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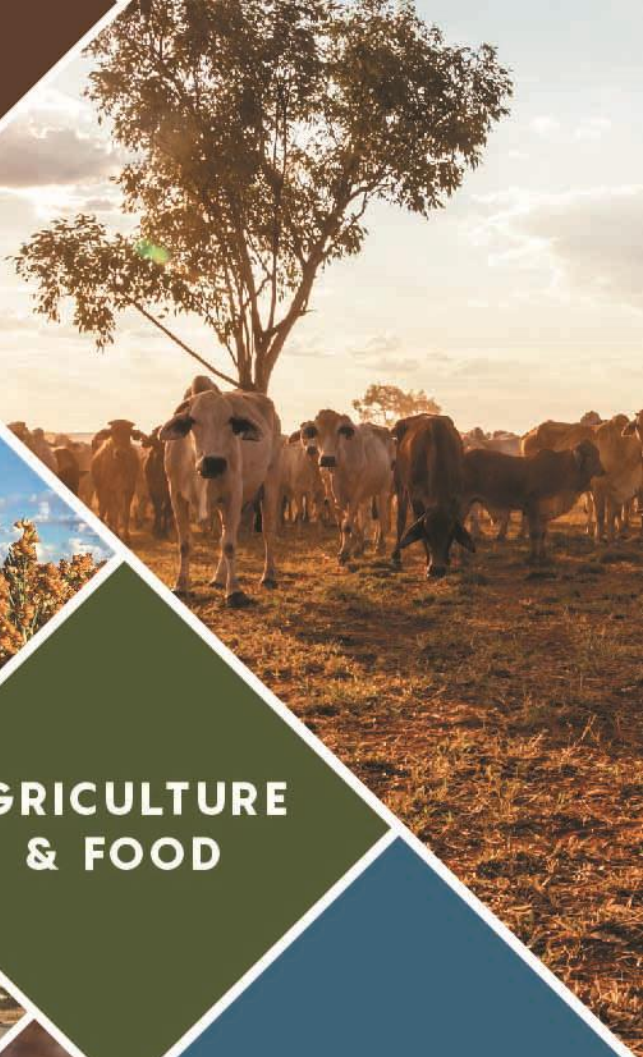

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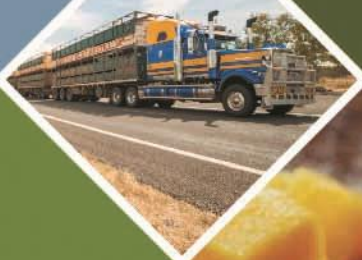

Investigating Chinese consumer's purchasing behaviour and their perception and willingness to pay for imported Australian fruits and vegetables

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CRCNA
DEVELOPING NORTHERN AUSTRALIA

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Executive Summary

The booming economy and the rise of the Chinese middle class make China one of the largest markets for agricultural produces. Australia exports several agricultural commodities to China, including fresh fruits and vegetables. With the growing demand for fresh fruits and vegetables in China, it is imperative to understand Chinese consumers' preference and perception of imported fruits and vegetables.

There are a number of factors associated with consumers' purchasing behaviour, especially in relation to food products. These include socio-economic factors of consumers, biophysical properties of food, price, brand, label, country of origin, and packaging, etc. At present, consumers' environmental awareness has changed the pattern of their purchasing behaviour and made them more inclined towards organic and environmentally friendly products. There have been even more concerns about the environmental footprint for perishable agricultural products such as fresh fruits and vegetables. The increasing demand for high-quality fresh fruits and vegetables in the global market opens opportunities for fresh fruits- and vegetables-exporting countries.

Growing economies such as China have attracted more attention from researchers, as they possess a large market share and high volume of import. Research has investigated to understand Chinese consumers' behaviour towards specific food products, for example, the changing trends in consumption patterns, which are attributed to the increase of income and purchasing capability. Several recent studies report that product knowledge and awareness of environment protection can affect consumers' purchasing behaviour and the amount of consumption. The first section of this study reviews recent research on Chinese consumers' preference for imported agricultural products and synthesises this information to develop a theoretical framework on consumer's purchasing behaviour. This study also investigates whether information about Chinese consumers' perception of Australian perishable agricultural commodities, including fruits and vegetables in particular, is available in the literature. The perception of Chinese consumers on other types of food or other imported products is beyond the scope of the current study.

The research aims of this study are twofold, the first is to explore, through a literature review, factors affecting Chinese consumers' perceptions about purchasing imported horticultural products. The second is to investigate Chinese consumers' perception and their purchasing intention towards imported Australian fresh fruits and vegetables.

For the literature review section, this study adopts a semi-systematic literature review approach to investigate Chinese consumers' perceptions and purchasing behaviour towards imported perishable horticultural commodities. This literature review serves two purposes: summarising and synthesising existing literature-based knowledge and identifying potential research gaps for future research. Three major academic journal databases, Science Direct, Scopus and Google Scholar have been considered to conduct the literature review of full-text research articles in English. To understand the market potential, data related to international trade in China were extracted from numerous sources, including but not limited to Australian Bureau of Statistics (ABS), Food and Agriculture Organization of the United Nations (FAO), International Trade Centre (ITC), and World Bank open data.

It is identified that there are seven factors which affect consumers' purchasing behaviour, and all these factors are supported by two associated theories: Theory of Planned Behaviour (TPB), and Alphabet Theory. This study develops a conceptual framework to link all associated factors shaping up Chinese consumers' purchasing behaviours. Although there have been numerous studies on Chinese consumer behaviour, only a few consider fruits and vegetables as primary products in their focus. It is found in the literature that the environmental concern of Chinese consumers makes them more aware of the product information, including the traceability of the product. It is also suggested from the literature that Chinese consumers are willing to pay a premium price for green and environment-friendly products.

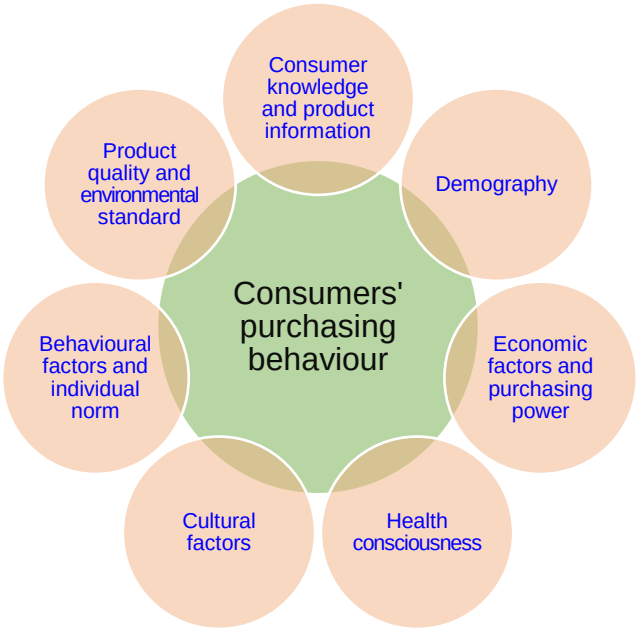

Figure: Conceptual framework for the current study

It is also indicated from the literature that behavioural attitudes, health consciousness, product information and environmental standards have a strong influence on consumers' purchasing behaviour. Other factors have moderate to weak correlation with their purchasing behaviour. As there are only a few studies focusing on Australian horticultural products, it is necessary that future research should take the current trade relationship between Australia and China into consideration. A future study on a sole factor or combination of factors and their impact on purchasing behaviours and purchasing intentions could be conducted.

The second part of this study utilises a discrete choice experiment embedded within an online survey to understand Chinese consumers' perception of imported Australian fresh fruits and vegetables. Data were collected from 13 selected provinces of China. Data were collected in two waves of online survey where the 1st wave was to test the survey tool, and the 2nd one was for data collection. Through this process, 924 qualified responses were collected from the main wave of the online survey. Collected data were analysed using several tools, including the mediation model, structural equation modelling (SME) and choice modelling. The key findings of the study suggest that:

- The Chinese consumers frequently purchased fruits and vegetables, and on average, they purchased about 2 kg of fruits and vegetables in a single shopping trip.
- The average income of the participants was about ¥ 233,000 per annum. The average expenditure on fruits and vegetables per week was ¥ 206, as revealed in this study.
- The respondents reported that they purchased fruits and vegetables from different locations and selling points, including online. This finding has implications for developing marketing strategies for Chinese consumers.
- The high percentage of respondents had past experience of purchasing imported fresh produces, and this implies that China is a very high demand market where imported fruits and vegetables are widely accepted.
- The Chinese consumers who had a higher personal preference for fresh fruits and vegetables tended to have better attitudes towards imported fresh fruits and vegetables.
- The Chinese consumers who had better attitudes towards imported fresh fruits and vegetables were more likely to purchase Australian produces.
- The image of Australian produces led to higher consumer satisfaction and motivated their willingness to buy.

- Taste was very important to the Chinese consumers, and who indicated taste as their motivation to buy fruits and vegetables were more likely to purchase imported products.
- The average appearance of fruits and vegetables were more preferred over the premium quality produces.
- Country of origin had some influence on the Chinese consumers' preference for fresh produce. Other Asian and African produces were preferred over the South American produces. However, the consumers' preference for produces from Australia and New Zealand was not identified in their survey responses.
- The analysis using latent class models employing total payment, revealed that class 1 representing 76 per cent of respondents who preferred excellent appearance, low levels of nutrition information, no food safety label, but both organic and environmental certification labels.
- The willingness to pay premiums for fresh produces was high among the Chinese consumers. The consumers indicated that they would pay a higher premium for organic produces, but unlikely to pay a higher price for produces with a food safety label.
- The Chinese consumer would pay about ¥ 2,170 annually for organic certified produces, which was a little bit high considering their estimated annual expenditure for fruits and vegetables, ¥ 11,125. However, the spending is highly correlated with income, and the consumers from the high-income group could easily accommodate the premium based on their budget.

Based on the findings, a few recommendations have been made:

- Australian producers need to understand the quality required to export fresh produces to China. Failing to meet the quality requirements may have severe consequences as the quality expectation for Australian produces is very high.
- Environment concern has a moderate effect on consumer purchase decision, while food safety label has less appeal to consumers. Producers should adopt environment-friendly production strategies and procedure to reach more Chinese consumers.
- The results indicate the high demand for fruits and vegetables among Chinese consumers in the 13 provinces where the research participants of this study were from. Further research is needed to quantify the demand more accurately.
- Taste perception can be highly important among Chinese consumers, which leads to their purchase of imported fruits and vegetables. Producers should be aware of this and need to ensure that they deliver quality fresh produces with superior taste.
- Chinese consumers have a high willingness to pay premiums for fresh produces. It is indicated that Chinese consumers would pay a high premium for organic certified produces, but not for produces with a food safety label. Further research is needed to ascertain and quantify these findings.

Australian producers and other stakeholders in the export supply chain can consider some take-away implications from this study. First, in order to ensure the sustainable export supply chain of fresh fruits and vegetables, the quality of produces should not be compromised. There is a need for the development of an information system regarding quality requirement for fresh produces to guide the existing and interested producers in the export supply chain. One important finding of the study is that the Chinese consumers did not trust food safety labels as an indication of high quality, but they highly preferred produces with organic certification. This provides Australian producers with some indications about where to invest in the future.

The current study demonstrates the level of acceptance of Australian fresh produces among Chinese consumers. Attributes such as taste, organic certification, low nutrition information, and average appearance, should be considered by Australian producers to increase the market share. A future study focusing more on individual norms and behavioural factors of Chinese consumers and the influence of these norms and factors on consumers' purchasing decision, could be conducted. Also, future research is recommended to ascertain the findings of this study with a larger and diverse consumer cohort.

Part One

1. Introduction

The quality and health benefits of food, together with the socio-economic factors of consumers largely affect their behaviour towards purchasing fresh produce such as fruits and vegetables (Lusk & McCluskey, 2018). In recent years, food consumption patterns have changed towards more healthy diets, particularly in the developed countries (Beatty et al., 2014). Consumers are also becoming more concerned about the environmental footprint of foods, and increasingly willing to pay a premium price for environment-friendly products such as organic products (Rana & Paul, 2017). Among the Asian countries, Chinese consumers have increasing demand for preservatives-free food (Yu et al., 2011). Socio-economic factors including educational background, personal income, and personal taste of consumers also play a vital role in purchase decisions for fresh fruits and vegetables (Pechey & Monsivais, 2016).

Consumer purchasing behaviour is a complex phenomenon that includes intrinsic and extrinsic factors associated with the food products. Intrinsic factors can be assessed by the consumers before consumption of the food (e.g. colour, size etc.), while the extrinsic factors are related to the product but not a part of it (price, brand, label, country of origin, packaging etc.) (Fernqvist & Ekelund, 2014). A growing trend among consumers is to purchase ethical or environmentally friendly grown food (Sandlin et al. 2017). In addition, the origin of food from domestic or imported sources plays an important role in purchasing behaviour (Qing et al, 2012). Credence attributes can affect the consumer purchasing behaviour, including consumers' confidence about the certification and labelling of food products (Moser et al, 2011). Environmental standards in the production system, traceability, and authenticity of agricultural produce can also be important (Lusk & McCluskey, 2018).

In the context of China, Liu et al. (2019) reported that Chinese consumers had very little trust in government supervision or traceability of imported apples, that might be due to consumers' lack of understanding of the government certification process. Previous research has showed that a better living standard of Chinese consumers leads to increased concern about food quality and safety (Liu et al. 2013). Hence, for highly perishable food products, it is important for the supply chain to pay attention to the food safety features before sending products to the Asian and Chinese markets (Wongprawmas, & Canavari, 2017, Liu et al., 2019). In a recent study, it was identified that there was a strong demand for Australian fruits in the Chinese market (Cao et al, 2020). However, establishing direct connection with retailers and consumers in China is a major challenge for Australian horticulture exporters (Cao et al, 2019a, 2019b).

With rapid economic growth, China has become one of the most important markets for imported agricultural produce, making it important for exporting countries to understand Chinese consumers' behaviour towards specific food products. For example, changing trends of consumption patterns is attributed to the rise of income and purchasing capability. Several recent studies reported that product knowledge and awareness of environment protection affected the consumer purchasing behaviour and the amount of consumption. This study reviews recent academic articles on Chinese consumers' preference for imported agricultural products and synthesises this to develop a theoretical framework on consumer's purchasing behaviour.

The research aim of part one of this study is first to identify consumers' preference and their purchasing behaviour for imported agricultural products and second, to explore, through a literature review, factors affecting Chinese consumers' perceptions about purchasing imported horticultural products.

Research Questions:

RQ1.1: What are the key factors that influence consumers' purchasing behaviour and what are the associate theories to describes such behaviours.?

RQ1.2: What are the key factors that influence Chinese consumers to purchase imported horticultural products?

RQ1.3: How the factors are linked to each other to shape up Chinese consumer purchasing behaviour?

RQ1.4: What is the perception about the Australian perishable agricultural produce among the Chinese consumers?

RQ1.5: What would be the key recommendations (including any research gap) for the Australian horticulture industry to improve and sustain their current export market in China?

2. Scope, limitation, and organisation of part one

To achieve the aims of the research, a semi-systematic literature review was undertaken. This study identifies different factors that affect consumers' perception about imported fruits and vegetables, with a focus on Chinese consumers. This study also investigates whether any information is available in the literature about Chinese consumers' perception of Australian perishable agricultural commodities, especially fruits and vegetables. The perception of Chinese consumers on other types of food or other imported products is beyond the scope of the current study. While the current literature review utilised three academic journal databases, there is no guarantee that all relevant articles are being included in this study. This study only considers journal articles published in English, which is another limitation of this study.

A detailed discussion on methodology is provided in egment three, followed by a description of the theory and practice associated with the factors affecting consumer behaviour in section four. A brief examination of the demand and supply profile of the targeted Chinese market is presented in section five. A discussion about factors influencing Chinese consumers' purchasing behaviour is provided in section six. section seven provides information on Chinese consumers perception on Australian fresh fruits and vegetables, followed by discussion of findings in section eight based on the current literature review. The conclusion and some direction for future reseach are included in the last section of Part one of this study.

3. Methodology for literature review

For literature review, this study adopts a semi-systematic approach to investigate Chinese consumers' perceptions and purchasing behaviour towards imported perishable horticultural commodities. This literature review serves two purposes: summarising and synthesising existing literature-based knowledge and identifying potential research gaps for future research. The semi-systematic and qualitative approaches are suitable for synthesising the state of knowledge and to classify common issues and patterns (Snyder, 2019). For this literature review, we consider three major academic journal databases, namely, Science Direct, Scopus and Google Scholar. The search framework is given in Table 1, which indicates that for review purpose, we considered articles published in the last 10 years only. However, to support the arguments other articles, which are not directly related to horticultural products, were also considered. To develop a conceptual and theoretical framework, we also considered articles that describe different theories related to consumer behaviours.

Table 1: Literature review strategy: Search framework

Where	International market, Asian markets, China
For whom	Consumers, public
Characteristics	Perception, preference, attitude, purchasing behaviour, willingness to buy/pay
What	Imported horticultural products, Australian horticultural products, perishable products, fruits & vegetables, mango, avocado, lychee
Temporal attributes	Recent 10 years

The full-text research articles (English language), which are used in this concept-centric literature review, are essentially categorised based on several concepts and information. The literature screening process was undertaken manually in two stages. The first stage is a screening based on the contents of the abstract, while the second one is on the basis of the full text. The framework of the semi-structured literature review is given in Figure 1. Due to the use of three databases for initial collection of articles, there were duplications recorded, which were removed before the screening process.

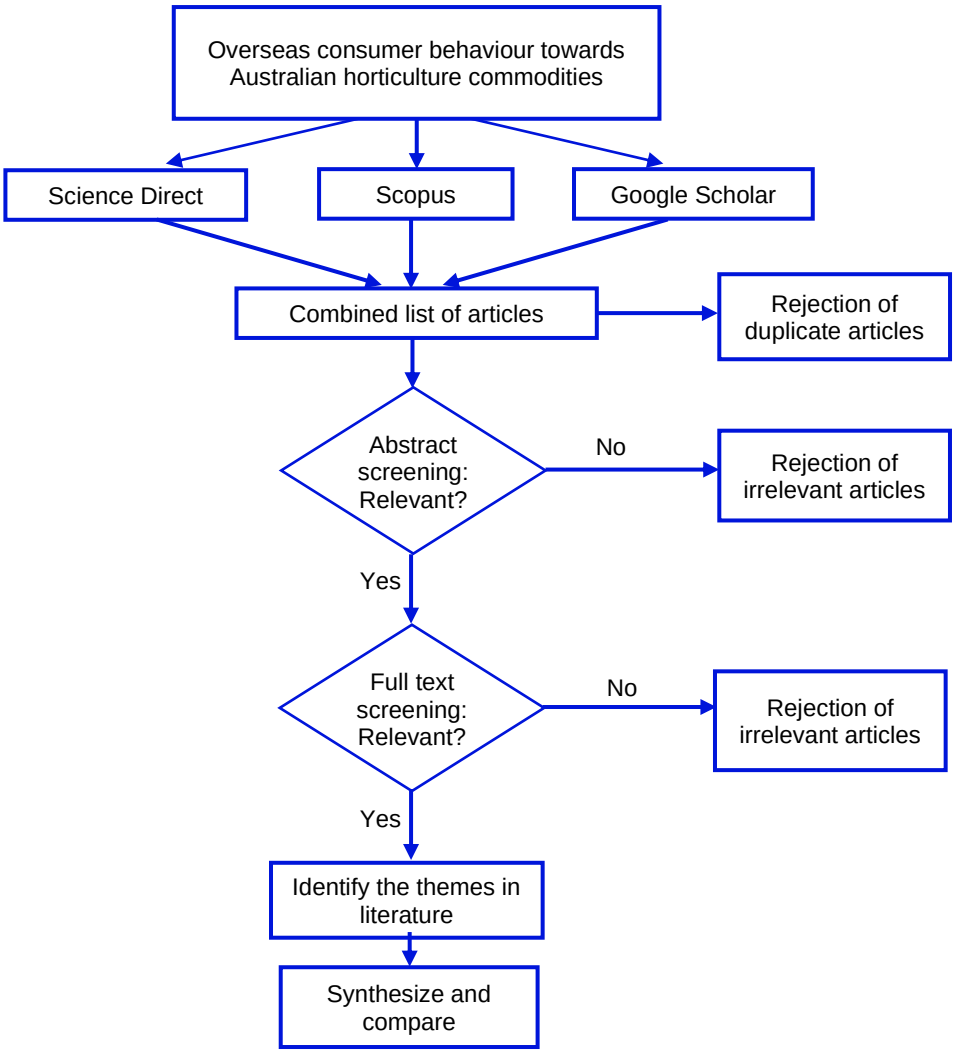

Figure 1: Flowchart for semi-systematic literature review

To understand the market potential, trade data for China were extracted from numerous sources, which include but not limited to the sources in the following list:

- Australian Bureau of Statistics (ABS),
- Food and Agriculture Organization of the United Nations (FAO),
- International Trade Centre (ITC), and
- World Bank open data.

4. Factors affecting consumer behaviour: Theory and practices

Consumer's preference for any product and their willingness to pay for it are mainly related to the concept of consumer behaviour, which can be analysed using the Theory of Planned Behaviour (TPB). The TPB was proposed by Ajzen (1991), which is an extension of the Theory of Reasoned Action (TRA). The TPB has three components: behavioural attitude, subjective norm, and perceived behavioural control. In recent years, with the growing concern over the sustainability and impact on the environment, researchers have proposed a new dimension of the TPB, namely the moral norm (Shin & Hancer, 2016).

Individual attitudes are the main antecedent that explains the consumer's choice across different products. According to TPB, a person will perform a certain behaviour if the person has actual control over the behaviour (Lim et al, 2016).

Subjective norms refer to individuals' action to perform under the external perceived social pressure and influence by other people (Ajzen, 1991, Shin & Hancer, 2016, Orapin, 2009). However, Ajzen (1991) argued that there is no direct significant relationship between subjective norms and consumer purchasing behaviour. Subjective norms play the role of a mediator during the purchase intention before buying a product (Jamil & Mat, 2011, Zhou, 2011). Some researchers indicated that subjective norms have a significant effect on online shopping (Leeraphong & Mardjo, 2013; Jamil & Mat, 2011). Researchers have found a statistically significant relationship between subjective norms and attitudes (Shin & Hancer, 2016). Thus, subjective norms can influence the purchasing intention through changing the behavioural attitude of consumers.

Various theoretical models on consumers' purchasing behaviour exist in the literature; however, the Alphabet theory is used commonly to investigate this behaviour (Feldmann & Hamm, 2015). Researchers have used the Alphabet theory to investigate consumer perceptions towards local food and organic food (Feldmann & Hamm, 2015, Zepeda & Deal, 2009), food product craftsmanship (Rivaroli et al. 2020), and livestock products (Stampa et al. 2020). The Alphabet theory is based on the Value-Belief-Norm theory (VBN) (Stern et al., 1999) and the Attitude-Behaviour-Context (ABC) theory (Guagnano et al., 1995). In the Alphabet theory, emphasis is given on both the context and the attitude to understand the behaviour of consumers. The framework of the Alphabet theory is illustrated in Figure 2.

Based on the theoretical framework presented in figure 2, researchers have investigated several factors associated with the components of the Alphabet theory. Table 2 includes all factors that can influence the behaviour of consumers. These factors are interrelated, and some contribute to different components of the theoretical framework.

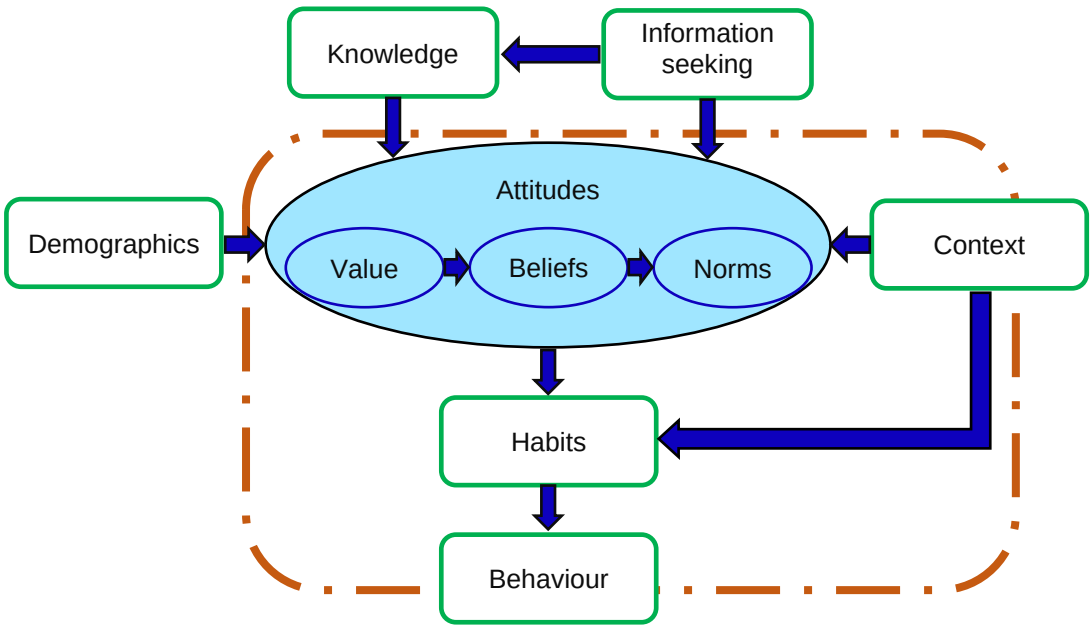

Figure 2: Theoretical framework of Alphabet theory

(adapted from Zepeda & Deal, 2009 and Rivaroli et al. 2020).

Table 2: Factors associated with the Alphabet theory and theory of planned behaviour

Components of Alphabet theory and TPB	Factors influencing consumers' purchasing behaviour	Reference
Socio-economic Demographics	• Age • Gender • Income • Education	Verain et al, 2012, Wang et al, 2016, Chen et al, 2014
Knowledge and information seeking	• Health consciousness • Nutrition value • Quality of products • Traceability • Environmental standard • Country of origin	Phelps & May 2018, Li & Xin 2015, Cheng 2016, Tian & Yu, 2017, Leggett, 2020, Hoffmann & Schlicht 2013
Value	• Cultural value • Traditional value • Ethnocentrism	Veeck et al, 2020, Zhou, 2008, Xin & Seo 2019
Belief	• Behavioural attitude • Perceived quality • Perceived value of the products • Motivation from reference group • Image and reputation of country specific products	Liu et al. 2011, Shin & Hancer, 2016, Seo, et al., 2020, Wang & Huo, 2016, Yin et al., 2017
Norm	• Individual/subjective norms • Moral Norm • Environmental concern • Self-image	Yen, 2017, Canova & Manganelli, 2016, Cheng et al., 2016, Fabinyi et al., 2016, Leggett, 2020
Habits	• Economic factors • Purchasing power • Healthy diet	Liu et al, 2011, Palma et al., 2016, Canova & Manganelli, 2016, Phelps & May 2018,

Theoretical frameworks to investigate consumers' behaviours generally use concepts, including values, norms, and beliefs. However, for a better understanding of consumers' purchasing behaviour and intention, researchers have split those categories into different factors. Based on the factors listed in Table 2, we have categorised them in seven different groups to shape a conceptual framework for the current study, as illustrated in Figure 3.

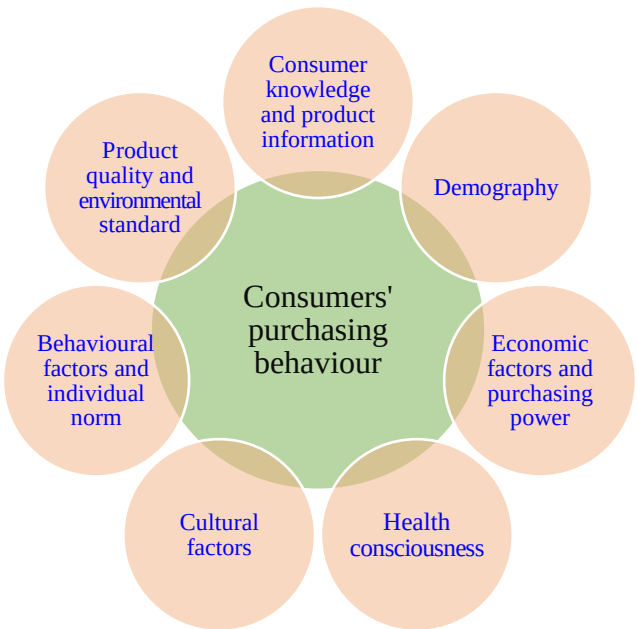

Figure 3: Conceptual framework for the current study

Factors associated with demographics were put together for the purpose of the current study. Economic factors are related to the purchasing power of the consumer and the change in their diet because of higher purchasing power. Cultural factors are associated with the consumption pattern based on the consumer's cultural background and their ethnocentrism. Behavioural factors and individual norms cover several factors related to the value, belief, and norm components of the theoretical framework. This category has intersections with most of the other categories. Health consciousness is related to consumer awareness about their diet and healthy lifestyle. This category is linked with the individuals' habit and knowledge-seeking aspects. Product quality and environmental standard are developed using the three attitudinal components of the Alphabet theory. Consumer knowledge and product information were derived from relevant components of the theory, and this category is closely connected with the product quality and environmental standard, and health consciousness categories.

In this literature review, the conceptual framework presented in Figure 3 is used to investigate how influential these factors are on Chinese consumers' purchasing behaviours. The focus of the study is on perishable horticultural products, however, articles on some other perishable food products (e.g. seafood) were occasionally included to develop a better understanding about Chinese consumers' purchasing behaviour.

5. Demand and supply profile of targeted market

The current estimated world population is about 7.9 billion people, of which 36% of the population lives in China or India (FAO, 2020). It is forecasted that by 2030 the total population of China and India will exceed 3 billion. To meet the demands of their rapidly growing populations, these countries import grains, fruits, vegetables, herbs, meat, and livestock from other countries in the world.

China is one of the giants in the world economy with a GDP of US$13.9 trillion. The recent growth in the GDP is notable as demonstrated in Table 3. The data indicate that the consumption expenditure has also followed a positive trend. The increasing consumer price index indicates that the consumers have more purchasing power to buy foods and dairy products.

Table 3: Economic profile of China (World Bank, 2020)

Year	GDP (trillion US$)	Annual growth in GDP (China) %	Consumption expenditure (% of GDP)	Consumer price index (base year 2010 = 100)
2010	6.087	10.6	48.9	100.00
2011	7.552	9.6	50.2	105.55
2012	8.532	7.9	51.1	108.32
2013	9.570	7.8	51.7	111.16
2014	10.476	7.4	52.5	113.29
2015	11.062	7.0	54.0	114.92
2016	11.233	6.8	55.0	117.22
2017	12.310	6.9	54.9	119.09
2018	13.895	6.8	Not available	121.56

China is accounted for about 40% of global consumption of fresh vegetables, both from domestic production and imported products (Euro monitor, 2017). The per capita consumption of vegetables and fruits in China has increased significantly in recent years (Figure 4). From 2000 to 2017, per capita consumption of vegetables increased by about 55% and fruits by 131% (Figure 4). The trend of growing per capita food consumption is predicted to continue at least up to the year 2030.

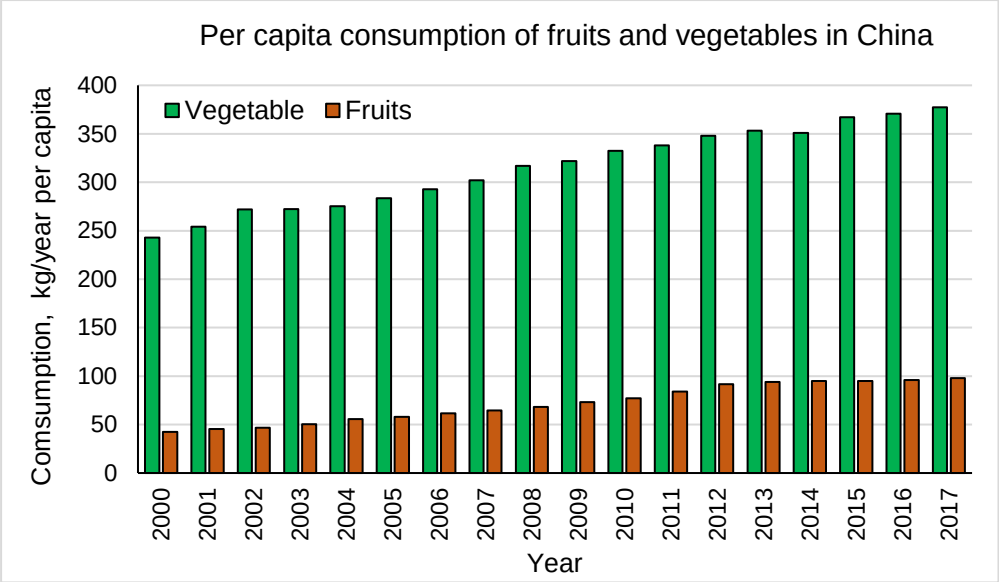

Figure 4: Per capita fruits and vegetable consumption in China

(Source: FAO, 2019)

The recent China-Australia Free Trade Agreement (ChAFTA) in 2015 has opened the opportunity for Australian exporters wishing to access the emerging Chinese market. A vast range of Australian products including beef, horticultural products and processed food will benefit from this agreement.

6. Factors influencing purchasing behaviour

Consumers purchasing behaviour changes over time, based on their individual state as well as the current state of the market and economic dynamics (Lobaugh et al, 2019). The literature review in this study is focused on the seven key factors affecting purchasing behaviour (Figure 3). These factors are common among other food products as suggested in the literature. These factors have been studied individually as well as in groups to develop an understanding of the current perception of consumers towards purchasing different products. This study focuses on the consumption of imported perishable horticultural products, especially fruits and vegetables. The following section provides a discussion of the identified factors and their influence on Chinese consumers' purchasing behaviour.

6.1 Demography

Consumer purchasing behaviour has tended to depend on the socio-demographic status of the consumer (Pechey & Monsivais, 2016). Gender, age, income, and education are commonly used as socio-demographic profiling variables (Verain et al, 2012). Urban middle- and high-income households of China are leaning more towards luxurious food consumption which is supplied by both domestic production and imports (Sheng & Song, 2019). Younger consumers (aged below 30) have a more positive attitude towards imported products (Wang et al, 2016). Along with age and income level, the education level of consumers has a high propensity to influence their purchasing behaviour. It is generally anticipated that with higher educational attainment, consumers are more likely to spend more of their income on imported fruits, which generally cost more compared to domestic products. Fruit and vegetable consumption differ significantly based on the gender of the consumer with female consumers being more likely to purchase and consume fruits and vegetables compared to male consumers (Li et al., 2012). Female consumers also appear more concerned about health and nutritional factors and are likely to purchase more organic food (Chen et al, 2014). However, not all studies found a strong association between the socio-demographic status and fruit and vegetable consumption patterns. For example, Roberts et al. (2018) investigated Chinese regional consumers and their perception of purchasing mangoes. Their study could not find any correlation of the mango consumption with the socio-

demographic factors of the consumers, including age, gender, education, and marital status (Roberts et al. 2018). Based on the literature review, it can be concluded that all four elements of demography (e.g. gender, age, income, and education) often have a moderate effect on Chinese consumers' purchasing behaviour.

6.2 Economic factors and purchasing power

A higher level of income and educational qualification of the consumer can elevate their purchasing power. Also, the increasing per capita GDP of Chinese consumers means that they are now more capable to purchase premium products including imported fruits and vegetables. The consumption of fresh fruits in China is more responsive to increasing income, compared to vegetables (Liu et al, 2011). Another common perception of Chinese consumers is that higher price reflects the quality of the product (Palma et al, 2016). Economic factors and purchasing power are related to the individuals' socio-economic status, that strongly affect their purchasing behaviour.

6.3 Health consciousness

Health awareness among consumers influences their purchasing behaviour for fruits and vegetables. Over time, Chinese consumers have been spending more on nutritional, healthy and exotic fruits and vegetables and the Chinese health foods market is now worth more than US$144 billion (DCCC, 2019). Feng et al. (2014) found that Chinese consumers who are consuming table grapes considered the health aspects and the good supplementary diet options as the main reason for their consumption. A study on the impact of fresh-fruit consumption on cause-specific mortality revealed that there was a significant causal relationship between fresh fruit consumption and lower mortality rate (Du et al, 2017). In different studies, it was reported that Chinese adults who were consuming more fruits and vegetables had significantly lower risk of diabetes (Du et al, 2017) and oesophageal cancer (Yang et al, 2020).

However, the current consumption level of fresh fruits and vegetables among Chinese consumers are much lower compared to Western consumers (Du, et al, 2017). Another study on China indicated that about 77% of respondents prioritised the nutritional content of the product over its flavour, and that had an impact on their purchasing behaviour (Phelps & May 2018). For example, Li & Xin (2015) reported that the nutritional ingredients of organic foods could make a positive impression on the consumers and increase the willingness to buy. A recent change in the food labelling requirement (inclusion of more information) in China also reflects the consumers' interest in the information related to the nutritional contents of the food (CIRS, 2020). With the changing lifestyle, Chinese consumers have become more health-conscious, and this has a strong influence on their purchasing behaviour, especially purchasing fruits and vegetables. Product information, nutrition value, environmental and food safety information are frequently requested by Chinese consumers due to their health consciousness.

6.4 Cultural factors

Chinee food culture has been an inherent part of Chinese tradition for thousands of years (Zhou, 2008). Their food consumption behaviour cannot be studied without an understanding of their culture (Zhou, 2008, Eves & Cheng, 2007). It is well established that Asian culture is different from Western culture and the consumer behaviour in Asian countries is strongly influenced by culture (Schütte & Ciarlante, 1998). There are several factors associated with the cultural factors (Hofstede, 1980). However, the individualism-collectivism factor seems to be more connected with consumers' purchasing behaviour. In the Chinese context, consumers often follow a collectivistic orientation, and their purchasing behaviours are influenced by specific reference groups (family, friend, relatives) (Liu et al. 2011). Regional image of products is interlinked with the culture and directly influences the purchasing behaviour of consumers (Pantano, 2011).

Consumers ethnocentrism is another cultural factor that may influence local consumers' preference of domestic products over imported products. However, recent research indicates that ethnocentrism among Chinese consumers is low and it does not affect the imported product market adversely (Ding, 2017). Product quality and origin country image of the imported products can potentially offset any impact of ethnocentrism on purchasing behaviour (Xin & Seo, 2019). Chinese agribusiness stakeholders (i.e., farmers, consumers, cooperatives, etc.) often make decisions and act based on their social capital (Xu et al., 2018). It is also an important cultural concern when it deals with consumer's decisions, especially when purchasing a premium-priced food such as organic products. Some studies have emphasised cultural factors and its association with Chinese consumers' purchasing behaviour (e.g., Liu et al. 2011). However, considering the key findings from

these studies, it is apparent that the relationship between the consumer's cultural background and their purchasing behaviour is weak, since economic factors and health consciousness may be dominating cultural factors.

6.5 Behavioural factors and individual norms

Behavioural factors and individual norms have a very strong correlation with the purchasing behaviour as identified through this literature review. Also, the interrelationship of these factors with other factors is evident in the literature. Consumers attitude and behaviour towards fresh fruits and vegetables are motivated by the health consciousness and perceived benefits (Lusk & McCluskey, 2018). As outlined above, consumers behave based on their attitudes, subjective norms, and perceived behaviour control. Both attitudes and perceived behaviour play an important role in healthy consumption behaviour (Canova & Manganelli, 2016). The attitude of Chinese consumers evolves around several factors associated with the dynamic economic setting. Over last two decades, Chinese consumers have developed a positive attitude towards traditionalism which may hinder the consumption of new products, including imported horticultural products (Veeck et al, 2020). However, Chinese consumers also adopt new products based on their individual norms and level of enthusiasm. Attitudinal differences among different groups of Chinese consumers based on their location are also identified in the literature (Zhou et al, 2010).

It was indicated in a study on Taiwanese consumers that image and reputation of imported fruits were the key predictors to affect the perceived behaviour of the consumers, leading to their satisfaction and purchasing intentions (Seo et al., 2020). The first experience of imported fruit consumption could develop a sustained image of the product in the consumer's mind. One study indicated that the attitude of the consumers had a profound impact on the intention to purchase local food products (Shin & Hancer, 2016).

The religious belief of consumers also influences their purchase behaviour for imported products (Bukhari et al, 2020). However, no empirical evidence was found regarding religious influence on imported fruit and vegetable consumption in the case of China. Moral norms, which are a comparatively new factor in the theory of planned behaviour, are also used to explain purchasing behaviour (Shin & Hancer, 2016). This factor is yet to be examined for the Chinese consumers' purchasing intention of imported fruits and vegetables. Furthermore, consumers' prior knowledge and access to the product information can change their attitude towards the consumption of imported organic products (Hoffmann & Schlicht, 2013). Self-image and reference groups' purchasing pattern can also change the consumption pattern of individuals (Yen, 2017).

6.6 Product quality and environmental standard

Industrialisation and globalisation have led to major changes in food processing and supply chains for food. At the same time, consumers concern about food safety and the environmental consequences of food production has risen (Asioli et al, 2017). Chinese consumers' purchasing intentions of fresh vegetables can be explained mostly by referring to the freshness, shelf life and total quality of the product (Cheng, 2016). Consumers' concern about the product quality and safety is due to the heavy use of pesticides and additives in the products and the potential chance of microbial contamination during the product processing (Cheng 2016). This concern is also associated with environmental impacts because of such practices. Similar attitudes and environmental concerns were also identified by researchers in the case of seafood consumption by Chinese consumers (Fabinyi et al., 2016). The behavioural intention of Chinese consumers towards safe food was also investigated by Liu et al. (2020) who reported that even with a lower level of knowledge on the food safety, Chinese consumers were willing to pay a premium price for safe food. A food safety certificate is another cue which can motivate Chinese consumers to pay premium prices (Wang & Huo, 2016, Yin, et al., 2017). The general perception among Chinese consumers is that imported fruits and vegetables have higher quality and safety. However, it is indicated in one study that the increasing demand for imported fruits over time was associated with a small decrease in the expected quality of the product (Tian & Yu, 2017).

The environmental concerns of fresh fruit and vegetable consumers in China has forced the horticulture sector and importers to lean towards green products (Leggett, 2020). Empirical evidence is also available for Chinese consumers to ascertain the influence of attitude and subjective norms towards green food consumption (Qi & Poleger, 2019). Chinese consumers have been more inclined to purchase local organic products compared to the imported products based on the trade-off between perceived health benefits and economic benefits (Sirieix et al, 2011).

6.7 Consumer knowledge and product information

Food choices are highly influenced by the information and labelling of the product which also creates an impression for the credence of the products (Fernqvist & Ekelund, 2014). Figure 5 indicates the association of credence cues with consumers' quality expectations.

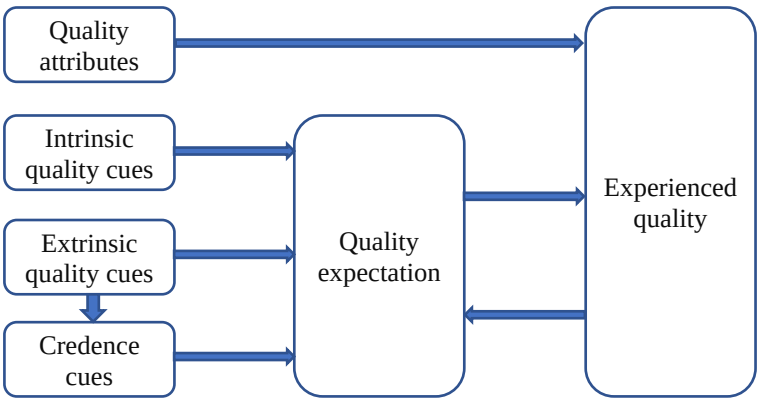

Figure 5: Effect of credence on consumers quality expectation.

(adopted from Fernqvist & Ekelund, 2014)

Available information of the product in the form of traceability is important to the consumers as it contains information regarding production and process (Jin et al 2017). Since 2010, the Chinese government has imposed food traceability requirement on the meat and vegetable supply chain (Liu et al, 2019). With traceability information now available, consumers are more willing to pay a premium price (Liu et al, 2019). Similar results were also reported by Gan et al., (2014) for the case of organic products. Consumers are also interested in new technologies that are being used in the food processing industry (e.g. high-pressure processing) (Lee et al., 2015). Chinese consumers' trust in the available information and certification is another issue that may affect their purchase intention (Wang et al. 2020).

Country of origin is considered as one of the cue attributes, and in fact, embeds some degree of information about other quality attributes (Gao et al, 2019). Information about the country of origin affects consumers' food choices and their preference for a product from one country over other countries (Thøgersen, 2019). The effect of country of origin images on Chinese consumers' intention to purchase imported fruits and vegetables is an important issue to be explored. With the advancement of technology, consumers now have more access to information. Thus, the product information is also strongly related to their purchasing behaviours.

7. Chinese consumers perceptions on Australian fresh fruits and vegetables

Australia exports several horticultural products to China. However, the trade value is comparatively lower than other fresh fruit exports. The following figure indicates that the export volume is increasing but is below the trade value of South American counterparts (Figure 6). South American countries have counter-seasonal advantages like Australia, but Australia has a spatial proximity advantage over Latin American exporters. Australian horticulture producers do not have the capacity to dominate the Chinese market and hence they need to focus on higher-margin and value-added products (Zhou et al, 2014). To understand the market segment of Australian products in China it is essential to undertake research on Chinese consumers' perceptions towards Australian products. Presently, limited research has been undertaken in this field.

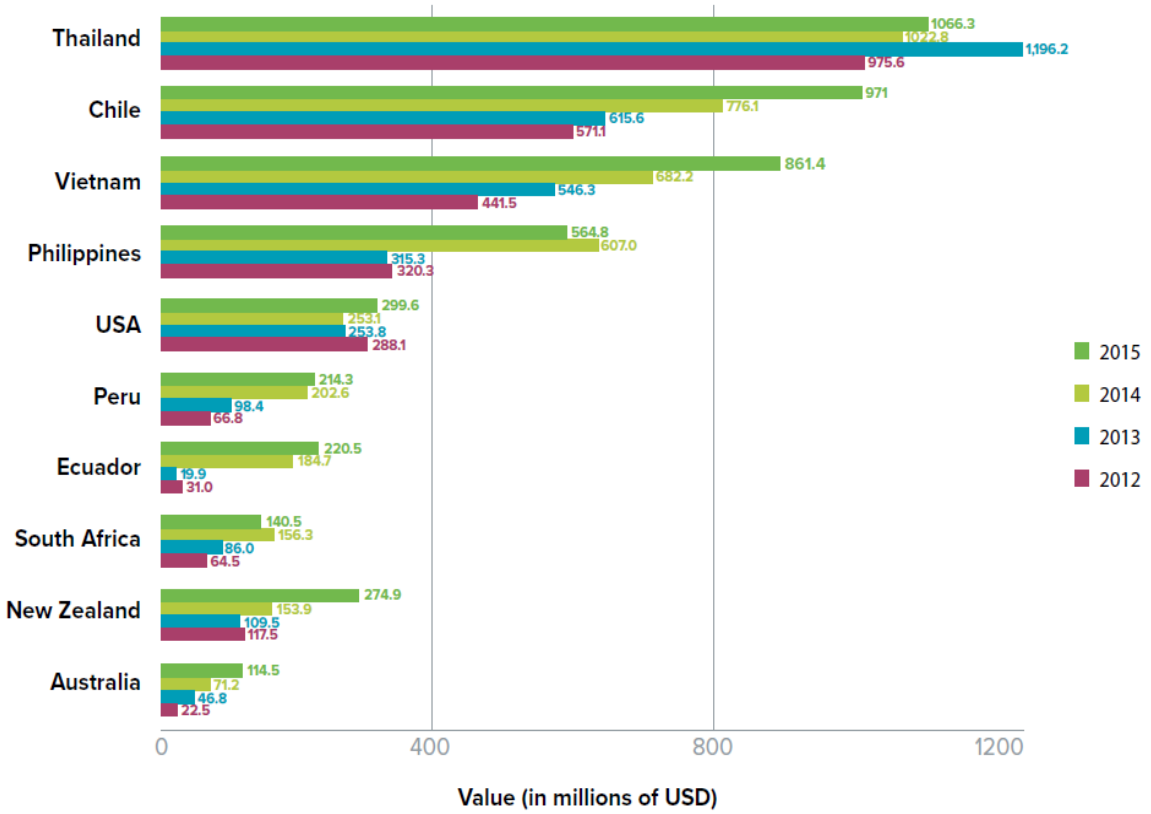

Figure 6: Import value of fresh fruits and vegetables in Chinese market

(Source; PMA, 2016)

Horticulture Australia has engaged in research to identify the market opportunity of Australian vegetables in China (Morgan, 2014). In this report, the authors mainly focused on the supply chain, market access, packaging requirements and pricing strategy. As a part of their research, a choice survey was conducted to investigate the price sensitivity of Australian products in the Chinese market. Price sensitivity testing results captured the consumers' willingness to pay for Australian products up to some limit. There is also another study by McCarthy (2015), which investigated Chinese consumers' preference for organic and green products to identify the opportunity and challenges for the regional Australian exporters. This study affirmed Chinese consumers' preference for organic and green products. It, however, had a broader scope and did not focus on Australian products. Recently, a group of researchers have engaged in a CRCNA funded research project to understand the perception of wholesalers and retailers in China about Australian fruits (Cao et al 2019, Cao et al 2020). This study also did not cover consumers' purchasing behaviour. Further research is recommended to obtain a better understanding of Chinese consumers' perception towards the Australian fresh fruits and vegetables.

8. Discussion based on literature review

The rise of the Chinese middle class and their changing food consumption patterns has triggered a large body of research to identify various factors affecting the purchasing behaviour of Chinese consumers. Most of the research in this field was developed based on the Theory of Planned Behaviour (TPB) developed by Ajzen (1991). Over time, this theoretical framework has been expanded and derivative, and the development of the Alphabet theory is an example of this (Rivaroli et al. 2020).

Even though numerous studies have been done on consumers' behaviour, only a few have considered fruits and vegetables as the primary products for their study. These studies were conducted in different settings and

used different methodologies. Table 4 summarises the research articles in this field, which focused on different food products (including fruits and vegetables), and within the temporal scope of the current study.

Table 4 indicates that researchers have investigated different products and employed different approaches to analyse consumers' purchasing behaviours. A choice experiment is one of the common techniques used in consumer choice studies (Jin et al., 2017, Liu et al, 2017, Yin et al, 2017, Yin et al., 2019). Many researchers have concentrated on organic products but only a few studies (e.g., Li et al., 2020, Jin et al., 2017, Sirieix et al., 2011) were included in this review since the scope of the current study is much broader. One important finding is that Chinese consumers want to ensure that the imported products are safe and all relevant information regarding production and processing should be available for them (Cheng et al, 2016, El Benni et al., 2019, Jin et al., 2017, Liu et al., 2019).

Consumers concern about environmental impacts due to production is also reflected in the literature. There is evidence that Chinese consumers are willing to pay a premium price for the green and environment-friendly products (Jin et al, 2017, Qi & Ploeger, 2019). To fulfil export protocols, fresh fruits and vegetables need to follow recommended biosecurity processes, including heat treatment, high-pressure processing, and radiation treatment. However, such measures can have a negative impact on consumer perceptions and food safety concerns (Cheng et al, 2016, Lee et al., 2015, Liu et al. 2020, Pin, 2019).

Most of the research work in the field of consumer behaviour evolved around the TPB. Researchers have also focused on identifying the interrelationship among different factors. For instance, Wang et al. (2020), investigated the interrelationship among the four basic components of TPB, namely perceived quality, attitude, subjective norm, and perceived behavioural control. The framework of Wang et al.'s (2020) study is presented in Figure 7. The authors concluded that the attitude of the consumer had the strongest influence on their behavioural intention for the purchase. A similar type of framework, which is used to investigate different research issues and establish the relationship among different factors, is also available in the literature (Qing et al, 2012, Frank et al 2014).

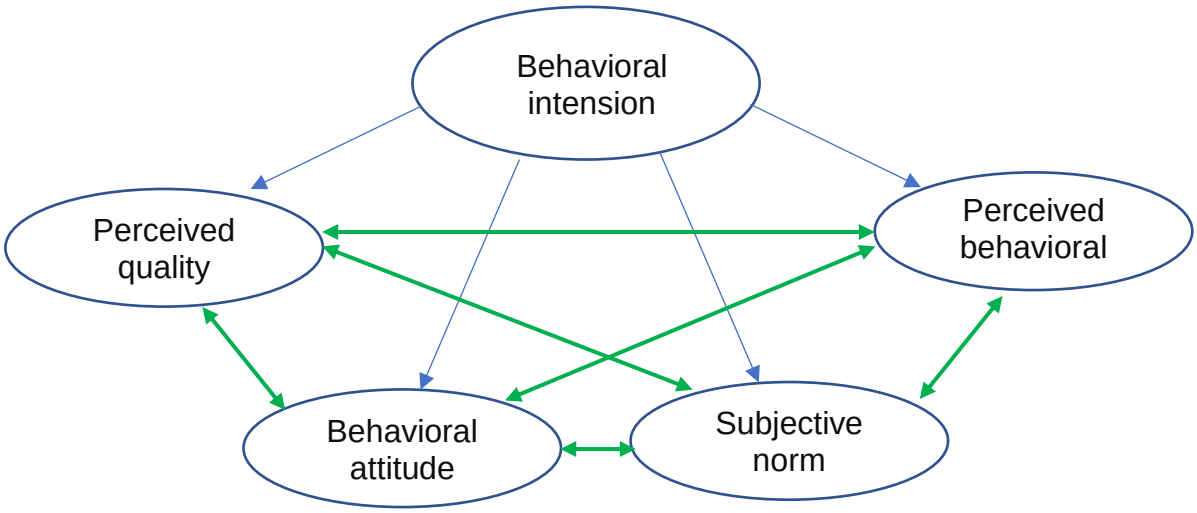

Figure 7: Conceptual framework for the interrelationship among the component of TPB

(Adopted from Wang et al, 2020)

Table 4: Recent research on Chinese consumers' perception on the imported food products (specially fruits and vegetables)

Reference	Study setting (countries and commodities)	Methods	Outcomes/findings	Comments / Recommendation
Cao et al 2019	China, mango, lychee and avocado	Desktop research, international visit and interview with wholesalers, importers, and retailers	Perception of wholesalers and retailers on the Australian produces (mango, avocado and lychee) were identified. Analysis on the supply chain operation and benchmarking analysis on fruit quality and price were conducted.	Recommendations and development strategies for northern Australian fruit industry.
Cao et al, 2020	China, mango, lychee and avocado	Face to face interview with wholesalers, importers and retailesr and in-field observations	The market outlook opportunity and challenges for selected fruits were investigated. The value chain perspective and value adding opportunities were briefly discussed.	
Cheng et al, 2016	Beijing, China, fresh vegetable	Quantitative study with a sample size of 590	Consumers' purchasing behaviour depended on their purchasing place and perceptions of freshness and pesticide residue.	Identification of control measure to ensure the safety of vegetables and enhance consumer's trust.
El Benni et al., 2019	China, infant milk formula	Choice experiment (Latent class model) with sample size 350	Chinese consumers were prepared to pay a premium for authenticity assured imported infant milk formula. Potential risk of using price as a quality and authenticity cue is also discussed.	Importance of traceability to enhance consumers' trust in the quality of the products.
Fabinyi et al., 2016	China, aquatic products	Quantitative study with sample size 300	Middle class Chinese consumers were less concerned about the seafood sustainability. Government should be responsible to ensure the sustainability of the products.	Policy development on the certification and promoting sustainability of agricultural products.
Jianying et al, 2014	China, table grapes	Mixed method with a total sample size 880	Consumption of grapes were based on consumers' functional cognition and sensory perception. Healthy and practical function were the main expected benefits and desired values in table grape consumption.	Investigation of the functional cognition of consumers on different products.
Jin et al., 2017	China, fresh produce (fruits and vegetables) in e-commerce environment.	Choice experiment with a sample size of 166	Certification and the diversity of the fresh produce portfolio had significant effects on the willingness to pay (WTP) among consumers. WTP values for "green" and "organic" attributes were high.	Investigation of the findings on the consumers preference on fresh produce in retail store.
Jin et al., 2017	China, food in general	Quantitative study with sample size 300	Consumers had a positive WTP for the food traceability system, but the average premium that consumers were willing to pay for traceability with detailed information was 10% higher than that with abbreviated information.	Traceability information should be available for consumers to help them to make purchasing decision.
Lee et al., 2015	China, beverage products	Qualitative methods with focus groups	Chinese consumer's perception of non-thermal processing technologies and ways to mitigate negative perceptions were investigated.	

Leggett, 2017	China, green food	Empirical research based on qualitative content analysis and field interview	Civil society organisations (CSOs) had helped the consumers to develop trust and helped small-scale farming through social media platforms.	Participants are not satisfied with the institutional certification mechanism.
Li et al. 2017,	China, European Union produce dairy products	Mixed method with 307 face to face survey	Consumers were willing to pay premium prices for products with EU label.	Future research aiming to reveal consumers' perception and preference for alternative product attributes (credential attributes that link to geographical origin labelling) is needed.
Li et al., 2020	China, organic food	Literature review	Different factors influencing willingness to pay for organic food were identified.	Investigation of the interrelationship between the factors, that influence consumers' willingness to pay.
Liu et al. 2020	China (metropolitan cities), Fuji apple products	Choice modelling, sample size 2092	Chinese consumers, in general, were willing to pay a premium for selected food safety attributes	Similar studies can be done for other attributes and in the regional areas.
Liu et al., 2019	China, Fuji apple	Choice modelling, sample size 2092	Chinese consumers had a lack of trust in government supervision and food label information. However, they were willing to pay more for traceable products, that could reassure them about the safety of a product.	
Pin, 2019	China, made in Italy products		The study aimed to outline the potentialities of Italian products in the Chinese food markets, where concerns were growing for food security (quantity and safety).	
Qi & Ploeger, 2019	Qingdao, China, green food	Quantitative analysis with structural equation modelling (sample size 300)	The study proposed a modified theory of planned behaviour (TPB) to identify the influence of cultural context in purchase intension of green food by Chinese consumers.	The model could be applied to other groups of food products as well as for other countries.
Seo et al., 2020	Taiwan, imported Korean pears	Structural equation modelling, sample size 332	The image and reputation of imported pears were identified as predictors of consumers' satisfaction and purchase intention.	Further research on consumers' motives and barriers influencing their purchase intension of imported products (from different origins) is needed.
Sirieix et al., 2011	Shanghai, China, organic products both locally produced and imported	Qualitative analysis, in depth interview with 23 respondents	For the respondents, local organic products had more acceptability due to environmental concerns. However, there were no perceived differences among the local and imported organic products.	Similar studies for a broader scope (entire China), whichi include participants who does not have any exposer to organic food, can be conducted.

9. Conclusion from the literature review

This literature review has identified several categories of factors which influence Chinese consumers purchasing behaviour. A conceptual framework has been developed to investigate the strength of these factors to control consumers' purchasing intention. It is indicated in the literature that behavioural attitudes, health consciousness, product information and environmental standards have a strong influence on consumers' purchasing behaviour. Other factors have moderate to weak correlation with their purchasing behaviour. Only a few studies were focused on Australian horticultural products, so there is a strong need for further research, given the current trade relationship between Australia and China. Future studies on a sole factor or combination of factors and their impact on purchasing behaviour and purchasing intention could be conducted. The interrelationships between the factors could be another avenue for future research. To gain a thorough understanding of the demand of Chinese consumers for Australian products, it is recommended that product specific consumer choice surveys be undertaken.

Part two

10. Introduction

The rise of the middle class in China propels rapid economic growth in recent years. China has become one of the largest markets for imported agriculture produce. So, it is very important for exporting countries to understand Chinese consumers' behaviour towards specific agricultural produce. Consumers' purchasing and consumption patterns can change significantly due to the rise in their income and purchasing capability. Several recent studies reported that product knowledge and awareness of environment protection can affect consumers' purchasing behaviour and the amount of consumption (Asioli et al., 2017, Fabinyi et al., 2016, Liu et al., 2020, Leggett, 2020, Qi & Poleger, 2019, Fernqvist & Ekelund, 2014, Jin et al., 2017, Liu et al., 2019, Liu et al., 2017). Among the other factors, behavioural attitudes, health consciousness, and product information also have a strong influence on consumers' purchasing behaviour (Lusk & McCluskey, 2018, Canova & Manganelli, 2016, Veeck et al., 2020, Seo et al., 2020, Phelps & May 2018, Li & Xin, 2015).

China is the largest export market for Australian fresh fruits and other agricultural produce (Xia & Nelson, 2018). Australia exports several horticultural products to China; however, the volume and trade value are lower compared to other exporting countries (PMA, 2016). With the growing demand for fresh fruits and vegetables in China (Gale et al., 2014), it is imperative to understand Chinese consumers' preference and perception of imported fruits and vegetables. Therefore, this section of the study aims to investigate Chinese consumers' perception and their purchasing intention towards imported Australian fresh fruits and vegetables. This study also investigates how likely Chinese consumer prefer Australian fresh fruits and vegetables over imported products from other countries. Another objective of the study is to identify Chinese consumers' willingness to pay for imported Australian fresh fruits and vegetables. The key research questions are:

RQ2.1: What are the key factors that influence Chinese consumers' purchasing behaviour for imported fresh fruits and vegetables?
RQ2.2: What are the interrelationships among these factors and how do they affect the Chinese consumers' purchasing intention?
RQ2.3: How likely do the Chinese consumers prefer Australian fresh fruits and vegetables over imported products from other countries?
RQ2.4: What would be the key recommendations for the Australian horticulture industry and other stakeholders to promote their products in the Chinese export market?

11. Scope, limitation, and organisation of part two

This report focuses on Chinese consumers' perception of imported, particularly from Australia, fresh fruits, and vegetables. The survey was conducted in the southern and eastern provinces of China. Only 13 provinces of China were considered for the study. Chinese consumers' perception was investigated using close-ended survey questions and a choice experiment. Emphasis was given to a few factors associated with the purchasing behaviour, which were explored in the previous section. This study presents some indicative results for the study area. Due to the population size, the outcomes of the study may not be generalised, and further research with a large sample size is needed to enhance the generalisability of the findings on Chinese consumers. The study's results indicate that about 74 per cent of the respondents had a higher education level (university degree), and this is higher than the national average percentage (about 9%) (National Bureau of Statistics of China, 2011). There are potential biases in this study's results due to the high educational level of the survey respondents. The survey employed in this study did not include any open-ended questions which could explore in-depth reasons behind the consumers' buying behaviour. The exclusion of open-ended questions is one limitation of the study. However, the survey tools included most of the common responses for each of the questions, and therefore, helped capturing consumers' purchasing behaviour up to a large extent. As this study only considers fresh fruits and vegetables, its results are not transferable to other products, including processed fruits and vegetables, and other food products.

The remaining sections of this part is organised as follows: Section 12 presents the introduction. Section 13 describes the scope, limitation, and organisation of the report. section 14 provides details of the research

methods, followed by the results and analysis in Section 15 and the discussion and recommendations in Section 16. A brief conclusion completes the section of this report.

12. Data and methods

An online survey was conducted to examine Chinese consumers' preferences for imported Australian fresh fruits and vegetables. This study considered the eastern and southern provinces of China as its research sites because of the close location proximity of these provinces to Australia. The selected provinces were Guangdong, Guangxi, Hainan, Henan, Hubei, Hunan, Shanghai, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi and Shandong (Figure 8). The targeted research sites cover about 19 per cent of the Chinese landmass. Guangdong, Shandong and Henan are the top three most populated provinces in China (CityPopulation, 2021). In the selected provinces, there are over 813 million residents, who account for about 58 per cent of the Chinese population. Given the large population of the research sites and the small sample size (about 1000), the results presented in this report are indicative, and may not be generalised for the entire Chinese population.

Figure 8: Selected Chinese provinces for the current study (Source: Travel China guide, 2020)

12.1 Data collection

In part one, the literature review on Chinese consumers' perception of fruits and vegetables revealed several factors related to consumers' purchasing behaviour, including health consciousness, environmental concern, quality perception, product knowledge, and image of the products. For the current study, a set of questionnaires were developed based on the factors affecting consumers' purchasing intention. The online survey was conducted in November 2020. The research methods and questionnaire for this study have been approved by the CQUniversity Human Research Ethics Committee (approval number: 0000022551). The sample was limited to residents of the eastern and southern provinces of China who were aged 18 years or above. Participants were asked if they would be willing to participate in a survey on imported

Australian fresh fruits and vegetables. As the participants gave consent to participate, they were provided with a self-administrated online questionnaire. The survey was administrated using Qualtrics, an online survey platform, which was also used to recruit participants. The entire survey was originally in English, which was then translated into the simplified Chinese language for the convenience of participants. A soft launch of the survey was organised, and data from 113 respondents were collected. After some minor modifications, the full launch of the survey, in which a "soft" quota for different age groups was applied to ensure the even participation of both the below- and above- 40-year age groups, was initiated. Through this process, 924 qualified responses were collected in total. Out of these 924 responses, only 630 participants had past experience of purchasing and consuming Australian fresh products. These 630 valid data sets were used in the mediation model, factor analysis, and structural equation modelling.

12.2 Mediation model

A simple mediation model was used to find mediation effects among the variables considered in the survey questionnaire. Out of 630 qualified respondents, two respondents' data were excluded as they did not provide information about their annual income. The simple mediation model was developed based on Model 4 of the PROCESS procedure (Hayes, 2018). As this model was run, the consumers' satisfaction and willingness to buy were being combined as a dependent variable (referred afterwards to as "attitude towards Australian products, ATA"). Personal preference (PP) was considered as an independent variable, with attitudes towards the imported products (ATI) being the mediator, and environmental concern (EC), age, income, and education being the covariates. In this model run, bootstrapping for the indirect effect was based on 10000 bootstrap samples, and confidence intervals were set as 95%.

12.3 Confirmatory factor analysis

A confirmatory factor analysis based on the previously discussed factors was undertaken. Three factors were identified for further analysis through the factor analysis and dimension reduction. These factors are the image and reputation of Australian products, environmental concern, and quality perception. These factors are used as latent constructs, and to develop the following research hypotheses:

- **H1:** Chinese consumers' quality perception influences their satisfaction with Australian fruits and vegetables.
- **H2:** Chinese consumers' environmental concern influences their satisfaction with Australian fruits and vegetables.
- **H3:** The image of Australian products influences Chinese consumers' satisfaction with Australian fruits and vegetables.
- **H4:** Chinese consumers' satisfaction with Australian fruits and vegetables influences their willingness to buy Australian fruits and vegetables.

12.4 Structural equation modelling (SEM)

A structural equation modelling (SEM) approach was adopted in the next stage of the study. All the items of measurement were measured on a five-point Likert scale (1= strongly disagree to 5= strongly agree). The questionnaire, which includes the items about the image of Australian products, quality perception, environment concern, and personal preferences, was assessed through the factor analysis, and selected questions were used in the SEM development. The demographic data collected through the survey is presented in the report as descriptive statistics. The hypotheses developed in this study was tested using SEM. Following a two-stage approach, a confirmatory factor analysis (CFA) with Principal Component Analysis was first performed to reduce the dimension of the problem and then SME was estimated to examine the causal relationship between the hypothesised constructs. The conceptual framework of SME is presented in Figure 9. Path coefficients extracted from both constrained and unconstrained SME were compared for each relationship. Significant differences in the Chi-square values between both models were also assessed.

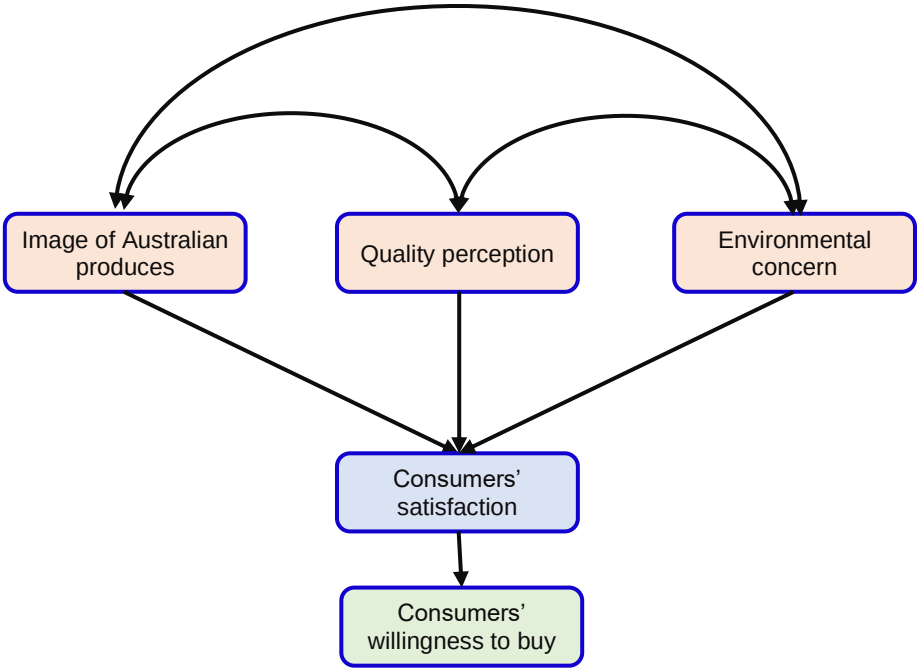

Figure 9: Conceptual framework for SEM

12.5 Choice experiment

Choice experiments, also known as choice modelling and choice-based conjoint analysis, were chosen as the methodology for the project, considering two key factors: the ability to focus on a small set of explanatory factors and the use of hypothetical scenarios. These allow the research to be much more targeted than other approaches, such as a hedonic pricing approach to analysis of the existing market data.

Choice experiments involve analysing the choices that participants make about a small set of similar trade-offs across repeated scenarios (Boxall et al. 1996; Rolfe et al. 2000). The scenarios are constructed by describing a situation in terms of a set of attributes, which can vary across different levels. Statistical analysis then reveals the relative importance of each attribute on the choices made. When one of the attributes is a monetary trade-off, the analysis allows the estimation of willingness-to-pay and part-worth estimates (Rolfe et al. 2000).

Choice experiments are applied in a wide variety of contexts, but advantages such as the flexibility, the options to frame choice tasks and scenarios in very different ways, the ability to frame choices in future contexts, and the richness of subsequent analysis make them, and the conjoint analysis more broadly, very suitable for exploring consumption drivers for market goods (Louviere et al, 2010). Choice experiments have been widely used to predict the market potential of horticultural products, including organic and fresh-cut fruits and vegetables (Moser et al., 2011, Sporleder et al., 2014, Miller et al., 2017, Yue & Tong, 2009, Yeh & Hartmann, 2016, Baselice et al., 2017). In China, there have been studies using choice experiments to assess consumer preferences include Lui et al. (2017) for eco-labelled rice, Jin et al. (2017) for attributes of fresh produce in e-commerce settings, and Yin et al. (2019) for tomatoes produced at different environmental standards. However, the relative importance of country/continent of origin and of other factors related to consumer demands for fresh fruits in China has not yet been covered.

12.5.1 Design of the experiment

In this study, a choice experiment was designed to assess consumers' willingness to pay for imported fresh fruits and vegetables. In designing the choice experiment, the analyst framed the base, usually the current situation and improvement options, identified key attributes of interest, designed the attributes into scenarios where realistic monetary trade-offs are presented, and chose appropriate levels.

In this study, one of the major challenges was to frame the description of fresh fruits and vegetables in ways that were succinct and relevant to both Chinese consumers and supply chain issues. Potential attributes were identified from the literature (Miller et al., 2017, Yin et al., 2019, Liu et al, 2017, Wang et al, 2019) and a smaller group was selected to reduce the potential for cognitive burden (De Shazo and Firmo, 2002; Caussade et al., 2005). The following attributes (and explanations of the attributes) were selected:

- **Appearance** refers to the physical state and condition of the product.
- **Availability of nutritional facts** refers to the level of information regarding the nutrition available to the consumer.
- **Food safety** label refers to the presence of the food safety sticker on the product.
- **Environmental certification** refers to the availability of environmental or organic label on the product.
- **Price premium** refers to (your) willingness to pay additional money for premium imported products.

12.5.2 Selection of alternatives

A second challenge was to ensure an adequate focus on the issue of interest and demand for Australian products. This has been achieved by using a labelled format, where four choice alternatives were presented in each choice set, representing separate geographic areas. Only four labels were selected to minimise the complexity in the choice task. For that reason, very broad categories, including pooling Australia with New Zealand, were chosen as follows:

- Option 1: Australia and New Zealand
- Option 2: South America
- Option 3: Asia (excluding China) and Africa
- Option 4: China (the base option).

The levels for each attribute were not described for the base (China) option, but for the other three labelled options. This means that the other three options, together with price premiums for each of the imported options, were essentially presented as improvements over the base option. Price was presented in terms of a premium over the price of local goods to simplify presentation and analysis.

These attributes were designed to represent the factors that participants would consider when purchasing fresh fruits and vegetables. This was considered to be realistic given that almost all participants had already indicated in their response to the earlier questions in the survey that they were familiar with imported fruits and vegetables. The issue of purchase volume was not included in the choice experiment because of the difficulties of framing for all respondents. Instead, participants were asked in other questions about their frequency and amount of imported fruits and vegetables that they purchased, and an assumption was made that those quantities would continue unchanged across the various choice scenarios.

12.5.3 Setting the levels

The levels allocated to each attribute were chosen to be as realistic as possible as well as spanning the range of potential variation (Table 5). Appearance and Availability of nutritional facts were treated as an ordinal variable across four levels, ranging from ‘Below average’ to ‘Excellent’ and from ‘No information’ to ‘High Information’ respectively. The Food safety label was treated as a dummy variable, being either present or not present. Environmental Certification was treated as an effect variable with three levels: ‘No label’, ‘Organic certification’ or ‘Environmental certification’. The price increase was included as a metric variable ranging from ¥1[1] to ¥10 per kilogram for the improvement alternatives, and an implied price increase of zero for the base China option. A summary of the attributes and the associated levels is provided in the table below.

[1] ¥1= 0.21321 AUD (as of 1st November 2020) (Exchange Rates, 2021)

Table 5: Attributes description and their levels in the choice experiment

Attributes	Description	Levels
Appearance	The physical state and condition of the product.	• Excellent • Premium • Average • Below average
Availability of nutritional facts	The level of information regarding the nutrition available to the consumer.	• High • Medium • Low • No information
Food safety label	The presence of food safety sticker on the product.	• Yes • No label
Environmental certification	The availability of environmental or organic label on the product.	• Environmental labelling • Organic label • No label
Price premium	Willingness to pay additional money for premium imported products	• I would pay ¥1 per kg more than the price of domestic produces • I would pay ¥3 per kg more than the price of domestic produces • I would pay ¥5 per kg more than the price of domestic produces • I would pay ¥10 per kg more than the price of domestic produces

12.5.4 Framing of the choice sets

Because it was not realistic to present respondents with all possible combinations of attributes and levels, an experimental design was used to select a smaller fraction of potential options. Efficient designs were created in the ©Ngene statistical software package for this purpose. Because it was difficult to identify suitable priors, a two-step design process was undertaken. In the initial design, priors were estimated from other similar choice experiments conducted on food demands in China (Lui et al. 2017; Jin et al. 2017; Yin et al. 2019; Wang et al. 2019). The Appearance and Nutrition variables were ordinal coded, Food Safety was dummy coded, Environmental Certification was effects coded, and Price was treated as a metric variable. This enabled 24 choice profiles to be created, with a D-error of 0.061. The choice sets from the experimental design were then blocked into four groups of six choice sets, which were then randomly allocated to the participants.

A soft launch was conducted at the beginning of November 2020, where 113 responses were collected from the target audience. The data for the choice experiments were analysed, and the coefficients for the attributes were used to new priors for an updated design in ©Ngene. The new design had smaller priors for Appearance, Nutrition and Price, a larger prior for Food Safety, and unchanged priors for Environmental Certification. The new design, with a smaller D-error of 0.45, was then used in the second (main) wave of the survey collection. Figure 10 presents an example of one out of the four choice tasks that respondents were asked to choose from. More details about the survey are provided in the Appendix.

Choice Card 1				
Attributes	**Option 1** Produced in Australia and/or New Zealand	**Option 2** Produced in South America (e.g., Chile, Brazil)	**Option 3** Produced in other country of Asia (excluding China) and Africa	**Option 4 (opt-out)**
Appearance	Below average	Average	Excellent	I would only buy Chinese fruits and vegetables.
Availability of nutritional facts	High information	Medium information	No information	
Food safety label	Food safety label	No label	No label	
Environmental certification	No label	中国环境标志认证		
Price premium	I would pay ¥3 per kg more than the price of domestic produces	I would pay ¥3 per kg more than the price of domestic produces	I would pay ¥5 per kg more than the price of domestic produces	
Your choice	☐	☐	☐	☐

Figure 10: Example of choice card in the choice experiment

The surveys were collected in electronic formats through a market research company, with the layout suitable for either computer or mobile phone devices. There were 113 surveys collected in the soft launch in early November 2020, and a further 924 collected in the main wave in mid-November 2020. The data from the main wave of the survey were considered for further analysis.

13. Results and findings

13.1 Participant's profile

This section highlights the socio-demographic and economic profile of the respondents. This profile is indicative of the population in the selected provinces of China and may not be generalised for the entire China which is a vast country with a large population.

13.1.1 Age group, gender, and location

The collected valid responses include 924 responses from people of different age groups. The responses were categorised in age groups and presented in Table 6. During the data collection, a soft quota system was used to ensure the number of respondents from the below 40 and that of the above 40 age groups are roughly equal. Table 6 indicates that the average age of the participants was 38.8 years (excluding the outlier group "65 and above") with a standard deviation of 10.8. High standard deviation indicates that the respondents are widely spread across different age groups.

Table 6: Age groups of the respondents

	Frequency	Percent	Average	Standard deviation	Median
18-24	82	8.9	38.8*	10.8	39.8
25-29	130	14.1			
30-34	157	17.0			
35-39	96	10.4			
40-44	177	19.2			
45-49	135	14.6			
50-54	25	2.7			
55-59	115	12.4			
60-64	5	0.5			
65 and above	2	0.2			
Total participants			924		

* Note: Without the outlier group "65 and above"

The collected data indicate that the proportions of female and male survey participants did not significantly differ (Table 7). The percentage of female respondents (58 per cent) is, however, slightly higher than that of male (41 per cent), and this may, to some extent, reflect that in many Asian countries such as China, there are often more women who go shopping for their and their family's daily food products than men. The numbers of participants who preferred not to answer and who identified themselves with a gender other than female or male are negligible.

Table 7: Respondents' gender information

	Frequency	Percent
Male	382	41.3
Female	537	58.1
Neither male nor female	3	0.3
Prefer not to answer	2	0.2
Total participants	924	

Only 13 Chinese provinces, namely Guangdong, Guangxi, Hainan, Henan, Hubei, Hunan, Shanghai, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, and Shandong, were considered for the data collection purpose. The data indicate that over 45 per cent of respondents were from Guangdong and about 20 per cent were from Shanghai (Figure 11). This large proportion of participants from Guangdong and Shanghai was expected, as these two cities are the largest (in population) among the selected provinces.

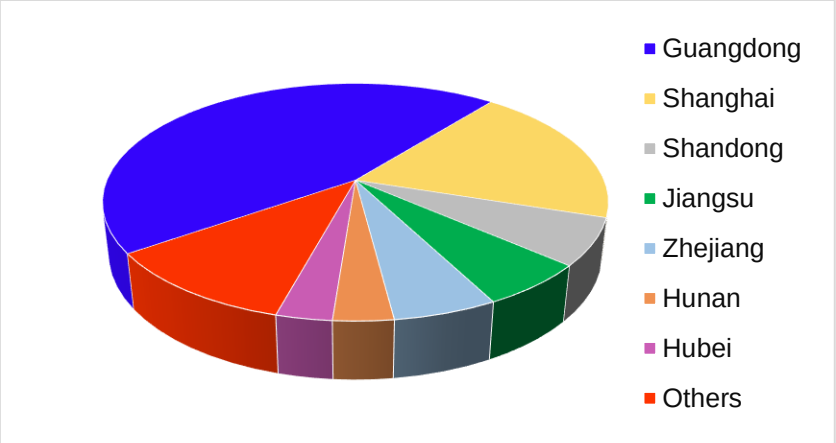

Figure 11: Distribution of the respondents by provinces

13.1.2 Household structure

The survey participants were asked about the size and structure of their household in two different questions. In response to the question about the structure of the household, approximately 63 per cent indicated that they were “married/partnered with one child living in the household” (Figure 12). This suggests that nuclear families with two parents and one child may be the most common family type in these regions, who are potentially the largest group of fruit/vegetable consumers in these markets. The percentage of the second and third largest groups (16 per cent and 14 per cent of participants, respectively), who were “married/partnered with no children in the household” and who were a “single/widower”, is considerably lower than that of the largest group. Hence, marketing strategies for Australian fruit/vegetable products, although should target consumers of all marriage statuses and family types, may focus more on those who are married/partnered with one child, who may represent the most common household type in the 13 Chinese provinces.

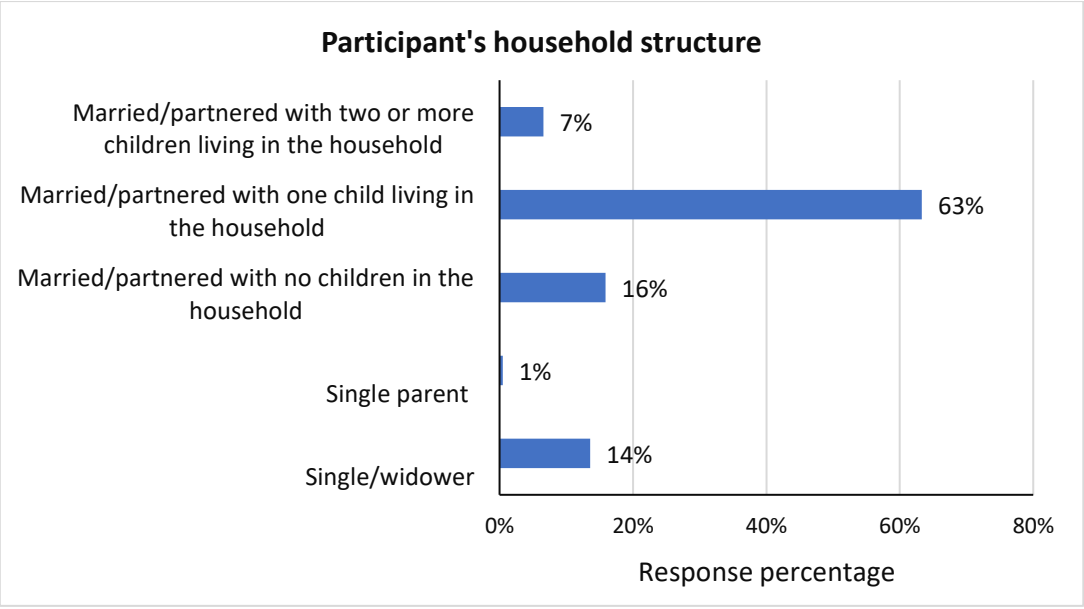

Figure 12: Household structure of the sample

In line with the question related to household structure, the participants also shared information about the number of people in their household (size of household), as shown in Table 8. Given that the respondents who were “married/partnered with one child” and “married/partnered with no children” are the largest respondent groups, as indicated in the preceding discussion, it is unsurprising that the majority of

participants (approximately 68 per cent) responding to this question reported that there were “2-3 people”, including them, in their household. However, around 27 per cent of participants revealed that the number of members residing in their household was about 4-5, and this does not well align with the small percentage of respondents (about 7 per cent) who were “married/partnered with two or more children” presented in Figure 12. This is perhaps because, in many respondents’ household, there were members other than parents and children (such as grandparents or relatives, for examples). This may be related to the fact that extended families where there are nuclear-family members and extended family members are still common in many Asian societies, including China. For that reason, when planning marketing strategies for Australian fruit/vegetable products, it is necessary to consider not only nuclear households, but also large households where there are more than three people. Although the number of large households may be, assumably, smaller than that of nuclear households, large households have more members who can be potential consumers of fruit/vegetable produces.

Table 8: Number of people in the respondents' household

	Percent	median
1 person	2.7	3 people
2-3 people	67.9	
4-5 people	27.1	
6-7 people	1.8	
8 or more people	0.5	
Total participants	924	

13.1.3 Education and employment

Responses from the participants indicated that the majority of them (about 74 per cent) have a “tertiary qualification” (Table 9). The second and third largest groups, namely the “trade/vocational qualification” and “secondary education” groups, account for only 13 per cent and 12 per cent of participants, respectively. The percentage of two other lower-level education groups of respondents is negligible. While it is impossible to conclude that people with higher-level education often purchase fruit/vegetable products, because many people with lower-level education might not participate in this survey, it can be however suggested that people with higher education qualifications tend to respond to invitations to surveys more positively. For that reason, there should be more strategies to approach and learn about the perceptions of Chinese consumers of different education levels, which are useful to understand their preference and habit of purchasing fruit/vegetable products in the market.

Table 9: Respondents' education level

	Percent
No formal qualifications	0.8
Primary education	0.5
Secondary education.	13.0
Trade/vocational qualifications	12.1
Tertiary qualification (University degree)	73.6
Total participants	924

Figure 13 shows the information about the respondents’ employment status. As can be seen, the majority of them (about 87 per cent) were employed, either full-time, part-time or casually. The second-largest participant group is retired people, who make up only around 5.6 per cent of respondents, and this proportion of retired people is much lower than that of employed people. This may, unsurprisingly, suggest that people with income (working or retirement income) are more likely to spend money on purchasing things, including basic things such as food in general and fruits/vegetables in particular; and these people are, hence, more motivated to participate in related surveys about food purchasing behaviours. Employment status is hence

also a considerable factor in approaching potential consumers and marketing fruit/vegetable products in China.

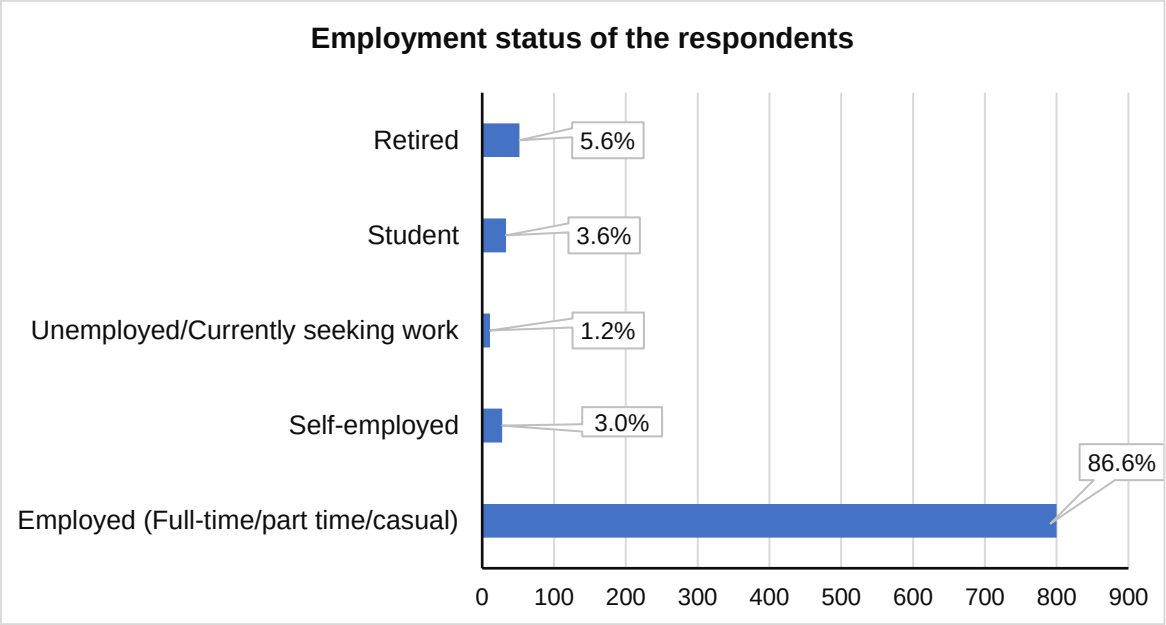

Figure 13: Respondents' employment status

13.1.4 Income and spending

The annual income and weekly spending on the fruits and vegetables by the respondent's household are presented in Table 10. The median annual income of the respondent is about ¥233,000[2], while the median weekly expenditure for fruits and vegetables is ¥206.

Table 10: Annual income and weekly expenditure on fruits and vegetables

Annual household income	Percent	Median	Weekly spending on fruits and vegetables	Percent	Median
Below ¥99,999	7.1	233,150.20	Below ¥50	3	206.04
¥100,000 - ¥199,999	32.6		¥50 - ¥149	27.4	
¥200,000 - ¥299,999	29.5		¥150 - ¥249	35	
¥300,000 - ¥399,999	21.4		¥250 - ¥349	23.4	
¥400,000 and above	8.3		¥350 and above	11.3	
prefer not to say	1				
Total Participants			924		

13.1.5 Food preference

Participants were asked about their habit of eating different types of food, including fruits, vegetables, seafood, meat and other food products. The result shows that the majority of respondents belong to the omnivore group (people who eat most types of food). Specifically, 91 per cent of them chose the option "I eat fruits, vegetables, meat, and seafood" (Table 11). This may reflect the most common eating habit among residents in the 13 Chinese provinces, where the number of people who follow a particular diet is much

[2] 1 AUD = 4.6902 CNY (as of 1st November 2020) (Exchange Rates, 2021)

lower than the number of omnivores. As it is illustrated in the table, only around 5.7 per cent, 1.4 per cent, 1.2 per cent and 0.6 per cent of respondents identified themselves as a flexitarian, vegan, vegetarian and pescatarian (pescatarians are those who eat fruit/vegetables and seafood, but not meat), respectively. It is assumed that although people of these four groups, individually, tend to eat more fruits/vegetables daily than people of the omnivore group, the omnivore group often consumes a much higher amount of fruits/vegetables in total, due to its large population.

Table 11: Respondents' food preferences

	Percent
I eat fruits, vegetables, meat, and seafood	91.0
I am a vegetarian (I do not eat meat or fish/seafood)	1.2
I am vegan (I do not eat animal products including dairy products, eggs, seafood, fish, white meat, or red meat)	1.4
I am a flexitarian (I try to eat mostly plant-based products, but sometimes eat animal products)	5.7
I eat fruit/vegetables and seafood – but not meat	0.6
Total respondents, N = 924	

The respondents shared their observation about the frequency of purchasing fresh fruits and vegetables in their family, as shown in Figure 14. It is indicated from their response that fruits and vegetables were highly favoured food products, which were "regularly" and "often" bought by around 58 per cent and 41 per cent of respondents (or their household members), respectively. This suggests that there is a high demand for these products among local households. The provinces where the respondents come from can be potential markets for Australian fruit products, as many people here may frequently consume fresh fruits and vegetables and may be willing to buy these products at least one to three times per week or per fortnight, as partly reflected in the participants' response.

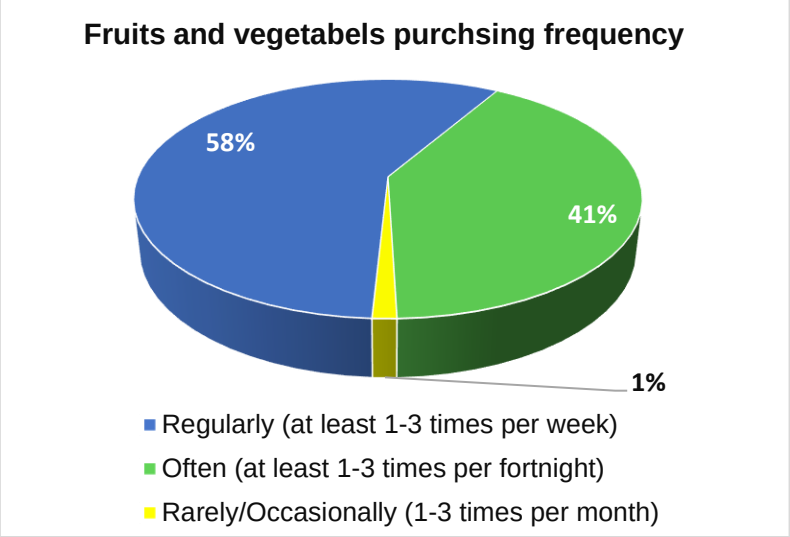

Figure 14: Fruits and vegetables purchasing frequency in the respondents' household

13.1.6 Location of purchase (fruits and vegetables)

Following up the question about the frequency of buying fresh fruits and vegetables, the respondents also reported details about how frequently they purchased these products for their family in different market types. As illustrated in Figure 15, supermarkets and hypermarkets were most of the respondents' preferred places for fruit and vegetable shopping. Specifically, on average, 29 per cent and 54 per cent of them went to the supermarket "regularly" and "often", respectively, and around 24 per cent and 46 per cent of them

visited a hypermarket “regularly” and “often”, respectively, to buy the products. This indicates that shopping in supermarkets and hypermarkets has nowadays become common among many people, and these market types should be given priority in distributing fruit and vegetable products to retailers. The third and fourth popular site choices for fruit and vegetable shopping were local retail shops (which were “regularly” and “often” visited by around 15 per cent and 56 per cent of respondents, respectively) and farmer’s markets/street vendors (“regularly” and “often” visited by about 19 per cent and 43 per cent of them, respectively). It seems that many people still maintain their habit of purchasing food at traditional markets or places near their home, and these market types should be considered as alternative retailing outlets for the products.

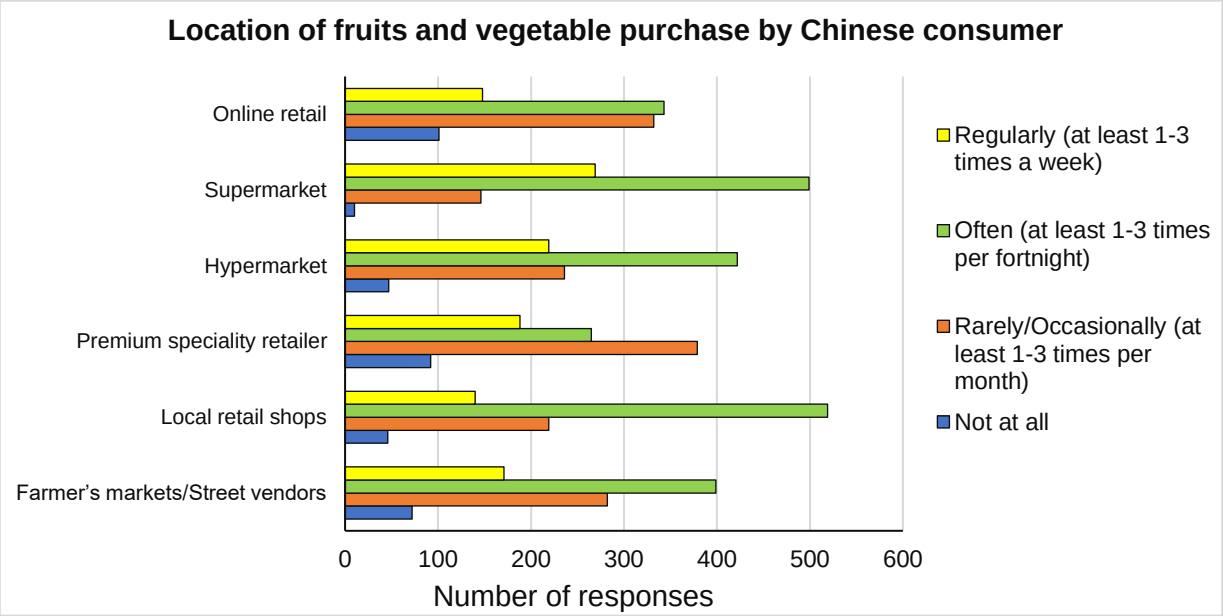

Figure 15: Chinese consumers’ preferred location to purchase fruits and vegetables

Online retail seemed to be a less attractive fruit/vegetable shopping site compared with other market types, as it was “regularly” and “often” chosen by only about 37 per cent and 16 per cent of participants, respectively. Online retail is still perhaps a new market type for fresh food products such as fruits and vegetables, and so it has not attracted much attention from shoppers. Among the options, “premium speciality retailer” was the least favoured fruit/vegetable shopping place, as only around 20 per cent and 29 per cent of respondents “regularly” and “often” bought fruits/vegetables from this retailer, respectively. This suggests that the frequency of visiting such premium retailers may depend on consumers’ budget and their willingness to pay for premium and high-value fruit/vegetable products.

13.1.7 Purchasing imported fruits and vegetables

A vast majority of respondents (approximately 93 per cent) stated that they had bought imported fresh fruits and vegetables in past (Figure 16(a)). This very high rate of respondents who revealed that they had purchased foreign fruits and vegetables may reflect the high interest in these products among residents in the 13 Chinese provinces (where the respondents come from) in particular and China in general. This suggests that China is a very high demand market where imported fruits and vegetables are widely accepted.

Figure 16 (b) illustrates the respondents’ experience of purchasing fresh fruits and vegetables originated from Australia. It is shown that most of them (around 68 per cent) had purchased these products. Australian fruits and vegetables may be, hence, quite well known to the respondents and many other consumers in China. In addition, although the rates of participants who answered “no” and “not sure” to this question are not high, with a relatively equal percentage of respondents (around 12 per cent) choosing the two options, this suggests the necessity to further market and promote Australian fruits and vegetables to more Chinese customers.

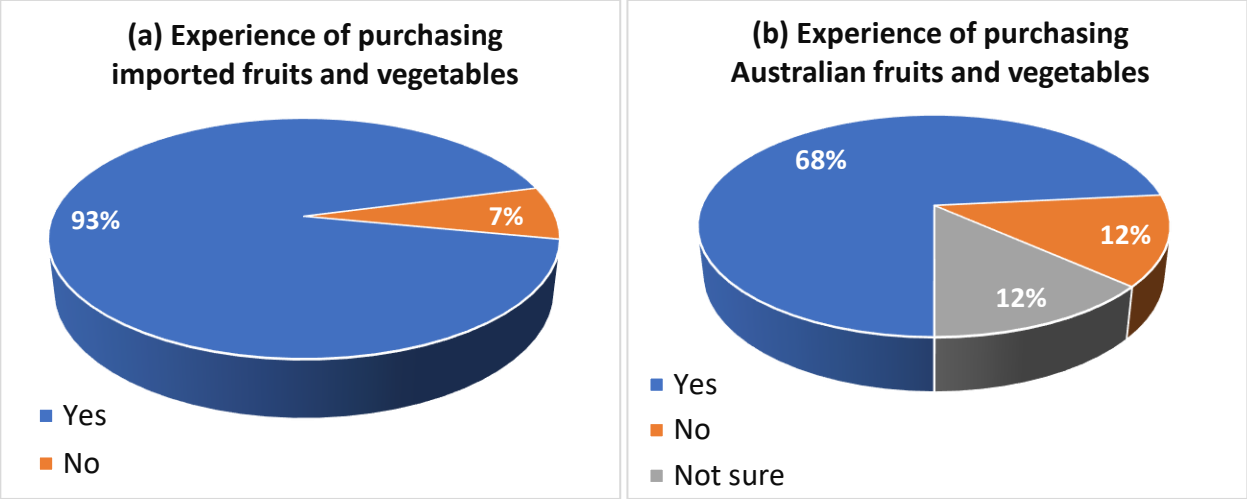

Figure 16: Chinese consumers' preference for a) Imported fruits and vegetables and b) Australian fruits and vegetables

Table 12 shows the participants' observation of the main grocery shopper in their household. As can be seen in the table, most of the respondents (approximately 72 per cent) said they were the one who often went to the grocery and bought food for the family. The percentage of participants who revealed that their family often did grocery shopping together (e.g. as a whole family or with a partner) is also considerable, with about 21 per cent choosing this option. It is, hence, indicated from this result that people who directly do the shopping are more likely to participate in surveys of the related topic than those who rarely or do not go shopping. This is understandable, as people who often go shopping may think that they have more experience of shopping and purchasing fruit/vegetable products to share in the survey.

Table 12: Main grocery shopper in the respondents' household

	Frequency	Percent
Myself	661	71.5
My partner	38	4.1
My parents	33	3.6
We do grocery shopping together (e.g. as a whole family or with a partner)	190	20.6
Other	2	0.2
Total	924	100.0

13.2 Mediation effects among the variables

The mediation effects among the variables considered in the survey questionnaire were examined by a simple mediation model. Table 13 shows the key results from the OLS regression linked to the total effect. Hence, the total effect of PP on ATA was positive and significant (total effect = .321, $p < .001$). This total effect was further broken down into direct and indirect effects in the following reporting of the simple mediation model results. Among the four covariates, both EC and income were significant in the regression linked to the total effect (both coefficients > 0, both p's < .001), which suggested that both increased environmental concerns and increased annual household income were associated with better attitudes towards Australian fresh fruits and vegetables.

Table 13: Key results from the OLS regression linked to the total effect

	Coefficient	*t*	*p*
PP	.321	6.202	< .001
EC	.263	4.933	< .001
Age	.002	.226	.821
Income	.117	6.092	< .001
Education	-.021	-.678	.498
Constant	1.279	6.413	< .001

Figure 17 shows the diagram based on the results from the simple mediation model. Hence, the direct effect of PP on ATA was positive and significant (direct effect = .088, $p < .05$). This result suggested the following relationship: When the mediator and covariates were all statistically controlled, those respondents who had a higher personal preference towards fresh fruits and vegetables tended to hold better attitudes towards Australian fresh fruits and vegetables.

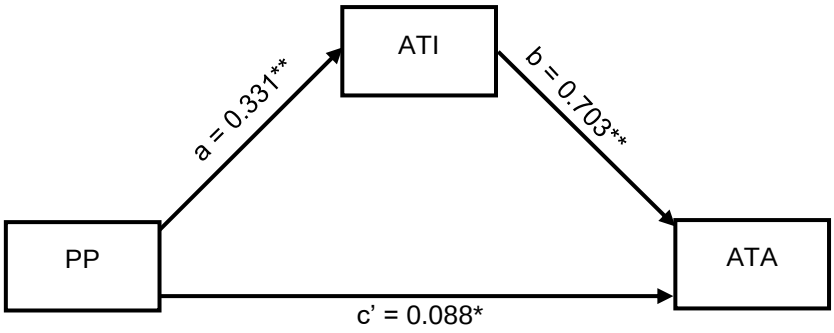

Figure 17: Diagram based on the results from the simple mediation model.

Notes: * stands for $p < .05$, ** stands for $p < .001$; a represents the effect of the independent variable on the mediator; b represents the effect of the mediator on the dependent variable; and c' represents the direct effect of the independent variable on the dependent variable.

The output of the simple mediation model run also supported that the indirect effect through ATI was different from zero with 95% confidence (indirect effect = 0.233, 95% bootstrap confidence interval: 0.136 to 0.348). This outcome, in combination with the results reflected in Figure 17, supported the following pattern: PP was indirectly related to ATA through their relationships with ATI. Specifically, those respondents who had a higher personal preference towards fresh fruits and vegetables tended to possess better attitudes towards imported fresh fruits and vegetables (because a was positive and significant in Figure 17), which were subsequently related to those respondents holding better attitudes towards Australian fresh fruits and vegetables (because b was positive and significant in Figure 17).

13.3 Factor analysis to identify motivating factors

Fin the section one, the literature review revealed several factors, including health consciousness, environmental concern, quality perception, product knowledge, and image of the products. Survey questionnaires were prepared to examine the respondents' perception related to some of these factors. To facilitate SEM and identify motivating factors using associated survey questions, a confirmatory factor analysis (CFA) was undertaken. The factor analysis helped to reduce the dimension of the problem and identify the prominent factors with higher factor loading. Four basic groups of variables namely, quality perception, personal preference, environmental concern, and images of Australian produce, were tested in the factor analysis. The results from the CFA indicate that only three variables had high factor loading, and these factors could be related to the Chinese respondents' motivation for purchasing Australian agricultural products. The results of the summary of the factor analysis are presented in Table 14. The 1st factor is the image and reputation of Australian products, while the other two are the environmental concern and quality perception. These factors were used as latent constructs and to develop the research hypotheses.

Table 14: Identified principal factors through factor analysis*

		Factors		
		1	2	3
QP_1	I judge the quality of the fresh fruits and vegetables by the quality assurance sticker.			.699
QP_2	I judge the quality of the fresh fruits and vegetables by their country of origin.			.783
QP_3	I judge the quality of the fresh fruits and vegetables based on recommendations and/or ratings received on social media.			.755
EC_1	Fresh fruits and vegetables should be produced in an environmentally friendly way.		.851	
EC_2	Appropriate certification (e.g. green certificate) should be used so that in-store fruit and vegetables are properly labelled.		.662	
EC_3	Detailed information regarding the entire supply chain of fresh fruits and vegetables should be available for the consumers (traceability).		.777	
AUS_Pro_Image_1	I believe Australian fruit and vegetable products are environmentally friendly.	.668		
AUS_Pro_Image_2	I trust appropriate label to identify authentic Australian products.	.653		
AUS_Pro_Image_3	Australian products are fresh and tasty compared to the products from other countries.	.770		
AUS_Pro_Image_4	My friends and family are impressed if I purchase Australian products	.749		
AUS_Pro_Image_5	Australian fresh fruits and vegetables are good for gift purposes.	.767		

* Factor analysis with Principal Component Analysis and Varimax rotation with Kaiser Normalization.

Through the factor analysis, three exogenous variables were identified and, in the next stage, the relationship between these variables and consumers' satisfaction and willingness to buy was investigated. Hence, we considered two endogenous variables in the structural equation modelling (SEM), namely satisfaction, and willingness to buy. To examine the relationships, a set of hypotheses (which is presented in the methodology section) was considered.

13.4 SEM to identify causal relationship among the variables

The mediation model indicates an indirect effect of personal preference on the Chinese consumers' satisfaction and willingness to buy Australian fruits and vegetables. However, the factor analysis only considered the direct effects of factors, and it rejected PP as a prominent factor. Hence, the hypotheses constructed after the factor analysis were considered to construct the structural equation model. The model is presented in Figure 18 with the rectangular box representing the measured variables and the oval box representing the latent variables.

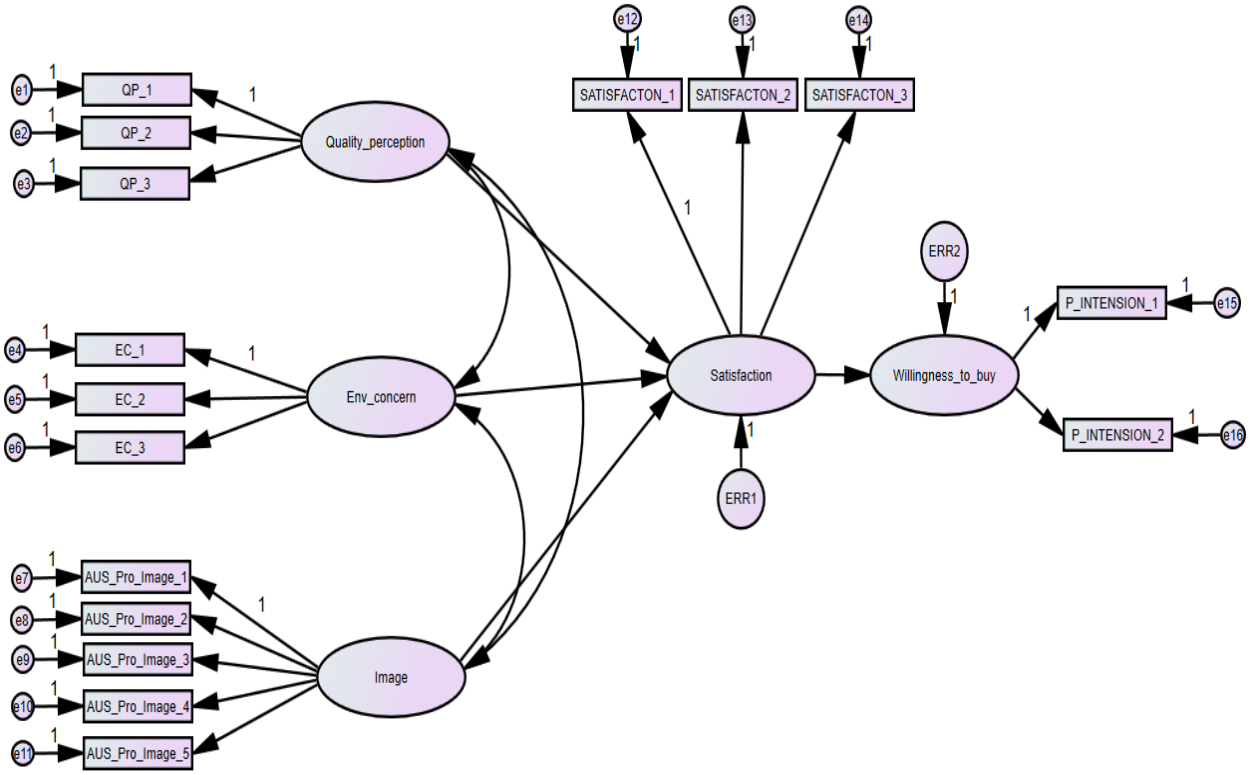

Figure 18: Structural equation model for Chinese consumers' willingness to buy Australian fruits and vegetables

13.4.1 Measurement model

The measurement model was evaluated through composite reliability, and convergent and discriminant validity. The level of significance was set at $p< 0.05$ to confirm the relationships between the measurement items and the corresponding latent constructs. The standardised loadings of all indicators were higher than 0.6, with the desired level of significance (Figure 19). Table 15 indicates that all of Cronbach's alpha values exceeded the threshold value of 0.7. The average variance extracted (AVE) is close to the significant level of 0.5, indicating a moderate convergent validity. The composite reliability (CR) was also calculated and found to be higher than the threshold value of 0.7. The results indicate that the model is statistically significant and also supports the internal consistency reliability.

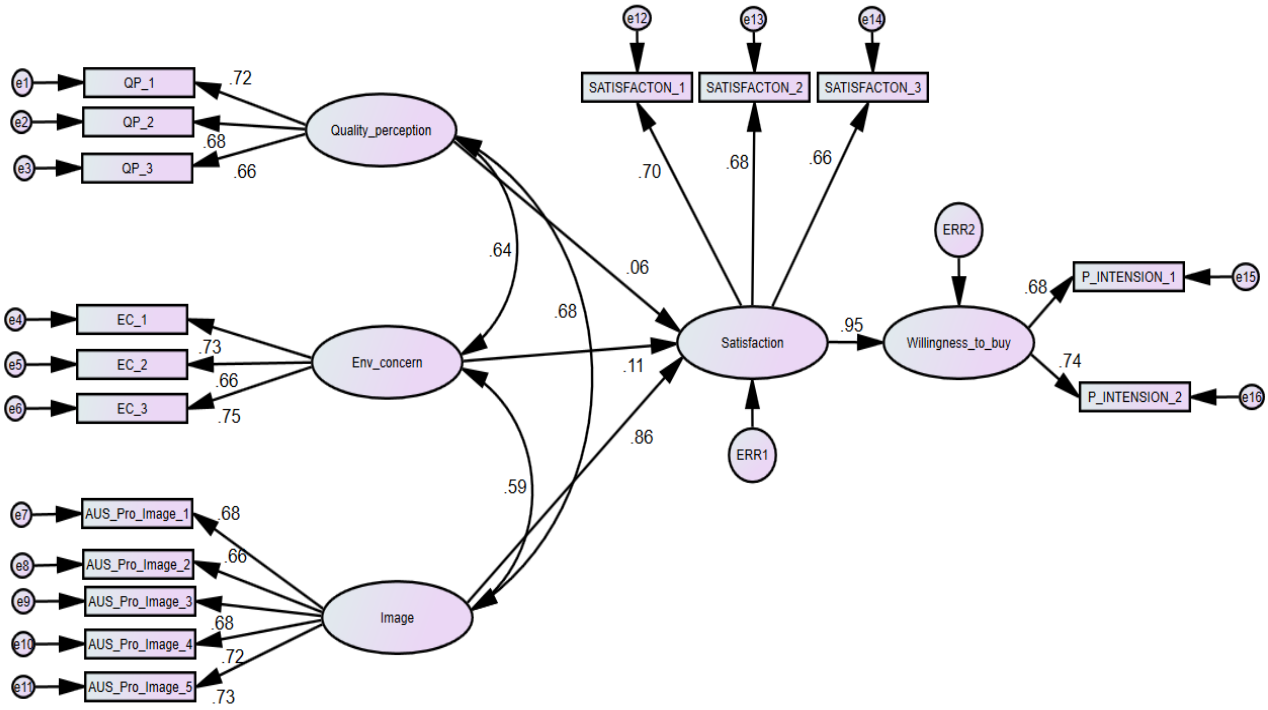

Figure 19: Structural equation model with factor loading and standardize path coefficients

Table 15: Convergent validity and reliability statistics of the sample

Latent constructs	Indicator	Standardized loading	Cronbach's Alpha	AVE	CR
Quality perception	QP_1	0.719	0.728	0.47	0.729
	QP_2	0.68			
	QP_3	0.663			
Environment concern	EC_1	0.725	0.748	0.50	0.753
	EC_2	0.656			
	EC_3	0.746			
AUS product image	AUS_Pro_Image_1	0.684	0.823	0.48	0.823
	AUS_Pro_Image_2	0.66			
	AUS_Pro_Image_3	0.678			
	AUS_Pro_Image_4	0.718			
	AUS_Pro_Image_5	0.731			
Satisfaction	Satisfaction_1	0.699	0.718	0.46	0.719
	Satisfaction_2	0.676			
	Satisfaction_3	0.661			

The discriminant validity results are presented in Table 16 in the correlation matrix. The diagonal values in the correlation matrix confirm that the square root of each construct's AVE was higher than the correlation with the other constructs. This indicates the acceptable discriminant validity of the latent constructs.

Table 16: Discriminant validity coefficient

	Quality_perception	Env_concern	Image
Quality_perception	**0.688**		
Env_concern	0.642	**0.710**	
Image	0.677	0.595	**0.695**

13.4.2 Structural model results

To examine the relationship between the latent constructs and the significance level, a structural model was developed. The model was essentially used to investigate the hypothesised relationship between exogenous and indigenous latent variables by using the standardised path coefficients (β) and t statistics with acceptable p-value <0.05. The results are presented in Table 17. The results indicate that the consumers' environmental concern and the image of Australian products lead to their satisfaction. However, the findings of this study did not support the hypothesis that quality perception affects the satisfaction level. The image of Australian products in the Chinese market had the most substantial effect on the consumers' satisfaction level. The image of Australian products is moderately correlated with the other two exogenous latent variables: quality perception and environmental concern. This indicates some indirect effect of the quality perception and environment concern on the endogenous variable satisfaction.

Table 17: Structural model results

Hypothesis	Standardised path coefficients (β)	Standard error	*t* value	*p* value	Decision
Quality perception → Satisfaction	0.065	0.047	1.146	0.252	Not supported
Env concern → Satisfaction	0.114	0.046	2.36	0.018	Supported
Image → Satisfaction	0.861	0.068	12.23	< 0.001	Supported
Satisfaction → Willingness to buy	0.954	0.072	15.018	< 0.001	Supported

The model fit results indicate that the Chi-square value is close to zero hence, there are very small differences between the expected and observed covariance matrix. The acceptable model fit is indicated by the Comparative Fit Index (CFI), which need to be greater than 0.9, and in the current case, it is 0.945. The Root Mean Square Error of Approximation (RMSEA) is related to residual in the model which need to be between 0.05 to 0.08 to indicate a better model fit. For the current model RMSEA value is 0.06. the other indicators commonly used to indicate model fits are GFI, AGFI, IFI and all need to be higher than 0.9. the current model exhibits an excellent fit as the respective values of GFI, AGFI, IFI are 0.936, 0.91, and 0.945.

13.5 Results of choice experiments and analysis

The choice data were analysed in LIMDEP using two main types of logit models to represent the choice data (Hensher et al. 2015). Random parameter models were applied to analyse the data set as a whole, with Price being analysed as a metric variable and results for the other four attributes being estimated for each level separately (with the lowest for each omitted for a base level). This helped to identify if there were significant variations in perceptions across the different levels for those attributes. In addition, Latent Class models were estimated to identify if preferences varied significantly across sub-groups in the data set. The following utility function was applied to the model.

$$U(Label) = Constant + \beta_1(Appear1) + \beta_2(Appear2) + \beta_3(Appear3) + \beta_4(NutLabel1) + \beta_5(NutLabel2) + \beta_6(NutLabel3) + \beta_7(FoodSaf1) + +\beta_8(EnvCert1) + \beta_9(EnvCert2) + \beta_{10}(Price) \quad \ldots\ldots (1)$$

Where separate coefficients are estimated for each level of the non-price attributes, with the lowest level being omitted for each to act as a base.

An initial task was to determine if the data collected in the soft launch could be combined with the data from the main survey. Significant differences between the data sets were tested with a form of the likelihood ratio test (Swait and Louviere 1993). This takes the following form:

$$LR = -2\ (Log\ L_{\lambda 1/2}\ -(Log\ L_{X1} + Log\ L_{X2})) \quad \text{.....(2)}$$

Where $Log\ L_{\lambda 1/2}$ is the log likelihood value attached to the multi-nominal logit (MNL) model of the stacked data set at the optimum level of ϕ. $Log\ L_{X1}$ and $Log\ L_{X2}$ are the log likelihoods of the MNL models for the individual data sets (Swait and Louviere 1993, Blamey et al 1998). The resulting likelihood ratio statistic follows an asymptotic chi-square distribution with (P + 1) degrees of freedom, where P is the number of parameters across the three models involved.
For this test, an MNL model was estimated for each data set separately and then jointly, and the resulting log-likelihood estimates applied to equation 1, giving the following result:

$$LR\ = -2\big(-4213.15 - (-3243.66\ +\ -515.97)\big)$$
$$= 453.52 \quad \text{.....(3)}$$

There are (13+1) degrees of freedom associated with the test, implying that the chi-square statistic at a 5% significance level is 23.68. This is smaller than the calculated statistic and means that the hypothesis that the vector of parameters is equivalent across the two data sets should be rejected. The differences in the scale parameter are not enough to account for the variations in the coefficients. Because of this, only the results of the main survey have been included in the analysis.

13.5.1 Payment vehicle

Two forms of the payment vehicle were used for the analysis. The first option used the price increases that were presented in the survey. These were framed as increases over the base option (purchasing fresh foods in China) for each of the labelled alternatives, where the relevant units were Yuan per kilogram of produce. This option took no account of the volume of consumption. The second option incorporated the expected volume of consumption as the product of average purchase amount by the frequency of purchase, calculated on an annual basis. This was multiplied by the price attribute to estimate the total annual payment implied by each price level.

13.5.2 Error Component models

The error components model was chosen for analysis as it is an extension of the multinomial logit model that addresses panel data effects as well as incorporating some random utility specifications. A key advantage of applying the error components model in this study over other possible applications such as the random parameters logit model is that the former allows the random error terms to be estimated for the alternatives (the labelled options) whereas the random parameters logit model allows one or more attributes to be randomised. Tests revealed limited variation in the distributions of attributes, providing limited potential for the application of random parameters logit models. As this study was very focused on the country-of-origin labels, this made the application of error components models more appealing.

The price attribute was treated as a metric variable, whereas Appearance, Food Safety and Environmental Certification were coded as categorical variables with separate coefficients for each level, and Food Safety was modelled as a dummy variable. The model was fitted by omitting the lowest level of the non-price attributes to act as a base and modelling the errors to be randomised around the alternatives. The model was repeated across the two payment vehicles of Price and Total pay. Both models were significant and had strong model fits, as evidenced by the Pseudo r-square and AIC statistics.

In the Price model, almost all attributes and levels were significant influences on choice (Table 18). As expected, the participants were more likely to choose options that had higher levels of the different attributes and lower prices. However, the respondents preferred average Appearance over both below average and higher levels, and low availability of nutrition facts over no information and higher levels. There were significant preferences for no Food Safety labels or Environmental certification labels, but a strong preference for Organic Certification. Fresh produce from Other Asia & Africa was preferred over South

America, which in turn was preferred over fresh food from China, with no significance attached to fresh food from Australia and New Zealand. Respondents with higher household income but without tertiary qualifications were more likely to choose the status quo base (continuing to purchase fresh produce from China). The standard deviations of the random effects for the alternatives were not significant, indicating that the population was relatively homogeneous in its views about fresh produce produced outside of China.

Table 18: Error Components model with price as opportunity cost

Parameters	Coefficient	Std.Error
Appearance Average (base = Below Average)	1.612***	0.127
Appearance Premium (base = Below Average)	0.986***	0.140
Appearance Excellent (base = Below Average)	0.783***	0.079
Nutrition label Low information (Base = No Information)	2.368***	0.154
Nutrition label Medium information (Base = No Information)	0.232*	0.139
Nutrition label High information (Base = No Information)	0.129*	0.075
Food Safety label (Base = no label)	-1.899***	0.076
Organic Certification (base = no certification)	3.293***	0.114
Environmental Certification (base = no certification)	-0.685***	0.102
Price (base = ¥0)	-0.420***	0.015
Constant – Australia & New Zealand (base = China)	0.448	0.629
Constant – South America (base = China)	1.128*	0.632
Constant – Other Asia & Africa (base = China)	2.392***	0.653
Socio-demographic factors predicting Status Quo choice (China)		
Male respondent	0.200	0.137
Have Children	-0.088	0.217
Household Income	0.000***	0.000
Employed	-0.016	0.365
Hold Tertiary qualification	-0.299**	0.146
Standard deviation of latent random effects		
Sigma Alt 1 (Australia & New Zealand)	0.000	0.030
Sigma Alt 2 (South America)	0.001	0.029
Sigma Alt 3 (Other Asia & Africa)	0.005	0.081
Model statistics		
# observations	3696	
Log Likelihood	-3228.8	
AIC/N	1.757	
McFadden R-sqd	0.370	
Chi squared	3789.9	

Notes: *** indicates significance at 1% level,
** indicates significance at 5% level,
* indicates significance at 10% level

When Total annual payment is used instead of Price as opportunity cost, the model fit is slightly weaker (Table 19). The model results are similar to the Price model.

Table 19: Error Components model with total annual pay as opportunity cost

Parameters	Coefficient	Std.Error
Appearance Average (base = Below Average)	0.830***	0.097
Appearance Premium (base = Below Average)	0.061	0.106
Appearance Excellent (base = Below Average)	0.743***	0.066
Nutrition label Low information (Base = No Information)	1.226***	0.110
Nutrition label Medium information (Base = No Information)	-0.156	0.112
Nutrition label High information (Base = No Information)	0.153**	0.064
Food Safety label (Base = no label)	-1.290***	0.057
Organic Certification (base = no certification)	1.941***	0.067
Environmental Certification (base = no certification)	0.205**	0.082
Total annual payment (base = ¥0)	-0.001***	0.000
Constant – Australia & New Zealand (base = China)	0.255	0.231
Constant – South America (base = China)	0.702***	0.228
Constant – Other Asia & Africa (base = China)	1.452***	0.227
Socio-demographic factors predicting Status Quo choice (China)		
Male respondent	0.139	0.108
Have Children	-0.123	0.133
Household Income	0.000**	0.000
Employed	0.107	0.194
Hold Tertiary qualification	-0.294**	0.134
Standard deviation of latent random effects		
Sigma Alt 1 (Australia & New Zealand)	0.000	0.020
Sigma Alt 2 (South America)	0.001	0.021
Sigma Alt 3 (Other Asia & Africa)	0.006	0.023
Model statistics		
# observations	3696	
Log Likelihood	-3719.8	
AIC/N	2.024	
McFadden R-sqd	0.274	
Chi squared	2808.5	

Notes: *** indicates significance at 1% level,
** indicates significance at 5% level,
* indicates significance at 10% level

13.5.3 Latent Class models

For the latent class modelling, a random utility specification was chosen to help account for the panel nature of the data. A two-class model was successfully identified, with negligible improvements with higher numbers of classes. Similar to the RPL models, the latent class models were replicated with the Price and Total Pay variables to represent the monetary trade-offs (Tables 20 and 21).

In the model employing Price (Table 20), Class 1, which accounted for 50 per cent of respondents, had no significant factors underpinning demand for the labelled alternatives (country groups) relative to the China base. Class 2, which accounted for 50 per cent of respondents, preferred average appearance, low levels of nutrition information, food safety and organic certification labels, but not environmental certification labels. For fresh produce from Australia & New Zealand, respondents in Class 2 with children and lower incomes were more likely to purchase from Australia and New Zealand. In comparison, households with children and tertiary education were more likely to purchase fresh produce from China than from South America or Other Asia & Africa.

Table 20: Latent Class, 2 classes, price increase = monetary trade-off

Parameter	Class 1		Class 2	
	Coefficient	*Std. Error*	*Coefficient*	*Std. Error*
Appearance Average	24.588	1.12E+06	1.162***	0.154
Appearance Premium	23.375	1.12E+06	-0.011	0.191
Appearance Excellent	32.969	832.815	-0.089	0.107
Nutrition Low Information	170.384	1.12E+06	0.949***	0.166
Nutrition Medium Information	81.486	1.12E+06	-0.337*	0.199
Nutrition High Information	64.199	4149.710	-2.282***	0.157
Food Safety label	-67.336	2753.770	0.465***	0.136
Organic Certification	68.435	3865.560	3.713***	0.168
Environmental Certification	-69.927	3926.320	-1.084***	0.192
Price	-11.236	770.823	-0.436***	0.020
Australia & New Zealand x Male	-1.212	94.910	-0.238	0.186
Australia & New Zealand x Children	-8.097	12.556	-0.534***	0.190
Australia & New Zealand x Household Inc.	0.000	0.000	0.000***	0.000
Australia & New Zealand x Tertiary Educ.	-3.935	9.894	-0.257	0.225
South America x Male	3.252	216.144	0.102	0.160
South America x Children	-5.688	217.336	0.344**	0.174
South America x Household Income	0.000	0.001	0.000	0.000
South America x Tertiary Educ.	-6.433	198.765	0.531***	0.201
Other Asia + Africa x Male	7.227	78.994	0.046	0.134
Other Asia + Africa x Children	-0.409	4.209	0.344**	0.147
Other Asia + Africa x Household Income	0.000	0.000	0.000*	0.000
Other Asia + Africa x Tertiary Educ.	0.524	3.757	0.481***	0.170
Probability of belonging to the class	0.497***	0.016	0.503***	0.016
	Model statistics			
# observations	3696			
Log Likelihood	-2177.2			
AIC/N	1.202			
McFadden R-sqd	0.575			
Chi squared (45 parameters)	5893.2			

Notes: *** indicates significance at 1% level,
** indicates significance at 5% level,
* indicates significance at 10% level

In the model employing Total Payment, there was a stronger relationship between both classes and demands for fresh produce (Table 21). Class 1, which accounted for 76 per cent of respondents, preferred excellent appearance, low levels of nutrition information, no food safety label but both organic and environmental certification labels. Class 2, which accounted for 24 per cent of respondents, preferred excellent appearance, all levels of nutrition information, and no food safety label or environmental certification labels.

For fresh produce from Australia & New Zealand, respondents in Class 1 who were male and did not have children were more likely to purchase, while respondents in Class 2 with children were more likely to purchase. There were similar patterns in demands for fresh produce from South America or Other Asia & Africa.

Table 21: Latent Class, 2 classes, price increase = monetary trade-off

Parameter	Class 1		Class 2	
	Coefficient	*Std.Error*	*Coefficient*	*Std.Error*
Appearance Average	-0.078	0.123	-3.322	14.385
Appearance Premium	-0.553***	0.129	-20.092*	10.280
Appearance Excellent	0.982***	0.079	40.251**	19.927
Nutrition Low Information	0.667***	0.133	78.289*	46.262
Nutrition Medium Information	-1.062***	0.141	74.661**	37.841
Nutrition High Information	-1.017***	0.096	53.842**	24.226
Food Safety label	-1.088***	0.074	-5.197*	2.949
Organic Certification	2.542***	0.095	11.148	13.671
Environmental Certification	2.343***	0.134	-29.299***	8.917
Price	-0.001***	0.000	0.000	0.000
Australia & New Zealand x Male	-0.402***	0.141	28.356	1.74E+06
Australia & New Zealand x Children	0.419***	0.146	-71.850**	33.559
Australia & New Zealand x Household Inc.	0.000	0.000	0.000	0.000
Australia & New Zealand x Tertiary Educ.	0.199	0.169	1.201	1.916
South America x Male	-0.441***	0.137	27.052	1.74E+06
South America x Children	0.686***	0.145	-60.915*	33.117
South America x Household Income	0.000	0.000	0.000	0.000
South America x Tertiary Educ.	0.396**	0.167	-0.391	2.416
Other Asia + Africa x Male	-0.608***	0.136	42.721	1.74E+06
Other Asia + Africa x Children	1.031***	0.144	-49.449**	23.478
Other Asia + Africa x Household Income	0.000	0.000	0.000	0.000
Other Asia + Africa x Tertiary Educ.	0.370**	0.168	0.911	1.589
Probability of belonging to the class	0.764***	0.014	0.236***	0.014
	Model statistics			
# observations	3696			
Log Likelihood	-2996.8			
AIC/N	1.646			
McFadden R-sqd	0.15			
Chi squared (45 parameters)	4253.9			

Notes: *** indicates significance at 1% level,
** indicates significance at 5% level,
* indicates significance at 10% level

13.5.4 Value Estimates

Values for changes in each attribute were calculated for the error components models, together with 95% confidence intervals using the Krinsky-Robb procedure (Tables 22 and 23). The results in table 22 show high values for willingness to pay premiums for fresh produce. Value estimation indicates that Chinese consumer would pay ¥7.85 premium per kilogram of fresh produce with organic certification. Chinese consumer would also pay primum for better quality fresh produce (premium and excellent quality). Interestingly, the consumer chooses to pay highest premium for average quality produces over the premium and excellent quality. Similarly, Chinese consumer would pay much higher for low nutrition information over no information or high information.

Table 22: Value estimates from EC model with price as opportunity cost

	Price premium per kilogram	Lower Confidence interval (0.25)	Upper Confidence interval (0.975)
Appearance Average	¥3.84	¥3.28	¥4.42
Appearance Premium	¥2.35	¥1.67	¥2.99
Appearance Excellent	¥1.87	¥1.50	¥2.24
Nutrition Low Information	¥5.64	¥5.06	¥6.28
Nutrition Medium Information	¥0.55	- ¥0.13	¥1.19
Nutrition High Information	¥0.31	- ¥0.06	¥0.66
Food Safety label	- ¥4.53	- ¥4.87	- ¥4.22
Organic Certification	¥7.85	¥7.46	¥8.24
Environmental Certification	- ¥1.63	- ¥2.05	- ¥1.19
Constant - Australia & New Zealand	NS	NS	NS
Constant - South America	¥2.69	- ¥0.35	¥5.52
Constant - Other Asia & Africa	¥5.70	¥2.68	¥8.54

NS = not significant

For the total annual payment model, the current expenditure was estimated at ¥11,125 per annum, and the current expenditure has a strong correlation with the annual income (Table 23). This indicated that the consumer would spend more on fresh produce with higher income. The annual payment model indicated that the Chinese consumer would pay ¥2,168.82 for fresh produces with organic certification. The pay increases appear to be higher, but this amount is realistic for the high-income group. Total annual payment model also suggested that it would be very unlikely for the consumer to pay premium for the produces with food safety label.

Table 23: Value estimates from EC model with Annual pay as opportunity cost

	Annual willingness to pay	Lower Confidence interval (0.25)	Upper Confidence interval (0.975)
Appearance Average	¥927.19	¥720.63	¥1,143.14
Appearance Premium	NS	NS	NS
Appearance Excellent	¥829.56	¥682.81	¥968.49
Nutrition Low Information	¥1,369.16	¥1,141.33	¥1,613.51
Nutrition Medium Information	NS	NS	NS
Nutrition High Information	¥171.43	¥25.13	¥311.52
Food Safety label	- ¥1,441.15	- ¥1,596.85	- ¥1,302.27
Organic Certification	¥2,168.82	¥1,996.88	¥2,382.91
Environmental Certification	¥229.56	¥39.66	¥419.43
Constant - Australia & New Zealand	NS	NS	NS
Constant - South America	¥783.87	¥280.84	¥1,281.88
Constant - Other Asia & Africa	¥1,621.86	¥1,099.50	¥2,133.53

NS = not significant

14. Discussion and Recommendation Based on Consumer's Survey Results

The results from the analysis indicate that Australian products had a high reputation among the Chinese consumers, that led to their satisfaction. The Chinese consumers believed that Australian products were of very high quality and produced in an environment-friendly way. This finding is also supported by the literature (e.g., Feng et al., 2021, Insch and Jackson, 2014). As Chinese consumers' quality perception and environment concern can motivate them to purchase Australian products, it is essential to hold up the brand image of Australian products in terms of quality and environment friendliness to foster future growth in this market. The promotion of Australian products is vital to ensure a sustainable export market in China. The key strategy for promoting Australian products should be focused on attributes of high quality and environment friendliness. The results indicate that quality perception did not have a direct impact on the Chinese consumers' satisfaction, but it had a high correlation with the image of Australian products. Personal preference and individual norms had a mediation effect on the consumers' attitudes towards Australian products. Future research is needed to analyse the individual norms and their impact on Chinese consumers' purchasing behaviour.

Further analysis of the consumers' preference was undertaken through the choice experiment with two types of logit models: Random parameter models and price model. The Chinese consumers preferred a higher level of attribute at a lower price, and this is expectable. The results also indicate that the average appearance of the produces was preferred over the other options. The finding that the Chinese consumers did not indicate any preference with the food safety label contradicts with some findings of the existing literature (Feng et al., 2021, Liu et al., 2020). However, Moruzzo et al. (2020) reported that Chinese consumers did not have a high level of trust in the government certification process for food safety labels, which led to no association of the food safety label on consumer's purchasing behaviour. The present study's survey results indicate the consumers' significant preferences for environmental certification and organic certification, supporting findings from a previous study by Yin et al. (2016). The country of origin also had some influences on the consumers' preferences. Fresh produces from Other Asia and Africa were preferred over South America by the consumers. However, the consumers' preference for produces from Australia and New Zealand was not identified in their survey responses. This finding is consistent with the literature (Feng, et al, 2021). Chinese consumers with higher income but no tertiary qualification preferred Chinese fresh produces over imported ones. The choice experiment results indicate the homogeneity in the views of the Chinese consumers towards imported fresh produce. The analysis using latent class models indicates that 50 per cent of respondents preferred average appearance, low levels of nutrition information, food safety and organic certification labels, but not environmental certification labels. Interestingly, the group respondents with children and lower incomes were more likely to purchase fresh produces from Australia and New Zealand. The analysis using latent class models, which employed the Total Payment reveals that 76 per cent of respondents preferred excellent appearance, low levels of nutrition information, no food safety label, but both organic and environmental certification labels. The analysis based on the price model of the choice experiment indicates that the willingness to pay premiums for fresh produces was high among the Chinese consumers. These findings are also in line with the existing literature (e.g., Yin et al., 2016). The Chinese consumers were willing to pay a maximum premium for organic products rather than for fresh produces with a food safety label.

The findings of this study highlight the importance of country and brand image on Chinese consumers' purchasing behaviour. The clean and green image of Australian producers would allow them to have a stronghold in the Chinese fresh fruit and vegetable market. E-commerce platforms would allow Chinese consumers to choose from a wide variety of imported fresh produces and purchase them online (Feng, et al., 2021). The current study indicates that over 50% of respondents purchased fruits and vegetables online frequently (at least 1-3 times per fortnight). Since online consumers do not often have the opportunity to check the appearance and quality of fresh produces, they rely mostly on country and product images. Appropriate certification and adequate product information would help Chinese consumers to ascertain the quality of fresh produces and motivate them to buy. These findings have great implications for the fresh produces export supply chain. The supply chain needs to ensure the traceability and green and clean certification of their produces.

14.1 Summary of key findings:

Key findings from the descriptive analysis are as follows:

- Higher number of female participants in the survey might indicate that female members of the household often purchased fresh fruits and vegetables for their family.

- The Chinese consumers frequently purchased fruits and vegetables, and on average, they purchased about 2 kg of fruits and vegetables in a single shopping trip.
- As expected, most of the participants indicated that they were married/partnered and had one child living in their household. The participants' responses to other questions also indicate that on average, there were three people living in their household.
- The majority of the respondents had a higher educational qualification, and this proportion does not match with The Chinese national statistics on education. For that reason, potential biases might exist in the findings.
- In addition to having a higher academic qualification, most of the respondents classified themselves as being employed.
- The average income of the participants was about ¥ 233,000 per annum.
- The average expenditure on fruits and vegetables per week was ¥ 206, as revealed in this study's findings.
- 91% of respondents identified themselves as an omnivore. The numbers of participants who identified themselves as belonging to the other categories, including the vegetarian category, were very small.
- The respondents indicated that they purchased fruits and vegetables from different locations and selling points, including online. This finding has implications for developing marketing strategies for Chinese consumers.
- A high percentage of respondents had past experience of purchasing imported fresh produces, and this implies that China is a very high demand market where imported fruits and vegetables are widely accepted.

Key findings from the mediation analysis and SEM are as follows:

- The Chinese consumers who had a higher personal preference for fresh fruits and vegetables tended to have better attitudes towards imported fresh fruits and vegetables.
- The Chinese consumers who had better attitudes towards the imported fresh fruits and vegetables were more likely to purchase Australian produces.
- Personal preference was not identified as a motivating factor in the confirmatory factor analysis. However, they have some association with the Chinese consumers' purchasing behaviour.
- Quality perception and environmental concern had a moderate effect on the satisfaction level of the consumers towards Australian produces.
- The study results indicate that the consumers' quality perception did not lead to their satisfaction. However, their quality perception had a strong influence on their view about the image of Australian fresh produces.
- The image of Australian produces led to higher consumer satisfaction and motivated their willingness to buy.

Key findings from the choice experiment are as follows:

- Taste was very important to the Chinese consumers, and who indicated taste as their motivation to buy fruits and vegetables were more likely to purchase imported products.
- The average appearance of fruits and vegetables were more preferred over the premium quality produces.
- Respondents with higher household income but without a tertiary qualification were more likely to purchase fresh produces from China rather than imported fresh produces.
- Country of origin had some influence on the Chinese consumers' preference for fresh produces. Other Asian and African produces were preferred over the South American produces. However, the consumers' preference for produces from Australia and New Zealand was not identified in their survey responses.
- The analysis using latent class models employing price reveals that class 2 representing 50 per cent of respondents, who preferred average appearance, low levels of nutrition information, food safety and organic certification labels, but not environmental certification labels.

- The analysis using latent class models employing total annual payment reveals that class 1 representing 76 per cent of respondents who preferred excellent appearance, low levels of nutrition information, no food safety label, but both organic and environmental certification labels.
- The willingness to pay premiums for fresh produces was high among the Chinese consumers.
- The Chinese consumers indicated that they would pay a higher premium for organic produces, but they would be unlikely to pay a higher price for produces with a food safety label.
- Higher level of nutritional value information was not highly regarded by the Chinese consumers as they chose not to pay a high premium. However, the consumers would pay about 5.60 Yuan premium per kilogram for low nutrition information over no information.
- The Chinese consumers would pay about ¥ 2,170 annually for organic certified produces, which is a little bit high considering their estimated annual expenditure for fruits and vegetables, ¥ 11,125. However, the spending is highly correlated with income, and the consumers from the high-income group could easily accommodate the premium based on their budget.

14.2 Recommendation:

- Australian producers need to understand the quality required to export fresh produces to China. Failing to meet the quality requirements may have severe consequences as the quality expectation for Australian produces is very high.
- Environment concern has a moderate effect on consumer purchase decision, while the food safety label has less appeal to consumers. Producers should adopt environment-friendly production strategies and procedure to reach more Chinese consumers.
- The results indicate the high demand for fruits and vegetables among Chinese consumers in the 13 provinces where the research participants of this study were from. Further research is needed to quantify the demand more accurately.
- Taste perception can be highly important among Chinese consumers, which leads to their purchase of imported fruits and vegetables. Producers should be aware of this and need to ensure that they deliver quality fresh produces with superior taste.
- Chinese consumers may have a high willingness to pay premiums for fresh produces. It is indicated that Chinese consumers would pay a high premium for organic certified produces but not for the produces with a food safety label. Further research is needed to ascertain and quantify these findings.

15. Conclusion

This study investigates factors which influence Chinese consumers purchasing behaviour and Chinese consumers' preference and willingness to pay for imported Australian fresh produces. The literature review indicated that behavioural attitudes, health consciousness, product information and environmental standards have a strong influence on consumers' purchasing behaviour with moderate correlation wih some other factors. The consumers survey results indicated that the Chinese consumers generally preferred high quality and organic fresh fruits and vegetables. SEM analysis reveals that the consumers' quality perception of fresh fruits and vegetables may not lead to their satisfaction, but it had a strong influence on developing their view about a clean and green image of Australian fresh produces. The results also indicate some association between the education level and the family size (in terms of number of children) of the respondents with their purchasing behaviour. The respondents with higher household income but without a tertiary qualification were more likely to prefer Chinese produces rather than imported fresh produces. The analysis using a price model employing total payment indicates that the male respondents without children would purchase fresh produces from Australia and New Zealand. Overall, the Chinese consumers' willingness to pay a premium price for imported Australian fresh produces was high, and the consumers would pay a higher premium for organic certified produces.

Australian producers and other stakeholders in the export supply chain can consider some take-away implications from this study. First, in order to ensure the sustainable export supply chain of fresh fruits and vegetables, the quality of produces should not be compromised. There is a need for the development of an information system regarding quality requirement for fresh produces to guide the existing and interested producers in the export supply chain. One important finding of the study is that the Chinese consumers did not trust food safety labels as an indication of high quality, but they highly preferred produces with organic certification. This provides Australian producers with some indications to Australian producers about where to invest in the future.

The current study demonstrates the level of acceptance of Australian fresh produces among Chinese consumers. Attributes such as taste, organic certification, low nutrition information and average appearance, should be considered by Australian producers to increase the market share. A future study focusing more on individual norms and behavioural factors of Chinese consumers and the influence of these norms and factors on consumers' purchasing decision could be conducted. Also, future research is recommended to ascertain the findings of this study with a larger and diverse consumer cohort.

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Appendix

Consumer Survey

Consent From

To provide us with your consent to participate in this study please read the information below and indicate your consent by checking the box at the bottom at this page:

1. An Information Sheet about the survey consumers perception of Australian fresh fruits and vegetables has been provided to me which I have read and understood.
2. I have been advised about the potential risks associated with this survey and that I have the opportunity to ask the research team any questions I may have about the survey and my participation.
3. I understand that my participation in this research is entirely voluntary. I have been invited to participate and I am free to withdraw from the survey at any time before clicking on the submit button. My non-participation or withdrawal of consent will have no consequences.
4. I understand a third-party service provider Qualtrics will collect data on behalf of CQU research team. I also understand that Qualtrics will be in data confidentiality agreement with CQU to ensure the privacy of collected data.
5. I understand that I will have the right not to provide information which is of personal nature.
6. I understand that any information or personal details gathered during the study will remain confidential and that all responses are anonymous.
7. I understand that findings from this survey will be made available through CRCNA's project webpage.
8. I understand that if I have any query or concern regarding the survey, I can contact the research team and/or the ethics office only via email.
9. I am aware that I can contact the research team directly should I have any questions or concerns about my participation in the survey. Their contact details are: A/Prof. Delwar Akbar, School of Business and Law, CQUniversity, Rockhampton, Qld 4702. Email: d.akbar@cqu.edu.au;
10. If I have concerns or complaints regarding the way the research is or has been conducted, I can contact the Ethics Officer at CQ University via email: ethics@cqu.edu.au.

☐ By checking this box, I am indicating that I have read and agree with the consent form and would like to continue to take the survey.

PART A:

Screening questions

Q1: Please indicate which age group (in years) you belong to:

- ☐ Below 18 (**screened out**)
- ☐ 18—24
- ☐ 25—29
- ☐ 30—34
- ☐ 35—39
- ☐ 40—44
- ☐ 45—49
- ☐ 50—54
- ☐ 55—59
- ☐ 60—64
- ☐ 65 and above

Q2: Please provide the name of the province you live.

Response option:
1. Guangdong, 2. Guangxi, 3. Hainan, 4. Henan, 5. Hubei, 6. Hunan, 7. Shanghai, 8. Jiangsu, 9. Zhejiang, 10. Anhui, 11. Fujian, 12. Jiangxi, 13. Shandong (**in a drop-down menu)**

Q3: Which of the following best describes your food preferences? (select one option)

- ☐ I eat fruits, vegetables, meat, and seafood
- ☐ I am a vegetarian (I do not eat meat or fish/seafood)
- ☐ I am vegan (I do not eat animal products including dairy products, eggs, seafood, fish, white meat, or red meat)
- ☐ I am a flexitarian (I try to eat mostly plant-based products, but sometimes eat animal products)
- ☐ I eat fruit/vegetables and seafood – but not meat

Q4: Please indicate how often fresh fruits and/or vegetable products are purchased in your household:

- ☐ 1. Regularly (at least 1-3 times per week)
- ☐ 2. Often (at least 1-3 times per fortnight)
- ☐ 3. Rarely/Occasionally (1-3 times per month)
- ☐ 4. Never (**exit survey**)

Questions about your perception on fresh fruits and vegetables

Q5: Using the scale below, please indicate how frequently you purchase fresh fruits and vegetables for your household from each of the following market types.

Please provide a response to EACH item:

Options	Not at all	Rarely/Occasionally (at least 1-3 times per month)	Often (at least 1-3 times per fortnight)	Regularly (at least 1-3 times a week)
Farmer's markets/Street vendors				
Local retail shops				
Premium speciality retailer				
Hypermarket				
Supermarket				
Online retail				

MOTIVATION TO PURCHASE FRESH FRUITS AND VEGETABLES

Please choose the BEST OPTION ONLY for EACH statement:

Q6: I buy fresh fruits and vegetables because _____ (complete a response in each row)

Items	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Fresh fruits and vegetables are healthier option.					
I like the taste of the fresh fruits and vegetables.					
I buy fresh fruits and vegetables for gift purposes.					
I buy fresh fruits and vegetables because my family members like them.					
I buy fresh fruits and vegetables because they are cheaper than processed fruits and vegetables.					
I buy fresh fruits and vegetables because they are available all year-round.					
I purchase fresh fruits and vegetables during cultural festivals.					
It is our family tradition to buy fresh fruits and vegetables.					

PERCEPTIONS ABOUT THE QUALITY OF FRESH FRUITS AND VEGETABLES

Q7: Please choose the BEST OPTION ONLY for each of the following statements.

Items	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I judge the quality of the fresh fruits and vegetables by their appearance.					
I judge the quality of the fresh fruits and vegetables by touching and smelling them.					
I judge the quality of the fresh fruits and vegetables by the quality assurance sticker.					
I judge the quality of the fresh fruits and vegetables by their country of origin.					
I judge the quality of the fresh fruits and vegetables based on the shop type/location where I purchase it.					
I judge the quality of the fresh fruits and vegetables based on recommendations and/or ratings received on social media.					

PERSONAL PREFERENCE

Q8: Please select the BEST OPTION ONLY for each of the following statements.

Items	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
It is a current trend in China to buy fresh fruit and vegetable products.					
I enjoy spending money on fresh fruits and vegetables compared to frozen or processed options.					
I get pleasure from eating fresh fruits and vegetables.					
I enjoy fresh fruits and vegetables while having meals with family or friends.					

ENVIRONMENTAL CONCERNS

Q9: Please select the BEST OPTION ONLY for each of the following statements.

Items	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Fresh fruits and vegetables should be produced in an environmentally friendly way.					
It is important to produce fruit and vegetables without genetical modification.					
Food safety is very important for fresh fruit and vegetable products.					
Appropriate certification (e.g. green certificate) should be used so that in-store fruit and vegetables are properly labelled.					
Detailed information regarding the entire supply chain of fresh fruits and vegetables should be available for the consumers (traceability).					

IMPORTED FRESH FRUITS AND VEGETABLES

Q10a: Have you ever bought imported fresh fruits and vegetables (SELECT ONE)

☐ Yes

☐ No (**exit to part B, choice experiment**)

Q10b: Please select the BEST OPTION ONLY for each of the following statements.

Items	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I am satisfied with the available range of imported fresh fruits and vegetables in the marketplaces.					
I am satisfied with the current state of environmental standard certification of imported fresh fruits and vegetables.					
I am satisfied with the information available about imported products.					
I am satisfied with the quality of the imported fresh fruits and vegetables.					
I would purchase more imported fresh produce if it were in my local retail store.					
I would pay premium price for imported products compared to the local products					

CURRENT MARKET STATUS OF AUSTRALIAN FRESH FRUITS AND VEGETABLES.

Q11a: Have you ever bought fresh fruits and vegetables imported from Australia (SELECT ONE)

☐ Yes

☐ No (**exit to part B, choice experiment**)

☐ Not sure (**exit to part B, choice experiment**)

Q11b: Please select the BEST OPTION ONLY for each of the following statements.

Items	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I am satisfied with the current state of environmental standard certification of Australian fresh fruits and vegetables.					
I am satisfied with the information available for the certified Australian producers.					
I like the quality of Australian fresh fruits and vegetables.					
I would purchase more Australian fresh produce if it were in my local retail store.					
I would pay premium price for authentic Australian fresh fruits and vegetables.					

AUSTRALIAN FRESH FRUITS AND VEGETABLES

Q12: Please select the BEST OPTION ONLY for each of the following statements

Items	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I learned about Australian fruits and vegetables from my family and friends.					
I believe Australian fruit and vegetable products are environmentally friendly.					
I trust appropriate label to identify authentic Australian products.					
Australian products are fresh and tasty compared to the products from other countries.					
Australian fresh fruits and vegetables have environmental standard certification.					
My friends and family are impressed if I purchase Australian products					
Australian fresh fruits and vegetables are good for gift purposes.					

PART B: Choice Experiment

Choice Tasks

As part of this survey, we would like you to make some choices about your preference for buying fresh fruits and vegetables. On the following pages, you will be shown different scenarios which offer options for fresh fruits and vegetables from different origin and attributes.

We want to identify your interest and willingness to pay for premium imported fruits and vegetables. The attributes presented in the choice cards are reflecting your motivation for purchasing imported products.

The next page explains all the attributes briefly and explains your task on the set of choice cards.

This experiment involves six choice tasks about your preference for purchasing fresh fruits and vegetables. The choices for each task may look very similar, but they do differ. Please treat each page separately. Please indicate your preference by selecting JUST ONE of the options in the last row of the choice set for each choice card.

CHOICE CARD EXAMPLE

Appearance *refers to the physical state and condition of the product.*

Availability of nutritional facts *refers to the level of information regarding the nutrition available to the consumer.*

Food safety label *refers to the presence of food safety sticker on the product.*

Attribute levels for Option 1, Option 2, and Option 3 *will change for each Choice Card.*

Choice Card 1				
Attributes	**Option 1** Produced in Australia and/or New Zealand	**Option 2** Produced in South America (e.g., Chile, Brazil)	**Option 3** Produced in other country of Asia (excluding China) and Africa	**Option 4 (opt-out)**
Appearance	Premium	Average	Premium	I would only buy Chinese fruits and vegetables.
Availability of nutritional facts	No information	Medium information	High information	
Food safety label	No label	Food safety label	Food safety label	
Environmental certification	No label	中国环境标志认证	ORGANIC	
Price premium	I would pay **¥1** per kg more than the price of domestic produces	I would pay **¥3** per kg more than the price of domestic produces	I would pay **¥5** per kg more than the price of domestic produces	
Your choice	☐	☐	☐	☐

Environmental certification *refers to the availability of environmental or organic label on the product.*

Price premium *refers to your willingness to pay additional money for premium imported products..*

Attribute levels for Option 4 *will remain the same for each Choice Card. Selecting this option refers that you are only choosing Chinese products for consumption.*

Please indicate your preference by selecting ***JUST ONE*** *of these options (in each choice card).*

CHOICE CARD 1 (Q13)

Please select the option that you most prefer based on your experiences

Choice Card 1				
Attributes	**Option 1** Produced in Australia and/or New Zealand	**Option 2** Produced in South America (e.g., Chile, Brazil)	**Option 3** Produced in other country of Asia (excluding China) and Africa	**Option 4 (opt-out)**
Appearance	Below average	Average	Excellent	I would only buy Chinese fruits and vegetables.
Availability of nutritional facts	High information	Medium information	No information	
Food safety label	Food safety label	No label	No label	
Environmental certification	No label	中国环境标志认证		
Price premium	I would pay ¥3 per kg more than the price of domestic produces	I would pay ¥3 per kg more than the price of domestic produces	I would pay ¥5 per kg more than the price of domestic produces	
Your choice	☐	☐	☐	☐

CHOICE CARD 2 (Q14)

Please select the option that you most prefer based on your experiences

Choice Card 2				
Attributes	**Option 1** Produced in Australia and/or New Zealand	**Option 2** Produced in South America (e.g., Chile, Brazil)	**Option 3** Produced in other country of Asia (excluding China) and Africa	**Option 4 (opt-out)**
Appearance	Excellent	Below average	Premium	I would only buy Chinese fruits and vegetables.
Availability of nutritional facts	No information	High information	Low information	
Food safety label	Food safety label	No label	Food safety label	
Environmental certification	No label			
Price premium	I would pay ¥3 per kg more than the price of domestic produces	I would pay ¥5 per kg more than the price of domestic produces	I would pay ¥3 per kg more than the price of domestic produces	
Your choice	☐	☐	☐	☐

CHOICE CARD 3 (Q15)

Please select the option that you most prefer based on your experiences

Choice Card 3				
Attributes	**Option 1** Produced in Australia and/or New Zealand	**Option 2** Produced in South America (e.g., Chile, Brazil)	**Option 3** Produced in other country of Asia (excluding China) and Africa	**Option 4 (opt-out)**
Appearance	Excellent	Average	Average	I would only buy Chinese fruits and vegetables.
Availability of nutritional facts	High information	Low information	Low information	
Food safety label	No label	Food safety label	Food safety label	
Environmental certification	中国环境标志认证	中国环境标志认证	No label	
Price premium	I would pay ¥1 per kg more than the price of domestic produces	I would pay ¥5 per kg more than the price of domestic produces	I would pay ¥10 per kg more than the price of domestic produces	
Your choice	☐	☐	☐	☐

CHOICE CARD 4 (Q16)

Please select the option that you most prefer based on your experiences

Choice Card 4				
Attributes	**Option 1** Produced in Australia and/or New Zealand	**Option 2** Produced in South America (e.g., Chile, Brazil)	**Option 3** Produced in other country of Asia (excluding China) and Africa	**Option 4 (opt-out)**
Appearance	Premium	Excellent	Below average	I would only buy Chinese fruits and vegetables.
Availability of nutritional facts	Low information	No information	High information	
Food safety label	Food safety label	Food safety label	No label	
Environmental certification			No label	
Price premium	I would pay ¥5 per kg more than the price of domestic produces	I would pay ¥5 per kg more than the price of domestic produces	I would pay ¥3 per kg more than the price of domestic produces	
Your choice	☐	☐	☐	☐

Based on the choice you have made on the choice experiment could you please specify

Q17: How much of your chosen option will you buy in a single shopping trip

Response option: < 1kg, 1kg, 2kg, 3kg, 4kg, 5kg, >5kg (Drop down menu)

Q18: How frequently would you buy your chosen option

Response option: more than twice a week, twice per week, once per week, twice per month, once per month, less than once per month (Drop down menu)

Your experience in completing the choice tasks

Q 19: For the choices you have just made, please select the BEST OPTION ONLY for the following statements

Items	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I am confident that I made the correct choices.					
I understood the information in the questionnaire.					
I needed more information than was provided.					
I found the choice options to be credible.					
I found the choice options confusing.					
Choice cards are adequately covered the possible options.					

PART C: General respondent information

The questions in this section relate to general respondent's characteristics. Please be assured that your responses to these questions will remain STRICTLY CONFIDENTIAL.

Q20: Which gender do you identify with the most?

- ☐ Male
- ☐ Female
- ☐ Neither male nor female
- ☐ Prefer not to answer

Q21: Which of the following best describes you?

- ☐ Single/ widower
- ☐ Single parent (number of children _____)
- ☐ Married/partnered with no children in the household
- ☐ Married/partnered with one child living in the household, Age of the child ____
- ☐ Married/partnered with two or more children living in the household, Age of the children_____

Q22: Please indicate how many people typically reside in your household including yourself?

- ☐ 1 person
- ☐ 2—3 people
- ☐ 4—5 people
- ☐ 6 —7 people
- ☐ 8 or more people

Q23: In an average week, my household spending on fruits and vegetables is…

- ☐ Below ¥50
- ☐ ¥50—¥149
- ☐ ¥150—¥249
- ☐ ¥250—¥349
- ☐ ¥350 and above

Q24: Your annual household income is

- ☐ Below ¥99,999
- ☐ ¥100,000—¥199,999
- ☐ ¥200,000—¥299,999
- ☐ ¥300,000—¥399,999
- ☐ ¥400,000 and above
- ☐ prefer not to say

Q25: What is your normal employment status?

- ☐ Employed (Full-time/part time/casual)
- ☐ Self-employed
- ☐ Unemployed/Currently seeking work
- ☐ Student
- ☐ Retired

Q26: Please indicate which of the following represents the highest education level you have completed.

- ☐ No formal qualifications
- ☐ Primary education
- ☐ Secondary education.
- ☐ Trade/vocational qualifications
- ☐ Tertiary qualification (University degree)

Q27: Please indicate who is the main grocery shopper in your household?

- ☐ Myself
- ☐ My partner
- ☐ My parents
- ☐ We do grocery shopping together (e.g. as a whole family or with a partner)
- ☐ Other

Many thanks for your time and efforts.