VALUATION OF COUNTRY OF ORIGINS OF ORGANIC PROCESSED FOOD A COMPARATIVE STUDY OF CONSUMER DEMAND FOR SOYMILK IN THE UNITED STATES AND CHINA

by

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Abstract

The organic food market in the United States expanded rapidly at annual rates between 12% and 21% from 1997 to 2008, yet the adoption rate of organic farming remained stagnant. Industry sources suggest that the degree of outsourcing organic inputs has been increasing during the most recent years. Organic foods are available at traditional supermarkets and mass merchandisers. Many retailers now offer organic food products in their private labels. This study focuses on organic soymilk, which illustrates these recent trends.

China, a major low income country which supplies organic agricultural ingredients to the U.S., has raised food safety concerns fueled by recent incidents. Organic foods have been marketed in China as eco-products in an effort to promote safer foods to meet domestic needs. While organic soybean is one of China's primary organic exports, China has been the leading importer of conventional soybeans with U.S. as its largest source, but most U.S. production is transgenic. China has a labeling policy on GM (genetically modified) products, which has been more tightly enforced in recent years.

This thesis examines U.S. and Chinese consumers' valuations of attributes of processed organic products, with an emphasis on eliciting their preferences of organic ingredients from different origins, in the case of soymilk. A survey was designed for each country. The U.S. survey was administered online nationwide. An enumerated survey was administered at three types of food retail channels in Beijing, Shanghai and Guangzhou in China. Respectively, 316 and 300 responses were collected from the U.S. and China. Choice experiment was used to elicit consumer values for various attributes of soymilk in both markets.

The results show that consumers in both countries are willing to pay premiums for processed foods such as soymilk with organic and non-GMO ingredients. The premium for organic soybeans is significantly higher than that for non-GMO beans. The results also indicate that U.S. consumers hold strong preferences for organic soymilk produced with domestically produced soybeans. In terms of brand preferences, U.S. respondents are willing to pay more for national brands relative to store brands, with taste as a major differentiating factor. In contrast, Chinese urban consumers' valuations depend greatly on nationalities of certifying agencies. U.S. certified organic product was perceived higher than EU or Chinese certified organic products, but Chinese-certified non-GMO products were preferred over those certified by U.S. agencies. Chinese urban consumers' values varied by cities and retail types, where they were surveyed.

Table of Contents

List of Figures

List of Tables

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Chapter 1 Introduction

1.1 Current Trends in the U.S. Organic Market

The organic food market in the United States has been expanding dramatically during the last decade, driven mainly by fast increases in consumer demand. Total sales of organic foods increased from 3.6 billion to 21.1 billion dollars at an annual rate between 12% and 21% from 1997 to 2008 (Nutrition Business Journal 2008). The percentage of U.S. adult consumers who bought organic products at least occasionally increased from 44% in 2001 (Food Marketing Institute 2006) to over 75% in 2008 (Organic Trade Association 2008a). In the 1990s, fruits and vegetables dominated nearly half of the organic consumption. Consumers now purchase a wide variety of organic products. The sales of processed organic food such as organic dairy, beverages, packaged and prepared foods have increased from 54% in 1997 to 63% of total organic sales in 2008 (Dimitri and Oberholtzer 2009). Accompanying the rapid growth of the organic market, a few trends have been observed in recent years.

The first trend is observed in the marketing channels. More and more conventional retail stores, besides health and natural stores, have entered the organic market and introduced organic products. In 1992, 68% of organic products were sold in health and natural stores and only 7% were available in conventional supermarkets (Dimitri and Greene 2002). However, by 2002, organic products are not only available in nearly 20,000 natural foods stores but also carried by 73% of all conventional grocery stores (Dimitri and Greene 2002). Virtually all large-box supermarkets across the country, including Wal-Mart and Target, developed sections of organic products in recent years, offering more convenience for organic shoppers. Sales of organic products in conventional supermarkets (e.g., Kroger) exceeded 4.4 billion dollars in 2009, accounting for 71.6% of all organic sales in natural supermarkets and FDMx (food, drug and mass merchandisers which include conventional supermarkets, excluding Wal-Mart) (Mintel 2009b). About 36% of the respondents of a national consumer survey in Mintel report indicated that conventional supermarkets are their primary source for organic food and beverages (Mintel 2009b). In contrast, natural supermarkets like Whole Foods Market, and natural stores like Trader Joe's were regarded as the primary retailing sources for 21% (Mintel 2009b).

Soaring demand for organic products also drove various types of retailers, including natural food stores, conventional supermarkets, and mass merchandisers to introduce store-brand (private label) organic products (Zhuang, Dimitri and Jaenicke 2009). In 2008, the market share of store-brand organic products was estimated at 17.4% in the United States (Nielsen 2008). Safeway's O Organics and Whole Food's 365 Organics attempted to compete with mainstream, national brands with a wider selection of organic products and lower prices. In addition, some natural stores such as Safeway which created the leading store brand of organic products attempted to differentiate their new store-brand organic products from "typical" store-brand products. Their strategy to separate the store name from their store-

brand organic product is an indication of disappearing boundaries between store brands and mainstream brands (Mintel 2008b). Also, efforts on using quality ingredients and attractive packaging may make once generic store-brand products appealing to organic consumers, especially during the recession period. More than half of organic or natural food consumers claimed to buy a mix of store-brand and national-brand organic products in 2009 (Mintel 2010b).

Another notable trend is an increase in imports of organic products. Although demand for organic products has been growing fast, the adoption rate of organic practice in the U.S. has remained low. Only a small percentage of the major U.S. field crops were grown under certified organic farming systems—corn (0.2%), soybeans (0.2%), and wheat (0.5%) (Greene 2007). Fifty-two percent of the organic companies reported that the lack of dependable supply of organic raw materials has restricted their companies from generating more sales of organic products (Wilcox 2007). Industry sources suggested that with increasing sales of organic processed products in recent years, outsourcing of organic ingredients by manufacturers of organic processed products has become a common practice given the shortage of domestic supply (Wilcox 2007; Greene et al. 2009). In 2008, the value of organic imports into the U.S. exceeded the value of U.S. organic exports by as much as a 4 to 1 ratio (USDA-FAS 2008). Moreover, certifying agencies accredited by the National Organic Program (NOP) certified 11,000 producers and handlers in over 100 foreign countries in 2007 (Greene et al. 2009), which facilitated imports of organic products into the U.S.

A fact worth mentioning is that the major trade partners with the U.S. in terms of organic products include the developing countries in Latin America and Asia with lower farm labor costs (Greene 2009). However, as the food safety legislation is often incomplete or has failed to meet the international requirements in developing countries, U.S. consumers' perceptions of the imported organic food from those regions may not be positive. In addition, frequent food safety incidents that occurred in the last decade may also influence the perceptions of domestic consumers in the developing countries towards domestically produced organic food products and thus impact their domestic market growth and production of organic products.

These trends could have significant impact on the future growth of the organic sector and the economic welfare of the players along the organic supply chain in the U.S. Because the financial performance and long-term prosperity of organic market is largely determined by consumers' willingness to pay for a price premium (Yiridoe et al. 2005), it is important to understand consumers' perceptions of and preferences for attributes of organic products.

Early studies found that consumers revealed high concerns for the environment which drove them to purchase organic foods in the 1980s and 1990s, (Oberholtzer, Dimitri and Greene 2005). More recently, some studies suggest that food safety and health benefits are the most prominent factors motivating organic food consumption (Vindigni, Janssen and Jager 2002; Harper and Makatouni 2002; Essoussi and Zahaf 2008; Tsakiridou et al. 2008). However, consumers' interests could evolve due to the changes in the market structure, marketing practices and procurement practices of

organic manufacturers. A recent nationwide survey of U.S. consumers indicated that 14 percent of organic consumers were concerned with country-of-origin issues (FAO/ITC/CTA 2001). In addition, supporting local and small farmers appeared to be one of the major reasons for consumers to purchase organic food lately (Whole Foods 2004). Thus, it is important to update the literature and address the newly emerging trends in the organic market.

The studies on consumer preferences for organic processed food products are especially limited relative to those on fresh products, probably because of the complexity in defining the attributes of processed food. This study aims to examine consumer attitudes towards these new phenomenon observed in the organic processed product markets. The primary focus is on soymilk, a rapidly growing market subjected to the emerging trends discussed above but without any previous study from this perspective.

1.2 U.S. Organic Soymilk Market

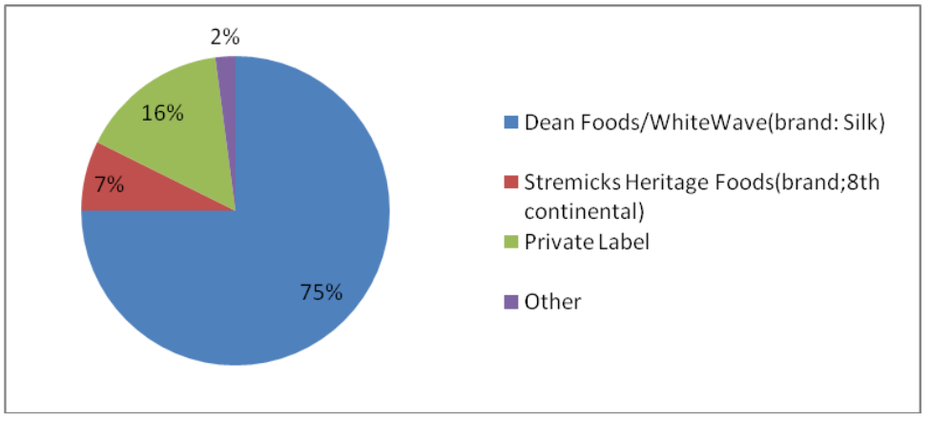
Organic soymilk has been one of the fastest growing products in the organic food sector in recent years. In the 1980s, soymilk started to gain popularity in the U.S. as people's awareness of health benefits and organic foods grew. The product was first introduced into natural food stores. Eden Foods, based in Clinton, Michigan, developed the first branded shelf-stable soymilk product in 1983 (Ferrier and Lewandowski 2002). In 1996, Silk soymilk of WhiteWave based in Boulder, Colorado, was put on the market as the first refrigerated soymilk in the nation. Such innovation dynamically improved the performance of this product. From 2003 to 2008, organic soymilk has been one of the biggest sellers in the organic non-dairy beverage category which led the growth of the organic beverage market (Mintel 2008b). In particular, the sales of Silk brand organic soymilk, the dominant brand, increased by 56% from 2006 to 2008 and accounted for one third of the organic non-dairy beverages market (Mintel 2010a). According to a national survey, around 17% of the U.S. population drinks soymilk and 70% of the soymilk drinkers consume soymilk as least once per month in 2008 (Mintel 2008a).

Expanding market channels also accelerated the growth of soymilk industry. Once only found in natural food stores, soymilk is now widely available at traditional supermarkets and mass merchandisers including Wal-Mart. In 2008, conventional supermarkets became the leading channel for soy-based food and beverage, accounting for 88% of the market shares (Mintel 2008b). Yet, conventional supermarkets are gradually losing shares to mass-merchandisers. The sales in mass-merchandisers and drug stores grew 9% from 2007 to 2008 as budget-conscious shoppers looked to mass retailers to save time and money. Such change could possibly boost the sales of soymilk because of the national-wide scale and availability of these types of stores.

Soaring demand for soymilk product attracted various types of retailers to introduce store-brand soymilk products. Silk, which was acquired by Dean Foods in 2002, has been dominating the soymilk market with 75% of the

market shares and sales of $360 million in 2009 (Mintel 2008a; Mintel 2009b). The second-largest national brand of soymilk, 8th Continent, followed accounting for 7.3% share (Figure 1-1). The dominance of national brands, however, is challenged by a boom of store-brand soymilk products offered by stores across all types of marketing channels. Great Value by Wal-Mart and O Organic soymilk by Safeway exemplify sophisticated private label products that have been created to compete with national brands. Increasing product innovations and lower prices are intended to make store brand soymilk more accessible to average consumers. Consequently, the sales of soymilk under store brand increased by 52% from 2007 to 2008, while sales of Silk increased only by 8.7% during the same time (Mintel 2008a).

Figure 1-1: Brand share of soymilk market (U.S.)



Soymilk makers have taken various strategies to increase their sales. Both types of brands—store brands and national brands—have emphasized the organic nature of soymilk products to boost the sales. In addition, national brand soymilk put in efforts on advertising and marketing soymilk with the focus on improved taste. According to the Nielsen monitor, Silk spent $25 million on media to launch its taste-focused "Take a Sip Forward" ad campaign as to attract new consumers by emphasizing its superior taste. Store brands, on the other hand, recently have introduced lines of organic soy beverages with much lower price. For example, a half-gallon of store brand soymilk retailed for $2.96 on average opposed to $3.45 for Silk in 2008 (Mintel 2008a). The effectiveness of these strategies depends on consumer valuations towards these two attributes: taste and price.

Despite the rapid increase in sales of organic soymilk, the U.S. acreage for organic soybeans, the major ingredient of soymilk, only increased by 10% during the same period from 2006 to 2008 (USDA-ERS 2010). Hence, a gap between domestic demand and domestic supply of organic soybeans exists. Due to the shortage of domestically grown organic soybeans, U.S. feed grain distributors and soy product manufacturers reported sourcing organic soybeans from other countries (Greene et al. 2009). According to the Cornucopia Institute, an organic industry watchdog based in Wisconsin, it was estimated that 50% of organic soybeans consumed in the U.S. were imported from China (Cornucopia

Institute 2009). Specifically in 2008, approximately 95 million kilograms organic soybeans were imported from China and approximately 120,000 kilograms from India. Similar statement about organic soybeans were made in several other studies (Dimitri and Oberholtzer 2009; Greene et al. 2009; Pozo 2009).

Increasing imports of organic soybeans by soymilk manufacturers had caught the public's attention on the quality of the imported beans. In 2009, the Cornucopia Institute created a scoreboard to evaluate the integrity of organic soy product companies in procuring their ingredients. Based on its report (2009), some big soymilk brands such as Vitasoy USA, Westsoy, SoyDream and Silk sourced large quantities of organic soybeans from China or India to meet the soaring demand. In comparison, some small national brands such as Eden Foods or Organic Valley stated that they sourced organic soybeans from American farms, which abided by the National Organic Program regulations strictly. In 2009, the Organic Consumers Association called for a boycott of Silk products because it was reported that Silk sourced organic soybeans from China and Brazil with disputable standards. Under the public pressure, Silk brand soymilk started to substitute U.S. grown non-genetically modified (GM) soybeans for imported organic soybeans. Correspondingly, the "organic" label on the product packaging was changed to "all natural", a widely challenged, voluntary labeling used by the processors. There is no consensus on regulating the "all natural" label. Some organizations consider "natural" as essentially conventional, non-organic product. It still remains to be seen how consumers who were used to buy Silk organic soymilk respond to such change in the labeling.

1.3 The Soymilk Market in China

Unlike in the high income countries such as the U.S. and the European Union where the organic market is primarily generated by domestic demand, organic farming and market for organic products in China were initially driven by exports in 1990s. Before 1999, over 95% of China's organic products were exported directly through organic traders, mainly to Japan, the EU and North America (Scoones 2008). In 2006, China's organic exports were valued at 350 million U.S. dollars, which is 1.2% of China's total food exports by value (Li 2007). Comparatively speaking, the size of domestic market remains small, accounting for roughly 0.02% of the food market share in 2006 (Lagos et al. 2010).

Higher income has prompted increasing interests in organic products in China, which has stimulated sales of organic products in domestic markets. The food safety incidents occurred over the past several years has also fueled domestic demand for organic food. In 2006, the Ministry of Agriculture(MOA) in China conducted a national inspection and found that more than 80% of the vegetable samples retained pesticide residuals over the maximum amount regulated by National Food and Safety Bureau (Lv, An and Guo 2006). In 2008, six Chinese infants died and nearly 300,000 children were sickened by the infant formula adulterated with melamine.

As part of an effort to promote safer food, organic foods in China have been marketed as eco-products that are free from chemical contamination. Studies have reported consumers' interest in organics to avoid risks of food safety incidents (Yang 2005; Yin 2008; Wang et al. 2009). A few processed products, such as organic chocolates and beverages, have entered China's domestic market. There even appeared imported organic lettuce and carrots in upper class neighborhoods in Beijing and Shanghai (Lagos et al. 2010). It can be expected that continuing income growth and increasing awareness of food safety problems will further boost China's organic market. Hence, it would be interesting to examine China consumers' attitudes towards various attributes of organic food products. This study focuses on soymilk, a main item of daily breakfast for consumers in China.

China is the first country where soymilk was produced. The oldest evidence of consuming soymilk dates back to 25 to 220 A.D. (Shurtleff and Aoyagi 2009). Soymilk is regarded as a major source for plant protein in China. The majority of soymilk in China is consumed fresh. Chinese consumers have always favored freshly pressed soymilk for breakfast over refrigerated milk produced the night before. Freshly made soymilk can be easily purchased from deli section at supermarkets, breakfast restaurants, or vendors in farmers' markets every day. Packaged soymilk market was first introduced to the Chinese market in 1983. Compared to other non-soymilk beverage market which maintained 20% annual growth rate for the last two decades (Heiniu Food Company 2009), however, the packaged soymilk market expanded slowly. The consumption for packaged soy products per capita has increased only by 1.5% during the period from 1993 to 2000 (Xia 2004). The 2002 China National Nutrition and Health Situation survey data showed that the daily intake of soymilk for Chinese resident was 12.0 gram per capita on average. Ma et al. (2008) found that, on average, 25% of the respondents consumed soymilk. Such percentage varied greatly between samples in city, towns and villages. In large cities, nearly 60% of respondents consumed soymilk while only 13% did in the villages, probably due to the lack of access to freshly made soymilk (Ma et al. 2008). In 2006, China's government made endorsements to recommend increasing soy beverage consumption because of its nutritional contents (Tian 2006), which could have increased the soymilk consumption in China.

After the baby milk scandals in 2008, Chinese consumers' demand for soymilk further increased. Moreover, consumers became more prone to make soymilk from soybeans themselves by using soymilk makers in order to better control their food quality and safety (Bi 2008). Joyoung, the largest company of soymilk makers in China sold around 5 million units in 2008 with total sales of 4.32 billion yuan, up 123 percent from the year before (Bi 2008). It has been predicted that such growth rate for soymilk makers will remain at 40% over the next three to five years (Bi 2008).

Food safety concerns make Chinese pursue for food products with certain assurance. One assurance was an introduction of "hazard free" foods, which were promoted to address the most concerned problems of veterinary medicines, illegal use of high-toxic pesticide and violations of residue standards. The agricultural products with this

label are required to go through supervisory processes to ensure residues of toxic and harmful substances in food are limited within the allowable range regulated by "Hazard free agricultural food standards" (Hazard Free Food Official website). Another assurance is the "green food" certification issued by the Chinese Green Food Development Center under the management of the Chinese Ministry of Agriculture. It is defined to be the food that "follow the principles of sustainable development, in accordance with the production of specific production methods which used no or limited amount of chemical inputs, fertilizers or addictives" (Green Food official website). Soymilk with the "green food" label has been introduced by packaged soymilk producers. As of 2010, 34 brands of soymilk have used the "green food" label. Alternatively, some foreign organic brands such as Organic Valley soymilk from Australia have appeared in retail stores in China and could be purchased online through e-commerce platforms. However, there has not been any organic soymilk product produced by Chinese companies yet. Nonetheless, sales of organic soybeans spiked after the baby milk formula incident in 2008. Organic soybeans are available in conventional supermarkets and specialty stores in large cities in China. Consumers can also purchase organic soybeans through online stores and home delivery services offered by organic companies (Lagos et al. 2010).

While organic soybeans is one of China's primary organic exports (Lagos et al. 2010), China has become the largest soybean importer in the world. Currently, most of the soybean production is concentrated in northeastern regions of China. Heilongjiang province alone produces around one third of all soybeans produced in China. However, in 2009 processing companies in Heilongjiang imported 441,000 metric tons of soybeans from other countries to counter the supply deficiency (Li and Pan 2009), which illustrates the underlying trend of increasing soybean imports to meet China's significant underutilized oilseed crushing capacity. Based on the data released from the USDA briefing room, nearly 60% of world trade of soybeans in 2010 is attributable to China's sharp rising demand. It is also projected that China will account for more than 85% of the projected growth in soybean imports over the next 10 years. The U.S., Argentina, Brazil are the largest trade partners with China in soybean trade. A notable fact is that the adoption rates of GM soybeans in these three countries increased substantially during the recent years, which likely implies that a significant proportion of China's soybean imports are transgenic. Because imported transgenic soybeans usually have around 2-3% higher oil yield relative to domestically produced soybeans and are priced lower (Li and Pan 2009), increased imports could severely threaten the economic well-being of local soybean producers in China. Thus, producers in Northeast area of China have been encouraged to apply for geographic indications to maintain their competitive advantage in domestic or international market. Also, because China's government has mandated GM imports entering China to be labeled in January 2002 (Gale et al. 2002), some domestic soybean producers tried to market their products by emphasizing their non-GMO attribute.

The domestic soybean producers' marketing strategy is likely effective. It was indicated by studies that Chinese consumers revealed interest in paying more for non-GMO vegetable oil and avoided GM foods in general after the enact of labeling regulations (Ho, Vermeer and Zhao 2006). Consequently, concerns related to GM foods may generate consequential impact on consumers' preferences for organic food which contains no GM organisms either. Also, there may be awareness growing about origins of ingredients, especially for soy products, because of growing concerns about GM foods.

Previous studies indicate that a lack of trust towards various certifying authorities could significantly deter organic food consumption in China (Yin, Wu and Chen 2008; Zou and Jia 2009). Because organic production in China were initiated by the export market, domestic organic food standards were developed based on exports standards set by international certification agencies. Organic food certifiers in China abide by the basic standards established by Codex Alimentarius and IFOAM(International Federation of Organic Agriculture Movement), which set the minimum requirements of certified organic food products (Willer and Yussefi 2007). Organic products issued by foreign agencies such as ECOCERT (French origin), BCS (based in Germany), IMO (based in Switzerland), OCIA (based in the United States) and JONA (based in Japan) can be found in the China's market. Most of these agencies are accredited by IFOAM (Willer and Tussefi 2007). For the products sold in the domestic market in China, labels created by the China National Certification and Accreditation (CNCA) are required on all organic foods since the end of 2006. As a result, all organic products sold in the domestic market must first be certified by Chinese official certifiers such as the China Organic Food Certification Center (COFCC). Third party certifying centers, private firms, and NGOs in China could also provide certifications as long as they are accredited by the CNCA (Lagos et al. 2010). In total, there are 20 to 30 domestic certifiers and around 10 foreign certifiers in China. Such diversified certifying agencies may affect consumers' behavior. It is worthy of examining if consumers in China distinguish certifying agencies from different countries. Additional questions of interest include how consumers' levels of trust on various organic certifying agencies differ, if any, and what consumers' preferences are towards various certifying entities.

1.4 Comparison of U.S. and Chinese Consumers' Perceptions

It has been observed in both markets in the U.S. and China that consumers are paying more attention to food safety issues related to agricultural production practices, such as an overuse of pesticides, which could result in the expansion of organic markets. However, China and the U.S. are significantly different from each other in many aspects including demographics and cultural, economic and political background. Moreover, the status of the organic markets in the two countries differs. The organic market in the U.S. has been relatively well developed and consumers in the U.S. are relatively more familiar with the organic products. In China, the organic concept for consumers is still fairly new and

the organic market is undeveloped. Significant implications could be drawn from comparing how consumers in the two countries value organic processed products to players along the supply chain in the organic food industries in both countries.

Moreover, the soybean trade patterns between these two countries extend beyond the scope of this comparative consumer study. China has been a main exporter of organic soybeans to the U.S. (Cornucopia Institute 2009), having the second most hectares of land under organic cultivation in the world (IFOAM and FiBL 2010). At the same time, China has been the leading importer of conventional soybeans with the U.S. as the largest exporter since 1990s. Meanwhile, for the U.S., China is one of the top six exporting market destinations for agricultural exports with the largest trade value in soybeans (USDA-FAS 2003).

The fact that the adoption rate of GM soybeans in the U.S. increased from 54% in 2000 to 93% in 2010 (USDA-NASS 2000-2010) implies that a significant proportion of soybean imports from the U.S. to China is transgenic. While labeling policies for organic and GM food are distinct in the U.S. and in China, it remains to be determined how differently consumers in these two countries value origins of organic and non-GMO products, if any. The results could make useful implications to the soybean industry in both countries. If U.S. consumers strongly prefer domestically produced organic products, introducing the labeling system of organic ingredients will help U.S. domestic producers compete with imports. Moreover, if Chinese consumers value domestically produced organic products, the cost of importing organic products from China to the U.S. may be increased gradually, which could render U.S. organic producers some advantage in the future. On the other hand, if Chinese consumers strongly prefer non-GMO soymilk, exports of U.S. conventional soybeans to China may diminish in the future.

Disputes and controversial events in recent years between these two countries make the comparison timely. The Organic Crop Improvement Association (OCIA) was one of the largest organic food inspection agencies to be accredited by the U.S. National Organic Program (NOP) to operate in China. The organic products certified by the OCIA could be imported to the U.S. with the "USDA Certified Organic" seal. The OCIA conducted the certification practice by forming a limited partnership with the Organic Food Development and Certification Center (OFDC) in China. In 2007, NOP indentified a conflict of interest with OCIA in China because some certification practice and inspections were conducted by members in state governmental agencies. Such practices violated the regulations that certification should be monitored by third party agencies instead of local governmental organizations. Thus, beginning in March 2008, products made in China that were certified by OCIA could no longer be labeled as certified organic when imported into the U.S. (OCIA 2010). The OCIA voluntarily ended their operations in China in November 2009. This event could possibly make U.S. consumers to question the integrity of certified organic products from China.

In contrast, China tightened its regulation on imports of GM food in recent years. On October 29th 2010, China rejected a cargo of 50,000 to 60,000 metric tons of U.S. corn as it was found to contain unsanctioned genetically modified strain. Such actions reflect the Chinese government's determination in reducing GM imports from the U.S., which could influence China consumers' perceptions towards GM food and towards foods imported from the U.S. Therefore, a comparative study can reveal how such food policies and trade events shaped the consumers' perceptions.

1.5 Objectives

The overall objective of this thesis is to access U.S. and Chinese consumers' valuations of attributes of processed organic products, with an emphasis on eliciting their preferences of organic ingredients from different origins. Specific objectives are threefold, pertaining to U.S. consumers, Chinese consumers, and a comparison between the two groups.

The first objective is to identify the consumption behavior of U.S. soymilk consumers and assess their preferences and perceptions for organic soymilk. Specifically, the primary focuses are on two attributes of soymilk products: origins of ingredients and brand types. In light of an increase in organic soybeans imported from other countries, a pertinent question is whether country of origins of organic products matter to U.S. consumers when they purchase soymilk products. Can they tell the difference in attributes of organic soymilk from different origins? What are the reasons behind such differences in perceived quality of organic soymilk made from ingredients sourced from different countries? Also, it will be interesting to find out whether consumers have brand loyalty in purchasing organic soymilk products, as the increasing appearance of private labeled soymilk. More importantly, do they care the procurement practice of the manufacturers? Do they prefer soymilk with domestically produced non-GMO ingredients or organic ones imported from overseas? These are all important questions to be addressed in this first objective.

With China being the largest soybean importer in the world and having strict labeling regulations on GM products, it is of interest to examine how much Chinese soymilk consumers care about non-GMO attribute of soybeans and whether their perception of organic or non-GMO product will be influenced by product origins. In addition, whether Chinese consumers would differentiate the ingredients of soymilk, soybeans, by its origins of production, will be studied.

Therefore, the second objective of this thesis is to examine Chinese consumers' preferences for organic and non-GMO foods in the case of soybean attributes used in soymilk. Moreover, I aim to determine whether Chinese consumers distinguish value-added processed foods by the origin of ingredients and by certification agencies. This study adds to the literature with few quantitative studies on Chinese preferences for value-added foods. It is expected that the findings will have wider implications to other organic and non-GMO foods in China.

Lastly, given considerable differences in the U.S. and China's markets, it is valuable to conduct a comparative study on the similarities and differences of consumer perceptions towards attributes of soymilk in these two countries.

Such comparison could help understand how the consumers are influenced by the current market structures, practices and trade patterns of organic processed foods in high and low income countries.

Therefore, the third objective of this thesis is to compare American and Chinese consumers' opinions and interpretations of organic food. The valuations of American and Chinese consumers towards organic ingredients in processed food from different origin are to be compared. The implications for the further growth of the organic industry and for the trade patterns will be drawn based on the comparison.

In sum, the objectives of this thesis are to:

1. Examine the U.S. consumers' preferences and perceptions for attributes of organic soymilk with emphases on origins of ingredients and brand types.
2. Assess Chinese consumer valuations towards attributes of soymilk, in particular, origins of ingredients and certifying agencies.
3. Compare preferences of consumers in the U.S. and in China and draw implications for developments of the organic markets in the two countries.

The rest of the thesis is organized as following. Previous literature on perceptions of organic food and factors influencing the perceptions in the U.S. and Chinese markets will be reviewed in chapter 2. Methodology of survey instrument and choice experiment will be discussed in chapter 3. Chapter 4 will describe the process of survey development and data collection. Interpretation of the results and model estimation based on choice experiment questions in both surveys will be discussed and compared in chapter 5. Lastly, implications of the findings on the organic market in the U.S. and China, as well as on international trade between these two countries, will be discussed in chapter 6.

Chapter 2 Literature Review

With the rapid growth of the organic market, a large body of research was devoted to examine consumer perceptions and preferences for organic food products. In recent years, soaring consumer demands led organic foods to be marketed widely through conventional retailing channels. All types of retailers started to provide store branded organic foods. Also, rapid globalization of products and markets made it important to understand consumers' responses towards companies' global procurement practices. Accordingly, a few studies on consumers' loyalty to organic brands and preferences of product origins have been conducted. However, most of studies targeted at fresh fruits and vegetables. Only a limited amount of research focused on processed organic food. Moreover, the majority of consumers demand studies of organic food were conducted in the U.S. and European markets where the organic markets are relatively mature. Studies on consumer preferences towards organic products in low income countries such as China are limited.

The previous literature on organic consumers will be reviewed in four sections. Studies on U.S. consumers' perceptions and willingness to pay (WTP) for organic food will be first discussed. The literature on brand preferences in the U.S. will then be reviewed, followed by the discussion on studies focusing on perceptions of country of origins of conventional and organic foods in the U.S. Lastly, previous studies on Chinese consumers' perceptions and preferences on organic food will be summarized.

2.1 Perceptions towards and Preferences for Organic Food in the U.S.

Since organic food was introduced into the U.S. market in the early 1990s, demands for organic products have been growing rapidly along with increasing consumers' concerns over issues such as food safety, environmental protection, and animal rights (Yiridoe et al. 2005). Researchers were prompted to find out how consumers valued organic products and what factors affected consumers' preferences over time.

It was consented that in general consumers perceived organic foods as safer, healthier and more environmentally friendly choices than conventional products, even though personal experiences and understandings, on which they based their judgments, were heterogeneous (Vindigni, Janssen and Jager 2002; Harper and Makatouni 2002; Tsakiridou et al. 2008; Essoussi and Zahaf, 2008). Thus, consumers were willing to pay extra for organic products. The premium in the market ranged from 10% to 217% depending on the type of food (Dimitri and Greene, 2002). Some studies also suggested that the premium amount varied relating to resident regions of respondents and categories of food. For example, Goldman and Clancy (1991) reported that one third of their respondents in New York were willing to pay 100% price premium for organic food in general. Yiridoe et al. (2005) summarized the results from previous studies on willingness to pay for organic products and concluded that consumers were willing to pay higher price premiums for

organic products with shorter shelf life (e.g., more for organic vegetables than for organic bread). Previous studies on consumer preferences for organic processed food products are relatively limited to those on fresh products. Batte et al. (2007) confirmed that consumers were willing to pay premiums for organic processed products, albeit less than for organic fresh food products.

Several econometric studies reported demand for organic food to be relatively own-price elastic in some European countries (Tauxe et al.1997; Roddy and Hutchinson 1996; Soler and Sanchez 2002). Wier, Hansen and Smed (2001) found high negative price/quantity relationship for frozen organic pea in the U.S., which indicated that American consumers were more sensitive to organic product price changes, compared to those of conventional counterparts.

Lancaster (1966) stated that consumer demand is linked to characteristics inherent in economic goods. Not only commodity-specific characteristics such as taste and appearance may influence consumers' decisions, but also attributes relating to consumers' experiences and their current concerns would matter significantly. Growing interests in organic products prompted numerous studies on consumers' evaluations of organic food in terms of various commodity related characteristics (e.g., taste, freshness) and intrinsic characteristics (e.g., quality, food safety) relative to conventional products. Previous studies supported that product quality characteristics affected consumers' preferences for organic food. These attributes included nutritional value, economic value, freshness, flavor or taste, ripeness and general appearance (especially of fruits and vegetables). These factors were proven to be important, however, the relative rankings of these attributes in affecting consumers' preferences towards organic foods differed across products (Jolly 1991; Estes, Herrera and Bender 1994; The Parker 1996; Woese, Boess and Bogl 1997; Bourn and Prescott 2002). Among the above-mentioned attributes, taste was ranked as the most important factor influencing consumer demand in some North American surveys (The Packer 2002). In contrast, some other studies revealed that consumers ranked nutritional value and freshness higher than taste (Buzby and Skees 1994; Torjusen, Nyberg and Wandel 1999).

Other important factors influencing consumer preferences for organic foods supported by the literature were human health, food safety, and environment benefits. Some studies ranked health benefits and food safety as the most important attributes influencing consumers' perceptions (Vindigni, Janssen and Jager 2002; Harper and Makatouni 2002; Essoussi and Zahaf 2008; Tsakiridou et al. 2008). Such results indicated that U.S. consumers were prone to put private interests higher than social benefits when purchasing organic products (Food Marketing Institute 2006; Dimitri and Oberholtzer 2006; Lonca 2010; Pozo 2009).

Beliefs and preferences towards organic products may change because social concerns and consumer needs change over time. For example, consumers' attitudes of supporting environmentally friendly products were related to the increasing importance of environmental problems in time (Pederson 2000). Halkier (2004) pointed out that consumers would modify their consumption practices to handle risks associated with their diet. Thus, purchasing organic may be

used by consumers to control the risks caused by the changing structure of agriculture, technology innovation or recent reporting of food hazards derived from a global production and processing system (Padel and Foster 2005; DuPuis 2000; DeLind 2000).

There are numerous studies in the U.S. on characterizing organic consumers in terms of their socio-economic and demographic characteristics to predict the prosperity of this market based on the growing trend of such groups of consumers. Various studies presented contrasting results depending on different research methods and geographic locations. Two factors which reached a consensus relatively easily were the impacts of gender and education. Most research suggested that women were more willing to purchase organic food, partially because they tended to be more informed about nutritional information as a primary grocery shopper (Van Ravenswaay and Hoehn 1991; Byrne et al. 1991; Buzby and Skees 1994; Govindasamy and Italia 1999; Tsakiridou et al. 2008). Also, women with children were more likely to purchase organic products at a premium (Govindasamy and Italia 1999; Oberholtzer, Dimitri and Greene 2007). Education was confirmed to play a significant role in influencing organic consumption behavior but the relevant attainment levels depended on specific circumstances (Dimitri and Oberholzer, 2009). It was found that consumers with bachelor degrees were more likely to purchase organic than without (Thompson and Kidwell 1998) . Yet, graduate degree holders were less likely to purchase organic products (Thompson and Kidwell 1998). Govindasamy and Italia (1999) found that people who had high school degrees were more prone to purchase organic food than without.

Other factors such as age and income were regarded as determining factors by some studies while as insignificant by other studies. An interpretation for finding a negative relationship between age and organic buying behavior was that younger consumers may care more about the chemical-free attribute and environmental quality (Hughner et al. 2007; Buzby and Skees 1994). In contrast, other studies suggested that older consumers may take preventive health decisions due to their vulnerability in physical condition (Jolly 1991; Misra, Huang and Ott 1991; Thompson and Kidwell 1998; Govindasamy and Italia 1999; Hartman Group 2002; Bhaskaran and Hardley 2002; Oberholtzer et al. 2009).The income impact on purchasing organic food has also been inconclusive. Some studies did not show income as a significant factor on organic consumption (Zepeda and Li 2007; Pozo 2009; Lonca 2010), while others pointed out that higher income group of consumers were more willing to consume organic or eco-labeled products (Loureiro, McCluskey and Mittelhammer 2001; Loureiro and Hine 2002; Smith et al. 2009).

2.1.1 Brand Preferences

Branding, as a means of product differentiation, is a long standing practice in the food industry. Large U.S. retailers realized that effective marketing of store brands can increase store loyalty, chain profitability, and product turnover (Liesse 1993). According to the Private Label Manufacturer Association (2011), store brands accounted for

nearly one quarter of market shares in U.S. supermarkets, drug chains and discount stores, representing $88.5 billion sales in 2010. Store brands have been perceived as being unique from consumers' perspectives as they are the only brands that recur throughout the storefront (Hansen, Singh and Chintagunta 2006). Studies have been conducted to investigate consumers' subjective perceptions towards various traits (besides price) of branded products.

The most frequently mentioned traits were product quality and risk associated with purchasing another brand. Early literature indicated that store-brand products were perceived as being of lower quality than national-brand products even if there was no actual quality difference (Brown 1972; Krueckberg and Hamilton 1981). For example, Brown (1972) found that one half of the shoppers perceived that store brands were of lower quality relative to national brands even though they were uncertain about the quality of store-labeled products due to lack of experience. However, this perception has faded with time. It was found in the later literature that a large number of consumers felt store brands usually performed as well as or tasted as good as national brands (Fitzell 1992; Sethuraman and Cole 1999). However, consumers also derived utility from national brands beyond what was explained by quality (Sethuraman and Cole 1999).

Some studies explored other factors such as the risk of changing brands. Monroe (1976) found that past experience with purchasing branded products which may reduce potential variability in performance of purchased products affected housewives' preferences for national and store brands. Livesey and Lennon (1978) concurred with Monroe that degrees of familiarity could result in different perceptions towards different types of brands. In the same vein, Richardson, Alan and Arun (1994) showed that brand reputation, which is a reassuring factor for consumers, created competitive advantage for national brands.

Collectively, the studies reviewed suggest that the perceived quality of private labeled products have been improving, but consumers are always aware of the risk associated with transferring brands, which would deter them from purchasing store-brand food products. However, rapid sale increase in store branded organic products recently may challenge such synopsis. Only a few studies specifically address the issue that whether organic consumers differentiate organic products based on brand types.

Zhuang, Dimitri, and Jaenicke (2009) used the weekly Nielsen Household scan data from 2004 to 2006 to estimate random utility models in a two-stage selection procedure—choosing between organic or non-organic milk and between private labeled and national labeled milk. The result indicated that there were differences between the ways organic and non-organic buyers approached the choice between private label and national band milk. Presence of children and marriage deterred organic consumers from purchasing store-brand products but increased the likelihood for non-organic consumers. In addition, coupons significantly increased consumers' probability to purchase national-brand, non-organic products but not national-branded, organic products. This research focused on impacts of characteristics of

consumers on purchasing decisions of organic and non-organic products, but did not compare respondents' preferences and valuations towards organic products under different brand types.

Lonca (2010) conducted a national survey to investigate U.S. consumers' preferences for organic and non-organic baby food products with ingredients from various origins and under different types of brands. Choice experiment was used to elicit consumers' WTP for different attributes of baby food product. The results suggested that consumers preferred national brand to store brands when choosing organic baby food products. It was found that baby food by Gerber, a national brand dominating 80% of the market share, was the first choice for 67% of respondents. Moreover, 57% of parents perceived organic divisions of major national brands as having higher quality compared to minor national labels or private labeled products. However, consumers' view of store-brand products as having "average" quality suggested a potential for growth of store-branded organic products.

Besides assessing brand preferences in terms of quality and risks, recently researchers introduced another potential factor shaping the consumers' perceptions towards types of brands of organic products. Jaenicke, Dimitri and Oberholtzer (2011) collected data from a 2009 survey of U.S. food retailers to test the linkage between organic imports and growth of organic private labeled products. Tobit and Bitobit procedures were used to test the relationship between organic store label and organic imports. Two separate univariate tobit estimation results suggested that development of store-brand organic products led to higher shares of imported organic products, raising questions relating to integrity of organic products sourced internationally. Consequently, further research on consumers' perceptions and preferences for store brand and national brand products are needed.

2.1.2 Country of Origins of Organic Food Products

Credible labeling of important credence attributes of food products enables consumers to make a decision that better matches his or her preference (Caswell and Mojduska 1996) .Country of origin (COO) is one credence attribute that has attracted much attention both from consumers and policy makers in recent years. Some studies revealed that COO labeling was significant in influencing consumers' evaluation of food products (Hong and Wyer 1989; Van der Lans et al. 2001). Primary focus has been put on meat products stemming in part from concern over Bovine spongiform Encephalopathy in the 1990s. Most studies reached the consensus that consumers revealed positive willingness to pay for meat products from their own countries (Hoffman 2000; Umberger et al. 2002; Loureriro and Umberger 2003; Loureiro and Umberger 2005; Umberger et al. 2003). Similar results were derived from research focusing on U.S. consumers' opinions of domestically produced and imported food products. It was observed that U.S. consumers preferred domestically produced fresh apples and tomatoes (Mabiso et al. 2005; Pozo 2009) and domestic vegetables used in baby food products (Lonca 2010) to imported counterparts.

As to the causes behind such inclination, Verlegh and Steenkamp (1999) concluded from their meta-analysis of COO studies that COO labeling could represent symbolic and emotional values to consumers. Patriotic consumers may reveal more attention to COO to show their emotional connections to their country. Besides, COO could also relate consumers to their social norms and personal beliefs. Findings from another meta-analysis of using 13 country-of-origin (COO) studies indicated that American consumers may value own country-of-origin more relative to consumers in other countries (Ehmke, Lusk and Tyner 2006). In addition, the authors speculated that some credence attributes such as organic production may have significant positive effects on the value of COO.

Several studies assessed consumers' valuation of COO relative to their valuation of the organic attribute. Umberger et al. (2003) conducted consumer surveys and experimental auctions in Chicago and Denver to elicit consumers' WTP for various attributes of beef including country of origin and certified organic. The results indicated that U.S. consumers were willing to pay more for COO labeling of beef products and ranked such attribute higher than organic. The reasons behind such high valuation of COO included food-safety concerns about imported beef, a strong desire to support U.S. producers, and beliefs that U.S. beef was of higher quality. Vander Mey (2004) conducted one regional survey in South Carolina and one national survey in the U.S. to investigate consumers' preferences towards various attributes of food products. Their estimation results confirmed the conclusion drew from study of Umberger et al. (2003) that American consumers had strong preference towards U.S grown foods over imported food. Also, consumers were willing to pay more for the label of locally grown and grown in the U.S relative to grown organically. Darby et al. (2006) and James, Rickard, and Rossman (2009) found that locally produced and processed fruit products were preferred.

Most recently, researchers began to explore consumers' perceptions of organic products produced from different countries as there has been an observable increase in imports in the U.S. organic sector. Pozo, Saak, and Peterson (2009) found that consumers could distinguish organic foods sourced from different country of origins in the case of fresh apples. Domestically produced organic apples were favored by American consumers. Moreover, "locally grown" was associated with the highest WTP among all the levels of location attributes of organic apples, followed by "regionally grown", "U.S. grown" and "imported". Lonca's study (2010) confirmed consumers' preferences for domestically grown organic ingredients in processed organic products. Respondents reported that local ingredients of organic baby food were superior to those imported ones. The quality of U.S. ingredients was rated high or somewhat high by 64% of respondents. Also, the results suggested that U.S. consumers perceived organic products from different foreign countries distinctively. American consumers' preferences towards imported ingredients from Canada resembled most with that of U.S. origins, followed by Australia and Europe. The lowest scores were given to ingredients from Mexico and China with 45% percent of respondents rating them as poor or somewhat poor in quality. Increased sales of organic processed food prompted researchers to examine consumer perceptions towards the location of the processors and the producers.

Ehmke (2006) indicated that consumers in different regions of the world tend to have significantly distinct COO values. Thus, there is a need to further the research on this topic by conducting comparative analysis of consumers' perceptions towards COO of organic foods in different countries. Especially, it will be interesting to compare the perceptions towards domestically produced organic products and organic products imported from the U.S. of consumers in a country that is ranked considerable poor in quality by U.S. respondents, i.e., China, to the perceptions of consumers in the U.S.

2.2 Consumer Studies for Organic Food in China Market

Different from the relatively mature U.S. organic market, adoption of organic practices and the market for organic products in China are still at the beginning stages. The size of domestic market is small. The literature on organic products in China is relatively small when compared to that on U.S. consumers. Series of local food scandals over the past several years stimulated Chinese consumers' increasing attention to food safety. Meng (2007) conducted a study to assess consumers' perceptions and valuations of agricultural products that are safer and of higher quality after a series of food incidents in 2006 (e.g., fresh peppers with toxic addictive Sudan I Red). It was found that consumers were concerned mainly about three food safety issues: chemical residuals, addictives, and product shelf life.

Some studies examined consumers' purchasing behavior of eco-foods: namely organic food, green food, and hazard-free food in the China market. The most prominent factors driving their consumption of these high-premium products were health benefit (Zhou, Huo and Peng 2004) and lower risk of food safety of eco-foods (Yang 2005; Tong 2006). In addition, researchers found that the knowledge level of eco-food strongly affected purchasing decisions (Yang 2005; Tong 2006). Tong (2006) also pointed out the significant impact of social norms. Based on her survey in Zhejiang province, the more people around the respondents purchased eco-products, the more likely the target respondents were to purchase similar kinds of food products. It was also revealed that most of the Chinese shoppers shopped for groceries in groups and their purchasing decisions were influenced by the people they shopped with (Robert 2007).

The development of domestic market for organic food since 2000 prompted consumer studies on China's organic food market specifically. Most of the studies suggested that consumers in China regarded organic food as safer food resources (Zhou, Huo and Peng 2004; Yang 2005; Wang and Jun 2003). Yin (2008) conducted a consumer survey in several conventional supermarkets in five major cities in China and found that consumers revealed strong desire to avoid risks of food safety incidents by purchasing organic food products. Wang et al. (2009) found that although nearly 50% of the respondents did not understand the basic concepts of organic food products although the food incidents issue triggered consumers' interest in purchasing safer food. Zou and Jia (2009) pointed out that the level of knowledge of organic food is positively related to the likelihood of purchasing organic food. They also found that consumers were

more willing to purchase branded organic food than generic ones. Pu's (2010) study indicated that social norms, health consciousness and availability were positively related to attitudes towards buying organic food.

There have been very few quantitative studies studying the willingness to pay for attributes of organic products in China. Generally speaking, consumers revealed interest in paying more for organic food. Yin, Wu and Chen (2008) conducted a survey in five major cities in Shandong province to analyze consumers' WTP for attributes of seven categories of organic food (fruit and vegetables, grain, meat, poultry, aquatic, dairy and processed food). The results suggested that consumers were willing to pay 28% more for organic version of these seven categories of food products on average. The three attributes that consumers were willing to pay most were health benefits (41%), better tastes (26%) and positive impacts on environment (11%). Further, it was found that consumers had different WTP for organic products based on the food categories. Organic fresh produce received the highest valuation while processed food received the lowest willingness to pay across all categories. The level of trust to organic certifications was found to have significant impacts on consumers' WTP for organic products. Moreover, household income was positively related to the WTP. Other demographic factors such like age, education level and having children did not show significant influence (Yin, Wu and Chen 2008). In the study conducted by Wang, Liu and Tian (2008) focusing on shoppers in supermarkets in Beijing revealed some similar results. The level of familiarity with organic products positively influenced respondent's WTP for organic products in a significant way. Also, it suggested that older people were willing to pay more for organic food. Other factors such as income and household size did not play a significant role in their study (Wang et al. 2008).

Another aspect of organic foods that is relevant to the current study is related to emerging concerns over biotechnology in China. Ho, Vermeer and Zhao (2006) conducted a consumer study just two months after the Beijing government implemented regulations on labeling genetically modified soybean oil. The researchers examined consumers' awareness and opinions on GM food by interviewing 1,000 respondents in Beijing and Shijiazhuang city. This survey found that Chinese consumers' awareness of GM product was substantially high (71% had heard of transgenic food) and was greatly influenced by government campaign for labeling cooking and salad oils using GM soybeans. The majority of consumers regarded unprocessed GM products as "unsafe" or "rather unsafe". Such concern was weaker towards processed GM food with only 18% thinking they are unsafe (Ho, Vermeer and Zhao 2006). Most consumers remained neutral or unwilling to consume GM food (Hou 2004; Zhao 2007). In addition, most consumers support GM labeling on their food products (Ho, Vermeer and Zhao 2006; Zhou 2003). Other studies indicated that Chinese consumers' understanding of GM food was restricted due to information availability (Zhou 2003; Chen, Shi and Getu 2004; Zhao 2007;).

2.3 Summary

Along with the rapid expansion of organic market in the U.S., an increasing number of studies on consumer demand for organic food products have been conducted. However, most studies have targeted fresh fruits and vegetables with a limited number of studies examining processed organic foods. The diversification of organic products in terms of varieties and brands necessitates further studies on consumers' perceptions and consumption behavior of processed organic products under different types of brands. In addition, there appears to be a correlation between store brand development and the observed increase in imported organic products. However, it has not been studied that how much U.S. consumers care about the procurement strategy adopted by different companies of organic processed products. Accordingly, this study is motivated to shed a light on this issue.

In addition, there have been numerous studies attempting to find consumers' valuations of countries of origin of food products in the U.S. However, only a few studies focused on organic foods. In addition, there was a lack of further inquiry about how beliefs are formed, especially towards countries which have consistently been considered as having poor food quality. Thus, by conducting a consumer survey in the U.S. as well as in China, this study could bring in more insight on how consumers' perceptions of origin could be influenced by various social, economical or political factors.

Increasing awareness of organic products, strong growth in domestic income and growing concerns over domestic food safety has led to an increase in domestic demand for organic products in China. The imports of organic products in China are on the rise (Lagos et al. 2010). However, there has not been any study analyzing consumers' perceptions towards origins of organic products and valuations of certification agencies from different countries. Thus, this study aims to fill this gap by assessing Chinese consumer's perceptions and willingness to pay for organic products from various origins and different certifiers.

The previous literature on GM and non-GMO food indicated that Chinese consumer may resist GM food if provided adequate information. Also, their perceptions are susceptible to the governmental campaigns and politic actions. Thus, a stricter control over imported GM soybean may bring more resistance towards GM soy products such as soy oil and processed soy food. Besides several studies on Chinese consumers' perceptions of GM or non-GMO food products, there was no single study on consumers' valuation and willingness to pay for the attribute of non-GMO in organic products. It is meaningful for us to address this new trend.

Chapter 3 Methodology

3.1 Introduction

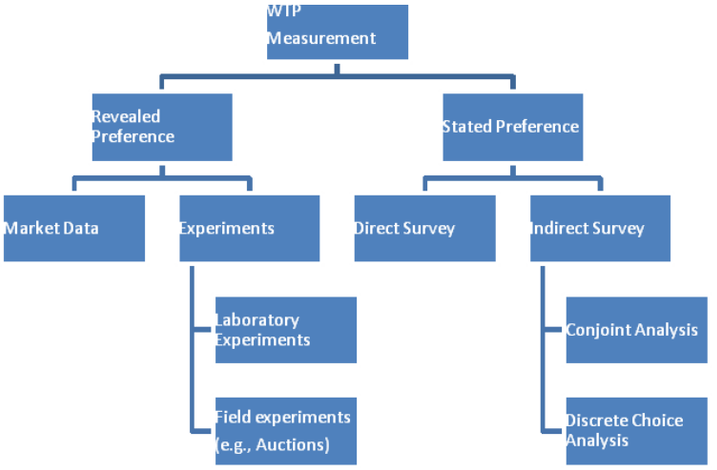
This chapter describes the methodology used to examine consumer preferences towards certain attributes of food products. The main objective of the thesis is to elicit consumers' valuations and preferences of soymilk products with differentiated attributes related to production practice and origin of ingredients. The methods used to evaluate consumers' willingness to pay (WTP) are first presented in the chapter. Since there is not a system either in the U.S. or in China to trace countries of origin of organic imports, secondary data are not available to observe consumers' purchasing behavior. Hence, primary data are collected. Techniques used to generate efficient choice tasks for discrete choice models are also described in this chapter. Methods to estimate willingness to pay for a specific attribute are then presented.

3.2 Methods to Measure WTP

It could be complicating to control for biases in hypothetical situations where consumers' demand and willingness to pay for a product with new attributes are assessed (Lusk and Hudson, 2004). The primary challenge in assuring the credibility of an elicitation technique is incentive compatibility. Individuals may respond differently when responding to hypothetical question than what they do in real purchase (Lusk and Hudson 2004). Rigorous valuation methods have been developed to deal with different types of questions. However, merits and drawbacks of each method depend greatly on estimation objectives and conceptual considerations.

Methods to measure willingness to pay are summarized in Figure 3-1. Consumers' WTP for products can be assessed based on both revealed preference and stated preference. The revealed preference data are derived from actual market data or simulated price-response experiments. In comparison, preference data obtained from tailored surveys are referred as stated preference (Louviere, Hensher and Swait 2000). Stated preferences can be obtained from either direct surveys or indirect surveys. The direct surveys ask consumers the amount they would like to pay for a specific product. On the other hand, indirect surveys provide respondents bundles of products to choose or rank according to their preference. Conjoint analysis and discrete choice analysis are the two most commonly used method in estimating people's WTP for food products based on indirect survey method (Breidert, Hahsler and Reutterer 2006).

Figure 3-1: Summary of WTP estimation methods



Source: Breidert, Hahsler and Reutterer 2006, Figure 1, p. 10.

Because information related to countries of origin of organic and non-GMO ingredient is not required on organic and non-GMO food products, such information is not always available to consumers. Accordingly, evaluation of WTP of consumers towards soymilk in this study involves estimating consumers' WTP for products with attributes in a hypothetical situation. Mainly four approaches could be used in this circumstance. In order to choose the most suitable one for this study, these four methods are discussed here.

The first two methods are experiment methods that are based on revealed preference. Experiments can be set up according to researchers' needs to investigate consumers' behaviors when the targeted product has not been introduced into the market yet. The first method is laboratory experiment, which is simulated by giving subjects limited amount of money to spend on a specific selection of goods. Although this method could generate data quickly, the artificial set up may influence respondents' purchasing decisions by making them act more rationally than they do in real life.

The second method is field experiment. This method is different from laboratory experiment by allowing respondents to perform in a real world shopping environment, often in the form of a test market. It is crucial for this method to select a test market with reasonable scale to represent the target market while maintaining feasibility to do the research investigation. However, this method requires considerable time and expenditure on monitoring consumers' shopping behavior responding to price changes of the specific products (Urban and Hauser 1993; Nagle and Holden 2002; Sattler and Nitschke 2003).

Experiment auction is a specific application of laboratory or field experiment. There are several auction methods which are incentive compatible, including Vickrey Auctions (Vickrey 1961) and BDM (Becker, Degroth and Marschak 1964). Often, respondents are required to participate in several rounds of auctions in order to reveal their true valuation

of products (Lusk and Darren 2004). Auction can be used to understand how consumers value the new attribute before the real launch of this product (Breidert, Hahsler and Reutterer 2006). It is viewed by some researchers to be the method which avoids non-response bias and elicits more precise estimates of WTP than survey instruments, because it is based on real purchasing behavior rather than intentions. However, higher cost and geographic restrictions are the two major drawbacks in applying this method (Lee and Hatcher 2001). Because this study targets respondents that are representative consumers of China and United States, geographic constraints make this method infeasible to address the study objectives.

WTP can be estimated from stated preference data. Brown et al. (1996) argued that respondents would feel easier to decide whether or not to accept a specific product at a set price than to directly assign a price to the product. Thus, indirect survey approaches have been used in many real-world applications. Conjoint analysis and discrete choice analysis are two commonly used methods in estimating WTP through indirect surveys.

Conjoint analysis is used to measure individual's preference structures instead of valuations of product attributes in the experiments. A set of possible realizations for a product attribute is referred to as the attribute levels. Through this method, each respondent is presented with a number of product profiles consisting of bundles of same attributes varied in different levels. Respondents are asked to indicate the rank order of the product according to the degree of preference. Then, the relative contributions of the different attribute levels which are called part-worths are estimated based on the overall preference valuations. At last, product utility is derived from the part-worths and evaluations of the full product set. Generally speaking, if the price sensitivity in the market under study is heterogeneous, it is important to estimate WTP at the individual level. In this case, conjoint analysis would be favored as it is typically capable of estimating WTP for the respondents at the individual level based on each respondent's data. However, in the case of classical conjoint analysis, respondents would not be asked to answer whether she or he would buy a product or not, which is regarded as one of the major drawbacks with respect to this elicitation techniques (Breidert, Hahsler and Reutterer 2006). Based on conjoint data, researchers must assume the status quo product to be purchased in the first place. If this assumption does not hold, consumers' WTP could not be correctly elicited.

Discrete choice analysis, on the other hand, offers respondents several alternatives of product with a set of attributes (price, brand, quality etc.) varied in different levels. By allowing respondents to choose among the products instead of rating or ranking the products, such method could mimic real purchasing situation more closely (Breidert, Hahsler and Reutterer 2006). In addition, product choice probabilities could be elicited at individual level as well as the aggregate level under discrete choice analysis. Also, compared to experimental auctions, discrete choice analysis is relatively less costly. Accordingly, WTP estimations based on this method with flexibility and realistic settings seems to be more appropriate for this study relative to other approaches.

Discrete choice analysis uses choice based conjoint (CBC) or dichotomous choice questions to collect large quantities of data. CBC is also referred as choice experiments (CE). In the CBC setting, respondents are required to choose one product (or choose "none") from several products with different levels of various attributes (e.g., price, brand, and color). In dichotomous choice questions, respondents are asked whether they would buy a certain good at a certain price level set by researchers. Both types of questions enjoy the merits of discrete choice method design, yet dichotomous choice questions alone cannot determine WTP for individual attributes. In CBC questions, however, researchers are allowed to investigate trade-offs and cross price elasticities between competing products attributes. In addition, compared with conjoint analysis, CBC analysis can estimate aggregated data as well as individual level data based on diffusion of advanced empirical Bayesian estimation techniques. Lusk and Schroeder (2004) found that there was generally very small difference between CBC responses and non-hypothetical responses in determining the marginal WTP for a change in product quality. This merit would be very significant when estimating WTP for a novel or new attribute of a product where hypothetical bias is the biggest concern (Lusk and Hudson 2004).

The CE has been widely used in the literature to measure consumer demand for agricultural products with novel attributes. Rigby and Burton (2005) analyzed consumer preferences for GM foods in the United Kingdom using choice experiments. Gao and Schroeder (2009) designed surveys with multiple choice experiments to find the consumers' responses towards new information about fresh beef products in estimating their WTP. James, Rickard and Rossman (2009) conducted a study on consumers' perceptions and valuations of organic, local and nutritional attributes of horticultural products. Given this study's objectives and the advantages of the CE method, it is the most appropriate method for estimating consumer preferences towards origin of soybeans used as ingredients of soymilk. Hence, the CE method is used in this thesis.

3.3 Choice Experiment Design

In a choice experiment, each respondent is required to answer several choice sets questions with different product bundles. In order to minimize time and effort needed to respond fully and accurately to the questions, it is researchers' goal to limit the number of questions asked while still ensuring that information are both reliable and statistically efficient (Johnson et al. 2007). Thus it is important to understand how to generate efficient number of questions in a choice experiment. In order to estimate the importance level for all product attributes, it is possible to design product profiles with all possible combinations of different levels of attributes, which is denoted as the full factorial set. However, the task may become tougher or even unfeasible if numbers of attributes and their levels increase. Thus, researchers often rely on fractional factorial designs which do not provide all but enough information for estimating the main effects of attributes of key interests. It is optimal to construct an orthogonal and balanced fractional

factorial. Orthogonal means that each level of each attribute of a product is combined with every level of all other attributes. If each level occurs equally often, the fractional factorial design is balanced (Kuhfeld 2009).

Given criteria for efficient measurement, search algorithms could be used to evaluate thousands of potential combinations to find the one closest to optimal design. The OPTEX procedure of SAS software is a popular tool to generate choice experiment designs and compute efficiency measures for a given model. The D-efficiency is a criterion that evaluates how well the combination of attributes is constructed to generate efficient amount of information needed for coefficient estimations. Usually, the more choice sets questions for each respondent, the higher D-efficiency could be. Most optimal level is reached when D-efficiency reaches 100%. However, in order to get reliable answers without exhausting the respondents, researchers could divide the generated sets of choice tasks into several blocks. While reducing the number of choice tasks each respondent has to answer, it should be kept in mind that more respondents may be needed to collect enough information.

Johnson et al. (2007) suggested the following rule of thumb for determining the sample size for choice surveys:

$$N = \frac{500 * NLEV}{NALT * NREP} \qquad (1)$$

where N is the minimal size of the respondent sample, $NLEV$ is the largest number of levels in any attribute, including interactions, $NALT$ is the number of alternatives per choice set and $NREP$ is the number of choice questions per respondent. Minimal size generally ranges from 100 to 300 for robust quantitative research where one does not intend to compare subgroups (Johnson et al. 2007).

3.4 Estimation Models

Estimation of consumers' willingness to pay for attributes of a product based on a choice experiment is derived from Lancaster's consumer economics model (1966) and the random utility model (Thurston 1972). Lancaster (1966) stated that consumers derive satisfaction not only from goods per se, but also from the attributes of the goods. Random utility theory stated that the utility for a choice obtained from consuming the jth product, denoted as U_{ij}, is the sum of deterministic component, V_{ij} and a random component, ε_{ij}. The random component follows a predetermined distribution that allows for uncertainty derived from unobservable impacts from product attributes and consumer characteristics to enter the equation. In this way, consumers' utility can depend both on attributes of the product (e.g., brand types, production practice, and origin of ingredients) and social, economic and attitudinal characteristics of respondents. Attributes of the product is denoted as Z_j and the respondent i's characteristics is denoted as S_i . This utility function can thus be written as:

$$U_{ij} = V_{ij}(Z_j, S_i) + \varepsilon_{ij}(Z_j, S_i) \quad (2)$$

After the process of becoming familiar with attributes of products, respondents are informed enough to choose the alternative that provides the greatest utility (Train 2009). Therefore, in the behavior model, respondent *i* chooses alternative *j* if and only if:

$U_{ij} > U_{ik}, \forall j \neq k.$

The deterministic part of the utility, V_{ij}, which is dependent on observable attributes assigned to the products (Z_j) and characteristics of the respondents (S_i), can be estimated. The unobservable part of utility, ε_{ij}, is the difference between true utility U_{ij} and observable utility V_{ij}. The unobserved part of the utility is treated as random and defined relative to a researchers' representation of the choice situation. Thus, a probability for a respondent to choose alternative *j* over *k* is:

$$\begin{aligned} P_{ij} &= \Pr ob\left(U_{ij} > U_{ik}, \forall j \neq k\right) \\ &= \Pr ob(V_{ij} + \varepsilon_{ij} > V_{ik} + \varepsilon_{ik}, \forall j \neq k) \\ &= \Pr ob(\varepsilon_{ik} - \varepsilon_{ij} < V_{ij} - V_{ik}, \forall j \neq k) \end{aligned} \quad (3)$$

According to features of the data collected, researchers can assign different joint density functions denoted as $f(\varepsilon)$ to represent the distribution of the random term. Using the density function $f(\varepsilon)$, the cumulative probability could be rewritten as

$$P_{ij} = \int_{\varepsilon} I\left(\varepsilon_{ik} - \varepsilon_{ij} < V_{ij} - V_{ik}, \forall j \neq k\right) f\left(\varepsilon_i\right) d_{\varepsilon i} \quad (4)$$

where $I(\cdot)$ is an indicator function, which equals 0 when the expression in parentheses is false and 1 otherwise. Accordingly, the unobserved portion of the utility function is dependent on the integral over the density function $f(\varepsilon)$.

Based on the assumption of the distribution of the error terms, different types of models are developed. Logit and nested logit models are derived under the assumption that ε_i is an independently, identically distributed (*iid*) extreme value and a type of generalized extreme value, respectively (Train 2009). In Probit models, the error terms are assumed

to have a multivariate normal distribution. For a mixed logit model, the assumption is that the unobserved portion of utility ε_i follows any distribution specified by researchers plus a part that is *iid* extreme value (Train 2009). Each model has its drawbacks and advantages depending on the situations. The most commonly used methods based on CE questions are multinomial logit models (MNL) and mixed logit (random parameter) models (RPL).

3.4.1 Multinomial Logit Model

A multinomial logit model is used when the dependent variable consists of more than two categories and is nominal. In other words, multinomial logit regression is appropriate in circumstances where responses are derived from more than two alternatives which are not ordinal in nature (e.g., the choice of hard cheese, semi-hard cheese and soft cheese for snacks).

The main selection probability axiom used in MNL is the independence-from-irrelevant alternatives (IIA) axiom (Louviere, Hensher and Swait 2000). The IIA assumption states that the ratio of probabilities of choosing one alternative over another is independent from the presence or absence of any additional alternative in the choice set. Such requirement is a prior in using this model and allows for introduction and elimination of alternatives in choice sets without re-estimation. Based on this property, the random elements in utility (e.g., ε_{ij}) are independent across alternatives and are identically distributed. If this random term in the MNL model is assumed to be extreme value type 1 (EV1) distributed, the density for each unobserved variable is:

$$f(\varepsilon_{ij}) = \exp(-\varepsilon_{ij}) * \exp(-\exp(-\varepsilon_{ij})) \tag{5}$$

The cumulative distribution is:

$$F(\varepsilon_{ij}) = \exp(-\exp(-\varepsilon_{ij})) \tag{6}$$

The difference between the two extreme value variables (ε_{ij} and ε_{ik}) follows a logistic distribution as the following:

$$F(\varepsilon^*_{ijk}) = \frac{F(\exp(\varepsilon^*_{ijk}))}{(1+\exp(\varepsilon^*_{ijk}))} \tag{7}$$

Now, recall the probability for respondent *i* to choose alternative *j* is

$$P_{ij} = \int_{\varepsilon_i} \left(\varepsilon_{ik} - \varepsilon_{ij} < V_{ij} - V_{ik}, \forall j \neq k\right) f\left(\varepsilon\right) d_{\varepsilon_i} \tag{8}$$

By assigning the EV1 distribution to the unobserved variables, the function above could be rewritten as:

$$P_{ij} = \frac{(\exp(\beta' X_{ij}))}{\sum_{j=1}^{J} \exp(\beta' X_{ij}))} \tag{9}$$

where and X_{ij} is a vector of observed attributes of alternative j. Therefore, the only unknown component in utility function is the parameters associated with each attribute in the observed component of the random utility expression (Louviere, Hensher and Swait 2000). Thus, the utility function is expressed as:

$$U_{ij} = \alpha' X_{ij} + \varepsilon_{ij} \tag{10}$$

where α' is a vector of fixed coefficients and ε_{ij} is *iid* extreme value. Using maximum likelihood method, the utility parameters of the MNL choice model, $\alpha's$, could be estimated.

The most obvious advantage of using MNL is convenience (Train 2009). Provided that the observed utility function (V_{ij}) is defined well and the unobserved utility (ε_{ij}) is small and independent, it is appropriate to use this method in generating unbiased results. However, as the researcher assigns a distribution to the random terms for convenience, the model has limitations in applications. According to Train (2009), there are mainly two kinds of limitations imposed on MNL models.

Firstly, the MNL depends on the critical IIA assumption. The IIA assumption restricts the types of substitution pattern which could be realistic in some choice situations but clearly inappropriate in others (Train 2009). Based on the IIA assumption, the ratio of probabilities of choosing one alternative over another is independent from introducing any additional alternative in the choice set. However, if the new alternative introduced influences the probability of choosing one old alternative more than others, the IIA requirement will be violated. For example, suppose there are currently two kinds of transportation for respondents to choose: bus and car. Then, a new express bus similar to the old bus but with additional attributes (e.g., faster or more colorful) is introduced in the choice set. Under this circumstance, it is expected that the probability of choosing the old bus system would be influenced more as it is more directly involved in this competition with the new bus relative to cars. Therefore, the ratio of probabilities of choosing car and old bus may not remain constant after the introduction of the new bus system. If this substitution pattern is true, MNL would either overestimate or underestimate demand for some product with certain attributes.

Secondly, specification of the distribution of the random utility component makes MNL unable to measure the value respondents put on certain attributes associated with the unobserved factors or purely random factors. If the valuations (or tastes) respondents formed based mainly on deterministic component with respect to observed variables, MNL could capture the taste variations by incorporating these observed variables in the model with *iid* random terms. However, if taste variation is at least partly random, MNL is misspecified. In this case, the unobserved factors influence each alternative, so there will be correlation among all alternatives, and random terms (denoted as ε_{ij}) cannot be *iid*.

Especially with the aim of estimating WTP for food products, the assumption of homogeneous preferences across respondents would be too unrealistic. It is highly possible that researchers will not include some important factors such as concerns for weight or previous experience of food incidents which could influence each respondent in a distinctive way. In addition, MNL model could work well at capturing the average tastes as an approximation, but it may not provide information on the distribution of tastes which is important for forecasting the potential demand for a new product with a niche market. Thus, it is suggested that data should be tested by multinomial logit model first to see whether it could fit within the restricted conditions (Hensher and Greene 2003). If not, then a model with more flexibility and less constraints on the random factors should be explored. Mixed logit model, which relaxes the IIA property and allows for part of the random terms to follow any distribution, facilitates the researcher to make more appropriate estimations based on more realistic assumptions.

3.4.2 Mixed Logit model

Mixed logit model, also known as random parameter logit model, has been known for many years before fully utilized with the advance of simulation methods using computer. It can be derived from various different behavior specifications and approximate any random utility model (McFadden and Train 2000). It is defined on the basis of the functional form of its choice probabilities. Any model whose choice probabilities can be expressed as the following could be called a mixed logit model:

$$P_{ij} = \int L_{ij}(\beta) f(\beta) d_{\beta} \tag{11}$$

where $L_{ij}(\beta)$ is the logit probability evaluated at parameters β:

$$L_{ij}(\beta) = \frac{e^{V_{ij}(\beta)}}{\sum_{j=1}^{J} e^{V_{ij}(\beta)}} \tag{12}$$

The vector $V_{ij}(\beta)$ represents the observed component of the utility and depends on parameters β. If there is a linear relationship between utility and observed factors (product attributes and respondent characteristics), $V_{ij}(\beta) = \beta' X_{ij}$ (where X_{ij} is the vector of observed variables relating to alternatives and decision makers). Consequently, the choice probability facing each respondent would be:

$$P_{ij} = \int (e^{\beta_i' X_{ij}} \Big/ \sum_{j=1}^{J} e^{\beta_i' X_{ik}}) f(\beta) d_{\beta} \tag{13}$$

Thus, the distinction between mixed logit models and simple logit models is the specification of the density function $f(\beta)$. Simple logit models (e.g., multinomial logit model) degenerate $f(\beta)$ at fixed parameters b, which means

that the probability density function for the unobserved variables is independent from respondents' tastes. The choice probability equation (13) in this case is equivalent to equation (9). On the other hand, mixed logit models allow for $f(\beta)$ to be continuous following certain distribution (e.g. normal). The probability of a choice under this density then becomes:

$$P_{ij} = \int (e^{V_{ij}(\beta)} \Big/ \sum_{j=1}^{J} e^{V_{ij}(\beta)}) \Phi(\beta \mid b, W) d_{\beta} \qquad (14)$$

where $\Phi(\beta \mid b, W)$ represent a multivariate normal distribution with mean b and covariance W. Through estimating the values of parameters β, researchers are able to obtain the information about the tastes (valuations) of respondents on the observed attributes. But most importantly, mixed logit model can also allow researchers to estimate the parameters which describe the density function. In equation (14), mean b and covariance W can tell the distribution of β across respondents. Consequently, mixed logit model breaks the assumption of homogeneity among the respondents. This facilitates researchers to find heterogeneous preferences among respondents through sketching out the population distribution of $f(\beta)$. Therefore, mixed logit model obviates the two limitations composed on MNL model, permitting estimations of random taste variation and the existence of unrestricted substitution pattern.

Recall the equation of basic utility equation (2) derived from choice experiment:

$$U_{ij} = V_{ij}(Z_j, S_i) + \varepsilon_{ij}(Z_j, S_i) \qquad (2)$$

The tastes of the respondents are dependent on deterministic component (V_{ij}) and random component (ε_{ij}). From equation (2), both the product attributes (Z_j) and characteristics of respondents could influence V_{ij} and ε_{ij}. However, for convenience, MNL model assumes that the probability of ε_{ij} follows an *iid* distribution, which does not count in correlations between unobserved factors with alternatives (see equation 10). In the mixed logit model, the utility function is defined as:

$$U_{ij} = \alpha X_{ij} + \mu_i Z_{ij} + \varepsilon_{ij} \qquad (14)$$

where μ_i is a vector of random terms with zero mean and Z_{ij} are error components which define the stochastic portion of utility along with ε_{ij}. Accordingly, the unobserved (random) component of utility is comprised of $\mu_i' Z_{ij}$ and ε_{ij}, instead of ε_{ij} alone in MNL model. Therefore, it allows for the correlation over alternatives depending on the specification of Z_{ij}.

An additional strength of using mixed logit model is its relaxation of the IIA property which restricts the substitution pattern in MNL model. The ratio of mixed logit probabilities for choosing alternative j and alternative k, P_{ij}

$/ P_{ik}$ depends on data including attributes of alternatives other than j and k. The substitution pattern could be determined empirically by specifying variables and mixing distribution (Train 2009).

In the mixed logit model, the specification of variables can also allow for repeated choices by each respondent. This feature is very significant as the respondents are often asked a series of repeated choice questions to allow the researcher observe the entire sequence of choices. Then, the issue of initial conditions confronting the researchers if the choices and data are not observed from the start of the process could be handled (Train 2009). Concerning the modeling of the utility function, the only difference between a mixed logit model with repeated choices and one with only one choice per respondent is that the integrand involves a product of logit formulas rather than one logit formula (Train 2009). Consider a sequence of alternatives with t denoting the choice situation, where person i chooses alternative j at each choice situation, $j = \{j_1,...,j_T\}$. Thus, the unconditional probability that person i choosing alternatives over a sequence of choices is:

$$P_{ij} = \int \prod_T [e^{\beta_i' X_{ijt}} \Big/ \sum_{j=1}^{J} e^{\beta_i' X_{ikt}}] f(\beta) d_\beta \qquad (15)$$

Past and future exogenous variables could be added to the utility to represent a lagged or anticipatory behavior of the respondent in a given period of time. The good thing is that lagged dependent variables could be added into mixed logit model without changing the estimation procedure (e.g., the probability formula or simulation method).In addition, the constraint of estimating tastes variation over time in MNL model is not a problem when using mixed logit model.

After the coefficients are estimated, consumer's willingness to pay for attribute l could be calculated by the formula below:

$$WTP_l = \frac{\beta_l}{\beta_p} \qquad (16)$$

where β_l represents the estimated coefficient of attribute variable l and β_p represents estimated coefficient for price variable.

Chapter 4 Data Collection in the U.S. and China

4.1 Introduction

This chapter describes how the data used to analyze consumer preferences towards various attributes of soymilk were collected. The survey design and each survey component are presented in detail in the following sections. Because the study aims to compare the similarities and differences of consumers' attitudes in the U.S. and China, distinct surveys were developed and administered in each country. These two surveys were developed in tandem to be consistent in most parts to facilitate comparisons. However, because market development as well as social and economic environment in these two countries are distinct, there are some differences in aspects of the administration and designs to capture true consumers' values on various attributes in both countries. In order to better describe the features of each survey, the U.S. survey is discussed first, followed by the Chinese survey.

4.2 Development of the U.S. Survey

Data for the U.S. portion of the study were collected in November, 2010 through an online consumer survey. This survey was administered nationwide to collect data from respondents representing the whole nation, as well as to reach more soymilk consumers within our limited time frame. Conducting a national survey is valid because the organic food market is national in scope. Moreover, soymilk products are currently available throughout the U.S. although it is a relatively new product in this market.

Among various methods to obtain WTP, the choice experiment method was used in order to assess the perceptions towards a relatively unfamiliar attribute: country of origin of an ingredient of a processed organic product, i.e., soybeans used in soymilk. The survey was distributed online to respondents through a well known U.S. research company. An on-line survey was used because this method is a very efficient and cost effective way to collect sufficient data in a wide geographic range. Moreover, Internet use is quite common in the U.S. with at least 76.3 % of population having access to the Internet (Internet World Stats 2009). Hence, it is feasible and valid to conduct an on-line national consumer survey to collect responses from a representative sample.

In order to minimize the negative effects (e.g., fatigue) from respondents when filling out the survey, the survey was divided into three versions so that the number of choice tasks faced by each respondent was reduced to six. According to the rule of thumb by Johnson et al. (2007), the minimal sample size for each version is 62.5 (N=500*3/ (4*6)) for the U.S. survey. In total, 318 survey responses were collected. Yet two of the responses in version 2 were completed less than five minutes and answers were mostly the same for all questions, suggesting respondents were not

completing in earnest. Thus, they were excluded from further analysis. As a result, 316 valid survey responses from the U.S. survey were used with 113, 98 and 105 effective responses for versions 1, 2 and 3 respectively.

4.2.1 Survey Design

A tailored survey was used to address the specific objectives of this study. In order to get reliable answers to the questions of interest, the survey design should be respondent-friendly, so that respondents will feel comfortable to reveal what they really think. Dillman (2007) introduced the idea of social exchange to describe how people could be motivated through a survey process to reduce survey errors and non-response. A survey should lead people to believe that expected rewards from answering the survey outweigh the anticipated cost. Thus, three key goals should be achieved in the process of survey design: establish trust, increase rewards and reduce the cost of potential respondents. The approaches used to reach these goals are closely related to the types of surveys. As mentioned before, web surveys are more convenient and less costly to be administered in wide geographic scope. However, some areas need special attention when designing an on-line survey. Precautionary steps taken in the survey design are described below.

First, there are risks of technical problems with receiving, advancing and sending back the on-line questionnaires due to the equipment, browser and transmission limitations (Dillman,Tortora and Bowker 1999). Failure to opening the survey and successfully accomplishing each question would significantly influence respondent's trust and confidence level in answering the on-line questions. In this study, the consumer survey was created using a web-based survey and reporting tool called "Axio survey". The system created links to the survey and allowed respondents to enter by clicking the link in their emails. In order to minimize the risks of technical problems, the on-line survey was pretested by 144 students and faculty members at Kansas State University and Oregon State University, and residents in San Francisco and Washington D.C areas. Feedback and responses allowed us to correct typographical errors and page layouts and to modify survey questions for improved clarity.

Moreover, in order to establish trust on the web survey, it is recommended to introduce the web questionnaire with a welcome screen that is motivational and trustworthy, emphasizing the ease of responding and the value of their participation. Thus, at the beginning of the survey, we explained to respondents the purpose of this survey, the sponsorship of USDA and Kansas State University (KSU) which are legitimate institutions, and the names of researchers to increase the credibility of this survey. Respondents were also assured that participation in the survey was voluntary and completely confidential, which may ease the tension in exposing their ideas and opinions.

Furthermore, rewards were provided to respondents in order to compensate for completing the survey. Respondents received partial or full credit on their accounts with the survey company depending on their levels of completion. Other ways were also used to reward the respondents such as saying thank you in the beginning page,

asking the questions in polite ways and asking for suggestions on the soymilk product marketing at the end of the survey. The principle was to make respondents feel respected throughout the process of taking this survey.

In addition, it is important to make the survey easy to understand, convenient to answer and limited in length in order to minimize the anticipated cost of answering the survey. This concern was especially applicable for this survey because it included some questions that may not be familiar to respondents. For example, consumers' opinions on soymilk product under different types of brands were asked. In order to elicit meaningful responses, definitions of different types of brands (general store brand, specialized store brand and national brand) were offered immediately prior to the question to provide necessary pieces of information. Sample pictures of products of famous brands were also presented. Both verbal definitions and graphic illustrations would help respondents to answer the questions more accurately. Moreover, the survey used different font size, bold prints and italics to draw attention to key phrases and help respondents better grasp the main points of questions. The web-survey instrument also makes it possible to manage the number of questions appearing on each screen. If a question contains a large number of sub-parts, the question was divided into two identical same questions with a different set of sub-parts and presented in two pages. For example, respondents were required to indicate their valuations of 15 various attributes of soymilk product. Two identical questions were created (Questions 7 and 8) to make it easier for the respondents to rate on 8 or 7 attributes at one time.

In addition, Dillman (2007) suggested that the order and logic of the questions would influence consumers' efficiency in answering significantly (Dillman 2007). The respondents would be fatigued and confused if questions were presented in a random manner. To deal with this issue, the U.S. survey presented general and straightforward questions on consumers' food purchasing habits (Questions 4-8) first. Respondents were then led to questions relating to more specific aspect of the product such as brand preference (Questions 9-12), perceptions of organic attributes (Questions 13-14) and origins of ingredients (Questions 22-25). Demographic information was asked in the last section (Questions 32-40) because this information is personal and potentially embarrassing (e.g., age and income). The above steps helped limit the survey completion time to 24 minutes on average, a reasonable amount of time devoted to a survey without making respondents feel fatigued and bored.

4.2.2 Survey Questions

The version of U.S. survey was comprised of four major parts: screening section, behavior and perceptions section, choice task section, and demographic section (see Appendix A). The screening section included two questions (Q2 and Q3) that was meant to restrict the respondents to those who are responsible for at least half of the household's grocery shopping and shop for soymilk regularly (more than once a month). The frequency cutoff was decided according to the information from Mintel's marketing report about soy product consumers (Mintel 2008a).

Behavioral and perceptions questions were designed to obtain information relating to consumers' soymilk shopping behavior and perceptions of various attributes of soymilk. This section has been further divided into three parts with different emphasis. The beginning part (Q4-Q8) consisted of questions on respondents' general food consumption behavior and perceptions on conventional and organic soymilk. The questions were all closed-ended questions with multiple items, where respondents were required to select a scale for each item, representing the level of preferences or opinions. Such design could help the researchers to quantify respondent's attitudes and preferences. Moreover, respondents were asked in these questions to recall their purchasing behavior during the last 12 months. Such design was intended to help respondents to recall their shopping habits more easily while establishing the basis for discussion and analysis.

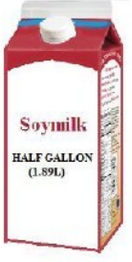
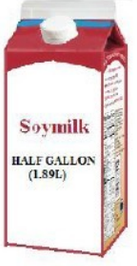
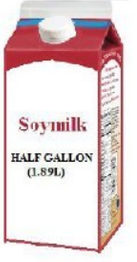
Question 4 asked respondents to identify main retail outlets where they shopped for soymilk products. Because of the possibility that respondents shopped for groceries in different retail stores, the response scale was set as "primary source" "secondary source" "seasonal source" and "never". The primary source was defined as the retail outlet where they most frequently buy soymilk. Respondents were asked to identify one retail outlet as the "primary source" for soymilk and identify the remaining retail outlets as the "secondary" or "seasonal" sources. Because we were concerned about how consumers respond to different types of labeling information of soymilk products, Question 5 asked about how frequently they paid attention to certain pieces of information on food labels. Q6 was on the level of trust towards different kinds of organizations providing the labeling information, so as to find out whether the level of trust towards certifications and labeling could influence consumers' purchasing behavior. Then, respondents were asked about their general preferences towards various attributes of soymilk in Q7. The five scales "not at all important" "not very important" "indifferent" "very important" "extremely important" were used here and in other questions eliciting preference and valuations of various attributes of the product. In this way, respondents could show their preferences towards each attribute without ranking them altogether.

Subsequently, respondents were directed to questions specifically relating to brand preferences of soymilk products. Respondents were asked to identify their usual shopping choices of branded soymilk products (Q9). The next question was intended to inquire about respondents' assessment of aspects of brands when choosing soymilk products (Q10). Two comparison questions were then presented to examine whether respondents could differentiate between different types of branded products (Q11 and Q12). These questions could be hypothetical as respondents may not have tried soymilk products under some brands. The respondents were thus reassured that their answers needed not be based on past experience. The scale used in these comparison questions was identical: "1 = highly inferior", "2 = slightly inferior", "3 = similar", "4 = slightly superior" and "5 = highly superior".

The third part of the behavior/perception section included questions related to respondents' shopping behavior of organic soymilk and preferences on origins of ingredients of organic or non-GMO soymilk. These questions relating to consumption frequency of organic soymilk (Q13) and preferences of attributes of organic soymilk (Q14) were presented at the end of this section immediately preceding the choice task section to increase awareness among respondents of various attributes of soymilk. The comparison questions between choosing soymilk products with different origins of ingredients were presented after the CE questions. The separation of the presentation of the questions in this part was to reduce the possibility that the questions formatted in matrix of answers and scales exhaust respondent's patience and energy. It is hoped that CE questions with pictures and simple product definitions could serve as an intermission for respondents from answering similar types of questions.

The next section is composed of 6 choice tasks in each of the three versions. Figure 4-1 shows an example of a choice task. In each task, the respondent were asked to choose among three soymilk products (A, B, & C) sold in half gallon cartons (64 ounces, 1.89 liters) in the refrigerated section of their typical grocery store, differentiated by four attributes varied in three levels. The half gallon carton size was chosen because it is the most common package size of soymilk available in the market. Besides the three soymilk products, the respondents were given the option of not buying any of the three products (option D) if they are not attracted to any product. The "no-buy" option was included to make a choice set "exhaustive". That is to say, the choice set takes into account all possible alternatives (Train 2003).

Figure 4-1: An example choice scenario included in the choice experiment (U.S.)

	A	B	C	D
				I choose not to purchase any of these 3 products
Price	$3.38	$2.78	$3.08	
Brand	General store brand	Specialized store brand	National brand	
Production	No Claim	Certified Organic	Non-GMO	
Origin of soybeans	Imported	No label	US	

○Product A ○Product B ○Product C ○I choose not to purchase any of these 3 products

The attributes of the soymilk product in the choice tasks and their levels are presented in Table 4-1. The price of soymilk varied at three levels. The price level was set at 30-cent increments above and below $3.08, which was the 2009 national average retail price for soymilk in half gallon carton reported in the AC Nielsen sales data. The pretest confirmed the validity of the setting of the prices.

Table 4-1: Attributes included in the choice experiment (U.S.)

Attributes	*Levels*
Price	$2.78 $3.08 $3.38
Brand	General Store Brand, Specialized Store Brand, National Brand
Production practice	Certified Organic, Non-GMO, No Claim
Origins of ingredients	U.S., Imported, No label

The brands under consideration included “national brand”, “specialized store brand” and “general store brand”. “National brand” was defined as “brands that are marketed throughout the U.S. and are usually advertised and owned by the manufacturer”. The example was provided as a brand owned by Dean Foods Company. The “specialized store brand” referred to “products manufactured or provided by the retailers that specialize in organic or natural food products” and was illustrated with an example of the store brand owned by Whole Foods. The “general store brand” was store-branded “products manufactured or provided by the retailers other than natural food stores”. Examples were provided as store brands owned by Wal-Mart or Kroger. This attribute would allow us to evaluate consumers’ responses to emerging store-branded soymilk products.

Production practices attribute also varied at three levels including “certified organic”, “non-GMO” and “no claim”. The definition for the “certified organic: label stated that the products were “produced and packaged according to the National Organic Standards regulated by the U.S. Department of Agriculture”. “Non-GMO: was defined as “the ingredients of manufacturing soymilk contain no genetically modified organisms”. The “no claim” attribute was explained to respondent that “there is no information relating to the production process on the product packaging, assuming that such production method could involve the use of approved chemicals to control for pests and weeds”.

The attribute “origin of soybeans” referred to the location where the major ingredients of soymilk, soybeans, were produced. Although such information has not been available in the market yet, it is the interest of the study to see how consumers value this attribute in the organic soymilk industry, which is facing increasing quantities of imports. Three levels were “imported”, “U.S.” and “no label”. The “imported” label indicated that “the ingredients for the

product were sourced from overseas." The "U.S." label indicated that "the ingredients for the product were sourced from U.S. farms." The "no label" meant that "there was no information relating to the origins of the ingredients on the product packaging."

The OPTEX procedure of SAS software was used to generate the efficient choice experiment design. The choice experiment design with 18 choice scenarios (3 alternatives for each task) yielded a D-efficiency value of 99.32%. In order to minimize respondent fatigue, the choice scenarios were grouped into three blocks, so each respondent would be asked to complete only six choice tasks. Respondents were instructed to make the selections as they would if they were facing these choices in an actual shopping experience. Such reminder to the survey participants could help reduce the hypothetical bias, although the respondents were not given actual money to make real purchase of soymilk products in this hypothetical experiment (Whitehead and Cherry 2004).

The last section was designed to collect demographic information including gender, age, race, family size, education, geographic location, and income. Besides an open-ended question on post code, the questions in this section were all closed questions with choices specifying different ranges, considering some information may be sensitive to some respondents (e.g., question relating to age and income).

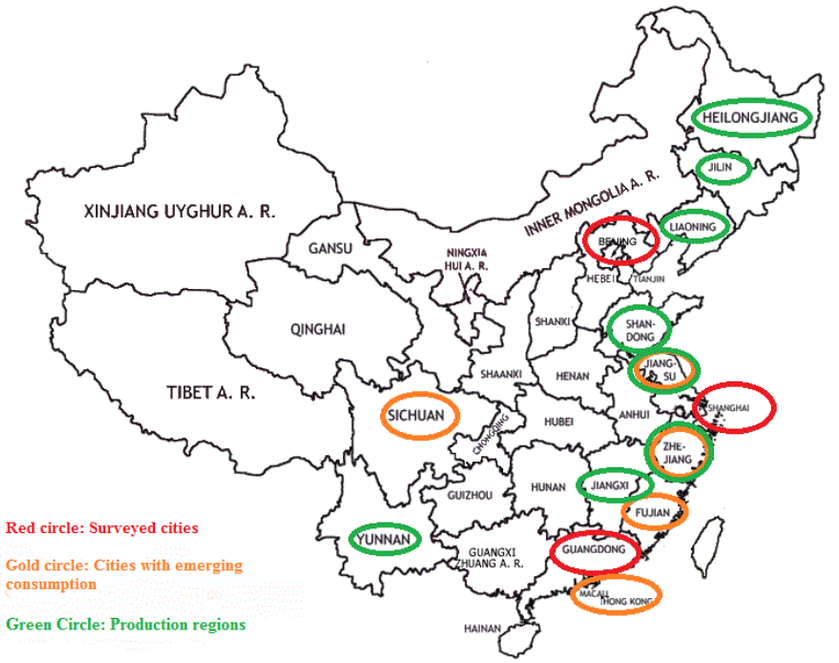
4.3 Development of the Chinese Survey

A consumer survey was designed to elicit Chinese consumer's attitudes towards attributes of soymilk. Because the organic market in China has not been well developed, organic food was not nationally available in China (Figure 4-2). Production of organic food (circled in green in Figure 4-2) in China is concentrated in the northern part (e.g., Heilongjiang, Jilin, and Liaoning) and Southeast part (e.g., Zhejiang, Fuzhou, and Jiangsu) of China (Sheng, Shen and Qiao et al. 2009). The consumption of organic food occurs mainly in big cities with relatively high income. Therefore, instead of a national consumer survey as in the U.S. case, the Chinese survey was conducted in three major cities: Beijing, Shanghai and Guangzhou (circled in red in Figure 4-2). These three cities are ranked among the top ten in terms of living standards and are the main domestic markets for organic food in China. Emerging markets for organic food including Shenzhen, Huangzhou, Nanjing, and Chengdu (circled in gold in Figure 4-2) are near the three cities as well (Lagos et al. 2010).

The survey was conducted in each city at three major types of food shopping outlets, namely a domestic supermarket (Hualian), a foreign owned supermarket (Carrefour), and a farmers' market (free markets in China). Foreign owned supermarkets have the scale and function similar to Wal-Mart and Target in the U.S. Domestic supermarkets have been founded by Chinese entities. Well known domestic supermarkets like Hualian or RenrenLe have similar scales and functions as foreign owned counterparts. Chinese free markets resemble farmers' markets in the

U.S., yet running on a daily basis all year long. Varieties of food products including vegetables, meat and seafood are available in free markets. The vendors in free markets sell freshly made processed products such as vegetable oil or soymilk as well.

Figure 4-2: Consumption and production geographic locations for organic food (China)



Different from the U.S. survey, the survey in China was conducted by trained interviewers intercepting shoppers at stores and enumerating their responses. For one reason, an online survey would not generate a representative sample. In China, use of the Internet is not as common as in the U.S. and a large percentage of users are students and younger generations, who are less likely to be engaged in household grocery shopping. Hence, the web survey would not generate a sample that would represent the target population. In contrast, the proposed method allows for trained interviewers to get in contact with actual shoppers in the markets. There are some additional advantages of using enumerated surveys in China. First, the method would be more likely to yield a high percentage of returns while controlling the targeted sample because interviewers could flexibly approach any respondent. Second, responses are more likely to be accurate, especially to questions on unfamiliar topics. In China, the organic concept remains relatively new and may not be well understood by many consumers. Moreover, surveys with CE are rare in China and most likely foreign to respondents. Through conversation, interviewers could explain questions further if respondents could not comprehend initially. Moreover, enumerated surveys allow for interviewers to observe the behavior and reactions from respondents directly as additional information (Miller, Derbert and Salkind 2002).

The survey in China was conducted by an experienced market research company. About 33 valid responses from each of the three shopping outlets in each of the three cities were collected. Thus, in total 300 valid responses for China survey were collected with 100 responses for each version, which were equally distributed among three cities and three retail types (11 for each retail type in each city).

4.3.1 *Survey Design*

Relative to other methods used in the tailored survey, particular efforts are needed in designing and administrating enumerated surveys. Human errors can be brought by interviewers leading to inaccurate and biased data. For example, it is possible for interviewers to lead respondents to answer questions in certain ways. It is also possible that interviewers provide wrong explanations to the questions. We communicated with the survey company to ensure that all interviewers were trained beforehand, and they were monitored by at least two field supervisors during the surveying process. To further reduce human errors, every term that might have required interviewers' explanation was defined clearly. For instance, because the pronunciation and characters of the term "organic" is the same with the word "synthetic" in Chinese, definitions of organic farming and organic food were provided right after the screening section so that respondents would not misunderstand the context of the survey. In addition to clear verbal definitions, organic eggs were given as a specific example to help respondents understand the correct meaning of organic food, because it is the most commonly known organic product in China. Each interviewer was then required to read the questions or narratives exactly as printed in the survey. Moreover, during the process, interviewers were required to read the questions aloud while respondents followed along in print. Such action prevented respondents from going through the questions too quickly without fully comprehending them.

Another possible pitfall of enumerated survey is its time and location constraint, which could possibly make the sample biased. For example, if interviews were conducted in respondents' home during weekdays, most respondents would be housewives (Miller and Salkind 2002). Also, to ensure all surveys are taken during similar timeframe, large numbers of interviewers are needed, which could increase the cost of administration. To deal with this issue, three major types of retail stores in China were selected to better target grocery shoppers, which increased the response rate and limited the administration cost. Moreover, a quota on age percentage, gender percentage and other demographic variables were set with the survey company to ensure representativeness of the respondents. At the end, 300 valid surveys were collected within one week in October 2010. Similar to the survey conducted in the U.S., respondents were rewarded with shopping coupons after completing the survey.

4.3.2 Survey Questions

Because the Chinese survey was administered differently from the U.S. survey, there are a few distinctions in the survey contents. On the other hand, most of the questions in the Chinese version were designed to be identical to those in the U.S. survey for consistency.

Similar to the U.S. version, the Chinese survey was also comprised of four parts: screening section, behavior and perception section, choice task section, and demographic section (see Appendix B). The screening section was meant to restrict respondents to those who are frequent soymilk drinkers and responsible for at least half of the household food shopping. In order to ensure the sample to be representative of the city population, demographic questions including age, gender and income were also included in the first part of the survey, which ensured the sample to be balanced in terms of these key characteristics.

The second part contained questions on food consumption behavior and perceptions on soymilk in China. As the market for branded soymilk products has not been fully developed yet in China, questions on brand preferences were dropped. Instead, freshly made soymilk was chosen as the target product of the Chinese survey. Correspondingly, some questions in this section were changed to incorporate features of soymilk consumption in China. Moreover, certain items were dropped or added to questions, consistent with the differences in the two markets.

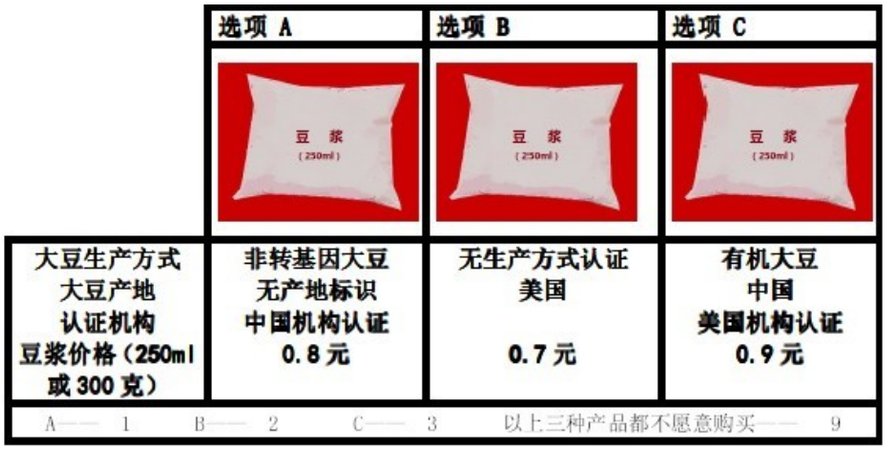
The first question in this section was to find out how often respondents would check on each piece of information on food labels. Similar to the U.S. survey, the labeled information included brand, certifying agencies, production and process claims, and origin of ingredients. The next question was about the level of trust towards different types of organizations providing the information on labels. In addition to the items in question Q6 of the U.S. survey, local (province) government was added because some provinces may have particular regulations or requirements that may be conveyed to consumers via labeling. Also, foreign and Chinese certification agencies were separately included in this question, instead of combining them into "foreign certification agencies accredited by U.S. government" as in the U.S. survey, because it was of specific interest to examine whether Chinese consumers differentiated organic products certified by various certification agencies.

The next question was on retail outlets where respondents shopped for soymilk. Instead of asking which retail stores the consumers usually shop for soymilk products (Q4 in the U.S. version), the question "how do you consume soymilk" was posed to find out exactly how Chinese consumers purchased and consumed soymilk. Two additional options included "make it by myself using soymilk makers" and "buy soymilk made by sellers in the free market." The following question (Q5) was to get consumers' perceptions of each attribute of soymilk. Consistent with the U.S. survey, the behavior/perception section also included a set of questions on consumers' purchasing behavior and preferences on

attributes of organic soymilk, and a set of questions on consumer's opinions towards origins of soybeans. These questions were comparable to the U.S. questions.

Choice experiment questions were presented in the third section of the survey. The OPTEX procedure of SAS software generated an efficient design with 18 choice scenarios (3 alternatives for each task) with a D-efficiency value of 94.24%. A typical choice scenario was shown in Figure 4-3. In each choice scenario, the respondent was asked to choose among three freshly made soymilk products packaged in 250 ml bags with three different attributes. To include all the possible alternatives, a "no-buy" option was also included to allow the respondents not to purchase any of the three specified products. Freshly made soymilk was chosen because it is a comparable product to the refrigerated packaged soymilk in the U.S. as the most commonly consumed form of soymilk. As discussed earlier, Chinese consumers prefer freshly made soymilk as a major drink for breakfast. The packaged soymilk in China, on the other hand, is consumed mainly as snack. Moreover, there is a growing trend that people would purchase the freshly made soymilk in China (Bi 2008). Fresh soymilk consumed at breakfast time is often not packaged in formal containers like refrigerated soymilk products. Therefore, an image of a generic bag filled with soymilk was used to allow consumers to relate the soymilk product with the kind they normally purchase. Product size was set at 250 milliliters based on the initial market research. Three to five samples of soymilk products sold in supermarkets, breakfast restaurants and free markets were collected from each of these three cities in order to see how products were sold in terms of packaging and content size in China. The exercise revealed that an adult consumes about 250 milliliters of soymilk for one average breakfast meal, which is also the most common package size for soymilk sold in retail outlets and restaurants in Beijing, Shanghai and Guangzhou.

Figure 4-3: An example choice scenario included in the choice experiment (China)



The attributes and levels of each attribute are presented in Table 4-2. The first attribute was a combination of production practices and agencies certifying the practices. In order to be comparable to the data collected from U.S., "certified organic" and "non-GMO" were the two types of production practice considered. Organic food products were defined to be "food derived from organic agricultural production system and the production process does not contain synthetic fertilizers, pesticides, livestock feed additives nor the of use genetic modified technology" (Sheng et al. 2009). "Non-GMO" was introduced as "the ingredients of manufacturing soymilk contain no genetically modified organisms". Organic and non-GMO foods in China can be certified by different certifiers (including Chinese and Foreign certifiers). Therefore, this attribute was specified as seven levels namely "organic certified by Chinese agencies", "organic certified by U.S. agencies", "organic certified by EU agencies", "non-GMO certified by Chinese agencies", "non-GMO certified by U.S. agencies", "non-GMO certified by EU agencies" and "no claim". "No claim" was explained to the respondent as that "the information about the production feature may not be available and soybean could be organic or non-GMO or soybeans are likely not organic and likely contain genetically modified crops". The rationale behind choosing European agencies is that a large number of European certification agencies are currently operating in China. Moreover, the first organic certification agency that certified organic products (green tea) from China was KAL from the Netherlands in 1990 (Zong 2002).

The "origin of ingredient" attribute referred to the location where soybeans were produced. Three levels were defined for this attribute including U.S., China, and no label. The definition explained to the respondents was "Soybeans could have been harvested in China or U.S., or the information on origin may not be available". As in the U.S. survey, "no label" conveyed that origins of soybeans were not revealed to the consumers.

The price of soymilk in China has been relatively low. The price level was set at 10 increments above and below 80 Chinese fen (1/100 of Chinese yuan), which was the average retail price based on the samplings of soymilk products in Beijing, Shanghai and Guangzhou in September 2010.

Table 4-2: Attributes included in the choice experiment (China)

Attributes	*Levels*
Production practice & Certification agencies	Organic certified by Chinese agencies, Organic certified by U.S. agencies, Organic certified by EU agencies, Non-GMO certified by Chinese agencies, Non-GMO certified by U.S. agencies, Non-GMO certified by EU agencies, No claim
Origins of ingredients	U.S., China, No label
Price	70 fen ,80 fen, 90 fen

The survey in China was pre-tested by a sample of 73 respondents consisting of citizens in mainland China and a small percentage of Chinese graduate students at Kansas State University. Feedbacks confirmed that the design of choice sets was valid and plausible.

The fourth part contained some of the demographic information. Besides age, gender, and income information presented in the first part of the survey, education level, number of children and size of the family were collected in this part. The race information was not included in the survey because 91.59% of the Chinese population is Han (China National Census Bureau 2005). Proportions of Han in the three selected cities are even higher.

Chapter 5 Results and Model Estimation

5.1 Introduction

Consumers' preferences towards various attributes of soymilk were analyzed based on consumer surveys conducted in the U.S. and China. The results of the surveys are presented separately in this chapter, with the results from the U.S. first. Then, the analysis of Chinese respondents' preferences is presented. Both sections are organized as follows. The respondents' characteristics are first presented to help understand who they were. Their food shopping behavior and perceptions of soymilk attributes are then assessed. Responses to the choice experiments are analyzed using mixed logit models and the estimation results are discussed next. Lastly, the willingness to pay values for individual attributes are calculated and analyzed. In the last section, the U.S. results are compared to the China results to show similarities and differences in consumer preferences in these two countries.

5.2 Results from the U.S. Survey

A national online survey was conducted during the third week of November 2010. In total, 2,401 surveys were sent to respondents, who were interested in nutrition information, health and wellness throughout U.S. via a well known research firm, and 316 were successfully completed (13% completion rate). The low incident rate was not a surprise because the screening questions excluded respondents who did not drink soymilk more than once a month. Such completion rate was consistent with Mintel report that 17% of the populations were heavy or moderate soymilk drinkers who consume soymilk more than once a month (Mintel 2008a). Three versions of the survey were distributed and the number of completed surveys was 113, 98 and 105 among versions 1, 2 and 3 respectively.

5.2.1 Respondent Characteristics

Characteristics of the sample were different from the national population in terms of gender, age, education, and income because the survey targeted soymilk drinkers (Table 5-1 and Table 5-2). However, the sample distribution was largely consistent with the Mintel report on soy-product consumers. In the sample, about 62.66% of respondents were male, slightly higher than the male proportion of the national population (49.27%). In contrast, most consumer surveys targeting consumers who did more than half of the grocery shopping had a relatively higher ratio of female (Bernard et al. 2006; Pozo 2009; Baudouin 2010). The relatively higher ratio of male respondents in the sample was also consistent with the Mintel report (see Appendix C, table C-2). It was indicated that soy products were more appealing to men than women, probably because of the statement by PR Newswire detailing research (2008) that soy may help men protect against prostate cancer and hair loss (Mintel, 2008a).

Moreover, the sample was different from the national average in terms of age distribution. The majority (about 60.12 %) of respondents were between 35 and 64 years old, compared to 39.7% of the national population (18 and older). In addition, this sample had less percentage of people older than 64 when compared with the national level (5.70% versus 37.10%). The difference might be because that soymilk is a relatively new product in the U.S. and it is harder for elder people to change consumption pattern in a short time. In addition, respondents were mainly from middle income and high income classes. About 32.6% of the respondents earned household annual income above $100,000, significantly a higher share than the national average, 20.21%. Meanwhile, only 22.16% of the respondents earned household income less than $50,000, which is a much smaller share than the 48.10% national average. The Mintel report (2008a) stated that soymilk drinkers were prone to be upper-income households, as soy-based foods tend to be more expensive, compared to their substitutes such as milk and rice milk(see Appendix C, table C-1). Also there is an observable trend showing that higher-income households have higher interest in healthy eating (Mintel 2008a) and thus be more interested in consuming soymilk. The sample also represented a group with higher education level. All respondents had finished high school or attained equivalent education. About 67.09% of the respondents held bachelor degree or above, significantly more than the national-level data (27.05%). Another 29.43% of respondents attained some college or associate education. A sample comprised of highly educated respondents is consistent with the findings on soy food consumption pattern by Rimal, Moon and Balasubramanian (2008). Their study suggested that soy food consumers were generally more educated than non-consumers. Previous research found that education could enhance consumers' access to nutrition information and help them maintain a healthy lifestyle (Grossman and Kaestner 1997; Nayga 1997). Indeed, Mintel report (2008a) indicated that soy food consumers were more likely to lead a healthier lifestyle. About 71.25% of our respondents lived in metro countries, which are less than that on national level, 82.64%.

The ethnicity in this sample was representative of the national average, only a little less diverse with 76.2% of the respondents being white compared to 74.35% of the national average. The sample includes a relatively higher portion of Asian respondents, which is consistent with the statement that soymilk is more popular among Asian (see Appendix C, table C-3), black and Hispanic consumers due to a higher incidence of lactose intolerance among ethnic populations (Mintel 2008a). The geographic distribution of the respondents resembled the national distribution in most cases. There is a slightly larger portion of people from Pacific, Corn Belt and Northern Plains regions in our sample compared with the national data.

Table 5-1: Demographic characteristics of the sample (U.S.)

Characteristics	U.S.	Survey Respondents	
	Frequency	N	%
Gender[1]			
Male	49.27%	198	62.66%
Female	50.73%	118	37.34%
Age[1]			
18-24	9.80%	18	5.70%
25-34	13.40%	90	28.48%
35-44	14.30%	59	18.67%
45-54	14.60%	72	22.78%
55-64	10.80%	59	18.67%
65 or above	37.10%	18	5.70%
Race[1]			
White	74.35%	241	76.27%
Black/African American	12.33%	15	4.75%
Hispanic	15.08%	20	6.33%
American Indian/Alaska	0.80%	3	0.95%
Asian	4.37%	31	9.81%
Hawaiian/Pacific Islander	0.15%	0	0.00%
Other	7.56%	6	1.90%

Notes: [1] ： 2006-2008 American Community Survey 3-Year Estimate

Table 5-2: Demographic characteristics of the sample (continued, U.S.)

Characteristics	U.S.	Survey Respondents	
	□requency	N	%
Household Annual Income[1]			
Less than $10,000	7.20%	9	2.85%
$10,000 - $24,999	16.10%	12	3.80%
$25,000 - $49,999	24.80%	49	15.51%
$50,000 - $74,999	18.80%	81	25.63%
$75,000 - $99,999	12.50%	62	19.62%
$100,000 -250,000	16.50%	97	30.70%
More than $250, 000	4.20%	6	1.90%
Education[2]			
Elementary	5.02%	0	0.00%
Middle	9.07%	0	0.00%
High school or equivalent	30.86%	11	3.48%
Some College or Associate Degree	28.00%	93	29.43%
Bachelor	17.74%	108	34.18%
Graduate	9.31%	104	32.91%
Geographic locations[3]			
Pacific	15.46%	62	19.62%
Mountain	7.21%	20	6.33%
Northern Plains	1.98%	10	3.16%
Southern Plains	9.27%	18	5.70%
Corn Belt	12.99%	58	18.35%
Lake States	6.80%	26	8.23%
Delta	3.37%	4	1.27%
Southeast	12.26%	40	12.66%
Appalachia	9.67%	21	6.65%
Northeast	20.35%	55	17.41%
AK, HI	0.65%	2	0.63%
Metro or rural counties[4]			
Counties in metro areas	82.64%	226	71.52%
Counties in rural areas	17.36%	90	28.48%

Notes: [1] ： 2006-2008 American Community Survey 3-Year Estimate;

[2] ： 2009 Current Population Survey;

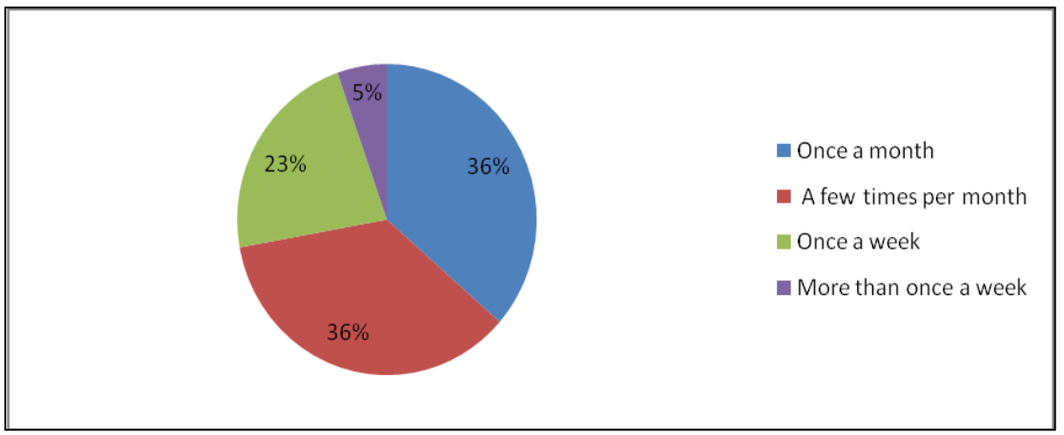
[3] ： 2009 U.S. census Bureau estimate;

[4]： 2000 U.S. census Bureau estimate

5.2.2 Food Shopping Behavior and Perceptions

Because the survey targeted soymilk drinkers, respondents did not include consumers who have never drunk soymilk (Figure 5-1). About 28% of the respondents shopped for soymilk at least once a week. Another 36% of the respondents shopped for soymilk a few times per month. The rest of the 36% of the respondents shopped for soymilk only once a month. Such distribution was largely consistent with the results in Mintel report (2008a) that indicated 37% of soy food consumers were heavy soymilk consumers and 34% of soy food consumers were moderate soy product or drink consumers.

Figure 5-1: Consumption frequency of soymilk products (U.S.)

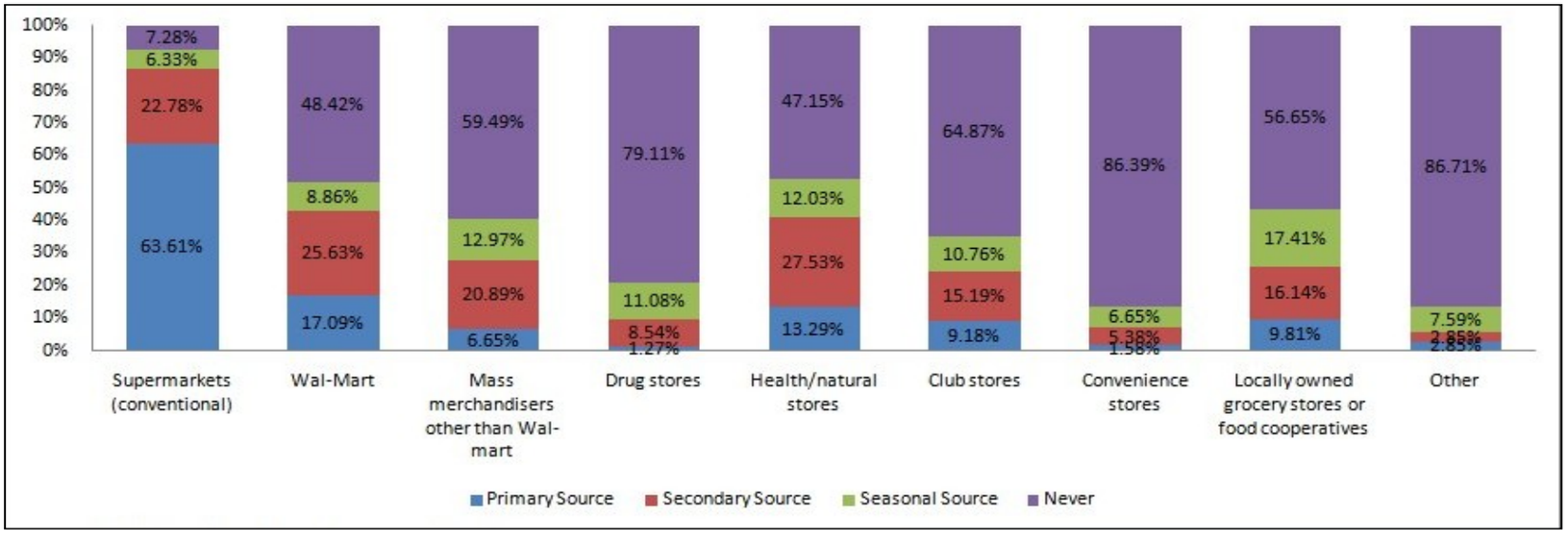


Regarding typical shopping venues for soymilk products, about 62% of respondents identified conventional supermarkets (e.g. Kroger, Supervalue or Safeway) as their primary source for soymilk purchasing (Figure 5-2). Such result was consistent with the conclusions of the Mintel report (2008a) that conventional supermarkets has become the leading channel for soy-based food and beverage, accounting for 88% of the market shares[1] in 2008 (Mintel 2008a). The second popular type of retail store was Wal-Mart in the sample with 17.09% of respondents choosing it as their primary retail store to buy soymilk products. Such percentage is lower than that from a national survey conducted by Mintel (2008a) suggesting one third of population choosing Wal-Mart to shop for soy products. Following Wal-Mart, health and natural stores such as Whole Foods Market was favored by 13.29% of soymilk shoppers. In general food retailing

[1] Due to the lack of information, sales of soy products at Wal-Mart were not included in the statistics by Mintel.

industry, health and natural stores only accounted for 1.3% of the market share (Datamonitor 2010). Comparatively speaking, consumers tend to shop for soymilk more often in health and natural stores than shop for other food products.

Figure 5-2: Retail stores where respondents shopped for soymilk products (U.S.)



Results suggested that respondents cared about and checked different items of information on the labels (Figure 5-3). The most frequently checked labeling information were brand and nutrition facts with 74.37% and 60.13% of the respondents checking this information more than half of the time. About half of respondents checked the claims regarding production or processing processes (e.g., certified organic, use non-genetically modified soybeans) more than half of the time. Around 37% of respondents would pay attention to the certifying agencies more than half of the time, and around 34% checked the information relating to origin of ingredients more than half of the time.

Figure 5-3: Frequency of checking labeling information of food products (U.S.)

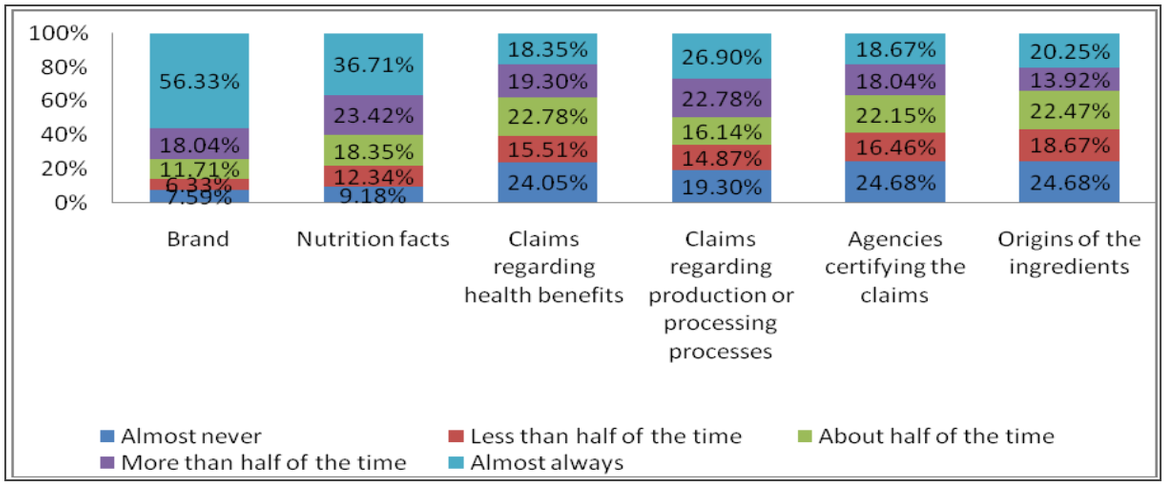
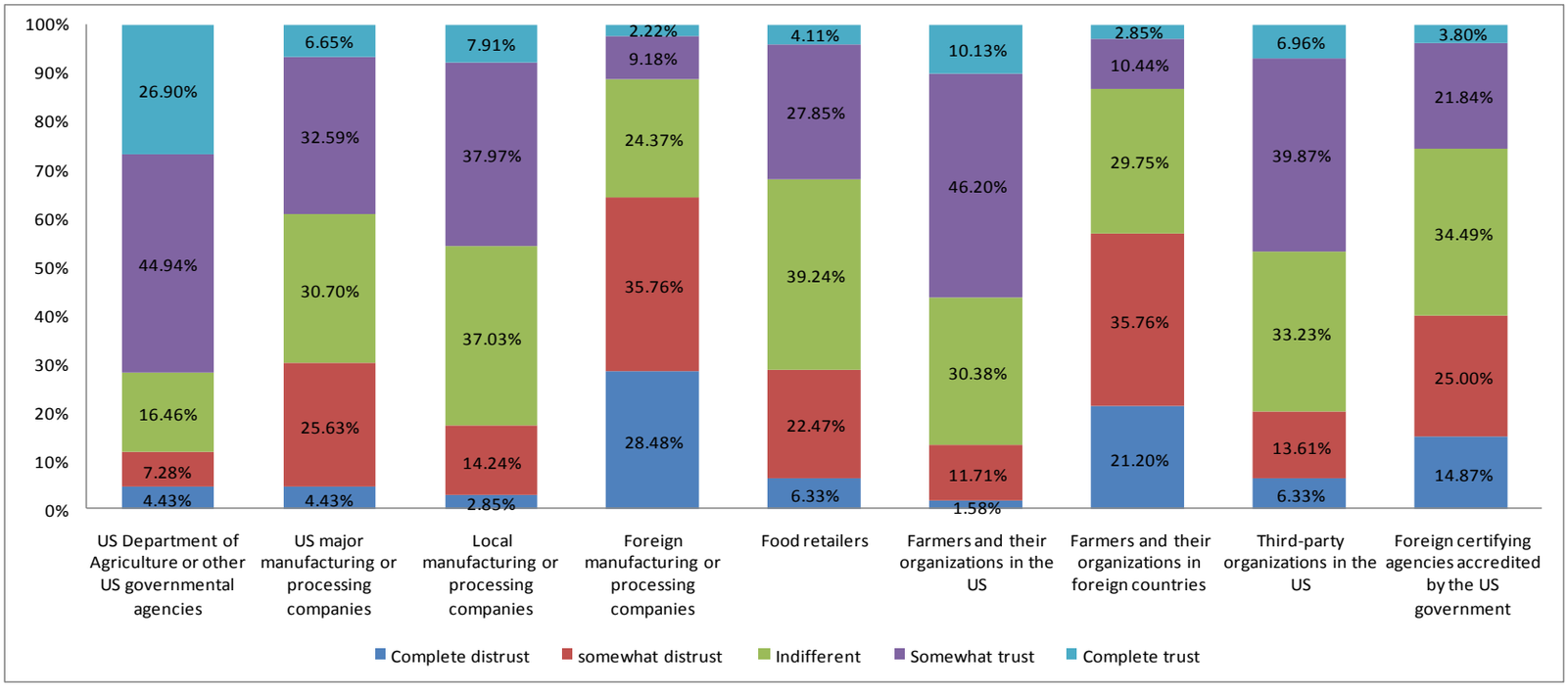


Figure 5-4 summarized the level of trust respondents placed on different types of organizations which provide the information on labels. In terms of origins of organizations, U.S. respondents tended to trust organizations authorized by U.S. entities more than foreign organizations. For instance, the second to the least trustworthy organization in the U.S. was manufacturing or processing companies which received somewhat trust or complete trust from 39.24% of the respondents. In contrast, the foreign counterparts (manufacturing or processing companies) were regarded as trustworthy by only 11.14% of respondents. Among U.S. organizations, the U.S. governmental organizations were trusted most by U.S. respondents with 71% of respondents showed somewhat trust or complete trust, followed by U.S. famers organizations (55% somewhat trust or complete trust), and third-party organizations (46.83%). Local or U.S. manufacturing or processing companies received somewhat trust or complete trust from 45.88% and 39.24% of respondents, respectively. U.S. food retailers received the least trust among the U.S. organizations and only 31.96% of the respondents had somewhat trust or complete trust on them. Three types of foreign organizations won least trust from U.S. respondents. Foreign certification agencies, foreign farmers and their organizations and foreign manufacturing or processing companies were somewhat trusted or completely trusted by 25.64%, 13.29%, and 11.14% of the respondents. Thus, it is plausible that consumers would prefer attributes claimed or certified by some agencies over others. As a result, U.S. certified organic

may be more appealing to U.S. consumers than foreign certified organic because of the trust issue.

Figure 5-4: Level of trust put on various organizations providing labeling information (U.S.)



How important the attributes are for respondents when purchasing soymilk products were presented in Table 5-3. Pairwise t-tests were conducted to see if the mean score for one attribute was significantly different from others. If the mean scores for two attributes share the same letter of superscript, it means that the mean values assigned for these two attributes were not significantly different at the 5% level. Superscripts were arranged in alphabetical orders to represent the rank of the importance level of various attributes. For example, the mean score for "taste" (superscripted with "a") was significantly higher than the mean score of "minimum use of preservatives" (superscripted with "b").

The scores for “taste” “minimum use of preservatives” and “low risk of food-borne illness” were statistically higher than those of other attributes. Such comparatively higher ranking indicates that these three attributes matter more to respondents than other attributes. The “all natural” attribute was ranked higher than the “certified organic” attribute which may explain the findings in Mintel’s report (2009a) that natural non-dairy beverage have outnumbered organic non-dairy beverage products. This finding also suggests that respondents care about the production process of ingredients. However, it is a bit surprising because “all natural” is a voluntary attribute claimed mostly by processors with ambiguous definition. On the other hand, “certified organic” products undergo strict inspections by certification agencies. This result may suggest that consumers lack clear understanding of the meanings of these two labels. The results from Mintel’s national consumer survey (2008a) confirmed this possibility by stating that more than half of the consumers erroneously thought product labeled as “natural” must meet governmental standards.

Price was ranked the 8th after “flavor” and “health claims”, suggesting that soymilk consumers are likely not extremely price sensitive and they were more concerned about attributes relating to product quality, health benefits and safety. The “Origins of soybeans” was ranked towards the bottom part of all the attributes, significantly lower than the price attribute. Accordingly, it could be expected that consumers would be attracted by lower priced soymilk product without paying too much attention to origins of ingredients if there is no observable difference in other more important attributes such like “taste” “minimum use of preservatives” and “low risk of food-borne illness”. The second to the lowest score was “types of retail outlets where soymilk is sold”, which was significantly lower than the score of “brand”. Such result suggests that brand attributes may influence consumers’ evaluations of soymilk product more than the retail types do. Lactose or casein free attribute was ranked last among all the attributes, indicating that the respondents were attracted to consume soymilk mainly because of benefits other than being allergic to lactose or casein. Hence, it is likely for more U.S. consumers to consume soymilk.

Table 5-3: Valuations of various attributes of soymilk products

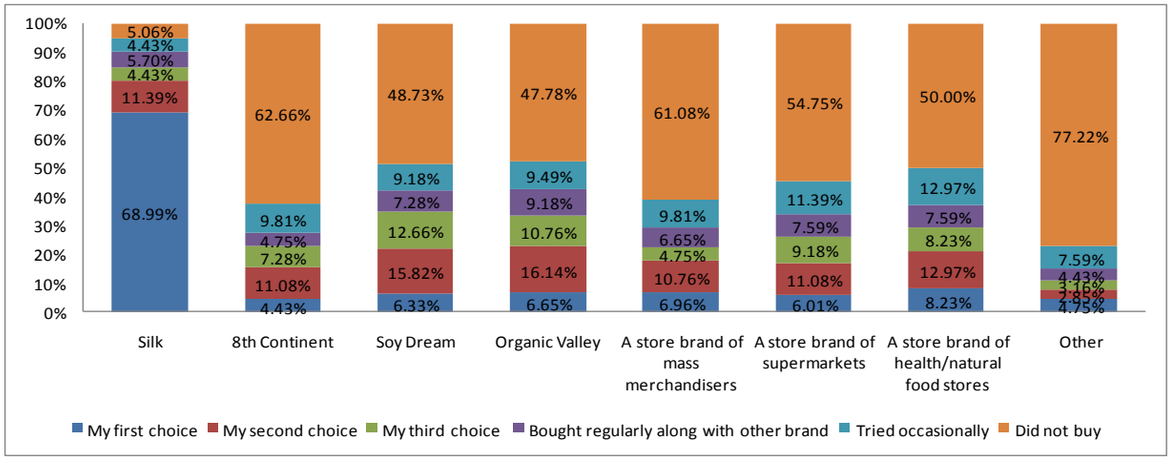
Variable	Mean	Std. Deviation
Taste	4.55[a]	0.81
Minimum use of preservatives	4.10[b]	1.06
Low risk of food-borne illness	4.06[b]	1.02
All natural	3.87[c]	1.08
Claims regarding the production and processing of ingredients	3.87[c]	1.04
Flavor	3.84[c,d]	1.18
Health claims	3.84[c,d]	1.13
Price	3.75[c,d]	1.1
Locations of manufacturing	3.68[d,e]	1.18
Added sugar or sweetener	3.59[d,e]	1.24
Certified organic	3.58[d,e]	1.18
Brand	3.54[d,e]	1.08
Origins of soybeans	3.52[e]	1.16
Types of retail outlets where soymilk is sold	3.25[f]	1.08
Lactose or casein free	3.20[f]	1.4

Note: 1=Not at all important, 2=Not very important, 3=Indifferent, 4=Very important, 5=Extremely important.
[a,b,c,d] Not significantly different at 5% level

5.2.2.1 ***Brand perceptions***

How respondents have purchased different brands of soymilk products during the past 12 months is shown in Figure 5-5. Among the listed brands, nearly 70% of the respondents chose "Silk" as their first choice. Such result is consistent with the survey results from Mintel's report (2008a), saying that Silk dominated 75% of the market share in soymilk market. The purchasing ranking for other three national brand soymilk products were "8th Continent", "Soy Dream" and "Organic Valley". The consumption frequency of the above three national brands was not too different from store brands in conventional soymilk sector. Among the store brands, the purchase percentage for store brand of health/natural food stores was slightly higher than store brands by supermarkets or mass merchandisers. It suggests the retail store type may influence consumers' perceptions on store brands and thus their purchasing decisions.

Figure 5-5: Consumption frequency of soymilk products under various types of brands (U.S.)



Why people would choose certain types of brand over others could be explained by respondents' perceptions of attributes of a brand. The mean and standard deviation for six attributes of a brand were shown in Table 5-4. Product was ranked first in choosing among brands, which indicated that people may be attracted to certain kinds of soymilk brand because they simply liked products under that brand better than others. Price was the second most important factor in choosing among brands. Interestingly, "transparency in disclosing where the ingredients are sourced" was ranked third and significantly different from the 4th one "types of the brands". This response is consistent with what was reported by the Cornucopia Institute (2009), claiming that people who purchased organic soy foods, such as tofu and soymilk, wanted to know whether soybeans were grown by American family farmers or imported from other countries (Cornucopia Institute 2009). It also suggests that the sourcing practices of certain brands can potentially influence soymilk consumers' purchasing decisions if consumers linked certain procurement practices with brands in the soymilk market. "The market share of the company that owns the brand" did not matter to respondents in choosing a brand. Therefore, although market centralization has been observed in the soymilk market with dominant players, such trend would not matter that much in consumers' mind.

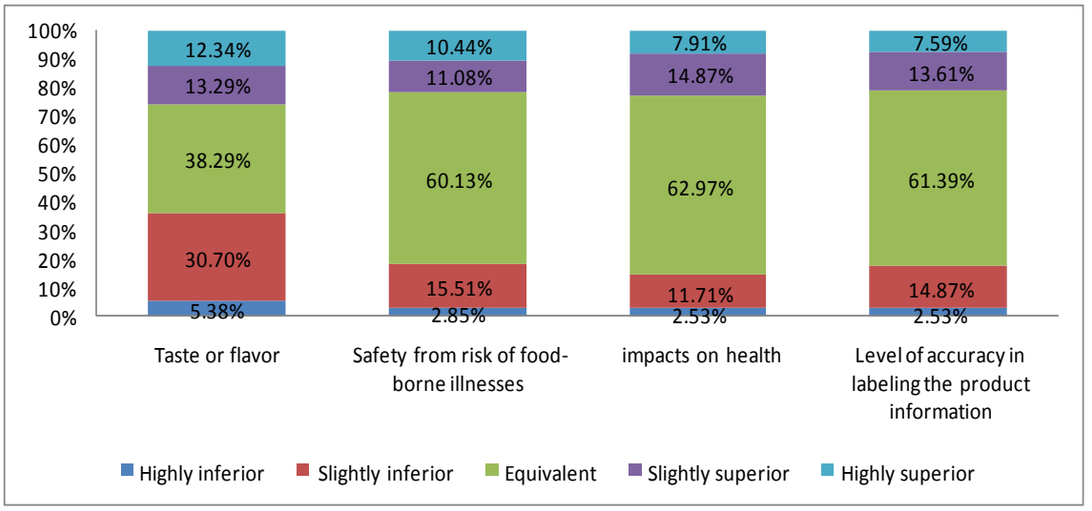
Table 5-4: Valuations of various aspects of brands when choosing soymilk products (U.S.)

Variable	Mean	Std. Deviation
Product	4.29[a]	0.86
Price	3.90[b]	1.10
Transparency in disclosing where their ingredients are sourced	3.70[c]	1.03
Types of the brands	3.47[d]	0.99
Ownership of the brand	3.21[e]	1.03
Market share of the company that owns the brand	2.42[f]	1.11

Note: 1=Not at all important, 2=Not very important, 3=Indifferent, 4=Very important, 5=Extremely important.
[a,b,c,d] Not significantly different at 5% level

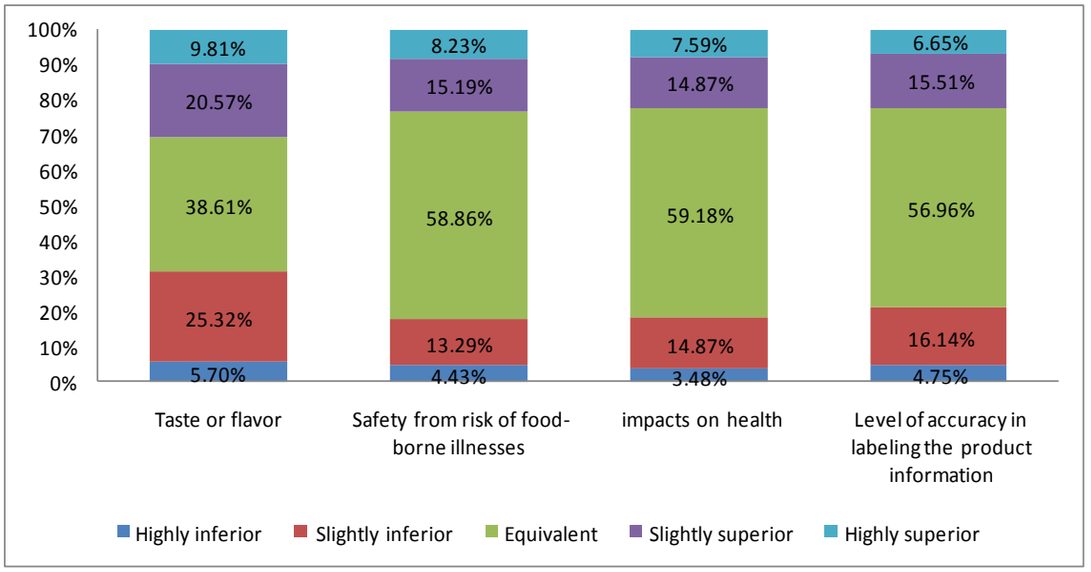
Consumer perceptions of a store brand soymilk product over national brands on brand attributes were compared in Figure 5-6. Over 60% of the respondents did not differentiate store brands from national brands in terms of "potential positive impacts on health", "safety from risk of food-borne illnesses" and "level of accuracy in labeling the product information". However, 61.71% of respondents perceived differences in "taste or flavor" of soymilk product between national brand and store brand; 36.08% of respondents thought national brand soymilk had better taste and flavors than store brand soymilk did, while 25.63% of respondents had opposite opinions.

Figure 5-6: Perception on brand attributes of store brands relative to national brands (U.S.)



The result was quite similar when the brand attributes were compared between store brands by natural food stores (e.g., Whole Foods and Trader Joe's) and store brands by general retail outlets (e.g., Kroger and Wal-Mart) (Figure 5-7). Nearly 60% of the respondents perceived no difference between these two kinds of store brands in "potential positive impacts on health", "safety from risk of food-borne illnesses" and "level of accuracy in labeling the product information". However, 67% of the respondents perceived differences in taste and flavor between the two types of store brands, with 31% of respondents thinking store brands by general retail outlet were inferior and 30% thinking these brands were superior in taste and flavor compared to the store brand in natural food stores. Thus, this symmetric distribution of perceptions implies no clear preference towards one type of store brand over another type. In sum, most consumers perceive differences in taste and flavor across brands. The taste attribute was also the attribute respondents ranked the highest in importance of soymilk products.

Figure 5-7: Perception on brand attributes of store brands in general retail outlet relative to store brands in natural/health stores(U.S.)

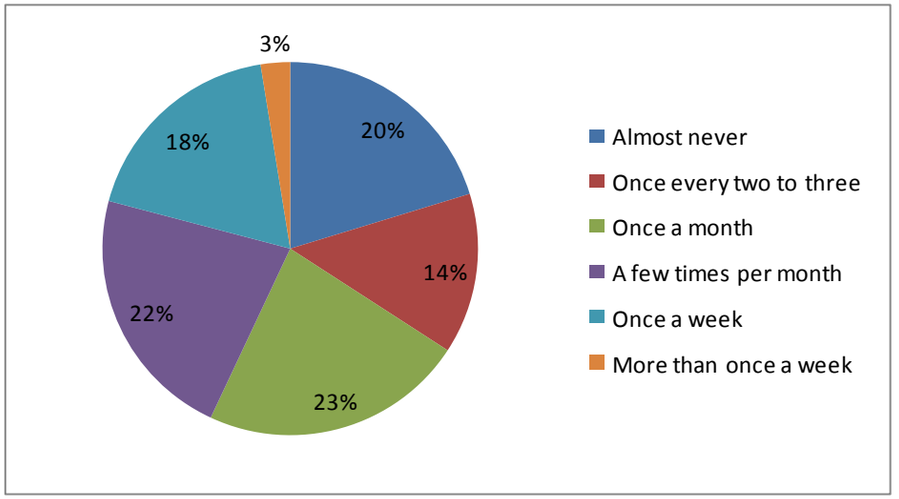


The finding that respondents could differentiate, or at minimum perceive differences in taste across brands, is consistent with the finding that "product" was ranked the highest among the attributes considered in deciding which brand of soymilk to purchase. In recent years, national brand companies emphasized marketing on improved tastes of their products. So it is expected that such strategy could render national brand soymilk products some advantage when competing with store brand counterparts. Even though their procurement practice was perceived as not being transparent, if the product taste is considered superior and most significant in consumers' mind, national brand soymilk companies may still sustain their dominance in the market.

5.2.3 Purchasing Behaviors and Perceptions of Organic Soymilk Products

It was found that only 20% of respondents almost never shopped for organic soymilk products in the past one year (Figure 5-8). Meanwhile, 66% of respondents shopped for organic soymilk more than once a month, 30% of which shopped for organic soymilk on a weekly basis. Mintel's national survey indicated that half of consumers purchased organic food and only 21% of U.S. consumers have purchased organic beverages on a regular basis in 2008 (Mintel 2008b). The result of this study confirmed the market observation by Mintel report (2008a) that soy product consumers are more likely to purchase organic products than general consumers.

Figure 5-8: Consumption frequency of organic soymilk products (U.S.)



Average scores for the importance of each attribute of organic soymilk are shown in Table 5-5. It was found that "taste or flavor" was ranked highest and significantly different from other attributes. The next top three attributes included "health benefits" and "minimum chemical use in production" and "low risk from food-borne illness". Such rankings were quite consistent with respondents' rankings of attributes of conventional soymilk. The only difference was that health claims were regarded to be more important for organic soymilk than conventional soymilk. In these questions, both for conventional and organic, the "health benefits", "minimum chemical use in production" and "low risk from food-borne illness" attributes were presented in a similar order, suggesting that the order in which attributes were presented could have had little impact on the results. Thus, this finding could imply that consumers of organic soymilk may be driven by its health benefits. Another notable difference was that "agencies certifying the claims" played an important role in organic soymilk and was ranked the 5th of importance level.

Similar to the results in the conventional soymilk sector, respondents considered "brand" significantly more important than "types of retail outlets where organic soymilk is sold". "Promotion of social justice" was ranked low, which confirmed the claim that U.S. consumers were prone to put private interests higher than social benefits when purchasing organic products (Food Marketing Institute 2006; Dimitri and Oberholtzer 2006; Lonca 2010; Pozo 2009). Similar to the general soymilk section, respondents indicated lower concern for origin of ingredients when purchasing organic soymilk product. Such result does not necessarily mean that products produced with ingredients from different origins were identical in consumers' mind. Current labeling system has not allowed for consumers to access such information conveniently. Respondents may care about this attribute without knowingly. Consumer perceptions on the ingredients' origin are discussed in the following section.

Table 5-5: Valuations of various attributes of organic soymilk products (U.S.)

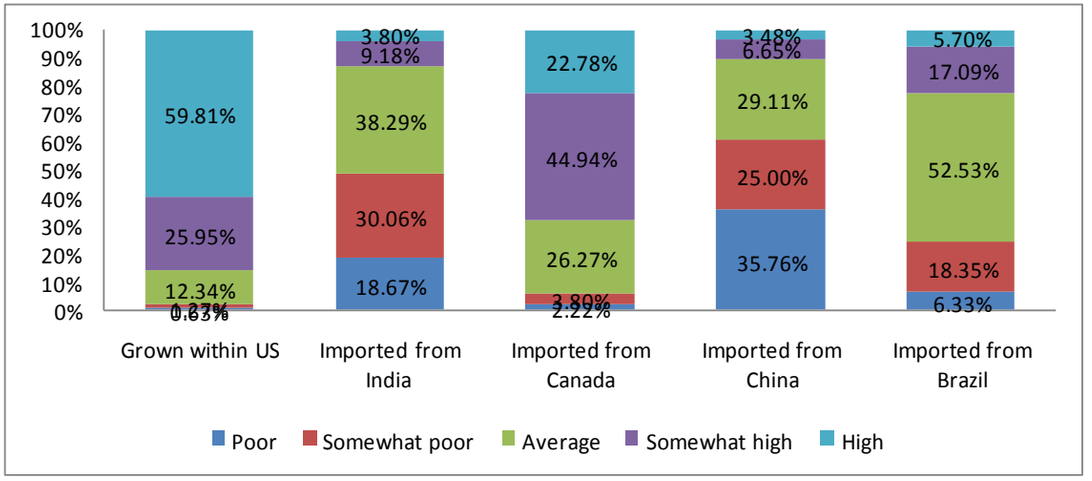
Variables	Mean	Std. Deviation
Taste or flavor	4.34[a]	0.90
Health benefits	4.05[b]	0.97
Minimal chemical use in production	3.97[b]	1.06
Low risk from food-borne illness	3.94[b]	1.03
Agencies certifying the claims	3.75[c]	1.00
Where the product was manufactured	3.71[c]	1.06
Use of non-genetically modified soybeans	3.69[c]	1.11
Origin of ingredients	3.69[c]	1.11
Brand	3.66[c]	1.14
Positive environmental impacts	3.65[c]	1.06
Promotion of social justice	3.40[d]	1.13
Types of retail outlets where organic soymilk is sold	3.31[d]	1.04

Note: 1=Not at all important, 2=Not very important, 3=Indifferent, 4=Very important, 5=Extremely important.
[a,b,c,d] Not significantly different at 5% level

5.2.4 Perceptions on Origins of Ingredients

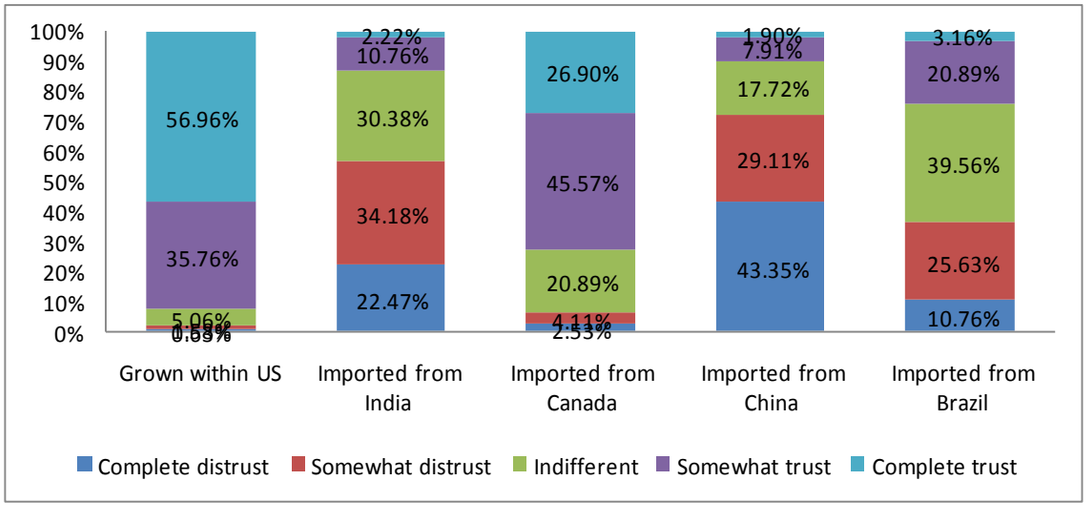
Even though the attribute "origin of ingredients" was ranked low in importance of attributes of soymilk and organic soymilk products, respondents still had distinct preferences towards organic ingredients produced from one country over another. The perceptions of the overall quality of organic soybeans sourced from different countries are shown in Figure 5-9. Domestically grown organic soybeans were preferred by U.S. respondents. Nearly 85.75% of the respondents perceived that the soybeans grown within the U.S. had somewhat high or high quality. Soybeans imported from Canada were considered to have the second best quality and 67.72% of respondents thought the quality to be somewhat high or high. U.S. respondents perceived imported soybeans to bear lower quality. Percentages of respondents regarding the quality to be high or somewhat high for soybeans imported from Brazil, India and China declined to 22.70%, 12.97% and 10.12%, respectively. Such results indicate that the consumers' attitudes and perceptions towards the ingredients from U.S. or abroad are distinct. It is notable that there was a significant difference in perception towards soybeans from India and China, two large low income countries in Asia. About 49% of respondents regarded organic soybeans from India as having poor or somewhat poor quality, while 60.76% of respondents thought organic soybeans from China having poor or somewhat poor quality. The result is consistent with the observations from Cornucopia's report in 2009 that consumers in the U.S. preferred the soybeans from India slightly more than those imported from China. Companies started to discontinue using Chinese soybeans and looked to India as an alternative source of cheaper organic soybeans (Cornucopia Institute 2009). Thus, India's organic soybean exports to U.S. may increase over time.

Figure 5-9: Perceived quality of organic ingredients of soymilk from different origins



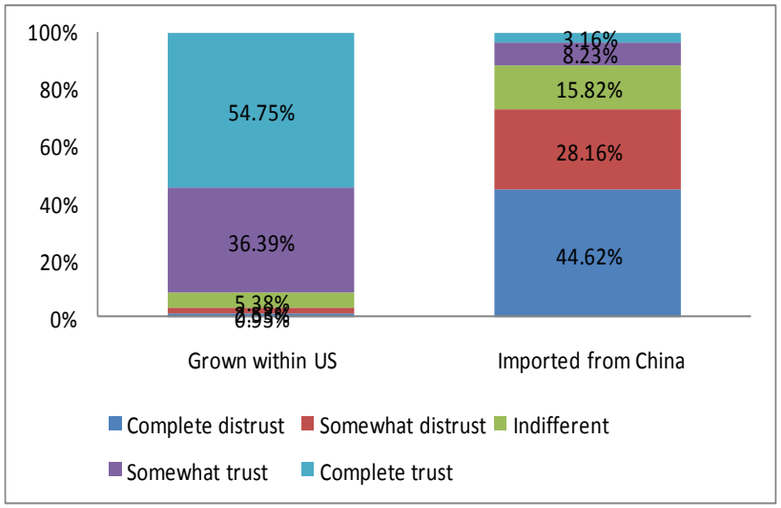
Consumers' distinctive perceptions towards ingredients from different origins may be explained by how much trust they placed in the accuracy of the "certified organic" label of soybeans sourced from different countries. Consumers' trust levels towards organic soymilk ingredients from different origins are shown in Figure 5-10. Most (92.72%) of the respondents trusted or completely trusted the labeled "certified organic" soybeans sourced from the U.S. and 72.47% for those from Canada. As to why respondents may trust soybeans certified in the U.S. more, one potential explanation could be the comparatively larger size of the organic market in the U.S. compared with other low income countries. It may also be related to the familiarity with the certifying systems. India and China received lowest trust with 12.98% and 9.81% of respondents trusting the label. If potential organic consumers are skeptical about organic labels, informed consumers may still be held back from organic consumption because of lack in the trust of organic labels, despite knowledge and awareness of organic food products (Giannakas 2002). Combined, U.S. consumers may be reluctant to purchase organic products with ingredients produced and certified by certain regions (e.g., China, India) where they do not trust in the labeling credibility.

Figure 5-10: Level of trust towards organic soymilk ingredients from different origins



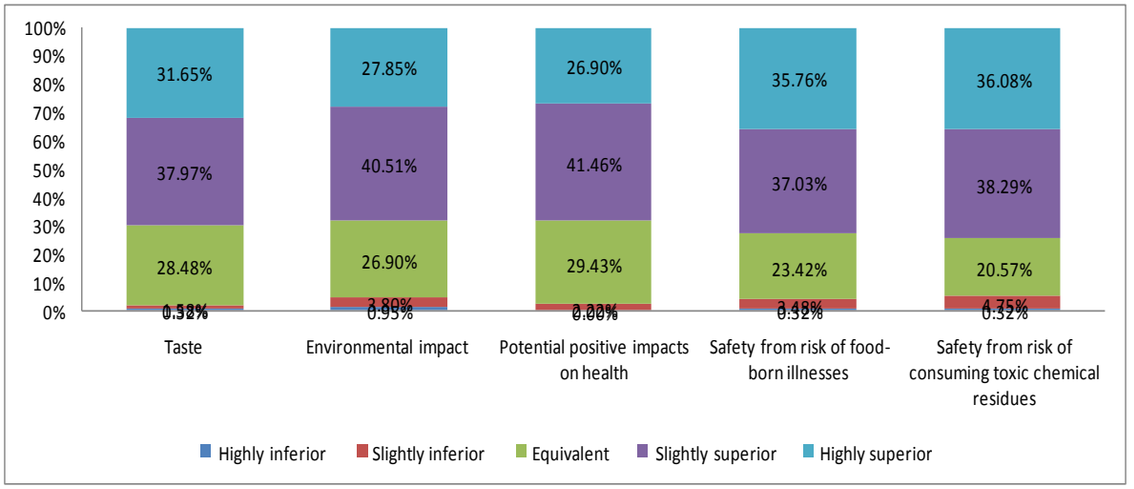
Consumers' trust levels on soybeans certified as non-GMO sourced from different origins are presented in Figure 5-11. The results were not much different from those on organic soybeans. More credibility was expressed towards soybeans produced in the U.S. compared to non-GMO soybeans produced in China (91.14% choosing trust or complete trust for U.S. versus 11.39% for China). This result is a bit surprising because statistics show that more than 91% of soybeans produced in the U.S. are GM soybeans and China has not permitted GM soybean production. This finding led us to believe that consumers' trust level did not accurately reflect the real production situation or market development of that specific category of food from different origins. Instead, the trust level might be related to their preferences in terms of other product attributes such as taste and health benefits. Also, it could be due to overall concerns over food safety issues in other countries (e.g., food incidents, technology).

Figure 5-11: Levels of trust towards Non-GMO soymilk ingredients from China and



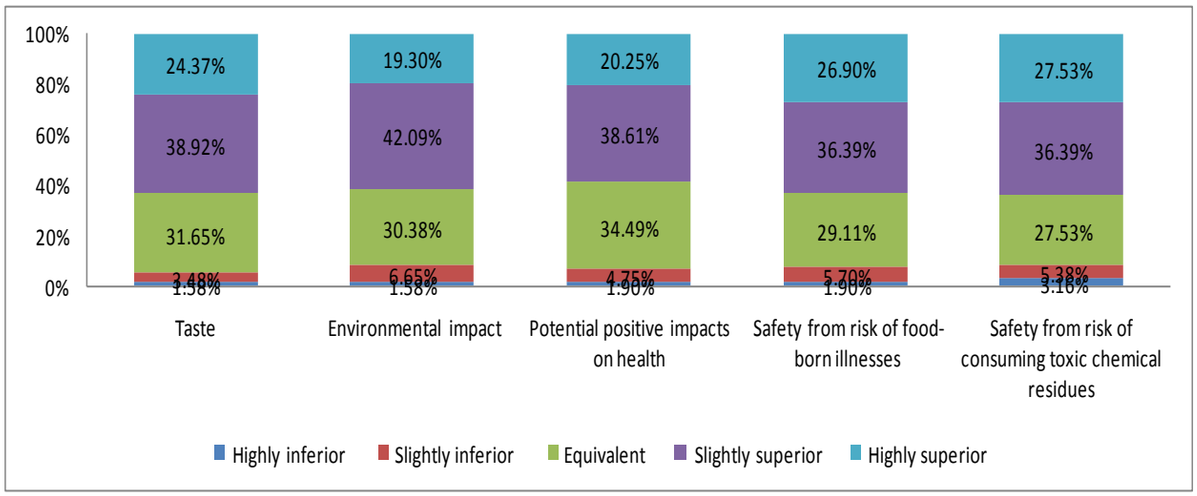
Consumers' perceptions of major attributes of U.S.-grown organic soybeans are compared with those of imported organic soybeans in Figure 5-12. Consistent with previous findings, U.S. respondents prefer organic soybeans grown in the U.S. to imported counterparts in terms of all attributes considered. The degrees of preferences were most considerable when comparing U.S.-grown organic soybeans with imported organic soybeans in terms of "safety from risk of food-borne illnesses" and "safety from risk of consuming toxic chemical residual," which were the 3rd and 4th concern in purchasing organic soymilk, with 72.78% and 74.37% of respondents regarded U.S. organic soybeans to be superior than imported organic soybeans. In comparison, 69.62%, 68.35% and 68.35% of the respondents regarded "taste", "environmental impact" and" potential positive impacts on health" of U.S. organic soybeans as being superior, respectively. Thus, respondents were prone to regarding organic products made in the U.S. highly in terms of food safety concerns.

Figure 5-12: **Comparison of soymilk products made from organic ingredients grown in the U.S. to similar products made from organic ingredients imported from overseas**



Such results carried over to a comparison between U.S.-grown, non-GMO soybeans and imported organic soybeans (Figure 5-13). The majority of respondents thought that U.S.-grown, non-GMO soybeans were superior to imported soybeans in terms of taste (63.29%), environmental impact (61.39%), potential positive impacts on health (58.86%), safety from risk of food-borne illnesses (63.29%) and safety from risk of consuming toxic chemical residues (63.92%). Pair-wise t-tests were conducted to see if the means scores for various attributes of non-GMO soybeans were statistically different than the mean scores for the corresponding attributes of organic soybeans. It was found that though the degrees of preferences were not as strong as that in the case of organic ingredients, there was no significant difference between the two comparison results. Accordingly, it is plausible that U.S. consumers hold strong preferences towards product made domestically and care more about locations of production relative to production practices. Moreover, consumers may not be viewing organic and non-GMO soybeans differently.

Figure 5-13:Comparison of perceptions of Non-GMO soymilk ingredients grown in the U.S. to imports (U.S.)



5.2.5 Model Estimation based on Choice Experiment (U.S.)

As discussed in chapter 4, various models can be used to estimate consumer's preferences and valuations based on CBC questions. Commonly used models are multinomial logit models and mixed logit models. A mixed logit model (RPL) is used to obtain WTP estimations of various attributes of soymilk products in this study for the following two reasons. First, some soymilk attributes in choice experiments were specified with overlapping traits. For example, the production practice attribute was specified as certified organic, non-genetically modified, and no label. It is possible that the probability of choosing certified organic could be influenced more by the added option of non-genetically modified product relative to choosing a product with no label. Therefore the IIA assumption which was a prior condition in the multinominal logit model is possibly unrealistic and overly restrictive. Second, there are growing quantities of consumer studies suggesting heterogeneous preferences among survey respondents (Alfnes and Rickertsen 2003; Lusk, Roosen and Fox 2003; Alfnes 2004; Tonsor et al 2005; Tonsor 2009). Hence, it is reasonable to use a mixed logit model to allow for the evaluations of preference heterogeneity.

5.2.5.1 ***Results from a Mixed Logit Model without Demographic Factors (U.S.)***

The data obtained from choice experiment in the U.S. survey was used to evaluate U.S. respondent's valuations of attributes of soymilk products. The mixed logit model without demographic factors was specified in the following equation:

$$U_{ij} = \beta_1 \mathrm{Pr}ice_{ij} + \beta_2 SSBrand_{ij} + \beta_3 NABrand_{ij} + \beta_4 ORG_{ij} + \beta_5 NGM_{ij} + \beta_6 US_{ij} + \beta_7 IMP_{ij} + \varepsilon_{ij} \quad (15)$$

where the β_k (k=1, 2… 7) are the parameters to be estimated. Each parameter is specified to be random and follow a normal distribution. Explanatory variables are the attributes in the choice experiments and are further explained in Table 5-6. These attribute variables entered the models as dummy variables. For brand types, *SSBrand* and *NABrand* represented "specialized store brand" and "national brand" with "general store brand" as the base attribute level. Two dummy variables, *Org* (certified organic) and *NGM* (contains no genetically modified organism) were included to define the production practice attribute, with "no claim" as the base. The countries of origin attribute were captured by the *US* (Ingredients grown in the U.S.) and *IMP* (imported ingredients) dummy variables with "no label" as the base.

Table 5-6: Definition of the variables in in mixed logit model (U.S.)

	Variable types	*Variable names*	*Definition*	
Attributes				
Price	Ordinal	Price	$3.38; $3.08; $2.78	
Types of brand	Dummy(with store brand in general retail as the base)	*SSBrand* *NABrand*	store brand in natural/health retail outlet national brand	
Production practice	Dummy(with no claim as the base)	*ORG* *NGM*	certified organic non-GMO	
Country of origins	Dummy(with no label as the base)	*US* *IMP*	With ingredients grown within U.S. with imported ingredients	
Demographic information				
Gender	Dummy	*GEN*	Female=1; Male=0	
Education	Dummy	*EDU*	Bachelor or higher=1; Other=0	
Having child or not	Dummy	*CHI*	Have child=1; Don't have child=0	
Income	Ordinal	*INC*	Average of each range (unit:10 thousand dollars)	
			less than 10000	0.75
			$10,000 - $24,999	1.75
			$25,000 - $49,999	3.75
			$50,000 - $74,999	6.25
			$75,000 - $99,999	8.75
			$100,000 -250,000	17.5
			More than $250, 000	30
Age	Ordinal	*AGE*	Average of each range	
			18-24	21
			25-34	29.5
			35-44	39.5
			45-54	49.5
			55-64	59.5
			65 and above	70
Race	Dummy	*RAC*	Black, Hispanic, Asian=1; White and other=0	

The mixed logit model (15) was estimated using the software LIMDEP 4.0. The estimation results are summarized in Table 5-7. The estimated coefficient for price was negative and significant at 1% level, indicating people's utility declined when soymilk became expensive. The coefficient of *IMP* (imported ingredients) was also

statistically significant at 1% level. Hence, respondents were less happy to purchase soymilk products with imported ingredients than products with no information on country of origin of soybeans. Other coefficients were estimated as being positive, suggesting respondents preferred soymilk products under specialized

Table 5-7: Mixed logit model without demographics (U.S.)

Variable		Mixed logit estimates
Price	Mean	-0.444***
		(0.103)
SSBrand	Mean	0.351**
		(0.168)
	Standard deviation	2.042***
		(0.501)
NABrand	Mean	0.834***
		(0.208)
	Standard deviation	2.333***
		(0.514)
ORG	Mean	2.707***
		(0.366)
	Standard deviation	0.306
		(0.473)
NGM	Mean	0.987***
		(0.301)
	Standard deviation	3.112***
		(0.744)
U.S.	Mean	1.776***
		(0.267)
	Standard deviation	0 .669
		(0.703)
IMP	Mean	-1.102***
		(0.002)
	Standard deviation	2.817***
		(0.642)
No. of observations:	1,896	
Log likelihood function:	-2065.966	
Degrees of freedom:	13	
McFadden Pseudo R-squared:	0.2139875	

Estimated standard errors are in parentheses; *, **, *** indicate the level of significance at the 10%,5%,and 1%, respectively.

store brands and national brands relative to those under general store brands. Moreover, the U.S. respondents preferred soymilk that was made from organic and non-GMO soybeans and U.S. grown soybeans. In addition, four coefficients (SSBrand, NABrand, NGM and IMP) had standard deviations which were statistically significant at 1% level. Such results indicated heterogeneous preferences associated with these four attributes across respondents.

5.2.5.2 ***Results from a Mixed Logit Model with Demographic Factors (U.S.)***

The mixed logit model above was extended to allow for interactions between choice variables and demographic characteristics of respondents. In additional to the variables in equation (15), the means of parameters of attribute variables were specified as functions of demographic variables. Based on the background information on soymilk and organic food market in the U.S., six demographic variables were considered in this model: gender, age, income, having a child or not, education and race. Each demographic variable in the model are defined in Table 5-6. The education variable was defined as a dummy variable with "having bachelor degree" as the dividing line because previous literature suggested that consumers with bachelor degrees were more likely to purchase organic food products (Thompson and Kidwell 1998). Also, consumers with bachelor degree were more willing to buy store brands and products with imported ingredients (Lonca 2010). In the U.S. sample, around 67% of respondents obtained bachelor degree or above. Regarding the race variable, it was indicated by Mintel report (2008a) that the usage of soymilk was higher among ethnic populations (Asian, black and Hispanic) due to a higher incidence of lactose intolerance. Hence, the ethnic population including Asian, black and Hispanic which accounted for 21% of our sample were contrasted to other ethnic population.

Estimation results for the mixed logit model with demographic variables are presented in Table 5-8. A likelihood ratio test was conducted to determine if the mixed logit model with demographic factors accounted for more variability in the sample relative to the mixed logit model without demographic factors. The likelihood ratio statistic was computed as:

D= -2 * (Ln(likelihood for null model) - Ln(likelihood for alternative model)) (16)

where the null model is the model without demographic variables and the alternative model is the model with additional demographic variables.

The value of log likelihood function of the alternative model was -2007.807 and that of the model without demographic variables was -2065.966. The log likelihood ratio test statistic D was 116.318 and greater than 50.998, the critical value for a chi-squared distribution with 36 (49-13) degrees of freedom at a 5% significance level. Obviously, additional parameters in the second model were not collectively zero. Therefore, WTP of the U.S. consumers toward various attributes was calculated using the second model.

Coefficient signs of the attribute variables did not change from incorporating the demographic variables. The estimated coefficient of the price variable remained negative and significant at 1%. Hence, U.S. respondents were sensitive to the soymilk price. Concerning brand preferences, respondents did not show clear preferences towards soymilk under store brands in natural and health stores over that in general retail outlets. However, the significant positive coefficient on the national brand suggested that respondents valued national brands significantly more than general store brands. Strong preferences towards soymilk under national brand may be because respondents preferred

the taste and flavor of national brands. Regarding production practices, coefficients for both variables were statistically significant and positive, indicating that U.S. respondents valued the labels of "certified organic" and "non-genetically modified". Again, this result is consistent with the previous finding that about half of respondents checking the claims regarding production or processing processes which reflect their concern and valuations. Lastly, in terms of preferences towards origins of ingredients, U.S. respondents showed strong preferences towards soymilk with ingredients grown within the U.S.

In comparison to the first model without demographic variables, the estimated coefficients of *SSBrand* (specialized Store brand) and *IMP* (with imported ingredients) were no longer statistically significant in the second model, which implies the possibility that demographic variables accounted for heterogeneity in preferences towards these two variables.

The interaction effects between attribute and demographic variables capturing heterogeneous preferences are shown in Table 5-9. Considering intentions of purchasing national brand products, the results suggested that female shoppers derived less utility from purchasing soymilk under national brand than general store brand relative to male counterparts. A possible explanation could be that the product information promoted by national brand (e.g., tastes) appealed more to male consumers. Yet, people with a bachelor degree derived higher utility from

Table 5-8: Mixed logit model with demographic variables (U.S.)

Variables		Mixed logit estimates
Price	Mean	-0.505***
		(0.103)
SSBrand	Mean	0.309
		(0.682)
	Standard deviation	2.031***
		(0.633)
NABrand	Mean	1.580**
		(0.112)
	Standard deviation	2.835***
		(0.608)
ORG	Mean	4.667***
		(.822)
	Standard deviation	0.109
		(0.492)
NGM	Mean	1.916**
		(0.833)
	Standard deviation	3.334***
		(0.909)
US	Mean	1.761***
		(0.592)
	Standard deviation	1.510*
		(0.781)
IMP	Mean	0.338
		(0.803)
	Standard deviation	3.484***
		(0.734)
No. of observations:1896		
Log likelihood function: -2007.807		
Degrees of freedom: 49		
McFadden Pseudo R-squared: 0.2361148		

Estimated standard errors are in parentheses; *, **, *** indicate the level of significance at the 10%,5%,and 1%, respectively.

purchasing national brand soymilk, relative to people without a bachelor degree. This could be due to more educated people having more access to information marketed by each type of brand. Thus, as a group, they preferred products under national brand which invested hugely on increasing its marketing information.

In terms of preferences towards organic soymilk products, impacts of age, education and having child or not were all estimated to be significant at 1% level. The results indicated that older people derived lower utility from organic products, which is consistent with previous studies that found a negative relationship between age and organic buying behavior (The Hartman Group 2002; Bhaskaran and Hardley 2002; Hughner et al. 2007; Oberholtzer, et al. 2009). The results also confirmed that more educated consumers (having bachelor degree or above) obtained higher

utility from organic soymilk (Dimitri and Oberholzer 2009). In addition, consumers with children were more satisfied from purchasing organic soymilk relative to the people who did not have children, which is consistent with the findings in previous studies as well (Govindasamy and Italia 1999; Oberholtzer, Dimitri and Greene 2007). Interestingly, the influence of education and the status of having child existed also in utility levels derived from purchasing non-GMO soymilk, indicating that more educated consumers and consumers with child cared more about these two types of production practice then others. It is possible that educated people were more likely to enhance their knowledge about these production practices so as to lead a healthier lifestyle. Also, consumers with children may be more sensitive about production practices relating to food safety and quality because they want to feed their children healthy food. Although the results in Table 5-8 showed that respondents on average did not differentiate between soymilk products with imported ingredients and "no label", older respondents derived significantly less satisfaction from purchasing soymilk with imported ingredients relative to younger respondents. This result is consistent with the study conducted by Pozo (2009) that found the WTP for imported organic apples decreased with older consumers.

Table 5-9: Interactions between demographic variables and attribute variables (U.S.)

	GEN	*AGE*	*EDU*	*INC*	*RAC*	*CHI*
SSBrand	-0.1333	0.006	0.237	-0.080	0.307	-0.638*
	(.3404)	(.0126)	(0.353)	(.028)	(0.420)	(0.387)
NABrand	-0.869**	-0.023*	0.826**	0.011	0.250	-0.161
	(.355)	(0.013)	(0.370)	(.0265)	(0.403)	(0.356)
ORG	-0.532*	-0.049***	1.113***	-0.022	0.052	0.899***
	(0.292)	(0.012)	(0.329)	(0.023)	(0.342)	(0.322)
NGM	-0.014	-0.025*	1.165***	-0.047	-0.987*	1.122***
	(0.384)	(0.015)	(0.430)	(0.032)	(0.508)	(0.425)
US	0.099	0.007	-0.193	0.0004	-0.157	0.058
	(0.282)	(0.010)	(0.306)	(0.022)	(0.348)	(0.299)
IMP	-0.576	-0.041**	0.753	-0.030	0.505	-0.239
	(0.416)	(0.016)	(0.459)	(0.034)	(0.484)	(0.440)

Estimated standard errors are in parentheses; *, **, *** indicate the level of significance at the 10%, 5%, and 1%, respectively.

The WTP for each attribute was calculated by dividing the coefficient of a specific attribute by the price coefficient and the results are shown in Table 5-10. The WTP and associated standard errors were obtained by using the WALD procedure in LIMDEP 4.0. Murphy et al. (2004) stated that in hypothetical conditions, consumers may overstate the value of goods by a factor of two or three, which was also the case in the study of organic baby food conducted by Lonca (2010). Accordingly, the estimated WTP for each attribute was divided by three to give a more realistic estimation. The results suggested that U.S. respondents did not value store brands offered by general retail outlets and

that by natural/health stores any differently. However, they were willing to pay 1.04 dollars more for national brand soymilk relative to general store brand soymilk.

With respect to production practices, U.S. respondents were willing to pay more for organic and non-GMO soymilk. The price premium for the organic attribute was 3.08 dollars. Such high willingness to pay for the organic attribute is consistent with the price premium organic soybeans has received. From 1995 to 2006, the price premium of organic soybeans ranged from 85% to 217%, which was generally higher than other field crops such as organic corn with price premium from 35% to 98% (Dimitri and Greene 2002; McBride and Greene 2008). The respondents were also willing to pay a premium of 1.27 dollars for the non-GMO attribute. Concerning production origins, respondents showed a strong preference for soymilk made from domestically grown soybeans and were willing to pay $1.16 more for soybeans grown in the U.S. The average willingness to pay for imported soybeans (*IMP*) was not significant at the 10% level.

Among various attributes in the choice set, the WTP for the organic attribute was the highest. Comparing the magnitudes, U.S. respondents were willing to pay 1.82 dollars more for organic over non-GMO soymilk ingredients, which were twice as much as 0.94 dollar, respondents were willing to pay for domestically produced soybeans over imports. Such result suggests producing organic soymilk as being highly advantageous. Adding the domestically grown attribute may increase the profitability for domestic organic soybean producers. However, non-GMO soybeans grown in the U.S. may not be competitive with imported organic ones.

Table 5-10: WTP estimations for the mixed logit models in dollars (U.S.)

Attributes	With demographics	Adjusted (divided by 3)
SSBrand	0.612	0.204
	(1.351)	
NABrand	3.129**	1.043
	(1.369)	
ORG	9.244***	3.081
	(1.611)	
NGM	3.795**	1.265
	(1.637)	
US	3.489***	1.163
	(1.148)	
IMP	0.670	0.223
	(1.596)	

Estimated standard errors are in parentheses; *, **, *** indicate the level of significance at the 10%, 5%, and 1%, respectively.

5.3 Results from the China Survey

An enumerated survey was conducted in China to examine consumers' attitudes towards soymilk attributes. In total, 318 responses were enumerated in three major cities namely Shanghai, Beijing and Guangzhou in China through a well known research firm. In each city, the interviewers approached shoppers in three types of retail outlets: domestic supermarkets (Hua lian), foreign owned supermarkets (Carrefour), and farmer's markets (free market in China). In the end, 18 responses were excluded because they were completed in a hasty manner with the same answer for most of the questions. Therefore 300 valid responses were used in the analysis, which were equally distributed among the cities and store types. That is to say, 100 completed surveys were collected in each city and 100 were completed surveys for each retail type.

5.3.1 Respondent Characteristics

The sample resembled the characteristics of the populations in the three surveyed cities in terms of gender and household income (Table 5-11). There was an equal distribution of gender within the sample with 50.33% male and 49.67% female, which was representative of the entire population (51.63% for male and 48.37% for female) of China and of the populations in the three targeted cities. The average household income in the sample was 5987.85 yuan[1], and its distribution was similar to that of the three surveyed cities. About 48% of respondents' household earned less than 5000 yuan a month, which was a slightly smaller proportion than the three-city weighted average of 51.22%. About 16% of the respondents' household income was above 9000 yuan a month, relatively higher when compared to the average

[1]: Chinese yuan (Ren min bi)

level of three cities (11.86%). Because the survey targeted people who were responsible for more than half of the household grocery shopping, population younger than 18 was excluded from the sample. The range of age was designed comparable to the U.S. survey even though the city-level statistics could not be found with such refined intervals. Generally speaking, the age distribution in the sample was consistent with the city-level statistics. Yet, compared with national population, the sample included fewer young respondents aged from 18-24 (13.67% in the sample versus 22% nationally) and fewer elder people aged from 61 to 80 (9.67% in the sample versus 12.51% nationally). In addition, respondents in the survey had attained relatively higher level of education compared to the three-city average and the national average. Half of the respondents had some college degree or above compared with only 7.08 % on average in the three surveyed cities. One possible explanation in part could be the exclusion of teenagers in our sample which may result in more adults with higher education level than that of national sample. In addition, it is possibly due to the fact that respondents were surveyed in the three cities which had higher proportions of highly educated population (7.08% at the city level had some college degree versus 3.88% nationally).

Table 5-11: Demographic characteristics of the sample

Characteristics	China population	Three city average	Survey respondents	
	Percentage	Percentage[5]	N	Percentage
Gender[1]				
Male	51.63%	51.15%	151	50.33%
Female	48.37%	48.85%	149	49.67%
Age[1]				
18-24	22.00%[4]		41	13.67%
25-34	20.65%[4]		76	25.33%
35-44	21.88%[4]		70	23.33%
45-60	21.53%[4]		84	28.00%
61-80	12.51%[4]		29	9.67%
15-64	86.07%[4]	90.96%	271	90.33%
65 and above	13.93%[4]	9.04%	29	9.67%
Education[2]				
Elementary[3]	38.31%	33.41%	6	2%
Secondary[3]	36.45%	41.71%	53	17.67%
High school or associate degree	21.96%	17.79%	101	33.67%
Some college or associate degree	3.88%(including above)	7.08%(including Above)	67	22.33%
Bachelor's degree			63	21%
Graduate degree (or higher)			10	3.33%
Household Monthly Income[1]				
less than 5000 yuan		50.76%	144	48%
5000-8999 yuan		37.37%	108	36%
Above 9000 yuan		11.86%	48	16%
Average				5987.85

Notes: [1] Based on Census Statistic Year Book of China, 2005

[2] National: Census Statistic Year Book of China, 2003; City: Census Statistic Year Book of China, 2005

[3] National statistic and city statistics were based on the population with more than 6 years old

[4] U.S. Census Bureau, International Database, 2005

[5] It is a weighted average of the average percentage data of each city based on the population

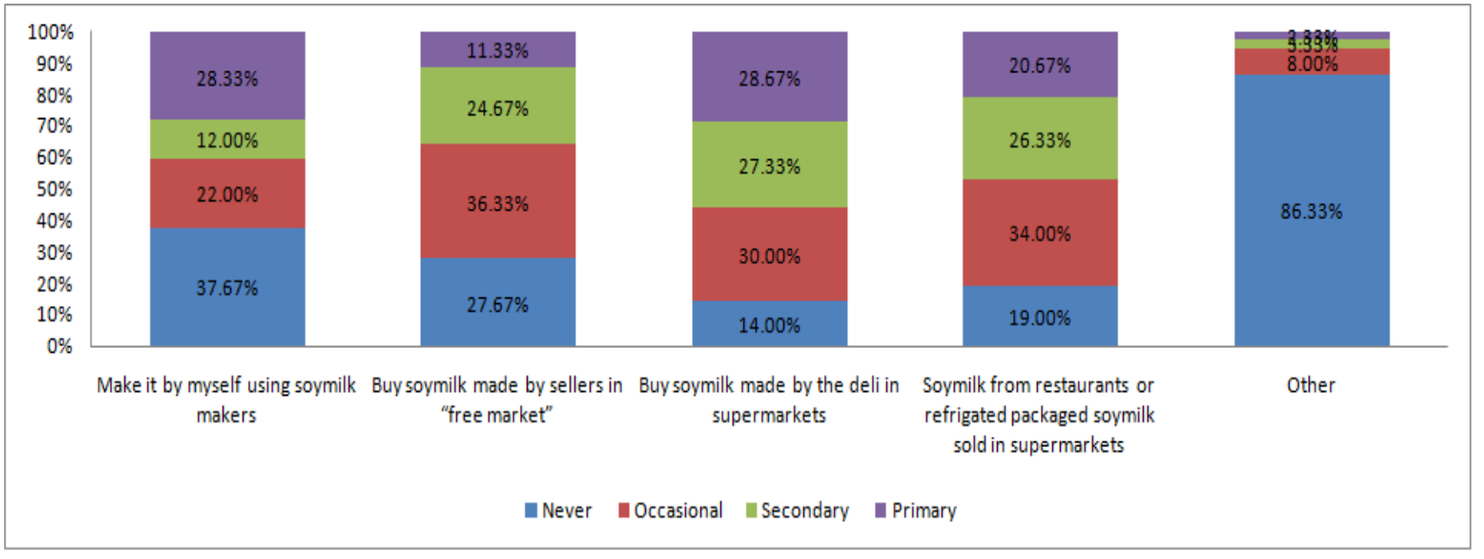
5.3.2 Food Shopping Behavior and Perceptions

The respondents revealed their purchasing behavior, their preferences and perceptions towards conventional soymilk products and organic soymilk products in the survey. These results may allow us to find out the factors that

influenced people's purchasing behavior of soymilk products and whether these factors affected consumption decisions differently in buying conventional and organic products.

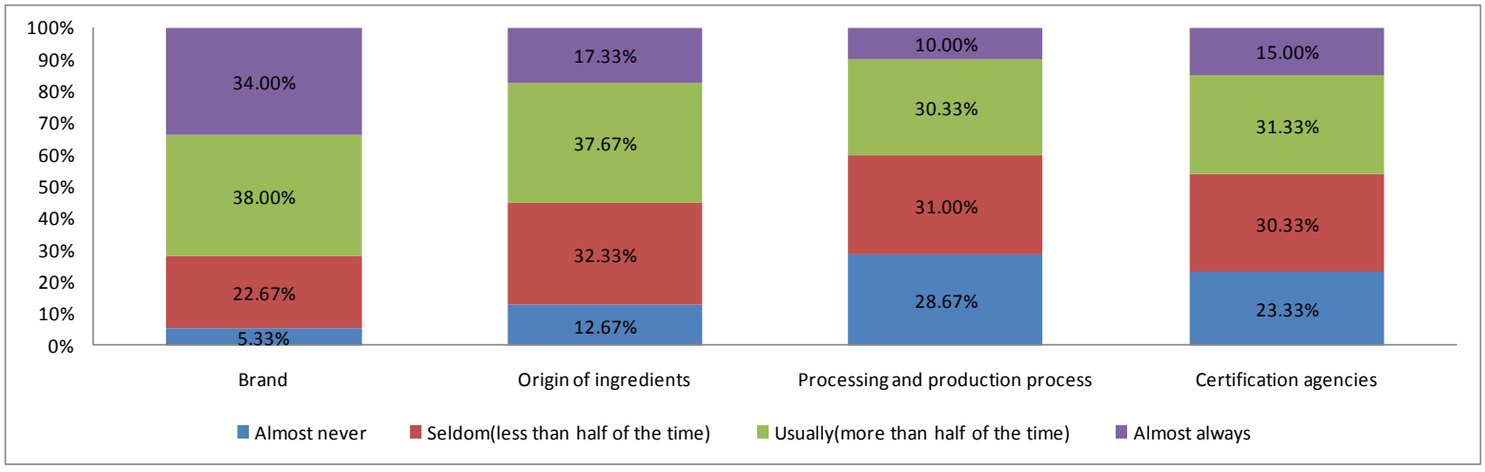
It was known before the survey that Chinese consumers consumed soymilk in a way that was rather different from U.S. consumers. In contrast to U.S. consumers who normally shopped for soymilk on a weekly basis, Chinese consumers often purchased soymilk at breakfast time right before it was consumed. They frequently bought soymilk made on the day of consumption rather than refrigerated, nicely packaged soymilk. The respondents' shopping patterns at various retail outlets are shown in Figure 5-14. The results suggested that the most common way of consuming soymilk was to purchase freshly made soymilk in deli department of supermarkets; 29% of the respondents chose it as the primary source and about 27% chose it as the secondary source for fresh soymilk). Deli departments in supermarkets in China function similarly to the deli departments in large supermarkets such as Hyvee or Wal-Mart in the U.S. Various kinds of freshly processed food such as soymilk, fried chicken, noodles and steamed buns etc. are sold there on a daily basis. Another 36% of the respondents chose to consume fresh soymilk made and sold by sellers in the "free market" as their secondary or primary source of soymilk. About 21% of respondents claimed that drinking soymilk at restaurants or consuming refrigerated packaged soymilk sold by supermarkets was their primary ways to consume soymilk. Such result was reasonable given the survey was conducted in large cities. With higher than national average income, a proportion of city residents that eat breakfast at a breakfast restaurant on their way to work is likely large. Lastly, 28% of respondents used soymilk makers to make fresh soymilk by themselves, which echoed the rapid increase of the sales of soymilk makers in China domestic markets. This relatively high proportion was also consistent with consumers being concerned about food safety and tried to ensure safety by making soymilk by themselves (Bi 2008).

Figure 5-14: Ways of consuming soymilk (China)



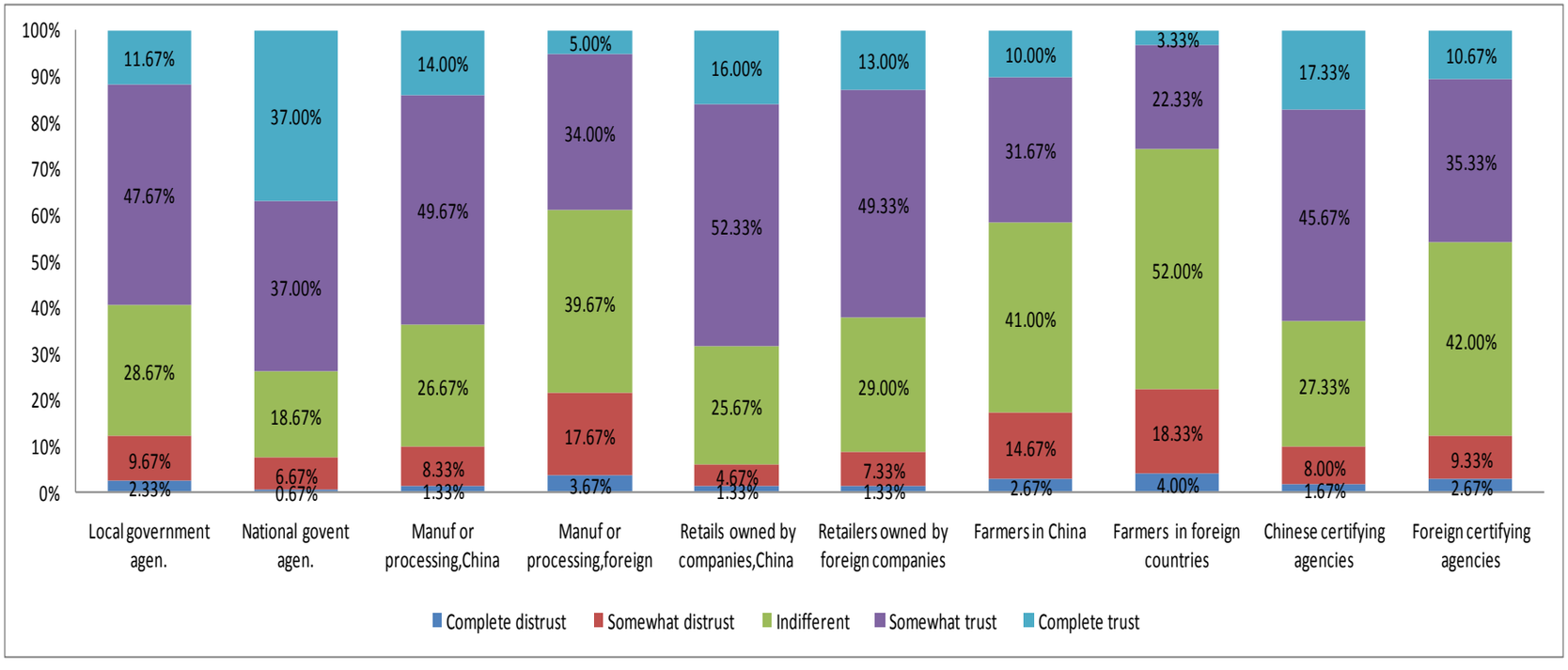
Similar to U.S. respondents, Chinese respondents paid attention to labels on food products. The results showed that "brand" was the piece of information respondents paid most attention to when purchasing food products (Figure 5-15). About 72% of respondents checked the brand of food products more than half of the time. Different from the U.S. results, many Chinese respondents cared about the origin of ingredients. The "origin of ingredients" information was the second most frequently checked piece of information and 55% of the respondents usually or almost always checked this information. Although "certification agencies" and "processing and production process" were checked less frequently, around 46% and 40% of respondents usually checked these two pieces of information.

Figure 5-15: Frequency of checking labeling information of food products (China)



The Chinese respondents placed different levels of trust on the information provided by different organizations (Figure 5-16). It was clear that the trust level on the information provided by all types of Chinese entities was considerably higher than foreign counter parties. For instance, the level of trust Chinese respondents put on the information provided by Chinese manufacturer or producers was relatively low among different type of entities with 63.7% of respondents having somewhat trust or complete trust. The trust on the information provided by foreign manufacturers or processors, however, was even lower with only 39% of respondents having some trust or complete trust. Among Chinese organizations providing labeling information, government or governmental agencies received the most trust. 74% of respondents trusted or completely trusted national governmental agencies in China. Following that, the ranking of trust levels received were retailers, manufacturers or processing companies, certifying agencies, local government agencies and farmers. The percentage of respondents having some trust or complete trust on the above organizations was 68.33%, 63.7%, 63.0%, 59.34%, and 41.7%, respectively. Trust levels on all foreign entities had the same ranking with retailers owned by foreign companies enjoying the highest trust level. On the other hand, foreign farmers were trusted the least by Chinese respondents. Only 25.7% of respondents placed some trust on the information by foreign farmers.

Figure 5-16: Level of trust put on various organizations providing labeling information (China)



The mean scores of importance of attributes of packaged soymilk were presented in Table 5-12. The top three attributes that matter most to respondents in soymilk consumption were "low risk of food-borne illness" "minimum use of preservatives" and "minimum use of pesticide in producing soybeans". Strong preferences towards these three food-safety related attributes are consistent with Chinese consumers' increasing awareness on food safety and rising demand for safety food. Production processes of ingredients including "non-GMO soybeans" and "certified organic soybeans" ranked in the middle among all the attributes. The preferences on these two attributes were not statistically different, indicating that respondents did not differentiate these two attributes much. The "location of manufacturing" and "origin of ingredients" attributes received relatively less attention from respondents. The respondents cared the least about the price probably due to the relatively low price of soymilk in China.

Table 5-12: Valuations of various attributes of ready-made soymilk (China)

Variable	Mean	Std. Deviation
Low risk of food-borne illness	4.44[a]	0.76
Minimum use of preservatives	4.43[a]	0.75
Minimum use of pesticide in producing soybeans	4.42[a]	0.8
Taste or flavor	4.19[b]	0.75
Non-GMO soybeans	3.90[c]	0.97
Brand	3.88[c]	0.92
Certified organic soybeans	3.79[c]	0.95
Types of soymilk retailers or makers	3.72[c]	0.89
Location of manufacturing	3.55[d]	0.86
Origin of ingredients	3.48[d]	0.91
Price	3.19[e]	1.03

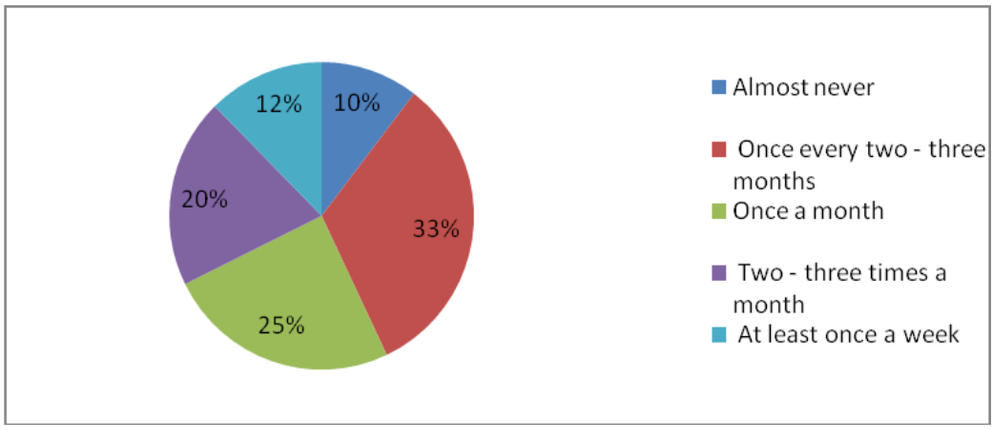
Note: 1=Not important 2=Slightly important 3= Moderately important 4=Very important 5=Extremely important
[a,b,c,d] Not significantly different at 5% level

5.3.3 Purchasing Behaviors and Perceptions of Organic Soymilk Products

The consumption frequency of organic food products was shown in Figure 5-17. About 57% of respondents consumed organic food products at least once a month. Another 33% of respondents consumed organic food once every 2-3 months. Only 10% of respondents indicated that they never purchased organic food products during the last 6 months. The high frequency of organic food consumption of the sample was slightly inconsistent with a report which suggested that organic products only accounted for less than 0.02% of the market share (Lagos et al. 2010). This discrepancy may be because some respondents counted non-certified organic food products. Some food retailers or farmers in the free market sometimes claim products as organic, even though they are not certified. Such unofficial claims from sellers in the free market could mislead respondents to think that they purchased organic products.

Nevertheless, results indicated that consumers were aware of benefits of organic food and prone to search for it on a regular basis.

Figure 5-17: Consumption frequency of organic food products (China)



Consistent with respondents' perceptions on various attributes of conventional soymilk, respondents' attitudes towards attributes of organic soybeans in China did not vary much for the top three attributes (Table 5-13). "Health benefit" "low risk from food borne illness" and "minimum chemical use" mattered most to Chinese respondents. "Positive environmental impact" was ranked the 5th following "taste or flavor", suggesting that Chinese respondents were concerned about environmental issues and realized the benefits of organic products in mitigating the environmental problems. Location of manufacturers and origin of ingredients were again ranked the lowest for purchasing organic soybeans.

Table 5-13: Valuations of various attributes of organic soybeans

Variable	Mean	Std. Deviation
Health benefit	4.51[a]	0.71
low risk from food borne illness	4.48[a,b]	0.74
Minimum chemical use	4.39[b]	0.77
Taste or flavor	4.14[c]	0.77
Positive environmental impacts	4.06[c]	0.83
Certifying agency	4.03[c]	0.83
Non-GMO	3.81[d]	0.91
social justice	3.75[d]	0.9
location of manufacturing	3.61[d,e]	0.86
origin of ingredients	3.60[e]	0.87

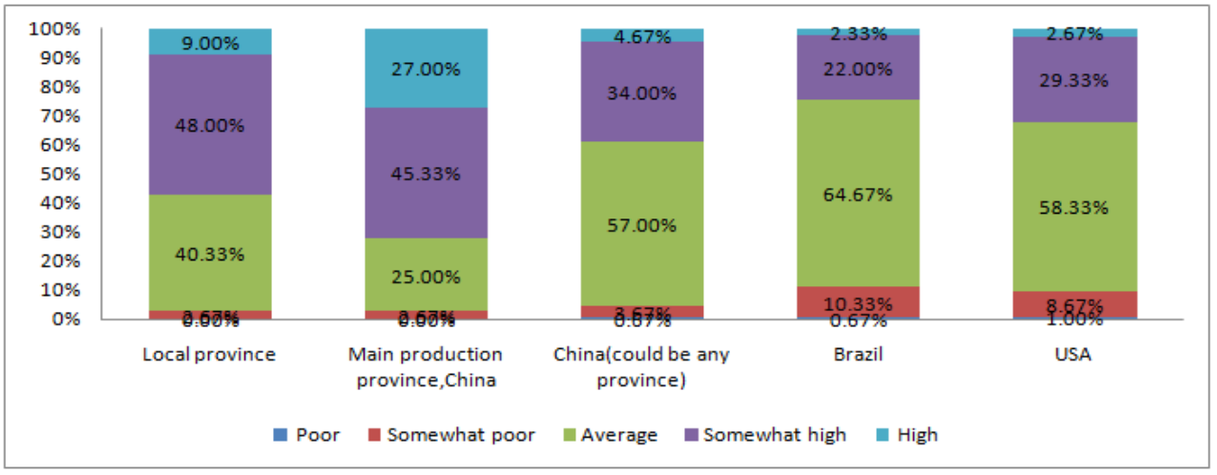
Note: 1=Not important 2=Slightly important 3= Moderately important 4=Very important 5=Extremely important
[a,b,c,d] Not significantly different at 5% level

5.3.4 Perceptions on Origins of Ingredients

Chinese respondents perceived differences in the quality of ingredients sourced from different origins. Their perceptions on the overall quality of ingredients for making organic soymilk from different origins are presented in Figure 5-18. The results indicate a slight preference of Chinese respondents towards soybeans produced by domestic producers in any province relative to imports; 38.67% of respondents regarded organic soybeans produced from any province in China as having somewhat high or high quality, while 32% of respondents valued organic soybeans imported from the U.S. in the same way. Moreover, the quality of soybeans imported from different countries was perceived to be different. Compared to the percentage of respondents viewing U.S. soybeans favorably, 24.33% thought Brazilian soybeans as having high or somewhat high quality. In addition, respondents distinguished soybeans produced in different locations within China and strongly preferred soybeans produced from main production region, with 72.33% regarding its quality favorably.

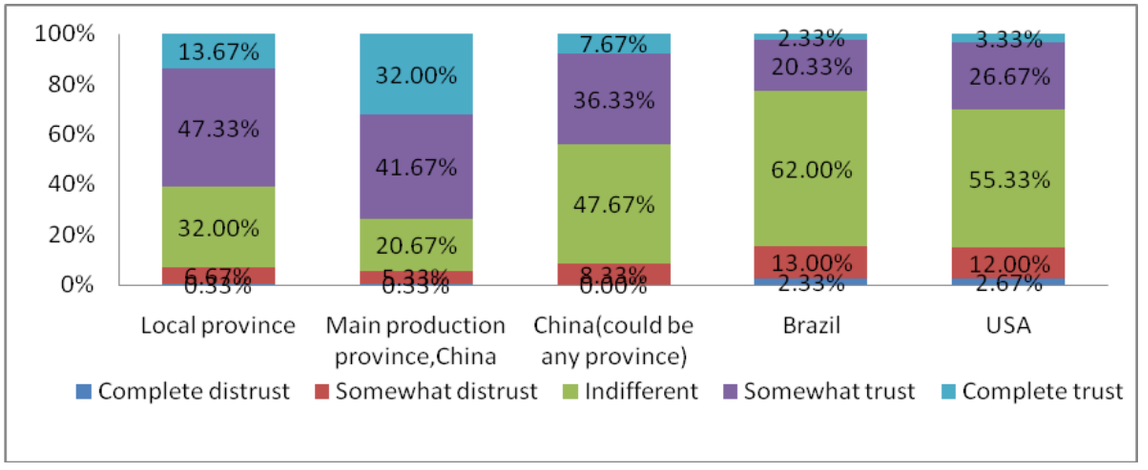
Such results indicated that Chinese respondents had distinctive perceptions towards origins of production. Labeling of origins could become an effective marketing tool for producers in main production areas to promote their products. Heilongjiang province produces around one third of the soybeans in the domestic market and accounts for two thirds of soybean exports. In addition, promoting green and organic food production is becoming a trend in northeastern China. Heilongjiang, Jilin, Liaoning, and Inner Mongolia accounted for 44% of organic production in China (Kledal et al. 2007). Biophysical conditions facilitate organic cultivation in these Northern provinces. In order to maintain competitive advantage in the domestic or international market, producers in the northeastern region of China have been encouraged to apply for geographic indications. Based on the results, such strategy could effectively boost the domestic organic soymilk market.

Figure 5-18: Comparison of quality perceptions of ingredients of organic soybeans from different origins



One possible explanation for such distinctive attitudes towards different production origins could be respondents' various level of trust on the label. Trust levels towards the "certified organic" soybeans from different origins are shown in Figure 5-19. Trust levels were consistent with perceptions of organic soybean quality. Respondents found "certified organic" labels from the main soybean production provinces in China to be most trustworthy, with 73.67% showing somewhat trust or complete trust. The trust level on the "certified organic" label decreased for soybeans from local province (60% somewhat trust or complete trust) and any other province in China (44% somewhat trust or complete trust). Trust levels towards soybeans produced in China and abroad were more distinct. Only 30% of respondents showed high levels of trust on certified organic soybeans imported from the U.S. The number decreased to 22.66% for certified organic soybeans imported from Brazil.

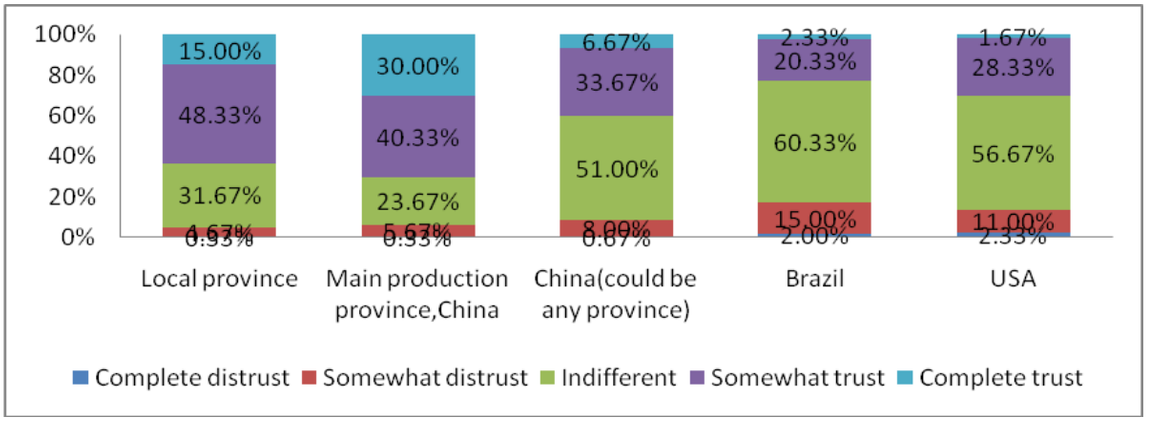
Figure 5-19: Level of trust put on the accuracy of the labels of "Certified Organic" on soybeans that are sourced from different origins



The levels of trust respondents placed on "non-GMO" labeled soybeans from different origins were not significantly different from that on certified organic soybeans from the same origin (Figure 5-20). 70.33% of the respondents trusted or completely trusted the "non-GMO" soybeans produced in main soybean production provinces in China to be truly non-GMO. Such number was 63.33% for local province which was regarded as the second most trustworthy production origin. Non-GMO soybeans produced in other areas in China received trust from 40.33% of the respondents. Compared to domestically grown non-GMO soybeans, foreign locations were still regarded as less trustworthy with U.S. receiving 30% and Brazil receiving 22.66% of somewhat trust and complete trust. Such results indicated that Chinese consumers had formed perceptions for certain country or origin in both organic and non-GMO food industry. Interestingly, Brazil was the least trusted even though compared to the U.S., the GM adoption rate in Brazil was 65% in 2007 (Clive 2008), nearly 26% lower than that of the U.S. In recent years, the share of U.S. soybean

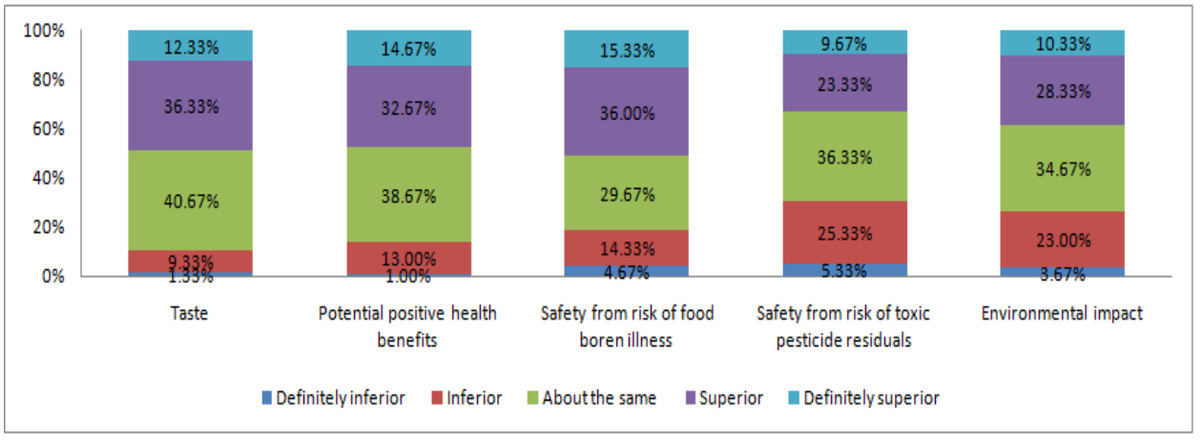
exports has been threatened by Brazil and Argentina. Brazil and Argentina increased their shares in the soybean export market from less than 15% before 1980s to more than 50% in 2010 (ERS 2010-2019). However, Chinese consumers' negative perceptions may indicate a slow penetration or lack of recognition of imported soybean from Brazil into the domestic food market in China. Also, it suggested that labeling of the origins may bring comparative advantage of U.S. soybeans relative to soybeans from South America in the China's market.

Figure 5-20: Level of trust put on the accuracy of the label "Non-GMO" on soybeans that are sourced from different origins



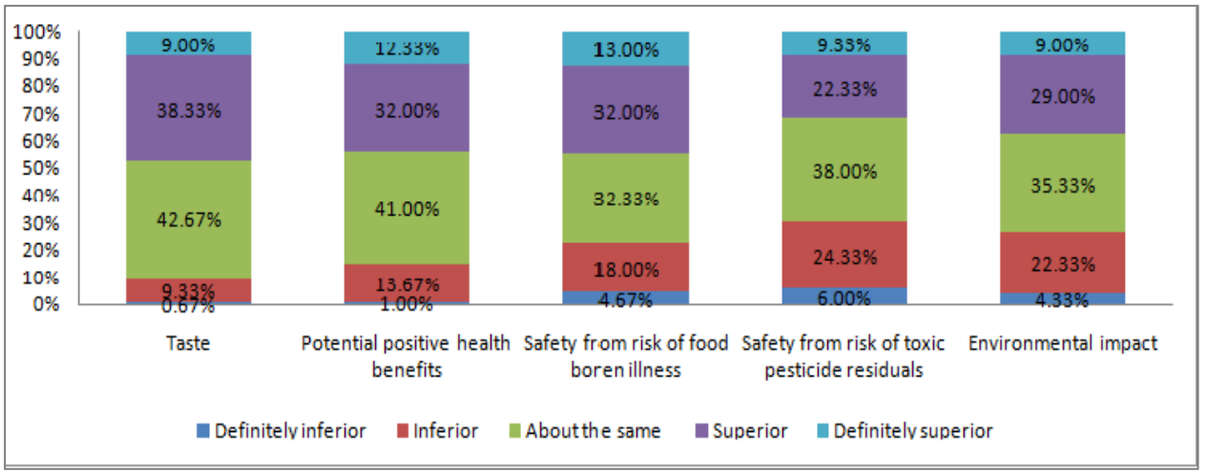
Consumers' perceptions of China-grown organic soybeans to imported organic soybeans were compared in terms of major attributes in Figure 5-21. The results showed that Chinese respondents favored some attributes of the organic soybeans produced in China than those imported from other countries. 51.3% of the respondents thought organic soybeans produced in China were superior in "safety from food borne illness" which suggested that such risk was not perceived as a problem associated with soybeans in China. Also, respondents valued taste and potential positive health benefits of soybeans produced domestically higher. In contrast, only 33% and 39% of respondents viewed that organic soybeans produced in China were superior in terms of "safety from risk of toxic pesticide residuals" and "environmental impact", respectively. Such perceptions likely reflect the problems exiting in food production in China.

Figure 5-21: Comparison between China-grown, organic soybeans with imported organic soybeans



A similar comparison is illustrated between China-grown, non-GMO soybeans and imported non-GMO soybeans in Figure 5-22. Respondents showed higher preferences towards domestically produced non-GMO soybeans in terms of "taste" and, "safety from risk of food borne illness" and "Potential positive health benefits", with 47.33%, 45.00%, and 44.33% of respondents viewed domestic soybeans as superior, respectively. In contrast, the "safety from risk of toxic pesticide residuals" and "environmental impact" attributes of domestically grown non-GMO soybeans were regarded as superior than imported ones among only 31.67% and 40% of the respondents, respectively. The comparison for each attribute of non-GMO soybeans was similar to that of organic soybeans.

Figure 5-22: Comparison between China-grown, Non-GMO soybeans with imported Non-GMO soybeans



To summarize, the findings suggest that Chinese respondents prefer domestically produced soybeans and perceive domestically grown soybeans as having better quality in terms of certain attributes relative to the imported

soybeans. Formation of preferences could be derived from different levels of trust towards the government or other organizations and also other normative motivations. Shimp and Sharma (1987) identified that COO orientation reflected consumers' ethnocentric tendencies. Country-of-origin labels would generate greatest impact on individuals whose economic livelihood may be threatened by foreign competition and also consumers who desire to purchase domestic goods as a means to achieve group belonging. Ehmke (2006) indicated that Chinese consumers' preferences were largely in accordance with the government food policy and likely to have normative motivation. Since 2001, China's government has placed strict regulations on GM labeling and encouraged domestic soybean producers to apply for certification to increase their advantage. Such actions could possibly inform domestic consumers of an increasing competition between domestic and foreign soybean producers. Consequently, Chinese consumers may be motivated by ethnocentric emotions to purchase soybeans produced within China.

5.3.5 Model Estimation Based on Choice Experiment (China)

A mixed logit model is used to estimate respondents' preferences and valuations of various attributes of soymilk in China because of the reasons discussed in estimating the U.S. model. Similar to the analysis of the U.S. data, two models were estimated: one with demographic variables and one without demographic variables. Due to the differences in market backgrounds in the U.S. and in China and the differences in the survey designs, different choice variables were included in China's model. The mixed logit model without demographic variables was specified as below:

$$U_{ij} = \beta_1 \mathrm{Price}_{ij} + \beta_2 USORG_{ij} + \beta_3 EUORG_{ij} + \beta_4 CNORG_{ij} + \beta_5 USNGM_{ij} + \beta_6 EUNGM_{ij} + \beta_7 CNNGM_{ij} + \beta_8 US_{ij} + \beta_9 CN_{ij} + \varepsilon_{ij} \quad (16)$$

where the β_k (k=1, 2 …, 9) are parameters to be estimated. Same as in equation (15), parameters are specified to be random and follow a normal distribution. Same with the U.S. model, 100 simulations were conducted to estimate each parameter. The explanatory variables are explained in detail in Table 5-14. Six dummy variables (*USORG* denotes U.S. certified organic; *EUORG* denotes EU certified organic; *CNORG* denotes China certified organic; *USNGM* denotes U.S. certified non-GMO; *EUNGM* denotes EU certified non-GMO; *CNNGM* denotes China certified non-GMO) were used to represent the production practice and types of certification agencies with "no claim" as the base. In addition, the *U.S.* (ingredients imported from U.S.) and *CN* (ingredients grown within China) variables were included as dummy variables to capture the effects of the production origins of ingredients with "no label" as the base (Table 5-15).

Table 5-14: Descriptions for variables in mixed logit model (China)

	Variable types	*Variable names*	*Definition*
Price(Unit:fen)	Ordinal		70;80;90
Production practice	Dummy (with no claim as the base)	*USORG*: organic certified by U.S. agencies *EUORG*: organic certified by EU agencies *CNORG*: organic certified by China agencies *USNGM*: non-GMO certified by U.S. agencies *EUNGM*: non-GMO certified by EU agencies *CNNGM*: non-GMO certified by China agencies	*USORG*=1,otherwise=0 *EUORG*=1,otherwise=0 *CNORG*=1,otherwise=0 *USNGM*=1,otherwise=0 *EUNGM*=1,otherwise=0 *CNNGM*=1,otherwise=0
Country of origins	Dummy (with no label as the base)	*US*: with ingredients imported from U.S. *CN*: with ingredients grown within China	*US*=1,otherwise=0 *CN*=1,otherwise=0
Demographic variables			
City	Dummy(with Guangzhou as the base)	*BJ* (Beijing), *SH* (Shanghai)	*BJ*=1,otherwise=0 *SH*=1,otherwise=0
Retail type	Dummy(with foreign supermarket as the base)	*CS* (Chinese supermarket) *FM* (Chinese farmers' market)	*CS*=1,otherwise=*0* *FM*=1,otherwise=0
Interactions between city and retail type	Dummy	*CS*BJ* (Chinese supermarket*Beijing) *CS*SH* (Chinese supermarket *Shanghai)	

5.3.5.1 ***Results from a Mixed Logit Model without Demographic Factors (China)***

The results of the mixed logit model without demographic variables are summarized in Table 5-15. The sign of the price variable was negative but insignificant, indicating that respondents in China were not very sensitive to the price of soymilk. Such result is also consistent with the findings that respondents ranked price as the least important attribute among those considered in purchasing soymilk. Except for the variable *USNGM* (U.S. certified non-GMO), coefficients for all other variables relating to production practice were positive and significant at the 5% or 1% level, suggesting

consumer preferred organic and non-GMO attributes certified by different agencies. Also, positive signs of coefficients for origins indicate respondents obtained utility from labeled pieces of information about production origins on food products. However, standard deviations for five attribute variables (*CNORG*, *USNGM*, *CNNGM*, *U.S.*, and *CN*) were significantly different than zero, which calls for the need to consider possible heterogeneity in preferences among respondents.

Table 5-15: Results from mixed logit model without demographic factors (China)

Variable		Mixed logit estimates
Price	Mean	-0.008
		(0.007)
USORG	Mean	4.430***
		(1.161)
	Standard deviation	2.174*
		(1.289)
EUORG	Mean	2.455***
		(0.692)
	Standard deviation	0.119
		(1.293)
CNORG	Mean	3.234***
		(0.956)
	Standard deviation	2.709**
		(1.193)
USNGM	Mean	-0.984
		(2.195)
	Standard deviation	11.742**
		(4.685)
EUNGM	Mean	2.072***
		(0.748)
	Standard deviation	2.172*
		(1.155)
CNNGM	Mean	2.143**
		(0.896)
	Standard deviation	7.736***
		(2.450)
U.S.	Mean	1.057**
		(0.463)
	Standard deviation	5.823***
		(1.884)
CN	Mean	2.271***
		(0.591)
	Standard deviation	3.407**
		(1.343)

No. of observations:	1800
Log likelihood function:	-2052.289
Degrees of freedom: 17	17
McFadden Pseudo R-squared:	0.1775481

Estimated standard errors are in parentheses; *, **, *** indicate the level of significance at the 10%,5%,and 1%, respectively.

5.3.5.2 ***Results from a Mixed Logit Models with Demographic Factors (China)***

In order to further improve the model, various combinations of demographic variables interacting with the attribute variables were considered in the model. Initially, the same set of demographic variables (except race) as the ones in the U.S. model was specified in the Chinese model, yet the problem with model convergence did not allow these variables to be included in the Chinese model. In subsequent specifications, many demographic variables were not statistically significant. At last, the model including city types, retail types, and interactions terms between city types and retail types stood out among trials of various specifications. Hence, the second model was specified as:

$$U_{ij} = \alpha' X_{ij} + \mu_i' Z_{ij} + \varepsilon_{ij} \qquad (17)$$

where α and μ are vectors of parameters to be estimated. The parameters α's are specified to be random and follows a normal distribution. X_{ij} is a vector of attribute variables included in equation (16). Z_{ij} are error components which incorporate the interactions between the attribute variables and city and retail types. The specifications of each variable were summarized in Table 5-14. Because the survey in China was conducted in three cities which could be distinguishable from each other in terms of geographical, political and demographic backgrounds, it is expected that there exist some heterogeneous preferences among respondents in these three cities. Also, the survey was conducted in three types of retail outlets. Therefore, it should be taken into consideration that locations for conducting the surveys could influence characteristics of respondents as well. Because consumers' attitudes towards origins of ingredients is a key attribute addressed in the study, "foreign supermarket" was used as the base for the retail type variable, which could also allow us to see whether consumers' perceptions would be influenced by the ownership of retail types as well.

The results for the mixed logit model with demographic variables are summarized in Table 5-16. The log likelihood ratio test was performed to compare the goodness of fit of model (16) and model (17). The log likelihood ratio statistic D was 176.404, greater than 46.194, the critical value of the chi-squared distribution with 32 (49-17) degrees of freedom at a 5% significance level. Therefore, the second model incorporating the demographic factors is a better fit and is preferred.

Signs for each attribute variable in the second model were the same with the first model without demographic information. The coefficient of the price variable was negative as expected; consumers' utility decline with higher prices. Moreover, it was statistically not different from zero just as in the first model, which indicated low price sensitivity of

Chinese respondents towards soymilk products. This result was possibly due to the considerably low price of soymilk in China. Based on the weighted average income of the sample and the average soymilk price in the choice experiment, soymilk expenses would account for 0.3% of the annual household income, while total food consumption accounted for 37.3% of household income (Seal, Regmi and Bernstein 2003). This result is consistent with the finding from Shono et al. (2000) which suggested an inelastic demand for soybeans in China in 2000. Regarding production practices, the results showed that Chinese respondents derived marginal utility from the labels of "U.S. certified organic", "EU organic", "EU non-GMO" and "China non-GMO"; the estimated coefficients of these variables were statistically significant and positive. Such results suggested respondents in China realized the benefits of organic and non-GMO production practice. Similar to the result in the first model, the parameter of *USNGM* remained to be statistically not different from zero. Regarding origins of ingredients, coefficients of the variables *U.S.* and *CN* were both positive and significant at the 5% level, indicating soybeans grown in China and imported from the U.S. were preferred by respondents in China relative to soybeans from unknown origin. By comparing the magnitude of these two coefficients, Chinese consumers preferred soybeans imported from the U.S. more than those grown within China, which is inconsistent with the results of the first model without demographic variables. A possible explanation could be based on largely heterogeneous preferences among cities and retail types towards these attributes. On the other hand, such result is consistent with the findings from previous questions which presented Chinese respondents' concerns over the food safety related attributes of domestic soybeans relative to imports.

Table 5-16: Results from mixed logit model with demographic factors (China)

Variable		Mixed logit estimates
Price	Mean	-0.010
		(0.007)
USORG	Mean	3.443***
		(1.135)
	Standard deviation	2.511*
		(1.396)
EUORG	Mean	1.763**
		(0.732)
	Standard deviation	0.866
		(1.200)
CNORG	Mean	1.457*
		(0.875)
	Standard deviation	2.649
		(1.778)
USNGM	Mean	0.006
		(1.069)
	Standard deviation	9.053***
		(3.159)
EUNGM	Mean	1.378**
		(0.617)
	Standard deviation	0.388
		(0.798)
CNNGM	Mean	3.465**
		(1.501)
	Standard deviation	9.816***
		(3.267)
US	Mean	2.565***
		(0.915)
	Standard deviation	9.154***
		(3.064)
CN	Mean	1.456**
		(0.595)
	Standard deviation	2.728***
		(1.045)
No. of observations:	1800	
Log likelihood function:	-1964.087	
Degrees of freedom: 17	49	
McFadden Pseudo R-squared:	0.2128947	

Estimated standard errors are in parentheses; *, **,*** indicate the level of significance at the 10%,5%,and 1%, respectively.

The interaction effects between attribute and demographic variables are shown in Table 5-17. Regarding preferences towards organic products, respondents in different cities distinctively valued organic products certified by

different types of certifying agencies. The results suggested that respondents in Beijing placed higher value on organic soymilk certified by U.S. and EU agencies than respondents in Guangzhou. Organic food certified by Chinese agencies was not preferred by respondents in Beijing. In contrast, respondents in Shanghai slightly preferred organic soybeans certified by U.S. agencies and by China agencies but not those certified by EU agencies. The results also suggested that respondents shopping in China supermarket in Shanghai were more likely to purchase organic products relative to respondents in Guangzhou. Among the three agencies certifying organic soybeans, the preference for Chinese agencies was the strongest among Shanghai respondents in China supermarkets. Therefore, respondents' purchasing intentions of organic products in Shanghai can be influenced by where they regularly shop. Generally speaking, younger Chinese people in urban areas are more likely to shop supermarkets than in free markets. In our sample, more than half of the respondents shopping in supermarkets are younger than 35 years while only around 33% of respondents in this age range shopped in free markets. In addition, there is a larger percentage (53%) of respondents in China supermarkets having higher education (college degree or above) relative to the other two groups (40% in foreign supermarkets and 49% in free market). Thus, it is likely that city and shopping venues are at least partially capturing impacts of age and education on respondents' shopping behavior.

Regarding non-GMO products that differed by certifying agencies, differences in attitudes of respondents across the three surveyed cities were not as noteworthy. Respondents in Beijing showed preferences towards non-GMO soymilk certified by U.S. agencies and by EU agencies and the respondents in Shanghai showed slight preference towards non-GMO soymilk certified by EU agencies. However, there were distinct perceptions held by respondents in these three cities towards origins of soybeans. It was found that respondents in Shanghai and Beijing derived lower utility from soybeans imported from the U.S., than respondents in Guangzhou. Moreover, respondents in Beijing appreciated soybeans grown within China more than respondents in Guangzhou did. Also, respondents in Chinese domestic supermarkets in Shanghai obtained statistically higher utility from purchasing Chinese soybeans. Thus again, retail types in Shanghai was proven to be an important factor when analyzing consumers' purchasing behavior.

Table 5-17: Interactions between demographic variables and choice variables (China)

	BJ	*SH*	*BJ*CS*	*SH*CS*
USOR	2.685**	1.569*	0.00342	5.038**
	(1.218)	(0.936)	(0.003)	(5.038)
EUOR	2.153**	0.375	0.452	3.402**
	(0.963)	(0.686)	(0.994)	(1.484)
CNOR	1.699	2.919*	1.804	5.628**
	(1.124)	(1.528)	(1.372)	(2.301)
USNG	2.979*	0.730	-0.556	-1.611
	(1.702)	(1.506)	(1.902)	(2.431)
EUNG	1.505*	1.261*	-0.749	0.903
	(0.796)	(0.685)	(0.896)	(1.411)
CNNG	-3.087	-2.421	3.379	3.187
	(2.151)	(1.791)	(2.418)	(2.526)
US	-4.041**	-3.732**	-0.582	1.701
	(1.867)	(1.469)	(1.238)	(1.404)
CN	2.307***	0.667	-0.572	4.861***
	(0.884)	(0.594)	(0.794)	(1.55)

Estimated standard errors are in parentheses; *, **, *** indicate the level of significance at the 10%,5%,and 1%, respectively

Table 5-18 compared the magnitude of willingness to pay for various product attributes in both mixed logit models. Similar to the U.S. survey, the estimated WTP for each attribute was divided by 3 to give a more realistic estimation. The results from mixed logit model with demographic variables showed that Chinese respondents were willing to pay more for organic food ingredients. Magnitudes of the WTP for organic processed food certified by different agencies were distinct but all statistically significant. The WTP for U.S. certified organic soybeans was the largest with 1.141 yuan, followed by EU certified organic (0.585 yuan). The WTP for organic soymilk certified by China agencies was the least and was 0.483 yuan. However, the results for non-GMO products were different. Chinese respondents were willing to pay 0.457 yuan more for EU certified non-GMO soybeans used in soymilk relative to soymilk with no information about the origin of soybeans, and the WTP was statistically significant at the 5% level. In contrast, the WTP for Chinese certified non-GMO soymilk was statistically significant at the 10% level, while the WTP for U.S. certified non-GMO food ingredients was not statistically significant. The WTP for both origin attributes (*US* and *CN*) were only significant at the 10% level with a 0.85 yuan and a 0.48 yuan WTP for soymilk made from soybeans from the U.S. and China, respectively. It is notable that the WTP for Chinese certified non-GMO soybeans (1.149 yuan) was larger than the highest WTP for organic soybeans, which were those certified by U.S. agencies (1.141 yuan). Such result suggests a bigger market potential for non-GMO soybeans certified by domestic agencies in China compared with

the market for organic soybeans. Accordingly, growing non-GMO soybeans and getting them certified by domestic certifying agencies may be a more effective strategy for Chinese producers.

Different from the U.S. models, the WTP for each attribute in the mixed logit model with demographics was more significant than the model without. For example, the WTP for the U.S. certified organic attribute was not statistically significant in the model without demographic variables. Yet when the demographic factors were incorporated, it became significant at the 1% level. It was similar for the attribute variables *EUOR*, *CNOR* and *EUNG* which were not significant at the 10% level in the first model but became significant at the 5% level in the second model. Therefore, adding demographic variables in the model helped reveal the WTP values among Chinese respondents.

Table 5-18: Willingness to pay for attributes of soymilk in mixed logit models in yuan (China)

Variables	With demographics	Adjusted (divided by 3)
USOR	3.424**	1.141
	(1.657)	
EUOR	1.754**	0.585
	(0.761)	
CNOR	1.449**	0.483
	(0.903)	
USNG	0.072	0.024
	(1.062)	
EUNG	1.371**	0.457
	(0.658)	
CNNG	3.446*	1.149
	(1.840)	
US	2.551*	0.850
	(1.434)	
CN	1.447*	0.482
	(0.791)	

Estimated standard errors are in parentheses; *, **, *** indicate the level of significance at the 10%,5%,and 1%, respectively.

5.4 Comparison of the Results between U.S. and China survey

The results from the U.S. and Chinese surveys are compared in this section focusing on consumers' preferences and valuations of various attributes of general food product and soymilk. This study specifically addresses the differences in consumers' demand for organic soymilk in the two countries. In addition, a trend of growing trade between these two countries in terms of organic and GM soybeans has been observed. Hence, consumers' perceptions and valuations towards origins of organic and non-GMO ingredients of processed foods are also compared between these two countries.

As illustrated in Table 5-19, respondents in the U.S. and China were distinct from each other in several ways. First of all, nearly half of the respondents in U.S. were from 45 to 64 years old, while such percentage was only about 28% among the respondents in China. Instead, the Chinese sample included a higher proportion of younger people with around 39% of respondents younger than 35 years, while only 14% of the respondents were younger than 35 in the U.S. sample. Moreover, U.S. respondents were more educated than respondents in China. About 67% of U.S. respondents obtained a bachelor or above degree while only 24% of Chinese respondents held a bachelor or above degree. In addition, the U.S. sample included a higher portion of high income people with about 32.6% of respondents earning annual family income of $100,000 and higher. In China, only 16% of respondents belonged to a relatively high income group with an annual family income more than 108,000 yuan, and there were 48% of respondents who earned income below the average level in the three cities (60,000 yuan). In comparison, only 22.16% of U.S. respondents earned income below the 2009 nominal medium household income in the U.S. ($49,777). All of these differences could possibly contribute to distinctions between people's food consumption behavior discussed in details in the following parts.

Table 5-19: Comparisons of selected demographic factors

Countries / *Demographics*	*U.S.*		*China*	
Age	18-24	0.00%	18- 24	13.67%
	25-34	13.67%	25-34	25.33%
	35-44	25.33%	35-44	23.33%
	45-54	23.33%	45-60	28.00%
	55-64	28.00%		
	65 or above	9.67%	61-80	9.57%
Education	Elementary	0.00%	Elementary	2.00%
	Middle	0.00%	Middle	17.67%
	High school or equivalent	3.48%	High school or equivalent	33.67%
	Some college or Associate	29.43%	Some college or Associate	22.33%
	Bachelor	34.18%	Bachelor	21.00%
	Graduate	32.91%	Graduate	3.33%
Income(annual)	Less than $10,000	2.85%	Less than 11999 yuan	1.67%
	$10,000 - $24,999	3.80%	12000-35999 yuan	9.33%
	$25,000 - $49,999	15.51%	36000-59999 yuan	37.00%
	$50,000 - $74,999	25.63%	60000-83999 yuan	25.33%
	$75,000 - $99,999	19.62%	84000-107999 yuan	10.67%
	$100,000 -250,000	30.70%	108000-131999 yuan	10.00%
	More than $250, 000	1.90%	Above 132000 yuan	6.00%

5.4.1 Comparison of General Food and Soymilk Consumption

The frequency of checking the labeling information on food products revealed people's valuations of various labeled attributes on general food consumption (Figure 5-3 and Figure 5-15). It was indicated respondents in both countries paid most attention to the brand of a food product. About 74% and 72% of U.S. respondents and respondents in China checked this information more than half of the time. Moreover, there were similar percentages of respondents in the U.S. (49.68%) and China (40.33%) who checked the claims regarding production or processing processes more than half of the time, indicating that respondents in both countries were concerned about and paid attention to this kind of information. However, Chinese respondents checked certification agencies more frequently than U.S. respondents (46.33% in China versus 36.71% in U.S. checking such information more than half of the time). In addition, the information relating to origins of ingredients was more often checked by Chinese respondents with 55% of respondents

checking it more than half of the time. By contrast, such attribute was paid relatively less attention by U.S. respondents with only 34.17% of the respondents checking the information more than half the time.

Label information	**% of sample checking more than half of the time**	
	U.S.	**China**
Brand	74.37%	72.00%
Processing & production process	49.68%	40.33%
Certification agencies	36.71%	46.33%
Origin of ingredients	34.17%	55.00%

When considering the product of interest, soymilk, consumer's valuations on product attributes showed similarities as well as differences. The comparison is presented in Table 5-20. The results showed many similarities in terms of the ranking of attributes. The "minimum use of preservatives" and "low risk of food-borne illness" attributes were placed high in the importance level by respondents from both U.S. and China, indicating the importance of food safety concerns in purchasing soymilk. Moreover, respondents from both countries ranked the "non-GMO", one of "production and processing of ingredients" attribute, as having medium importance. The "origins of ingredients" attributes were viewed as less important and placed towards the bottom part of attributes included in the surveys by both sets of respondents.

However, taste was valued by U.S. respondents as the top attribute in purchasing soymilk. For Chinese respondents, taste was placed after the food safety-related attributes in terms of importance. Price was viewed as the least important attribute by Chinese respondents, while U.S. respondents ranked the price attribute in the middle. Hence, Chinese respondents were less price-sensitive towards soymilk probably due to the relatively low price of this product, which could suggest the potentiality for higher price premium product with better attributes. In contrast, the U.S. respondents regarded retail types as the least important attributes while Chinese respondents placed it in the middle of the attributes. The difference might arise from the fact that soymilk in the U.S. are branded. In China, soymilk is freshly made and normally does not carry a registered brand. Thus, perceived quality of soymilk products might be somewhat related to types of retailers in China.

When comparing the perceived importance of each attribute, Chinese respondents valued attributes relating to the food safety issue considerably more than U.S. respondents did, although respondents in both countries considered these attributes as very important. The scores given to "low risk of food-borne illness", "minimum use of preservatives" "minimum use of pesticide" were significantly higher in China's survey than those in the U.S. survey, indicating that respondents in China were aware of the food incidents relating to overuse of preservatives or pesticides and have started

to look for products which could address these issues. However, there were no significant differences between the scores given to the attribute of "certified organic" by U.S. and China respondents which were near the bottom of the list.

Table 5-20: Valuations of various attributes of soymilk products by U.S. and Chinese respondents

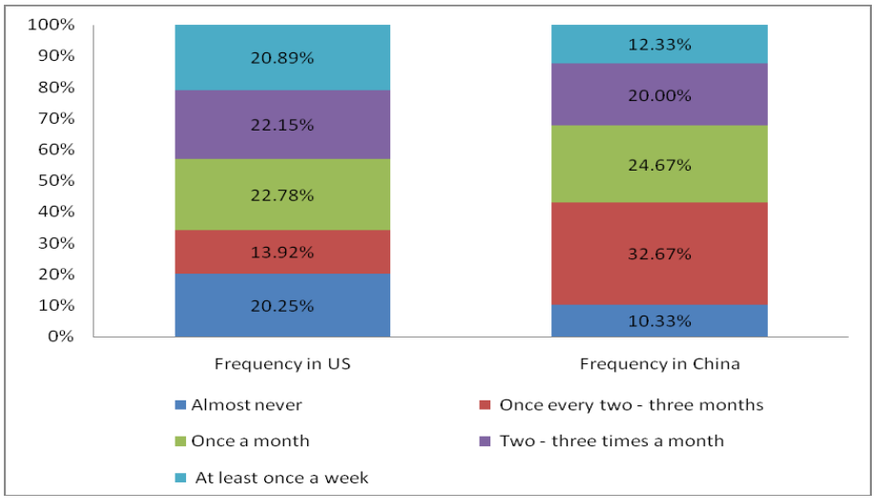
Variable	Mean (U.S.)	Mean(China)	Comparison*
Taste	4.55[a]	4.19[b']	U.S.>China
Minimum use of preservatives	4.10[b]	4.43[a']	China>U.S.
Low risk of food-borne illness	4.06[b]	4.44[a']	China>U.S.
Production and processing of ingredients	3.87[c]	4.42 [a'](pesticide)	China>U.S.
Production and processing of ingredients	3.87[c]	3.9 [c'](Non-GMO)	No difference
Price	3.75[c,d]	3.19[e']	U.S.>China
Locations of manufacturing	3.68[d,e]	3.55[d']	No difference
Certified organic	3.58[d,e]	3.79[c']	No difference
Origins of soybeans	3.52[e]	3.48[d']	No difference
Types of retail outlets	3.25[f]	3.72[e']	China>U.S.

Note: 1=Not at all important, 2=Not very important, 3=Indifferent, 4=Very important, 5=Extremely important
*: significantly different at 5% level
[a,b,c,d] Not significantly different at 5% level ; [a',b',c',d'] Not significantly different at 5% level

5.4.2 Comparison of Interpretations and Valuations of Organic Soymilk

Although the organic market is comparatively less developed in China than in the U.S., surprisingly, the results revealed that Chinese consumers were aware of organic food products as much as U.S. consumers did in speaking of consumption frequency. Figure 5-23 compares consumption frequency of organic soymilk in U.S. and consumption frequency of organic food products in China. Only a small fraction of the respondents in both countries (20% in the U.S. and 10% in China) claimed that they have never shopped for organic food items during the last 12 months. Meanwhile, 66% of respondents shopped for organic soymilk in the U.S. and 57% of respondents in China purchased organic food products more than once a month. Although such high percentage in China could most likely include the people who purchased some uncertified organic products, the results could still indicate that consumers in China were familiar with so called organic food products and sought them out as frequently as U.S. consumers.

Figure 5-23: Consumption frequency of organic soymilk in U.S. and organic food product in China



How important respondents perceive of various attributes of organic soymilk by U.S. and Chinese respondents are compared in Table 5-21. Attributes of organic soymilk that were most important to respondents were similar in both countries. In both countries, respondents considered health benefits and food safety-related attributes including "low risk from food borne illness" and "minimum chemical use" as very important attributes associated with organic soymilk. For U.S. respondents, heath benefit was not considered to be important in purchasing soymilk in general, but was regarded to be very important in organic soymilk consumption. Hence, purchasing organic soymilk may be driven more by health benefits in the U.S. However, when comparing the mean scores of the attributes relating to health benefits and food safety, Chinese respondents assigned significantly higher scores than U.S. respondents, suggesting that Chinese consumers were probably relying on organic products to address their needs in pursuing safer and healthier food. In purchasing organic soymilk, taste was ranked as the most important attribute by the U.S. respondents and significantly above other attributes. For respondents in China, taste was considered important, but was ranked after health benefits and food safety attributes. This again indicated that consumers in China regarded organic food to be a way to get safer food.

In the case of China, besides "health benefit", "low risk from food borne illness" and "minimum chemical use", "positive environmental impact" was ranked the 5th next to "taste or flavor", suggesting that Chinese consumers recognized benefits of organic products in mitigating the environmental problems. Respondents in both countries did not show much difference in assessing the importance of manufacturing location, the use of non-GMO soybeans and origins of ingredients, and indicated low levels of interest for these attributes when purchasing organic soymilk product. Finally,

Chinese respondents paid significantly more attention to the agencies certified the organic products than U.S. respondents.

Table 5-21: Valuations of various attributes of organic soymilk by U.S. and Chinese respondents

Variables	Mean(U.S.)	Mean(China)	T-test results*
Taste or flavor	4.34[a]	4.14[c']	U.S. > China
Health benefits	4.05[b]	4.51[a']	China>U.S.
Minimal chemical use in production	3.97[b]	4.39[b']	China>U.S.
Low risk from food-borne illness	3.94[b]	4.48[a',b']	China>U.S.
Agencies certifying the claims	3.75[c]	4.03[c']	China>U.S.
Where the product was manufactured	3.71[c]	3.61[d',e']	No difference
Use of non-genetically modified soybeans	3.69[c]	3.81[d']	No difference
Origin of ingredients	3.69[c]	3.6[e']	No difference
Positive environmental impacts	3.65[c]	4.06[c']	China>U.S.
Promotion of social justice	3.4[c]	3.75[d']	China>U.S.

Note: 1=Not at all important, 2=Not very important, 3=Indifferent, 4=Very important, 5=Extremely important.

*: significantly different at 5% level

[a,b,c,d] Not significantly different at 5% level; [a',b',c,'d'] Not significantly different at 5% level

To summarize, the majority of U.S. and Chinese respondents were aware of organic food products and shopped for them on a regular basis. However, reasons for purchasing organic soymilk were slightly different. For U.S. consumers, health benefits associated with organic products were likely to be the major driver. In comparison, Chinese consumers were prone to purchase organic food products mainly due to concerns of food safety and environmental problems. Origins of ingredients in processed organic product were paid less attention to by respondents in both countries. However, Chinese respondents stated higher concerns over the certifications agencies when purchasing organic soymilk than U.S. respondents did.

5.4.3 Comparison of Perceptions of Ingredients from Different Origins

5.4.3.1 *Perceptions of Domestic Organic Soybeans Relative to Imports*

Figure 5-24 compares U.S. and Chinese respondents' perceptions of the overall quality of organic soybeans sourced from different countries. It was suggested that U.S. and Chinese respondents had preferences towards ingredients produced from one country over another even though the importance of the attribute "origin of ingredients"

was ranked relatively low by respondents in both countries. The results revealed that respondents in both countries perceived organic soybeans produced domestically having better quality than imports. Such perceptions could be explained by the trust respondents placed on the accuracy of the "certified organic" label of soybeans sourced from different countries (Figure 5-2625). The respondents in both countries placed more trust on the "certified organic" label of soybeans produced domestically. The preference for domestically grown soybeans was stronger among U.S. respondents. Nearly 85.75% of U.S. respondents U.S. perceived that the soybeans grown within U.S. had somewhat high or high quality, while only 10.12% regarded organic soybeans imported from China as being of somewhat high or high quality. Based on the Chinese survey, 72.33% of Chinese respondents regarded soybeans from main production areas in China as having somewhat high or high quality and 38.67% of the respondents considered soybeans from any province in China having somewhat high or high quality. About 32% of the China respondents viewed U.S. soybeans as having somewhat high or high quality. Therefore, relatively speaking, U.S. consumers had well-defined attitudes towards soybeans grown domestically and abroad. Labeling the country of origin of soybeans would help U.S. domestic organic producers obtain advantages over imports. Such strategy would not be as effective for Chinese domestic organic producers to compete against imported organic soybeans from U.S. However, organic soybeans from main production provinces in China were strongly preferred by Chinese respondents, suggesting that labeling production regions could become one effective marketing tool for organic producers in those production regions (e.g., Heilongjiang province) to promote their products.

Figure 5-24: Perceived quality of organic ingredients of soymilk from different origins from U.S. consumers and Chinese consumers

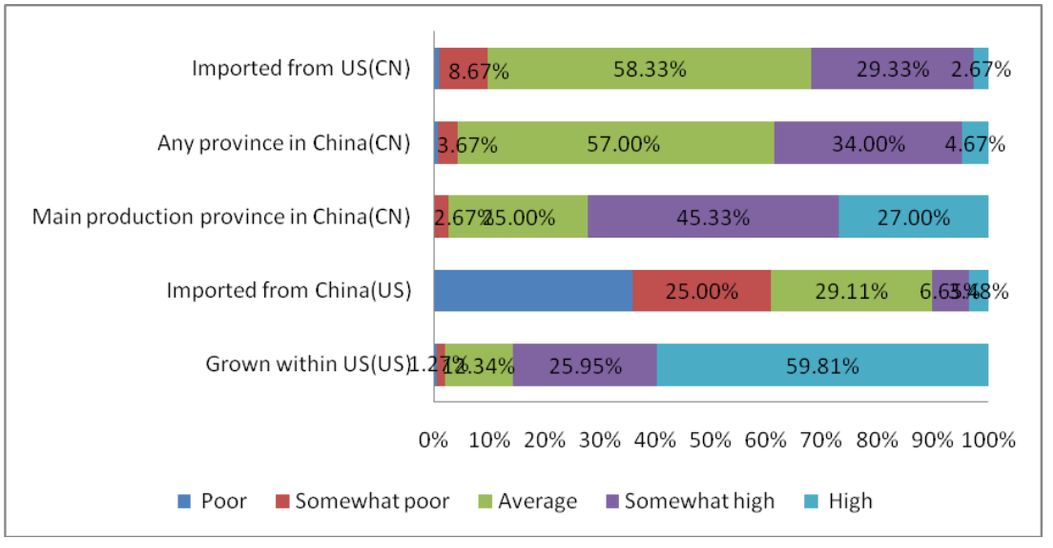
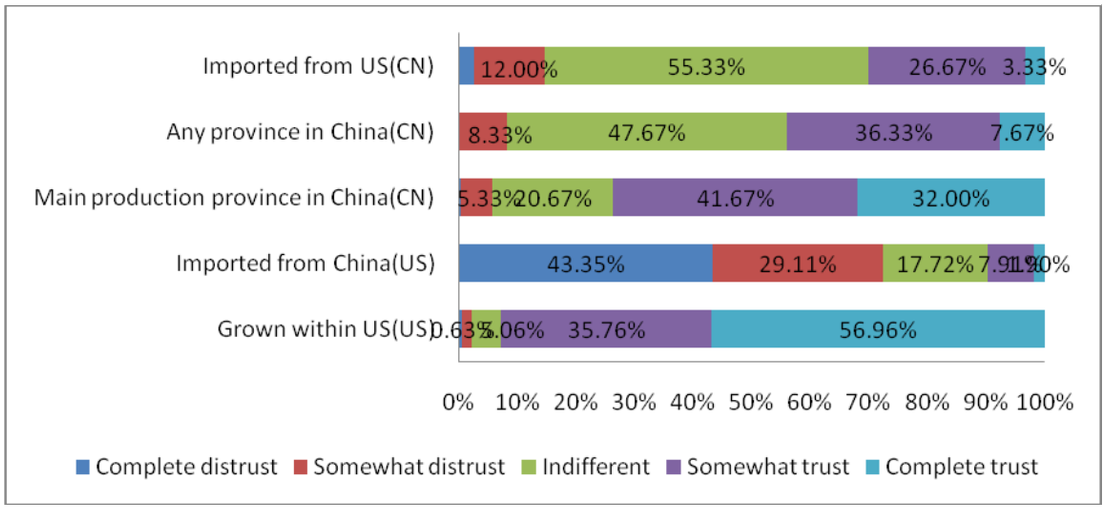


Figure 5-25: Level of trust towards organic soymilk ingredients from different origins perceived by U.S. and Chinese consumers



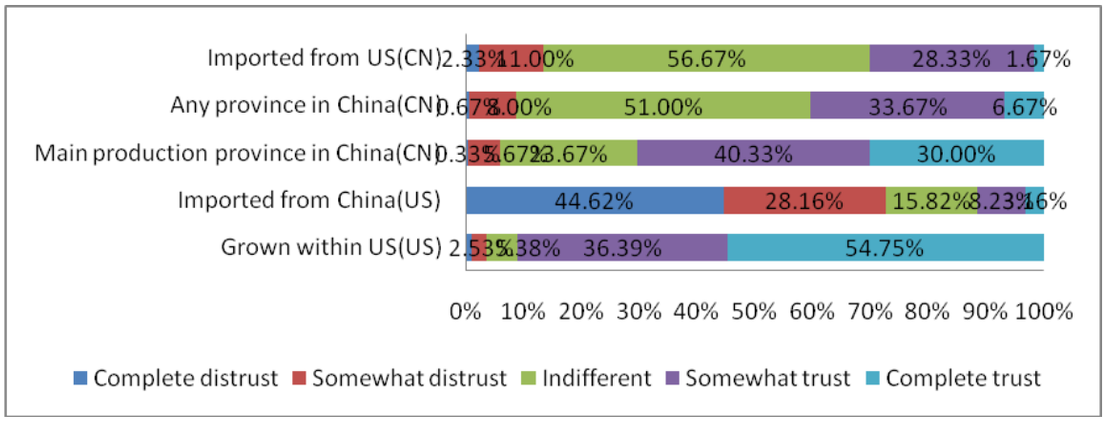
A comparison of perceptions of major attributes of organic soybeans from different origins could further explain why U.S. respondents hold a stronger preference for domestically grown soybeans than respondents in China. U.S. respondents viewed organic soybeans grown in the U.S. very superior to imported counterparts in terms of all attributes considered in the survey, especially the ones relating to food safety concerns (Figure 5-12). About three out of four respondents considered U.S. organic soybeans as being superior to imported organic soybeans regarding the attributes of "safety from risk of food-borne illnesses" and "safety from risk of consuming toxic chemical residual". On the other hand, about half of Chinese respondents regarded the domestically grown organic soybeans as being superior to imported soybeans (Figure 5-21) in terms of a few of the attributes considered such as "taste" and "potential positive health benefits". However, only 33% and 39% of respondents viewed that organic soybeans produced in China were superior in terms of "safety from risk of toxic pesticide residuals" and "environmental impact", respectively. Such perceptions suggest the possibility that Chinese consumers may be held back from preferring domestic organic soybeans due to their concerns on food safety and environmental issues.

5.4.3.2 ***Perceptions of Domestic Non-GMO Soybeans Relative to Imports***

Similar to perceptions of organic soybeans from different countries, the majority of U.S. respondents viewed domestically produced non-GMO soybeans as having superior quality in terms of various attributes (Figure 5-26). For example, 63% of U.S. respondents perceived that U.S.-grown, non-GMO soybeans were superior to imported non-GMO soybeans in terms of taste, safety from risk of food-borne illnesses, and safety from risk of consuming toxic chemical residues. In addition, respondents' trust level on soybeans certified as non-GMO sourced from the U.S. was

considerably higher than those produced in China (Figure 5-26). U.S. grown, non-GMO soybeans were somewhat trusted or completely trusted to be non-GMO by 91.14% of U.S. respondents. This number was only 11.39% for non-GMO soybeans imported from China. In contrast, 40.33% of respondents perceived non-GMO soybeans produced in China as trustworthy while 30% held same views towards imported non-GMO soybeans from the U.S., which is a much smaller difference. These trust scores were consistent with respondent's concerns over food safety related attributes of non-GMO soybeans from different origins. These results are noteworthy, because more than 91% of soybeans produced in the U.S. are GM soybeans and GM soybean production is prohibited in China. The results might be due to the possibility that the valuation of food products of consumers from both countries is heavily dependent on images of countries without paying too much attention to actual production practices of particular products. The trust on the certifying system might be another possible explanation.

Figure 5-26: Level of trust towards Non-GMO soymilk ingredients from China and U.S.



5.4.3.3 ***Perceptions of Domestic and Foreign Organizations which Provide Labeling Information***

The comparison on how much trust consumers place on different types of organizations providing the information on labels indicated that domestic organizations were trusted more by U.S. respondents and Chinese respondents (Figure 5-4 and Figure 5-16). However, the level of distrust towards foreign agencies was higher in the U.S. For example,, only 25.6% of U.S. respondents considered foreign certifying agencies accredited by the U.S. government as being somewhat or completely trusted. In contrast, the proportion of Chinese respondents somewhat or completely trusting foreign certification agencies was 46%.

In addition, trust levels placed on different types of domestic agencies were different for U.S. and Chinese respondents. In both countries, governmental agencies were regarded as being the most trustworthy with 71% and 74%

of U.S. and Chinese respondents, respectively, showing somewhat or complete trust. However, U.S. respondents tended to trust farmers more than retailers, with 55% trusting U.S. farmers and only 31.96% trusting U.S. retailers. In contrast, Chinese retailers were regarded as the second most trustworthy organization, being somewhat or completely trusted by 68.33% of respondents. However, only 41.7% of Chinese respondents regarded their farmers as trustworthy.

The disputes and controversial events that occurred in recent years relating to food policies may have influenced U.S. and China consumers' perceptions on various certification agencies. OCIA's decision to retract from the Chinese market could contribute to U.S. consumers' hesitation in trusting foreign certification agencies, while the Chinese government's rejection of improperly labeled GM corn imports may have increased Chinese consumers' doubts on labeling information provided by foreign organizations as well. Higher trust levels on domestic certifying agencies may partly explain why respondents in both countries perceived domestically produced organic and non-GMO products to be better than the imported ones.

5.4.3.4 ***Comparison of the Results from Model Estimations***

Table 5-22 compares the estimated coefficients of soymilk attributes from mixed logit model with demographic variables. Chinese respondents revealed less price sensitivity towards soymilk. The estimated coefficient of the price variable was negative but insignificant in the case of China. U.S. respondents, on the hand, were sensitive to changes in soymilk price. The difference in the Chinese and U.S. results could be attributed the differences in the product unit used in each choice experiment. The Chinese product was specified as a single serving, while the U.S. product could be consumed over several days or more. This is consistent with the result that price was considered to be more important for U.S. respondents when purchasing soymilk.

Regarding types of production practice, coefficients for organic and non-GMO attributes were significant and positive in the U.S. case, indicating that U.S. respondents valued these two types of labels on soymilk products. The results of WTP estimations (Table 5-23) comparing the magnitudes of values assigned to these two attributes revealed that U.S. respondents were willing to pay much more for the attribute of organic than the attribute of non-GMO (3.08 dollars for organic versus 1.27 dollars for non-GMO). Chinese respondents, like U.S. consumers, were also willing to pay a premium for the organic and non-GMO attributes. Moreover, respondents in China differentiate soybeans with these attributes by the nationalities of certification agencies, which was consistent with the finding that Chinese respondents were more aware of certification agencies of organic soymilk products. The organic soymilk certified by U.S. certifying agencies was assigned the highest valuation. The respondents in China were willing to pay 1.141 Chinese yuan for soymilk made from U.S. certified organic soybeans and 0.585 yuan for soymilk made from EU certified organic. Consumers in China were also willing to pay 0.457 yuan more for soymilk from non-GMO soybeans

certified by EU agencies. The respondents in China were not willing to pay a premium for U.S. non-GMO soybeans probably due to distrust of non-GMO of U.S soybeans. In terms of attitudes towards origins of ingredients, U.S. respondents strongly preferred soymilk with ingredients grown within the U.S. and were willing to pay $1.76 more for ingredients grown in the U.S. Chinese respondents were willing to pay 0.85 and 0.45 yuan for soymilk with soybeans grown in the U.S. and in China, respectively. However, both WTP were statistically significant only at 10%.

Table 5-22: Comparison of results from mixed logit model with demographic variables in U.S. and China

Variables	Mixed logit estimates (U.S.)	Mixed logit estimates(China)	
Price	-0.505***		-0.010
	(0.103)		(0.007)
ORG	4.667***	*USORG*	3.443***
	(0.822)		(1.135)
		EUORG	1.763**
			(0.732)
		CNORG	1.457*
			(0.875)
NGM	1.916**	*USNGM*	0.006
	(0.833)		(1.069)
		EUNGM	1.378**
			(0.617)
		CNNGM	3.465**
			(1.501)
US	1.761***		2.565***
	(0.592)		(0.915)
IMP	0.338	*CN*	1.456**
	(0.803)		(0.595)

Estimated standard errors are in parentheses; *, **, *** indicate the level of significance at the 10%, 5%, and 1%, respectively.

Table 5-23: Comparison of WTP estimations for the mixed logit models U.S. and China

Variables	U.S.			China			
	WTP($)	Adjusted	%WTP[a]		WTP(yuan)	Adjusted	%WTP[b]
ORG	9.244***	3.081	100.032	USORG	3.424**	1.141	142.62
	(1.611)				(1.657)		0
				EUORG	1.754**	0.585	
					(0.761)		73.125
				CNORG	1.449**	0.483	
					(0.903)		60.375
NGM	3.795**	1.265	41.071	*USNGM*	0.072	0.024	3.00
	(1.637)				(1.062)		
				EUNGM	1.371**	0.457	57.125
					(0.658)		
				CNNGM	3.446*	1.149	143.63
					(1.840)		
US	3.489***	1.163	37.759	*US*	2.551*	0.850	106.25
	(1.148)				(1.434)		0
IMP	0.670	0.223	7.240	*CN*	1.447*	0.482	60.250
	(1.596)				(0.791)		

Estimated standard errors are in parentheses; *, **, *** indicate the level of significance at the 10%, 5%, and 1%, respectively;[a]; the base price is the middle price of in choice set of U.S. survey $2.78 ; [b]; the base price is the middle price in choice set of China survey 0.8 yuan.

Chapter 6 Conclusions and Implications

This chapter concludes the thesis and presents implications of this study. The objectives and methods of this thesis are reviewed first. The results from two surveys in the U.S. and China are then discussed. Implications and recommendations based on these results for participants along supply chains in both countries are stated. Similarities and differences on consumer preferences towards attributes of soymilk between respondents in China and in the U.S. are summarized in the following section. Implications for future trade patterns between the U.S. and China in terms of organic, non-GM, and conventional soybeans are drawn based on the results of the comparison. Limitations of this study are discussed in the section before conclusion.

6.1 Research Objectives and Methodology

As sales of organic foods have witnessed substantial growth, some new trends and issues have emerged in the U.S. organic market. The main type of retail outlets for organic products has changed from natural and health stores, which are limited in numbers in the U.S., to conventional supermarkets. Some large-box supermarkets such as Wal-Mart and Target have also started to carry organic products. In addition, retailers have begun to introduce organic products under their own store brands at a relatively lower price to compete with currently dominant, national-branded organic products. Such changes in organic market have increased the availability and affordability of organic products as well as making it more convenient to purchase organic foods.

However, production of organic ingredients in the U.S. has failed to catch up with the fast growing demand. Thus, increasing imports of organic ingredients to the U.S. has been observed. The major trade partners with the U.S. include low-income countries with low labor cost but relatively high frequency of food incidents in both domestic and international markets. This study focused on soymilk, a rapidly growing product undergoing these emerging trends. The first objective was to examine U.S. consumers' preferences and valuations for attributes of organic soymilk with the emphases on brand types and origins of ingredients.

The second objective of this thesis was to assess consumer preferences towards organic products in a low-income country. The organic markets in low-income countries are often not well developed and the consumers may not understand organic food well. However, the fast growing income and increasing awareness of food safety problems may influence consumers' preferences and valuations of organic products. This study examined preferences of consumers in China, the biggest soybean trade partner with the U.S. Consumption patterns of soymilk in China are quite different from the U.S. Branded packaged soymilk is not favored by Chinese consumers. Instead, fresh soymilk is a main item for daily breakfast. Moreover, more Chinese residents are reported purchasing soybeans to produce soymilk by themselves

so as to better control the safety of their food. Organic soybeans have appeared in the domestic market. Because the organic market in China was initially export-oriented, various types of certification agencies can certify organic products for domestic sale and exports. Therefore, valuations of Chinese consumers towards attributes of organic soymilk were studied in this thesis, with focus on origins of ingredients and certifying agencies.

The U.S. and China are distinguishable from each other in terms of political, demographical, and economic characteristics. They are also engaged in a close trade relationship in terms of soybeans. Accordingly, the third objective of this study was to compare preferences of consumers in the U.S. and in China and draw implications for the growth of organic food industry and for future trade of organic and conventional soybeans between these two countries.

Two versions of surveys were designed and conducted. Both surveys targeted main grocery shoppers of households who have regularly shopped for soymilk. The U.S. survey was delivered on-line to random respondents nationwide via a well-known market research company. Due to the low internet usage rate in China, an enumerated survey was developed and administered at three types of food retail channels in Beijing, Shanghai and Guangzhou in China. Exactly 316 and 300 valid responses were collected from the U.S. and China surveys, respectively. Choice experiments were used in both surveys to elicit consumers' WTP for soymilk attributes of interest. Because of the differences in the U.S. and China, choice attributes and levels were specified separately. In the U.S. survey, each consumer was asked to choose among three soymilk products sold in half gallon cartons differentiated by attributes of price, types of brand, production practices and countries of origin of soybeans. In the Chinese survey, each respondent was asked to choose among three freshly made soymilk products in 250ml bags differentiated by attributes of price, production practices and certification agencies, and countries of origin of soybeans. Mixed logit models were used to analyze the choice experiment responses.

6.2 Results and Implications

6.2.1 U.S. Consumer Preferences

6.2.1.1 ***Health Benefits Drive Sales in Organic Soymilk***

The results revealed that U.S. soymilk consumers significantly valued the "certified organic" attribute and were willing to pay 3.065 dollars for products that are certified organic. Such high willingness to pay for the attribute of organic is consistent with high price premiums organic soybeans have received and shows that soymilk consumers appreciate the organic attribute of soybeans in consuming soymilk. Consumers also showed preferences for the "non-GMO" attribute of soymilk. The willingness to pay for the attribute of "non-GMO" was 1.259 dollars, less than that for the "certified organic" attribute. As such, soymilk consumers cared about production processes of its ingredient.

About two out of three respondents shopped for organic soymilk more than once a month. The respondents considered "taste", "minimum use of preservatives" and "low risk of food-borne illness" as the most important attributes in soymilk. Regarding organic soymilk, "health benefit" was viewed to be the second most important attribute and ranked above the "minimum use of preservatives" and "low risk of food-borne illness" attributes. On the other hand, the lowest score was given to "lactose or casein free" attribute of soymilk, suggesting that soymilk consumers were attracted to consume soymilk mainly because of factors other than being allergic to lactose or casein. Purchasing organic soymilk could be mainly driven by beliefs that organic soymilk could enhance health and are relatively safe. Also, more educated people and people with children were more likely to consume organic soymilk products, possibly because stronger intention paid to food safety and health drove these two groups of people to know more about organic foods.

Collectively, results imply a great potential for the organic soymilk market to expand in the U.S., based on interest in healthy diet. High WTPs and driving factors for consuming organic soymilk suggested that highlighting health benefits of organic soymilk may bring more opportunities and profitability to this industry. Some players in the soymilk industry have already marketed their products through emphasizing health benefits. For example, SOYJOY, which was launched in 2007, invested on its "Fortified with Optimism" campaign which sent out messages that eating whole soy products like SOYJOY will make you healthier (Mintel 2008a). Also, the United Soybean Board has helped fund research on soy's effects on breast cancer and heart disease. However, literature and online searches have not identified any study on comparing the health benefits of organic soymilk and conventional soymilk. Thus, if additional health benefits associated with organic soymilk could be shown, a further expansion of organic soymilk market could be expected.

6.2.1.2 ***Food Safety Concerns Differentiated Organic Products from Different Origins***

The study found that U.S. consumers value organic soymilk products with ingredients from different origins distinctively, despite the lack of access to such information in the current marketplace. Generally speaking, respondents showed strong preference for soymilk made from domestically grown soybeans and were willing to pay $1.17 more for ingredients grown within the U.S. The majority of respondents regarded organic soymilk ingredients grown domestically as having better quality than imported counterparts. Nearly 85.75% of respondents perceived that the soybeans grown within the U.S. had somewhat high or high quality. About 10 to 20% of respondents regarded soybeans imported from Brazil, India and China to have high or somewhat high quality. In addition, organic soymilk ingredients grown in the U.S. were perceived to be superior to imports in terms of all product attributes considered in this study. Preferences were most distinct when comparing U.S.-grown organic soybeans with imported organic soybeans in terms of "safety from risk of food-borne illnesses" and "safety from risk of consuming toxic chemical residual" which were

the 3rd and 4th attributes of importance in purchasing organic soymilk. Thus, it is plausible that U.S. consumers are prone to trust and prefer organic food produced in the U.S. because of food safety concerns. Such perceptions were also related to their trust level on certifying systems. These results indicated that U.S. consumers tended to trust U.S. organic soymilk much more than certified organic soymilk imported from China or India.

Strong preferences toward soymilk produced from organic soybeans grown domestically imply that appropriate labeling on origins of soybeans may promote sales of organic soymilk made from U.S.-grown organic soybeans. In general, consumer's willingness to pay for organic ingredients with origin information would give competitive advantages to the U.S. organic producers when competing with relatively cheaper imports. However, the domestically produced non-GMO soybeans were possibly less preferred by U.S. respondents when compared to imported organic soybeans. As a result, the labeling strategy should be carefully formulated to maximize consumer appeal. In addition, although many food incidents in recent years may have caused U.S. consumers to question the food safety level of imported food products, such perceptions may change and the willingness to pay for domestically grown ingredients may decrease when low-income countries increase food quality and safety. For example, U.S. Food and Drug Administration (FDA) opened its first office in China in November 2008 in an effort to improve traceability and food safety control. In addition, the China's government attempted to better monitor the safety of food exports by certifying the exporters and producers (Gale and Buzby 2009). However, the effectiveness of these measures in improving product quality and whether the measures would change the image of imported food remains to be studied.

6.2.1.3 ***Taste Helped Build Soymilk Brand Loyalty***

Concerning brand preferences, U.S. soymilk consumers were willing to pay 1.04 dollars more (based on estimated WTP adjusted by the factor of 3) for soymilk under national brands over soymilk under general store brands. This premium exceeds the difference in market price (49 cents) between store brand soymilk and the dominant national brand soymilk in 2008 (Mintel 2008a). In the survey, Silk was the first choice for nearly 70% of respondents, which confirms Silk's dominant position in this market. Among attributes of branded soymilk products, "product" was ranked first in influencing consumer's choice of soymilk brands. About 61.71% of respondents perceived differences in the "taste or flavor" of soymilk under national brand from store-brand counterparts. Also, about a third of respondents thought national-brand soymilk had better taste and flavor than store-brand soymilk, while a quarter of respondents had opposite opinions. However, such preferences were less obvious when comparing store brands by natural food stores with store brands by general retail outlets. In addition, male and more educated soymilk consumers were more likely to purchase national-brand soymilk products.

U.S. consumers' preferences for national-brand soymilk suggested that the dominance of national brands in the soymilk market would probably sustain. In recent years, national-brand soymilk companies made investments to improve the taste of their products, including Dean Foods' Silk. The results showed that the "product" and "taste" were the two most significant factors influencing people in choosing one brand over another. Because U.S. respondents differentiated types of brands in terms of "tastes", the marketing strategy of national brand soymilk companies on taste will likely to be effective in securing their market shares, despite challenges with procuring all domestic soybeans to make their organic and alternative products.

6.2.2 Urban Chinese Consumer Preferences

6.2.2.1 *Food Safety Concerns Potentially Expands Domestic Organic and Non-GMO Soymilk (soybean) Market in Urban China*

About 57% of Chinese respondents consumed organic food products at least once a month, which showed a high level of awareness of organic food. In addition, willingness to pay for soymilk with organic ingredients varied from 0.483 to 1.141 yuan depending on the type of certifying agency. In addition, Chinese respondents were willing to pay even more (1.149 yuan) for Chinese certified non-GMO soymilk.

The top three attributes that mattered most to Chinese respondents in soymilk consumption were "low risk of food-borne illness", "minimum use of preservatives" and "minimum use of pesticide in producing soybeans". Regarding attributes of organic soybeans used to make soymilk, "health benefit", "low risk from food borne illness" and "minimum chemical use" mattered most to Chinese respondents. Accordingly, it can be concluded that organic food products were perceived to be safer and healthier by urban Chinese consumers. Strong preferences towards food-safety related attributes of soymilk suggested that urban Chinese consumers' increasing awareness on food safety and rising demand for safer food. In addition, "price" was ranked the lowest in terms of importance, suggesting a potential market for higher priced soymilk or soybeans with attributes valued by consumers.

The study suggested that such products could be organic soymilk or soybeans. It is expected that growing concerns of food safety issues may drive more consumers to purchase organic alternatives even though their prices are higher. According to a series of studies conducted in China, India, and six Latin American countries by International Fund for Agricultural Development, farmers in low income countries who switched to organic agriculture achieved higher earnings and an improved standard of living (Yang, Jewison and Greene 2006). Thus, the expanding organic market could possibly generate more entrepreneurs in developing more profitable ways of farming in China. However, the relatively higher willingness to pay for Chinese certified non-GMO soybeans over the certified organic soybeans

indicates that Chinese government could enforce the non-GMO label under the monitor of Chinese certification agencies in order to improve the financial situations of current domestic soybean producers.

6.2.2.2 *Different Attitudes towards Production Origins*

The model estimation results indicated that consumers in urban areas in China appreciated the labels of production origins and valued soymilk products differently by the origin of soybeans. Relative to no claim on production origin, respondents valued soymilk from soybeans grown in China and imported from the U.S. Average willingness to pays for soymilk produce made from domestic soybeans and U.S. imported were statistically significant at 10% and were 0.48 yuan and 0.85 yuan, respectively. The results also indicated strong heterogeneity in preferences among respondents in different cities and retail outlets towards soybean origins. For example, respondents in Shanghai and Beijing on average gave lower values for soybeans imported from the U.S., relative to respondents in Guangzhou. In addition, retail types in Shanghai were proven to be an important factor affecting consumers' purchasing behaviors.

It was of particular interest that the coefficient on the U.S. origin was greater than the coefficient on China origin. The concerns over food safety may have held the Chinese consumers back from trusting food products made domestically. Respondents regarded domestically grown organic soybeans as being inferior to imported ones in terms of food safety related attributes such as "safety from risk of toxic pesticide residuals" and "environmental impact" (Figure 5-21).

At the same time, respondents showed a clear preference for quality of soybeans produced from the main production regions in China. About three quarters of respondents regarded soybeans from main production regions in China as having high or somewhat high quality, while only roughly one third regarded soybeans from any province in China and U.S. as having high or somewhat high quality. These perceptions were consistent with levels of trust placed on certified organic soybeans from different origins.

In recent years, local governments have encouraged farmers in northeast China to apply for geographic indications in order to better compete with increasing imports of GM soybeans. The study results supported the effectiveness of such strategy. However, higher scores of importance respondents gave to "certifying agencies" relative to "origin of ingredients", when purchasing organic soymilk, suggest that types and nationalities of certifying agencies may have more impact than production origins on influencing urban Chinese people's purchasing behaviors.

6.2.2.3 *Certified Organic Soymilk Ingredients Differentiated by Types of Certification Agencies*

Chinese respondents held distinct valuations for soymilk products with organic and non-GMO soymilk ingredients certified by different types of certifying agencies. Among organic soymilk, the WTP was the largest (1.141 yuan) for the ones certified by U.S certifying agencies and the least (0.483 yuan) for those certified by China agencies.

Cities and retail types interactively influenced respondents' valuations on production practices and certification agencies. For example, respondents in Beijing placed higher value on organic soymilk certified by U.S. and EU agencies. The results also suggested that respondents shopping in China supermarkets in Shanghai were more likely to purchase organic products certified by all three types of certification agencies relative to respondents in Guangzhou. Also, 46% of the respondents checked this kind of labeling information when purchasing food products.

Results are consistent with consumers in China considering certification as a way to ensure the safety of food. Hence, it is possible for producers in China to take advantage of the certification system to obtain better prices for their products. Based on the survey conducted by the EU-China Trade project (2008), farmers pointed out that the certification agencies play a key role in providing information about proper production practices. If certification agencies train and educate Chinese farmers to follow more efficient and safer production practices, having more farm products certified could possibly improve domestic farming practices and enhance the overall food safety level

The results also suggested that urban Chinese consumers regarded foreign certifying agencies (EU and U.S. agencies) more highly than domestic ones in certifying organic products. The attention paid to certification agencies showed consumers' concerns over the integrity and qualifications of certification agencies. Such awareness indicates the need in improving the quality of services of domestic agencies. Increasing domestic demand for organic foods and consumers' preferences towards stricter certification could boost quality standards of domestic food goods sold in China.

6.2.3 Comparison of U.S. and China Consumer Preferences

6.2.3.1 ***Possibility of Further Expansion of Organic Soymilk Market***

The study revealed that both consumers in urban areas in China and in the U.S. perceived organic products as having higher quality and were willing to pay a premium for organic soymilk. Although the Chinese organic market is not as developed as in the U.S., Chinese consumers were aware of organic food products as much as U.S. consumers were in terms of consumption frequency. Such purchasing behavior is probably due to high concerns over food safety in the conventional food sector in China.

In both countries, the consumption of organic soymilk was driven mainly by perceived health benefits and food safety-related attributes such as "low risk of food-borne illness" and "minimum use of preservatives". Comparing the scores given to various attributes of soymilk in terms of importance, Chinese respondents exhibited higher valuations towards attributes relating to food safety (e.g., "low risk of food-borne illness", "minimum use of preservatives" "minimum use of pesticide") than U.S. respondents did. Prompted by frequent food safety incidents in China, Chinese consumers are becoming more concerned with health benefits and food safety problems. They expect that organic food could address these issues.

The preferences over organic soymilk in both countries suggest that the organic soymilk market in both countries could possibly expand in the future. However, strategies to expand the markets should be different in these two countries. Improving tastes and enforcing the production origin labeling are possibly the most effective ways in the U.S. Focusing on certification and proper production origin labeling, on the hand, might boost the organic soymilk market in urban China.

6.2.3.2 *Contrasting Attitudes towards Organic Food from Different Origins in U.S. and China*

U.S. respondents showed strong preferences for domestically grown soybean and were willing to pay an average $1.17 more for ingredients grown in the U.S. Most (85.75%) respondents in the U.S. perceived that the soybeans grown within U.S. had somewhat high or high quality, while only 10.12% regarded the organic soybeans imported from China as being of somewhat high or high quality. Also, U.S. respondents viewed the organic soybeans grown domestically to be very superior to imports in terms of attributes of organic soymilk considered in the study, especially the ones relating to food safety concerns.

Respondents in China, on the other hand, also valued the production origin information. However, Chinese consumers did not reveal preferences towards domestically grown organic soybeans over imports. Organic soybeans grown in the U.S. and in China were both preferred by Chinese consumers, relative to no information on the production origin. Preferences were consistent with their perceptions of the quality of organic ingredients. Similar proportion of respondents(about one in three) considered soybeans from any province in China or U.S. soybeans having somewhat high or high quality. Also, only about a third viewed that organic soybeans produced in China were superior in terms of "safety from risk of toxic pesticide residuals" and "environmental impact". In addition, Chinese respondents held high regards for U.S. organic certifying agencies. They were, on average, willing to pay 1.141 yuan more for U.S. certified organic soymilk ingredients relative to "no claim", compared to 0.483 yuan for Chinese certified ones.

6.2.3.3 *Attitudes towards GMO Soybeans*

Consumers in both the U.S. and urban China were willing to pay a premium for non-GMO soymilk, which indirectly suggest that they perceived the GM attribute to be inferior. Although placing non-GMO labels on food products are currently voluntary in both countries, our results indicate the market value of such labeling practice and the possibility in promoting such attribute through a national program such as the National Organic Program in the U.S. Chinese consumers in urban areas also differentiated non-GM soybeans by certification agencies. They were willing to pay 0.457 yuan more for "EU certified non-GMO" food ingredients relative to "no label". Yet, the willingness to pay for "U.S. certified non-GMO" food ingredients was not significantly different from zero, probably reflecting their knowledge about the fact that the majority of U.S. soybeans are GM.

6.2.3.4 ***Implications for the Trade Pattern of Soybeans between U.S. and China***

Consumer preferences towards various attributes of conventional and organic soymilk in the U.S. and in China could have significant impacts on future trade patterns of soybeans between these two countries. China has been reported to be one of the largest exporters of organic soybeans to the U.S. market (Cornucopia Institute 2009). The current domestic market for organic products in China is very limited. However, with income growth and an increasing desire for safer food, the expansion of organic soymilk market in China could be fast. The competition for organic soybeans between domestic soymilk manufacturers and U.S. soymilk manufacturers is expected to become intensified. As a result, costs to import soybeans from China may increase, and thus organic soybean exports from China to the U.S will be reduced. U.S. soymilk manufacturers may seek organic soybeans from other countries.

Organic soybean trade between the two countries would also be influenced by consumers' perceptions and preferences towards countries of origin of organic soybeans. Contrasting perceptions and preferences towards origins of organic ingredients were found between U.S. and Chinese respondents. U.S. consumers perceived the quality of imported organic ingredients from China to be considerably lower than domestic ones, and were willing to pay significantly more for the U.S. grown organic ingredients. If origin labels were required for ingredients, U.S. soy food producers may turn to encourage expansion of domestic sources and imports of organic soybeans may be reduced.

On the other hand, consumers in China highly valued organic soybeans certified by U.S. agencies, which suggest a potential business opportunity for U.S. organic certification service in China along with growing needs in China's organic market. However, Chinese respondents clearly did not think highly of U.S certification agencies for non-GMO products. Chinese consumers seem aware of the GM nature of U.S. soybeans and resist their imports. Also, due to the strong interests consumers have in buying non-GM soybeans, the products produced with GM soybeans will possibly be rejected by consumers if the GM labeling policy is strictly enforced. Consumers' perceptions on non-GM food product could affect U.S. exports of conventional soybeans to China. On January 5, 2002, import regulations regarding bio-safety and management of transgenic products were issued by the Chinese Ministry of Agriculture. All GM animals and plants entering China for sale, production, processing or research were required to be labeled to enter China with safety certification. If agricultural GMO to be imported are not labeled as required, the goods cannot enter the territory of China until being relabeled (Gale et al. 2002). However, it took a long time to implement such act. Only recently, the Chinese government showed tougher governance over the imported GM food products and required customs to strictly inspect labeling of imported food products. Currently, the U.S. is the largest soybean exporter to China. As a large percentage of U.S. soybeans are trans-genetic, it is likely that the labeling policy of GM ingredients will influence soybean exports from U.S. to China negatively.

6.3 Limitations

There are several limitations associated with this study. One limitation is derived from the hypothetical nature of choice experiments. In the consumer surveys, respondents in the U.S. and China were provided with detailed explanation regarding each attribute in the choice experiments. For example, definition of "organic" was presented in both surveys before respondents started to answer the choice tasks. Such information could clear possible misunderstanding of attributes and allow for correct elicitation of consumer preferences. However, such setting would be different from what respondents face in stores. Providing such information would possibly lead the people who normally would not care too much about this attribute to overstate their willingness to pay. It would be helpful if another survey without definition to be conducted as a comparison group to find the impacts of the information. However, the budget constraint restrained such action. The limitation is possibly more prominent in the Chinese case because of relatively less marketing and labeling information available in the domestic market. There are many Chinese shoppers in farmers' markets where products have no labeling or packaging at all. Thus, respondents may give much more rational answers based on the information provided, which could possibly diverge from their real purchasing behaviors.

Another limitation stems from the enumerated survey method used for the Chinese study, which put a constraint on the geographic locations of the respondents. Although the cities were carefully selected and different types of retail outlets were covered, representativeness of the sample might still have been influenced. For example, the education level of the sample was higher than the national average level. Such disparity may make it hard to extend the survey results to the national level. In addition, the enumerated survey method put addition requirements on the length of the survey. In order to reduce the respondent fatigue, attributes of "certification agencies" and "production practice" were combined in choice sets to reduce the number of choice tasks faced by each respondent. Such design makes it difficult to distinguish the effects of production practices and certification agencies. Moreover, the presence of an interviewer can cause bias in responses, although measurements were taken to minimize the impacts of interviewers in the interview survey. For example, when asking about comparative assessments on products from different countries of origin, respondents might have felt uncomfortable to share their real thoughts in front of interviewers because of the social pressure on such questions.

Yet another limitation is the lack of information on the soymilk market. As the soymilk market in U.S. is emerging, there are not many studies available on soymilk. As a result, the Mintel report on soy food and products were used as an only reference to compare to this study's findings. It is hard to make detailed implications to the industry based on limited information of this niche market. In China, the information on soymilk, especially on ready-made fresh

soymilk industry, is also unavailable probably because this product is too common in people's life. Hence, the China survey was designed based on informal observation and on limited market samples in the three surveyed cities.

Moreover, for comparison purpose, most parts of the China survey were designed to be identical to the U.S. survey. Therefore, some other issues in China's soymilk market that could influence respondent's soymilk consumption might have been left out from the study. For example, as free markets remain common and popular places for Chinese people to do daily grocery shopping, locally produced fresh produce, which are cheaper, may be more accessible to and thus preferred by Chinese consumers. Therefore, the "locality" attribute could be very significant to Chinese soymilk consumers who make soymilk from fresh soybeans purchased at free markets. However, such issue matters little to U.S. consumers, and thus such attribute was not considered in the study.

6.4 Conclusion

This thesis studied consumer preferences towards soymilk products, which have received limited attention in the past literature. The study also contributed to the understanding of consumers in low-income countries in terms of their perceptions of organic products, which is lacking in the current literature. Quantitative analyses were conducted to access consumers' valuations of processed organic soymilk, focusing on origins of soybeans. Recommendations based on these analyses could be valuable to market players of processed organic products in the U.S. and China. Perceptions and preferences of consumers in these two countries were compared to predict future trade patterns of organic and conventional soybeans between U.S. and China. Such implication is significant because both countries are important players in the global soybean and organic markets. Furthermore, the study addressed two sets of consumers with diverging food safety concerns and in organic markets at different maturity, providing a reference to both low and high income countries in promoting organic foods. Future research could focus on how food policies and market demand influence production and procurement decisions of producers and processors of organic foods in the U.S. and China.

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Appendix A U.S. Survey

SURVEY ON ORGANIC SOYMILK

Opening Instructions

Thank you for agreeing to participate in our survey. The survey is being conducted as part of the project, "The Impacts of Imports and Consolidation on the U.S. Organic Food System", which is funded by the National Research Initiative of the U.S. Department of Agriculture. You may have noticed that increasingly more food products are labeled with information on how they have been produced and handled. This survey is designed to better understand what aspects of soymilk products are important to shoppers. This survey will take you about 15 minutes to finish.

As you start the survey, please note that there is no option to go back to previous pages.

Your participation is strictly voluntary, and your response to this survey will be kept completely anonymous. If you have questions about the rights of research subjects or about the manner in which the study is conducted, please contact Rick Scheidt, Chair, Committee on Research Involving Human Subjects, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.

Sincerely,

Hikaru Hanawa Peterson, Associate Professor
Xianghong Li, Research Assistant Professor
Yue Zheng, Masters Candidate
Department of Agricultural Economics
Kansas State University

Question 1 ***** required *****
Please enter your user ID (survey code) here:

Question 2 ***** required *****
How much of your household's grocery shopping do you personally do?

All or most of it
About half of it
Less than half of it

Question 3 ***** required *****
How often did you or your household shop for soymilk during the past 12 months?

Almost never
Once every two - three months

Once a month
A few times per month
Once a week
More than once a week

PART A. SHOPPING BEHAVIOR & PERCEPTIONS

Question 4 ***** required *****

Where did you generally shop for **soymilk** during the past 12 months? Please identify one retail outlet as the "Primary Source" (the retail outlet where you most frequently buy soymilk) and identify all the remaining retail outlets where you shop for soymilk as the "Secondary" or "Seasonal" sources. If you never shop for soymilk at a particular store category, choose "Never".

1 - Primary Source | 2 Secondary Source - | 3 - Seasonal Source |4 - Never

	1	2	3	4
Supermarkets (e.g., Kroger, Supervalue, Safeway)				
Wal-Mart				
Mass merchandisers other than Wal-mart(e.g., Kmart or Target)				
Drug stores (e.g., CVS, Walgreens, Rite Aid)				
Health/natural supermarkets (e.g., Whole Foods Market, Trader Joe's Company, GNC)				
Club stores (e.g., Costco or Sam's Club)				
Convenience stores (e.g.,7 Eleven)				
Locally owned grocery stores or food cooperatives				
Other				

Question 5 ***** required *****

When you are purchasing food items including **soymilk**, how **often** do you check the **label** for each of the following pieces of information? (Choose one for each row)

1 - Almost never | 2 - Less than half of the time

3 - About half of the time | 4 - More than half of the time | 5 - Almost always

	1	2	3	4	5
Brand					
Nutritional content (e.g., calories, sodium, sugar)					
Claims regarding health benefits (e.g., reduce heart disease)					
Claims regarding production or processing processes (e.g., certified organic, use no GM soybeans, limited use of pesticide in farm production or preservatives in processing)					
Agencies certifying the claims (e.g., organic certifying agencies, Non-GM certifying agencies, other NGO)					
Origins of the ingredients					

Question 6 ** *required* **
On a scale of 1 to 5, how much **trust** do you place on the following **organizations** which provide the information on the label?

1 – Complete distrust | 2 – somewhat distrust | 3 - Indifferent |4 - Somewhat trust | 5 - Complete trust

	1	2	3	4	5
U.S. Department of Agriculture or other U.S. governmental agencies					
U.S. major manufacturing or processing companies					
Local manufacturing or processing companies					
Foreign manufacturing or processing companies					
Food retail stores					
Farmers and their organizations in the U.S.					
Farmers and their organizations in foreign countries					
Third-party organizations in the U.S. (e.g., health organizations, research institutes)					
Foreign certifying agencies accredited by the U.S. government (e.g., Quality System Assessment, National Organic Program)					

Question 7 ** *required* **
How important to you are the following **attributes** of **soymilk**?

1 - Not at all important | 2 – Not very important | 3 – Indifferent| 4-Very important | 5 - Extremely important

	1	2	3	4	5
Price					
Brand					
Taste					
Flavor (e.g., chocolate or vanilla)					
Certified organic					
Added sugar or sweetener					
Lactose or casein free					
All natural					

Question 8 ** *required* **
How important to you are the following **attributes** of **soymilk**? **(Continued)**

1 - Not at all important | 2 – Not very important | 3 –Indifferent | 4- Very important | 5 - Extremely important|

	1	2	3	4	5
Health claims (e.g., high soy protein level, reduces cholesterol or the risk of heart disease)					
Minimum use of preservatives					
Low risk of food-borne illness					
Claims regarding the production and processing of ingredients (e.g., minimum use of pesticides in producing soybeans, use of non-genetically modified soybeans)					
Origins of soybeans (e.g., harvested locally or in the U.S. or overseas)					
Types of retail outlets where soymilk is sold					
Locations of manufacturing (e.g., local or in the U.S. or overseas)					

Questions 9 through 12 deal with different brands of soymilk.
National brands are available and are usually advertised and owned by the manufacturer (e.g., Silk by Dean Foods Company, 8th Continent by Stremicks Heritage Foods). National branded soymilk accounts for almost 80% of the market share in North America. **Store brands** refer to products that are typically those manufactured or provided by one company for offer under the brand of another company, often a wholesaler or retailer (e.g., Naturally Preferred by Kroger, Great Value available at Wal-Mart).

Question 9 ***** required *****
Please indicate the **brands** of **soymilk** you bought during the past 12 months (Choose the closest description for each row).

Example of soymilk under a national brand

Example of soymilk under a store brand

1 - My first choice | 2 - My second choice | 3 - My third choice s

4 -Bought regularly along with other brand | 5 - Tried occasionally | 6- Did not buy

	1	2	3	4	5	6
Silk						
8th Continent						
Soy Dream						
Organic Valley						
A store brand of mass merchandisers (e.g., Great Value by Wal-Mart)						
A store brand of supermarkets (e.g.,: Naturally Preferred by Kroger)						
A store brand of health/natural food stores (e.g., 365 Organic by Whole Foods)						
Other						

Question 10 ***** required *****

How important to you are the following **aspects of brands** when choosing a **soymilk** product? (Choose one for each row. If you have no opinion, please choose"3" equal to "Indifferent")

1 - Not at all important | 2 – Not very important 3 – Indifferent |4 - Very important | 5 - Extremely important

	1	2	3	4	5	6
Price						
Product						
Transparency in disclosing where their ingredients are sourced						
Ownership of the brand (e.g., family-owned business, local cooperatives, private companies)						
Types of the brands (e.g., store brand, national brand)						
Market share of the company that owns the brand						

Question 11 ***** required *****

Compared to a ***national brand*** **soymilk** (e.g. Silk), how do you perceive a ***store brand*** **soymilk** (e.g., Naturally Preferred or Great Value) regarding the following attributes? (Your answer does not need to be based on your experience with the products of these brands)

1 - Highly inferior | 2 - Slightly inferior | 3 – Equivalent |4 - Slightly superior | 5 - Highly superior

	1	**2**	**3**	**4**	**5**
Taste or flavor					
Safety from risk of food-borne illnesses					
Potential positive impacts on health					
Level of accuracy in labeling the product information					

Question 12 ***** required *****

Compared to a **store brand soymilk** of ***natural food stores*** (e.g. Whole Foods and Trader Joe's), how do you perceive a **store brand soymilk** of ***general retail outlets*** (e.g., Kroger and Wal-Mart) regarding the following attributes? (Your answer does not need to be based on your experience with the products of these brands)

1 - Highly inferior | 2 - Slightly inferior | 3 – Equivalent |4 - Slightly superior | 5 - Highly superior

	1	**2**	**3**	**4**	**5**
Taste					
Safety from risk of food-borne illnesses					
Potential positive impacts on health					
Level of accuracy in labeling the product information					

Questions 13 to 14 pertain to organic soymilk.

Organic food products are made in a way that complies with organic standards set by national governments and international organizations. Organic food products are produced **without** using most conventional **pesticides**, **fertilizers** made with synthetic ingredients or sewage sludge, **bioengineering**, or ionizing radiation.

Non-GMO food products mean that the food ingredients contain **no genetically modified organisms**.

Question 13 ***** required *****

How **often** did you shop for ***organic*** **soymilk** during the past 12 months?

1 –Almost never | 2- Once every two - three months |3 - Once a month | 4 - Two - three times a month | 5 -Once a week | 6 – More than once a week

	1	2	3	4	5	6
Frequency						

Question 14 ***** required *****

How important to you are the following **attributes** of ***organic*** **soymilk**? (Choose one from each row. Your choice does not necessarily depend on your experience of consuming organic soymilk. If you have no opinion, please choose"3" equal to "Indifferent")

1-Not important | 2 – Not very important |3 –Indifferent| 4 - Very important | 5 - Extremely important

	1	2	3	4	5
Brand					
Types of retail outlets where organic soymilk is sold					
Taste or flavor					
Use of non-genetically modified soybeans					
Minimal chemical use in production					
Positive environmental impacts					
Promotion of social justice (e.g., fair treatment of farm labor)					
Health benefits					
low risk from food-borne illness					
Agencies certifying the claims (e.g., USDA, non-governmental					

organizations, foreign certifying agencies)					
Where the product was manufactured(e.g., locally, in the U.S., overseas)					
Origin of ingredients (e.g., harvested in your state or other states or overseas)					

PART B. CHOICE TASKS

In the following, please assume a situation where you're shopping for soymilk for you or someone in your household, sold in half gallon cartons (64 ounces, 1.89 liters) in the refrigerated section of a store where you normally shop for groceries.

Suppose you find products that are offered under the following **types of brands**:

National brand is marketed throughout the U.S. and is usually advertised and owned by the manufacturer (e.g., brand owned by Dean Foods Company).

Specialized store brand refers to the store brand products manufactured or provided by the retailers that specialize in organic or natural food products (e.g., store brand owned by Whole Foods).

General store brand is known as the store brand products manufactured or provided by the retailers other than natural food stores (e.g., store brand owned by Wal-Mart or Target).

Further, you find that the product can be labeled for **how it was produced**. The labels you see include:

Non-GMOO: the ingredients contain no genetically modified organisms.

Certified Organic: the organic label signifies that the ingredients were produced, processed, and packaged according to the National Organic Standards regulated by the U.S. Department of Agriculture.

No claim: there is no information relating to the production process on the product packaging.

Lastly, you note that some of the products indicate **where the ingredients originate**. Specifically,

Imported: the ingredients for the product were sourced from overseas.

U.S.: the ingredients for the product were sourced from U.S. farms.

No label: there is no information relating to the origins of the ingredients on the product packaging.

In questions 15 through 20 below, you are asked to choose from 3 soymilk products that vary in price, brand, production process attributes, and origins of ingredients. Besides these attributes, the soymilk products are identical (e.g., the same flavor and expiration date). You may also choose to buy none of the 3 products.

It is important that you make your selections as you would if you were facing these choices in an actual shopping experience.

Question 15 ** *required* **

Please choose from the following 3 soymilk products:

	A	B	C
			
Price	$3.38	$3.08	$2.78
Brand	Specialized Store brand	National brand	General Store brand
Production	Non-GMO	Certified Organic	No claim
Origin of soybeans	No Label	Imported	US

	Product A
	Product B
	Product C
	I choose not to purchase any of these 3 products

Question 16 ** *required* **

Please choose from the following 3 soymilk products:

	A	B	C
			
Price	$2.78	$3.08	$3.38
Brand	Specialized store brand	National brand	General store brand
Production	Non-GMO	No Claim	Certified Organic
Origin of soybeans	Imported	US	No Label

	Product A
	Product B

	Product C
	I choose not to purchase any of these 3 products

Question 17 ***** required *****

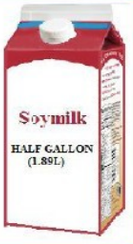
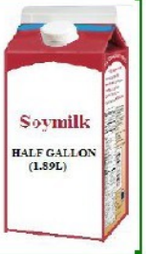
Please choose from the following 3 soymilk products:

	A	B	C
			
Price	$2.78	$3.08	$3.38
Brand	National brand	Specialized store brand	General store brand
Production	No claim	Certified Organic	Non-GMO
Origin of soybeans	No Label	Imported	US

	Product A
	Product B
	Product C
	I choose not to purchase any of these 3 products

Question 18 ***** required *****

Please choose from the following 3 soymilk products:

	A	B	C
			
Price	$2.78	$3.08	$3.38
Brand	National brand	General store brand	Specialized store brand
Production	No claim	Certified Organic	Non-GMO
Origin of soybeans	Imported	No Label	US

	Product A
	Product B
	Product C
	I choose not to purchase any of these 3 products

Question 19 ***** required *****

Please choose from the following 3 soymilk products:

	A	B	C
			
Price	$3.08	$3.38	$2.78
Brand	National brand	Specialized store brand	General store brand
Production	Certified Organic	Non-GMO	No claim
Origin of soybeans	No Label	US	Imported

	Product A
	Product B
	Product C
	I choose not to purchase any of these 3 products

Question 20 ** *required* **

Please choose from the following 3 soymilk products:

	A	B	C
			
Price	$3.38	$2.78	$3.08
Brand	General store brand	Specialized store brand	National brand
Production	No Claim	Certified Organic	Non-GMO
Origin of soybeans	Imported	No label	US

	Product A
	Product B
	Product C
	I choose not to purchase any of these 3 products

The main ingredients of making soymilk are soybeans. Please answer questions 21 through 25 based on your preference or perceptions of soybeans.

Question 21 ** *required* **

What are your perceptions of the **overall quality** of ***organic*** **soybeans** sourced from following countries? (Choose one from each row. Your answer does not need to be based on your experience with the products from these locations.)

1 - Poor | 2 - Somewhat poor | 3 - Average | 4 - Somewhat high |5 - High | 6 - I don't know

	1	2	3	4	5	6
Grown within U.S.						
Imported from India						
Imported from Canada						
Imported from China						

Imported from Argentina						

Question 22 ** *required* **
How much **trust** do you place in the **accuracy of the label** of soybeans that sourced from following countries are "**Certified Organic**"? (Choose one from each row. If you have no opinion, choose "3" equal to "Indifferent".)

1 - Complete distrust | 2 – Somewhat distrust | 3 - Indifferent |4 - Somewhat trust | 5 - Complete trust

	1	2	3	4	5
Grown within U.S.					
Imported from India					
Imported from Canada					
Imported from China					
Imported from Argentina					

Question 23 ** *required* **
How much **trust** do you place in the **accuracy of the label** of soybeans that sourced from following countries are "**Non-GMO**"(no genetically modified organism)? (Choose one from each row.)

1 - Complete distrust | 2 – Somewhat distrust | 3 – Indifferent |4 - Somewhat trust | 5 - Complete trust

	1	2	3	4	5
Grown within U.S.					
Imported from China					

Question 24 ** *required* **
Compared to **imported**, ***organic*** **soybeans**, how do you perceive **U.S.-grown, *organic* soybeans** in terms of the following attributes? (Choose one from each row.)

1 - Definitely inferior | 2 - Inferior | 3 - About the same |4 - Superior | 5 - Definitely superior

	1	2	3	4	5
Taste					
Environmental impact					
Potential positive impacts on health					
Safety from risk of food-borne illness					
Safety from risk of consuming toxic chemical residues					

Question 25 ** *required* **

Compared to **imported, *organic* soybeans**, how do you perceive **U.S.-grown, *non-GMO* soybeans** in terms of the following attributes? (Choose one from each row.)

1 - Definitely inferior | 2 - Inferior | 3 - About the same |4 - Superior | 5 - Definitely superior

	1	2	3	4	5
Taste					
Environmental impact					
Potential positive impacts on health					
Safety from risk of food-borne illness					
Safety from risk of consuming toxic chemical residues					

PART C. DEMOGRAPHIC INFORMATION

Question 32 ** *required* **

What is your gender?

	Male
	Female

Question 33 ** *required* **

What is your age?

	Under 24
	25-34
	35-44
	45-54
	55-64
	65 and older

Question 34 ** *required* **

Which best describes your race? (Choose all that apply)

	White
	Black/ African American
	Hispanic
	American Indian/Alaska Native
	Asian
	Native Hawaiian/ Pacific Islander
	Other

Question 35 ***** required *****
How many children under 18 live in your household?

	Zero
	One
	Two
	Three
	Four
	Five
	Six
	Seven
	Eight
	Nine
	Ten or more

Question 36 ***** required *****
How many people live in your household in total?

	One
	Two
	Three
	Four
	Five
	Six
	Seven
	Eight
	Nine
	Ten or more

Question 37 ** *required* **

What is your 5-digit zip code?

Question 38 ** *required* **

Which of the following best describes the county of your residence?

	Counties in metro areas of 1 million population or more
	Counties in metro areas of 250,000 to 1 million population
	Counties in metro areas of fewer than 250,000 populations
	Urban population of 20,000 or more, adjacent to a metro area
	Urban population of 20,000 or more, not adjacent to a metro area
	Urban population of 2,500 to 19,999, adjacent to a metro area
	Urban population of 2,500 to 19,999, not adjacent to a metro area
	Completely rural or less than 2,500 urban population, adjacent to a metro area
	Completely rural or less than 2,500 urban population, not adjacent to a metro area

Question 39 ** *required* **

What is the highest education level that you have completed? (Choose one)

	Elementary school (through 5th grade)
	Middle school (6th through 8th grade)
	High school or equivalent (9th through 12th grade)
	Some College or Associate Degree
	Bachelor's Degree
	Graduate school

Question 40 ** *required* **

What is your annual household income before tax? (Choose one)

	Less than $10,000
	$10,000 - $24,999
	$25,000 - $49,999
	$50,000 - $74,999
	$75,000 - $99,999
	$100,000 -250,000
	More than $250, 000

Question 41

Any comments, opinions, or questions about ***organic* soymilk** production, marketing, or consumption? Use the space below.

Closing Message

Congratulations!

You have completed this research study. Your e-Rewards account will be credited partial or full credit amount based on the level of completion within 7-10 business days. Thank you for your time and your opinions!

Appendix B China survey

定量研究问卷－版本 2

DMR-2233

研究设计要求:

城市【单选】

上海	北京	广州
1	2	3

配额要求：

性别【单选】

男性	女性
1	2

年龄【单选】

18-24	25-34	35-44	45-60	61-80
1	2	3	4	5

家庭月收入【单选】

5000 以下	5000-8999	9000 以上
1	2	3

数据质量控制：

访问时间:_____年_____月___日_____时_____分到_____时_____分

访问员姓名:____

访问检查	我郑重声明，并以人格担保，本问卷的访问完全按照培训的要求进行，访问的结果客观、真实。	
一审		督　导[签名]
二审		审核员[签名]
复核		复核员[签名]

编码[签名]	编码检查[签名]	第一录入[签名]	第二录入[签名]

被访者姓名		联系电话	
家庭住址			

介绍语：

小姐/先生，您好！我们是大正市场研究公司的访问员。现在我们正在进行一项关于食品方面的研究，想听听您的意见。耽搁您一点时间，问您几个简单的问题，可以吗？谢谢您的合作！

甄别问卷

S1	请问您是家里食品的主要采购者吗？		
		【代码】	**【跳转】**
	是的，大部分食品都是我负责购买…	01	
	是的，一半以上的食品都是我负责购买…	02	
	不是，一半以下的食品是我负责购买…	03	**终止**
	不是，一年只偶尔买几次…	04	

S2	请问您在过去一年内经常喝豆浆吗?		
		【代码】	**【跳转】**
	是…	1	
	否…	2	**终止**

S3	记录被访者的性别		
		【代码】	**【跳转】**
	男…	1	**检查配额**
	女…	2	

S4	请问您的实足年龄是多少?		
	记录实足年龄: _____岁	**【代码】**	**【跳转】**
	18 岁以下…	0	**终止**
	18-24 岁…	1	**检查配额**
	25-34 岁…	2	
	35-44 岁…	3	
	45-60 岁…	4	
	61-80 岁…	5	
	80 岁以上…	6	**终止**
	否…	2	

S7	请问您的家庭月总收入(包括工资、奖金、津贴、投资收益等)是多少？		
		【代码】	**【跳转】**
	1000 元以下…	01	**检查配额**
	1000-1999 元…	02	

2000-2999 元…	03	
3000-3999 元…	04	
4000-4999 元…	05	
5000-5999 元…	06	
6000-6999 元…	07	
7000-7999 元…	08	
8000-8999 元…	09	
9000-9999 元…	10	
10000-10999 元…	11	
11000-11999 元…	12	
12000-12999 元…	13	
13000-17000 元…	14	
17000 元以上	15	

这份问卷是**为了了解我国消费者对有机产品的理解与购买习惯。我们希望您能配合我们完成这份问卷。这份问卷大概要占用您15分钟的时间。谢谢！**

有机食品是指来自于有机农业生产体系，产地环境符合相关标准， 建立了严格的质量管理体系，生产过程中**不使用化学合成的肥料、农药、生长调节剂和家畜饲料添加剂，不采用基因工程技术及其产物，** 并且经过合法机构依据有机食品相关标准认证获得认证证书供人们食用的一类食品。例如在日常生活中俗称的“土鸡蛋”（指在农民小规模散养的，吃天然食物,并没有注射过抗生素或激素的土鸡所产的鸡蛋），就是有机农产品的一个比较贴切的代表。

第一部分：食品购买选择

Q1

当您在购买食品时，请问您***多久***查看一次食品的以下各项**商标信息**？请用 1-4 分进行符合程度打分。 1 分表示频率最低，几乎从不查看（小于 30%的时间要查看）；2 分表示偶尔查看（30%-50%的时间要查看）；3 分表示经常查看（50%-80%的时间要查看）； 4 分表示频率最高，几乎每次都要查看。

	几乎从不查看	偶尔查看	经常查看	每次都查看
1.品牌	1	2	3	4
2.食品原材料的产地	1	2	3	4
3.食品原材料生产与加工过程（比如：是否是有机食品，非转基因食品，是否无农药残留，无防腐剂，食品加工地等）	1	2	3	4

	4.食品认证机构（比如：有机认证机构，非转基因食品认证机构等）	1	2	3	4

Q2	请问您对以下提供食品商标信息的**组织**有多信任？（1 分为信任程度最低，5 为信任程度最高来划分等级,请对**每一个**组织进行信任度评级。）					
		一点都不信任	比较不信任	中立，没有意见	有点信任	非常信任
	1.省级政府的相关机构	1	2	3	4	5
	2.国家级相关机构	1	2	3	4	5
	3.中国的食品制造加工企业	1	2	3	4	5
	4.外国的食品制造加工企业	1	2	3	4	5
	5.中国食品零售商（比如：华联超市等）	1	2	3	4	5
	6.外国食品零售商（比如：沃尔玛超市等）	1	2	3	4	5
	7.中国农民及农民机构代表	1	2	3	4	5
	8.外国农民及农民机构代表	1	2	3	4	5
	9.中国的食品认证相关机构	1	2	3	4	5
	10.外国的食品认证相关机构	1	2	3	4	5

Q3	请问您在最近半年内**多久**购买一次**有机**食品？	
		【代码】
	几乎从不购买…	1
	两三个月购买一次…	2
	大概一个月购买一次…	2
	一个月购买两到三次…	2
	至少一周购买一次…	5

Q4	请问您是通过**何种方式**购买**豆浆**的？				
		从不使用的方式	偶尔为之	第二主要方式	主要购买方式
	1.使用豆浆机自己做豆浆喝	1	22	3	4
	2.从自由市场（或农贸市场）买商贩做好的豆浆喝	1	2	3	4
	3.从超市买超市自制的豆浆喝	1	2	3	4
	4.从餐饮店或超市购买盒装（或袋装）豆浆喝	1	2	3	4
	5.其他方式	1	2	3	4

5	请问如果您要购买**豆浆产品**时，您觉得以下**各产品属性**有多重要？(以 1 为重要程度最低，5 为重要程度最高来划分等级，请对每一种属性的**重要程度**进行评级。您不一定要有购买有机豆浆的经验)					
		很不重要	不是很重要	说不上重要不重要	比较重要	非常重要
	1.价格	1	2	3	4	5
	2.品牌	1	2	3	4	5
	3.味道	1	2	3	4	5
	4.无添加食品防腐剂	1	2	3	4	5
	5.食品安全系数高(得食源性疾病概率低)	1	2	3	4	5
	6.制造豆浆使用的大豆无农药残留	1	2	3	4	5
	7.制造豆浆使用的大豆是非转基因大豆	1	2	3	4	5
	8.制造豆浆使用的大豆是有机大豆	1	2	3	4	5
	9.大豆生产地（比如：是否是本地（省）生产，是否是大豆主要产地黑龙江省生产，是否是海外生产等)	1	2	3	4	5
	10.制造加工豆浆地域(比如：是否是本地（省）生产，是否是外省生产，是否是海外生产等)	1	2	3	4	5

	11.豆浆制造商的类型（比如：是超市，餐饮店，农贸市场商贩还是豆浆公司制造）	1	2	3	4	5

Q6	您认为制成有机豆浆的**有机大豆**的以下**属性**有多重要？（以 1 为重要程度最低，5 为重要程度最高来划分等级，请对每一种属性的**重要程度**进行评级。您不一定要有购买有机豆浆的经验）					
		很不重要	不是很重要	说不上重要不重要	比较重要	非常重要
	1.味道好	1	2	3	4	5
	2.是非转基因大豆	1	2	3	4	5
	3.生产中不使用农药	1	2	3	4	5
	4.有益于生态环境的保护	1	2	3	4	5
	5.有利于维护社会公平（指确保农业参与者能够得到公平回报，动物能被提供必要生存条件等）	1	2	3	4	5
	6.有益于身体健康	1	2	3	4	5
	7.安全系数高(得食源性疾病概率低)	1	2	3	4	5
	8.有机食品认证机构	1	2	3	4	5
	9.食品加工地（比如：是否是本省、外省企业或者是海外企业）	1	2	3	4	5
	10.产地（比如：是否是本地（省）生产，是否是大豆主要产地黑龙江省生产，是否从国外进口）	1	2	3	4	5

Q7	请问您对以下产地生产的**有机大豆**的**质量**印象如何？（以 1 为质量最差，5 为质量最好来划分等级，请对每一个大豆产地进行评级。您不一定要有购买过以下产地生产的有机大豆的经验，只需填写您对各个产地生产的有机大豆**印象**即可）					
		质量最差	质量比较差	质量一般	质量比较高	质量很高
	1.本省（生产）	1	2	3	4	5
	2.中国主要大豆产地（生产），例如东北黑龙江省	1	2	3	4	5
	3.中国境内任何产地（生产）	1	2	3	4	5
	4.巴西（进口）	1	2	3	4	5
	5.美国(进口)	1	2	3	4	5

8	请问您有多相信以下产地生产的大豆是 **“有机大豆”**？ （以 1 为信任程度最低，5 为信任程度最高来划分等级，请您对每一个大豆产地进行评级。您不一定要有购买过以下产地生产的有机大豆的经验，只需填写您对各个产地生产的有机大豆**印象**即可）					
		一点都不信任	比较不信任	中立，没有意见	有点信任	非常信任
	1.本省（生产）	1	2	3	4	5
	2.中国主要大豆产地（生产），例如东北黑龙江省	1	2	3	4	5
	3.中国境内任何产地（生产）	1	2	3	4	5
	4.巴西（进口）	1	2	3	4	5
	5.美国(进口)	1	2	3	4	5

9	请问您有多相信以下产地生产的大豆是**“非转基因大豆”**？（以 1 为信任程度最低，5 为信任程度最高来划分等级，请您对每一个大豆产地进行评级。您不一定要有购买过以下产地生产的有机大豆的经验，只需填写您对各个产地生产的有机大豆**印象**即可）					
		一点都不信任	比较不信任	中立，没有意见	有点信任	非常信任
	1.本省（生产）	1	2	3	4	5

	2. 中国主要大豆产地（生产），例如东北黑龙江省	1	2	3	4	5
	3. 中国境内任何产地（生产）	1	2	3	4	5
	4. 巴西（进口）	1	2	3	4	5
	5. 美国(进口)	1	2	3	4	5

第二部分：产品选择

现在请您假设您在商店购买**袋装豆浆产品**，产品规格是 **250 毫升**（相当于一个成人一顿早餐的消费量）。假设您要从三种豆浆产品中做出选择。这三种产品在大豆**产地，**大豆**属性**，产品的**认证机构**以及**价格方面各不相同**。

具体信息如下：

大豆**产地**：中国生产，美国生产，以及无产地标识

大豆**属性**：有机大豆，非转基因大豆，以及无生产方式认证（也就是说,生产方式没有指明,可能是非有机产品或者转基因产品）

认证机构：中国认证，美国认证以及欧洲认证

商品**价格**：0.9 元，0.8 元，0.7 元。

在回答以下六道问题时，请您在认真阅读了所提供的产品信息后，从三种豆浆产品中选择出您最愿意购买的产品，并在选中的选项前画“√”。

Q10. 请选择一种您最愿意购买的袋装豆浆产品（250ml,约 300 克）。

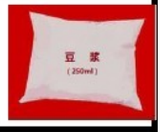
	选项 A	选项 B	选项 C
			
大豆生产方式	非转基因大豆	无生产方式认证	有机大豆
大豆产地	无产地标识	美国	中国
认证机构	中国机构认证		美国机构认证
豆浆价格（250ml 或 300 克）	0.8 元	0.7 元	0.9 元

A—— 1　　B—— 2　　C—— 3　　以上三种产品都不愿意购买—— 9

Q11. 请选择一种您最愿意购买的袋装豆浆产品（250ml,约 300 克）。

	选项 A	选项 B	选项 C
			
大豆生产方式	无生产方式认证	有机大豆	非转基因大豆
大豆产地	美国	无产地标识	中国
认证机构		欧洲机构认证	欧洲机构认证
豆浆价格（250ml 或 300 克）	0.8 元	0.9 元	0.7 元
A—— 1 B—— 2 C—— 3 以上三种产品都不愿意购买—— 9			

Q12. 请选择一种您最愿意购买的袋装豆浆产品（250ml,约 300 克）。

	选项 A	选项 B	选项 C
			
大豆生产方式	有机大豆	非转基因大豆	无生产方式认证
大豆产地	无产地标识	美国	中国
认证机构	中国机构认证	中国机构认证	
豆浆价格（250ml 或 300 克）	0.7 元	0.9 元	0.8 元
A—— 1 B—— 2 C—— 3 以上三种产品都不愿意购买—— 9			

Q13. 请选择一种您最愿意购买的袋装豆浆产品（250ml,约 300 克）。

	选项 A	选项 B	选项 C
			
大豆生产方式	有机大豆	非转基因大豆	有机大豆
大豆产地	无产地标识	中国	美国
认证机构	欧洲机构认证	美国机构认证	中国机构认证
豆浆价格（250ml 或 300 克）	0.8 元	0.9 元	0.7 元

A—— 1　　B—— 2　　C—— 3　　以上三种产品都不愿意购买—— 9

Q14. 请选择一种您最愿意购买的袋装豆浆产品（250ml,约 300 克）。

	选项 A	选项 B	选项 C
			
大豆生产方式	非转基因大豆	有机大豆	非转基因大豆
大豆产地	美国	中国	无产地标识
认证机构	美国机构认证	美国机构认证	中国机构认证
豆浆价格（250ml 或 300 克）	0.8 元	0.7 元	0.9 元

A—— 1　　B—— 2　　C—— 3　　以上三种产品都不愿意购买—— 9

Q15. 请选择一种您最愿意购买的袋装豆浆产品（250ml,约 300 克）。

	选项 A	选项 B	选项 C
			
大豆生产方式	有机大豆	有机大豆	非转基因大豆
大豆产地	无产地标识	中国	美国
认证机构	美国机构认证	欧洲机构认证	欧洲机构认证
豆浆价格（250ml 或 300 克）	0.7 元	0.8 元	0.9 元
A—— 1 B—— 2 C—— 3 以上三种产品都不愿意购买—— 9			

Q16	相比于***进口*的有机大豆**，您认为***中国生产*的有机大豆**在以下方面的优劣程度如何？（请对每一个方面都进行比较） **1 - 绝对次于进口大豆 | 2 - 较次于进口大豆 | 3 - 两者差不多 |4 - 较优于进口大豆 | 5 - 绝对优于进口大豆**					
		绝对次于进口大豆	较次于口大豆	两者差不多	较优于进口大豆	绝对优于进口大豆
	1. 口味	1	2	3	4	5
	2. 对于人体健康的积极影响	1	2	3	4	5
	3. 食用安全性	1	2	3	4	5
	4. 受农药化肥的污染程度	1	2	3	4	5
	5. 生产方式的环保效果	1	2	3	4	5

Q17	相比于***进口*的非转基因大豆**，您认为***中国生产*的非转基因大豆在**以下方面的优劣程度如何？（请对每一个方面都进行比较） **1 - 绝对次于进口大豆	2 - 较次于进口大豆	3 - 两者差不多 |4 - 较优于进口大豆	5 - 绝对优于进口大豆**					
		绝对次于进口大豆	较次于大豆	两者差不多	较优于进口大豆	绝对优于进口大豆
	1. 口味	1	2	3	4	5
	2. 对于人体健康的积极影响	1	2	3	4	5
	3. 食用安全性	1	2	3	4	5
	4. 受农药化肥的污染程度	1	2	3	4	5
	5. 生产方式的环保效果	1	2	3	4	5

第三部分：样本信息

请您务必根据您的自身情况真实作答。我们在此向您保证我们对您的所有的信息和答案将严格保密,并且问卷不会涉及任何暴露您身份信息的问题。

W1	您家里有年龄未满 18 岁的小孩吗？	
	有…	1
	没有…	2

W2	现在您家里常住人口有多少呢？	
	1 个…	1
	2 个…	2
	3 个…	3
	4 个…	4
	5 个…	5
	6 个…	6

	7 个…	7
	8 个…	8

W3	请问您所完成的最高学历是？	
	小学…	1
	初中…	2
	高中或与此相当学历…	3
	大专…	4
	大学本科…	5
	研究生…	6

非常感谢您的支持与配合。如若您有关于有机豆浆生产，市场营销和产品销售的意见与建议，请在此处告知我们，再次感谢！

SURVEY ON ORGANIC SOYMILK IN CHINA (translation)

PART 0: SCREEN QUESTION:

S1: How much of your household's grocery shopping do you personally do?

a. All or most of it
b. More than half of it
c. Less than half of it (exit)
g. Only a few times a year (exit)

S2: Did you regularly consume **soymilk** during the past year?

a. Yes (directing to the soymilk survey)
b. No (exit)

S3: Gender:

a. Male
b. Female

S4: What is your age?

a. Below 18
b. 18-24
c. 25-34
d. 35-44
e. 45-60
f. 61-80
g. Above 80

S5: **How much is** your estimated monthly household income before tax (RMB)?

a. Below 1000
b. 1000-1999
c. 2000-2999
d. 3000-3999
e. 4000-4999
f. 5000-5999
g. 6000-6999
h. 7000-7999
i. 8000-8999
j. 9000-9999
k. 10000-10999
l. 11000-11999
m. 12000-12999
n. 13000-17000
o. Above 17000

This questionnaire is to help our study of understanding Chinese consumers' perceptions and purchasing habits of organic products. We will appreciate your time and cooperation. This questionnaire should take about 15 minutes to accomplish. Thank you!

Organic food is the kind of food products with ingredients from organic agricultural production system, with producing environment abiding by certain standards. The quality management system is based on strict regulations. The production process does not use synthetic fertilizers, pesticides, growth regulators and livestock feed additives. Also the production and processing process does not allow using genetic engineering technology or the GM ingredients. Organic products must go through the inspections from certification agencies to get certified. For example, the so called "land egg" (referring to the eggs from small-scale farmers. The chickens were raised to eat natural food without being injected with antibiotics or hormones), is a proper example of organic agricultural product.

PART A. FOOD SHOPPING

Q1: When you purchase food products, how ***often*** do you check the **label** for each of the following pieces of information? (Ranking from 1 representing the lowest frequency to 5 representing the highest frequency, please circle one for each row)

1 - Almost never | 2 – Seldom(less than half of the time |3 – Usually (more than half of the time) | 4 - Almost always

	1	2	3	4
Brand				
Origins of the ingredients				
Claims regarding production or processing processes (e.g., certified organic, use no GMO, no pesticide in production, or no preservatives in processing, location of processing companies)				
Certifying agencies(e.g., organic certifying agencies, Non-GMO certifying agencies)				

Q2: How much trust do you place on the following **organizations** which provide the information on the label? (Ranking from 1 representing the lowest level of trust to 5 representing the highest level of trust, please circle one for each row)

1 – Complete distrust | 2 – somewhat distrust | 3 - Indifferent |4 - Somewhat trust | 5 - Complete trust

	1 1	2 2	3 3	4 4	5 5
Local(your provincial) government agencies					
China's national government agencies					
Manufacturing or processing companies in China					
Manufacturing or processing companies in foreign countries					
Food retail stores owned by companies in China(e.g., Hualian Supermarket)					
Food retail stores owned by foreign companies(e.g., Wal-mart)					
Farmers and their organizations in China					
Farmers and their organizations in foreign countries					
Chinese certifying agencies					
Foreign certifying agencies					

Q3: How **often** did you purchase ***organic*** **food products** during the last 6 months?

1 –Almost never 2| - Once every two - three months| |3 - Once a month |4 - Two - three times a month |5 - At least once a week

	1	2	3	4	5
Frequency					

Q4: How do you consume **soymilk? (**Choose one from each row)

1-never 2|-occasional 3|-secondary 4|-primary

	1	2	3	4	5
Make it by myself using soymilk makers					
Buy soymilk made by sellers in "free market"					
Buy soymilk made by the deli in supermarkets					
Buy packaged soymilk products from restaurants or supermarkets					
Other					

Question 5: How **important** to you are the following **attributes** of **ready-made soymilk**? (Ranking from 1 representing the lowest level of importance to 5 representing the highest level of importance, choose one for each row. Your choice does not necessarily depend on your experience of buying ready-made **soymilk**.)

1 - Not at all important | 2 – Not very important 3 – Indifferent |4 - Very important | 5 - Extremely important

	1	2	3	4	5
Price					
Brand					
Taste or flavor					
Minimum use of preservatives					
Low risk of food-borne illness					
Minimum use of pesticide in producing soybeans					
Non-GMO soybeans					
Certified organic soybeans					
Origin of ingredients (e.g., in your province, in the main production province Heilongjiang, other provinces or overseas)					
Location of manufacturing (e.g., in your province, in the main production province Heilongjiang, other provinces or overseas)					
Types of soymilk retailers or makers (Vendor/deli/brand)					

Q6: How important to you are the following attributes of ***organic*** **soybeans** that are used to produce ***organic*** **soymilk**? (Ranking from 1 representing the lowest level of importance to 5 representing the highest level of importance, choose one for each row. Your choice does not necessarily depend on your experience of consuming organic soymilk.)

1 - Not at all important | 2 – Not very important 3 – Indifferent |4 - Very important | 5 - Extremely important

	1	2	3	4	5
Taste					
Non-GMO					
Minimal chemical use in production					
Positive environmental impacts					
Promotion of social justice (e.g., fair treatment of farm labor, animal welfare)					

Health benefits					
Low risk from food-borne illness					
Certifying agency					
Location of manufacturing (e.g., in your province or other provinces or overseas)					
Origin of ingredients (e.g., harvested in your province or main soybean production province Heilongjiang or overseas)					

Q7: What are your perceptions of the **overall quality** of ***organic*** **soybeans** with the following location-of-origin labels? (Choose one from each row. Your answer does not need to be based on your experience with the products from these locations.)

1 - Poor | 2 - Somewhat poor | 3 - Average | 4 - Somewhat high |5 - High

Countries	level of quality				
	1	2	3	4	5
Grown within your province					
Grown within main soybean production province in China(e.g., Heilongjiang province)					
Grown within China(could be any province)					
Imported from Brazil					
Imported from U.S.					

Q8: How much **trust** do you place in the **accuracy of the label** of soybeans that sourced from following countries are "**Certified Organic**"? (Choose one for each row.)

1 - Complete distrust | 2 – Somewhat distrust | 3 - Indifferent |4 - Somewhat trust | 5 - Complete trust

Countries	level of trust				
	1	2	3	4	5
Grown within your province					
Grown within main soybean production province in China(e.g., Heilongjiang province)					
Grown within China (could be any province)					
Imported from U.S.					
Imported from Brazil					

Q9: How much **trust** do you place in the **accuracy of the label** of soybeans that sourced from following countries are "**Non-GMO**"? (Choose one from each row.)

1 - Complete distrust | 2 – Somewhat distrust | 3 – Indifferent |4 - Somewhat trust | 5 - Complete trust

Countries	level of trust				
	1	2	3	4	5
Grown within your province					
Grown within main soybean production province in China(e.g., Heilongjiang province)					
Grown within China(could be any province)					

Imported from U.S.					
Imported from Brazil					

PART B: CHOICE TASKS:

In the following, you are asked to respond assuming a situation where you are buying ready-made soymilk packaged in 250 ml bags from a vendor or at a store. 250 ml is about how much an adult would consume for breakfast in a day. Suppose you are given a choice among products that vary by certain attributes, which are labeled. The types of attributes you will find include: price (per 250 ml bag), the country of origins of soybeans used to make the product, what sort of soybeans were used to make the product (e.g., non-GMO), and which agency certified that feature of soybeans.

Specifically, soybeans could have been harvested in China or U.S., or the information on origin may not be available. Soybeans could be organic or non-GMO, or the information about the feature may not be available, in which case soybeans are likely not organic and likely contain genetically modified crops. The agencies certifying the claim of organic or non-gm can be Chinese, American (U.S.), or European (EU).

For each of questions 14 to 19, choose one product you would purchase from the 3 products based on the provided information. It is important that you make your selections just as you would if you were actually facing these choices in your shopping decisions.

Q10: Please choose one from the 3 soymilk products:

	A	B	C
			
Production	Non-GMO	No claim	Organic
Origin	No label	US	China
Certification agencies	China agencies		US agencies
Price(yuan/250ml)	0.8	0.7	0.9

A----1 B----2 C----3 I will not choose any of them----9

Q11: Please choose one from the 3 soymilk products:

	A	B	C
			
Production	No claim	Organic	Non-GMO
Origin	US	No label	China
Certification		EU agencies	EU agencies
Price(yuan/250ml)	0.8	0.9	0.7

A----1 B----2 C----3 I will not choose any of them----9

Q12: Please choose one from the 3 soymilk products:

	A	B	C
			
Production	Organic	Non-GMO	No claim
Origin	No label	US	China
Certification	China agencies	China agencies	
Price(yuan/250ml)	0.7	0.9	0.8

A----1 B----2 C----3 I will not choose any of them----9

Q13: Please choose one from the 3 soymilk products:

	A	B	C
			
Production	Organic	Non-GMO	Organic
Origin	No label	China	US
Certification	EU agencies	US agencies	China agencies
Price(yuan/250ml)	0.8	0.9	0.7
A----1 B----2 C----3 I will not choose any of them----9			

Q14: Please choose one from the 3 soymilk products:

	A	B	C
			
Production	Organic	Non-GMO	Organic
Origin	No label	China	US
Certification	EU agencies	US agencies	China agencies
Price(yuan/250ml)	0.8	0.9	0.7
A----1 B----2 C----3 I will not choose any of them----9			

Q15: Please choose one from the 3 soymilk products:

	A	B	C
			
Production	Organic	Organic	Non-GMO
Origin	No label	China	US
Certification	US agencies	EU agencies	EU agencies
Price(yuan/250ml)	0.7	0.8	0.9
A----1 B----2 C----3 I will not choose any of them----9			

Q16: Compared to ***imported*, organic soybeans**, how do you perceive ***China-grown*, organic soybeans** in terms of the following attributes? (Choose one for each row.)

1 - Definitely inferior | 2 - Inferior | 3 - About the same |4 - Superior | 5 - Definitely superior

	1	2	3	4	5
Taste					
Potential positive impacts on health					
Safety from risk of food-borne illness					
Safety from risk of toxic pesticide residuals					
Environmental impact					

Q17: Compared to ***imported,* non-GMO soybeans**, how do you perceive ***China-grown*, non-GMO soybeans** in terms of the following attributes? (Choose one from each row.)

1 - Definitely inferior | 2 - Inferior | 3 - About the same |4 - Superior | 5 - Definitely superior

	1	2	3	4	5
Taste					
Potential positive impacts on health					
Safety from risk of food-borne illness					
Safety from risk of toxic pesticide residuals					
Environmental impact					

PART C. DEMOGRAPHIC INFORMATION

Please be sure to answer the questions based on your real situation. We are here to assure you that your information and answers will be kept strictly confidential. This survey will not contain questions which could make your identity recognized.

W1: Do you have any child under 18 living in your household?

a. Yes

b. No

W2: How many people live in your household in total?

1 - One | 2 - Two | 3 - Three | 4 - Four | 5 - Five | 6 - Six |7 - Seven | 8 - Eight

	1	2	3	4	5	6	7	8
Number of people live in your household								

W3: The highest education level that you have completed (choose one):

a. Elementary school
b. Middle school
c. High school or equivalent
d. Some College or Associate Degree
e. Bachelor's Degree
f. Graduate school

Any comments, opinions, or questions about **organic soymilk** production, marketing, or consumption? Use the space below.

_____

Congratulations!

You have fully qualified and completed this research study. Thank you for your time and your opinions!

Appendix C Profile of Soy Product Consumers (Mintel, 2008a)

Table C-1: Consumption of soy-based food and/or drink in the past 12 months, by gender, age, household income and presence of children, September 2008 (Base: 2,000 adults aged 18+ with access to the internet)

	Eaten soy-based food and/or drinks
	%
All	28
Age:	
18-24	34
25-34	34
35-44	29
45-54	24
55-64	22
65+	23
Household income:	
<$25K	26
$25K-49.9K	23
$50K-74.9K	28
$75K-99.9K	36
$100K+	31
Presence of children in Household:	
Children in Household	28
No Children in Household	28

Source: Mintel report "Soy-based Food and Drink - US - December 2008", section of "The Consumer: Usage and Frequency of Use", Figure 34.

Table C-2: Soy-based products consumed in past month, by gender, September 2008 (Base: **553 adults aged 18+ who ate/drank soy products in the past 12 months)**

	Total (%)	Male (%)	Female (%)
Heavy users	37	40	35
Every day	12	13	12

A few times per week	25	27	23

Source: Mintel report "Soy-based Food and Drink - US - December 2008", section of "The Consumer: Usage and Frequency of Use", Figure 36.

Table C-3: Use of soy foods and beverages, by race and Hispanic origin, April 2007-June 2008

	Total (%)	**White (%)**	**Black (%)**	**Asian (%)**	**Hispanic (%)**	**Non-Hispanic (%)**
Meat alternatives	25	22	39	27	40	23
Soymilk	10	8	15	24	12	10

Source: Mintel report "Soy-based Food and Drink - US - December 2008", section of "Market Drivers", Figure 22.