causing many consumers to question the efficacy of supply chain logistics, as well as food safety standards. A number of surveys were conducted immediately after the scandal to explore impact on consumer shopping habits and trust in the British food safety system. A study of over 2,000 British consumers by Which?(2013), published three months after the first contamination outbreak showed that confidence in the UK safety mechanisms had decreased. This study surveyed British consumers before and immediately after the contamination event and found that there had been a significant change in consumer confidence; where 92 per cent of British consumers reported a level of confidence in UK food safety mechanisms before the event, this figure had dropped to 72 per cent post-scandal. This study also reported that consumer trust in the food industry had experienced a 24 per cent decrease since the beginning of the scandal (Which? 2013). When asked about the effect this had had on their shopping habits, 60 per cent of respondents indicated a change of shopping habits as a result of the scandal; over two-thirds of survey respondents stated that they felt that the government had been neglecting law enforcement; and half of the respondents indicated a lack of trust in food labelling information (Which? 2013). Another report by the Consumer Council published six months after the outbreak found similar results with a third of respondents indicating that their confidence in the safety of food that they purchased had declined as a result of the scandal (The Consumer Council 2013).

The above evidence suggests that trust in food safety mechanisms have dropped. Similarly, trust in retailers has dropped as well. Following Horsegate, the level of trust in the ability of food retailers to provide safe and traceable food had decreased. Results from a OnePoll survey conducted in February 2013 were reported on the online news source FarmingUK, indicating that a significant decrease in public trust in supermarkets immediately after the contamination outbreak, with stated trust dropping from 69 per cent to 35 per cent (OnePoll 2013, as cited in FarmingUK 2014). This study also showed that 61 per cent consumers indicated that they had little or no trust in supermarkets post-scandal (Smedley 2014). Another study commissioned by

the National Farmers' Union a year after the events showed that public trust had increased to 52 per cent, but still remained about 20 points behind trust levels prior to the scandal (FarmingUK 2014).

The studies above show some drop of consumer confidence and trust. Furthermore, there is mixed evidence in regards to actual purchase habits. In a study published one month following the outbreak, almost half of respondents stated that the scandal had no effect on their shopping habits (Kantar 2013). The Consumer Council study published six months after the scandal also showed similar results, with 40 per cent of participants stated that they were "not affected" by the issues, and another 17 per cent were not "bothered" by them (The Consumer Council 2013). In contrast, Yamoah and Yawson (2014) analysis of supermarket loyal card data showed a constant decline in sales volume of beefburgers over the six weeks immediately following the scandal. However, in an interview with the Yorkshire Post, the Agriculture and Horticulture Development Board's market intelligence and consumer insight manager stated that retail sales recovered a month after the scandal, despite a 20 per cent decline immediately after the event (Yorkshire Post 2013). Furthermore, Agriculture and Horticulture Development Board reported that total sales volume of British meat in 2013 had only decreased by one per cent when compared to 2012 figures (Yorkshire Post 2013).

Similarly, the 2011 outbreak of foodborne illness in Europe rendered similar consumer responses. Between May and June 2011, the European Union (and nearby markets) experienced an outbreak of E. coli (*Escherichia coli*) originating from bean sprouts produced in Germany. The outbreak (described by the European Food Safety Authority as the worst food-borne illness outbreak in Germany for 60 years) caused the deaths of 53 people (51 within Germany), with a total of 3,950 people affected (EFSA 2012). The location of the strain's outbreak was found to be an organic farm in Lower Saxony, Germany, which was subsequently closed down. This particular outbreak resulted in international markets placing import restrictions or bans on German fresh produce, implementing more strict food import inspection processes, as well as taking legal action to mitigate loss of produce sales (BBC 2011; Croatian Times 2011; Deutsche Welle 2011). A study conducted by de Vocht et al. (2012) examined the reactions of 6,312 Belgian consumers to news coverage of the E. coli outbreak in order to quantify consumer food safety risk perceptions of this event. Overall, this study found that, as there were no reported clinical cases of E. coli outbreak in Belgium, consumers did not feel a need to reduce the amount of fresh produce that they consumed. In addition, when consumers' perceived that particular fresh produce items had a high susceptibility for E. coli, a significantly reduced intention to eat fresh produce was observed (de Vocht et al. 2012).

Another attribute UK of concern for UK consumers is country of origin information. A cross-country study by Font i Furnols et al. (2011) evaluated the effect country of origin, price, and feeding system had on Spanish, French, and British consumers' purchase intention for meat. They found that country of origin labelling was the most important factor in the consumer decision making process, where 57 per cent of UK consumers, 47 per cent of Spanish consumers, and 67 per cent of French consumers considered it to be most important. Following the Horsemeat scandal, the above mentioned study by Which? (2013) found that the majority of respondents (83 per cent) stated that country of origin labelling should be mandatory (Which? 2013). Country of origin information was also found to be a significant factor in the formation of consumer trust.

Mintel (2013b) explored a number of factors that could increase consumer trust, with research showing that 43-48 per cent of respondents found British-made ingredients important, alongside manufacturing details (i.e., where and when products were made), animal welfare certification, and the exclusion of artificial ingredients.

Demand for British-made food products also grew following the Horsemeat scandal. A report by Mintel (2013a) compared perceptions of British consumers before and after the scandal, and found that a proportion of those who preferred British food over imported food had increased from 40 to 50 per cent, and 34 per cent of consumers agreed that this attribute was an important factor. Similarly, a third of consumers stated that they were willing to pay more for British-made after the contamination event (Mintel 2013a). Six months after the scandal, Mintel (2013b) conducted a follow-up study, indicating that consumers still preferred provenance-related credence attributes, including British-made foods. Almost half of all respondents (48 per cent) stated that presence of British ingredients was one of the top five factors that influenced their trust in a product (Mintel 2013b). In another study, over three-quarters of consumers felt that British supermarkets should sell more food produced by British farms (Smedley 2014).

Similar trends relating to food origin can be seen in increasing demand for locally produced food that are often available from retail outlets such as farmers' markets. In 2011, there were over 550 markets and 230,000 stallholders throughout the UK (FARMA 2011 as cited in Spiller 2012) with 15 per cent of UK consumers shopping regularly and another 25 per cent shopping locally 'sometimes' (Gadema and Oglethorpe 2011). In a study by Spiller (2012), participants were recruited at farmers' markets around Northeastern England and questioned about their perceptions of food being sold at the markets. The majority of respondents considered local food to be safe, high quality, and “gourmet” (Spiller 2012). Again, the Horsegate scandal also led to an increase in demand for local food. Following the scandal, 13 per cent of UK consumers stated that they were more likely to buy more locally sourced meat (Kantar 2013), while purchases of local foods increased from 17 to 21 per cent in the UK between December 2012 to March 2013 (Mintel 2013a).

International literature has indicated a rise in the amount of labelling information relating to a food product’s traceability and region of origin. This type of labelling can be used to promote food from specific regions that are associated with higher quality (Loureiro and Umberger 2007). Both country of origin and local food are associated with a product’s locational origin, some differences exist. A product’s country-of-origin is often associated with consumers’ trust, including food safety concerns (Mintel 2013b) or potential stronger preferences of products from culturally similar countries (Pouta et al. 2010; Ehmke 2006). Local food, however, has no uniform definition of its geographical location of origin as the term “local” pertains to the proximity of production to consumers. This may range from a subjectively short distance of a production site from a consumer’s location, to production which occurs on a national level; in addition, local food is also often associated with other attributes than the product’s freight distance travelled, including freshness, support for local producers, environmental concerns, better taste, safety, quality and gourmet status (Edwards-Jones et al. 2008). Likewise, country-of-origin is also often associated with a higher level of quality in food products (Loureiro and Umberger 2007).

In addition, functional food sales in Europe, which is another type of credence attribute, have historically been the highest in the UK (Kahl et al. 2012). There is some evidence to suggest that a more health-conscious consumer group is emerging, for example, due to the increase in the number of health-food specialty shops across the market (Verdict 2014).

UK consumers also show a preference for environmental quality credence attributes in food production. This type of information is usually presented by "eco-labels" or sustainability labels. Grunert et al. (2014) explored the relationship between consumer purchase motivation, understanding and use of sustainability labels in the UK, France, Germany, Spain, Sweden, and Poland. Compared to all other countries, the results indicate highest usage of these labels in the UK. Similarly, Aguilar and Cai (2010) assessed the effect of environmental certification labelling on UK and US consumer purchase intentions for wooden bedside tables. Results showed that products with an eco-label were preferred 4-16 times more than those without one within both US and UK consumers. Moreover, the UK respondents preferred products that were certified by a non-governmental organisation over government certification. UK consumers also showed a higher belief in the need for certification in the harvest of tropical forests versus temperate forests, consistent with Kozak et al. (2004) (as cited in Aguilar and Cai 2010) who found that consumers express a negative preference toward tropical wood products due to the perception that environmental forestry practices are poor in these areas. Both US and UK consumers expressed a preference that was 37 and 40 per cent lower, respectively, when a tropical product was labelled with country of origin compared to a product without this information. In total, UK consumers had stronger attitudes toward certified products than their US counterparts and they also had stronger desires for environmental certification of tropical and temperate wood products (Aguilar and Cai 2010).

Similarly, consumer preference for sustainably labelled seafood has been explored. UK consumers pay, on average, a 14 per cent premium on fish with a sustainable eco-label issued by the Marine Stewardship Council (Roheim et al. 2011). Brécard et al. (2009) conducted research of over 5,000 European consumers of fish products and found that the demand for eco-labelled seafood was also influenced by desires for other attributes (e.g., freshness and origin information) and whether the fish was wild caught or farmed, as well as price. The study also showed that consumers that mistrusted fishery regulations were more likely to favour private ecolabels, and that the 'green fish consumer' (described as a consumer likely to purchase these products) is typically an educated woman who is knowledgeable about marine conservation issues (Brécard et al. 2009).

Another environment related credence attribute concerning GHG are carbon labels, which are often associated with climate change. Gadema and Oglethorpe (2011) explored consumer purchasing habits and perceptions towards carbon labels in the UK. When consumers were asked whether "they would find advantage in having carbon labels, 72 per cent of respondents expressed preference for carbon labels in food products" (Gadema and Oglethorpe 2011 p. 818). However, there is a notable level of confusion surrounding these labels as well, with 89 per cent of consumers agreeing that these labels are difficult to understand (Gadema and Oglethorpe 2011). Looking at actual sales there is little or no impact of the presence of carbon labels on consumer behaviour. In a carbon labelling experiment, about 40 grocery products were labelled with colours according to their carbon emissions -- with black representing above average carbon emissions and green representing below average carbon emissions. Sales were then recorded over three months. Results

indicated that black-labelled sales decreased by 6 per cent and green labelled sales increased by 4 per cent over that time. A substantial change was not seen until green-labelled products were made the cheapest, with 20 per cent of consumers switching from black- to green-labelled products (Vanclay et al. 2011). Another study on carbon labels in supermarket own brand products in a large UK supermarket showed that a trial of carbon labels had no significant impact on sales to shift from high carbon to low carbon products (Hornibrook et al. 2013).

Conversely, a high level of awareness and consumer willingness to pay to offset carbon emissions in air travel has been noted. In one study, Brouwer et al. (2008) interviewed 349 passengers in an airport-intercept survey. Of these, 18 per cent were British. They found that UK and Dutch passengers were significantly more aware of the connection between air travel and climate change, with British passengers more concerned than passengers of other nationalities. British passengers also placed a higher value on the environment than other issues, such as employment, health or the economy. Moreover, 80 per cent of European passengers were willing to pay an additional tax on top of their plane ticket for an offset program funding tree-planting. Of all passengers, only 14 per cent protested this tax, offering the justification that they did not believe the tax would make a significant difference. Passengers from North America, Asia, and Europe were willing to pay € 16-27 per flight, where passengers from Europe were highest. On average, all passengers were willing to pay € 23 per flight (Brouwer et al. 2008).

The next credence attribute of consumer concern is organic. Annual sales of organic products in the UK had witnessed its first growth since 2008 (Best 2014). Organic food sales increased by almost 3 per cent to a total of £1.79 billion as of January 2014. Sales of meat, fish, and poultry increased by 2 per cent, vegetable sales increased by 3 per cent, and dairy sales increased by 4 per cent (Best 2014). The provision of locally-grown food as 'organic' has been indicated as a strong purchase motivator for UK consumers, and an attribute that influenced their decision to shop at the farmers' market (Spiller 2012). Therefore, organic certification labelling can affect consumer attitudes. There is also evidence to suggest that health-conscious consumers are increasing their purchases of organic foods, with major UK retailers reporting significant increases in sales of organic products (Doward 2014). Garcia et al. (2010) evaluated supermarket loyal card data of 1.2 million UK supermarket shoppers and conducted focus groups to assess the use of labels in purchase decisions. Their study revealed that consumers purchased organic products for reasons other than concern for the environment, such as health (no pesticide use) and as an extension of a healthy lifestyle (Garcia et al. 2010).

Consumers in the UK have also shown preference for ethical attributes in food products. Such attributes include the preservation or improvement of conditions for affected groups in food production, and includes elements such as fair trade and animal welfare. The inclusion of a higher degree of animal welfare adhesion in food production is in particular demanded from UK consumers. Surveys conducted in the European Union have confirmed that most people are highly concerned about the welfare of animals processed into animal products, and that this will influence their purchasing decisions considerably (Passatino et al. 2008; Toma et al. 2012). A similar study by Mintel confirms that around 40 per cent of UK consumers rate animal welfare as their biggest concern in terms of food choice (Mintel 2010).

The effects of the provision of animal welfare information on consumer perceptions and/or WTP has been assessed in a number of studies. Ellis et al. (2009) administered questionnaires to the general public in central Scotland and northern England to evaluate consumer awareness of UK dairy production methods and animal welfare issues. Half of the respondents indicated that they felt that the UK had a positive animal welfare situation, most respondents (93 per cent) were willing to pay more for the maintenance of "good dairy welfare". However, despite nearly every respondent stating that they were willing to pay for animal welfare, two-thirds of respondents also wanted more information on food production (Ellis et al., 2009). Similarly, Napolitano et al. (2007) administered yogurt taste tests with and without information on various levels of animal welfare to UK consumers. For each product, consumers expressed a higher WTP for products that were labelled with high animal welfare standards compared to those labelled with lower welfare standards (Napolitano et al. 2007). Nocella et al. (2010) study of willingness to pay for farm animal welfare rendered similar results, wherein researchers analysed responses from over 25,000 European consumers (of which 12 per cent were British), with the majority (over 80 percent) expressing that animal welfare improvement was 'very important'.

Another notable ethical attribute that has shown positive response from UK consumers is Fair Trade. This attribute is a trading partnership which aims to provide 'fair prices' to producers, mostly in developing markets, and improve conditions for sustainable development of disadvantaged producers (Poelman et al. 2008). By the end of 2011, the Fair Trade market in the United Kingdom had reached over £1billion in retail sales (Yamoah et al. 2013a). Sales of Fairtrade products in the UK had risen by 14 per cent in 2013, representing increases in sales of Fair Trade-certified products of 316 per cent for fresh produce, 52 per cent for chocolate, and 25 per cent for sugar products (Askew 2014d).

Increased sales of Fair Trade products in the UK mirror stated consumer preferences. Research conducted by Nandonde (2012) showed that credence processing attributes described as 'ethical' (including Fair Trade) are strong influencing factors on consumer purchase intentions. After interviewing over 200 Fair Trade-knowledgeable consumers recruited in Newcastle about their preferences in coffee, results showed that ethical process credence attributes were the most influential in consumer purchase intention, with 'Fair Trade' having the highest influence.

There is also some evidence to suggest that UK Fair Trade consumer loyalty withstood the economic recession of 2008. Bondy and Talwar (2011) conducted an online stated preference survey amongst consumers in the UK, US, and Canada to assess their loyalty to Fair Trade during the economic recession. An online survey was administered to over 300 Fair Trade consumers, and results showed that, though 'occasional buyers' showed a decrease in Fair Trade purchases, regular buyers purchased Fair Trade products during this period. In addition, although American and Canadian consumers significantly decreased their spending on Fair Trade products, UK consumers did not (Bondy and Talwar 2011). However, other studies have shown a decrease in Fair Trade purchases in relation to product price increases. Yamoah et al. (2013b) estimated the impacts of price, distribution, and promotion of Fair Trade products on sales volumes. Contrary to the Fair Trade operational ideology (that consumers will pay a premium to provide a fair price to producers), consumers in this study reacted to price similarly to the way conventional shoppers do; and while distribution had a positive effect on sales, there was no statistically significant correlation revealed between promotional activity and sales (Yamoah et al. 2013b). Similarly,

Yamoah et al. (2013a) explored Fair Trade buying behaviour through loyalty card data in order to understand which market segment purchase Fair Trade products. Their results showed that Fair Trade products do not present an equal appeal to all consumer segments, with affluent consumers, young families and older families showing higher appeal, and young adults (students included) in the low appeal category. Based on these findings, it is suggested that, due to the differences in consumer segmentation, shifting focus on marketing activity to consumer segments willing to pay a premium would be well advised, as opposed to continuing attempts to 'mainstream' Fair Trade products (Yamoah et al. 2013a).

2.2 China

2.2.1 Background

The People's Republic of China is currently the world's most populous country, with a population of 1.35 billion (estimate for July 2014). At present, the total gross domestic product (GDP) of China sits at US$13.39 trillion (2013 estimate) – the third-highest country in terms of GDP in the world – with a real growth rate of 7.7 per cent (2013 estimate). In addition, GDP per capita for Chinese consumers was estimated at approximately US$9,800 in 2013 (CIA 2014b).

China has become a major export market for New Zealand, and now ranks as New Zealand's second-largest export market (NZT 2014), as well as the largest export market for New Zealand agricultural products. The signing of a Free Trade Agreement with China in October 2008 has led to a significant overall increase in trade between New Zealand and China. Trade values for specific New Zealand agricultural commodities to China in 2013 are shown in Table 2.2 below. This table demonstrates that New Zealand's agricultural exports to China was valued at NZ$6.98 billion in 2013 – a 55 per cent increase from the previous year. In addition, China held the top position of total export value for sheep meat, dairy, milk, cream and butter products from New Zealand, as well as holding status as New Zealand's second-largest export market for frozen beef products, meat products overall, and fruit and vegetable products. China is also New Zealand's third-largest export market for cheese and curd products (Statistics New Zealand 2014). The overall ranking of this market in total value of exports for the specified commodity groups are also shown in Column 3 (Export Share Rank), with the number 1 representing the highest total export value.

Table 2.2: Exports of New Zealand agricultural commodities to China (2013)

Commodity (or Commodity Group)	Total Export Value (NZ$000)	Export Share Rank
Meat or Meat Products (Total)	1,025,554	2
Beef, fresh and chilled*	3,893	19
Beef, frozen products*	185,741	2
Sheep meat*	669,094	1
Dairy (Total)	4,752,670	1
Milk and cream**	4,029,670	1
Butter**	267,757	1
Cheese and curd products**	117,678	3
Fruit and vegetables	119,428	2
Wine	20,993	6
TOTAL AGRICULTURAL	**6,979,165**	**1**

Source: Statistics New Zealand 2014.
*Values for commodity type are included in Meat and Meat Products (Total) and do not contribute to the total value of total agricultural exports to this market.
**Values for commodity type are included in Dairy (Total) and do not contribute to the total value of total agricultural exports to this market.

There is significant evidence to suggest that China has a substantial number of wealthy consumers interested in purchasing premium goods. In 2012, it was estimated that China was home to 50 million affluent consumers, with this figure expected to increase to approximately 280 million people by the year 2020 (BCG 2012). Furthermore, wealthy Chinese consumers have linked the purchase of premium and/or luxury goods to a symbolic conveyance of personal success and prestige. These trends are most marked in major cities in China, where types of luxury products types is expected to diversify by the year 2020 (BCG, 2012). This is in line with retailer behaviour in this market, with US retailer WalMart's strategic outlook shifting to focus for its' 400 Chinese supermarket outlets on wealthy Chinese consumers in major cities over general public (Riley 2014).

2.2.2 Credence attributes

The first attribute to look into is food safety, an important one in China. Food safety issues in the Chinese market have led to scepticism of the domestic food industry, and to increases in consumer concern for food safety. A survey with over 1,000 respondents showed that two-thirds of respondents ranked food safety as their dominant social concern, over high consumer prices and government corruption (Pan 2012 as cited in Bai 2013). Similarly, Zheng et al. (2013) surveyed urban consumers on their preferences for food attributes and found the food attributes that were considered as most important were not those related to taste or texture, but those related to food safety such as the minimal use of preservatives and pesticides and low chance of foodborne illness.

The Chinese food market has experienced a number of food safety scares in recent years. This includes incidences of tainted meats and dairy products, such as US retailer Wal-Mart's "fox meat scandal", wherein fox DNA was found in stocked delicacy donkey meat products in 2014 (Jourdan 2014). Perhaps one of the most significant incidents regarding food safety to New Zealand within the Chinese food market was Fonterra's botulism scare. In August 2013, Chinese authorities declared a ban on all Fonterra products entering the Chinese market after Fonterra suspected the incidence of a type of bacteria that can cause botulism in a batch of whey protein powder. The batches in question were produced in May 2012 in a New Zealand-based processing plant, which was found to have an incidence of the bacterium *clostridium botulinium*, with authorities finding unacceptable levels of the bacteria at the processing plant site in late July 2013. As a result, international partners using Fonterra raw materials also recalled products, including Danone and Nutricia, and Fonterra experienced a complete import ban from China (Askew 2013a). While the products themselves contained no incidence of harmful bacteria, Fonterra faced import bans from other international markets including Russia, Belarus and Kazakhstan that were later revoked by governing bodies in these markets (Best 2013).

Chinese consumer concern for food safety could be associated with consumer preference for industrial scale production over traditional small-scale farming. Dutra de Barcellos et al. (2013) surveyed over 470 consumers across six Chinese cities, and found that consumers indicated a higher preference for industrial pig farming methods over traditional, less-mechanised methods.

This may be due to a perception of industrialised farming systems as being more modern and therefore more able to guarantee quality and safety than family-run operations (Dutra de Barcellos et al. 2013). In relation to animal welfare, Zhao and Wu (2011) surveyed over 260 visitors to Chinese zoos in order to explore consumer understanding and WTP of animal welfare. Researchers found that though 58 per cent of respondents had heard of the term 'animal welfare', there was a low level of understanding of the concept with 80 per cent of the sample having a low understanding or no understanding (Zhao and Wu 2011). However, the majority of the sample (88 per cent) agreed that people should pay more attention to animal welfare, and 85 per cent responded positively towards the creation of animal welfare legislation. When asked about WTP for animal welfare improvements, the majority (90 per cent) favoured paying to improve animal welfare. Education and income had an effect on all factors, while age and career type had an influence on awareness and understanding (Zhao and Wu 2011).

The Chinese government has recently introduced a number of food safety assurance schemes including a system of food labels. However, many consumers have limited trust, as well as limited recognition, understanding and trust in the authenticity of these labels (Sun and Collins 2012; Liu et al. 2012). Consumers have indicated a level of distrust of these certifications, suspecting that they can be fraudulent or attained without meeting the necessary standards and, in general, not trusting the government's ability to uphold these standards (Sun and Collins 2012). However, consumers still seem to prefer some sort of certification than nothing at all (Sun and Collins 2012). Han et al. (2012) also showed that, although there is a demand for certified safe products in China, factors such as price and income constraints, and perception of safety risks in the market have significant impact on purchase intention of these products.

This reported lack of trust in the government's ability to assure food safety has led to some consumers to looking elsewhere for food safety information. Instead of determining food safety from government-issued food labels, there is evidence that consumers are beginning to look towards the retailers. Zhang et al. (2010) evaluated how consumers determined safety when purchasing milk products; they found that consumers in Beijing had limited trust in food safety assurance logos, and instead were more likely to use the retailer's reputability to judge the safety of the product. It was also found that 80 per cent of respondents ranked the outlet of purchase as the most important factor when determining a product's safety. Other research has shown that Chinese consumers use their trust in retailers to determine the safety of the products in question, indicating the importance in maintaining the reputation of food suppliers and retailers (Chen 2013). Other sources of food information, such as media, can also play a significant role in offering safety information to consumers. While it has been implied that the Chinese media tends to limit public exposure to information regarding food safety incidents (Xu and Wu 2010), the mass media (eg. television and newspapers) are still consumers' main sources of food safety information (Liu et al. 2013). The Chinese government has its relaxed media restrictions in recent years, allowing reports about environmental issues on the condition that the government itself is not implied to be at fault (Brandes 2013). Furthermore, other research has found that the only sources of information that are considered indisputable by Chinese consumers are recommendations from friends or family members, indicating that interpersonal networks have the potential to transcend information attained from both government sources and retailers claims (Sun and Collins 2012).

Trust has been noted as an important influencing factor on Chinese consumers' purchasing decisions. In a study by Chen (2013), over 1,000 consumers in Beijing were surveyed to see how types of trust relate to perception of food safety. Results of this study suggest that improvements in consumer trust of retailers and manufacturers could contribute to an increase in the perception of safety in food products (Chen 2013).

In line with Chinese consumers' food safety concerns, demand for the traceability of agricultural products has increased in recent years. Xu and Wu (2010) conducted a study that evaluated consumer perception of food safety and WTP for milk that was certified traceable by the Chinese government. Out of over 1,750 respondents, a third of consumers stated that they were "strongly dissatisfied" with the food safety situation in their region, and another third chose to purchase certified traceable food. Out of the 569 respondents who chose to purchase certified traceable food, over two thirds were willing to pay an additional premium. WTP for these premiums are shown in Table 2.3. It was also found that over two-thirds of respondents were unaware that the food traceability system (FTS) even existed; finally, overall analysis showed that "awareness of the FTS affects both consumer purchase choices and WTP for CT [certified traceable] food" (Xu and Wu 2010 p. 1372). Willingness to pay is also associated with the certification entity. Currently, government CT schemes are preferred over a third party, but it has been anticipated that Chinese consumers will show a higher preference for third parties in the future as awareness for these certification schemes rises (Bai et al. 2013).

Table 2.3: Chinese consumers' WTP for certified traceable food

Percentage of respondents	Additional premium (%)
32	0
53	1-15
11	16-30
3	31-50
0.5	Over 51

Source: Xu and Wu 2010.

The second attribute is country of origin. China has recently increased total imports, with consumers in this market indicating preference for imported products (OECD, 2013). Some studies have suggested that imported food is often regarded as higher quality and safer than domestic equivalents (Zhou and Hui 2003; Knight et al. 2008). Countries like New Zealand and Australia, which are perceived to be "clean and green", are more likely to harness a premium from consumers who are very concerned about food safety (Chen 2012). In a 2012 assessment of consumer preference for country-of-origin, 18 per cent of respondents preferred food imported from Australia and New Zealand over all other regions, including those of Europe, Japan, Korea, USA, Hong Kong and Taiwan (Chen 2012).

There is also a strong preference by Chinese consumers for health/functional foods. In China, the value of the functional foods market has been estimated at RMB 600 billion; with this value expected to increase to approximately RBM 1 trillion by the end of 2015, with an average annual growth rate of 20 per cent. Within the functional/health foods market in China, three distinct product types were identified by the Hong Kong Trade Development Council (HKTDC): traditional health food, modern health food, and functional health food. A HKTDC study found that, in 2013, the market share of the Chinese health food market for functional foods was 65 per

cent, with nutritional supplements accounting for the remaining 35 per cent. The three main health food imports include products designed to enhance the immune system (26 per cent), nutritional supplements (18 per cent), and products designed to improve blood lipid reduction functionality (12 per cent). Furthermore, China's disproportionately aging population may bring about steady growth in the functional foods market, with "green health" consumers assisting the market segment's growth (HKTDC 2013).

In a consumer survey conducted by Hong Kong Trade Development Council (HKTDC 2013), 59 per cent stated that they had taken nutritional supplements, 55 per cent had consumed health foods, and a 23 per cent had taken health foods with added functionality. Specific segments of Chinese consumers interested in purchasing health products differ, women's health and children's health segments indicated being the strongest. Within the women's health segment, consumers purchase products which claim to assist with aspects of beauty, weight loss, blood replenishment, bowel movements and detoxification, while children's health segment participants purchase high volumes of products that claim to assist with brain function, bone strengthening, enhanced immunity and memory improvements. The popularity of these types of foods has been attributed to the growth of "green consumers" in China, as well as resultant from consumer food health scares (HKTDC 2013).

Besides concern for food safety, country of origin, and functional food, Chinese consumers are beginning to show a development of what Shwartz (1994) (as cited in Thøgersen and Zhou 2012) has called "universalism" values, which describe altruistic virtues such as environmental protection and social justice rather than egoistic ones like saving money or earning it. The prevalence of these are not yet comparable to those in Western markets. In order to quantify the presence of these values, the "Consciousness of Green Consumption" survey questioned respondents about their motivations for purchasing "green" products. The results revealed that the purchase decisions were motivated by egoistic reasons such as concerns over health (by 40 per cent of respondents) and by fashion (35 per cent of respondents), whereas almost a quarter of the respondents indicated that protecting the environment was their motivation for buying green products (Liao and Li 2010). A study by Thøgersen and Zhou (2010) also found that these "universalism" values were the strongest motivating factors for urban consumers of organic products. This finding is important, as in a collectivistic society like China, these values are commonly regarded as secondary to traditional virtues of conformity, achievement and tradition, which scored much lower, indicating that "buying intentions are primarily related to personal attitudes and only marginally to perceived social norms" (Thøgersen and Zhou 2010 p. 16). Another study by Thøgersen and Zhou (2012) evaluated the motives of early adopters of 'sustainable lifestyle elements' and compared these motives to those of consumers in Western Europe. In this study, organic food was used as a proxy for consumer preferences for "green" innovations, because of the increasing availability of organic products in Chinese supermarkets. Results were consistent with the numerous studies done on Western European consumers, in that early adopters of organics were motivated by beliefs that organic products were "better for the environment", which suggests the development of these "universalism" values amongst these buyers (Thøgersen and Zhou 2012).

In relation to New Zealand food, Betts et al. (2010) examined Chinese attitudes towards sustainability attributes of New Zealand kiwifruit. Results indicated that Chinese consumers

valued sustainability attributes kiwifruit, and were increasingly interested in sustainable practices and purchases. Study participants valued products "with no chemical residue at point of sale", "from a pollution free area" and from "environmentally friendly production", while they were indifferent towards products with "low carbon emissions" and "biodegradable packaging". Water efficiency was the least important for all participants in relation to the other environmental product attributes. The study also showed that consumers valued country of origin information but lacked trust in product label validity (Betts et al. 2010).

In 2009, a survey commissioned by the China Environment Federation conducted in order to determine the environmental consciousness of Chinese consumers using categories defined by Yan (2003). These categories ranked from "light green" (those that have a vague or weak dedication to "green" issues) to "dark green" (those who claim that environmental issues are at the forefront of their purchasing decisions). The survey found that "dark greens" constituted 11 per cent of the population in 2009 (Sohu.com and the China Environment Federation, 2009, as cited in Liao and Li 2010). This represents a market of about 154 million consumers (worldbank.org 2014).

In China, education is another critical factor to the formation of intention to buy eco-friendly products. Wang et al. (2013) assessed determinants of ecologically conscious behaviour (ECB) in urban Chinese consumers and their impacts. Results showed that consumers' understanding and valuation of the environment is the basis for the development of sustainable consumption behaviour, and "the disparity in consumers' knowledge of resource conservation and environmental protection directly or indirectly determines their disparity in ECB", which can include sustainable consumption behaviour (p. 997). This study found that ECB in urban areas was more motivated by altruistic values, with altruism including environmental knowledge and social responsibility. Another study on rural residents by Wang et al. (2014) suggested that consumers in rural areas partake in ECB because there is a direct benefit gained (such as saving money or making money). Wang et al. (2014) analysed the motivations in rural residents having sustainable consumption behaviours, and found that they are much more motivated by egoistic values rather than altruistic ones, and are more likely to engage in sustainable consumption behaviours that save expenses and deliver extra income rather than those that are purely altruistic. The researchers prescribe great importance to education in its ability to influence behaviour, since prior knowledge is necessary to facilitate understanding and valuation of the environment. Wang et al. (2014) also found that price of environmentally friendly products was another factor, as consumers were reluctant to purchase due to higher prices. This is consistent with results attained in Sun and Collins (2012) study, which surveyed consumers across four major Chinese cities, and found that they would purchase products with sustainable attributes (in this case, biodegradable packaging) if the price was equal to that of conventional products. Chuanmin et al. (2014) conducted another analysis of consumer low-carbon agri-food purchases amongst over 870 consumers across six Chinese cities. Results showed that there was large variation among different consumer segments in their purchasing behaviour, and that those with the strongest low-carbon purchasing powers are young and middle-aged males with high levels of education and income, and live in economically developed areas (Chuanmin et al. 2014).

The preference for organic is another product attribute researched in Chinese consumers. Organic is often regarded by Chinese consumers as healthier, more "natural", "residue free", and "safer"

due to lack of chemical fertilisers or pesticides during production (Zheng 2011; Yin et al. 2010; Chen 2012). A number of studies have explored obstacles for organic food purchases, such as price and education. On one hand, price has been cited as the most prevalent obstacles for the purchase of organic food products, with prices reaching up to between 3 and 5 times that of conventionally-produced food products (Yin et al. 2010; Thøgersen and Zhou 2012). As a result, the majority of organic products are being consumed by urban, middle class families with higher incomes (Sheng et al. 2009). On another hand, high consumer concern for safety may supersede concerns for high price. Chen (2012) showed that just over 60 per cent of respondents were willing to pay a 20-50 per cent premium on organics; this compares with Yin et al. (2010) finding that an ideal organic premium to be up to 35 per cent. General awareness of organic foods can be an additional obstacle to their purchase, as urban residents who are more exposed to media and developing market trends are more likely to encounter information on organics than those in rural sectors. Chen (2012) showed that consumers with at least a high school education are more likely to have a higher awareness and intention to purchase organics, while respondents with lower levels of education exhibited a lower awareness and purchase intention. However, when the more educated group was questioned about their level of understanding of the concept of "organic", the majority of respondents indicated that they had a limited understanding of what the term meant, with 45 per cent saying that they knew "a little" about organics, while only 16 per cent said that they knew "a lot" about organic food. When all respondents were questioned on their willingness to purchase organics, approximately half indicated that they were at least occasional buyers, suggesting that consumers are tolerant of the organic price premium regardless of their limited understanding of the concept (Chen 2012).

Consumer preference toward GM has also been studied in some research. Research has shown that Chinese consumers have positive attitudes to GM foods. De Steur et al. (2010) assessed China consumer WTP GM folate fortified rice in the Shanxi Province, one of the poorest regions of China. The Shanxi Province has one of the highest rates of neural-tube defects in the world, which is caused by low folate intake. This study surveyed over 940 rice consumers, results showing a general willingness to accept GM rice with an acceptance rate of 62 per cent (De Steur et al. 2010). Interestingly, less than half of respondents were aware of the concept of genetically modified food, and over 60 per cent were incorrect in their perception of what the concept meant. The average price respondents were willing to pay for 1 kilogram of GM rice was about 4 RMB (about half a euro) which is significantly higher than the average price of conventionally produced rice at 3 RMB. This indicates about a 34 per cent premium for GM rice. Results also showed that lower incomes and levels of education had a negative effect on attitude and purchase intention of GM rice. Farmers, though less likely to be aware of genetically modified food, were more likely to accept GM food, yet with a lower WTP than other consumers (De Steur et al. 2010). This study suggested that acceptance is influenced by consumers' perceptions of risks and benefits, as well as objective knowledge. Researchers suggest that communication surrounding the use of GM rice should be focused on improving the knowledge and consumer perception of high-risk groups in this province, specifically low-educated women.

There has also been some research conducted relating to Chinese consumer trends regarding Fair Trade products. A study by Gomersall and Wang (2012) of Chinese consumers within a Fair Trade boutique store showed that only half of these customers had heard of the term "Fair Trade", despite

being intercepted at a Fair Trade store. When asked to explain their understanding of Fair Trade issues, only 2 of 100 participants indicated a complete understanding of the social issues relating to Fair Trade products, whereas three quarters of the respondents had a limited understanding of the term. Despite a lack of knowledge, WTP for Fair Trade products was demonstrated to be standard across all levels of understanding with an associated preferred premium of between 5-10 per cent (Gomersall and Wang 2012).

2.3 India

2.3.1 Background

India's population is growing rapidly, with a current population of 1.23 billion people – the second-most populous country globally. The total gross domestic product (GDP) of India in 2013 was US$4.96 trillion – the fourth-highest internationally – with a real growth rate of 4.7 per cent (2013 estimate). However, GDP per capita for Indian consumers was estimated at approximately US$4,000 in 2013 (CIA 2014c).

At present, India represents New Zealand's 38th strongest trade partner, and holds the rank of New Zealand's 17th-highest export market for fruit and vegetable products (Statistics New Zealand 2014). While current trade volumes with India are relatively low, potential has been identified with the development of new regulations and a bilaterial trade agreement between New Zealand and India, as well as negotiations underway for the development of a Free Trade Agreement between New Zealand and India (MFAT, 2014).

2.3.2 Credence attributes

Food safety concerns have also been indicated as high interest to Indian consumers. The provision of food safety information has been shown to influence consumers who otherwise would have not sought out this information. A study conducted by Birol et al. (2010a) demonstrated that customers who were exposed to information regarding "food safety certified" labelled grapes were more likely to purchase them than those who did not see the additional information. Consumers were ranked according to a "food safety consciousness index", and the impact of food safety information and certification was significantly greater for consumers that were more food safety conscious (Birol et al. 2010a).

Similarly, Indian consumers' awareness and preference for organic foods is increasing. Several studies have identified an Indian consumer perception that organic food is "safer" and "healthier" than conventional food due to lack of pesticides and artificial fertilizers (Finzer et al. 2013; Osswald and Dittrich 2010; Kumar and Ali 2011; Chakrabarti 2010). Kumar and Ali (2011) analysed the factors that affected consumer awareness of organic, surveying 200 residents of two major Indian cities. They found that respondents considered organics to be safer than conventional food and better for health, while also being beneficial to the environment (Kumar and Ali 2011). Finzer et al. (2013) study of consumer attitudes towards organic foods showed that 47 per cent of survey participants in South Delhi were aware of potential chemical residues on their produce. Of these 47 per cent, the majority (86 per cent) were willing to pay an additional third of the product price for organics, citing health concerns as a major motivating factor (Finzer et al. 2013).

Similarly, Chakrabarti (2010) survey of health food experts found that these experts stated that Indian consumers were motivated most by the idea that organic food is better for health, potentially due to the exclusion of pesticides, chemical fertilisers, artificial preservatives, or genetically modified organisms (GMO) in the organic production line. In terms of awareness of organic foods, 64 per cent of experts believed that awareness of the organic category was due to the health and nutritional aspects of organic food, while only 21 per cent of experts felt that it stemmed from friendliness to the environment (Chakrabarti 2010). Finally, price may be an obstacle to the purchase of organic foods, as suggested by Kumar and Ali (2011) who showed that 60 per cent of the 200 respondents indicated that they would be willing to pay a premium for organic food, while 35 per cent were unable to say whether or not they would be willing to pay this premium (Kumar and Ali 2011).

In addition, a preference for GM-free food has also been explored amongst Indian consumers. A study by Krishna and Qaim (2008) explored WTP for genetically modified *Bacillus thuringiensis* (Bt) vegetables (vegetables that had been genetically modified to contain a gene that improves resistance to certain crop pests). Out of the 600 Indian consumers surveyed, results showed that acceptance for these vegetables were high, with almost 60 per cent willing to purchase them at current market prices, and another 40 per cent willing to purchase after a price discount. The majority of respondents (80 per cent) were willing to purchase Bt vegetables at a 10 per cent price discount, and there was an average WTP for residue-free vegetables at a 57 per cent premium. In addition, it was found that education and exposure to mass media decreases willingness to pay for Bt vegetables, and "people who are most concerned about pesticide residues are least willing to accept Bt-food" (Krishna and Qaim 2008 p. 248). Goyal and Gurtoo (2011) survey of 51 urban Indian and 28 European respondents showed that about 40 per cent of Indians claimed to be aware of the uses and controversies surrounding GMO (approximately 15 percentage points higher than European respondents) while an approximate 55 per cent claimed to know "briefly" about what GMOs are (compared to 65 per cent of European respondents) (Goyal and Gurtoo 2011). Respondents in this study were also asked about their preferences in GMO application; while 40 per cent and 29 per cent of respondents preferred GMO to be used in medicine and crops (respectively), no respondents preferred the use of GMO in food (Goyal and Gurtoo 2011). This is aligned with Ramaswami et al. (2013) study of New Delhi residents and their perception toward products containing GMOs. Overall, respondents were WTP a 16 per cent premium for GM free products, while only 8 per cent were unwilling to purchase any products containing GMOs (Ramaswami et al., 2013). Mandal and Paul (2012) found that product knowledge is a key factor to acceptance of GM foods, while GM information is influential in increasing consumers' knowledge of GM foods. Results also showed that young consumers, who are health conscious, are concerned with GM food consumption (Mandal and Paul 2012).

The effects of GM labelling in products is varied. As previously mentioned, 50 per cent of Indian consumers did not decrease their willingness to pay after learning that a product contained GMOs via a food label (Ramaswami et al. 2013). However, for the other 50 per cent who were averse to GM food, labels had a negative effect on consumer purchasing decisions (Ramaswami et al. 2013). Similarly, Bansal and Gruère (2010) surveyed Indian consumers on their preferences for GM-labelled rice, cottonseed oil, eggplant and soybean oil products. Results indicated that GM labelling had the potential to motivate consumers to switch products, depending on the product.

While consumers were not as likely to switch to oils labelled as non-GM (which could be attributed to their significant price elasticity), they were likely to pay more for non-GM labelled eggplant and rice (Bansal and Gruère 2010). This may indicate a general aversion to GM products amongst Indian consumers and a WTP extra for GM-free food products.

Recent developments in the Indian consumer market suggests that there may be a small, emerging segment of wealthy Indian consumers that are aware of products with environmental and/or ethical credentials. However, unlike other developing markets such as China, whose consumers are beginning to develop a preference for products with environmental and ethical credence attributes, there is evidence to suggest that Indian consumers are not yet willing to pay a premium for these attributes. Ishaswini and Datta (2011) conducted research amongst urban, middle-class consumers to determine the extent of their environmental concerns and awareness of environmentally benign products. Results suggested that, though the majority of respondents were aware that eco-friendly products would contribute to a sustainable future, 31 per cent were unwilling to pay any premium for these products. Of the respondents with a positive WTP, 43 per cent preferred a premium between 5-10 per cent for these products (Ishaswini and Datta 2011). The researchers suggest that price may be an obstacle, but also that "pro-environmental concerns among consumers in economically developed nations seem to be much higher than the developing economies such as India." (Ishaswini and Datta 2011, p 128.)

With regards to awareness of environmentally-friendly consumption activities amongst Indian consumers, consistent with other developing countries, Indian consumers are beginning to show a preference for environmentally friendly products. Mahapatra (2013) evaluated Indian consumers' general attitudes towards the environment, and assess the factors that influence environmentally conscious behaviour in the purchase of green products. Researchers surveyed over 160 Indian consumers, and found that the majority (88 per cent) were aware of green products, and about 60 per cent of the sample stated that they did not believe Indian companies "green" promotion was sincere. Respondents' perception and WTP for green products were influenced by personal benefit received as well as price, convenience, performance, availability, and environmental and health concerns. Almost half of these respondents were willing to pay an additional 5-10 per cent for green products when they were convinced that the cost of ownership was less than the actual cost (Mahapatra 2013). Saxena and Khadelwal (2010) surveyed 300 Indian consumers to ascertain consumer attitudes towards environmentally friendly products and which consumers hold positive opinions toward green brands; and that consumers were generally willing to pay a premium for green products. Kumar and Gautam (2010) found that consumers were in favour of green products, but these opinions about sustainable food products were not supported in their buying behaviour. In this study, price was a significant influence to this behavioural gap, followed by taste and trust.

Besides price, general awareness can also impact the formation of purchase intention of food products with associated credence attributes. Osswald and Dittrich (2010) explored the idea of "sustainable food choices" in India and the potential obstacles to its development. Researchers suggested greater visibility to assist in the growth of the organic food sector, for there is a general lack of awareness surrounding the benefits of seasonal, organic and locally-produced food (Osswald and Dittrich 2010). In India, education can influence a consumer's awareness of organic products. Kumar and Ali (2011) showed that 64 per cent of Indian consumers with a graduate-level education were aware of organic foods, and only 22 per cent were unaware of organic foods.

It was observed that people with certain educational backgrounds (eg. Medical or science training) were more aware of organics than graduates of other fields. Higher income levels were also correlated with higher levels of awareness, with regression results showing that those who earned more than 500,000 rupees annually were twice as likely to be aware of organics as a product category (Kumar and Ali 2011).

Indian consumers value eco-friendly packaging and eco-labelling in products. Vernekar and Wadhwa (2011) survey of urban residents from Delhi and the New Capital Region, found that 89 per cent of respondents indicated that eco-friendly packaging "strongly influenced" their purchasing decisions. Respondents between 18-50 years of age reported eco-friendly packaging as the most important factor influencing their purchasing decision in each of the product categories provided (Vernekar Wadhwa 2011).These results further indicate that a majority of the respondents regarded biodegradable packaging as "one of the most important factors of product attractiveness", with 62 and 36 per cent indicating that it had a strong and moderate effects, respectively, on their likelihood to buy. Regarding attitude to eco-labels, Ishaswini and Datta (2011) showed that 78 per cent of Indians stated that their purchasing decisions would be influenced by the presence of an eco-label. However, the consumer acceptance of eco-labelling has also shown to be influenced by price, with 56 per cent of Indian consumers considering environmental factors when making purchases but 44 per cent stating that their acceptance of an eco-labelling scheme would be either dependent or highly dependent on price (Shingrup 2013).

Similarly, the Greendex Survey (National Geographic and GlobeScan 2012) -- which focuses on behaviour and the material lifestyles of 17 countries, including the UK, China and India -- ranked India as the fifth most environmentally concerned nation, with almost two-thirds of Indian consumers stating that they were concerned about environmental issues. When questioned about climate change, two-thirds of Indian respondents showed a significant level of concern. Indian consumers also showed the third highest concern for fresh water shortage, with over two-thirds stating they were concerned and half of all Indian respondents indicated a concern for species and habitat loss. The results of Greendex survey also show that Indians have the highest perception of their own environmentally-activities. Indian consumers were also ranked as the guiltiest about their impact on the environment (with 45 per cent feeling guilty or very guilty) and the most likely to be influenced to adopt environmentally friendly behaviour by people they knew with 42 per cent of respondents confirming this. Indian respondents were also one of the most dedicated to minimizing environmental impacts, ranking number three out of all countries. Despite these positive results, Indian consumers are showing a large decrease in many of these concerns such as for climate change, air and water pollution, freshwater shortage, and species and habitat loss. When consumers were asked whether or not they considered themselves "green", almost two thirds (63 per cent) felt that they were "green" currently, while an additional third felt that they were "not currently green" but planned to be in the next five years (National Geographic and GlobeScan 2012).

2.4 Singapore

2.4.1 Background

Singapore is currently the 41st wealthiest nation globally, with a GDP of US$339 billion in 2013, exhibited a real growth rate of 4.1 per cent per annum. The existence of wealthy consumers within the Singapore market can be evidenced by the market's national GDP, particularly GDP per capita, which is currently the seventh-highest globally (CIA, 2014d). Singapore represents an important export market for New Zealand's agricultural products, with trade values for agricultural commodity exports from New Zealand to Singapore shown in Table 2.4 below. Singapore is currently the ninth-strongest export market for New Zealand's agricultural products, representing a total export value of NZ$653 million in 2013. In addition, Singapore represents New Zealand's fourth-strongest export market for fresh and chilled beef products, as well as New Zealand's seventh-strongest export market for milk and cream products (Statistics New Zealand 2014). The overall ranking of this market in total value of exports for the specified commodity groups are also shown in Column 3 (Export Share Rank), with the number 1 representing the highest total export value.

Table 2.4: Exports of New Zealand agricultural commodities to Singapore (2013)

Commodity (or Commodity Group)	Total Export Value (NZ$000)	Export Share Rank
Meat or Meat Products	55,409	17
Beef, fresh and chilled*	17,204	4
Beef, frozen products*	17,998	13
Sheep meat*	11,810	24
Dairy	401,024	10
Milk and cream**	270,306	7
Butter**	36,833	20
Cheese and curd products**	10,453	25
Fruit and vegetables	37,537	14
Wine	19,683	7
TOTAL AGRICULTURAL	**653,550**	**9**

Source: Statistics New Zealand 2014.
*Values for commodity type are included in Meat and Meat Products (Total) and do not contribute to the total value of total agricultural exports to this market.
**Values for commodity type are included in Dairy (Total) and do not contribute to the total value of total agricultural exports to this market.

It is important to note that Singapore itself comprises a singular city-state, with 100 per cent of the population situated in an urban environment (AAFC, 2011). Due to these restrictions on space and resources, Singapore imports nearly 90 per cent of all food products. Food retail in general comprises 40 per cent of total retail spending in Singapore per annum (SGE, 2013). In addition, between 1975 and 2013, consumer spending was retained at an average of SG$13,424.09 million per annum, reaching a record high in the fourth quarter of 2013 of SG$28,464.20 million (Trading Economics, 2014).

However, there is some evidence to suggest that Singaporean consumers are selective in spending. Many Singaporean consumers are choosing to protect themselves from future potential changes in the labour market by saving money and limiting their spending generally. In a 2013 study of

consumer confidence, a majority of consumers (63 per cent) stated that their spare cash was being immediately put into savings, followed by spending on holidays (49 per cent, Q4 2013), and investments in shares of stocks/mutual funds (26 per cent, Q4 2013); however, 6 per cent of Singaporean consumers indicated that they had no spare cash on a weekly basis (Q4 2013). A study conducted by Nielsen (2013a) investigated Singaporean consumer confidence. When asked to rate their perceptions of the state of their personal finances in the following 12 months, 49 per cent of consumers perceived this as "good", with only 6 per cent of respondents indicating that they perceived their personal finances to be "excellent". In addition, when asked to indicate actions to save money, 25 per cent of Singaporean consumers stated that they would "switch to cheaper grocery brands" to cut down household expenses – the third highest response in this study (Nielsen, 2013a). Similarly, a study by Phau et al. (2009) of 300 Singaporean postgraduate students' purchase intentions towards counterfeit luxury goods found that students may not be willing to pay a premium for genuine luxury goods, opting to purchase counterfeit products over the former with price as the key incentive. This may be indicative of spending trends amongst Singaporean consumers into the future.

Despite Singaporean consumers being conservative in spending, increases in luxury spending and the purchase of premium goods have been observed. While consumers are more cautious about their purchase decisions, overall spending on luxury goods increased in Singapore between 2012 and 2013 driven by a demand for exclusivity and premium product quality (Euromonitor 2014). Singaporean consumers have also indicated a WTP a premium of imported luxury goods, with historical sales of these items increasing by 18 per cent between 2006 and 2010 (AAFC 2011).

Within the Singapore market, several studies have indicated a mixed demand for overseas food and produce not commonly found in this market. On one hand, a consumer demand for foreign food products be seen in the rise of such types of food retail as French artisan bakeries and farmers' markets previously unseen across Singapore in 2013 (Ranasinghe 2013). Similarly, demand for foreign products have also been indicated by Singaporean consumers, with a 2013 study showing that 33 per cent of Singaporean consumers prefer to purchase local brands over large global brands (Nielsen 2013b). However, consumers do not appear to specifically seek out foreign food products, with only 17 per cent of consumers stating the regular use of specialty foreign food shops in an early 2014 study (Weber Shandwick 2014).

In considering consumer willingness to purchase New Zealand food products, it may be useful to consider Singaporean attitudes to and opinions of New Zealand as a whole. A study by Tourism Australia (2014) explored Singaporean consumers' attitudes to various potential holiday destinations internationally. Results showed that 57 per cent of respondents perceived New Zealand as having "world class beauty and natural environments", with an additional 25 per cent perceiving New Zealand to have "good food, wine, local cuisine and produce", and a further 27 per cent perceiving New Zealand to have "friendly and open citizens" and "local hospitality" (Tourism Australia 2014).

2.4.2 Credence attributes

Singaporean consumers have indicated a preference for the provision of a higher degree of certifiable food safety. Due to the market's high reliance on food imports, as well as recent food

safety scares throughout other Asian markets, Singaporean consumers are increasingly seeking food choices that guarantee safety in consumption (NZTE, 2014c; AusTrade 2014). However, little research exists about consumer attitudes towards food safety.

There is some evidence to suggest that consumer concerns regarding food safety have led to an increase in consumer demand for traceability information in Singapore. A study by Weber Shandwick (2014) investigated food purchasing habits in Singapore, showing that knowledge of a food product's origins and/or whether a food product had been produced against ethical standards was either extremely to very important (43 per cent) or moderately important (39 per cent) to consumers. Only 1 per cent of respondents stated that this knowledge was very unimportant in food purchase decision making, with a further 2 per cent stating that this knowledge was unimportant (Weber Shandwick 2014).

Linked significantly with health and safety elements, the sale of functional and health-oriented foods has grown in Singapore in recent years. Between 2007 and 2010, Singaporean consumers reduced their purchases of high-calorie foods by 1 per cent, and high-fat foods by 4 per cent; consistent with this, purchases of low-sugar, non-carbonated drinks increased by 26 per cent (AAFC 2011). These trends coupled with busy working hours for Singaporeans (an average of 48 hours per week) have led to an increase in demand for convenience foods, particularly those which have organic, healthy or natural attributes (AAFC 2011).

Regarding environment related credence attributes, there is currently little evidence to suggest that Singaporean consumers are aligned with consumption behaviours designed to enhance environmental quality. However, there are some initiatives being undertaken in the city state to educate the general public as to how purchasing behaviours may have an effect on the environment in general. This includes the Green Singapore Sale, an annual shopping event wherein consumers are encouraged to purchase products that mitigate negative environmental effects of production and increase consumer awareness of environmentally-friendly shopping (Kuan 2013).

In general, there are currently very few sources of information detailing Singaporean consumers' attitudes towards, and subsequent WTP for, credence attributes in food products. This indicates a gap in the literature, in particular as Singapore represents a potential trade market for New Zealand food exports.

2.5 Indonesia

2.5.1 Background

Indonesia has had consistently stable growth rates during the past decade. According to the CIA World Factbook (2014e), the GDP of Indonesia was US$1.28 trillion in 2013 with an approximate real growth rate of around 6 per cent annually. The current rate of GDP per capita in Indonesia was estimated at approximately US$5,200 in 2013 (CIA 2014e). By 2030, Indonesia is expected to comprise of at least 40 per cent of ASEAN's economic growth (Razdan et al. 2013). In addition, New Zealand's trade relationship with Indonesia has been given greater potential by the ASEAN, Australia and New Zealand Free Trade Agreement, into which Indonesia became a member in January 2012. In addition, New Zealand exporters may experience a complete removal of tariffs

for goods imported into Indonesia by the year 2020, indicating the strength of bilateral trade relations between the two countries (NZTE 2014d).

Indonesia is currently the ninth-largest export market for New Zealand products overall (NZT 2014), and is the eighth-largest market for agricultural exports with total agricultural exports to Indonesia valued at approximately NZ$661.5 million in 2013 (Statistics New Zealand 2014). The value of export for specific agricultural commodities to Indonesia is detailed in Table 2.5 below. As shown in this table, exports of specific agricultural commodities to Indonesia include milk and cream products, of which Indonesia is New Zealand's fifth-largest export market, and seventh-largest export market for frozen beef, dairy and cheese and curd products (Statistics New Zealand 2014). The overall ranking of this market in total value of exports for the specified commodity groups are also shown in Column 3 (Export Share Rank), with the number 1 representing the highest total export value.

Table 2.5: Exports of New Zealand agricultural commodities to Indonesia (2013)

Commodity (or Commodity Group)	Total Export Value (NZ$000)	Export Share Rank
Meat or Meat Products	54,371	18
Beef, fresh and chilled*	1,019	26
Beef, frozen products*	48,002	7
Dairy	479,752	7
Milk and cream**	291,215	5
Butter**	77,153	9
Cheese and curd products	54,026	7
Fruit and vegetables	23,541	19
TOTAL AGRICULTURAL	**661,509**	**8**

Source: Statistics New Zealand 2014.
*Values for commodity type are included in Meat and Meat Products (Total) and do not contribute to the total value of total agricultural exports to this market.
**Values for commodity type are included in Dairy (Total) and do not contribute to the total value of total agricultural exports to this market.

The economy of Indonesia is expected to grow significantly in upcoming years. A report published by Razdan et al. 2014 reported that Indonesia's economic activity represents 33 per cent of ASEAN GDP, and is predicted to account for about 40 per cent of all economic growth in the ASEAN market by 2030. According to this report, approximately 60 per cent of Indonesia's population is under the age of 30, sustaining a population growth of 2.9 million people annually. In addition, the Indonesian market is becoming increasingly urbanised, accompanied by a rise in consumer incomes and increased Westernisation, with approximately 55 million urban consumers. Of these consumers, 20 million are considered wealthy and do not match the profile of the traditional Indonesian consumer. Consumer spending rates are expected to increase by over 7 per cent annually, and are estimated to be worth US$1 trillion by 2030 (Razdan et al. 2014). These developments may lead to opportunities for New Zealand exporters in premium market segments.

Increases in consumer spending have brought about a number of shifts in the Indonesian marketplace, particularly within the fast-moving consumer goods (FMCG) category. According to Kantar Worldpanel (2014a), Indonesia's economic gains and consumer spending increases have highlighted the country as a growth market with premiumisation potential. As a result, significant increases in brand presence has occurred within the market, with 173 new food brands appearing

in Indonesia in 2013. In addition, Kantar Worldpanel (2014a) reported that 61 new beverage brands, 12 new homecare brands, and 26 personal care brands have appeared as well. The report also states that as FMCG purchases have increased, the average frequency of consumers'' time spent shopping has decreased, leading to the development of tighter competition between emerging brands in the market as the likelihood of consumer awareness of new brands decreases alongside reported decreases in consumer shopping time (Kantar Worldpanel 2014a). This may be relevant for New Zealand food exporters when considering the Indonesian market for New Zealand food product export.

Consumer spending in Indonesia, particularly within premium segments, has increased significantly in recent years, with this trend expected to continue. The premiumisation of consumer goods has increased in urban Indonesia, particularly in the fast-moving consumer goods (FMCG) category, and especially for food and drink products. Between 2012 and 2013, significant increases in purchase rates of premium grocery items were seen, for example in cheese (46 per cent), liquid soap (39 per cent increase), and moulded chocolate (35 per cent increase) (Kantar Worldpanel, 2014a). In addition, market value shares of premium FMCG products (as compared with non-premium items) have either shown little increase or remained relatively consistent in urban Indonesia (Kantar Worldpanel, 2014a).

Similarly, package sizes in FMCG sales in urban Indonesia have increased in recent years, reflecting a consumer preference for larger quantities within a single package, for example, with consumers increasingly purchasing the larger shampoo bottle format rather than the smaller sachet format. Particularly in urban Indonesia, a 5 per cent consumer switch to larger package sizes for fabric conditioner has been seen, as well as 4 per cent consumer shift to larger package sizes for biscuits between 2012 and 2013 (Kantar Worldpanel, 2014a). To illustrate this, 52 per cent of products within the FMCG category experienced increases in average volume purchased, as well as average package size between 2012 and 2013 (Kantar Worldpanel, 2014a).

In considering Indonesian consumption trends and patterns, it is also important to consider the types of retailers commonly used in this market. At present within the Indonesian market, consumers are faced with a variety of retail channels - from modern supermarkets to traditional market stalls. As indicated in a study by Razdan et al. (2013), the use of modern retail channels has been driven by increasing consumer use of convenience stores, which increased by 5 per cent between 2011 and 2013. However, findings from a study by Capillary (2013) have shown that around 91 per cent of Indonesian consumers regularly (and exclusively) use locally-operated businesses. As indicated by Razdan et al. (2013), there currently exists a consumer perception that modern retail fundamentally implies higher product prices, and price-conscious consumers tend to shop via more traditional channels, such as *warungs* (traditional Indonesian family-owned and operated stores) and wet markets (fresh food produce markets). However, the same study showed that wealthy urban consumers in Indonesia have exhibited a higher rate of use of hypermarkets, supermarkets and convenience stores in recent years.

Generally, mass grocery retail sales are expected to increase in the future, despite a current dominance by smaller retailers. Research conducted by Business Monitor International (BMI 2014) As a result of increasing foreign direct investment (FDI) in Indonesia, mass grocery retail is expected to increase 10.7 per cent per annum, leading to an overall grocery market share of 32

per cent by the year 2021. In addition, two studies (Razdan et al. 2013, Kantar Worldpanel, 2014b) have indicated that Indonesian consumers may also exhibit a greater degree of loyalty and trust in local brands, with urban market shares for brands dominated almost entirely by local brands. However, these studies also show that consumers within the wealthy urban class are driving growth in foreign brands, with new product categories to the Indonesian market purchased almost exclusively by consumers in this bracket (Razdan et al., 2013; Kantar Worldpanel 2014b).

In order to get a clear sense of the current state of the Indonesian market, it is important to consider the current food consumption patterns in Indonesia. Increases in consumption as (measured by BMI (2014)) are expected across most goods categories in Indonesia, especially within the food sector. Consumption of food products is expected to increase in the latter half of 2014 by 9.1 per cent, with a compound annual growth rate (CAGR) of 7.6 per cent per annum to 2018 (BMI 2014). In addition, mass grocery retail sales are projected to grow by 14.2 per cent in the latter half of 2014, with a CAGR of 10.7 per cent per annum between 2014 and 2018. In addition, food consumption per capita is expected to grow by a CAGR of 6.6 per cent between 2014 and 2018 (BMI 2014).

New Zealand companies are already exhibiting signs of trust in Indonesia as a potential growth market for New Zealand food product exports. In March 2014, Fonterra initiated construction of a milk powder manufacturing plant in Indonesia, set to be completed by May 2015. This plant was planned to be built in order to meet demand for dairy products throughout Indonesia, and will have the capacity to produce and package 12,000 tonnes of milk powder products per year for use with Fonterra's Anlene, Anmum and Anchor Boneeto brands (Reuters 2014).

2.5.2 Credence attributes

At present, research on Indonesian consumer preferences for credence attributes is scarce. However, some sources suggest that consumer demand for environmental and ethical attributes in food products may exist or increase in the Indonesian food market.

Overall, there are few recent studies on Indonesian consumers' attitudes toward credence attributes, yet some insight can be gained by a backdated country profile conducted by the Department of Primary Industries (DPI) (2004). This study surveyed Indonesian food industry stakeholders to assess consumer preferences for food safety, "green" food choices, and animal welfare. When food industry stakeholders were asked about consumer attitudes toward food safety, less than a quarter stated that Indonesian consumers considered food safety to be important. Despite outbreaks of zoonotic diseases in the region, respondents considered consumers to be minimally aware of issues surrounding food safety and would be willing to purchase products without safety assurance. Stakeholders generally associated food safety with good hygiene, minimal chemical residues, and having infrastructure in place to prevent contamination events. With reference to clean food, while only a third stated that Indonesian consumers valued this attribute. According to the respondents, the physical appearance of food was very important to Indonesian consumers, and 57 per cent of respondents noted that consumers valued the prevention of physical contamination, and were more likely to purchase 'clean' looking food. Furthermore, a difference in understanding between clean and safe food was identified, with clean food being understood as the external appearance being free from contaminants, while safe food referred to

the internal composition of the food. Despite these priorities, price was still indicated as a strong influencing factor, with respondents indicating that consumers would choose price over external appearance, for they could "always clean it and wash it at home" (DPI, 2004).

The study mentioned above also included questions related to "green food", animal welfare, and other ethical food attributes. Similarly, when asked about "green" food choices, respondents indicated that it was minimally important to consumers, with zero per cent saying that it was important. In general, respondents indicated that consumers were most affected by price and quality, and with the majority of the consumers being unaware of environmental issues, it had not yet emerged as a priority on the market (DPI, 2004). The results for animal welfare was similar, with none of the respondents stating that animal welfare was important to consumers. While animal welfare was less important, animal-borne diseases was a priority, with respondents stating that it could have a significant impact on consumer behaviour. Results for ethical foods were similar, with none of the respondents stating that it was important to Indonesian consumers. Ethical food was interpreted as 'honest business practices' and 'truth in labelling', in particular the use of Halal production practices (DPI, 2004).

For organics, more recent studies exist. Indonesian organic agriculture has been increasing at a rate of 10 per cent per annum, with products expanding on the Indonesian domestic market (Arifin et al. 2009; Inawati 2010). Concerning Indonesian consumer preferences and attitudes towards organics, a number of key findings have been presented. These include a high consumer awareness of organics, the association of organics with higher healthiness and safety, as well as a noted consumer desire for the purchase of organic products.

Firstly, consumer knowledge and perception regarding organics has been shown to be relatively strong in Indonesia. Kurnia et al. (2013) assessed the preferences of over 300 Muslim Indonesians in the Yogyakarta province, a major organic rice growing region. Results showed that respondents had a fair knowledge of organic food, with only 10 per cent unfamiliar with the concept, though none of the respondents had a complete understanding of the concept (Kurnia et al. 2013). Wahida et al.'s (2013) survey of over 1,000 urban Javanese consumers showed similar results, with two-thirds having heard of "organic" or "pesticide-free" food products. Within this study, consumers indicated a perception of conventionally-produced foods as having higher health and safety attributes, as well as increased environmental stewardship attributes. Hermawan and Yusran's (2013) survey of over 100 Jakarta-based students showed that health consciousness correlated strongly with a higher willingness to pay for organic foods, with concern for the environment having a positive influence on perception of organics. The majority of respondents (90-95 per cent) of Wahida et al.'s (2013) study perceived organic and pesticide-free foods to be healthier than those produced through conventional farming systems and considered them to be more environmentally friendly

Despite preferences indicated by consumers, the high price attached to organic products was indicated as an obstacle for purchase. In Kurnia et al.'s (2013) study, almost half of the respondents had historically purchased organic goods, however the remainder avoided organics for concerns about low affordability (18 per cent), scepticism about authenticity of organic claims (10 per cent), lack of availability (11 per cent), and the perception of a subpar product appearance (23 per cent). Ferdi (2008) also showed that willingness to pay for organic goods and their price were inversely

proportional. However, despite these obstacles, these studies found that older individuals, as well as people with children and higher incomes and education levels were more likely to purchase organics (Kurnia et al. 2013; Ferdi 2008). Ferdi (2008) also showed that organic buyers were more frequently older individuals, with 20 per cent of organic consumer respondents being between the age of 50-59, and only 10 per cent in the under 29 category. Regarding education, the results of Wahida et al.'s (2013) study found that although 90 per cent of the respondents had the equivalent of a high school education, approximately a third had purchased organics in the past, 65 per cent of respondents indicated that they would prefer to purchase products with organic certification, and 60 per cent of respondents preferred this certification to be done by the government, despite current lack of food certification standardisation. These consumers also showed a high WTP for the selected organic foods including an additional 20 per cent for chillies, 22 per cent for mango, 20 per cent for shrimp, and 18 per cent for chicken. Lastly, for all commodities, half of the consumers were willing to pay at least an additional 10 per cent for organics (Wahida et al. 2013).

The increasing trend of organics may be associated with the increase in interest in a "healthy lifestyle" and similar lifestyle trends in Indonesia (Hermawan and Yusran 2013). Wulandari et al. (2012) conducted a study on preferences amongst about 400 Jakarta consumers. It was found that environmentally friendly attitudes and lifestyles were influential in increasing the likelihood of purchasing environmentally friendly products. The study also defined four segments of consumers continuum on tendency towards environmental sustainability; these were conventional consumers (41 per cent of sample with no opinion on environmental sustainability and no purchase of environmentally sustainable products out of concern for the environment), green consumers (23 per cent of sample with minimal environmental effort and purchase of environmentally friendly products, though no knowledge or opinions about it), greener consumers (20 per cent of sample with tangible effort in preservation of the environment and interest in sustainability, but inadequate knowledge), and greenest consumers (16 per cent of sample with opinions and knowledge about environmental sustainability and purchase products that are sustainable and an environmentally friendly attitude is part of their lifestyle) (Wulandari et al. 2012). Similarly, Lita et al. (2014) assessed which green practices by hotels and restaurants influenced re-visit intention of domestic tourists in the West Sumatra Province, as well as WTP for environmentally friendly services. Approximately 200 tourists were asked, and results showed that respondents' attitudes toward green behaviour had a significant impact on consumers' perception of the hotels and restaurants, with these respondents willing to pay more for environmentally friendly hotel service. Results further indicated that tourists' concern for the environment influenced their WTP for environmental services, with the tourists' higher level of education suggested as contributing to this effect in this study. The authors suggest that the respondents' young age (31 per cent were between 21-30 years old) suggested a potentially higher power for restaurants and hotels that would charge more for environmentally friendly services. The authors further suggest that the respondents' "position as local people, highly educated, young, pride as residence at tourist destination and sense of ownership to culture and environment could further explain positive attitude and behaviour toward green practices" (Lita et al. 2014 p. 269).

Chapter 3
Choice Modelling

3.1 Introduction

The past research has shown importance of the selected product credence attributes for consumers in UK, China and India, and potentially Singapore and Indonesia. In order to empirically measure the value of these attributes, choice modelling provides a practical tool to quantify how people trade-off between the multiple product attributes and to assess consumers' willingness-to-pay (WTP), or willingness-to-accept (WTA) in some cases, for each attribute.

Choice modelling is a tool that economists commonly use to estimate WTP and it is particularly useful when the consideration of *multiple* attributes and trade-offs is required rather than assessing product as a whole (Hanley et al. 2001; Czajkowski 2014). Applications from a wide range of study contexts in both developed and developing economies illustrates the flexibility of the method. By definition, choice modelling is a non-market valuation method using stated preferences opposed to preferences observed from markets. This distinction is important as research sometimes considers goods or services that do not currently exist in markets (e.g. new products), are not usually traded in these markets or have no markets. There are also other benefits including that choice modelling:

- is a practical yet realistic way to provide detailed information regarding consumer preferences and trade-offs on the attributes that the research is focused on;
- de-emphasises the monetary valuation as price is only one of the many attributes;
- combines attribute trade-offs with repeated choices which can reduce strategic answers or people saying yes just because they feel good about the topic.

More discussion of benefits can be found for example in Bateman et al. (2002), Birol et al. (2006), Hanley et al. (2001) and Rolfe et al. (2002). Hence choice modelling is a measurement of consumer preferences using indirect inference from choices; besides WTP this provides information of whether a selected attribute has positive or negative impact on preferences, the preference ranking of all selected attributes, or a preferred level of each attribute; and potentially how respondent characteristics may impact on WTP.

3.1.1 Choice experiments

The data for choice modelling is typically provided from surveys including *choice experiment* (CE). CE presents a sequence of *choice sets* to the survey respondents. Each choice set is made up of a number of alternatives that represent the given context with different attribute combinations. Each alternative differs based on the assigned attribute levels (e.g. low, medium, high). The alternatives can be either labelled (e.g. branding) or generic (e.g. product A and B) and often an alternative that has no additional cost (or that allows a participant to "opt out") is included in the choice set in order to increase the meaningfulness of the experiment and to avoid forced choices (Domínguez-Torreiro and Soliño 2011; Hensher 2010; Lusk and Schroeder 2004). Thus CE involves simulating a context that includes mutually exhaustive choices (Ben-Akiva and Lerman

1985) that the consumer would normally make choices of. The respondents' choice data is analysed using statistical models to quantify the impacts of attributes on consumer choices and to understand why these alternatives where chosen (Hensher et al. 2005). A brief overview of statistical models is provided in Appendix A.

3.1.2 Practical considerations

The implementation of discrete choice modelling method in practice contains seven steps as summarised in Bennet and Admowicz (2001). The first step is the clarification of the decision problem including context, policy framing and study objectives. The second step involves attribute and attribute level selection. Important here is the relevancy of the attributes, measurability and causal possible relationships between them (Blamey et al. 2002). The third step involves questionnaire development including CE, appropriate framing questions and sample characteristics. The fourth step is the development of an experimental design using statistical techniques to select which choice sets to include in the CE as the efficiency of the experiment will vary depending on selected attribute combinations (Rose and Bliemer 2009, Greiner et al. 2014). The fifth step includes considerations of sampling frame and the survey mode for the data-collection. The sixth step involves preparing and analysing that data with a suitable econometric model. The last step concludes the study with key results, inference and useful implications.

Finally, choice modelling have been criticised of the hypothetical nature of the experiments and thus accuracy of the results. In some instances, it is possible to compare the estimated WTP with the actual WTP that would occur in the market. This is called as external validity. In an early study, Louviere and Woodworth (1983) report high correlations between predicted and observed choices for individuals asked to make choices among brands of pet foods. More recently, Brooks and Lusk (2010) found CE and scanner data for milk choices were equally good predictors of consumer choice. Likewise, Lusk (2011) found food values to be significantly related to actual grocery store purchases while Mørkbak and Nordström (2009) found their estimated premiums for outdoor chicken production are reasonable when comparing the existing market prices for an indoor reared or ecologically produced chicken.

3.2 Literature review: choice experiment applications on credence attributes

Choice experiments (CE) have been widely used to value empirically consumer preferences for food products' credence and other attributes including food safety and traceability, production method, health and functional foods, GM foods, country of origin, animal welfare and eco-labelling amongst others. This is an initial review including a number of CE studies around the world. Before the literature review focusing on credence attributes, some overall comments of the sampling and econometric approach are provided. Overall, the most studies gathered responses amongst the general population while some focused specific groups such as students or urban consumers. In Asia, the Japanese studies seem to favour the mail survey modes while mall/store intercept surveys have been used in in China and India. Moreover, Birol et al. (2009) note that although the Indian (Mumbai) consumers were generally familiar with the market surveys, the CE surveys with hypothetical questions were new to the respondents. In Europe and North-America, online panels have been popular as they often include a good consumer base of variety of food

products. In terms of the data-analysis, the recent studies seemed to apply the models accounting respondents' preference heterogeneity (e.g. Abidoye et al. 2011, Zheng et al. 2013, Ortega et al. 2011, Ortega et al. 2012, Tonsor 2011) while a few used the simpler standard models (e.g. Bai et al. 2013, Koistinen et al. 2013, Steiner et al. 2010, Wolf et al. 2011) confirming the importance of this "work horse" model. The cost attributes are always context specific yet overall the studies seem to use absolute price per product unit (e.g. bag of onions or kilo of meat). Price can also be defined in other ways such as in relative terms (e.g. 10 per cent more than average; average price; 10 per cent less than average) (Abidoye et al. 2011, Moser et al. 2012). In this review, the estimated WTP were compared to the average retail prices (or other base price) of the product where possible. This was done in order to compare studies from multiple countries within different time periods.

3.2.1 Studies from Asia

First, CE studies of credence attributes from Asia have examined a variety of food products including fruit, milk, pork and soybeans. In India, a focus has been on transparency of the information between production and consumption. Moser et al. (2012) found that consumers valued information opposed to having no information provided about the variety of credence attributes on bananas. In more detail, people were willing to pay most for avoiding pesticides spraying up to 5.40 RS, or 36 per cent more, or at least using bio-degradable pesticides leading to a WTP of 3.47 RS or 23 per cent more. Next, people were willing to pay more for production with a lower environmental impact. WTP for different producer characteristics was highest and different product provenances had little variation in WTP, between 4 and 13 per cent yet, overall, information was preferred over no information. Finally, pesticide spraying and high environmental impact lead to WTA for 28 per cent price discount, particularly for the latter.

Table 3.1: Indian consumers' WTP for product transparency information of bananas

		Price: RS/ bananas	Relative WTP (%)*
Product origin (vs. no information)	Local	0.75	5%
	Karnataka	1.21	8%
	Kerala	0.77	5%
	Gujarat	-0.13	-1%
	India	0.59	4%
	No information	-0.47	-3%
Use of pesticides (vs. no information)	Sprayed with pesticides	-1.23	-8%
	Bio-degradable pesticides	3.47	23%
	Not sprayed	5.40	36%
	No information	-1.67	-11%
Producer characteristics (vs. no information)	Co-operative organization of farmers	1.90	13%
	Small-scale independent farm	1.32	9%
	Small-scale contracted farm	1.05	7%
	Producer company	1.02	7%
	No information	-0.93	-6%
Environmental impact (vs. no information)	Low	4.07	27%
	Medium	1.45	10%
	High	-4.21	-28%
	No information	-0.29	-2%

Source: Moser et al. 2012.
*Compared to average 15 RS of the lowest and highest current market prices for bananas

Birol et al. (2009, 2010a) explore consumers' demand for safe, certified and quality grapes in an upper-middle-income (Andheri) and a lower-middle-income (Charkop) areas in Mumbai, India. Overall, consumers are demanding organic grapes that are Good Agricultural Practices (GAP) certified and ensured for safety and quality. However, the price of grapes was not found as a significant determinant of grape choice in this context making the valuation of the attributes not possible. Yet, it was concluded that the preferences from two locations differ which implies a possibility of sub-regional disparities in India. Differences between the samples include, for example, that while GAP certification had the highest priority in Charkop followed by sweet taste bananas, these were preferred in vice versa order by Andheri respondents. Moreover, while organic production was preferred over non-organic methods in both samples, the semi-organic production was only preferred by Andheri respondents.

In China, Ortega et al. (2012) explored consumer preferences for milk safety attributes. They found highest WTP among urban consumers for Government certification for food safety opposed no certification which was over 1.5 times higher than WTP for the national milk brand. These were followed by private certification while people were willing to pay -0.64 RMB or 37 per cent less if the product is sold after a three month threshold. The result that consumers were not willing to pay a premium for UHT milk with longer self-life was indorsed to the consumer perception that UHT milk with longer shelf lives are not as "fresh" as those with shelf lives that are shorter.

Table 3.2: Chinese consumers' WTP for milk food safety attributes

	WTP (RMB per milk product)	Relative WTP (%)*
Shelf-life over 3 months	-0.64	-37%
Government certification	3.55	203%
Private certification	1.72	98%
Brand (national vs. local)	2.07	118%

Source: Ortega et al. 2012.
*compared to 1.75 RMB/unit average of the prices provided in the study

In another milk product study from China, the respondents faced choices across three options including Mengniu pasteurized milk labelled with traceability certificated by government agent, ultra-high temperature (UHT) milk without traceability labelling and Changfu pasteurized milk labelled with traceability certificated by an industrial association (Bai et al. 2013). The study found that urban consumers have a strong preferences for traceable milk as shown by the highest WTP of 6.09 RMB which implies up to 244 per cent more or 144 per cent price premium (compared to a current price at 2.5 RMB). These preferences are associated with certificate issuers where the government certificated milk is valued 56 per cent higher than industrial association certification, both opposed to third-party certificated milk. Finally, people preferred pasteurised milk over UHT milk shown by negative WTP for the latter indicating WTA for price discount.

Table 3.3: Chinese consumers' WTP for traceability certified milk

	RMB per 250 g bag	Relative WTP (%)*
UHT milk opposed to pasteurised milk	−0.79	-53%
Label with traceability	6.09	244%
Traceability certifier		
Government	3.50	140%
Industrial association	2.25	64%

Source: Bai et al. 2013.
*Compared to the market prices: 2.5 RMB/250g with government certification (Mengiu milk), 1.5 RMB/250g for UHT milk and 3.5 RMB/250g with industrial certification (Changfu milk)

Food safety, traceability and certification systems have also been studied in pork. Chinese consumers were willing to pay 106 per cent increase in price for Government safety certification (opposed to none) which was the highest in a relative comparison; this was followed by private third-party certification, traceability and other additive information in labels with WTP ranging from 2.89-6.9 RMB (or 29-69 per cent more) (Ortega et al. 2011). Furthermore, it can be expected that the WTP for pork can vary across different consumer segments rather than being individual specific. This was confirmed in this study. Across four consumer groups, government safety certification was valued highest, between 5 and 27 RMB (or 50-270 per cent more) indicating price premiums in all but consumers in consumer Class 1. This class (38 per cent of the sample) appears to be overall the most sensitive to the product price, thus they are "price conscious". Consumers in Class 2 (13 per cent of the sample) obtain most utility from either government or private certification compared to the traceability system or the product-specific label (which reduced WTP). Class 3 (28 per cent of the sample) is characterized by consumers who enjoy having pork as a part of the daily diet and are not willing to pay premiums for other than government certification.. Lastly, Class 4 (21 per cent of the sample) include shoppers that have positive food safety risk perception (rated from no concern to extreme concern) coefficients and a relatively high WTP for all attributes; hence the name ''Worried Consumers". Moreover, the wealthier consumers were less likely to belong to the ''Price Conscious'' or ''Pork Lovers'' classes relative to "Worried consumer" class. This confirms the result that consumers in classes 1 and 3 had a lower WTP for the food safety attributes relative to the consumer WTP in other two groups.

Table 3.4: Chinese consumers' WTP for pork food safety attributes

		WTP (all consumers)	WTP (4 consumer groups)			
			1. Price Conscious 38%	2. Certification Conscious 13%	3. Pork Lovers 28%	4. Worried Consumers 21%
Government safety certification	RMB/500 grams	10.59	5.01	26.96	12.61	26.37
	Relative WTP (%)*	106%	50%	270%	126%	264%
Private third-party safety certification	RMB/500 grams	6.90	3.82	20.58	9.25	11.53
	Relative WTP (%)*	69%	38%	206%	93%	115%
Traceability information	RMB/500g	5.86	3.42	10.57	2.52	20.16
	Relative WTP (%)*	59%	34%	106%	25%	202%
Additional product information	RMB/500g	2.89	1.51	-27.60	0.66	14.52
	Relative WTP (%)*	29%	15%	-276%	7%	145%

Source: Ortega et al. 2011.
*Compared to the retail price 10 RMB per 500 grams of pork

One more Chinese study[1] focuses on soybeans used to produce soymilk. In particular, Zheng et al. (2013) explored consumer preferences for certification of the non-GM and organic production practices and country of origin. They found that WTP or 0.90 RMB or 113 per cent more was clearly highest for organic soybean certified by U.S. agency opposed to no claim at all. This was followed Chinese certifications for both organic and non-GM products. Of different certification schemes the lowest WTP was for EU-certification, as authors note, perhaps reflecting lack of familiarity of this entity. Finally, people were willing to pay for an information of the products origin, and about 36 per cent more for domestic than US ingredients.

Table 3.5: Chinese consumers' preferences for the soybean milk

	WTP: BMB per 250-ml soymilk	Relative WTP (%)*
Organic production	0.90 certified by US-agency	113%
	0.45 certified by EU-agency	56%
	0.63 Chinese certification	79%
Non-GM production	0.49 certified by US-agency	61%
	0.37 certified by EU-agency	46%
	0.62 Chinese certification	78%
Origin of ingredients	0.33 for US origin	41%
	0.45 for China origin	56%

Source: Zheng et al. 2013.
*Compared to an average retail price 0.80 RMB/250ml (in 2010)

[1] Authors called this choice-based conjoint study rather than CE.

In Japan, Iwamoto et al. (2003) found that consumers were willing to pay an 11 per cent premium to purchase Eco-labelled (relating to manure treatment) milk and a 10 per cent premium to purchase HACCP[2] (food safety) labelled milk. These were higher than the premium of 3 per cent for purchasing milk that is an extra one day fresher.

Table 3.6: Japanese consumers' WTP for HACCP and Eco labelled milk products

	Yen/litre	Relative WTP (%)*
HACCP (food safety) labelled milk	165	110%
Eco-labelled milk	167	111%
Freshness	145	103%

Source: Iwamoto et al. 2003.
*Compared to average 150 Yen/litre of the retail price range 140-150 Yen

Another study focused on Japanese consumers' demand for organic milk alongside animal medicinal products and low-stress feeding (Managi et al. 2008). The highest premium was for organic milk produced with the tightened restrictions for medicine use and low-stress feeding practices (Case 1) resulting 115-154 per cent premium compared to the base scenario without these improvements. The highest marginal premium up to 65 per cent was for restricting medicine use, everything else equal (Case 2). The authors included two model specifications, one without (Model 1) and another with (Model 2) socio-economic and other covariates, with reasonably similar welfare estimates.

Table 3.7: Japanese consumers' WTP for organic milk

		Base case	Case 1	Case 2	Case 3	Case 4
Organic feed		No	Yes	No	No	Yes
Medicine use restricted		No	No	Yes	No	Yes
Low-stress feeding		No	No	No	Yes	Yes
Model 1	Yen/litre	150	210	232	181	323
	Relative WTP (%)*	-	140%	155%	121%	215%
Model 2 (with covariates)	Yen/litre	150	234	248	199	381
	Relative WTP (%)*	-	156%	165%	133%	254%

Source: Managi et al. 2008.
*Compared to the base case price of 150 Yen/litre

Hu et al. (2006) explored Japanese consumers' perceptions on credence attributes associated with canola oil. In particular, this included nutrient information, use of GM-seeds, certification of organic or functional food and whether the product is imported. They found, firstly, that Japanese consumers are willing to pay 800 Yen to be able to buy canola oil as indicated by the negative value for "not buying" option. Secondly, Japanese consumers are willing to pay 14-35 per cent less for oleic acid oil and vitamin E enriched oil, all compared to canola oil with low in saturated fat. Thus consumers may value the conventional nutrition information rather than other nutritional attributes. Moreover, consumers were willing to pay, on average, up to 1525 Yen to avoid GM-oil; which is about twice as high compared to a price of a regular bottle. Finally, consumers are willing to pay between 200 and 700 Yen per bottle for avoiding imported products or for different

[2] HACPP = Hazard Analysis Critical Control Point is a certification process for food safety

certifications. Importantly, there is a clear WTP asymmetry between avoidance of GM-oil and organic production.

Table 3.8: Japanese consumers' WTP for credence attributes in oil products

		Yen/bottle of oil	Relative WTP (%)*
Not buy -option		-800.89	-115%
Nutrition information	Rich in oleic acid	-96.03	-14%
	Rich in vitamin E	-171.41	-25%
GM-ingredients	Information of GM given	-1525.67	-219%
	No information	-1341.88	-192%
Certified for	Organic	220.87	32%
	Functional food	523.24	75%
Imported product		-700.25	-100%

Source: Hu et al. 2006.
*698 Yen/bottle is highest actual price of a bottle of regular oil

Finally, Aizaki et al. (2012) explore consumers' preferences for beef products food safety. This is a concern in Japan which in the past has experienced disturbance in the food market with the Bovine Spongiform Encephalopathy (BSE)[3] crisis. In this study, the respondents were asked to choose between four beef products: domestic Wagyu beef, domestic dairy beef, Australian beef and US beef. The study found that the two types of domestic beef were valued the highest with WTP up to 1036 Yen per kilo. In all cases, people prefer BSE-tested meat. The price premiums for BSE-testing were up to 33 per cent for domestic Wagyu beef, up to 113 per cent for domestic dairy beef, up to 164 per cent for Australian beef and up to 97 per cent for US beef. These WTP were higher amongst those who prefer BSE-tested beef; and naturally those respondents who did not prefer the certain type of beef would want price discounts to accept the product. Overall, Japanese preferences were greatly influenced by the BSE-test status and alongside food safety, the results indicate preferences for domestic meat.

Table 3.9: Japanese consumers' WTP for BSE-tested beef

			BSE-untested		BSE-tested	
Beef type		**N**	**Yen/100 grams**	**Relative WTP (%)***	**Yen/100 grams**	**Relative WTP (%)***
Domestic Wagyu	Prefers Wagyu beef	61	502	72%	915	131%
	Prefers BSE-tested beef	279	-229	33% lower	927	133%
	Not prefer dWagyu beef	14	-130	19% lower	800	115%
Domestic dairy	Prefers dairy beef	60	411	83%	1036	208%
	Prefers BSE-tested dairy beef	285	-364	73%	1062	213%
	Not prefer dairy beef	9	-607	122% lower	805	162%
Australian	Prefers Australian beef	32	184	71%	682	264%
	Prefers BSE-tested beef	270	-983	381% lower	554	215%
	Not prefer Australian beef	52	-595	231% lower	-343	133% lower
US	Prefers US beef	18	-11	6% lower	391	197%
	Prefers BSE-tested beef	156	-821	415% lower	193	97%
	Not prefer US beef	180	-2110	1066% lower	-814	411% lower

Source: Aizaki et al. 2012.

[3] Also known as "mad cow disease" (Yu and Gao 2011).

*compared to average retail price 698 Yen/100g for domestic Wagyu beef (price vector 498-898 Yen), 498 RMB/100g for domestic dairy beef (298-698 Yen), 258 RMB/100g for Australian beef (148-398 Yen), and 198 RMB/100g for US beef (98-298 Yen)

3.2.2 Non-Asian studies

Secondly, studies outside of Asia include examples mainly from Europe and North-America with a wide range of food-products (and some non-food products) namely for different meat and fruit but also eggs, bread and wine. Firstly, credence attributes in meat production has been explored in Scandinavia and North-America. In Sweden, for instance, consumers appear to value most animal welfare attributes positively. As in Chapter 2, these animal welfare attributes can be considered as ethical credence attributes. In particular, of the selected pig animal welfare attributes consumers preferred most banning the fixation of sows and were willing to pay 54.3 SEK/kg for this as shown by the highest relative WTP in this particular study (Lagerkvist et al. 2006). The same study found that Swedish consumers were willing to pay 48.6 for allowing fixation only at the delivery opposed to permanent fixation, 34-48 SEK/kg for providing plentiful indoor straws or outdoor housing option for pigs, and 16 SEK/kg for restricting castration practices whereas animal welfare attributes of tail docking (if biting would occur) and no castration opposed to surgical procedures lead to price discounts up to 21 per cent.

Table 3.10: Swedish consumers' WTP for pig welfare in production

	WTP in SEK per 1 kilo of pork	**Relative WTP (%)***
Housing system		
indoors, plenty of straws	34.4	46%
outdoors	47.9	64%
Castration opposed to surgical		
None	-15.9	21% lower
immunocastration	15.7	21%
No tail docking, biting can occur	-10.6	14% lower
No tail docking, biting is prevented	7.9	11%
Fixation		
fixation only at delivery	48.6	65%
banning fixation	54.3	72%

Source: Lagerkvist et al. 2006.

*Compared to base price 75 SEK/kg

In a similar study few years later by Liljenstolpe (2008), mobile slaughter was considered as a good transportation alternative for pigs with a highest relative WTP of 1.41 $/lb, or a 19 per cent price premium over the average retail price. These preferences can be related to lower environmental impact as pigs do not have to be transported over long distances. People were also willing to pay for 15-20 per cent premiums for limiting stock size to 100-200 pigs opposed to 400 pigs and 3 per cent premium for not mixing unfamiliar pigs with each other. In contrast, ‘‘no castration’’ is regarded negatively by the respondents as indicated by a WTP 15 per cent below the actual retail price. This can be associated with food safety concern as not castrating piglets can lead to increased risk of boar taint.

Table 3.11: Sweden: Consumers' WTP for pig welfare in production

	WTP in US$ per pound of pork	Relative WTP (%)*
Mobile slaughter	1.41	155%
No castration	-1.13	124% lower
Stock limit	1.09 for limit of 200 pigs	120%
	1.50 for limit of 100 pigs	165%
Mixing of unfamiliar pigs	1.00 for forbidding	110%

Source: Liljenstolpe (2008)
*Compared to the retail price of pork 0.91 US$/lb

Carlsson et al. have also published series of papers focused on variety of agricultural production and credence attributes including animal welfare in Sweden. The WTP estimates for chicken, beef, pork, egg, milk and grain products are summarised in Carlsson et al. (2005). For meat products other than pork, banning GM-fodder resulted clearly the highest WTP. However, when comparing to the average retail prices these WTP were even higher for eggs and milk (45-49 per cent of the retail price) than for meat product (8-15 per cent of the retail price). For pork, the outdoor production was valued the highest 27.5/kg or 66 per cent more.

Regarding other agricultural products, the highest WTP for eggs was 20 SEK/6 eggs or 83 per cent premium for banning battery cage produced eggs. For milk, consumers were most concerned of the type of animal feed and were willing to 88 per cent more for non-GM feed than GM fodder. This is similar to meat production as above. Finally for flour, consumers were more concerned on use of pesticides and cadmium content than farm origin and choice of husbandry. In fact, consumers prefer avoiding spraying in production, but saying that it was preferred method when crop is affected by disease. Consumers are also willing to pay 5.50 SEK or 60 per cent more for analysing soil so that high cadmium levels would not end to the product and hence in consumption.

Table 3.12: Swedish consumers' WTP for meat production attributes: chicken, beef and pork

	Chicken		Beef		Pig	
	SEK/1 kg	Relative WTP (%)*	SEK/1 kg	Relative WTP (%)*	SEK/1 kg	Relative WTP (%)*
Label: farm and husbandry (vs. min requirements)			7.31	18%	3.54	9%
GM-fodder label	7.92	9%	6.17	15%	3.45	8%
GM fodder banned	15.73	18%	18.74	45%	21.69	52%
All year outdoor production	6.74	8%	1.82	4%	27.5	66%
Mobile slaughter vs. transport live animals to slaughter	-3.31	4% lower	3.77	9%	3.17	8%
Slower growth	11.28	13%				

Source: Carlsson et al. 2005.
* Compared to the averages of the price vectors: 89.6 SEK/kg (chicken) and 41.6 SEK/kg (beef and pork)

Table 3.13: Swedish consumers' WTP for other agricultural production attributes: eggs and milk

	Eggs		Milk	
	SEK/6 eggs	Relative WTP (%)*	SEK/1 litre	Relative WTP (%)*
GM-fodder label	4.94	45%	3.46	49%
GM fodder banned	10.42	95%	6.52	93%
Battery cages co-exist with free range	13.39	122%		
Battery cages are banned	20.11	183%		
Omega 3 enriched	2.12	19%		
Free-range indoor production vs. stanchion			2.67	38%
Cow and calf together 8-12 weeks vs. 1-4 days			1.43	20%

Source: Carlsson et al. 2005.

*Compared to the averages of the price vector: 11 SEK/6 eggs and 7 SEK/litre milk

Table 3.14: Swedish consumers' WTP for other agricultural production attributes: flour

	SEK /2kg	Relative WTP (%)*
Label: farm and husbandry (vs. min requirements)	4.16	45%
No spraying	6.82	74%
Spraying if crop is affected	6.80	74%
Soil and grain analysed for cadmium	5.50	60%

Source: Carlsson et al. (2005)

* Compared to the averages of the price vector: 9.2 SEK/2 kg flour

Next, the credence attributes included in the labels can be important for consumers when they are making purchase decisions such as the products' country-of-origin. For example, Pouta et al. (2010) found that Finnish consumers prefer domestic chicken products. Essentially, the study identified four types of consumers: first those who had a strong domestic preference for domestic meat whereas the production method and seasoning were relatively unimportant (62 per cent of the sample); second those who had strong preferences for domestic as well as Danish products, and unseasoned products while also organic production and animal welfare were somewhat important (16 per cent of the sample); third those for who the price was very important alongside seasoning (12 per cent of the sample); and last a group who preferred organic production and production promoting animal welfare (9 per cent of the sample). Across these consumer groups, the WTP was substantially reduced by 30-44 per cent, 46-92 per cent and 46-77 per cent when an imported product (from Thailand, Brazil or Denmark) was offered. Moreover, in relative terms, the Finnish consumers were willing to pay more for animal welfare promoting chicken production than for organic production, and less for production promoting consumer health.

Table 3.15: Finnish consumers' WTP for broiler chicken products' country of origin

	Relative WTP (%)	Average
Danish product	30–44% lower	37% lower
Thai product	46–92% lower	69% lower
Brazilian product	46–77% lower	62% lower

Source: Pouta et al. 2010.

Danish consumers also prefer domestic pork indicated by a WTP 23.9 DKK or 4 per cent more (Mørkbak et al. 2010). The same study found high preferences for the lower product fat content. In fact, 3-6 per cent fat content opposed to over 13 per cent fat content was the only attribute that itself resulted in a price premium (106 per cent) in this study. The WTP for food safety (reduced salmonella risk) was 19.6 DKK (or 78 per cent more), followed by WTP of 8.7 DKK (or 35 per cent more) for outdoor production and WTP of 7 DKK for reduced use of antimicrobial agents. Thus in the present study animal welfare (i.e. outdoor production and reduction in use of antibiotics was valued little lower than other product attributes (food safety and fat content), although in some cases antibiotic uses is associated also with food safety.

Table 3.16: Danish consumers' WTP for pork food safety characteristics

	DKK/500 g of minced pork	Relative WTP (%)*
Outdoor production	8.66	35%
Domestic product	23.93	96%
Food safety	19.56	78%
Fat content (vs. over 13%)		106%
3-6%	26.50	
7-10%	24.77	99%
11-13%	14.64	59%
Reduced use of antibiotics	7.13	29%

Source: Mørkbak et al. 2010.
*Compared to a DKK 25/ 500 g of minced pork

The same authors explored consumer preferences for food safety in further detail (Mørkbak et al. 2011). In particular, this study included chicken alongside pork product as well as testing the effect of describing food safety in additional attributes. These include reduced use of antibiotics alongside salmonella for pork, and campylobacter alongside salmonella for chicken. Similar to pork as above study, the domestic chicken products were valued highly opposed to foreign country of origin, WTP about 36 DKK/ 500g or premiums between 42-45 per cent. While consumers were willing to pay for both food safety attributes, between 29 and 78 per cent for pork and between 59 and 145 per cent for chicken, there was no support that WTP for the primary food safety attribute was impacted by the additional attribute.

Table 3.17: Danish consumers' WTP for food safety attributes for pork and chicken

Pork		One food safety attribute		Two food safety attributes	
		DKK/ 500g	Relative WTP (%)*	DKK/ 500g	Relative WTP (%)*
Outdoor production		7.13	29%	8.66	35%
Country of origin: domestic		30.94	124%	23.93	96%
Food safety: Salmonella free-label		19.56	78%	19.56	78%
Food safety: Reduced use of antibiotics-label		N/A	-	7.13	29%
Fat content (%) (vs. over 13%)	3-6%	29.11	116%	26.50	106%
	7-10%	27.72	111%	24.77	99%
	11-13%	18.12	39%	14.64	59%
Chicken		**One food safety attribute**		**Two food safety attributes**	
		DKK/ 500g	**Relative WTP (%)***	**DKK/ 500g**	**Relative WTP (%)***
Outdoor production		9.40	38%	14.06	25%
Country of origin: domestic		35.54	142%	36.21	145%
Food safety Salmonella free-label		N/A	-	14.66	59%
Food safety: Campylobacter free-label		21.84	87%	26.35	105%

Source: Mørkbak et al. 2011.
* Average prices are DKK 25 for pork and chicken based on Mørkbak et al. (2010) for pork. Similar scale was used for chicken here although the price vectors vary from DKK 20-80 for pork and DKK 25-115 for chicken.

In another study, Mørkbak and Nordstrom (2009) found that Danish consumers were willing to pay most for chicken's outdoor rearing opportunity, even before food safety, and that additional information of these attributes increase the WTP by 120 per cent and 158 per cent, respectively. These reported WTP are for the "reference person" (i.e. woman, low education and income, no children, living rural, aged under 50 years). Additional information can increase WTP for outdoor rearing within educated, higher income and urban consumers while age, gender and having children reduce WTP. Likewise, additional information can increase WTP for food safety within urban consumers and consumers with children, poor kitchen hygiene and health issues while age, gender, higher education and income reduce WTP.

Table 3.18: Danish consumers' WTP for food safety and chicken outdoor production attributes

	With information		Without information	
	DKK/ 1300g (whole chilled chicken)	Relative WTP (%)*	DKK/ 1300g (whole chilled chicken)	Relative WTP (%)*
Food safety: campylobacter-free label	20.88	49%	8.08	19%
Outdoor production	34.56	80%	15.68	36%

Source: Mørkbak and Nordstrom 2009.
*Compared to average 43 DKK/1033g of the actual market prices 44 DKK/1300g (an indoor reared chicken) and 42 DKK/1300g (ecologically produced chicken) in 2008

In another study from Finland, by Koistinen et al. (2013) explored consumer preferences for fat content, production methods and carbon footprint information for beef and pork products. The authors estimated average WTP over all respondents as well as WTP for six consumer groups. Firstly, the average WTP for the baseline products were similar for beef (24.50 €/kg) and pork

(23.65 €/kg). These WTP amounts were increased slightly if the respondent was "fat content conscious" and more so if the respondent was "Ideological but passive", "Content with conventional" or if one prefer beef; and likewise the overall WTP was reduced if the consumer was conscious about price or production method.

Looking next at the relative WTP (compared to the base product as above), the average WTP implies that people were willing to pay most for organic production, followed by animal welfare, safety and healthiness and lastly for conventional system. People were also willing to pay more the fat content defined at the 5 per cent level. As expected, these WTP vary across the six consumer groups. First, the price conscious consumers (23 per cent of the sample) were willing to pay at least 11 per cent premium for animal welfare promoting production methods for pork and beef when combined with a low fat content. This was closely followed by production methods promoting Safety and Healthiness and Organic production. The second group of consumers (23 per cent of the sample) had the strongest preferences for a low fat content but also for the none-conventional production methods. The price premiums for these alternative production methods were about 42 per cent higher than the baseline product with little variation across the production types. Third consumer group (17 per cent of the sample) was a rather average having no striking characteristic. These "Ideological but passive" were willing to pay up to a 30 per cent premium for pork and a 20 per cent premium for beef when products had a low fat content and produced with one of the alternative, more responsible production methods. The fourth group (14 per cent of the sample) prefer the conventional production methods as indicated by reduced WTP for the alternative methods. Moreover, these consumers were the least price sensitive of all consumer groups. The fifth group (12 per cent of the sample), with an illustrative name "beef preferring" had 81 per cent higher baseline WTP for the beef (47 €/kg) compared to pork (26 €/kg). This group gain a relatively small value from different product attributes, between 0-2 per cent for beef and 2-16 per cent for pork. The last consumer group (11 per cent of the sample) was most concerned of the production methods and they were willing to pay 63-66 per cent premiums for the organic production and 18-19 per cent premiums for animal welfare promoting production compared to conventional methods.

Finally, adding information of carbon footprint was found to have negative impacts on consumer beef choices but positive for pork choices; this might be due to the direct relationship between carbon footprint and product type where pigs, unlike cows, have a smaller footprint (Koistinen et al. 2013).

Table 3.19: Finnish consumers' WTP for the baseline beef and pork products: with conventional production and fat content not defined

	Average WTP	WTP: 6 consumer groups					
		1.Price conscious (23%)	2.Fat content conscious (23%)	3.Ideological/ passive (17%)	4.Content with conventional (14%)	5.Prefer beef (12%)	6.Production method conscious (11%)
	WTP: € per 1 kilo of meat						
Beef	24.50	6.95	26.71	45.39	79.33	46.57	20.09
Pork	23.65	6.82	26.47	39.28	78.32	25.93	19.68

Source: Koistinen et al. 2013.

Table 3.20: Finnish consumers' WTP for beef products

	Average WTP	WTP: 6 consumer groups					
		1. Price conscious (23%)	2. Fat content conscious (23%)	3. Ideological/passive (17%)	4. Content with conventional (14%)	5. Prefer beef (12%)	6. Production method conscious (11%)
Conventional, 5% fat	6.7%	7.4%	40.0%	17.6%	1.7%	1.1%	1.1%
Safety & Healthiness, 5% fat	8.4%	9.6%	42.0%	18.4%	3.1%	1.2%	10.0%
Animal welfare, 5% fat	9.2%	11.0%	42.8%	19.0%	1.5%	1.5%	18.2%
Organic, 5% fat	9.7%	9.7%	42.3%	20.0%	-0.2%	1.6%	62.8%
Safety & Healthiness, fat % not defined	2.0%	2.6%	5.1%	1.2%	1.4%	0.2%	9.1%
Animal welfare, fat % not defined	2.9%	4.3%	7.0%	2.1%	-0.2%	0.5%	17.5%
Organic, fat % not defined	3.5%	2.8%	5.8%	3.8%	-2.0%	0.6%	62.6%

Source: Koistinen et al. (2013)

Table 3.21: Finnish consumers' WTP for pork products

	Average WTP	WTP: 6 consumer groups					
		1. Price conscious (23%)	2. Fat content conscious (23%)	3. Ideological/ passive (17%)	4. Content with conventional (14%)	5. Prefer beef (12%)	6. Production method conscious (11%)
Conventional, 5% fat	7.5%	7.8%	40.9%	27.0%	1.8%	11.0%	1.2%
Safety & Healthiness, 5% fat	9.4%	10.1%	43.0%	28.0%	3.2%	12.6%	10.7%
Animal welfare, 5% fat	10.3%	11.6%	43.8%	28.9%	1.6%	15.4%	19.4%
Organic, 5% fat	10.9%	10.3%	43.3%	30.4%	-0.2%	16.0%	65.8%
Safety & Healthiness, fat % not defined	2.3%	2.8%	5.2%	2.0%	1.5%	2.0%	9.7%
Animal welfare, fat % not defined	3.3%	4.5%	7.2%	3.5%	-0.2%	5.6%	18.6%
Organic, fat % not defined	3.9%	2.9%	6.0%	6.2%	-2.1%	6.3%	65.6%

Source: Koistinen et al. 2013.

Table 3.22: Finnish consumers' WTP for carbon footprint relative to the baseline beef and pork products

	Average WTP	WTP: 6 consumer groups					
		1. Price conscious (23%)	2. Fat content conscious (23%)	3. Ideological/ passive (17%)	4. Content with conventional (14%)	5. Prefer beef (12%)	6. Production method conscious (11%)
Beef	-1.6%	-0.9%	-3.1%	-1.7%	-2.1%	-0.2%	-2.9%
Pork	2.2%	1.0%	5.1%	4.8%	-0.9%	1.0%	13.8%

Source: Koistinen et al. 2013.

Similar to Scandinavian studies, several US based studies focus on credence attributes on meat products. In context of beef steak, Abidoye et al. (2011) found that improvements in a product traceability from processing plant only to the birth farm was valued highest with a WTP $US 3.77 per steak (or 38 per cent more) while traceability to feed lot was valued 10 per cent more. The next highest WTP was for grass-feed opposed to grain-fed being 3.44 $ per steak or 34 per cent more but 8 per cent lower for mix of grass-and-grain feeding. Likewise, consumers are willing to pay 20 per cent less for non-domestic steak. Lastly, no use of growth promotants was also valued up to $0.76 or 8 per cent relative to the retail price.

Table 3.23: US consumers WTP for steak production attributes

	$ per steak	Relative WTP (%)*
Traceability (vs. processing plant only)		
to birth farm	3.77	38%
to feed lot	1.00	10%
Non U.S. producer	-2.01	20% lower
No growth promotants	0.76	8%
Feed type: Grass-fed	3.44	34%
Feed type: Mix of grass and grain	-0.80	8% lower

Source: Abidoye et al. 2011.
*Compared to the average retail price of $10/steak

In another beef steak study from USA, Loureiro and Umberger (2007) found that consumers value U.S. Department of Agriculture (USDA) certification for food safety more than any of the other selected attributes, including country-of-origin labelling, traceability and tenderness. For example, the USDA certification resulted in 20 per cent price premium and this was valued over third time higher than country of origin, which typically has been valued highly. This may indicate that consumers may only associate country-of-origin with higher food safety and quality if that country is already associated with higher food safety and quality (Loureiro and Umberger 2007).

Table 3.24: US consumers WTP for the rib-eye beef steak attributes

	$/ pound of steak	Relative WTP (%)*
Country of origin label	2.57	38%
Guaranteed tender	0.95	14%
Food safety inspected by USDA	8.07	120%
Traceability to farm	1.90	28%

Source: Loureiro and Umberger 2007.
*compared to average price of beef ribeye steak $6.57/pound in 2003

In a pig welfare study, Tonsor et al. (2009a) found that the average WTP was highest for pork from Brazil opposed to domestic meat with 169 per cent premium (269 per cent more), which contrast observations from Europe. The second highest WTP ($3.53 or 60 per cent more) was for a label implying gestation crate free production while also Canadian meat had a positive but much lower WTP compared to Brazil (41 per cent more); lastly people were also willing to pay 1.27 $ per pound (or 36 per cent more) for the information about the farm size. The study also identified four distinctive groups of consumers labelled as "pork enjoyers" (32 per cent of the sample), "attribute conscious" (33 per cent), "ban preferring" (20 per cent) and finally the "price conscious" (14 per cent) consumers who were only concerned of the price of the product. "Pork Enjoyers'', solely, were willing to pay $0.70 (or 20 per cent more) for farm size preferences for pork from large rather than median sized farms while only the "Attribute conscious" consumers were also willing-to-pay 65 per cent more for pork originated from Canada, although less than pork from Brazil. Finally, consumers who preferred no use of gestation crates (i.e. "ban preferring" consumers) regardless if this production practice is voluntary or mandatory. Therefore, across user groups there are diverse preferences for country-of-origin, production practices, and farm sizes.

Table 3.25: US consumers' preferences for pork production attributes

		WTP US$ per pound of pork Relative WTP (%)*				
		Average all consumers	**Pork Enjoyers (32.2%)**	**Attribute Conscious (33.3%)**	**Price Conscious (14.1%)**	**Ban Preferring (20.4%)**
Country of origin (vs. US)	Canada	1.44 (41%)	n/s	2.29 (65%)	n/s	n/s
	Brazil	9.49 (269%)	2.90 (82%)	13.13 (372%)	n/s	5.35 (152%)
Gestation crate practices (vs. typical)	Labelled as crate free	2.11 (60%)	0.84 (24%)	1.86 (53%)	n/s	3.13 (89%)
	Banned	n/s	1.00 (28%)	3.39 (96%)	n/s	5.62 (159%)
Farm Size (vs. median)	Small	n/s	n/s	n/s	n/s	n/s
	Large	1.27 (36%)	0.70 (20%)	n/s	n/s	n/s

Source: Tonsor et al. 2009a.
n/s non-significant → WTP not different from zero
*Compared to average retail price 3.53/lb for boneless pork chops (in 1998–2007)

Other US based studies on meat production have focused on the certifications of credence attributes. For example Nilsson et al. (2006) and Lusk et al. (2007) estimated WTP for pork chops certified for farm environmental practices, animal-wellbeing and pigs have not received antibiotics. Lusk et al. (2007) found that, overall, consumers were willing to pay a $0.67or 19 per cent more for a pork chop if the product is environmentally certified. Likewise consumers were willing to pay up to $0.90 or 26 per cent more for pork chops certified for animal well-being and restricted use of antibiotics. Moreover, the study found that altruistic individuals are willing-to-pay more for pork products public good attributes than less altruistic individuals and free riders[4].

[4] Altruistic and free rider-consumers were defined based on the additional questions in the survey

Nilsson et al. (2006) in their related study explore consumer preferences across three distinctive consumer segments that they named as "attribute conscious" (16 per cent of the sample), "price conscious" (41 per cent) and "concerned shoppers" (43 per cent). They found that a significant segment of consumers would purchase certified pork at the anticipated marginal cost of certification. In particular, combination of all these programs lead to highest WTP, up to a 200 per cent premium. However, as authors note, this premium is only indicated by one consumer groups, which in this study represented only 16 per cent of the sample. Moreover, the attribute conscious consumers and price concerned consumers can be considered as most different while the concerned shoppers fell in between these two classes. These "concerned shoppers" prefer the certification programs; yet if the price is getting too high they would choose the conventional product instead.

Table 3.26: US consumers' WTP for certification programs for pork chops

			WTP across consumer groups (b)		
		Average WTP (a)	Attribute conscious (16%)	Price Consciou s (41%)	Concerned Shoppers (43%)
Environmentally certified	$ per pound of pork chops	0.67	2.58	0.24	1.45
	Relative WTP (%)*	(19%)	(75%)	(7%)	(42%)
Certified for animal well-being	$ per pound of pork chops	0.84	-	0.26	1.81
	Relative WTP (%)*	(24%)		(8%)	(52%)
Certified free of antibiotics	$ per pound of pork chops	0.90	2.66	0.19	2.50
	Relative WTP (%)*	(26%)	(77%)	(6%)	(72%)
Combinations of programs					
Environment & Welfare	$ per pound of pork chops	-	5.71	0.53	3.19
	Relative WTP (%)*		(166%)	(15%)	(92%)
Environment & Antibiotic	$ per pound of pork chops	-	5.60	0.41	3.59
	Relative WTP (%)*		(162%)	(12%)	(104%)
Welfare & Antibiotics	$ per pound of pork chops	-	4.64	0.42	4.12
	Relative WTP (%)*		(124%)	(12%)	(119%)
Certification for all three programs	$ per pound of pork chops	-	10.46	0.67	5.14
	Relative WTP (%)*		(303%)	(19%)	(149%)

Sources: (a) Lusk et al. 2007 and (b) Nilsson et al. 2006.
* The average retail price for pork chops: 3.45 dollars per pound (in 2004)

Regarding farm animal welfare certification, Olynk et al. (2010) estimate US consumers' WTP for production process claims by different verifying parties over two livestock products (pork and milk). They also tested existence of social desirability bias between choices made from respondents private "direct" point-of-view and then what they "indirectly" believed the average citizen would choose. This can be considered as a type of consumer-citizen distinction (Sagoff 1988). Olynk et al. (2010) found highest WTP for US-certification for pasture access when asking

respondents' private preferences[5]; in contrast, the citizen type WTP was highest for the private-third party certification entities for both milk and pork. Overall, the third party certification entity (relative to self-certification) was valued highest but in association with the production attributes the USDA certification became most highly valued almost every time apart from transportation, which the certification almost every time resulted in WTA for price discount. Moreover, some evidence for social desirability bias was found, for milk in particular, while looking at the WTP for pork in Table 3.27 below it seems that asking preferences indirectly overestimate WTP for most attributes.

Table 3.27: US consumers' preferences from two perspectives for pork product certification

		Pork			
		Direct WTP ("consumer")		Indirect WTP ("Citizen")	
	Certified by:	$/ pound	Relative WTP (%)*	$/ pound	Relative WTP (%)*
Individual crates/stalls	Self-Verified	0.93	23%	2.66	66%
	Consumer Group	1.09	27%	n/a	
	USDA	1.74	43%	2.58	64%
Pasture access	Self-Verified	1.22	30%	n/a	
	Third-party	1.29	32%	-3.30	82% lower
	Consumer Group	1.33	33%	1.74	43%
	USDA	3.84	96%	6.30	57% premium
Claims of antibiotic use	Third-party	-1.33	33% lower	-3.43	86% lower
	Consumer Group	-0.08	2% lower	0.29	7%
	USDA	2.91	73%	4.27	6% premium
Trucking/ transport	Self-Verified	0.74	18%	n/a	
	Third-party	-3.95	99% lower	-7.01	175% lower
	Consumer Group	-1.55	39% lower	-1.46	36% lower
	USDA	n/a		-1.30	32% lower
Certification entities	Consumer croup	n/a		n/a	
	Third-party	n/a		7.65	91% premium
	USDA	-3.38	84% lower	-7.42	185% lower

Source: Olynk et al. 2010.

*average retail price $4.01 /lb for boneless pork chops and $3.99/gallon of milk (in 2008).

[5] WTP for milk were not applicable due to insignificant price attribute.

Table 3.28: US consumers' preferences from two perspectives for milk product certification

		Milk**	
		Indirect WTP ("Citizen")	
	Certified by:	**$/ gallon**	**Relative WTP (%)***
Individual crates/stalls	Self-Verified	0.50	13%
	Consumer Group	n/a	
	USDA	1.02	26%
Pasture access	Self-Verified	n/a	
	Third-party	-1.63	41% lower
	Consumer Group	1.17	29%
	USDA	2.14	54%
Claims of antibiotic use	Third-party	-2.12	53% lower
	Consumer Group	0.53	13%
	USDA	1.08	27%
Trucking/ transport	Self-Verified	n/a	
	Third-party	-3.20	80% lower
	Consumer Group	n/a	
	USDA	n/a	
Certification entities	Consumer croup	-1.12	28% lower
	Third-party	3.71	93%
	USDA	-2.46	62% lower

Source: Olynk et al. 2010.
*average retail price $4.01 /lb for boneless pork chops and $3.99/gallon of milk (in 2008).
** Price for Milk products in "direct sample" was non-significant

Tonsor (2011) combined concerns of pig animal welfare, food safety and certification verifying all the product claims. They found a highest WTP, between $1.87 and $2.48 or 37-50 per cent more, for USDA certified pork chops, whereas private third-party certifications lead to up to 16 per cent price discount rather than premiums. People were also willing to pay up to 1.43 per pound if they were informed the pork chops originated from a family farm; and people were willing to pay up to 167 per cent more if the gestation crates are banned compared to voluntary crate free practices. However, these preferences were sensitive for the study design including the food safety and quality attributes. Foreign product origin was found if not negative, to have a relatively low WTP which contrasts Tonsor et al. (2009a) findings. Moreover, these WTP above were sensitive whether or not respondents were presented pork chop scenarios including food safety and quality attributes. Adding these attributes were found to increase WTP for gestation crate free labelling and imported products but reducing WTP for others. In relation to other attributes, food safety and quality were valued after USDA certification and about the same than gestation crate free practices.

Table 3.29: US consumers' WTP for animal welfare and food safety attributes in pork production

	With food safety and quality attributes		Without food safety and quality attributes	
	$/pound	**Relative WTP (%)***	**$/pound**	**Relative WTP (%)***
Labelled gestation crate free	0.79	16%	0.45	9%
Gestation crate ban	0.43	9%	1.20	24%
Country of origin (vs. US)				
Canada	0.03	0.6%	-0.05	1% lower
Brazil	-1.78	36% lower	-4.59	92% lower
Family farm	0.42	8%	1.43	29%
USDA certification	1.87	37%	2.48	50%
Third-party certification	-0.24	5% lower	-0.82	16% lower
Quality assured	0.79	16%	n/a	-
Food safety assured	0.78	16%	n/a	-

Source: Tonsor 2011.
*Compared to average retail price 4.99 $/lb from the price range of $3.49-6.49/lb (in 2008)

A study from Canada (Steiner et al. 2010) focused on non-GM certification for red meat alongside meat fat content and traceability. Consumers' valued most a non-GM steak with WTP almost four times as high than WTP for farm origin traceability. The authors included two model specifications, one without (Model 1) and another with (Model 2) socio-economic and other covariates, where accounting socio-economic differences appear to increase WTP for both attributes.

Table 3.30: Canadian consumers' WTP for bison steak attributes

	Model specification 1		Model specification 2 (with socio-economic covariates)	
	$(CAN)/ kilo	**Relative WTP (%)***	**$(CAN)/ kilo**	**Relative WTP (%)***
Certified guarantee traceability	$1.28	6%	2.91	14%
Certified guarantee non-GM	$5.03	25%	10.04	49%

Source: Steiner et al. 2010.
*Compared to the average $CN 20.49/kg of the given retail price range ($13.99-$28.99)

Finally, the Wolf et al. (2011) milk product study explore consumer preferences for food safety alongside certification entities. In a split-sample CE, some participants were provided with an additional food safety attribute, while also the description of the rbST-free[6] label was varied for half of the respondents. Furthermore, they split the sample according to the respondents normal purchasing behaviour related to the quantity of milk they buy. The study found, firstly, that US consumers' were willing to pay 21-74 per cent more for USDA certification and this was valued highest regardless the quantity been purchased. In contrast, consumers were willing to pay up to 10-34 per cent less for the private third-party certification. Secondly, US consumers were also

[6] Recombinant bovine somatotropin (rbST) is a growth hormone that encourages milk production.

willing to pay between 9 and 16 per cent more for label information about intensive grazing, whereas only those who buy half-gallon of milk were willing to pay 8-10 per cent more for information about moderate grazing. Thirdly, it appears that consumers' purchasing half-gallon have higher relative WTP for many attributes. Moreover, wording used in the rbST-labels for half-gallon milk products can impact on consumers' preferences in terms magnitudes of the WTP; thus from a marketing point-of-view the choice of the label can matter. Finally, while people were willing-to-pay 18-31 per cent more premiums for having additional food safety attribute, yet overall this was not until the third highest determinant for the choices after USDA certification and rbST-free products.

Table 3.31: US consumers' WTP for milk food safety

	With food safety	No food safety	with food safety	No food safety		
				Label [1]	Label [2]	Label [3]
	$ per Half-Gallon Relative WTP (%)*		$ per Gallon Relative WTP (%)*			
rbST-free	1.23 (46%)	1.09 (41%)	0.88 (20%)	0.88 (20%)	1.68 (37%)	0.87 (19%)
Intensive Grazing	n/s	0.32 (12%)	0.41 (9%)	n/s	0.70 (16%)	0.31 (7%)
Moderate Grazing	0.28 (10%)	0.21 (8%)	n/s	n/s	-0.37 (-8%)	n/s
Family Farm	0.39 (14%)	0.46 (17%)	0.52 (12%)	0.33 (7%)	0.50 (11%)	0.51 (11%)
Local	0.22 (8%)	0.19 (7%)	0.19 (4%)	n/s	0.51 (11%)	0.37 (8%)
USDA Verification	2.00 (74%)	1.69 (63%)	1.99 (44%)	1.33 (30%)	1.95 (43%)	0.94 (21%)
Private Verification	-0.44 (-16%)	-0.92 (-34%)	-0.50 (-11%)	-0.74 (-16%)	-0.64 (-14%)	-0.46 (-10%)
Enhanced Food Safety	0.83 (31%)	n/a	0.83 (18%)	n/a	n/a	n/a

Source: Wolf et al. 2011.
n/s attribute not significant; n/a attribute not applicable
rbST-Labels: 1 "No artificial hormones"; 2 "Our farmers pledge, milk from cows not supplemented with rbST"; 3 "From cows not treated with rbST"
*Compared to average retail prices: $US 4.49/ gallon of milk and $US 2.69/half-gallon of milk

Functional foods can be considered as another type of credence attributes (this was already briefly mentioned in one of the Japanese studies). Functional foods, while no unique definition, have potential to increase health benefits, for one or more target functions in the body, and to reduce risk of diseases (Bitzios et al. 2011, Barreiro-Hule et al. 2008). Bitzios et al. (2011) explored the UK consumer attitudes toward the functional ingredient of bread alongside bread type, slicing and texture of bread, organic production and possible health benefits in UK. Specifically the health benefits was considered as being beneficial for people's health in general whereas functional foods, as part of a healthy diet, have a specific positive impact on bacteria in the colon. They estimated WTP across three distinctive consumer groups. Relative to the third group (34 per cent of the sample), Group 1 (35 per cent of the sample) included consumers who were health

conscious, with restrained eating habits, and who were non-external and emotional eaters[7]; whereas Group 2 (30 per cent of the sample) was not determined by health conscious or emotional eating habits. All consumer groups, as expected, were less likely to select product with a higher price. The key results were, firstly, that bread type, wholegrain in particular, was valued highest. Secondly, consumers were willing to pay for the functional ingredient and health benefits but only by some consumers. In comparison, the direct health claims were valued 50 per cent higher than functional ingredient. Moreover, health benefits can have combined positive impact on WTP with either functional ingredient or method of production, yet with WTP similar to the health claim alone. Finally, across the consumer groups, Group 1 had the highest WTP for bread type, Group 2 had lower WTP for bread type but higher WTP for texture and slicing attributes while Group 3 preferred the conventional production type but was also the one with positive attitudes toward both health claims and functional ingredients.

Table 3.32: UK consumers' WTP for functional ingredients in bread choices

	Consumer group 1 (35.4%)		**Consumer group 2 (30.4%)**		**Consumer group 3 (34.2%)**	
	£ per 800g loaf of bread	**Relative WTP (%)***	**£ per 800g loaf of bread**	**Relative WTP (%)***	**£ per 800g loaf of bread**	**Relative WTP (%)***
Type of bread						
Rye	1.99	137%	-0.70	-48%	-1.12	-77%
Whole	4.11	283%	1.71	118%	n/a	
Brown	2.90	200%	0.59	41%	-0.30	-21%
50/50	1.67	115%	0.92	63%	n/a	
Organic production	n/a		n/a		-0.41	-28%
Functional ingredient (fibre)	n/a		n/a		0.18	12%
No slicing	n/a		n/a		-0.31	-21%
Slicing	-0.39	-27%	0.60	41%	-0.11	-8%
Texture relative to soft bread						
Springy	n/a		1.01	70%	-0.29	-20%
Firm	n/a		1.14	79%	-0.26	-18%
Crumbly	-0.66	-46%	1.05	72%	-0.22	-15%
Health benefit	n/a		0.90	62%	0.27	19%
Health benefit*Functional ingredient	n/a		0.60	41%	0.20	14%
Health benefit*Production	n/a		1.00	69%	n/a	

Source: Bitzios et al. 2011.
*Compared to the average retail price £1.45 (from a price range £0.7-£2.2)
n/a: attribute non-significant

[7] "Emotional eating, refers to a situation of excessive eating which is brought about by a state of confusion between an individual's internal arousal states … External eating refers to a situation in which an individual responds to some form of food related stimuli, irrespective of their internal status with respect to hunger or satiety. … Restrained eating, is a state when the conscious restrictive control associated with suppressed eating behaviour…" (Bitzios et al., 2011, p. 720).

Barreiro-Hurle et al. (2008) also looked into functional attributes but for wine. The result show that Spanish consumers were willing to pay a 58 per cent more for wine made from types of grape that are Resveratrol content enhanced. This premium is relative to the respondents' maximum price of €10.11 they would typically pay for a bottle of wine. Other WTP estimates show strong preferences for aged wines and that organic production was preferred opposed to conventional production. Finally, respondents were willing to pay 7-12 per cent more for wines from Rioja and La Mancha opposed to wines from rest of the Spain; whereas they prefer wine from rest of the Spain compared to Andalusia.

Table 3.33: Spanish consumers' preferences for functional wine

		WTP: € per bottle of wine	Relative WTP (%)*
Origin: opposed to "rest of Spain"	Andalusia	-0.64	-6%
	La Mancha	1.22	12%
	Rioja	0.67	7%
Organic production		1.53	15%
Type of wine: oak aged		5.41	54%
Resveratrol content enhanced grapes		5.89	58%

Source: Barreiro-Hurle et al. 2008.
*Compared to the maximum price (10.11€/ bottle) consumers declare they usually pay for wine

Finally, Gallardo (2011) considered only search and experience attributes and found that US consumers are willing to pay 11-13 per cent more for a one unit increase in sweetness, juiciness, and texture and 3-4 per cent more for firmness and ripeness of pears[8]. These WTP were about two to almost five times higher than WTP to firmness and ripeness.

Table 3.34: US consumers' WTP for pear search and experience attributes

	$/pound of pears	Relative WTP (%)*
Sweetness	0.19	13%
Juiciness	0.16	11%
Firmness	0.06	4%
Texture	0.16	11%
Ripeness, Ready to eat**	0.04	3%

Source: Gallardo 2011.
*Compared to $1.49/pound that is assumed to represent all pears available at the market.
**One unit increase means one day extra to wait until fully ripe.

Some CE studies included credence attributes yet no WTP estimates; however, they can still offer some useful observations. One such example is from Jaeger and Rose (2008) who found that New Zealand consumers, overall, considered not only the characteristics of the fruits, but also the eating occasion in which the fruit was to be consumed; these preferences vary from one fruit to another and from one consumer to another. Although typically people chooses the cheaper options available; sometimes the price of fruit can act as a proxy for quality.

In addition, two non-food studies are included in this review. Mackerron et al. (2009) were one of the first to study to value off-sets in terms of WTP for carbon offset certification and co-benefits

[8] In the study, each attribute apart from ripeness were rated from 1 to 9 scale varying from not sweet/not juicy/hard/mealy to ideally sweet/ideally juicy/soft/buttery. The study include also estimates for attribute ratings from scale of 2-5 and scale of 5-8. However, these are not included here for brevity.

among airline customers in the UK. While the consumers were willing to pay, on average, 107 per cent more for the offset program in general, the highest WTP (125 per cent more) was for the project co-benefits for conservation and biodiversity. These WTP amount can be considered in relation to the price vector from £4-£20 representing the actual charges of voluntary carbon offsets programs in the market. As can be seen, the WTP amounts were little sensitive for type of the model specification providing similar results.

Table 3.35: UK consumers' WTP for airline carbon offset certification programs

		Model 1	Model 2**	Average: Relative WTP (%)*
		£/ person per flight	£/ person per flight	
Carbon Offset		13.24	12.47	107%
Co-benefits	Human development	12.72	12.84	106%
	Conservation and biodiversity	15.84	14.98	128%
	Technology and market development	10.42	10.56	87%
Government certified		11.11	11.14	93%

Source: Mackerron et al. 2009.
*Average of Model 1 and Model 2 is compared to £12 average actual carbon offset charges (range £4-£20)
**Model 2 included socio-economic covariates

Another non-food study from O'Brien and Teisl (2004) focus on consumers' valuation for certified forest products, paper towels namely, in USA. The certification attributes included forest workers' rights, no clear-cutting of trees, sustainable management, fish/wildlife protection and environment where each attribute was defined as an industry score with the higher score reflecting to more active resource protection, more sustainable practices and/or better well-being of the forest workers. The authors estimated WTP for three certification entities including Environmental Protection Agency (EPA), a Made-in-Maine logo (quota sampling included respondents from Maine) and additional information in certification[9]. These were compared to the base case using label certified by the Forest Stewardship Council (FSC).

Overall, US consumers are willing to pay premiums for all certifications in the product. In more detail, they are willing to pay 70-113 per cent more for paper towels certified for workers' rights; 73-132 per cent more for certifications about no clear cutting of forests; 81-112 per cent more for certifications about sustainable forest management; 93-189 per cent for fish and wildlife certification; and 131-161 per cent for environment certification. Thus, overall, the highest WTP occur for environmental valuation whereas no one entity was consistently valued highest. EPA certification might be preferred for workers' rights and no clear cutting while added information with FSC is preferred for sustainable management and fish and wildlife certifications, and lastly, local Made in Maine logo is preferred to certify the attempts to reduce environmental pollution.

[9] The authors estimated WTP for three industrial scores from median to higher. In all cases, the WTP had similar patterns with decreasing toward higher industry scores, thus only the median scores (i.e. score = 75) are reported here for brevity.

Table 3.36: US consumers WTP for the forest product (paper towels) production attributes

	Certification by 'Made in Maine' logo		Certification by EPA		Baseline with added information	
	$ /six-pack **	Relative WTP (%)*	$ /six-pack **	Relative WTP (%)*	$ /six-pack **	Relative WTP (%)*
Worker's rights	0.66	70%	1.06	113%	0.88	94%
No clear cutting	0.80	101%	1.04	132%	0.58	73%
Sustainable management	0.61	81%	0.75	100%	0.84	112%
Fish & wildlife protection	0.51	93%	0.70	127%	1.04	189%
Environmental pollution	1.03	161%	0.86	134%	0.84	131%

Source: O'Brien and Teisl 2004.
*Compared to baseline prices with no added information and label certified by the Forest Stewardship Council: $0.94/6 pack for Workers' rights, $0.79 for no clear cutting, $0.75 for Sustainable management, $0.55 for Fish and wildlife protection, and $0.64 for Environmental pollution
** WTP for the median industrial attribute scores

3.2.2 Cross-country studies

While number of studies have been conducted in different countries, the direct cross-country comparisons are rare. For beef steaks, Tonsor et al. (2009b) found that US and Canadian consumers valued quality attributes (tenderness of steak) highest while Japanese and Mexican consumers valued enhanced food safety the most. These attributes had the highest WTP in the relative comparison regardless their income level or whether the consumers were frequent or infrequent buyers of steak. A comparison of the WTP values across countries shows that tenderness and the high level of foods safety was valued highest by the Frequent Japanese consumers with lower income.

Table 3.37: Consumer preferences for the steak food safety and tenderness in a cross-country comparison

		WTP: $ per 1 pound of steak			
		Canada	**Japan**	**Mexico**	**USA**
Frequent Consumers, Low Income	**Tender**	4.91	13.07	9.51	4.30
	Food safety vs. typical				
	enhanced by 40%	2.89	1.81	2.34	1.44
	enhanced by 80%	3.89	17.99	11.81	-0.94
Frequent Consumers, High Income	**Tender**	4.57	17.51	9.15	3.46
	Food safety vs. typical				
	enhanced by 40%	2.70	2.53	2.23	1.78
	enhanced by 80%	3.60	24.06	11.32	-0.75
Infrequent Consumers, Low Income	**Tender**	6.54	10.33	18.23	5.06
	Food safety vs. typical				
	enhanced by 40%	3.86	1.48	4.45	1.70
	enhanced by 80%	5.13	14.20	22.52	-1.12

Source: Tonsor et al. 2009.

In another study, Basu and Hicks (2008) explored the WTP for Fairtrade coffee in USA and Germany. While the study provided no WTP estimates, overall, consumers had similar preferences for common label attributes (price, certifier and countries of origin). The Fairtrade Labelling Organization -certifier was ranked second highest after growers' revenue. Moreover, US consumers preferred price discount if the product was origin from Brazil.

More evidence can be found from conjoint experiments that share some similar elements with CEs. Ehmke et al. (2008) found that Chinese consumers' were willing to pay 121 per cent price premium[10] for pesticide free onions which was clearly the highest WTP in the relative comparison. Consumers also preferred domestic onions opposed to foreign with a 50 per cent price premium while they were against the increase of GM onions. In contrast to Chinese, French, USA and Nigerian consumers were most concerned about GM content than use of pesticides of country of origin. In fact, all these countries' consumers had the highest WTP for non-GM content, up to WTP 312 per cent increase in price in Niger, 197 per cent in France and 71 per cent in USA. The second highest WTP for these countries varied between less than 1 per cent of GM content and domestic onions. The use of pesticides had a relatively low WTP; in fact, the pesticide free practice was considered negative utility in Niger. This contrast results from China in particular where consumers consider GM food content reduction more valuable than pesticide-free production.

Table 3.38: Consumer WTP for onion GM, pesticide and origin attributes in a cross-country comparison

	China		France		USA				Niger	
					Indiana		Kansas			
	WTP $US per 1 pound	Relative WTP (%)	WTP $US per 1 pound	Relative WTP (%)	WTP $US per 1 pound	Relative WTP (%)	WTP $US per 1 pound	Relative WTP (%)	WTP $US per 1 pound	Relative WTP (%)
0% GM content	0.26	40%	1.30	197%	0.47	71%	0.60	91%	2.06	312%
GM content < 1%	0.16	24%	0.89	135%	0.40	61%	0.41	62%	1.34	203%
GM content 1%-5%	-0.03	-6%	0.46	70%	0.21	32%	0.25	38%	0.51	77%
Pesticide free	0.8	121 %	0.44	67%	0.29	44%	0.33	50%	-0.90	-64%
Domestic onions	0.33	50%	0.41	62%	0.35	53%	0.51	77%	0.86	130%

Source: Ehmke et al. 2008.
*Relative to a retail price 0.66 US$ per 1 pound bag of onions

The type of organic certification labelling has been shown to affect consumer attitudes. Janssen and Hamm (2012) conducted a study to determine consumer preferences for specific organic product certification labels through choice experiments in six European countries, including the UK. The different certification entities included type of private, international (Demeter) and

[10] Relative to 0.66 US$ per bag

domestic, logos, governmental logos and voluntary (old) EU logo[11]. British consumers exhibited the highest WTP for products with the Soil Association label, as well as products labeled by the certification body 'Organic Farmers & Growers' opposed to having no certification at all. In other markets, Swiss, Czech and Danish consumers are willing to pay most for the government organic logos varying from 53-56 per cent more for certified organic apples and eggs. In contrast, German consumers had the highest WTP were almost the same for governmental and Demeter (private, international farmers certification) logos varying from 49 to 105 per cent more while in Italy consumers are willing to pay most for the EU logo varying from 53-56 per cent more for certified organic apples and eggs. Overall the highest WTP were for the logos that consumers knew and trust and which have perceived strict organic standards and control system.

Table 3.39: European consumers (Czech Republic, Denmark, Germany) WTP for organic certification logos

	Czech Republic		Denmark		Germany	
Logo:	**Apples**	**Eggs**	**Apples**	**Eggs**	**Apples**	**Eggs**
EU (old)	13%	23%	14%	20%	0%	21%
Government	56%	53%	52%	54%	51%	92%
Demeter - international private	9%	12%	14%	22%	49%	105%

Source: Janssen and Hamm 2012.

Table 3.40: European consumers' (Italy, Switzerland, UK) WTP for organic certification logos

	Italy		Switzerland		UK	
Logo:	**Apples**	**Eggs**	**Apples**	**Eggs**	**Apples**	**Eggs**
EU	80%	84%			8%	0%
Government (fake)*			18%	23%		
Demeter - international private	41%	37%	33%	31%		
CCPB -private	48%	56%				
Bio Suisse -private			54%	77%		
Soil Association -private					26%	27%
Organic Farmers & Growers - private					33%	36%

Source: Janssen and Hamm 2012.
*no real government logo existed so the study used a "fake" logo

Supporting some of the findings of the overall CE review, Morkbak et al. (2008) review a number of consumer preference studies including 11 CE studies on WTP for food safety and quality in meat. Their findings imply that WTP for food safety can depend on product, in particular context of animal welfare, banning GM fodder, place of origin and food safety in general. In addition, it is not clear how cultural differences across countries affect WTP for food safety. In another meta-analysis, Lagervist and Hess (2011) found that WTP for animal welfare can be impacted by respondent income and age, and information of the animals' conditions whereas no support was found for geographical disparities. Aizaki (2012) reviewed 38 CE related to consumer valuations for food products in Japan context concluding that consumers prefer local products and regions that may have some favourable images; Japanese also prefer eco-friendly production practices but

[11] This study used "old EU logo" which was voluntary; since then all organic products must be labelled with the mandatory EU logo while other organic logos can only be used additionally.

WTP for these can vary according to consumer characteristics; and that food safety issues are generally divided into ensuring food safety in production, applications of biotechnology and GM, and cases of discovering Bovine Spongiform Encephalopathy (BSE) in Japan. In addition, while additional information often can impact on the consumers' preferences there is also a threshold for the amount of information in the CE questionnaires which after participants reach their cognitive limits and thus accuracy of the valuations (Aizaki, 2012). BSE incident had also a significant impact in beef industry in USA (Yu and Gao 2011). In their meta-analysis of consumer preferences toward country-of-origin, Yu and Gao (2011) found that consumers in North-America were willing to pay most and the Korean and Japanese were willing to pay least for the US-beef products compared to consumers in other countries; in addition, whereas the BSE scandal reduced WTP for the US beef products for the non-US consumers, this impact was not found as significant in USA. Finally, Ehmke (2006) findings from a cross-country meta-analysis support that WTP can depend on the number of other credence attributes included in the product descriptions, and the location of the consumer.

Chapter 4
Consumer Preferences and Technology

As discussed above, consumer attitudes towards basic and credence attributes in food products are shifting. The empirical results from the choice experiment studies show what consumers, on average, are willing to pay for these attributes. In considering consumer purchase behaviour, it is also important to consider the means by which consumers investigate, form ideas towards and purchase food items. Recent technological advances and their use by consumers are changing the way in which people generate knowledge and awareness of, and ultimately purchase, preferred foods. Such new technological developments include the use of mobile devices, as well as other "real-world" items, and their integration with the Internet (Web 2.0), particularly within the processes of online marketplaces and social media. The uptake and use of these technologies and their relation to food purchase intentions and behaviours are reviewed next. This chapter examines the mechanisms of Web 2.0, current trends in social media and mobile technology use, as well as developing trends in technology, such as code scanning, product traceability and the Internet of Things (RFID).

4.1 Internet and Web 2.0

Around the world, the Internet is a common tool used by a broad spectrum of people for the purposes of social interaction, education and entertainment. The uptake of internet usage has increased significantly in recent years, especially in the developing world. In 2013, the International Telecommunication Union (ITU) estimated that approximately 2.75 billion individuals regularly accessed the internet. Of these, 958 million users are based in the developed world, and around 1.8 billion in the developing world. The highest concentration of internet users was found in the Asia/Pacific region, with 1.27 billion users, closely followed by 582 million users in the Americas, and 467 million users throughout Europe. Finally, overall global internet usage has increased between by approximately 33 per cent in the developing world, and approximately 55.5 per cent in the developed world between 2005 and 2013 (ITU 2014).

Internet use in the major markets examined in this report has increased significantly. China currently has the highest amount of individual internet users, with 641.6 million users recorded in 2014 (ILS 2014). This is followed by 279.8 million current users in the United States, 243.2 million current users in India. 42.3 million users in Indonesia, and 4.45 million users in Singapore (ILS 2014). Furthermore, in 2013, the Indonesian taxi company Express Group (the second-largest taxi company in Indonesia by market share) installed wireless internet connections in 400 taxis in the regions of Jakarta, Depok, Tangerang and Bekasi, in response to growing traffic congestion and associated customer boredom (Lukman 2013). WiFi-enabled consumer-facing taxi services have also been reported in parts of the UK (The Telegraph 2012), China (Johnson 2012) and India (Chhabria 2012). The inclusion of internet services in public transportation may indicate the significance of internet usage to consumers in these markets.

The development of new internet-based services and tools within the last decade has expanded the potential of internet use and communication. These new services have often been referred to under the collective title Web 2.0 (O'Reilly 2005a, O'Reilly 2005b). The term Web 2.0 specifically

refers to both a general and specific set of internet-based tools and processes which have emerged in recent years, such as blogs, wikis, multimedia sharing and streaming services, podcasts, Really Simple Syndication (RSS) and social media (incorporating social networking) (Thomson 2008). These processes generally allow for a high volume of participation with internet users, with users given the opportunity to create their own content, compared with older "read-only" internet tools (Wilkins 2007). However, older internet-based tools and processes (Web 1.0) still be of high relevance to today's internet users, such as the online marketplace (or *electronic commerce*, more commonly known as *e-commerce*).

The application of Web 2.0 tools and processes has often, and more frequently, been claimed as having major potential as a marketing tool. One definition of Web 2.0 by O'Reilly (2006) states that "*Web 2.0 is the business revolution in the computer industry caused by the move to the internet as platform, and an attempt to understand the rules for success on that new platform. Chief among those rules is this: Build applications that harness network effects to get better the more people use them."* Another definition by Moran (2008) extends this, stating that Web 2.0 marketing (specifically) is *"any way to get attention for your message using people connected to the Internet".* Web 2.0 marketing has also been stated to present an appeal to advertisers and marketers in allowing a mechanism for the physical allocation of advertising within internet browsing and email, as well as systems of consumer data and relationship management protocol (Hanson and Kalyanam 2007). Modern online marketing could therefore be dependent on the development of a robust understanding of Web 2.0 applications and processes in order to achieve maximum effectiveness.

People are increasingly using internet-based services to interact, collect and share information. Therefore, as internet usage increases globally, so does the frequency and nature of online interactions between individual users, with many such interactions occurring within virtual communities. The development of Web 2.0 tools and services has vastly broadened the abilities and scope of virtual communities internationally, including blogs, wikis and social media. An example of a long-standing virtual community is that of The Well, which has been described as "the world's most influential online community". The Well is an online community which has been in operation since 1985. It uses the connective bridge of "conferences", wherein registered users share their thoughts and ideas with like-minded individuals in subject categories as broad as the arts, politics, education, computers, health and many other spheres (The Well 2014).

The nature and mechanics of virtual communities could be of interest to businesses seeking to extend marketing activities beyond traditional channels. Several studies have indicated that virtual communities rely heavily on information sharing between users, which then strengthens social ties within virtual communities. Interactions within virtual communities rely upon the development of mutual trust, vision and identification (Chiu et al. 2006). This has previously been linked to effective marketing strategy, especially in relation to online vehicles (Flavian et al. 2004). Consumers have also exhibited a higher amount of trust in consumer comments regarding a product or service over producer- or firm-generated content (Cheong and Morrison 2008). For a venture to be commercially successful in virtual communities, Spaulding (2010) suggests that a company should avoid the use of traditional advertising behaviours, and instead attempt to contribute something of value to that community (as defined by the nature and patronage of the community under examination), maintaining an open-mindedness towards marketing

experimentation, and allowing for a genuine two-way interaction between consumers and the business.

As previously mentioned, Web 2.0 includes a set of internet-based communication tools and processes such as blogs, wikis and social media. The term "blog" stems from the complete term "web-log", and refers to sets of online publishing tools which allow internet users to publish their own web pages (Thomson 2008). Studies have found that blogs are commonly written as a form of personal self-expression (such as a personal journal), but can pertain to any topic which the creator deems appropriate. However, blogs are not limited to this function, and can also be used as a device to filter information, share files, and perform most functions normally available within the format of a standard web page (Richardson 2010). A blog is most commonly constructed and maintained for the presentation and transfer of information, and considered one of the essential elements of Web 2.0 (Mariano 2011).

Secondly, similarly to the blog the development of the Wiki provides a platform for the dissemination of mass amounts of information. The term "wiki" is short for the Hawaiian word "wiki-wiki", roughly translating to "quick". A wiki acts as a web page upon which users can collaboratively add their own information regarding a particular topic, often within an encyclopaedia-style format (Richardson 2010). The most famous example of this is Wikipedia, the multilingual internet-based free encyclopaedia, which is freely open for all internet users to add information, include citations and exemplary links, as well as browse and read (Wikipedia 2014). This type of open access to information and interaction within a web page is typical of Web 2.0 tools and processes.

Thirdly, the online marketplace (e-commerce) is one of the strongest business tools to emerge from Web processes prior to the development of Web 2.0 tools and services. The development of the online marketplace may have originated in the 1980s with the inception of the Videotex – a communication system resembling a modern computer which allowed business-to-business (B2B) sales via a telephone connection (InfoWorld 1981), while business-to-consumer (B2C) only became possible and commercially viable in the 1990s with the development and refinement of the internet (Aldrich 2011). The online marketplace is typically consumer-facing, and usually deals with B2C or consumer-to-consumer transactions (C2C) exclusively. Examples of online marketplaces include online auction sites (such as eBay or New Zealand's TradeMe), large online shopping services (such as Amazon.com), and retailers who have developed and established their own online presence (TechTarget 2005).

Online shopping has grown in importance amongst consumers internationally in recent years. A 2014 study of approximately 1,000 US consumers' shopping habits found that 62 per cent had purchased goods online, with only 1 per cent claiming that they had never shopped online. The same study also found that around 20 per cent of participants had used internet shopping to purchase food and groceries, with 37 per cent stating that they would never buy food and/or grocery items from e-commerce sites such as Amazon.com (WalkerSands 2014). While food and grocery retains a low share of total goods purchased online (around 7 per cent at its maximum in some international markets), some studies have suggested that over 50 per cent of consumers have already purchased food and grocery items online at least once in the past (Harding and Tager 2013).

As technology develops, the integration and application of new technologies with the daily lives of its users becomes more intricate and commonly accepted. Therefore, the development of an in-depth understanding of these tools is important for marketers to better understand consumers and communicate product information to consumers. In this sense, the development and growth in popularity of Web 2.0 applications has led to a shift in the traditional approach to marketing. While traditional marketing is concerned with one-way communication (i.e. from advertisers/marketers to consumers), Web 2.0 requires marketers to directly interact with their consumers. Constantinides and Fountain (2007) suggest that the Web 2.0 marketer should be able to use Web 2.0 tools to directly communicate and interact with consumers in the establishment of an equal relationship between business and consumer.

An example of the effective use of Web 2.0 tools in food marketing is Local Food Plus, a Canadian local food promotional programme which uses online tools to endorse their services. The programme uses a certification scheme (Certified Local Sustainable) to verify and communicate the sustainability attributes of producers' goods, and encourages consumers to purchase food from local sources. Their website features a search tool, where interested consumers can find producers and/or retailers which provide food products certified within the Local Food Plus scheme, and encourages consumers to take a "Pledge" of spending at least CN$10 per week on local and sustainable foods (Local Food Plus 2014). In addition, Local Food Plus engages partnerships between other economic actors, such as retailers, producers and producer groups (and similar), establishing mutually beneficial promotional relationships with all actors across the supply chain. Local Food Plus therefore represents the use of non-traditional methods of consumer engagement to promote their products and services (Campbell and MacRae 2013).

The establishment of an online presence for a retailer or other commercial entity may require careful consideration. For example, Tesco's (the UK's largest supermarket retailer, specialising in the sale of food and grocery items) online retail presence has negatively affected the sales performance of its physical retail outlets throughout the UK, with pre-tax sales dropping by 6.9 per cent in April 2014, and total revenue dropping by 0.2 per cent in the previous year (Askew 2014a; 2014c). However, Tesco still intends to increase its investments in online retail, as total UK online grocery sales totalled £6.5 billion in 2014, with sales expected to increase to £15 billion by 2018 (Askew 2014b). Similarly, many UK retailers have established their own online retail presence, including Morrisons, Marks and Spencer and ASDA (Askew 2013b, Russell 2013, ASDA 2014).

In a study of Singaporean consumers' attitudes to online shopping, Hung and Thai (2013) found that consumers' trust of an online retailer correlates with their attitude towards the online retailer. Consumer trust increased alongside the frequency of positive experiences with the online retailer, suggesting that the more often a consumer had a positive experience using an online retail channel, the more they would tend to trust its mechanisms, leading to a more positive attitude towards it (Hung and Thai 2013). Similarly, Hailimi et al. (2011) found that, amongst a sample of Singaporean consumers, perceived ease of use, usefulness, and security of an online retailer presented a correlation with the development of a positive attitude towards online retail, suggesting that improvements made within these factors may improve the likelihood of regular consumer purchases. Conversely, within the same study it was found that a as participant's concern for their personal privacy while using online retail increased, their potential online retail

use decreased, while the characteristics of the products available via the online retail channel had no effect on consumer attitudes (Hailimi et al. 2011). In another study 2013 study of international consumer satisfaction with online retail, 51 per cent of Singaporean respondents indicated overall satisfaction with online shopping channels (SBR 2013). This was the lowest recorded satisfaction rating of all countries involved in this study, as United States consumers indicated an 83 per cent overall satisfaction rate, with Europe stating 78 per cent, and China 60 per cent. In addition, within the same study, 81 per cent of Singaporean respondents indicated a tendency to abandon their order, with 55 per cent stating that a delivery of more than 8 days for their package would increase changes of cart abandonment. Furthermore, nearly all Singaporean respondents within this study rated the inclusion of a parcel tracking service as either "essential" or "nice to have" (SBR 2013). Despite reported dissatisfaction with online retail channels, online shopping has increased in Singapore in recent years. With specific reference to food, a 2014 study of food purchasing habits in Singapore found that 53 per cent of respondents had purchased food online at least once, with a further 15 per cent regularly purchasing food online (one to three times per month) (Weber Shandwick 2014). It is also important to note that the internet has been evidenced as the strongest source of information gathering prior to food and beverage purchases for Singaporean consumers (Nielsen 2013b).

Indonesia has experienced growth in total online sales in recent years. Canadean (2013) found that between 2007 and 2012, total online sales experienced growth of 14 per cent – from a value of US$1.14 billion in 2007 to US$2.78 billion in 2012 – with a CAGR of 19.5 per cent per annum. The total sales value of online retail in Indonesia is expected to grow significantly in the short term, with a CAGR of 22.36 per cent expected between 2012 and 2017, up to US$7.62 billion by 2017. Shares in online retail within Indonesia were dominated by electrical and electronics goods in 2012, with a market share of 52.2 per cent, whereas the food and grocery sector in Indonesia accounted for only 8.1 per cent of online retail market share in 2012 (Canadean 2013). This market share (food and grocery) is expected to decrease via online channels, with an expected 5.2 per cent share by the year 2017 (Canadean 2013). Another study of Indonesian consumers' purchasing and lifestyle habits by Razdan et al. (2013) notes that Indonesian consumers are wary of online retail channels, as over half of respondents (56 per cent) stated that online shopping has a "fraudulent image", and 36 per cent claimed that a lack of physical product testing dissuades them from using online retail channels. Despite this, the study found that 58 per cent of respondents reported to have purchased clothing online within the previous 12 months (Razdan et al. 2013).

For New Zealand food products, online retail mechanisms could lead to higher returns for exporters. This has been shown by a recent development occurred via popular Chinese online marketplace Tmall.com selling New Zealand live seafood products. The promotion (prompted by New Zealand Trade and Enterprise), which took place in mid-April 2014, allowed Chinese consumers to purchase live New Zealand seafood products via Tmall.com, with these products packaged and freighted to Shanghai within 36 hours of purchase, and completing delivery within 72 hours of purchase. This is particularly significant considering that China is New Zealand's largest current seafood export market, with export volumes (and subsequent returns) increasing by 19 per cent (a total value of NZ$376 million) in 2013 (NZTE 2014a). In total, the campaign resulted in almost 9,600 deliveries of meat and seafood products, with New Zealand producers contributing approximately NZ$280,000 worth of product (Lew 2014). However, while sales

volumes were significant, with 4,400 orders placed for live oysters (at 72 RMB for a package of 4 oysters), the cost of advertising these products via Tmall.com was approximately 1.09million RMB for the seven day period, effectively resulting in an approximate loss of 773,200 RMB for the campaign (China Digital Review 2014). Therefore, while the mechanisms used for the sale of New Zealand products overseas may have been effective, more cost-effective means of advertising and marketing may be warranted to achieve maximum returns in future actions.

4.2 Social media

Social media is perhaps the most important development within Web 2.0, hence it is discussed in its own subchapter. Social media refers to the essential tools for user connectivity and content sharing. Social media is not to be confused with the concept of social networking, which refers to the establishment of connections between internet users and the inherent creation of virtual communities based upon this (Stelzner 2009), although the two terms are known to be used synonymously. Some examples of social media websites include social networking websites such as Facebook, Twitter, LinkedIn and Google+, as well as the blogging community Tumblr, multimedia (video) content sharing website YouTube, and social photography websites Instagram and Flickr (eBizMBA 2014).

The term *social media* is broad. Boyd and Ellison (2007) provide one definition of social networking and social media as *"web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system"* (Boyd and Ellison 2007, p. 211). Kietzmann et al. (2011) provide a second definition, typifying social media as *"[employing] mobile and web-based technologies to create highly interactive platforms via which individuals and communities share, co-create, discuss, and modify user-generated content"* (Kietzmann et al. 2011, p. 241). It is also important to understand some aspects of terminology within social media frameworks, such as those referring to different types of content. Sharma and Rehman (2012) state that businesses often define social media content as either user-generated content (UGC) or consumer-generated media (CGM). This is further clarified by Krumm et al. (2008), who state that UGC refers to content (information, data, images, etc.) voluntary uploaded to the internet by regular users, while Gretzel et al. (2008) clarify that CGM refers to content produced by consumers in relation to a specific product or service with the express intent of sharing this information with other consumers.

In recent years, the acceptance and usage of social media has grown significantly. Pew Research Center (2013) examine some key determinants of social media use in the US. The study found firstly that most social media users are between 18-29 years old. However, older people are also active users of social media, with 78 per cent of 30-49 year olds currently using social media, 65 per cent of 50-64 year olds, and 46 per cent of the 65+ age bracket currently using social media. Secondly, gender differences were a marginal determinant of social media use, as 78 per cent of women compared with 69 per cent of men use social networking sites. Lastly, indicators including household income, educational attainment and area of residence had little effect on uptake and use of social media (Pew Research Center 2013).

Internationally, the current amount of social networking website users is high, and is projected to increase within the coming years. Estimates produced by eMarketer (2013) indicate that there were approximately 1.73 billion users of social networking sites globally, which is projected to increase to approximately 2.55 billion users by 2017. The Asia-Pacific region has the largest user base, with approximately 777 million users in 2013, projected to increase to approximately 1.23 billion users by 2017 (eMarketer 2013). A panel study of New Zealand social media users (UMR Research 2012) indicated Facebook to be the most popular form of social media (76 per cent), followed by LinkedIn (29 per cent), Twitter (19 per cent) and Google+ (13 per cent). Only 20 per cent of participants were not on any social networking site. Moreover, Facebook users more likely to use other social networking sites (i.e. Twitter, Google+ and LinkedIn) (UMR Research 2012).

In China, consumers are generally unable to access social media sites such as Facebook, Twitter and YouTube due to government blocking of these websites in response to political unrest in 2009 (Liebelson 2014). However, there exist equivalent social media websites, which are currently in popular use in China, including social networking sites WeChat, Sina Weibo, Tencent QQ and Tencent Weibo, as well as certain Western social networking sites, such as LinkedIn. Around 91 per cent of Chinese internet users currently use social media, spending an average of 47 minutes on these sites per day (Simcott 2014). However, the Chinese government still retains tight regulatory controls over social media, actively screening and censoring content by deleting posts which are seen as inappropriate, and enforces a strict "real name" policy for social media users (Simcott 2014). The highest concentrations of social media users in China reside in coastal cities, with the highest amount of Chinese social media users located in the Guangdong (11 per cent), Jiangsu (9 per cent) and Zhejjang regions (7.7 per cent) (iiMedia 2014). In order to create value for New Zealand exports via social media, it is important to know which social networking sites Chinese consumers are using as an alternative to currently blocked Western social media. Any reference to the sites Facebook, Twitter and YouTube within this report will, by default, exclude Chinese consumer information.

As a consequence of increases in the use of social media internationally, the diversity of its applications and functionality have expanded. For example, currently 23 per cent of Facebook users have claimed that they check their account more than 5 times per day; and 400 million "tweets" on average sent via Twitter every day (Digital Insights 2013). Jakarta (Indonesia) represents the highest, most active amount of Twitter users in an urban area, with 29 million active Twitter accounts reported (Razdan et al. 2013). Furthermore, a study carried out by United Parcel Service (UPS 2013) examining consumer preferences for online retail found that Facebook was the most popular social networking site for Singaporean respondents, with 81 per cent of all respondents stating that they follow a retailer through Facebook, with a further 59 per cent indicating that they perceived this to be a good way to keep up-to-date with retailer developments (UPS 2013). Global users of social media are increasingly adapting their interactive behaviours within social media, creating new trends in this area that require advertisers and marketers to increase monitoring activities.

The importance of social media as a marketing tool is strong. Experian (2013) indicate 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). The most popular social media service, Facebook, currently caters for 1.23 billion monthly active users (as of 31 December 2013), and 945 million

monthly active users of Facebook mobile products (as of 31 December 2013) (Facebook 2014a). Similarly, YouTube receives over 1 billion monthly active users, with 100 hours of video uploaded to YouTube every minute (YouTube 2014). Table 4.1 below lists the Top 10 most visited websites internationally between mid-February and mid-March 2014 (social media sites are shown in italics). When including online marketplaces, 7 out of 10 of the top 10 most visited websites pertain to these categories (Alexa 2014). This indicates the importance of the rise of social media popularity in recent years, as half of the top 10 most visited websites on the internet are social media sites.

Table 4.1: Top 10 most visited websites (global) – February/March 2014.

Rank	Website
1	Google (homepage)
2	*Facebook*
3	*YouTube*
4	Yahoo!
5	Baidu
6	*Wikipedia*
7	*QQ*
8	*LinkedIn*
9	TaoBao
10	*Twitter*

Source: Alexa 2014.

The top-rated brands with Facebook representation (i.e. brand/company page) amongst Facebook users in the United Kingdom, United States, India, Indonesia and Singapore in February 2014 are outlined in Table 4.2 below. In relation to the increased and diversified use of social media, consumers are increasingly aligning themselves with their preferred brands via engagement with social media. Within the functionality of Facebook, for example, it is possible for a user to "like" or "follow" a brand or company page, via which they will regularly receive business-generated content from said company. The volume of "likes" or similar tallying of page adherence can be potentially used to quantify the popularity of a particular company or brand via social media portals.

Table 4.2: Number of fans for the top five brands on Facebook across 5 international markets (February 2014)

BRAND RANK	United Kingdom	United States	India	Indonesia	Singapore
1	Amazon UK (4.16 million)	Walmart (32.0 million)	Tata Docomo (12.1 million)	Batik Indonesia (4.66 million)	Samsung Mobile (304 thousand)
2	Skittles (2.78 million)	Amazon.com (22.0 million)	Nokia India (10.0 million)	BlackBerry (4.37 million)	McDonald's Singapore (261 thousand)
3	Coca-Cola (2.51 million)	Target (21.5 million)	Samsung Mobile India (9.63 million)	Samsung Mobile (3.99 million)	FlyScoot (258 thousand)
4	Cadbury Crème Egg (2.29 million)	Samsung Mobile USA (19.7 million)	Fastrack (8.49 million)	Yamaha Motor Indonesia (3.98 million)	Subway Singapore (226 thousand)
5	iTunes (2.11 million)	Subway (19.5 million)	Aircel India (6.73 million)	Intel (3.54 million)	KFC Singapore (223 thousand)

Source: SocialBakers 2014h, SocialBakers 2014i, SocialBakers 2014a, SocialBakers 2014b, SocialBakers 2014g.

Similarly, the use of social media website Twitter in advertising and marketing campaigns could also be highly significant, especially for fast-moving consumer goods (FMCG) food products. Reflecting the current use of Twitter as an advertising and marketing tool, the top-rated brands with Twitter representation amongst Twitter users in the United Kingdom, United States, India, Indonesia and Singapore in April 2014 are outlined in Table 4.3 below. Twitter currently houses 200 million daily users, with more than 500 million messages (or "tweets") sent daily. In has also been shown that 52 per cent of Twitter users intentionally follow brand pages in order to be notified of promotional and product news. In addition, exposure to promotional tweets has shown a 12 per cent increase in Twitter users' intentions to purchase a particular product (Boston 2013).

Table 4.3: Number of followers for the top five brands on Twitter across 5 international markets (April 2014)

BRAND RANK	United Kingdom	United States	India	Indonesia	Singapore
1	Nando's UK (1.34 million)	Samsung Mobile USA (5.25 million)	Rendezvous Sports World (1.13 million)	XL Axiata (594 thousand)	TigerAir (34.7 thousand)
2	Twibbon (1.21 million)	Whole Foods Market (3.66 million)	TrepUp (654 thousand)	AirAsia Indonesia (512 thousand)	JetStar Asia (34.5 thousand)
3	Aluminaid (986 thousand)	AddThis (2.64 million)	HCL Technologies (211 thousand)	Samsung Indonesia (443 thousand)	AirAsiaGo.com (28.1 thousand)
4	Topshop (823 thousand)	Sony (2.21 million)	Vodafone India (181 thousand)	Garuda Indonesia (396 thousand)	Bubbly (21.1 thousand)
5	American Airlines (792 thousand)	Threadless (2.20 million)	Samsung Mobile India (162 thousand)	Lalu Lintas (383 thousand)	H&M Singapore (16.9 thousand)

Source: SocialBakers 2014n, SocialBakers 2014o, SocialBakers 2014j, SocialBakers 2014k, SocialBakers 2014m.

The top-rated overall industries with Facebook representation amongst Facebook users in the United Kingdom, United States, India, Indonesia and Singapore are shown in Table 4.4 below. In can be seen that an increasingly proportion of social media users are actively choosing to connect with brands and companies via social media mechanisms. To further indicate the potential of marketing through social media, over 50 per cent of social media users internationally had "liked" or "followed" their preferred brands via their preferred social media site in 2011 (Van Belleghem 2011). Additionally, around 80 per cent of Facebook users prefer to connect with personally preferred brands via Facebook rather than any other social media service (HubSpot 2013; McGrail 2012), while 60 per cent of social media-using consumers have stated that the use and integration of social media with other applications increases the likelihood that they will share information regarding products and services (Digital Insights 2013). Approximately 69 per cent of Singaporean consumers have connected with their favourite brands via social media, with these levels of engagement expected to increase (Capillary 2013).

To place consumer brand preference in these markets (as indicated by users' adherence via social media) in context for New Zealand parties, the top-rated brands and industries with social media

representation amongst New Zealand social media users are displayed in Tables 4.5, 4.6 and 4.7 on the following page. Within the Top 5 brands amongst New Zealand Facebook users (by number of local likes) as shown in Table 4.5 below, 3 are involved in the fast-moving consumer goods (FMCG) foods industry. The top brand amongst New Zealand Facebook users was indicated as local airline Air New Zealand, with the fifth-most liked brand in New Zealand indicated as online commerce provider Mighty Ape. Conversely, within the Top 5 New Zealand-based brands on Twitter (by number of local followers) as shown in Table 4.6, none are related in any way to food or grocery industries. Instead, the most followed brand is Grab-a-seat, an online Air New Zealand service for the provision of discounted airline travel. Following this is Pure New Zealand, the official Twitter page for Tourism New Zealand, arbiters of the "100% Pure New Zealand" marketing campaign. Two mobile phone carriers follow, which are in turn followed by GeoNet (online response service for natural hazards). Within the Top 5 industries in New Zealand by sum of Facebook fans as shown in Table 4.7 below, two food-based industries are indicated as the most popular. Following this, eCommerce brands are the third-most liked, with beverages and retail in the fourth and fifth positions respectively. This may be highly relevant for the sale of New Zealand food products using digital and online methods.

However, "likes" received by Facebook brand pages may not necessarily be indicative of an accurate fan base of consumers. Veritasium (2014) found that mechanisms currently exist which enable to Facebook page administrator to purchase likes via "click-farms" – businesses mostly based in South Asia through which workers receive an approximate US$1.00 per 1000 pages they "like". The website BoostLikes is an example of this type of venture, and allows Facebook page administrators to purchase 'likes' across a broad range of price categories, with one exemplary price plan offering 1000 Facebook page likes in exchange for US$70.00. This practice is publically disapproved by Facebook, and is not condoned or offered under the official Facebook Terms of Use. Facebook have responded to this with the development of their own advertising mechanisms for gathering page likes, made accessible for Facebook page administrators. However, the targeting mechanisms currently in use by Facebook does not guarantee the delivery of advertising material to a page's target user group(s) (Veritasium 2014). Facebook's current advertising and marketing mechanisms allow the advertiser to target the delivery of material to users aggregated by location, gender, age, likes and interest, relationship status, workplace and educational attainment (Facebook 2014b).

The use of social media in advertising and marketing campaigns is increasing rapidly. This is particularly important when considering that the global commissioning attributed to internet-based advertising has outpaced every other channel (Lewis and Nichols 2011). As social networking sites themselves are corporate entities, these sites have engaged in the provision of advertising and marketing tools to interested parties (Kreps and Pearson 2009). The total amount of revenue raised by advertising via Facebook equated US$6.15 billion in 2013, following from US$5.09 billion in 2012. Similarly, the annual advertising revenue generated by Twitter has increased from US$45 million in 2010 to US$405.5 million in 2013 (Statistic Brain 2014). It has also been predicted by Twitter that advertising revenue generated by the site will reach approximately US$1 billion in 2014 (Erlichman and Womack 2012).

Table 4.4: Number of fans for the top five industries on Facebook (February 2014)

RANK	United Kingdom	United States	India	Indonesia	Singapore
1	FMCG Food (33.3 million)	Retail Food (175 million)	Electronics (78.5 million)	Electronics (30.0 million)	Retail Food (1.79 million)
2	eCommerce (19.9 million)	Retail (163 million)	FMCG Food (52.9 million)	Beauty (26.5 million)	FMCG Food (1.68 million)
3	Fashion (15.2 million)	FMCG Food (126 million)	Auto (45.7 million)	FMCG Food (17.3 million)	Fashion (1.43 million)
4	Beverages (13.5 million)	Beverages (95.9 million)	Beauty (44.7 million)	eCommerce (15.5 million)	eCommerce (1.20 million)
5	Electronics (13.4 million)	Fashion (90.6 million)	eCommerce (33.8 million)	Fashion (13.6 million)	Electronics (1.13 million)

Source: SocialBakers 2014h, SocialBakers 2014i, SocialBakers 2014a, SocialBakers 2014b, SocialBakers 2014g

Table 4.5: Number of fans for the top 5 brands on Facebook – New Zealand (February 2014)

BRAND RANK	Brand
1	Air New Zealand (347 thousand)
2	Whittaker's Chocolate Lovers (291 thousand)
3	McDonald's NZ (284 thousand)
4	KFC (279 thousand)
5	Mighty Ape (232 thousand)

Source: SocialBakers 2014e.

Table 4.6: Number of followors for the Top 5 brands on Twitter – New Zealand (April 2014)

BRAND RANK	Brand
1	Grab-a-seat (87.1 thousand)
2	Pure New Zealand (65.5 thousand)
3	Vodafone New Zealand (38.2 thousand)
4	Telecom New Zealand (28.2 thousand)
5	GeoNet (27.6 thousand)

Source: SocialBakers 2014l.

Table 4.7: Number of fans for the top 5 industries on Facebook – New Zealand (February 2014)

RANK	Industry	Number of Fans
1	FMCG Food	2,461,780
2	Retail Food	1,721,285
3	eCommerce	1,684,597
4	Beverages	1,170,486
5	Retail	913,681

Source: SocialBakers 2014e.

In considering the significant volumes of advertising revenue generated by social media, it is important to understand how businesses are using these mechanisms for advertising and marketing purposes. Two studies identified consider business professionals' attitudes towards social media, while a third study examines the current business use of social media mechanisms. Firstly, as indicated by a survey of the Top 200 businesses of the Australian stock market (ASX200) conducted by BRR Media (2013), around 78 per cent of ASX200 companies used at least one social media site within their marketing campaigns, with 59 per cent of companies asserting that social media is an important marketing channel for their industry, and an additional 66 per cent of companies stating that they will be increasing their involvement with social media as a result. The same study found that the ASX200 companies involved most predominantly in consumer-focused sectors have indicated the highest involvement with social media, using the highest degree of individual social media platforms, and 50 per cent of consumer-discretionary companies (involved in the sale of automobiles and components; consumer durables and apparel; consumer services; media, and; retail) of the ASX200 claiming that social media is very important for their sector (BRR Media 2013).

Secondly, Lewis and Nichols (2011) assessed the attitudes of business professionals towards social media, showing that those with between 7 and 10 years' professional experience tended to have a more positive attitude towards social media generally than those with over 15 years' professional business experience. However, this study also indicated that the more engaged with social media the participants became, the more likely they were to recognise its value, suggesting that those with less experience could have been more engaged with the medium (Lewis and Nichols 2011).

With reference to particular social media platforms, a third study by Digital Insights (2013) of current business use of social media internationally found that 74 per cent of marketers have stated that the use of Facebook is important in their lead generation strategy. Forty per cent of marketers are currently using Google+ as part of their marketing strategy, with 70 per cent asserting that they wish to learn more about the platform, and an additional 67 per cent intending to increase their activity within Google+ in the future. In 2013 there were approximately 3 million companies with an online presence via LinkedIn, and around 23 per cent of marketers including high degrees of involvement in social media and blogging (Digital Insights 2013).

Marketers could find an understanding of the way in which consumers are using these media useful. Consistently with Web 2.0 tools, the use of social media has helped to shape new consumer trends in relation to how consumers examine, understand and interact with brands and companies, as indicated by the literature. Berthon et al. (2012) outlined the potential of social media as a marketing vessel. In particular, the authors indicated that the key developments within Web 2.0 that have given rise to social media include a shift of power from that of the producer/marketer to that of the consumer. In particular, the authors found that the ability of firms to interact directly with consumers, as well as the consumer's ability to upload content relating to companies, brands and products, meant that the consumer is able to generate marketing material, rather than simply observe it. This study showed that social media acts as a type of conduit for this material, via which a potentially significant number of other users of social media websites may be able to view and interact with this consumer generated media (CGM). In addition, Berthon et al. (2011) found that information generated by consumers via social media tends to be interpreted locally –

consumers in one geographical region may interpret CGM in an inverse manner from those in a different region.

The development and uptake of social media by internet users has also changed the role of the consumer, compared to traditional marketing relationship structures. Several studies have highlighted that the ability of companies to directly engage their customers has led to the involvement of the consumer in the storytelling process of the company or product (Singh and Sonnenburg 2012, Kaplan and Haenlein 2010, Hanna et al. 2011). Thus, there is a greater importance imposed on the interaction with, and deep understanding of, a brand's "audience" in order to create success within a social media marketing campaign. Kaplan and Haenlein (2010) suggest that, firstly, a company's social media marketing campaign must be consistent across all social networking sites used for promotional activities, if multiple channels are used; and secondly, a company should be highly active, conversational and engaging in order to be effective via social media. Similarly, Hanna et al. (2011) suggest that all types of social media (i.e. Facebook, Twitter, YouTube) should be considered as an integrated "package" within effective social media marketing strategies.

Social media not only provides an opportunity for direct consumer interaction, but also provides companies with an opportunity to "collaborate" with their consumers, allowing them to propagate and spread assertions about their brand(s) amongst the consumer's social connections. This is particularly prominent in sites such as Facebook and Twitter, wherein active engagement with the consumer is more common and less difficult to achieve (Smith et al. 2012). Companies are able to develop a network of followers - users who have "liked" or "followed" the company's page, from which they will regularly receive business-generated content pertaining to new products, services or promotional activities. In this sense, as described by Long (2012), social media provides companies with an ideal platform for interaction and engagement about new products and/or services in real-time. In addition, many studies have indicated that the frequency of interactions between consumers and brand pages is increasing internationally, allowing for a "live" interchange of communication and information between the two (Hanna et al. 2011, Guo 2011, Meixner et al. 2013). To illustrate this, Guo (2011) examined the marketing behaviours and performance of 100 global brands in social media, in order to determine which industries were most actively involved in engaging with their fans. Of the 11 industries examined, media and technology were seen to be the two top industries globally to engage in social media marketing, whereas finance, apparel and food and beverage industries were the least engaged (Guo 2011). Therefore, marketers interested in using social media could consider aspects of interactivity with consumers as important in this process.

Concerning the value of social media's marketing effectiveness, it is important to consider the type of content which is being promoted. Throughout many forms of social media, media content may vary, and may be presented in the form of images, text or videos – all of which provoke unique responses from consumers. An Ipsos (2013) study of social media users across 24 countries examining the frequency of user sharing by post type for social media content found that pictures were the most shared content type (43 per cent of users), closely followed by the text-based updates about sharing of opinions (26 per cent) and general status updates (26 per cent). Almost as popular were links to other websites (26 per cent), the sharing of a preference or recommendation (25 per cent), and linked to news items (22 per cent) or other websites (21 per

cent). The study also found that the least popular forms of social media content posts were video clips (19 per cent), and the sharing of the users' future plans or activities (9 per cent) (Ipsos 2013). Similarly, Geddes-Soltess (2012) found that text posts which contain 80 characters or less have been shown to receive 23 per cent more user interaction than longer text posts. In another study conducted by Figueiredo et al. (2014) examining of the popularity of YouTube content, participants were asked to evaluate pairs of videos and compare their own evaluation of the video against the popularity of the video. While a significant amount of bias towards the selected content was perceived, participants who stated a high preference level for a particular video most often stated preference for a video which already exhibited high levels of popularity (Figueiredo et al. 2014). These results may have further implications for social media marketers in determining the potential popularity of their campaigns.

The popularity and reach of posts by brand pages can also be important in the determination of an effective social media marketing campaign. De Vries et al. (2012) examine determinants of the popularity and spread (by users "sharing" content) of brand page posts on Facebook, stating that, depending on the aimed type of consumer interaction, a different set of actions may be required. For example, in order to boost the "likes" of a particular brand page post, social media marketers should aim at posting content which is interesting, vivid or entertaining, or content which would be understood by their social media followers. Conversely, in order to gain a higher number of comments on a particular brand page post, social media marketers should aim to post content which is provocative and/or interactive (a question or request) (De Vries et al. 2012).

As previously discussed, the development, use and proliferation of social media (and Web 2.0) has greatly increased the power of the consumer with regards to product information and marketing assimilation. It has been noted that within many virtual communities, word of mouth (WOM), or electronic word of mouth (eWOM) is a major means of communication between participating individuals. Previous research in this area has suggested that word-of-mouth communication, particularly between online consumers, has a considerable influence on product perception and consumer choice (Gupta and Harris 2010, Gruen et al. 2006), for example, amongst consumers who want to make an informed purchase decision (Park and Kim 2008). It has also been demonstrated that consumers do not find negative product reviews useful in informing their purchase decisions (Sen and Lerman 2007).

Gupta and Harris (2010) conclude that consumer reactions to eWOM information is dependent on the type of consumer using this information; for example, users with high willingness to interpret eWOM information regarding a product will take generally longer to assess a particular product and seek to purchase an optimal product, while users with low willingness to process this information would not tend to use eWOM to inform their purchase decisions. In addition, Park and Lee (2008) demonstrate that while high volumes of reviews may improve the perceived popularity of a product or service, online consumers may also become overloaded with eWOM. However, low-involvement consumers are generally able to ignore these high volumes of information, and instead perceive this as indicative of the product or service's popularity (Park and Lee 2008).

The credibility of eWOM information is another important consideration which can be determined by personal factors. Brown et al. (2007) demonstrate that the credibility of those who are providing

eWOM information is also highly important in the development of a positive opinion of the product. In this sense, it is suggested that in order to avoid the development of negative attitudes towards a product or company, marketers should not attempt to influence eWOM reactions from online consumers, but rather provide "open, honest, and authentic" dialogue with consumers in such forums (Brown et al. 2007 p. 16). Similarly, Doh and Hwang (2009) indicate that if all eWOM information in a singular forum is positive, this may have a negative effect on the perceived credibility of this information. These are relevant considerations, as consumer perception of the credibility of "viral" campaigns has been found to be a significant determinant of marketing success (Van Noort et al. 2012). To mitigate negative product perceptions, Xie et al. (2011) demonstrate that the credibility of online reviews (eWOM) has been shown to be improved through the provision of personal identifying information, such as name, state of residence, gender, among others. This suggests that the presence of a personal quality to the information presented may be associated with the efficacy of eWOM.

Social media-based eWOM may provide an even more effective means of consumer engagement if eWOM is effective in communicating the positive attributes of a product or service through a personal quality. Chu and Kim (2011) demonstrate that several factors influence the uptake and dissemination of product-related eWOM within social networking sites, the most significant of which was described as "consumer susceptibility to interpersonal influence" (p. 66). As social networking inherently relies on the interconnectedness of its users with the exchange of information as a main tool of communication therein, users who participate in information exchange often are more likely to become engaged in eWOM-related activities, and purchase products via eWOM recommendations (Chu and Kim 2011). Similarly, Wang et al. (2012) found that peer communication via social media may reinforce consumption patterns in two ways – firstly, by bringing users into indirect involvement with a product, and secondly, by stimulating a sense of "peer conformity". Conversely, within the same study, a sense of exclusivity and "uniqueness" in product purchasing was required by many consumers, with those consumers with a high need for "uniqueness" less likely to conform to other peers' product involvement activity (Wang et al. 2012). Trusov et al. (2009) similarly demonstrated that general WOM referrals to social media websites can impact on the establishment of new service consumers with long-term elasticity exhibited as 20-30 times higher than traditional marketing vessels.

In order to develop an effective marketing strategy based on social media streams, consumer willingness to receive marketing information via these avenues can be determined. The level of "genuineness" in engagement with consumers via social media may affect a brand's total perception, or may determine consumers' future interaction with brands in this manner. For example, Rutsaert et al. (2013a) examined the willingness of consumers to receive official government information regarding the risks of pesticide residues on vegetables, finding that social media sites Facebook and Twitter were perceived as non-ideal sources of information pertaining to this, while Wikipedia was perceived as a very reliable source of information. In a similar study, Rutsaert et al. (2013b) also demonstrated that information presented via social media streams is often, but not always intentionally, inaccurate and/or misleading, which may lead to trust issues relating to the accuracy of information received by consumers. Previous studies also indicated the perception of social networking sites such as Facebook and Twitter as being less-than-ideal platforms for the dissemination of public information, as such information receives very little user

interaction or engagement (Thackeray et al. 2012). In addition, this study identified four key consumer segments in terms of their level of current satisfaction with information relating to the incidence of pesticide residues in foods received, and by current level of interest in receiving this information. These groups were similar in size, and included those who were very satisfied and interested (24 per cent), those not satisfied and very interested (28 per cent), those not satisfied with some interest (25 per cent) and those satisfied with little interest (23 per cent).

Consumer perception of business activity via social media is also highly important when considering online marketing strategy. Methods of advertising dissemination employed by companies using social media as part of their marketing strategy may have an effect on consumer uptake and responsiveness. Within Facebook's advertising mechanisms, the concept of "reach" (i.e. how many page fans or followers a post is distributed to) is central to successful dissemination of material. A company may also choose to purchase this type of exposure by paying to distribute a particular post or page to a higher degree of Facebook users, particularly those that have already "liked" or "followed" a particular page or brand. However, Nielsen (2010) indicate that "organic exposure", or the sharing of brand or company posts through social means as opposed to paid advertising, tends to reach many more potential customers than otherwise. To illustrate this, the purchasing of a "home page advertisement" (which is displayed on some Facebook users' News Feeds) may generate increased awareness of the page or brand by 4 per cent, while the use of both a paid home page advertisement and organic social reach may increase awareness of that page or brand by 13 per cent. In addition, the number of Facebook users engaged by page or brand advertising tends to be less than those exposed to that page or brand organically (Nielsen 2010).

Commercial entities that are currently experiencing significant rates of consumer engagement and uptake have shown similar patterns in online interaction with their respective audiences. A 2012 study revealed several key indications of a successfully engaging Facebook post, including the most effective times and days of the week to post content, the type of content that leverages the most engagement, and strategies to increase interactivity in posting. Using a base of 1,800 Facebook Pages from the site's most popular brands, the study determined that, for the food and beverage industry, the most engagement and interaction was gained during weekends, with only 18 per cent of total interaction with posts occurring on weekdays. In addition, across all industrial categories, posts made between 8pm and 7am (off-work times) gained around 14 per cent higher rates of interaction than those made between 8am and 7pm. In addition, Pages which post more than 7 times per week exhibited at 23 per cent lesser rate of interaction with Fans. As previously discussed, images are the most popular form of "attached content" to include in a post, particularly when Fans are asked to interact with it in some way – either by providing a "caption" for the image, "tagging" a friend in the image, or "sharing" the image. Short length (around 80 words maximum) text posts also popular, particularly if they contain a question directed at Facebook users - these posts comprise 29 per cent of all posts across Facebook (SalesForce 2012). With reference to types of posts which achieve the highest levels of engagement with Facebook users, the most engaging company posts are often charged with an incentive, such as the possibility of winning a competition prize when interacting with an image (SocialBakers 2014a-o).

In order to place some of these considerations in context, it is important to examine how New Zealand companies are currently using social media (particularly Facebook) to leverage consumer adherence. These include (but are not limited to) New Zealand companies Fonterra (and the brands

Anchor, Anlene and Anmum), Zespri Kiwifruit, ENZA (and the subsidiary branded apple varieties Envy and Jazz) New Zealand Lamb and Silver Fern Farms, all of which maintain a social media presence that can be analysed for strategic effectiveness. The Facebook Page of Silver Fern Farms, producing red meats (beef, lamb and venison) of New Zealand origin, contains posts which coerce a high degree of interactivity with users. Such posts include links to Silver Fern Farms-endorsed competitions (with attached images of cooked and prepared red meat products), recipes (with specific mention of Silver Fern Farms products as key ingredients), and video content related to company or product developments. One such competition listed on their Facebook page allows UK users to win a trip to New Zealand. The page currently has 3,194 likes (as of 30th April 2014), with the Page most popular with users within the age group of 25-34 year olds, and users within the city of Auckland, New Zealand (Silver Fern Farms 2014).

By comparison, the Facebook Page for New Zealand dairy corporation Fonterra features a varied array of visual and text-based content. The most frequently used type of content within the Fonterra Facebook Page is photographical material, featuring an array of settings, all of which adhere to images of picturesque landscapes, "Kiwi" imagery, Fonterra producers actively engaged in their work, and similar imagery. In addition, the Fonterra Facebook Page contains text posts that prompt the user into interaction. One such post (from April 20th 2014) states "Happy Easter! What are you up to this weekend?" - Similarly, another post (from April 17th 2014) states "It's Easter! Hot cross buns should always be topped with "_____" - the included line at the end of the text post conjuring responses from engaged Facebook users. The Fonterra Facebook Page currently has 19,438 likes (as of 30th April 2014), as is most popular with users in the age bracket of 25-34 years old, and most popular within the city of Auckland, New Zealand (Fonterra 2014a). Fonterra also hosts three other related Facebook Pages, including: the Fonterra Grass Roots Fund (5,819 likes) – providing funding for rural grass roots projects and initiatives; Fonterra Careers (511 likes) – a page which promotes the uptake and dissemination of knowledge regarding jobs within Fonterra's New Zealand businesses; and Fonterra Brands Lanka Careers (1,536 likes) a page which promotes the uptake and dissemination of knowledge regarding jobs within Fonterra's Sri Lankan businesses (Fonterra 2014b, Fonterra 2014c, Fonterra 2014d).

Likewise, the subsidiary brands of Fonterra have exhibited successful use of social media outlets for promotional activities. Fonterra's key brands include Anchor, Anlene and Anmum (Fonterra 2014e), all of which have separate social media outlets. Anchor, for example, is Fonterra's flagship milk brand (also known as Fernleaf in certain international markets), which currently maintains two country-specific websites (UK and New Zealand), three country- and product-specific Facebook pages and a Twitter page (Anchor 2014a-2014c). A summary of Anchor's international Facebook and Twitter pages and their numbers of fans/followers is described in Table 4.8 below.

Table 4.8: Anchor's international market-based Facebook and Twitter pages

Platform	Page Name	Number of Fans/Followers
Facebook	Anchor (UK)	88,710
	Anchor (NZ)	31,448
	Anchor Adult Pro	56,145
Twitter	Anchor (@Anchor_Dairy)	4,244

Source: Anchor 2014c, 2014d.

Similarly, nutritional formula brand Anlene currently maintains four country-specific websites, six country-specific Facebook pages, a Singapore-specific YouTube account and one country-specific Twitter accounts (Anlene 2014a-2014g). A summary of Anlene's international Facebook and Twitter pages and their numbers of fans/followers is described in Table 4.9 below.

Table 4.9: Anlene's international market-based Facebook and Twitter pages

Platform	Page Name	Number of Fans/Followers
Facebook	Anlene Hong Kong	11,254
	Anlene Indonesia	52,490
	Anlene Movement Phillipines	66,159
	Anlene Singapore	10,491
	Anlene Thailand	13,477
	Anlene Viet Nam	4,837
Twitter	Anlene Indonesia	10,809

Source: Anlene 2014e-2014g.

Finally, infant nutritional formula brand Anmum currently maintains a Phillipines-specific website, as well as five country-specific and one support-based Facebook page(s) and one country-specific Twitter pages (Anmum 2014a-2014c). A summary of Anmum's international Facebook and Twitter pages and their numbers of fans/followers is described in Table 4.10 below.

Table 4.10: Anmum's international market-based Facebook and Twitter pages

Platform	Page Name	Number of Fans/Followers
Facebook	Anmum Hong Kong	16,086
	Anmum Indonesia	36,686
	Anmum Club Thailand	81,251
	Anmum Vietnam	44,734
	Club Bintang Anmum (Malaysia)	3,293
	Anmum Mommy Circle (support page)	38,125
Twitter	Bintang Anmum (Indonesia) (@BintangAnmum)	2,336

Source: Anmum 2014b-2014c.

Zespri Kiwifruit is another example of a New Zealand based export-focussed food company successfully using social media to promote their food products. The company is highly engaged in social media use and development, displaying high presence on both Facebook and Twitter. Zespri has multiple pages, all of which cater to a specific international export market; a similar approach is also applied on the company's Twitter pages. Posts made by these pages exhibit high rates of engagement with Facebook and Twitter users, indicating effective communication and interaction with consumers via this platform. The main Zespri Kiwifruit Facebook page (a page without specific market affiliations) includes an interactive Recipe Generator app that allows users to create recipes that include Zespri Kiwifruit products, as well as providing the user with locations where Zespri products are available (Zespri 2014b, 2014c). Zespri Kiwifruit have also established profiles on other prominent social media sites, including Pinterest, LinkedIn and Instagram (Zespri 2014d, 2014e, 2014f). In addition, Zespri maintains a wide range of country-specific websites, including those focussed on China, Indonesia, Japan, Korea, Malaysia, Phillipines, Singapore, Taiwan, Thailand, and Vietnam, as well as generic Europe and North America-focused websites

(Zespri 2014a). A summary of Zespri's international Facebook and Twitter pages and their numbers of fans/followers is described in Table 4.11 below.

Table 4.11: Zespri's international market-based Facebook and Twitter pages

Platform	Page Name	Number of Fans/Followers
Facebook	Zespri Kiwifruit (Main)	10,325
	Zespri Kiwifruit Arabia	11,363
	Zespri Kiwifruit Australia	4,733
	Zespri Kiwifruit Belgium	7,045
	Zespri Kiwifruit Brazil	5,508
	Zespri Kiwifruit France	13,387
	Zespri Kiwifruit Germany	10,376
	Zespri Kiwifruit India	6,739
	Zespri Kiwifruit Indonesia	19,004
	Zespri Kiwifruit Italy	14,456
	Zespri Kiwifruit Latin America	10,164
	Zespri Kiwifruit Malaysia	18,086
	Zespri Kiwifruit Nederlands	4,713
	Zespri Kiwifruit Singapore	9,790
	Zespri Kiwifruit Spain	21,850
	Zespri Kiwifruit Taiwan	60,701
Twitter	Team Zespri (@ZESPRIkiwifruit)	2,199
	Zespri Kiwifruit SEA (Singapore)	237

Source: Zespri 2014b, 2014c.

Similarly, New Zealand-based apple and kiwifruit exporter ENZA (a brand owned and maintained by Turners & Growers) have developed a social media following for their Jazz and Envy apple varieties. A summary of ENZA's international Facebook and Twitter pages and their numbers of fans/followers is described in Table 4.12 below. ENZA also provides separate websites for the two apple varieties – a Jazz apple website focusing on the New Zealand domestic market (ENZA 2008) and an Envy apple website with no specific market focus (ENZA, n.d.). ENZA also maintains its own brand website, Facebook and YouTube accounts – however, these have shown low engagement and a lack of updates, with ENZA's Facebook page's most recent post uploaded on 3rd April 2013 (ENZA 2010, 2014c, 2014d).

Table 4.12: ENZA's international market-based Facebook and Twitter pages

Platform	Page Name	Number of Fans/Followers
Facebook	Envy Apple	913
	Jazz Apples NZ	3,478
	ENZA Fruit	332
Twitter	Envy Apple	1,105
	Jazz Apples Australia (@JazzAppleAust)	465
	Jazz Apples NZ (@JAZZAPPLES_NZ)	1,207
	Jazz Apples USA (@jazzapple)	2,720

Source: ENZA 2014a-2014c, 2014e-2014f.

In order to prescribe a method for the development of a socially-engaging social media post, it is important to examine the most popular posts in previous months within the New Zealand companies with Facebook presence. The most engaging post from a company or brand page on

Facebook within New Zealand during December 2013 was produced by ASB Bank. By sharing an image indicating that for every 1 like that post received, ASB Bank would donate $1 to the children's charity Starship Foundation, ASB Bank secured 42,000 total interactions with the post. This post was highly effective in achieving optimal engagement, receiving 35,000 likes, with an additional 6,299 shares and 388 comments, rendering an overall engagement rate of 40.1 per cent (SocialBakers 2014c). Similarly, posts made by clothing retailer Glassons became the most popular posts in January and March 2014 respectively, including a featured image of a Glassons gift card (alongside white flowers) against a brightly-coloured backdrop offering users the opportunity to win a $500 gift card by liking both the posts themselves and the Glassons Facebook Page. These posts gained 18,000 (January 2014) and 17,000 (March 2014) total interactions respectively, and engagement rates of 15.1 per cent (January 2014) and 12.1 per cent (March 2014) respectively (SocialBakers 2014c, SocialBakers 2014d, SocialBakers 2014e, SocialBakers 2014f). These posts highlight the previously discussed success factors of social media posting for high engagement, such as the use of simplistic and minimal text, bright and uncluttered imagery, and the inclusion of an incentive for interaction.

New Zealand Lamb represents a final example of a New Zealand-focused company to successfully build a strong following on social media and retain consumers' attention and interest with engaging posts. The meat product promotional group's Facebook page currently has 14,528 likes, with posts reaching up to approximately 1 million people by organic spread (i.e. through the recommendation of a friend or through viewing another user's interaction with the page). The main age of fans is between 25 and 54 years old (73 per cent) with most international fans based in Germany, Austria, Iran and the USA. The posts that secured the highest amount of likes and interaction from consumers were those with shareable content, especially recipes. Thus, New Zealand Lamb retained consumers' interest and increased the number of interactions between users and the New Zealand Lamb page by varying posted content. The use of Facebook's official advertising campaigns also assisted the page in gaining 3,192 new fans in 2013, of which 1,733 people liked the page as a direct result of paid advertising and 1,459 liked the page organically. In this sense, New Zealand Lamb has effectively used marketing strategies via social media in order to retain consumer interest in both their social media presence and New Zealand lamb products in general (Segmenta Communications, 2014).

Another use of social media by businesses is to assist in the mitigation of negative consumer perceptions. As social media is able to accelerate the spread of information, Lindsey (2014) found that in the event of public outrage concerning either a company's alignments, actions or advocacies, negative sentiment can spread faster than usual. Furthermore, consumer affairs and public relations experts have suggested that, as both a means of mitigation of negative sentiment and to increase transparency, the company's social media outlets should communicate with their customers in a clear, personal manner (Lindsey 2014). A Canadian study has also shown that the provision of transparent information from companies or brands via personal communication in social media increases positive perception of that company or brand (Arnot 2011). It is therefore important to outline strategies to mitigate negative response prior to the establishment of a company or brand social media presence.

A recent example of this can be seen in the British Food Standards Agency's (FSA) public interaction via social media in order to mitigate negative response during a recent traceability

scare. During the "Horsegate" incident of 2013, social media allowed the public agency to communicate with concerned consumers regarding food safety and/or ethical issues. In particular, the accessible and frequently-utilised platforms of Facebook and Twitter were used by the FSA, in addition to standard communication channels (i.e. FSA website, email updates). In addition, the FSA developed mobile "apps" to assist in the dissemination of timely information. Through the use of these platforms, the FSA was able to successfully manage consumer expectations of government responsiveness and promote a positive behavioural outcome from the events, while simultaneously developing a sense of the public outcry and monitoring the situation from a social angle. In this sense, the use of social media channels was used effectively to mitigate some public concern regarding food safety and traceability issues within the UK food chain (Panagiotopoulos et al. 2013). Similarly, a study of by Gaspar et al. (2014) found that during the 2011 E. coli outbreak in Europe (as previously discussed) Spanish consumers used Twitter to seek and provide information regarding the outbreak (by finding information provided by involved agencies or communicating possible strategies to avoid illness), as well as to communicate their feelings (positive and negative) regarding events associated with this. The findings of this study suggest that consumers may use social media during food crises as a means of coping with the current situation, as well as providing and receiving assistance in relation to these events (Gaspar et al. 2014).

4.3 Mobile technology

The uptake of novel mobile technologies has been significant in recent years, particularly with the surge in popularity of the "smartphone" – a cellular phone with combined capabilities of telecommunications and computing in a singular, small device (Hornyak 2013). The technology integrated into a smartphone device can include such elements as the touch-screen, WiFi, Bluetooth and mobile internet connectivity and the ability to operate applications (more commonly known as "apps")(Technopedia 2014a). Similarly, the use of tablets – a portable, touch-screen computer (Technopedia 2014b) – has also increased in recent years. In the US in 2012, there were approximately 121 smartphone and 94 million tablet users, representing respective increases of 31 and 180 per cent (Adobe 2013). A 2013 study of US mobile technology users showed that 34 per cent of participants conformed to the 18-29 years age bracket, 37 per cent within the 30-49 years age bracket, and 29 per cent within the 50-64 years age bracket. The same study also indicated even gender distributions in mobile users – 47 per cent female to 53 per cent male (Adobe 2013). By comparison, throughout ASEAN countries, mobile device ownership and use is increasing significantly. Currently 85 per cent of Singaporean consumers own a mobile device with internet capabilities. In addition, 100 per cent of Indonesian consumers own an internet-capable mobile device, and use their mobile devices exclusively to connect to the internet (Capillary 2013).

The operating system of a mobile device has a significant effect on its use. The most common operating systems are Android, Blackberry Linux, iOS and Windows Mobile internationally (Quirk eMarketing 2009). The operating system of a mobile device will determine the types of software that they will run, with different operating systems adhering to their own unique types of software (NC State University 2014). The availability of an application (or "app") for a particular mobile operating system, but not for others, has potential to sever a wide range of potential consumers from its use. A 2013 study of US mobile technology users showed that 52 per cent of

respondents used an Android device, with an additional 27 per cent indicated that they used an iPhone (iOS) (Adobe 2013). 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.

The provision and/or enhancement of mobile technologies may encourage a higher degree of market participation. In developing countries such as Uganda, Muto and Yamano (2009) have found that the expansion of mobile phone coverage networks has encouraged remotely-located farmers to increase involvement in district centres than previously. Similarly, the use of mobile technologies in traditional market commerce via electronic mechanisms for payment, may be of future importance. Mobile commerce, or the use of mobile technologies in traditional commerce, has been shown to have desirable qualities, increasing attributes of privacy, security, ease-of-use and convenience for the consumer in financial transactions (Chang et al. 2009). The use of mobile devices, particularly those with internet connectivity, may also present an opportunity to marketers, as smartphones are capable of accessing the internet. Consumers may retrieve product information from almost any location immediately, thus providing the ability to determine the characteristics of products and services (Crittenden et al. 2013).

The willingness of consumers to accept marketing communications via mobile technologies will be of high importance. Mobile marketing, as defined by Shankar and Balasubramanian (2009), is "the two- or multi-way communication and promotion of an offer between a firm and its customers using a mobile medium, device, or technology" (p. 118). Gao et al. (2013) showed that United States, 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. Furthermore, the use of permission-based mobile marketing (marketing materials are displayed to the mobile user only with that user's permission) was highly effective in generating a positive attitude to, and higher acceptance of, mobile marketing. Additional findings within the same study included that Chinese and European participants were highly risk-averse when considering mobile marketing involvement, while risk avoidance had little impact on US consumers' acceptance of mobile marketing (Gao et al. 2013). In another study, Persaud and Azhar (2012) suggest that brand trust and permission are key determinants for consumers' willingness to accept mobile marketing, are privacy and security concerns are high. In addition, consumers prefer to have some control over marketing interactions as far as when and how they would participate (Persaud and Azhar 2012). Similarly, Watson et al. (2013) showed that consumers consider their mobile devices to be personal technology, over which they should exercise control, therefore exhibiting negative attitudes towards mobile marketing. Furthermore, Sultan et al. (2009) showed that youth consumers in the US and Pakistan exhibit similar attitudes to mobile marketing acceptance, with personal attachment to mobile technology, as well as the potential risks of engaging with mobile marketing activities, shown as the two key indicators of acceptance of mobile marketing in these markets. In addition, this study showed that mobile devices were associated with personal identity and status, with this influencing mobile activity heavily (Sultan et al. 2009).

The use of mobile applications ("apps") in mobile marketing activities is an attractive prospect for marketers. A mobile app is defined by Technopedia (2014c) as "a type of application software designed to run on a mobile device, such as a smartphone or tablet computer". The interactive

nature of apps, as well as the focus and engagement they require from users, has presented the marketer with the possibility of their use in product promotion and communication. Bellman et al. (2011) demonstrate that the use of pre-branded mobile apps increase the users' interest in the product or product category of the brand, with the perceived creativity of the app effecting the formation of the user's attitude to the brand, as well as their purchase intentions (Bellman et al. 2011). Kim et al. (2013) examine the nature of the branded mobile app, particularly which attributes encourage the highest degree of engagement with users. These attributes included those of "vividness, novelty, motivation, control, customization, feedback, and multiplatforming" (p. 61). In addition, the inclusion of functionality to improve the personal customisation of branded apps correlated positively with the persuasiveness of marketing elements therein (Kim et al. 2013).

There are currently several mobile apps relating to New Zealand products (particularly food) available which may serve as exemplary models for effective marketing via smartphone apps, however, these apps are currently more relevant to the New Zealand domestic market. One such app is that of STQRY (currently available for iOS and Android). This app uses global positioning system (GPS) technology to assist the user in finding places of interest in a particular city, and attaches a "story" about each location as indicated on the GPS map. Places of interest as indicated by the on-screen map contain affixed QR codes (see Section 4.5) which users interested in knowing more about the location may use to display additional information on their mobile device screen. While the locations included are currently more focused towards tourism (cultural attractions), this app presents an opportunity to New Zealand food product marketing in the interaction of real-world items and mobile technology (STQRY 2014, NZTE 2014b).

Some retailers in the US are already making use of GPS-assisted mobile technology, with retailers Safeway and Giant Eagle fitting out 200 physical outlets with Apple's iBeacon technology. This technology, in the form of an iOS app, allows the customer to receive discount coupons for use in-store, as well as be "guided" through the physical outlet to locate shopping list items. iBeacon offers much more precise locational information than GPS, and can therefore be used within a smaller location field, such as a physical retailer outlet (Panzarino 2014).

There are also currently other mobile apps in relation to New Zealand food products available. These include the apps Fast, Fresh and Tasty, a New Zealand-specific cooking app, and FoodSwitch, a health and nutrition app. Fast, Fresh and Tasty is currently only available for iOS, and operates as a guide to using local ingredients in home-cooked meals, specifically based in the New Zealand domestic market. The app makers emphasise the ability of the user to locate ingredients by recipe of department (within a physical food retailer outlet), find the best quality and freshest ingredients, and contains recipes that are up-to-date and personally tested (Fast, Fresh and Tasty 2014). While this app appears to present an opportunity to New Zealand food marketers, it does not currently have any application to overseas markets.

Similarly, the app FoodSwitch is a New Zealand-based app developed by the National Institute for Health Innovation aimed at encouraging New Zealand consumers to eat a more nutritionally-balanced diet. It allows the user to scan the barcode of a food product with their mobile device, after which the device will display a "traffic-light" colour code on-screen indicating the total fat, saturated fat, sugar and salt of a product. Following this, the app displays a list of healthier alternatives to the user. The app also allows users to share this information via email or preferred

social media (currently allowing for Facebook and Twitter) (FoodSwitch 2014). While this app is not specifically related to the sale of New Zealand food products overseas, it does offer technological opportunities for the interaction between consumer, product and the internet which could be used in relation to improving New Zealand producer returns.

Finally, the use of mobile coupon systems (or "m-coupons") may be of interest to mobile marketers. The m-coupon can be viewed as a digital form of the traditional paper coupon, and allows the consumer to use a digital coupon (often received through mobile communications or interactions) to financial discounts or other benefits in relation to the purchase of a product. These may be used in conjunction with a mobile app, or through another form of communication between the firm and consumer (i.e. an email subscription list) (Im and Ha 2013). As with other mobile marketing consumer studies, Achadinha et al. (2014) found that South African consumers showed positive attitudes towards the use of m-coupons, but indicated a desire to exert a higher degree of control over the amount of m-coupons they received. In addition, a small percentage of participants showed awareness of m-coupons, with only 23 per cent having used m-coupons prior to their participation in this study.

4.4 Technology integration

The final consideration is that of the integration of mobile technologies with Web 2.0 applications. This type of mobile technology integration with Web 2.0 applications, such as social media, is rapidly increasing. This type of integration has been termed "the Internet of Things", and refers to the increasing interconnectedness of technology with internet access. Such devices as mobile phones, personal computers, and even in-car GPS systems, could be including within the Internet of Things, as they are able to (and often required to) consistently access the internet as a matter of function (Hersent et al. 2011).

In addition to personal mobile technology, food packaging applications may present a new means of consumer engagement with food marketing. As mobile users are more frequently using their devices to interact with "the real world" (the Internet of Things), points of interaction between physical reality and the internet are becoming more common. As previously discussed, marketers extending their digital strategy to include social media and mobile marketing techniques are being increasingly required to interact with consumers. In a broad sense, marketing strategies combined with the Internet of Things can be referred to as "participative marketing" that incorporates interactive processes between the product, marketer and consumer (Jara et al. 2013). Consumer engagement may be achieved through the use of barcodes affixed to product packaging, either in the form of the traditional 1-dimensional barcode, or new types of 2-dimensional barcodes.

A current international body responsible for barcode scanning technology within supply chains is GS1. GS1 (and its subsequent international branches, including GS1 New Zealand) is a not-for-profit association specialising in the provision of bar coding, data synchronisation and radio frequency technologies currently used most predominantly in the delivery of traceability systems for the food industry. Services include internationally-compliant barcoding services, Radio Frequency Identification tagging technology (RFID), online product data cataloguing, among other similar services (GS1NZ 2014). The use of such technologies may have implications for the communication of food safety, traceability and similar attributes in New Zealand food products.

For example, a Nestle representative commented that "We see GS1 bar codes as a critical part of our food safety programme, and they are critical to managing the complexity of a factory and supply chain that involve hundreds of raw and packing materials…" (GS1 2014a).

Another point of integration between the physical world and internet connectivity occurs in the use of Quick Response (QR) codes. The appearance of the QR code is similar to the barcode, but differs in its square shape and "pixelated" appearance (comprising a series of smaller black squares within the centre of the larger boundary square). The QR code is "scanned" using the camera capabilities of a smartphone, which then automatically directs the internet browser of the smartphone to a specific web address. QR codes have also been internationally standardised via the International Standards Organisation (ISO/IEC 18004). Other types of 2-dimensional codes (similar to QR) that are currently in use include Data Matrix, Aztec and EZ codes (Ebling 2010). The potential applications of 2-dimensional code technology are broad, with one potential application pertaining to a mobile tagging system for the identification and provision of information regarding genetically-modified food (Shiang-Yen et al. 2013).

QR codes are currently being used in conjunction with promotional activities, in particular in advertising. Such an example is Tesco's South Korean arm HomePlus' use of "virtual shops" in advertising in 2011. HomePlus used a consumer-facing poster-based advertising campaign to promote online shopping via smartphone interaction. Placed in prominent public spaces, such as underground train stations, the poster campaign featured the display of a life-sized supermarket shelf, on which items faced towards the train platform, constituting a "virtual store". People would be able to use their smart-phone to scan a QR code affixed to the picture of each product, which would add that item to a virtual shopping cart via the HomePlus smartphone app or mobile website. Following the submission of payment information and the completion of the online sale, deliveries of the selected items would be made to the consumers' specified address, allowing for a less time-intensive grocery shopping experience. Through the use of this campaign, total sales increased by 130 per cent for HomePlus, and registered users of HomePlus online shopping increased by 76 per cent (Solon 2011, The Telegraph 2011).

The use of QR codes in marketing activities relies upon mechanisms which attract the consumer rather than use traditional marketing techniques to "push" products onto a consumer. Cata et al. (2013) demonstrate the effectiveness of QR-based marketing through the use of two case studies. One such case study, involving a meat production company called HoneyBaked Ham, displays a QR code on product packaging, enticing consumers with a "Customer Secret Offer" promised by the scanning of the QR code. This then leads to the HoneyBaked Ham website catalogue, through which users are offered discounts on particular products. The use of QR codes with an effective marketing strategy for a particular product create value for HoneyBaked Ham in that providing a benefit to the consumers has shown strong correlation with QR code use. The second case study examined the use of QR codes by a US-based teenage clothing company. In this instance, the company affixed QR codes to products, which were linked with the company's Facebook page. However, Cata et al. suggest that, in not providing a point of interaction on the QR code landing page, this company missed an opportunity to interact with its consumers, and thus the use of a QR code was not effective in this instance (Cata et al. 2013). The integrative elements of QR codes may thus be of interest when considering their use in marketing activities.

Another example of QR code use in marketing activities relates to wine purchasing activities. Higgins et al. (2013) demonstrate that consumers whom already exhibit a strong interest in wine are more likely to utilise packaging-based QR codes to inform their purchase decision than consumers who are less involved or knowledge regarding wine. However, while the supply of QR codes affixed to wine labels has increased within the US market, there is little evidence that these codes are being used more frequently, or that demand for QR codes on wine packaging has increased (except among a small proportion of US consumers interested in wine production elements pre-purchase) (Higgins et al. 2013). Likewise, Watson et al. (2013) investigated consumer attitudes regarding mobile marketing, particularly in relation to the use of QR codes. The study found that consumers tend to react more positively to the use of QR codes than any other form of mobile marketing (i.e. SMS marketing), with consumers citing a perceived higher level of control as the basis for this. Other reasons cited by consumers for the development of positive attitudes towards the use of QR codes included their ease of use, and the provision of additional information, as well as benefits to the user (Watson et al. 2013).

As studies have indicated that QR codes can be used in a variety of consumer products, it is also important to consider consumer willingness to engage with QR and similar barcode technology when assessing its marketing effectiveness. Atkinson (2013) shows that consumers who exhibit lower levels of trust in food manufacturers to accurately convey product information are more likely to engage with QR codes than otherwise. Through the use of a QR code affixed to the packaging of a product, a consumer may instantly receive additional information regarding a product, which may provide gratification of corporate claims of nutritional, sustainable and ethical stewardship in production. Similarly, a consumer who exhibits a higher degree of trust in a government's ability to effectively regulate food manufacturers may use QR codes to obtain additional information regarding the sustainability credentials of the product in question (Atkinson 2013). In addition, a 2012 survey found that consumers not only prefer high levels of responsiveness in their interaction with QR codes, but also the provision of a high-quality service (Shin et al. 2012). This has further implications for food manufacturers, in that the provision of a QR code may encourage and increase consumer trust in a product, especially with regards to the sustainability credentials of the item or producer. This information may be beneficial to marketers seeking to use QR codes in alignment with promotional activities.

One more recent technological development which could improve traceability within the supply chain is that of radio-frequency identification (RFID) chips. The RFID chip is a small microchip which features a wireless tracking system capable of being received over long distances, as well as integration with scanning technology (i.e. an RFID "reader"), similar to that used for scanning barcodes. The chip itself is humidity, light and temperature resistant, and is thus suited to travelling long distances similar to those of an export-based supply chain. In this sense, the RFID chip (or tag) can be used to track food items over long distances remotely, mitigating the need for physical interaction with the tag along the supply chain, and providing real-time traceability information (Abad et al. 2009; Regattieri et al. 2007; Reiche et al. 2012). The use of RFID tags in supply chain traceability protocol could also prove beneficial to the stewardship of food safety, and could be used to assist in the mitigation of food spilage and contamination by tracing a food product's physical location (Hong et al. 2011). It would therefore be possible that this process could be useful in providing a more innovative, real-time form of traceability information to the consumer.

Retailers in the United States and Europe are already utilising RFID tag-based, particularly within the apparel industry. While several key international apparel retailers currently use this system for anti-theft and stocktaking purposes, other retailers are applying RFID technology to traceability across the clothing supply chain. This is most evident in US retailer WalMart's used of RFID tracking technology, initiated in 2005 to track pallets of clothing across its logistics operations. To initiate this process, manufacturers of clothing items will attach RFID tags to items with the intention of these tags being electronically read upon reaching their destination, allowing the retailer to verify stock logistics across the supply chain (GS1 2014b).

RFID technology has also been applied in an experimental setting to food supply chains. In a 2008 experimental case study of the application of RFID tags to food traceability (conducted by Hartley and Sundermann (2010)), 10 cattle were ear-tagged using RFID chips, with additional electronic product code (EPC) and barcodes affixed to shipping implements, and shipped to Hong Kong. Across all points of the logistics chain, tag data was effectively accessed and read by all operators, leading to an effective means of tracking for New Zealand food products (Hartley and Sundermann 2010). This may be of interest to New Zealand exporters, as this technology may grow and enhance supply chain visibility and product traceability for New Zealand food products in associated export markets.

As RFID technology can provide real-time traceability information, it is important to consider consumer attitudes towards the provision of traceability information in food products. A number of studies have explored consumer willingness to receive traceability information and their potential willingness to pay (WTP) a premium for the provision of such information. This information is also relevant to improving New Zealand producer returns in overseas markets. For example, Zhang et al. (2012) found that consumers in Nanjing, China, were willing to pay for traceability information of milk (21.7 per cent), cooking oil (19.8 per cent) and pork (16.7 per cent) products (Zhang et al. 2012). Several studies have also confirmed an increased WTP for food traceability attributes exists amongst Chinese consumers, particularly within urban areas (Bai et al. 2013, Chen et al. 2014, Ortega et al. 2011, Wu et al. 2009), while a study of Taiwanese consumers found that the provision traceability information strengthened a consumer's purchase intentions towards fast foods, with higher consumer involvement indicated by fast food outlets which adopted a food traceability programme (Chen and Huang, 2013).

Consumer acceptance of RFID technology use by retailers in relation to food products may be of interest. In a 2011 study involving 388 consumers in relation to their acceptance of RFID technology in marketing activities, Boeck et al. examined consumer willingness to interact with RFID technology via a store-promoted loyalty program using RFID identification tags. The authors found that when consumers perceive the use of RFID as intrusive to their privacy, a negative attitude towards the marketing campaign therein will be developed. In addition, consumers have exhibited an "intrusion threshold", wherein their perception of RFID use within a particular marketing activity as intrusive may vary depending on the depth and scope of marketing activities. However, in general, consumers in this study also exhibited willingness to carry RFID tags that may identify them to the retailer at a distance (Boeck et al. 2011). Similarly, Dean's (2012) examination of consumer attitudes towards a proposed RFID-based checkout system in grocery retailers in the US found that a majority of consumers were opposed to the concept (40 per cent opposed), with concern expressed for the loss of traditional service in grocery

retailer outlets. In addition, the use of RFID tags on food items elicited a negative effect on consumers' willingness to pay for RFID inclusion (77.4 per cent opposed) (Dean 2012).

Similar to RFID, the integration of Near Field Communication (NFC) technology and other technological devices is increasing. NFC technology is most commonly housed within the circuitry of mobile phones, and can be used in a similar fashion to RFID chipsets. For example, an NFC device can be used to pay for goods and services, as well as in conjunction with retailer loyalty programmes (i.e. collection of reward points redeemable for goods), or to provide casual, non-government-issued identification when required. The integration of RFID/NFC technologies with mobile devices has led to the development of the "mobile wallet". This system of payment uses RFID/NFC technology integrated with mobile devices (usually mobile phones) and connection with Internet banking services to elicit financial transactions through proximity. This technology is already being used by a select group of retailers, with the frequency of retailers with access to NFC payment technology increasing (Ashour 2014). Corporate bodies in charge of the development and proliferation of NFC technology include credit card arbiters MasterCard (PayPass) and Visa (PayWave), Google's Wallet service on Android and Apple's Passbook service on iOS (MasterCard 2014, Visa 2014, Google 2014, Apple 2014). The use of NFC technology in payment and loyalty programmes could be of interest to food manufacturers, as the inclusion of technologies which complement this may be warranted in the future.

Consumer attitudes towards mobile wallet payment systems were examined in a 2013 report by Vibes. This study found that 85 per cent of US consumers stating that a belief that non-payment mobile wallet applications would provide them with some benefit. In addition, 59 per cent of consumers stated that they would view retailers more positively with retailer provision of mobile wallet content (i.e. discounts and offers), with 44 per cent of consumers not currently using mobile wallet technology claiming that this technology would enhance their shopping experience (Vibes 2013). However, previous studies have indicated a general ambivalence amongst consumers towards the use of this technology, with perceived risk and lack of trust indicated as key barriers to the use of mobile wallet technology (Hayashi 2012, Luarn and Juo 2010, Rinne 2013). This technology, as identified by the literature, may be of future interest to food producers and marketers, as the use of such technologies may increase producer New Zealand producer returns for food products.

Chapter 5
Conclusion

This report is part of a wider research project motivated from the earlier research of consumer preferences toward credence attributes in UK, China and India (Saunders et al., 2013). That study showed, for example, that among all countries food safety was the most important food attribute and also that consumer preferences and their willingness to pay for different food attributes differ across countries.

In this report, consumer demand for a number of credence attributes were examined, including food safety, country of origin, traceability, local food, functional and health foods, eco-labelling, environmental quality, carbon labelling and reduction, organic, genetically modified (GM) food, animal welfare and fair trade. These attributes are features of a product that are not directly determinable at the purchase situation or via product experience (Wirth et al. 2011). Demand for these attributes was examined in selected consumer markets including United Kingdom, China, India, Singapore and Indonesia. Extensive research currently exists in relation to the United Kingdom, China, and India, whereas little research was found in Singapore and Indonesia markets.

The review of consumer preferences indicate that UK consumers are increasingly demanding food products that provide traceability and country-of-origin labelling, and include certification for food safety. Food safety concerns have also arisen with food safety scares, including the 2011 outbreak of E.coli from organic bean sprouts originating from Germany. In particular, demand for buying British-made food products has risen following the January 2013 “Horsegate” scandal. This may be due to consumer perceptions of food risk associated with and consumers’ trust of particular foreign markets. Another credence attribute that have been identified as important to UK consumers include carbon labelling or strategies to reduce carbon emissions. Although a number of studies have shown some demand for these attributes, there is also some level of confusion amongst consumers surrounding carbon labels. A major shift to the purchase of food products with less carbon has not been identified, apart from some evidence of positive attitudes and WTP for consumer air travel. Likewise, “ethical” production attributes such as organic, fair trade and animal welfare certification continue to be in high demand amongst UK consumers.

In China, the market is rapidly shifting as a higher degree of wealthy Chinese consumers emerge. The literature review indicated that the most important credence attribute for Chinese consumers is certification for food safety, alongside products that provide traceability information. The notion of food safety is related to the idea of “green food” in China, as consumers may identify organic foods as being safer and healthier due to a lack of pesticide and other residues on food. Chinese consumers have shown a high willingness to pay for organic products, which is mostly driven by concerns for health rather than concern for the environment. However, research has identified a growing consumer group concerned about the state of the environment, who are increasingly adopting sustainable lifestyles. Regarding GM foods, some research has indicated an overall positive view of these products amongst Chinese consumers. For example, one study showed that preference for GM foods may be increased when products have important health benefits, such as genetically modified folate enrichment in rice.

India is another market of increasing economic importance to New Zealand, with a growing class of wealthy consumers. Although relatively lower than in China, Indian consumers are showing an increase in interest for green consumption. For example, eco-labelling and eco-friendly packaging has been shown to strongly influence urban Indian consumers' purchase decisions. Similar to China, Indian consumers also regard organics as a healthier alternative to conventionally-produced food, due to a low incidence of pesticide residues and health concerns, rather than environmental concerns. However, price and product availability have been shown to be a significant limiting factor to the purchase of organic foods amongst Indian consumers. With regard to GM food products, mixed preferences have been identified in the literature. In one study, consumers who reported themselves as averse to GM technology were still willing to purchase GM foods. Another study showed an overall positive perception of GM Bt vegetables, with more consumers willing to purchase these products with price discounts, though higher discounts were required for consumers more concerned with pesticide residues. Moreover, knowledge surrounding GM is limited amongst Indian consumers.

In contrast, there is little research on consumer preferences for credence attributes in food products amongst Singaporean and Indonesian consumers. However, Singapore's middle-class is growing, and there is some indication of increasing interest in environmental credence attributes. For example, the "Green Singapore Sale" in a national event that encourages consumers to purchase eco-friendly products. On the other hand, in Indonesia research has included demand for organic products as a part of an increasing interest in healthy lifestyles in this market.

Overall, the literature provides some key information in regard to consumer preferences, in general, for credence attributes in food products in the selected markets. Following this, a number of international choice modelling studies including credence attributes were reviewed. Choice modelling, also known as choice experiments, is a method used to empirically measure consumers' willingness to pay (WTP) for each attribute, which can then identify possible price premiums for these attributes. This method is beneficial in that it allows for the exploration of trade-offs that people make in their purchase decisions. This in turn provides more robust estimates for the marginal WTP, and whether each product is considered as a whole or irrelative to the trade-offs.

A number of choice experiment applications worldwide, primarily from Asia, Europe and USA with a few cross-country examples, extends the review over the selected key markets in order to provide a patterns of consumer attitudes toward credence attributes in a wider context. These applications consider different food and non-food products, illustrating a wide range of products with credence attributes. These include for example food safety and traceability, organic production, local food/country of origin, functional foods, farm ownership, certification, brand, animal welfare and environmental impact. Appendix B provides a summary table of the type of credence attributes and WTP for each attribute (relative to the actual market or other base price).

First, as indicated above, food safety and traceability are described as very important credence attributes for consumers. A review of empirical choice experiments indicated that Chinese were willing to pay from 98 to 203 per cent more for milk product with food safety certification and WTP from 59 to 244 per cent more for milk and pork traceability. Similar results were seen in Japan, where consumers were indicated as willing to pay 155 to 165 per cent more for restricted antibiotic use in milk production, and 97 to 264 per cent premium for BSE-tested beef. In Sweden,

consumers were willing to pay 60 per cent more for flour with lower incidence of cadmium levels, while Danish consumers are willing to pay between 19 to 105 per cent more for higher food safety credentials in chicken and pork products. Likewise, in the US, consumers are willing to pay up to 46 per cent more for beef, pork and milk with enhanced food safety and traceability credentials, or the inclusion of this information on labels for these products.

Quality is another important credence attribute. For example, Japanese consumers are willing to pay 103 per cent more for milk products that are one day fresher while Chinese consumers have indicated a preference for a 37 per cent price discount if the milk product is sold after a three month threshold of the shelf-life. Consumers also prefer lower fat content in meat products, as shown in Finnish and Danish studies wherein consumers were willing to pay 7 to 10 more for beef and pork, and 39 to 116 per cent more for pork with a lower fat content (5 per cent and lower than 13 per cent, respectively). In the US, consumers have indicated similar WTP of between 14 and 16 per cent for pork with enhanced quality attributes, and "guaranteed tender" beef steak.

Functional, or health foods, have also been considered as a type of credence attribute. In the context of oil, eggs, bread and wine products, choice experiment findings indicated that Japanese consumers were willing to pay 75 per cent more for certified-functional oil; however, people were willing to pay 14 to 25 per cent less for oleic acid and vitamin-enriched oil compared with conventional nutritional information indicating that an oil product was low in saturated fat content. In Sweden, consumers were willing to pay 19 per cent more for omega-3 enriched eggs, while in the UK, some consumers were willing to pay 12 per cent more for functional bread and 19 to 62 per cent more for bread with associated health benefits; however, these preferences may not apply for all consumer groups as in the UK case. Spanish consumers were willing to pay 58 per cent more for Resveratrol content enhanced grapes used in wine making compared with a price that they would typically pay for a bottle of wine.

The reviewed studies also consider a variety of the agricultural production practices. In India, consumers prefer for pesticide free or biodegradable pesticides, with an indicated WTP of 23 to 36 per cent relative the typical retail price. Indian consumers also preferred lower environmental impact in production and were willing to pay 27 per cent more for this. This is consistent with the earlier findings regarding the increases in green consumption in India. In China, consumers were willing to pay 56 to 113 per cent more for certified organic foods and 46 to 78 per cent more for certified GM-free soymilk. In Japan, consumers indicated a willingness to pay up to a 122 to 156 more for organic feed and low-stress feeding in milk production; Japanese consumers were also willing to pay twice as much as a typical product price to avoid the GM ingredients in oil products, and about 32 per cent more for certified organic oil. Likewise, in Sweden, consumers want to know if GM-feed is used in agricultural production (chicken, pigs and cattle) and are willing to pay 8 to 49 per cent for the provision of this information on product labels, and 18 to 95 more for banning GM-fodder. Swedish consumers also prefer restrictions of pesticide use, indicating a willingness to pay about 74 per cent more for a product if no spraying of grain is allowed, or it is allowed only if the crop is affected. Spanish consumers are willing to pay 15 to 54 per cent more for organic and/or aged wine. Finnish consumers were willing to pay relatively less (about 2 to 7 per cent more) for beef and pork produced using alternative production methods, and 2 per cent more for the provision of information about the carbon footprint of pork products, but not beef products. US consumers are willing to pay 7 to 29per cent more for milk and pork originating

from a family farm and 36 per cent more for pork products originating from a large rather than medium size farm. Again, these preferences can vary across consumer segments as shown by some studies; within bread choices, for example, a UK study showed that about 34 per cent of the sample preferred conventional over organic methods of bread production, while the remainder were indifferent to production methods used.

Information about product origins is also highly valued by consumers internationally. This can include both country of origin and local food attributes. Overall, consumers seem to prefer domestic products and have indicated a willingness to pay 56 per cent more for domestic soymilk ingredients in China; 100 per cent more to avoid imported oil in Japan; and in Denmark and Finland consumers were willing to pay between 96 to 145 more for domestic pork and chicken while WTP was reduced by 30 to 92 per cent when imported products were offered. In the US, on study estimated consumers WTP of 38 per cent more for country-of-origin labelling of beef steak. However, some inconsistency was observed in consumers' WTP for non-domestic meat studies estimating both positive and negative WTP. Finally, some studies have considered products' locality. For example, US consumers were willing to pay 4 to 11 per cent more if the milk product was locally produced, while Spanish consumers were willing to pay up to 12 per cent more for wine from certain regions compared to rest of Spain. Indian consumers also indicated a preference for country-of-origin information on banana products, but these had a relatively lower WTP, only up to 8 per cent compared with the average retail price for these products. As indicated, these preferences can be associated with food safety concerns. Similarly, it has been suggested that the country of origin of a product may become more important for consumers as the volume of information relating to a product's credence attributes increases.

The review of choice experiment studies also indicate that consumers prefer certification for food safety, traceability or environmental impacts of products. Chinese consumers in particular appear to favour Government certification of food products, and were willing to pay 64 to 140 per cent more for the provision of traceability, organic and GM-free certification. Government certification was valued higher than third-party (industrial) or foreign certification, apart from organic soymilk, which was preferred to be certified by a US agency.

In comparison, in the US, consumers were willing to pay 21 to 74 per cent more for USDA-certified milk products, but prefer an 11 to 34 per cent price discount for privately-certified milk. Similar results were indicated for meat products, for which people were willing to pay 37 to 120 per cent more for pork and beef products with USDA-certification, but preferred a 5 to 16 per cent price discount for private certification. In addition, US consumers were willing to pay 43 to 96 per cent for a variety of animal welfare attributes certified by USDA, but with inconsistent WTP (both premiums and discounts) for consumer group and third-party certifications. In the context of non-food items, UK consumers are, on average, willing to pay a 107 per cent more for government-certified airline carbon offset programmes, while US consumers are willing to pay 73 to 189 per cent more for certified paper towels products that guarantee the maintenance of forest worker's rights, no clear cutting of forests, sustainable forest management, fish and wildlife protection and, in particular, reductions in production-related environmental pollution.

Finally, this report reviewed a number of technologies which consumers are using in everyday life. The use of these technologies has increased rapidly amongst consumers globally. Significant

numbers of people now use the Internet globally, with approximately 2.75 billion people regularly accessing the internet in 2013. This is consistent with increases in the provision of internet tools and services comprising what is commonly known as Web 2.0 (including blogs, wikis, online marketplaces and social media).

Communities of users online known as virtual communities have come to acquire the social characteristics of traditional social communities. In addition, there has been a greater provision and use of online marketplaces (e-commerce) in recent years. Consumers across a range of international markets have exhibited high uptake of online shopping via e-commerce outlets, with sales increasingly steadily over the past five years. While food and grocery items are currently being sold through online vehicles, these have not proven to be highly successful yet, and may require further research to examine the most effective means of promoting online sales of food items.

Perhaps the most significant development within the Web 2.0 framework is that of social media, with an approximate 1.73 billion users internationally, of which roughly 777 million are located in the Asia-Pacific region with a further projected increase up to 2.55 billion users by the year 2017. The mainstream social media websites (including Facebook, Twitter and Google+) has significant potential as a food marketing tool, apart from China where consumers are currently restricted from using Western social media websites. Brands may establish their own online presence from which users can track news and updates; at present the most popular industries within social media include FMCG food and retail food brands and companies. In addition, the proportion of marketing activities focused on social media is increasing for major brands internationally, signalling its importance as a marketing vessel.

Social media marketing mechanisms allow for a more in-depth consumer-focused experience. As consumers may directly interact with their favourite brands and companies. This kind of consumer-business engagement has a potential to increase the likelihood of consumer loyalty and purchase frequency. Some companies have increased their use of social media, improving its effectiveness in conjunction with marketing activities through innovation and interaction with their consumer base. Interactions between consumers has exhibited a similar effect; for example electronic Word-of-Mouth between consumers may have strong effect on consumer attitudes to products and brands. Similarly, increase access to product information may alter consumer perception of products and brands through these mechanisms including, but not limited to, other users' experiences as well as food safety and traceability information.

"Smartphones" (i.e. mobile phones with computer-like features) have become a new method for consumers to generate information, interact with and purchase food products. Mobile technologies have strong potential as a means of communicating marketing information to consumers. While smartphone users have indicated an openness to receiving marketing materials through personal devices, many consumers have responded negatively to this, stating concerns about the infringement of privacy through these personal devices. The use of branded mobile applications ("apps") may mitigate this, with the willing use of these apps resulting in positive consumer response. While New Zealand food-focused apps currently exist, there is little information to suggest that these may be used for the successful sale of New Zealand food products internationally.

Technology associated with mobile devices and the internet has shown future potential as an effective means of marketing New Zealand's food products. Such technologies include the use of barcodes and QR codes, as well as RFID and NFC technologies. For example, the scanning of QR codes by the mobile user allows marketers to establish a type of participative marketing, through which the consumer is "pulled" to the information, rather than having this information "pushed" upon them (as in traditional marketing platforms). QR codes are currently being using in conjunction with promotional activities in international markets, such as "virtual shops" in South Korea.

Similarly, the use of RFID and NFC technology has been signalled as having significant future application in the sale of food products with real-time information for example about traceability information. Consumers in major international markets have also indicated a willingness to pay a premium for the provision of traceability information in food products, with RFID suggested as a means of collecting this information. Likewise, RFID and NFC technology can be "activated" via a portable device, allowing the provision of product information upon activation. This may be of interest to marketers of New Zealand food products for use in promotional activities should this technology become more commonplace. Applications of these technologies are already being rolled out by major companies internationally, and while consumers might currently be cautious about their use, consumer adherence is expected to increase in the future.

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Appendix A
Choice Modelling Method/Not Included

Modelling preferences

Chapter 4 described briefly the choice experiment methodology. This appendix provides a further description of the statistical models used in modelling preferences and translating these preferences into monetary values, that is willingness to pay (WTP).

Firstly, the respondents' choice data is analysed using econometric models to quantify the impacts of attributes on consumer choices and to understand why these alternatives where chosen (Hensher et al., 2005). It can be assumed that people make choices that are best for them – in economics this is said to *maximise their utility*. This involves specification of utility as function of attributes associated with some weight for the preference where utility is considered as an "index of attractiveness" (Ben-Akiva and Lerman, 1985), or simply as a measure of preferences. On the basis of behavioural random utility theory (Thurstone, 1927) a random component is included in this function to represent all other factors that influence on people's choices but which are not observable by the researcher. Essentially, with this component the researcher can elucidate why otherwise equal consumers may make different choices (Czajkowski, 2014). This randomness does not mean people make random choices, it is rather a consequence of unobserved factors influencing consumer choices (Manski, 1977). The utility for each alternative can be then estimated based on that people choose alternative *i* only if this yields maximum utility compared to other alternatives available. These assumptions combined with statistical assumptions are used to derive econometric choice models to estimate the likelihood of choices.

Secondly, the standard and the simplest econometric model is a multinomial logit (MNL) model (McFadden, 1974). While this is a well-known "work horse" model (Hensher et al., 2005), it might be limited to represent the empirical data obtained from the surveys due to strict assumptions associated with the model. The state-of-art models allow more flexibility for this, a random parameter logit (RPL) model being the most common alternative. The RPL model is a generalisation of the MNL model that relaxes many of the assumptions (Hensher et al., 2005; Revelt and Train, 1998; Train 2003); importantly within this model the consumer preferences are not fixed to be same, they are represented as a population average with some diversity. Another model option allow consumers' preferences to vary between consumer segments with similar preferences rather than being individual specific. Models can also include nested structures or correlation between the alternatives (Train 2003), or isolation of the "scale" of how much observed utility matters relative to the unobserved utility (Swait, 2007; Czajkowski, 2014). The overall aim is to use the estimated utility weights (i.e. preference weights) to translate them as consumers' WTP for different attributes, which is calculated on the basis of how people trade-off one attribute against changes in product price. This is ratio

$$\text{WTP} = -\hat{\beta}_k \Big/ \hat{\beta}_{cost}$$

Where β_k is estimate for the *k* attribute and β_{cost} is estimate for the product price.

Finally, while the state-of-art econometric models can provide more accurate representation of consumer preference, each additional parameter included in the model increases the complexity of estimation and interpretation processes. The final models used in the studies are selected on a case-by-case basis according to the limits of the empirical data.

Appendix B
Summary Table

Relative willingness to pay for credence attributes used in the choice experiments, 2003 to 2013

Attribute	Product	Country	Average WTP	
Food safety				
Certified by	Pork	China (2011)	Government: 106% Private third-party: 69%	
	Milk	China (2012)	Government: 203% Private: 98%	
	Beef steak	USA (2007)	USDA: 120%	
	Dairy	China, India, UK (2013)	China: 74% India: 73% UK: 16%	
	Lamb	China, India, UK (2013)	China: 44% India: 77% UK: 18%	
Label	Chicken	Denmark (2011)	Salmonella free: 59% campylobacter-free: One food safety attribute: 87% Two food safety attributes: 105%	
	Chicken	Denmark (2009)	campylobacter-free: With information: 49% Without information: 19%	
	Pork	Denmark (2010, 2011)	Salmonella free: 78%	
	Milk	Japan (2003)	HACCP: 110%	
	Milk	USA (2011)	rbST-free per gallon	19%-37%
	Milk	USA (2011)	rbST-free per half-gallon	41%-46%
Assured/ Enhanced in production	Pork	USA (2011)	16%	
	Milk	USA (2011)	per gallon	18%
	Milk	USA (2011)	per half-gallon	31%
	Beef	Finland (2013)	2%	
	Pork	Finland (2013)	2%	
Analysed for cadmium	Flour/grain	Sweden (2005)	60%	
Tested for BSE	Beef	Japan (2012)	Domestic Wagyu: 115-133% Domestic dairy: 162-213% Australian beef: from -133% to 264% US beef: from -411% to 197%	
Use of antibiotics restricted/ reduced	Pork	Denmark (2010, 2011)	29%	
	Milk	Japan	155-165%	
	Pork chops	USA (2007)	Certified: 26%	
	Pork	USA (2010)[12]	Certified by Third-party: -33% Consumer group: -2% USDA: 73%	
No growth promotants	Beef steak	USA	8%	
Certification opposed to no claims				
Government	Milk	USA (2011)	USDA/ gallon	without food safety: 21-43% with food safety: 44%
	Milk	USA (2011)	USDA/ half-gallon	without food safety: 63% with food safety: 74%
	Pork	USA (2010)	USDA vs. self-certification: -84%	
	Pork	USA (2011)	USDA: With food safety and quality: 37% Without food safety and quality: 50%	

[12] Note: only the consumer "direct" preferences as these reflect respondents "own" preferences

Private-third party	Milk	USA (2011)	Private/ gallon	without food safety: from -16% to -10% with food safety: -11%
	Milk	USA (2011)	Private/ half-gallon	without food safety: -34% with food safety: -16%
	Pork	USA (2011)	With food safety and quality: -5% Without food safety and quality: -16%	
Traceability				
Certified	Milk	China (2013)	Government certification: 140%	
	Milk	China (2013)	Industrial certification: 64%	
	Pork	China (2011)	59%	
	Bison steak	Canada (2010)	Up to 14%	
Labelled	Milk	China (2013)	244%	
	Beef steak	USA (2007)	28%	
Detail information	Beef steak	USA (2011)	To birth farm: 38% To feed lot: 10%	
Local Food/Country of Origin				
Label of origin	Soymilk	China (2013)	US origin: 41% China origin: 56%	
	Beef steak	USA (2007)	38%	
Local	Milk	USA (2011)	per gallon	4%-11%
	Milk	USA (2011)	per half-gallon	7%-8%
Region of origin	Bananas	India (2012)	Local: 5% Karnataka: 8% Kerala: 5% Gujarat: -1% Rest of India: 4%	
	Wine	Spain (2008)	Region of origin (vs. rest of Spain) Andalusia: -6% La Mancha: 12% Rioja: 7%	
Domestic product	Pork	Denmark (2010, 2011)	One food safety attribute: 124% Two food safety attributes: 96%	
	Chicken	Denmark (2011)	One food safety attribute: 142% Two food safety attributes: 145%	
	Onions	China, France, USA, Niger (2008)	China: 50% France: 62% USA: 53-77% Niger: 130%	
Non-domestic product	Chicken	Finland (2010)	Danish product: 30–44% lower Thai product: 46–92% lower Brazilian product: 46–77% lower	
	Oil	Japan (2006)	-100%	
	Beef steak	USA (2011)	-20%	
	Pork	USA (2009)	Canada: 41% Brazil: 269%	
	Pork	USA (2011)	Canada: With food safety and quality: 0.6% Without food safety and quality: -1% Brazil: With food safety and quality: -36% Without food safety and quality: -92%	
	Dairy	China, India, UK (2013)	China India UK	foreign origin: 26% NZ origin: 49% foreign origin: -20% NZ origin: 10% foreign origin: -4% NZ origin: 3%
	Lamb	China, India, UK (2013)	China	foreign origin: 10% NZ origin: 24%

			India	NZ origin: 21%
			UK	foreign origin: -5%
				NZ origin: 6%
Functional Foods				
	Wine	Spain (2008)	Resveratrol enhanced grapes: 58%	
	Bread	UK (2011)	Consumer group 3: 12%	
	Eggs	Sweden (2005)	Omega 3 enriched: 19%	
	Oil	Japan (2006)	Certified: 75%	
Nutritional information	Oil	Japan (2006)	Vs. low in saturated fat	
			Rich in oleic acid: -14%	
			Rich in vitamin E: -25%	
	Bread	UK (2011)	Health benefits	
			Consumer group 2: 62%	
			Consumer group 3: 19%	
Quality				
Quality assured	Pork	USA	16%	
Fat content	Pork	Denmark (2010, 2011)	(vs. over 13%)	
			3-6% content: 106-116%	
			7-10% content: 99-111%	
			11-13% content: 39-59%	
	Beef	Finland (2013)	5% content: 7-10%	
	Pork	Finland (2013)	5% content: 8-10%	
Tenderness	Beef steak	USA	14%	
Freshness	Milk	Japan (2003)	An extra 1 day fresher: 103%	
	Milk	China (2012)	Shelf-life over 3 months: -37%	
Brand/ type				
	Milk	China (2012)	National brand (vs. local): 118%	
	Milk	China (2013)	UHT milk: -53%	
	Pork	China (2011)	Additional product information: 29%	
	Wine	Spain (2008)	Oak aged wine vs. young wine: 54%	
	Bread	UK (2011)	Consumer group 1:	Rye: 141%
				Whole: 291%
				Brown: 206%
				50/50: 118%
			Consumer group 2:	Rye: -50%
				Whole: 121%
				Brown: 42%
				50/50: 65%
			Consumer group 3:	Rye: -79%
				Brown: -21%
Environment/Social attributes				
Environmental impact	Bananas	India (2012)	Low: 27%	
			Medium: 10%	
			High: -28%	
Forest workers' rights	Paper towels	USA (2004)	Certified by 'Made in Maine': 70%	
			Certified by EPA: 113%	
			Certified by CSF + additional information: 94%	
No clear cutting - forest	Paper towels	USA (2004)	Certified by 'Made in Maine': 101%	
			Certified by EPA: 132%	
			Certified by CSF + additional information: 73%	
Biodiversity	Dairy	China, India, UK (2013)	China: 22%	
			India: 27%	
			UK: 6%	
	Lamb	China, India, UK (2013)	China: 15%	
			India: 42%	
			UK: 6%	
Sustainable forest management	Paper towels	USA (2004)	Certified by 'Made in Maine': 81%	
			Certified by EPA: 100%	
			Certified by CSF + additional information: 112%	
Fish & wildlife protection	Paper towels	USA (2004)	Certified by 'Made in Maine': 93%	
			Certified by EPA: 127%	

			Certified by CSF + additional information: 189%
Water quality	Dairy	China, India, UK (2013)	China: 16% India: 19% UK: 3%
	Lamb	China, India, UK (2013)	China: 12% India: 26% UK: 7%
Environment certification/ label	Paper towels	USA (2004)	Certified by 'Made in Maine': 161% Certified by EPA: 134% Certified by CSF + additional information: 131%
	Milk	Japan (2003)	Eco-labelled milk: 111%
	Pork chops	USA (2007)	19%
Carbon/ GHG emissions	Airlines	UK (2009)	Carbon Offset program: 107% UK Government certified: 93% Co-benefits Human development: 106% Conservation and biodiversity: 128% Technology and market development: 87%
	Dairy	China, India, UK (2013)	China: 25% India: 38% UK: 7%
	Lamb	China, India, UK (2013)	China: 14% India: 39% UK: 7%
	Beef	Finland (2013)	-2%
	Pork	Finland (2013)	2%
Organic production			
	Soymilk	China (2013)	US-certification: 113% EU-certification: 56% Chinese certification: 79%
	Beef	Finland (2013)	7%
	Pork	Finland (2013)	4%
	Milk	Japan (2008)	140%-156%
	Oil	Japan (2006)	Certified organic: 32%
	Wine	Spain (2008)	15%
	Bread	UK (2011)	Consumer group 3: -28%
	Apples	Czech Republic, Denmark, Germany, Italy, Switzerland, UK (2012)	Certified by Czech Republic: EU: 13% Government: 56% Private (international): 9% Denmark: EU: 14% Government: 52% Private (international): 14% Germany: Government: 51% Private (international): 49% Italy: EU: 80% Private: 48% Private (international): 41% Switzerland: private: 54% Government (fake): 18% Private (international): 33% UK: EU: 8% Private: 26-33%
	Eggs	Czech Republic, Denmark, Germany, Italy, Switzerland, UK (2012)	Certified by Czech Republic: EU: 23% Government: 53% Private (international): 12% Denmark: EU: 20% Government: 54% Private (international): 22%

			Germany:	EU: 21% Government: 92% Private (international): 105%
			Italy:	EU: 84% Private: 56% Private (international): 37%
			Switzerland:	private: 77% Government (fake): 23% Private (international): 31%
			UK:	Private: 27-36%
Use of pesticides				
	Bananas	India (2012)	Sprayed: -8% Bio-degradable spray: 23%	
None	Onions	China, France, USA, Niger (2008)	China: 121% France: 67% USA: 44-50% Niger: -64%	
	Bananas	India (2012)	36%	
	Flour	Sweden (2005)	74%	
Restricted	Flour	Sweden (2005)	74%	
GM in production				
GM-free	Bison steak	Canada (2010)	Certified: up to 49%	
	Soymilk	China (2013)	US-certification: 61% EU-certification: 46% Chinese certification: 78%	
	Onions	China, France, USA, Niger (2008)	China: 40% France: 197% USA: 71-91% Niger: 312%	
	Oil	Japan (2006)	192%-219% to avoid GM-seeds	
GM content <1%	Onions	China, France, USA, Niger (2008)	China: 24% France: 135% USA: 61-62% Niger: 203%	
GM content 1%-5%	Onions	China, France, USA, Niger (2008)	China: - 6% France: 70% USA: 32-38% Niger: 77%	
GM fodder	Beef	Sweden (2005)	GM-fodder labelled: 15% GM fodder banned: 45%	
	Chicken	Sweden (2005)	GM-fodder labelled: 9% GM fodder banned: 18%	
	Eggs	Sweden (2005)	GM-fodder labelled: 45% GM fodder banned: 95%	
	Milk	Sweden (2005)	GM-fodder labelled: 49% GM fodder banned: 93%	
	Pork	Sweden (2005)	GM-fodder labelled: 8% GM fodder banned: 52%	
Producer characteristics				
	Bananas	India (2012)	Co-operative organization of farmers: 13% Small-scale independent farm: 9% Small-scale contracted farm: 7% Producer company: 7%	
Farm size	Pork chops	USA	Large vs. median: 36%	
Family Farm	Milk	USA (2011)	per gallon per half-gallon	7-12% 14-17%
	Pork	USA (2011)	With food safety and quality: 8% Without food safety and quality: 29%	
Farm origin and husbandry	Flour/grain	Sweden (2005)	45%	
	Beef	Sweden (2005)	18%	

	Pork	Sweden (2005)	9%
Animal Welfare: pigs			
Overall	Pork	Finland (2013)	4%
	Pork chops	USA (2007)	Certified: 24%
Castration	Pork	Sweden (2006)	None: -21% Immunocastration: 21%
	Pork	Sweden (2008)	None: -124%
Tail docking	Pork	Sweden (2006)	None, tail biting can occur: -14% None, tail biting is prevented: 11%
Trucking/ transport	Pork chops	USA (2010)[13]	Self-verified: 18% Third-party certified: -99% Consumer group certified: -39%
	Pork	Sweden (2008)	Mobile transport: 155%
	Pork	Sweden (2005)	Mobile transport: 8%
Stock limit (vs. 400 pigs)	Pork	Sweden (2008)	Limit 200 pig: 165% Limit 100 pigs: 120%
Mixing of unfamiliar pigs	Pork	Sweden (2008)	forbidden: 110%
Fixation	Pork	Sweden (2006)	fixation only at delivery: 65% banning fixation: 72%
Gestation crate use	Pork	USA (2011)	Labelled gestation crate free: With food safety and quality attributes: 16% Without food safety and quality attributes: 9% Gestation crate ban: With food safety and quality attributes: 9% Without food safety and quality attributes: 24%
	Pork chops	USA (2009)	Crate practices (vs. typical): 60%
	Pork	USA (2009)	Crates banned: Consumer group 1: 28% Consumer group 2: 96% Consumer group 3: - Consumer group 4:159%
	Pork chops	USA (2010)[14]	Individual crates/stalls certified by Self-verified: 23% Consumer group: 27% USDA: 43%
Type of housing system	Pork	Denmark (2010, 2011)	Outdoors: One food safety attribute: 29% Two food safety attributes: 35%
	Pork	Sweden (2006)	Indoors, plenty of straws: 46% Outdoors: 64%
	Pork	Sweden (2005)	Outdoors: 66%
	Pork	USA (2010)[15]	Pasture access certified by Self-verified: 30% Third-party: 32% Consumer group: 33% USDA: 96%
Animal Welfare: chicken			
Battery cages	Chicken	Sweden (2005)	Battery cages co-exist with free range: 122% Battery cages are banned: 183%
Outdoor production	Chicken	Sweden (2005)	112%
	Chicken	Denmark (2010, 2011)	One food safety attribute: 38% Two food safety attributes: 25%
	Chicken	Denmark (2009)	With information: 80% Without information: 36%

[13] Note: only the consumer "direct" preferences as these reflect respondents "own" preferences
[14] Note: only the consumer "direct" preferences as these reflect respondents "own" preferences
[15] Note: only the consumer "direct" preferences as these reflect respondents "own" preferences

Transport	chicken	Sweden (2005)	Mobile: -4%
Growth	chicken	Sweden (2005)	Slower growth: 13%
Animal welfare: cattle			
Production type	Beef	Finland (2013)	7%
Certified	Dairy	China, India, UK (2013)	China: 26% India: 42% UK: 17%
Feed type	Milk	Japan (2008)	Low-stress: 121-133%
	Beef steak	USA (2011)	Grass-fed over grain fed: 34% Grass-grain fed over grain only -8%
	Milk	USA (2010)	Intensive Grazing: 7%-16% per gallon 12% per half-gallon Moderate Grazing: -8% per gallon 8%-10% per half-gallon
Transport	Beef	Sweden (2005)	Mobile: 9%
Housing type/ system	Beef	Sweden (2005)	Outdoor: 4%
	Milk	Sweden (2005)	Free-range indoor production Vs. stanchion: 38%
Cow and calf together	Milk	Sweden (2005)	for 8-12 weeks (vs. 1-4 days): 20%
Animal welfare: sheep			
certified	Lamb	China, India, UK (2013)	China: 13% India: 41% UK: 22%

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