

Introduction

Given that China is the largest importer of food and beverages in the world (AusTrade, 2013), this market cannot be ignored. In particular, the niche market for organic food in China deserves the attention of Australian exporters. Consumption of organic food in China is growing rapidly largely due to worries over food safety (Marchesini, Hasimu and Spadoni, 2010; Euromonitor, 2011). Relative to the literature on Western consumers, the literature on organic food consumption in China and Asia is sparse (Roberts & Rundle-Thiele, 2007; Marchesini, Hasimu & Spadoni, 2010; Sirieix, Kledal, & Sulitang, 2011; Lobo & Chen (2012); Thørgersen & Zhou, 2012). This study aims to identify the factors that motivate the purchase green or organic food in China. The 'Green Food' label refers to a category of food that is grown in a safe and ecologically sound manner. This research has four objectives: firstly, to understand the opportunities and challenges that the Chinese market poses for regional Australian agri-food exporters. Secondly, the aim is to identify the demographic characteristics of the green/organic food buyer in China. The third objective is to identify the reasons why consumers buy green/organic food. Specifically, are those factors motivated by altruistic concern (i.e., environment and animal welfare concern) and/or self-interest (i.e., personal health concern). The final objective is to identify whether consumers of certified organic food differ from green food consumers in terms of demographic characteristics.

Challenges and opportunities faced by regional Australian exporters

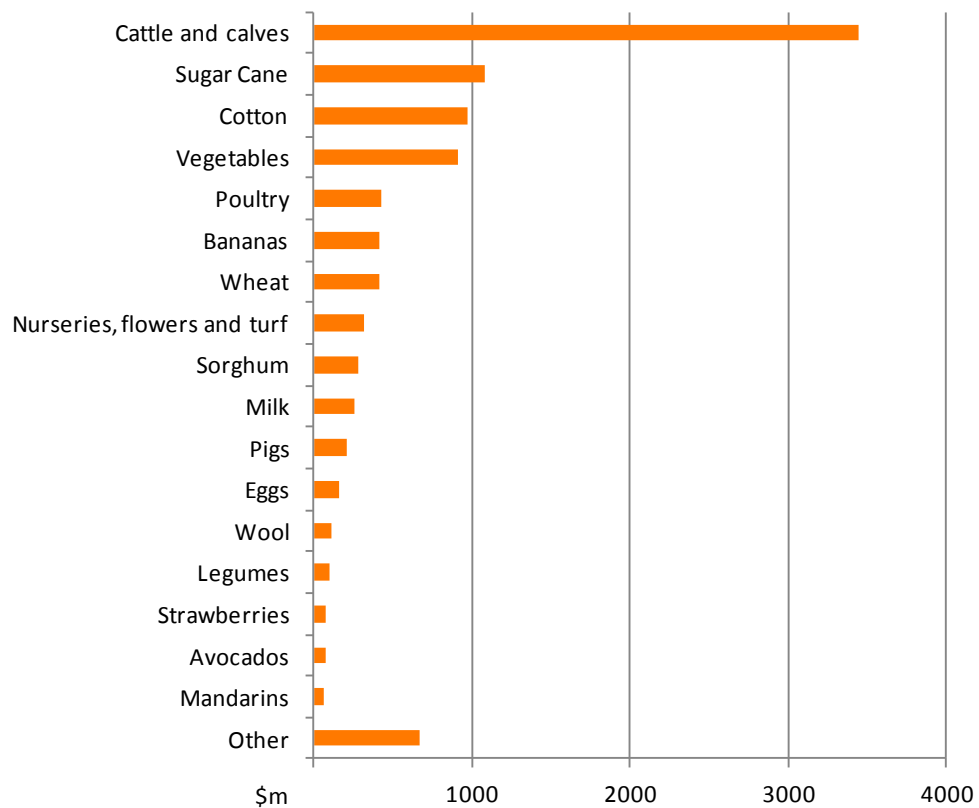
Australia's food and agricultural industry plays an important role in supporting regional jobs and communities. Agriculture is a key pillar of the economy and it supports an array of secondary industries such as transport and logistics, food service, food and beverage manufacturing, wholesaling and retailing. Queensland's agricultural exports are worth \$8.9 billion per annum, but it is recognised that the sector has to become more export-focused (Department of Agriculture, Fisheries and Forestry, 2013). Figure 1 shows the value of agricultural production to Queensland, and while cattle and sugar cane are the most significant sectors, vegetables and bananas are also important in terms of value (DFAT, 2012). Queensland is Australia's leading state for fruit and vegetable production. The last agricultural census found that Queensland had an estimated 4,021 horticultural businesses in 2009-10. The gross value of Australia's horticultural exports was \$1.9 billion (ABS, 2012). Horticulture Australia (HAL) has identified China as a potential export market for horticultural produce. Nuts, table grapes, citrus, summerfruit and cherries have seen strong export growth (HAL, 2013). It is widely acknowledged that the increase in household disposable income and the prevalence of food safety scandals in China have helped boost imports of food and beverages (Austrade, 2014). The ABARES report *What Asia Wants* (2013) shows that the value of fruit and vegetable consumption in China is projected to be US\$118 billion and US\$551 billion in 2050, respectively, over 50 per cent higher than in 2007.

Claims are being made that Queensland, along with Northern Australia, will become a 'food bowl' for Asia, but these perceptions are not well informed (CSIRO, 2009). The expansion of irrigated agriculture has historically been limited due a challenging climate. Issues to consider include the environmental impacts of irrigated agriculture, insufficient water, indigenous water rights, poor quality soil, isolation and distance from major population centres which reduces access to skills and labour (CSIRO, 2009). Horticultural exports remain at low levels. In 2012, Australia had a trade deficit for fresh and processed fruit, nuts

and vegetables of \$863 million (Department of Agriculture, 2012). There are a range of factors explaining Australia's poor export performance. Market access remains a significant issue. In general, it is easier for processed foods to access the China market. Export of fresh produce (particularly fruit) is limited by quarantine restrictions. An ABARES (2014) study of vegetable growers found that the majority of growers believed exporting was too difficult or time-consuming. Inadequate prices for exported vegetables and shipping costs were the most commonly stated impediments to developing export markets (Valle, Caboche & Lubulwa, 2014). The agricultural sector faces many challenges, including competitive challenges in overseas markets (i.e., Chile, New Zealand, South Africa), a high Australia dollar, globally high production costs, limited supply capability, market access barriers, high tariffs, shelf life for perishable products, supply chain logistics and a highly variable climate (Department of Agriculture, Fisheries and Forestry, 2013). A recent market report on market opportunities for Australian vegetables in China concluded that export barriers are significant, but not insurmountable (Morgan and Wright, 2014).

Being 'clean and green' is no longer a differentiator for Australia in production. Chinese export demand is likely to drive an increase in farm-gate returns in the future (AusVeg, 2012). With rising populations in middle and higher income brackets, there is an opportunity to export certified organic products at a price premium (Commonwealth of Australia, 2014). According to the BFA (Biological Farmers Association), Queensland has the largest amount of certified organic production land in Australia. Queensland has the highest value of farm-gate organic agricultural production in Australia at 32 per cent or \$140 million, including almost 70 per cent or \$52 million of Australia's growing organic beef industry. Many farmers who move to certified organic farming are attracted by the high growth rates. Organic agriculture is the fastest growing sector in agriculture. Exact figures for organic exports are difficult to ascertain but exports are estimated to be valued at \$126m which is 10% of overall industry value. The organic meat and dairy sector are success stories but exports overall remain suppressed due to lack of supply (Monk, Mascitelli, Lobo, Chen and Bez, 2012). In China, certain categories of organic products have good prospects, including processed and frozen food, dairy products, cereals, wine, infant formula and baby food as well as non-food items such as cosmetics (Chen 2012). Compliance costs exist in China. Organic products that have not been certified by the Chinese authorities cannot be labelled as 'organic'. Australia and China are expected to sign a Free Trade Agreement in the future, and exporters should be able to take advantage of a reduction in tariff and non-tariff barriers (Austrade, 2014).

Figure 1: Value of agricultural production to Queensland, 2011–12



Source: Department of Foreign Affairs and Trade (DFAT) and Australian Bureau of Statistics

Literature Review

Role of demographics

Studies into who buys organic food highlight demographic variables like gender, age, income, education and presence of children in the household (see Yiridoe et al., 2005 for a review). Females with children are likely to be organic consumers (Dettmann & Dimitri, 2009; Van Doorn & Verhoef, 2011) and concern for young children is likely to increase organic food consumption (Kriwy & Mecking, 2012). Researchers take a gendered perspective in studies of food consumption. The role of women in the food system is emphasised as they tend to be responsible for food preparation and food shopping. Furthermore, social pressures around healthy eating and bodily fitness, particularly in relation to children's eating patterns, are relevant (Little, Ilbury & Watts, 2009).

There are mixed messages in the literature regarding the influence of household income on organic consumption; some studies show organic food buyers to be on relatively high incomes (Govindnasamy & Italia, 1990) while others have found that income is insignificant (Smith et al., 2009). In a recent study, it was concluded that income does not influence the initial decision to purchase organic food, but it does affect expenditure on organic food quite significantly (Kriwy & Mecking, 2012). Howie (2004) found that consumers on low incomes (less than \$50,000) are more likely to purchase organic food. Lockie *et al.*, (2002) found that the relationship between income and consumption was not strong as consumers take non-

price attributes into account such as shelf-life, family acceptance, quality and the avoidance of waste.

Education is one of the few demographic variables to be consistently associated with organic or local food purchase (Yin *et al.*, 2010). Zepeda & Deal (2009) suggest that education is a measure of one's level of knowledge and information-seeking behaviour; indeed, scholars refer to the rise of the 'reflexive' consumer (Moore, 2008) as consumers actively seek information from the Internet, books and magazines and the mass media. While many Western studies provide an insight into consumer demographics, the results are conflicting and fail to paint a consistent picture of the 'typical' organic consumer. In contrast, studies on both organic and green consumption in China highlight income and education (Zhang, 2005; Thøgersen and Zhou, 2012; Zhu *et al.*, 2013).

The following hypothesis has been advanced:

H1: Green food consumption in China is influenced by certain demographic factors, notably gender, family life cycle stage, education and income.

Role of trust

The organic food literature shows that distrust of food processing has a strong influence on organic food consumption (Grunert, 1992; Kristiansen & Grunert, 1991). Furthermore, consumers who lack confidence in regulators and in the mainstream food industry are more inclined to be heavy organic food consumers (Squires, Juric & Cornwell, 2001). According to Marchesini *et al.*, (2012), the trust deficit in China is enormous and it has played a key role in boosting organic and all certified food purchases

Organic foods are 'credence goods' because many of the attributes that consumers may consider important are not obvious or easily verified – in other words simply looking at the food does not give the consumer any idea of how it was produced (Gifford & Bernard, 2011). The relevance of credence attributes "underlines the considerable role played by certification and labeling aimed at reinforcing consumers' confidence in organic food' (Guido *et al.*, 2010: 99). BildtgÅrd (2008) argues that certification schemes help maintain people's trust in food in modern society. This study aims to test the influence of trust on green food consumption in China:

H2: Individuals who consume green/organic food are likely to distrust the Chinese food system.

Purchase motivations

In the food marketing literature, there is a general consensus as to why people buy organic food. Together with personal health concern and concern about the degradation of the natural environment, product attributes such as taste and quality are important (Baker *et al.*, 2004; Didier & Sirieix, 2008; Hill & Lynchehaun, 2002; Honkanen *et al.*, 2006; Lyons, 2006; McEachern & McClean, 2002; Pearson, Henryks & Jones, 2010; Torjusen *et al.*, 2001). In a large-scale study of the adoption of organic food by Chinese consumers, it was found that beliefs about its healthiness, taste and environmental friendliness were important, as is the case in the West (Thøgersen & Zhou, 2012). An exploratory study on the factors driving organic food consumption in China found that health concerns was a significant motivator and environmental concern only slightly affected purchase intention (Yin *et al.*, 2010).

Many studies posit that organic food purchase behavior is motivated by the perceived healthiness of such products (Guido, 2009; Guido *et al.*, 2010). Health concern is based mostly on the presence of pesticides and additives in conventionally grown food. Many consumers are becoming more and more aware of health risks associated with the consumption of conventional food (such as pesticide residues) as well as novel (e.g., genetically modified) food products (Siegrist 2008). According to Makatouni (2002), responsibility for the health and well-being of the family is the most important reason for parents to buy organic foods.

Researchers argue that ethical principles, such as ecological sustainability, care for farmers' welfare and care for animal welfare—which constitute a philosophy for organic farming—drive consumers' choices of organic food (Guido *et al.*, 2010). Researchers have linked moral attitudes, namely the positive, self-rewarding feeling of doing the right thing, to the consumption of organic food (Arvola *et al.*, 2008). For instance, studies show that animal welfare concerns (Hutchins & Greenhalgh, 1997) influence organic food consumption. Animal welfare concerns are more important for particular organic produce (i.e., eggs, chicken and pork products) and in countries where intensive animal farming systems are commonly used (Pearson, Henryks & Jones, 2010).

Research suggests that organic food consumers rank private or personal benefits higher than the social benefits of organic agriculture (Yiridoe *et al.*, 2005). According to Zanolli & Naspetti (2002), organic food is more likely to be purchased as a result of ego-centric values, such as health or pleasure, rather than altruistic motives. Kriwy & Meckling (2012) recommend marketers to stress self-interested reasons for buying organic food instead of emphasising altruistic aspects. There is some evidence that organic food consumers value health benefits as well as concern for the environment (Oude Ophuis *et al.*, 1992; Davies *et al.*, 1995; Wandel & Bugge, 1997; Squires, Juric & Cornwell, 2001). Pino, Peluso & Guido (2012) emphasise ethical motivations and conclude that ethics affect the purchase intentions of regular consumers, whereas food safety concerns influence the purchase intentions of occasional consumers. While some studies conclude that ecological concerns (i.e. protection of water supplies, wildlife and overall balance of nature) are important in explaining consumption of organic foods (Goldman & Clancy, 1991; Oude Ophuis *et al.*, 1992; Fotopoulos & Krystallis, 2002), others show that they are not so important and environmental concern ranks slightly lower than healthy content (Jolly *et al.*, 1989; Paul & Rana, 2012). In a study of Chinese consumers, Sirieix *et al.*, (2011) concluded that consumers were driven more by self-oriented motives rather than altruistic or other-oriented motivations (i.e. support for small-holder farmers, animal welfare and environmental preservation).

As the organic market in China grows, a natural question is what motivates consumers to buy organic/green food? The following hypothesis emerges from the literature review:

H3: Chinese consumers are motivated to buy green/organic food for health and environmental reasons.

Research Design

The population of interest was consumers of certified green food and organic food, as most consumers do not understand the distinction between organic and green food rating-systems. Green food is a solely Chinese certification and is comparable to, but differs from, organic

products (Marchesini, Hasimu and Spadoni, 2010). The ecological labels are shown in Figure II.



Figure II: Chinese Food Quality Certification Signs.

The survey instrument was originally developed in English and translated into Chinese. The survey contained a section on socio-demographic information, purchase motivation, sources of information used in decision-making, outlets used to buy food, familiarity with green food and organic food, willingness to pay and consumer attitudes towards food safety. The survey was informed by the literature and it was pilot tested on a convenience sample. Based on feedback from the participants, some questions were reworded to avoid ambiguity.

An online survey was conducted in May and June 2014. Online surveys are becoming a viable method of data-collection in research and appealing because they are a cost- and time-efficient way of accessing a large number of participants (Sue and Ritter, 2007). Data collection is ongoing and hence this paper reports preliminary findings only. A total of 250 consumers responded to the survey to date and this includes 199 individuals who had previously bought green food. Most of the respondents come from Beijing, Shanghai, Guangdong and Chongqing. These cities are geographically dispersed – being located in the north, south, east and west of China, and they are considered first tier cities that contribute strongly to China’s economic development.

Data processing and analysis included descriptive analysis (frequency distributions) and bivariate analysis (t-test). Parametric (t test) methods were used to detect significant differences between consumers of green food and consumers of certified organic food. A chi-square test was used to analyse the relationship between demographic characteristics and organic food consumption (Bryman and Cramer, 1997).

Data findings

Table 1 offers a demographic profile of the sample. Females were over-represented in the survey, with 70% females and 30% males. The Chinese census data shows more males (51.3%) than females (48.7) in the general population (National Bureau of Statistics on China, 2013). The female bias is quite marked and may be due to fact that women were more interested in the topic than men. A gender bias towards females is common in early studies of organic food (Hughner *et al.*, 2007; Lockie, Lyons, Lawrence & Grice, 2004) and in Chinese studies (Thørgersen and Zhou, 2012), since women traditionally assume responsibility for feeding the family.

Most respondents were young, with 79% of respondents in the 26-45 year age bracket. The age composition was 37% aged 26-35 years, 42% aged 36-45 years, 4% aged 46-55 years, and only 1% aged 56 years and over.

Main occupations cited were administrative/clerical (36%), teacher/researcher (27%), university student (15%), public servant (12%) and businessperson (4%).

The majority of respondents were married (73%) and most married respondents (62%) had a child.

Household income was classified into seven categories. The sample had a relatively high income, with 27% earning between 6,001 and 10,000 RMB and 24% earning between 10,001 and 20,000 RMB (approximately 1 Chinese Yuan/Renminbi = 0.1732 AUD).

The respondents were well educated with 45% having an undergraduate degree and 45% having a post-graduate degree. Analysis of statistical data shows that 27% of the Chinese population of tertiary age were in tertiary education in 2011 (UNESCO, 2013) so this sample is more educated than the general population.

Table 1: Summary of findings on demographics

Variable		Responses	Percentage
Gender (n=187)	Male	56	30%
	Female	131	70%
Age (n=190)	Below 18	0	0%
	18 - 25	31	16%
	26 - 35	71	37%
	36 - 45	79	42%
	46 - 55	8	4%
	56 and over	1	1%
Married (n=191)	Yes	139	73%
	No	52	27%
Children (n=191)	No children	20	10%
	Young children – aged below 12	88	46%
	Older children – aged 12 and over	31	16%
Household Income Per Month (n=190)	Less than 3000 RMB	8	4%
	3,001 to 6,000 RMB	50	26%
	6,001 to 10,000 RMB	51	27%
	10,001 to 20,000 RMB	45	24%
	20,001 to 30,000 RMB	15	8%
	30,001 to 50,000 RMB	14	7%
	More than 50,000 RMB	7	4%
Education (n=180)	Senior High School or below	2	1%
	Technical and/or Vocational School	5	3%
	Junior colleges	12	6%
	Undergraduate	84	45%
	Post-graduate	85	45%
Occupation (n= 192)	Company staff/clerical	70	36%
	Public servant	23	12%
	Businessman	8	4%
	University student	29	15%
	Military man	1	1%

	Doctor	0	0%
	Teacher and/or researcher	51	27%
	Labourer & related	2	1%
	Home duties	4	2%
	Retired	0	0%
	Other (comic author, designer, journalist)	4	2%

Demographics and certified organic food consumption

The majority of respondents (80%) had bought green food and 66% had bought certified organic food. Bivariate analysis, defined as relationships between pairs of variables, was conducted. Cross tabulations were used to explore relationships between organic food consumption and demographic variables. No significant effects of gender, marital status, occupation, city tiers or overseas experience were found. And after collapsing the age groups into two categories: aged 35 and below and aged 36 and over, age was found to be an influential factor and was related to the purchase of certified organic food. Consumers aged 36 and over were more likely to buy certified organic food (51.6%). The marital status variable was further collapsed to two groups: household with no child and household with child. The presence of children in the household was also found to be an influential factor, with 67.5% of respondents that have a child are more likely to purchase certified organic food while only 32.5% of those that have no child would purchase certified organic food (see Table II).

Table II: Impact of Consumer Demographics on Certified Organic Food Consumption (P value/Pearson Chi-Square)

		Buy certified organic food	Pearson Chi-square
Age	35 and below	48.4%	$X^2 = 5.616$; sig.=.018*
	36 and above	51.6%	
Child	Have no child	32.5%	$X^2 = 4.915$; sig.=.027*
	Have child	67.5%	

Purchasing patterns and knowledge of green food and certified organic food

Fruit and vegetables were the most popular type of green food purchased (81%), with milk and dairy products being the second most popular (48%), followed by meat (34%), pre-packaged goods including ready meals, snack food, breakfast cereals (23%) and bread and bakery products (12%). International supermarkets such as Carrefour and Walmart was the most popular food purchasing channel (59%) followed by Chinese supermarkets (53%). One fifth of the sample (20%) purchased food from health food stores, from wet markets/farmers' markets (20%) and from a local food shop (19%). An interesting finding was that online fruit and vegetable box delivery was used by 16% of the sample and 8% obtained produce from Community Supported Agriculture (CSA) schemes.

Average weekly expenditure on green food was 125.35 RMB. Green food accounted for approximately a third of total food expenditure (37.7%). One area of interest was willingness to pay for green food and most respondents were willing to pay much more for green food than conventional food. An estimated 42% said they were willing to pay up to 30% more for

green food; 41% were willing to pay between 31% and 50% more and 14% were willing to pay between 51% and 100% more.

One area of interest is the Chinese consumer's knowledge of green food. A five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used and respondents were asked the question: to what extent do you agree or disagree with the following statements concerning your knowledge of green food? The answers are given in Table III. While Chinese consumers have heard of green food and know a little about it, they were not inclined to agree that they had good knowledge of green food.

Table III: Green food - knowledge and familiarity.

Statistic	I have heard of green food	I know a little bit about green food	I have good knowledge of green food
Mean	4.31	3.91	2.83
Total Responses	201	193	190

The survey showed that the Chinese consumer's ability to distinguish organic food from green food is restricted. Over half of the sample (59%) were aware that the concept of green food is different from that of organic food.

Trust in food systems and motivations for purchasing green food

The survey was designed to elicit consumer attitudes towards food safety. A five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used and respondents were asked the question: to what extent do you agree or disagree with the following statements concerning your level of trust in food? The answers are shown in Figure III. The data shows that consumers feel that food is not as safe as it once was and they do not have enough information to judge properly whether food is safe or not. They do not trust the government to ensure that pesticide residue levels are safe or that additives in food are not harmful; they do not trust Chinese food brands, food sold in restaurants or in farmers' markets.

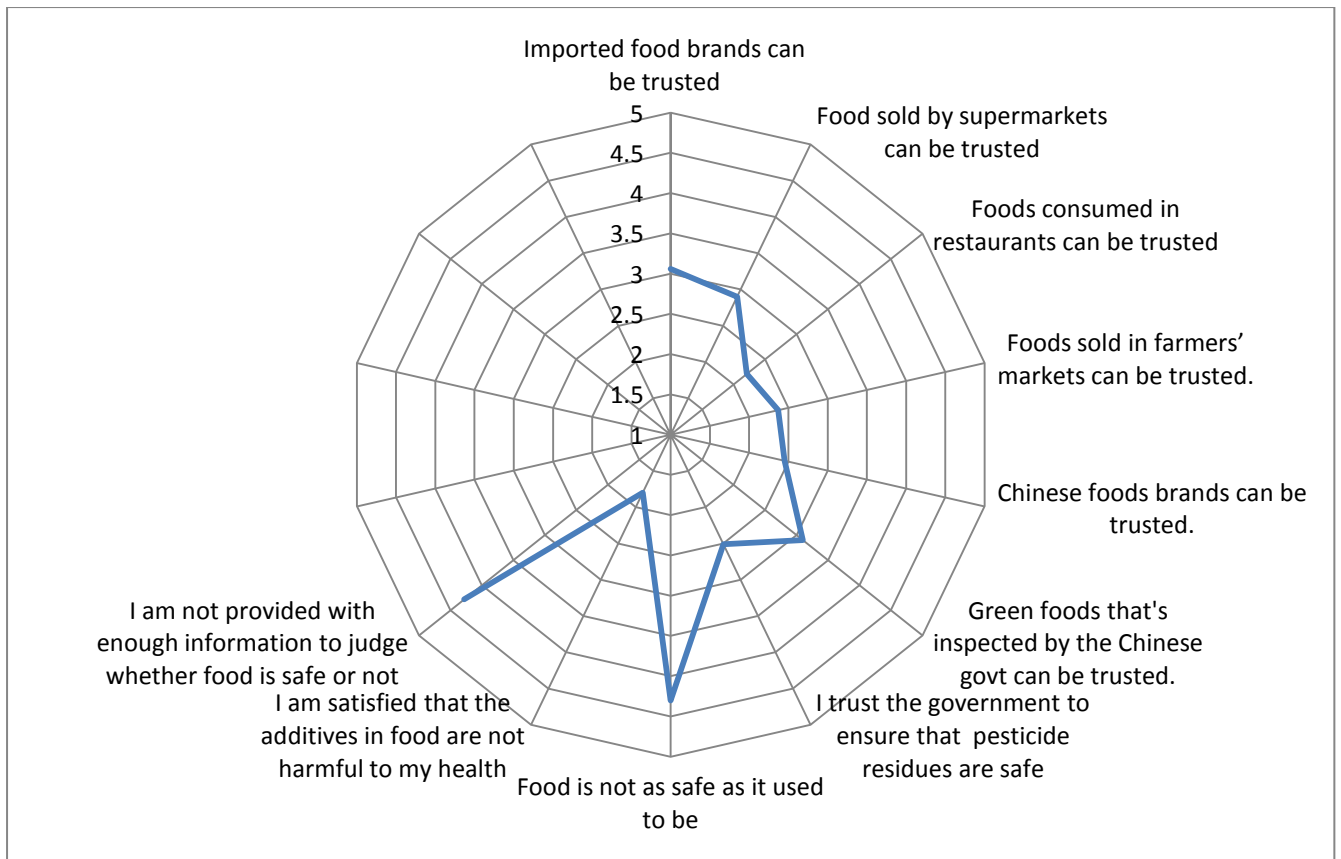


Figure III: Trust in food system

A further comparison was conducted on the motivations of respondents who purchased green food and those who did not purchase green food. A five-point Likert scale ranging from 1 (very important) to 5 (not at all important) was used and respondents were asked the question: how important are each of the following factors in motivating you to buy food? From Table IV, we can see that green food purchasers attach greater importance to most of the motivating factors than the non-purchasers. Food safety receives a higher score (which offers some support for hypothesis 3). The non-purchasers attach slightly more value to the freshness of the product, whether it has a well-known brand and whether it is free of genetically modified ingredients; however, statistics from independent t-test indicate that most of these differences are not significant, apart from the factor 'helps support Chinese farmers', which the green food consumers rate significantly higher than those who did not consume green food ($t=2.013$; $sig.=.046$).

Table IV: Motivations of green food purchasers and non-purchasers – a comparison

Motivating factors	Purchasers	Non purchasers
Green food will improve the future health of my family.	4.29	4.22
Green food will improve my future health.	4.26	4.19
Green food is safe.	4.25	4.09
Environmentally-friendly in the way it is produced, packaged and transported.	4.18	4.18
The food I buy has the green label and is pesticide reduced.	4.13	4.03
Comes from humanely treated livestock.	4.14	3.97
Does not contain genetically modified ingredients.	4.09	4.10
Green food is high quality and has high nutritional value.	4.07	3.97
Produce is fresh.	3.73	3.82
The green food I buy helps support Chinese farmers.*	3.81	3.47
Sourced within season.	3.74	3.68
The green food I buy is competitively priced.	3.70	3.65
Tastes good.	3.68	3.55
Green food is easy to prepare.	3.48	3.47
The green food I buy comes from a farmers market and there is a long-term, trusting relationship with grower.	3.34	3.48
The green food I buy has a well-known brand name or comes from a well-respected region.	3.31	3.33
Green food is easy to buy.	3.30	2.97

Figure IV shows that while most of the motivating factors were considered important, health concerns (i.e. family and personal health) and food safety received the highest score. Other important factors were whether the food was pesticide reduced; whether food comes from humanely treated stock; whether food is environmentally-friendly in the way it is produced and packaged; does not contain GM ingredients and is of high quality and has high nutritional value.

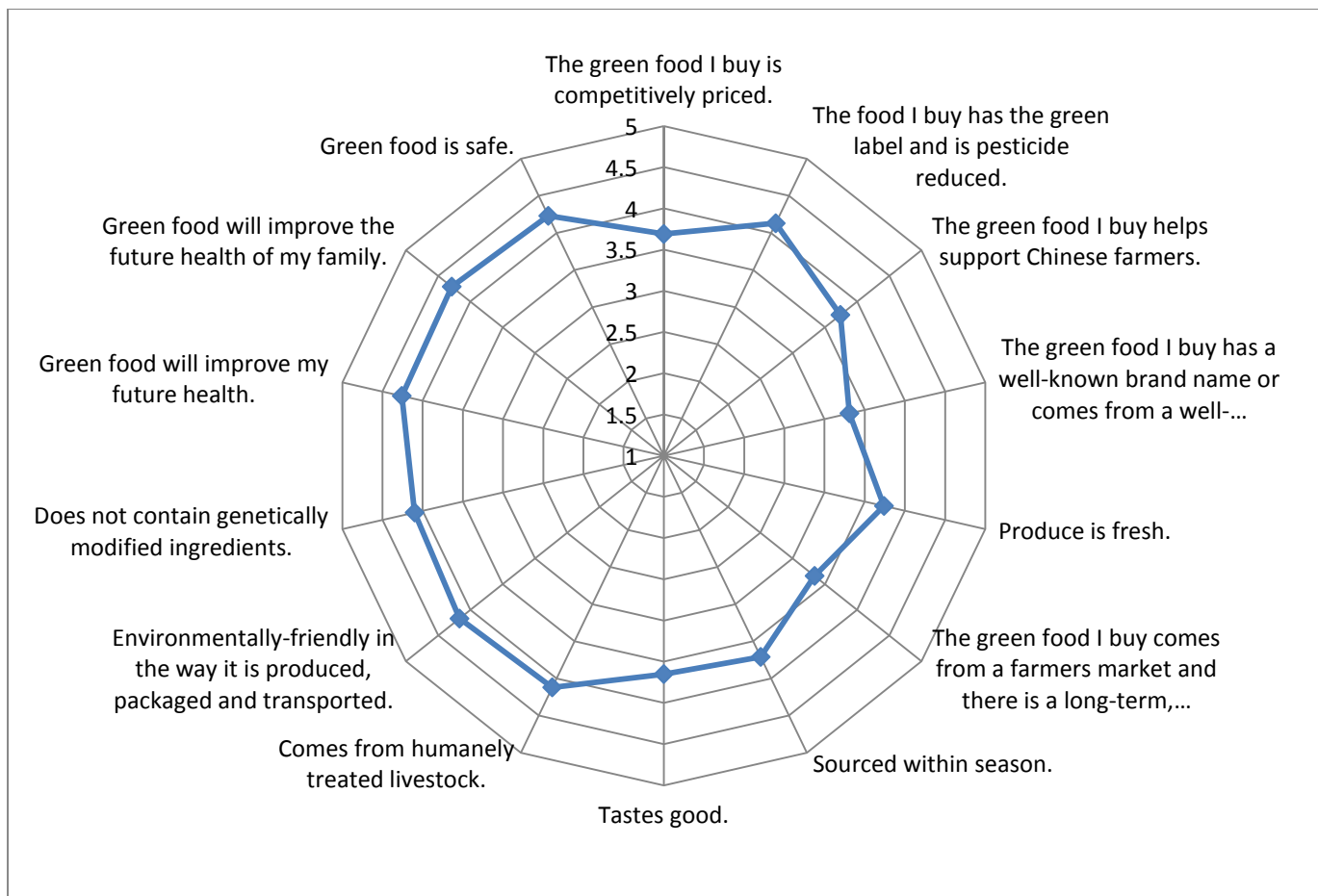


Figure IV: Motivations for purchasing green food

Survey findings and discussion

This study contributes to the literature by explaining the factors that influence green/organic food consumption in China. One objective was to identify whether consumers of certified organic food differ from green food consumers in terms of demographic characteristics. Age was found to be an influential factor affecting purchase of certified organic food. Consumers aged 36 and over were more likely to buy certified organic food. The presence of children in the household was also found to be an influential factor. However, other factors such as gender, education and income were not found to be significant. These findings do not fully accord with the literature. Research on organic food consumption in China highlights income (Yin, Wu, Du and Chen, 2009) and education (Thogersen and Zhou, 2012). Studies on Western consumers show that concern for young children is likely to increase organic food consumption (Kriwy & Mecking, 2012); the organic food buyer is likely to be female (Lockie *et al.*, 2004), female with children (Dettmann & Dimitri, 2009; Van Doorn & Verhoef, 2011) and is likely to be highly educated (Govindnasamy & Italia, 1990; Kriwy & Mecking, 2012). The literature on Western consumers gives mixed messages with regard to the influence of household income on organic food consumption. Some studies show organic food buyers to be on relatively high incomes (Govindnasamy & Italia, 1990) while others have found that income is insignificant (Smith *et al.*, 2009). Studies using demographic profiling report inconsistent findings, hence the lack of clear trends arising from this study is not surprising.

The survey revealed that there were some gaps in respondents' knowledge of green food and only half of those surveyed could distinguish between organic and green food. This finding is not surprising given that that "organic food is a new and not very well known concept" in China (Thorgersen & Zhou, 2012: 328). The organic label competes strongly with the green food label in terms of image and positioning in the market and they are often confused (Marchesini, Hasimu & Canavari, 2012).

There was support for the third hypothesis, that Chinese consumers are motivated to buy green food for health and environmental reasons. The consumers of green food were motivated by several factors, in particular, health, including one's own health and the health of one's family; whether the food is pesticide-reduced and carries the green label; animal welfare; whether the food is environmentally-friendly in the way it is produced and packaged; whether it is free of GM ingredients and is of high quality and has high nutritional value. There were no significant differences between green food purchasers and non-purchasers, apart from the factor, 'helps support Chinese farmers', which the green food consumers rate significantly higher than those who did not consume green food. This finding suggests that green food buyers are more motivated by altruistic concern than non-green food buyers. The importance given to health, environmental factors, farmer welfare and animal welfare is not surprising in the context of the literature review. In general, personal health and environmental considerations are strong motivating factors (Baker *et al.*, 2004; Didier & Sirieix, 2008; Hill & Lynchehaun, 2002; Honkanen *et al.*, 2006; Kriwy & Mecking, 2012; Lyons, 2006; Makatouni, 2002; McEachern & McClean, 2002; Pearson, Henryks & Jones, 2010; Squires *et al.*, 2001; Torjusen *et al.*, 2001).

The study provided support for hypothesis 2 - that individuals who consume green/organic food are likely to distrust the Chinese food system. This finding is in accordance with the literature. Bing *et al.*, (2011) found that purchase of green food in China is related to food safety concerns. Although China has plenty of product quality regulations, enforcement is weak (Jin, Lin & Yao, 2011). One survey found that 36% of respondents are strongly dissatisfied with food safety conditions (Xu & Wu, 2009). The problem of fraud, where companies falsely advertise pesticide-treated produce as organic, is an ever-present concern, leading to a large trust deficit (Marchesini *et al.*, 2012; Li, Ge & Bai, 2013).

Opportunities for regional food producers

There is good potential to export certified organic products, products that have a strong, traceable food safety dimension, to wealthy Chinese consumers. While Northern Australia is unlikely to become a 'food bowl' to Asia, strong export opportunities exist. While export barriers cannot be underestimated, the signing of an Australia-China Free Trade agreement would be a boost to the industry.

This survey has practical implications for regional food producers, along with Australian food policy makers and organic certifying bodies in Australia. In line with the trade literature (Mintel, 2012), the study shows that fruit and vegetables are the most popular type of green food purchased and the main distribution channels are supermarkets. Regional food exporters could increase the effectiveness of their marketing activities by appropriate segmentation strategies. This study suggests that segmenting the organic food market on the basis of age and presence of children in the household would be useful. The descriptive characteristics of the sample showed that the sample was drawn from the middle classes and respondents were

well educated and on high incomes. It would be prudent for regional food producers to segment the market, not just on socio-demographic variables, but also on behavioural aspects such as benefits sought from green/organic food. The food attributes that regional food producers promote must be relevant and important to their consumers. They need to emphasise the health and safety benefits of Australian food. The 'clean and green' image of Australian food will remain important, particularly in the light of Chinese consumers' high level of distrust in the domestic food system. The study shows that Chinese consumers are willing to pay a price premium for green food, although the literature reports that high prices are a barrier to purchase in China, particularly in the case of organic food (Yin et al., 2010; Marchesini *et al.*, 2010). Regional food producers in Australia should price their produce carefully and consider setting a premium in the 31% to 50% range. However, studies show that willingness to pay for organic/green food is affected by demographics, notably age, gender, family size and household income (Xia & Zeng, 2008). A moderate price premium is likely to make the product more affordable for Chinese consumers and relieve their concern over food safety issues.

A generic branding strategy spearheaded by AusTrade, HAL, Department of Agriculture or organic certifying bodies is needed to take advantage of the demand for safe, chemical-free produce. Organic certifying bodies in Australia could tackle knowledge gaps by providing information on organic production methods and philosophy (such as lower pollution, biodiversity preservation and other environmental aspects, the absence of antibiotics, chemical fertilisers, pesticides, GM ingredients, artificial colours and flavours in organic food). Public debates, seminars, expert speakers and events such as organic food fairs and international trade fairs could be used to educate buyers and reduce their uncertainty about the difference between certified organic, green-labelled and conventional food. Clearly, there is a need to expedite market access. In Free Trade negotiations with China, it is important that the interests of organic farmers are represented and that the Australian certified organic standard will be accepted by Chinese authorities.

Limitations of study

This study had a number of limitations and further research is recommended. The small sample size limits generalisation of the findings. The sample was mainly female, young and well educated and this may contribute to low variation in responses. This may explain the insignificance of demographic factors on certified organic food consumption and the willingness to pay a high price premium for green food. There are also some concerns surrounding Internet-based surveys. The main one is coverage bias, the fact that some people do not have access to, or choose not to use, the Internet (Solomon, 2001). As data collection is ongoing, the aim is to recruit a more diverse and larger sample and overcome some of these limitations. This survey showed that there is demand for fruit and vegetables, but this breakdown is too broad and further studies are needed to pinpoint where exactly the opportunities lie and whether there is demand for niche products not grown in the Chinese market, such as heirloom varieties.

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References

- Arvola, A., Vassallo, M., Dean, M., Lampil, P., Saba, A., Lahteenmaaki, L., & Shepherd, R. (2008). Predicting intentions to purchase organic food: the role of affective and moral attitudes in the theory of planned behaviour. *Appetite*, 50 (2-3), 443-454.
- ABARES (2013). *What Asia wants: Long-term food consumption trends in Asia*, Andrews, N and Gunning-Trant, C (eds.), ABARES Research report, Canberra, October. Retrieved 4 August, 2014, from:
http://data.daff.gov.au/data/warehouse/research_reports/9aat/2013/WhatAsiaWants/longtermFoodConsumptionTrendsInAsia_v.1.1.0.pdf
- ABS (2012) *Agricultural Commodities, Australia, 2010–11*, cat. no. 7121.0, Australian Bureau of Statistics, Canberra. Retrieved 5 August, 2014, from:
<http://www.abs.gov.au/websitedbs/c311215.nsf/web/Agriculture+-+Agricultural+Census>
- AusTrade (2014) *AusTrade - Food and Beverage to China - Trends and Opportunities* Retrieved 10 August, 2014 from: <http://www.austrade.gov.au/export/export-markets/countries/china/industries/Food-and-beverage>
- AusVeg (2012). *Australian vegetable industry Strategic Investment Plan 2012 – 2017*. Melbourne: Consulting and Implementation Services
- Baker, S., Thompson, K. E., & Engelken, J. (2004). Mapping the values driving organic food choice. *European Journal of Marketing*, 38 (8), 995-1012.
- Bildtgård, T. (2008). Trust in food in modern and late-modern societies. *Anthropology of Food*, 47(1), 99-128
- Bing, Z., Chaipooirutana, S. & Combs, H. (2011). Green product consumer buyer behaviour in China. *American Journal of Business Research*, 4 (1), 55-71.
- Bryman, A., & Cramer, D. (1997) *Quantitative Data Analysis with SPSS for Windows*. London: Routledge.
- Chen, J. (2012). *A study investigating the determinants of consumer buyer behaviour relating to the purchase of organic food products in urban China*. Unpublished PhD. Swinburne University of Technology, Victoria
- Commonwealth of Australia (2014). *Agricultural Competitiveness Issues Paper*. Canberra: Australian Government.
- CSIRO (2009). *Northern Australia Land and Water Science Review 2009*. Canberra: Department of Infrastructure, Transport, Regional Development and Local Government.
- Davies, A., Titterton, A., & Conchrane, C. (1995). Who buys organic food? A profile of the purchasers of organic food in Northern Ireland. *British Food Journal*, 97 (10), 17-23.
- Department of Foreign Affairs and Trade (2012). *Regional Profile for Queensland - State* Retrieved 8 August, 2014 from:
http://www.daff.gov.au/abares/pages/publications/display.aspx?url=http://143.188.17.20/anrdl/daffservice/display.php?fid=pb_myregr9ab_01020130305_11a.xml
- Department of Agriculture (2012). Horticulture Fact Sheet: Overview – Australian Horticulture. Retrieved August 18, 2014 from: <http://www.daff.gov.au/agriculture-food/food/publications/hort-fact-sheet>
- Department of Agriculture, Fisheries and Forestry (2013). *Queensland's agriculture strategy: A 2040 vision to double agricultural production*. Brisbane: Queensland Government.
- Dettmann, R., & Dimitri, C. (2009). Who's buying organic vegetables? Demographic characteristics of US consumers. *Journal of Food Products Marketing*, 16, (1), 79-91.
- Didier, T., & Sirieix, L. (2008). Measuring consumer's willingness to pay for organic and fair trade products. *International Journal of Consumer Studies*, 32 (5), 479-490.
- Euromonitor. (2011). *Certified organic: Recession no serious threat to organic food and drinks*. UK: Euromonitor International – Global Briefing.
- Fotopoulos, C., & Krystallis, A. (2002). Purchasing motives and profile of Greek organic consumer: a countrywide survey? *British Food Journal*, 104 (9), 730-764.
- Gifford, K., & Bernard, J. (2011). The effect of information on consumers' willingness to pay for natural and organic chicken. *International Journal of Consumer Studies*, 35 (3), 282-289.

- Goldman, B.J., and Clancy, K.L. (1991). A survey of organic produce purchases and related attitudes of food co-operative shoppers. *American Journal of Alternative Agriculture*, 6 (2), 89-96.
- Govindnasamy, R., & Italia, J (1990). Predicting willingness to pay for organically grown fresh produce. *Journal of Food Distribution Research*, 30 (2), 44-53
- Goldman, B.J., and Clancy, K.L. (1991). A survey of organic produce purchases and related attitudes of food co-operative shoppers. *American Journal of Alternative Agriculture*, 6 (2), 89-96.
- Grunert, S.C. (1992). Everybody seems concerned about the environment: but is it reflected in Danish consumers' food choice. Working Paper, Handelshøjskolen, Aarhus, Denmark.
- Guido, G., (2009), *Behind Ethical Consumption: Purchasing Motives and Marketing Strategies for Organic Food Products, Non-GMOs, Bio-Fuels*. Bern: Peter Lang AG International Academic Publishers.
- Guido, G., Prete, I., Peluso, A., Maloumy-Baka, C., & Buffa, C (2010). The role of ethics and product personality in the intention to purchase organic food products: a structural equation modelling approach. *International Review of Economics*, 57 (1), 79-102.
- HAL (2013). *HAL Annual Report 2012-13* Sydney: HAL. Retrieved from: http://www.horticulture.com.au/about_hal/hal_documents.asp?src=side#Document_Type1
- Hill, H., & Lynchehaun, F. (2002). Organic Milk: Attitudes and Consumption Patterns. *British Food Journal*, 104 (7), 526-542.
- Honkanen, P., Verplanken, B., & Olsen S.O. (2006). Ethical values and motives driving organic food choice. *Journal of Consumer Behaviour*, 5 (5), 420-431.
- Howie, M., (2004). Research roots out myths behind organic foods. *Feedstuffs*, 76, 16-17.
- Hughner, R.S., McDonagh, P., Prothero, A., Shultz, C.J., & Stanton, J., (2007). Who are organic food consumers? A compilation and review of why people purchase organic food. *Journal of Consumer Behavior*, 6, 94-110.
- Hutchins, R.K., & Greenhalgh, L.A. (1997). Organic confusion: sustaining competitive advantage. *British Food Journal*, 99 (9), 336-8.
- ITC. (2011). Organic food products in China: Market overview. *International Trade Centre – Technical Paper*. Retrieved 8 August, 2014 from <http://www.intracen.org/ORGANIC-FOOD-PRODUCTS-IN-CHINA-MARKET-OVERVIEW>
- Jolly, D.A., Schutz, H.G., Diaz-Knauf, K., & Johal, J., (1989). Organic foods, consumer attitudes and use. *Food Technology*, 43 (11), 60-66.
- Jin, Y., Lin, L., & Yao, L. (2011). Do Consumers Trust the National Inspection Exemption Brands? Evidence from Infant Formula in China? Paper presented at *The Agricultural & Applied Economics Association's 2011 AAEA & NAREA Joint Annual Meeting*, Pittsburgh, Pennsylvania, July 24-26, 2011.
- Kriwy, P., & Mecking, R.A., (2012). Health and environmental consciousness, costs of behaviour and the purchase of organic food. *International Journal of Consumer Studies*, 36, 30-37.
- Kristiansen, K., & Grunert, S.C., (1991). The effect of ecological consciousness on the demand for organic foods, in Bradley, F. (Ed.), *Marketing Thought Around the World. Proceedings of European Marketing Academy Conference*, Dublin, pp. 299-318.
- Little, J., Ilbery, B., & Watts, D. (2009). [Gender, Consumption and the Relocalisation of Food: A Research Agenda](#). *Sociologia Ruralis*, 49 (3), 201-217.
- Li, C., Ge, Y. & Bai, G. (2013). Issues concerning “greenification” of green food enterprises. *Asian Agricultural Research*, 5 (5), 3-8.
- Lobo, A. & Chen, J. (2012). Marketing of organic food in urban China: An analysis of consumers' lifestyle segments. *Journal of International Marketing and Exporting*, 17, 14-26
- Lockie, S., Lyons, K., Lawrence, G., & Mummery, K. (2002). Eating 'green': motivations behind organic food consumption in Australia. *Sociologia Ruralis*, 42 (1), 20-37
- Lockie, S., Lyons, K., Lawrence, G., & Grice, J., (2004). Choosing organics: a path analysis of factors underlying the selection of organic food among Australian consumers. *Appetite*, 43, 135-146.
- Lyons, K. (2006). Environmental Values and Food Choices: Views from Australian Organic Food Consumers. *Journal of Australian Studies*, 30 (87), 155-166
- Makatouni, A. (2002). What motivates consumers to buy organic food in the UK? Results from a qualitative study. *British Food Journal*, 104, 345-352.

- Marchesini, S., Huliyeti, H. & Canavari, M. (2012). Perceptual maps analysis for organic food consumers in China: a study on Shanghai consumers. In *22nd Annual IFAMA World Forum and Symposium, The Road to 2050: "The China Factor"*, Shanghai, China June 10 - 14, 2012. Retrieved 10 June, 2014, from: https://www.ifama.org/events/conferences/2012/cmsdocs/Symposium/PDF%20Symposium%20Papers/703_Paper.pdf
- Marchesini, S., Hasimu, H., & Spadoni, R. (2010). An overview of the organic and green food market in China in Hass, Rainer Canavari, Maurizio, Slee, Bill (Eds.). *Looking East Looking West: Organic and Quality Food Marketing in Asia and Europe* (pp. 155-172). Wageningen, NLD: Wageningen Academic Publishers.
- McEachern, M.G., & McClean, P. (2002). Organic Purchasing Motivations and Attitudes: Are They Ethical? *International Journal of Consumer Studies*, 26 (2), 85-92.
- Mintel. (2012). Growth in organic products in China as consumers adopt multiple self protection strategies. *Mintel Oxygen Reports*. Retrieved 5 May, 2014, from <http://store.mintel.com>
- Monk, A., Mascitelli, B., Lobo, A., Chen, J. & Bez, N. (2012). *Australian organic market report 2012*. Brisbane: Biological Farmers Association (BFA) Ltd.
- Moore, O. (2008). How embedded are organic fresh fruit and vegetables at Irish farmer's markets and what does the answer say about the organic movement? An exploration, using three models. *International Journal of Agricultural Resources, Governance and Ecology*, 7(1-2), 144-157.
- Morgan, B. & Wright, C. (2014). *The Market Opportunities for Australian Vegetables in China*. 2014 AUSVEG National Convention, Cairns Convention Centre, 19-21 June 2014. Retrieved 8 July, 2014, from: <http://ausveg.com.au/events/convention-2014/2014-speaker-sessions.htm>
- National Bureau of Statistics on China (2013), "Statistical Communiqué of the People's Republic of China on the 2012 National Economic and Social Development", Retrieved 16 July, 2014 from: http://www.stats.gov.cn/english/newsandcomingevents/t20130222_402874607.htm
- Oude Ophuis, P.A.M., van Dam, Y.K., & Lamers, A.M.J. (1992). Relative importance of health aspects and environmental issues for food consumption: product attributes of lettuce. in Grunert, K., and Fuglede, D. (Eds), *Marketing for Europe, Proceedings of the 21st European Marketing Academy Conference*, Aarhus, Denmark, pp. 929-47.
- Paul, J., & Rana, J. (2012). Consumer behaviour and purchase intention for organic food. *Journal of Consumer Behaviour*, 29 (6), 412-422.
- Pearson, D., Henryks, J., & Jones, H., (2010). Organic food: what we know (and do not know) about consumers. *Renewable Agriculture and Food Systems*, 26 (2), 171-177.
- Pino, G., Peluso, A.M., & Guido, G. (2012). Determinants of Regular and Occasional Consumers' Intentions to Buy Organic Food. *The Journal of Consumer Affairs*, 1 (Spring), 157-169.
- Roberts, J.A., & Rundle-Thiele, S.R., (2007). Organic food: observations of Chinese purchasing behaviours. In *The Australian and New Zealand Marketing Academy (ANZMAC) Conference 2007: 3Rs: Reputation, Responsibility & Relevance*, December 3-5, 2007, Dunedin, New Zealand: 3430-3436.
- Roitner-Schobesberger, B., Darnhofer, I., Somsook, S., & Vogl, C. R. (2008). Consumer perceptions of organic foods in Bangkok, Thailand. *Food Policy*, 33(2), 112-121
- Sirieix, L., Kledal, P. R., & Sulitang, T. (2011). Organic food consumers' trade-offs between local or imported, conventional or organic products: a qualitative study in Shanghai. *International Journal of Consumer Studies*, 35(6), 670-678.
- Sirieix, L., Persillet, V., & Alessandrin, A. (2006). Consumers and organic food in France: a means-end chain study, in *Sociological Perspectives of Organic Agriculture* (ed. by G.C. Holt & M.J. Reed), pp. 70-87. CABI, Wallingford, UK
- Siegrist, M. (2008). Factors Influencing Public Acceptance of Innovative Food Technologies and Products. *Trends in Food Science & Technology*, 19 (11), 603-608.
- Smith, T.A., Huang, C.L., & Lin B.H., (2009). Does price or income affect organic choice? Analysis of U.S. produce users. *Journal of Agriculture & Applied Economics*, 413, 731-744.
- Soil Association. (2012). *Organic market report 2012*. UK: Soil Association.
- Solomon D.J., (2001). Conducting web-based surveys. *Practical Assessment, Research & Evaluation*, 7(19), 1. Retrieved July 12, 2014 from <http://PAREonline.net/getvn.asp?v=7&n=19>

- Squires, L., Juric, B., & Cornwell, T. (2001). Level of market development and intensity of organic food consumption: cross cultural study of Danish and New Zealand consumers. *Journal of Consumer Marketing*, 18 (5), 392-409.
- Sue, V. M., & Ritter, L. A. (2007). *Conducting online surveys*. Sage Publications, Thousand Oaks, California.
- Torjusen, H., Lieblein, G., Wandel, M., & Francis, C.A. (2001). Food system orientation and quality perception among consumers and producers of organic food in Hedmark County, Norway. *Food Quality and Preference*, 12 (3), 207-216.
- Truong, T. T., Yap, M. H., & Ineson, E. M. (2012). Potential Vietnamese consumers' perceptions of organic foods. *British Food Journal*, 114(4), 529-543
- Thøgersen, J., & Zhou, Y. (2012). Chinese consumers' adoption of a 'green' innovation – The case of organic food. *Journal of Marketing Management*, 28 (3-4), 313-333.
- UNESCO (2013), *UIS Statistics in brief - Education (all levels) profile – China*. Retrieved 5 January, 2014 from:
http://stats.uis.unesco.org/unesco/TableViewer/document.aspx?ReportId=121&IF_Language=eng&BR_Country=1560 (accessed on July 17, 2014)
- Valle, H, Caboche, T & Lubulwa, M. (2014), *Australian vegetable growing farms: An economic survey, 2011–12 and 2012–13*, ABARES Research report 14.1 Canberra: Horticulture Australia Limited.
- Van Doorn, J., & Verhoef, P.C., (2011). Willingness to pay for organic products: differences between virtue and vice foods. *International Journal of Research in Marketing*, 28 (3), 167-280.
- Xia, W., & Zeng, Y. (2008). Consumer's Willingness to Pay for Organic Food in the Perspective of Meta-analysis. Paper presented at: *International Conference on Applied Economics. ICOAE* (pp. 933-943)
- Xu, L., & Wu, L. (2009), Food Safety and consumer willingness to pay for certified traceable food in China. *Journal of Science and Food Agriculture*, 90, 1368-1373
- Yiridoe, E., Bonti-Ankomah, S., & Martin, R. (2005). Comparison of consumer perceptions and preference toward organic versus conventionally produced foods: a review and update of the literature. *Renewable Agriculture and Food Systems*, 20 (4), 193-205.
- Yin, S., Wu, L., Du, L., & Chen, M. (2010). Consumers' purchase intension of organic food in China. *Journal of the Science of Food and Agriculture*, 90, (8), 1361-7.
- Wandel, M., & Bugge, A. (1997). Environmental concern in consumer evaluation of food quality. *Food Quality and Preference*, 8 (1),19-26
- Zanoli, R., & Naspetti, S. (2002). Consumer motivations in the purchase of organic food: a means-end approach. *British Food Journal*, 104 (8), 643-653.
- Zepeda, L., and Deal, D. (2009). Organic and local food consumer behaviour: Alphabet theory. *International Journal of Consumer Studies*, 33 (6), 697-705.
- Zhang, X. (2005). Chinese Consumers' Concerns About Food Safety. *Journal of International Food & Agribusiness Marketing*, 17 (1), 57-69.
- Zhu, Q., Li, Y., Geng, Y., & Qi, Y. (2013). Green food consumption intention, behaviours and influencing factors among Chinese consumers. *Food Quality and Preference*, 28, 279-286.