

CONSUMER KNOWLEDGE AND PREFERENCE FOR WESTERN FOOD: A CASE STUDY
OF CHINA'S ORANGE JUICE MARKET

By

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A THESIS PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE
MASTER OF SCIENCE

UNIVERSITY OF FLORIDA

2013

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ACKNOWLEDGMENTS

I would like to take this opportunity to express my sincere gratitude to those who have helped me in the way of accomplishing this important goal. At first place, I would like to give my thanks to the Food and Resource Economics Department for offering me the professional training. Without its support, nothing could be possible.

Most gratefully, I would to give my appreciation to my major professor Dr. Gao, Zhifeng for his tremendous support, help and encouragement throughout this fruitful and wonderful journey. It would not have been possible without his advice and guidance to fulfill all the achievements. His patience and kindness have impressed me so deeply. He is a friend and a mentor who I have always believed in.

Additionally, my great thanks go to my co-chair professor Dr. House, Lisa. She has offered remarkable guidance and helps in various aspects such like solving my study program, giving me instructions and giving me encouragement. Besides, my thankfulness also goes to my committee member, Dr. Zhihua Su for her suggestions and help in the software and models. Although they are not on my committee, my thanks also go to Dr. Steven M. Slutsky, Dr John J. VanSickle and Dr. Yaşar Yeşilçay for their tremendous helps and instructions given to me.

Besides, I would also thank my fellow friends and graduate classmates here in Gainesville for their helps which make my life here much more enjoyable and fun.

At last, I would like to give my most grateful appreciation to my parents for their supports and loves.

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LIST OF ABBREVIATIONS

FDOC	Florida Department of Citrus
FCOJ	From Frozen Concentrated Orange Juice
FSOJ	Fresh Squeezed Orange Juice
MT	Metric Tons
NFC	Not From Concentrate Orange Juice
OJD	Orange Juice Drinks with less than 100% juice
OLS	Ordinary Least Square
ROJC	Refrigerated Orange Juice from Concentrate
WTP	WTP

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May 2013

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Major: Food and Resource Economics

With increasing income per capita, Chinese consumers have not only increased their demand for almost every agricultural product, but also have experienced a change in consumption patterns. With a quickening pace of life, more consumers begin turning to more convenient western food products, such as pizza, fried chicken, sandwich, fruit juice etc., to save time and meet nutritional needs. The structural changes in Chinese consumers' food consumption gain attraction from many international food exporters. For instance, the increase of orange juice in China is very significant and attractive to the world's largest orange juice producers such as the United States and Brazil. In order to decide the types of orange juice products that best satisfy Chinese consumers' needs, a mall intercept survey of 1,454 participants was conducted to determine Chinese consumer knowledge, perceptions, consumption patterns and willingness to pay (WTP) for orange juice products. Results showed that most Chinese consumers have limited knowledge and biased perceptions of orange juice. Although they are willing to pay more for higher quality orange juice, they may lack the ability to distinguish it from the lower quality one.

CHAPTER 1 INTRODUCTION

With a huge population of over one billion and a rapidly growing economy, the People's Republic of China has been a new land for western food industries to exploit and discover. The increasing purchasing power and China's huge population indicate an incredibly large potential market for western food producers; especially in those areas where China's domestic industries are not well developed such like the convenience food industries. Additionally, China's entry into the World Trade Organization (WTO) in 2001 facilitated the opening of its market and gave western companies convenient access (Tacconelli et al. 2009). The agricultural product exporters have greeted a booming demand from China.

By one report of United States Department of Agriculture (USDA), China surpassed Mexico to become the second-largest market for U.S. agricultural exports in 2010 with a total consumption of \$15.1 billion of America-made agricultural products (International Agricultural Trade Service, 2010). On the other hand, with the rapid growth in economy and increasing income per capita, Chinese consumers not only increase the demand for almost every agricultural product but also experience a change in consumption patterns. One obvious change is that Chinese people consumed more high-fat food like dairy products, meats, oils, fruits and vegetables but fewer staples like rice and flour than before (Fan and Agcaoili-Sombilla, 1997; Guo et al., 2000). Besides, Chinese consumers are increasing their consumption of western foods, especially western convenience foods, including both meals, pre-packaged food from fast food restaurants and pre-prepared western food like pizza from Wal-Mart (Veeck & Veeck, 2000). Restaurants such like McDonalds, KFC and Pizza Hut that serve western-style foods have successfully opened their market in China. For instance, KFC, the most popular western restaurant in China, now has over 3,000 locations by 2012. Even Pizza Hut that entered Chinese

market very late now has over 560 locations by 2012. The increasing appearance and success of western restaurant indicted the great changes in both food consumption patterns and life-styles. Besides changes in consumption patterns brought by the influx of western fast food restaurants, vegetables, fruits, meats and non-alcoholic beverages account for the majority of Chinese expenditures in grocery stores (Bhandari & Smith, 2000).

The Chinese consumption patterns now provide western food products with great opportunities. For instance, although China is still the world's largest consumer of fresh oranges generally, the consumption of orange juice in China increased by 42.86% from 2007 to 2012, while the consumption of fresh orange only increased by 21.72% in the same time period. Despite the rapid increase in orange juice consumption, the annual consumption per capita in China is 10.1 liters, which is much lower than Russia (20.1 liters per person) and the United States (30.3 liters per person). Orange juice continues to lead the juice market despite the declining market share of all kinds of fruit juice from 2008 with 57 percent to 2011 with 47.2 percent (Global Agricultural Information Network, 2012).

The increasing demand and changing consumption patterns in China indicate potential opportunities in the orange juice market of China for global orange juice exporters. It was pointed out by USDA Annual Citrus Annual China (2012) that the production of frozen concentrated orange juice (FCOJ¹) and not from concentrate (NFC²) reached 25,000 metric tons (MT) (converted into a Brix value of 65) in China in MY2011/12 (October-September).

Although this was an increase of 80 percent compared with the previous year, domestic supplies

¹ FCOJ: Is orange juice obtained from concentrated orange juice (COJ) that is reconstituted with water. COJ is orange juice made by removing, through evaporation, the water from the orange juice of fresh, ripe oranges that have been squeezed in extraction machines.

² NFC: Is orange juice processed and pasteurized by flash heating immediately after squeezing the fruit without removing the water content from the juice.

were still inadequate to meet the nation's demand for orange juice, especially FCOJ for which the imported juice account for about 75% of total juice consumption in China. As a result, China's juice market may continue to depend largely on imports because of China's limited domestic supplies of the varietal oranges for juice production. Beverage companies were expected to source more imported FCOJ to accommodate the escalating demand for juice and juice beverages in China.

The increasing consumption of orange juice in China is likely the result of a combination of factors, i.e. increasing income, changes in lifestyle and convenient access to a variety of brand options (Abbott 1990). Other than income, the changes in lifestyle of Chinese consumers might play a very important role in the structural changes to the consumption. With the rapid pace of life, more consumers may choose to substitute fresh fruit with more convenient products, such as fruit juice, to save time and meet their demand for nutrients. Additionally, orange juice wins over soft drinks is the result of people considering health outweighs price (Granato et al. 2010). This is another factor that likely leads to the increased consumption of orange juice. In addition, western fast and convenience food products are in fashion in China. Chinese consumers can show their social status by consuming western food as the symbol of powerfulness and wealth (Sklair 1994). Since China has had a rapid and sustained growth in gross domestic product—about 9% annual rate since 1979 (Morrison 2009)—Chinese consumers are wealthier than ever. The enlarged purchasing power enables Chinese consumers to purchase the more expensive beverages like imported orange juice.

The increasing demand for fruit juice is very attractive to world largest orange juice exporters such as the United States, Brazil and others. Increased demand for fruit juice of China will not only benefit juice producers but also fruit growers due to the increased demand for raw

materials from the juice processors. However, it is critical for the exporters to provide the right type of products to satisfy consumer demand, otherwise excessive supply will incur loss for the exporters, producers as well as growers.

The fruit juice market is complicated by the diversity of product types in the market. For instance, orange juice products are classified as fresh squeezed orange juice (FSOJ³), NFC, from FCOJ, and orange juice drinks with less than 100% juice (OJD⁴). Although some consumers may not know the difference among those different types of orange juice products, the production and shipping cost differ significantly. For instance, NFC orange juice has been a major type of orange juice served on the American families' dining table for a couple of years. Although NFC orange juice has always been favored for its high quality of being freshly produced and have a natural taste, its high production and shipping cost made it beatable when competing with other cheaper orange juice. Worldwide, NFC orange juice seems to be more popular in the higher income regions and countries such as European Union, Japan and Canada besides the United States (Figure 1-1). Because China has sustained an economic growth and become the second largest economy in the world, China may have potential to develop this relatively new kind of orange juice market. Therefore, it is essential for the worldwide and the U.S. juice producers to have a better understanding of Chinese consumer current knowledge as well as their attitude and WTP for different types of juice products. This is particularly true for country like China where juice market is at its young age and consumers may probably have little knowledge to differentiate the somewhat confusing juice products.

³ FSOJ: Is orange juice squeezed from fresh fruit and packaged in paper cartons, glass or plastic containers, without being pasteurized. No additional water or other ingredients are added.

⁴ Is sweetened beverage that is made from diluted orange juice containing no less than 10% orange juice content with other ingredients added such as sweetener and acidulant.

The objective of the study is to have a better understanding of current Chinese orange juice market and determine Chinese consumer knowledge, consumption habits and perception of different types of orange juice, with an emphasis on consumer WTP for different types of orange juice.

The determination of Chinese consumers' knowledge, perception and WTP for different types of orange juice, could provide valuable information on Chinese people's new consumption habits and lifestyle. In addition, this study can offer useful references to the U.S. and the world major orange juice producers who are interested in the development of citrus juice market in China. It also provides valuable information for world major juice exporters to better balance their plans and adjust their strategy in this young and pre-mature market. Moreover, this study can be used as a basis of further research to build a more in-depth and conclusive study of orange juice market in China.

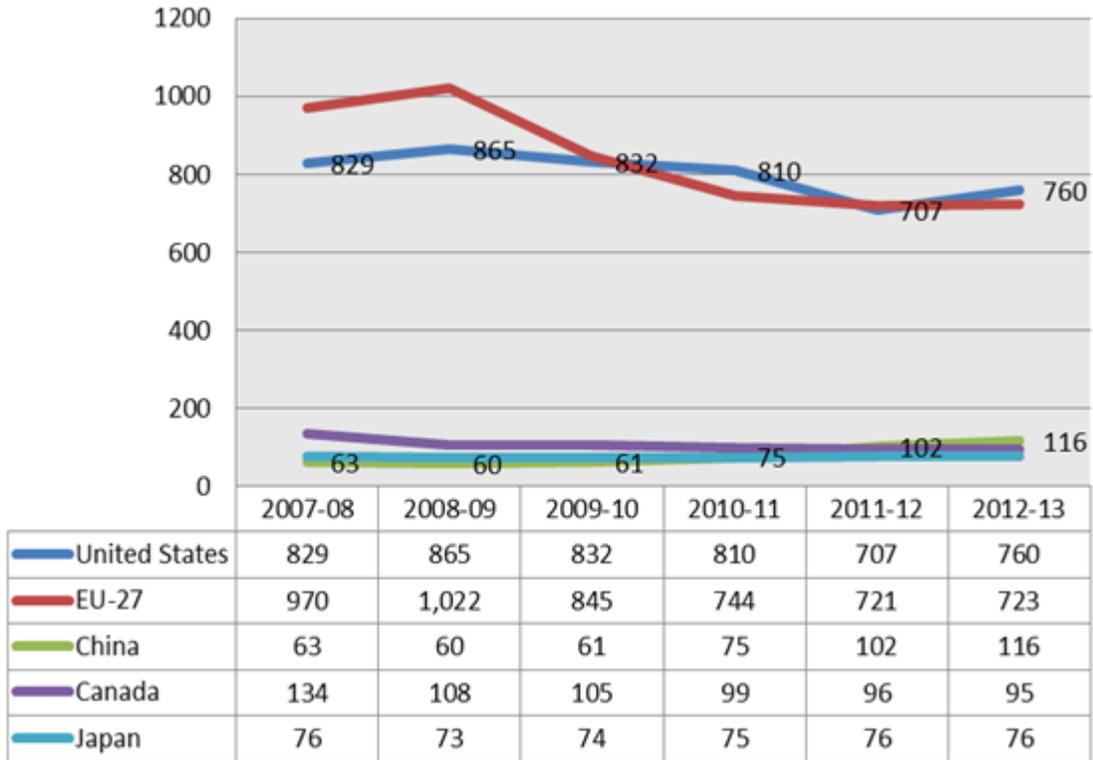


Figure 1-1. Total orange juice consumption of major countries (Unit: 1,000 metric tons at 65 degrees brix)

CHAPTER 2 LITERATURE REVIEW

There have been some prior studies on western convenience foods in China and factors that influenced Chinese food preferences. The majority of those researches mainly focused on consumption habits and consumption patterns. This literature review starts with the previous research on western food consumption in China, followed by those prior studies on factors influencing Chinese preference of western convenience foods and at last preference of orange juice.

Prior Studies of Western Convenience Foods in China

KFC was the first western fast food chain that arrived in China in 1987 and now is the most popular one in China. By the end of 2010, there were 2,100 Kentucky Fried Chicken (KFC) restaurants in 459 cities. This number comes to over 3,000 by the end of 2012 and KFC is still opening new sites across the country. Besides the great success of KFC, Pizza Huts and McDonald's are also very successful in China.

Veeck and Veeck (2000) used the survey data of 150 household primary shoppers in Nanjing, China collected in 1993 to study the changes in Chinese food consumption patterns. By clustering the respondents into convenience shoppers, frequent shoppers, and traditional shoppers, their results showed that those convenience shoppers who were mostly younger, single, primarily male adults with above average incomes would purchase more convenience foods than the other two groups. However, those mid-class younger participants who got married which made the majority of frequent shoppers also ate out and consumed convenience food at a considerable frequency (Veeck & Veeck 2000).

Hu and Duval (2003) conducted a study on the food consumption patterns of Chinese who lived in the United States. They collected the data by interviewing Chinese consumers in

four major American cities: New York, Chicago, Los Angeles and Miami. The results showed that the participants consumed an increasing amount of convenience food, such as hamburgers, pizza etc. in the United States. However, the most participants claimed that they ate convenience food not because they preferred it, but because of the time saved from convenience food. The data also showed that almost half of the interviewees increased their consumption of convenience food after they came to the United States. Hu and Duval concluded that the advantages of western convenience food somewhat outweighed the custom and tradition when preparing time is a significant value to the participants.

To examine why the western convenience food is so popular and successful in China, many researchers examine factors influencing behaviors of the Chinese consumers.

With the rapid pace in China, Sklair (1994) and Watson (2006) argued that this trend is the result of increased incomes and the easy access to a larger variety of food options besides the lifestyle changes. They also pointed out that western food and culture are in fashion because Chinese consumers viewed foreign brands as symbols of social status and an indicator of “modern” life. Similarly wearing foreign imported clothes, dining in western restaurants and even drinking star bucks when shopping are all symbols of social status (Sklair 1994). The phenomenon will continue going on and the consumption for western convenience food will continue increasing not only due to its convenience but also because of the status value.

After Sklair’s (1994) analysis of the symbols meaning of imported brands in China, Jussaume (2001) conducted a study of 542 households in Qingdao, China with a focus on household food consumption patterns. In this study, Jussaume divided the whole sample into two categories: modern one and traditional one according to their consumption pattern of meat and fresh fruits, assuming meat and fresh fruits were modern foods in China at that time. The results

showed that people with higher income were more likely to buy a higher percent of meat and better quality fresh fruits as showed in the modern group, while the low income consumed lower level of meat and fruits as showed in the traditional group. Bhandari and Smith (2000) also concluded that there was a significant link among education, income and consumption patterns.

The studies of Jussaume (2001) and Veeck and Veeck (2000) also concluded that an increasing frequency of eating out and increasing consumption of snack foods accounted for the increasing consumption of western-style convenience foods. Western fast food restaurants not only provided the most convenient food service, but also attracted people by promoting themselves as excellent places for socialization. Serving a lot of popular snack foods and attractive for dining out, western fast food restaurants grow more and more popular and eventually increase people's consumption of western convenience food.

Chinese consumers preferring western convenience food has other reasons. According to the study of Shone, Nobuhiro, and Kaiser (2000), success of western-style convenience foods were changeable in functions but unchanged in quality. For instance, KFC in China acted as meeting and party locations where people could stay for hours, with much more functions than that in the United States where the restaurant is just a place for people to get fast food and would at most stay for minutes. Those changeable functional characteristics brought prosperous life to those "modern" foods in China.

Marr and Hatfield (2001) conducted a survey in Shanghai to investigate the brand value effect on consumption. By interviewing the Chinese consumers in Shanghai, they concluded that brand loyalty was a factor that contributed to the popularity of western convenience food. They focused on western snacks and noticed that Pringles potato chips were the most popular potato chips in Shanghai although their prices were higher than the domestic brand chips. The loyal

customers continued to purchase Pringles chips rather than others in spite other brands might advertise more frequently.

Curtis et al. (2007) investigated the consumer preference for western-style convenience foods through a survey by choosing convenience sample of 599 consumers in Beijing, China. The study mainly focused on three kinds of representative western-style convenience food: French fries, potato chips and mashed potatoes. The results of analysis show that significant variables that influenced French fries consumptions included gender, income level, marital status, and existence of children in the household. The opinion that western foods are equally healthy or healthier than traditional Chinese foods and western foods taste no worse than traditional Chinese foods also counts (Curtis et al. 2007). While in general, gender and positive opinions on taste superiority of western foods remarkably leads to the increased consumption of all three potato products.

To sum up, the western convenience food industries are developing very fast in China. There are several factors facilitate this popularity, including the advantages of convenience food itself, consumers' characteristics and changes in Chinese consumption habits and patterns.

Factors Influencing Demand for Orange Juice

Convenience is becoming a more important factor affecting consumers' choice of foods, and orange juice might be a convenient substitute of fresh oranges. Factors influencing people's demand for orange juice has been investigated extensively. A mainly interest was on the impact of various factors that may decrease or increase the demand for orange juice. In general, the possible variables that may affect the demand for orange juice include prices of orange juice, prices of substitute beverage, household income, seasonality, brands, demographics and advertising (Davis et al. 2008). Of those factors, advertising is significantly important in some

situations (Ward 1978). The following literature review mainly focuses on the factors that have a significant influence on demand for orange juice.

Davis et al. (2008) used the ACNielsen data to determine the impact of demographics on consumer demand for orange juice. They firstly built the model using total orange juice gallons as dependent variable and selected orange juice price, substitute's prices, and per capita income, percentage of Black, Asian, and Hispanic as explanatory variables (Davis et al. 2008). They also added nine interaction terms into the model for the first run. Davis et al. concluded that income, price of orange juice and substitutes were significant regressors. The outcome also indicated that there was difference in demand of orange juice when there were changes in ethnicities. For the cities with higher percentage of Black and Hispanic, there was less demand for orange juice while the opposite stood for cities with higher percent of Asians.

In the United States, about 99 percent of orange juice market was shared among FCOJ, NFC and refrigerated orange juice from concentrate (RECON 2008). Of them, NFC is considered as the juice with the highest quality and thus is sold in greatest amount in gallons in the United States (Brown 2000). Besides, many American families have formed a habit of intake orange juice at breakfast for nutrition needs. It is becoming a somewhat tradition or customs to drink orange juice when having breakfast. As this tradition of eating habits spread over non-white family, the demand of orange juice may also increase as a result.

When coming to the effect of advertising on the demand of juice, different researchers had opposite conclusions. According to the study of Kinnucan et al. (2001), juice advertising had the largest influence within the nonalcoholic beverage group compared with other beverages. They also found that only juice had a positive and statistically significant own-advertising elasticity (Kinnucan et al. 2001).

Zheng & Kaiser (2008) conducted a study of the advertising effect on the U.S. nonalcoholic beverage demand using survey data. They concluded that advertising positively affects demand for milk, soft drinks, and coffee/tea, but not for juice or bottled water (Zheng & Kaiser 2008). They also summarized the cross-effect among the goods as the result of advertising. For instance, advertising of juice is good for milk but bad for soft drinks; advertising of bottled water is good for milk but bad for juice; and advertising of coffee/tea is good for milk but bad for juice. Therefore, juice can be considered as supplement of milk, but substitutes for bottled water, soft drinks and coffee/tea. Besides the advertising effect, Zheng & Kaiser also concluded that some other effects like customs and culture that may affect the beverage demand. For instance, Americans have always been more concerned about their body fitness. The perception of eating healthier is spreading all over the world from the United States. Under this circumstance, orange juice, especially NFC, which substitutes for soft drinks and coffee/tea, but more healthier will have a increasing amount of consumption with the spreading of idea of eating health and keeping fit.

In conclusion, demographics such like income, gender, education may have an effect on the demand of orange juice. Besides, consumption and living habits, advertising may also account for the increased consumption. The role that this study plays is a reflector of Chinese consumer's demand of orange juice and indicator of the changes in the recent years. Although many studies determined various variables influencing the orange juice demand few studied Chinese consumer juice demand due to the limited consumption in the previous years. This study will mainly focus on the burgeoning Chinese orange market and investigate the Chinese consumer's preference and demand of orange juice. A simple linear regression method will be

used to determine the impacts of demographics and other factors that have been shown to have significant influences on consumer demand for orange juice by previous studies.

CHAPTER 3 DATA

A qualitative study of consumers' attitudes towards different types of orange juice was conducted by using semi-structured interviews as the primary research approach. From March to June of 2012, mall intercept surveys were conducted in four major cities in China—Beijing, Shanghai, Zhengzhou and Shenzhen—by randomly stopping grocery shoppers in major stores in the cities. These four cities partially represent the diverse types of cities in China: Beijing is the political and cultural capital city of China while Shanghai is the financial and commercial capital; Zhengzhou is an average city in central China and Shenzhen in the south is characterized by a large number of immigrants from other places of China. In each city about 365 people participated in the surveys and total of 1,454 questionnaires were collected.

The sample was carefully chosen to accommodate all age groups and a proportional gender ratio. Participants received 15-20 RMB (\$2.41-3.22) cash to ensure engagement and improve the quality of the surveys. The interviewees could choose either to provide their responses via paper and pencil or verbally. All interviewees' answers were recorded and field notes were taken down in conjunction with the interviews for later reference. All the original survey answers, memoranda, and field notes were entered into computer files for further analysis.

In the survey, each participant was asked thirty-five short questions regarding their knowledge, preferences, attitudes and WTP, as well as the demographics such as gender, age, income, education, employment status, marital status, number of children in the family, monthly expenditure on food and times eating. The first part of the survey asked participants about their juice consumption patterns as well as basic shopping habits when purchasing orange juice. The primary purpose of buying orange juices and frequency of consuming orange juice in the last month before the survey was also collected. The second part of the survey asked participants'

agreement/disagreement with some statements about different types of orange juice products.

These questions were designed to test consumers' basic knowledge and perceptions of different types of orange juice, such as consumers' opinions of orange juice's safety, tastes and availability in the market when compared with other fruit juice.

The last part of survey concerned the respondents' WTP for different types of orange juice. There were six types of orange juice in the questionnaire: 1) Orange juice drink with juice content $\geq 10\%$ (OJD 10%), 2) Orange juice drink with juice content $\geq 25\%$ (OJD 25%), 3) Orange juice drink with juice content $\geq 50\%$ (OJD 50%), 4) Orange juice drink with juice content $\geq 75\%$ (OJD 75%), 5) 100% Reconstituted Orange Juice from Frozen Concentrate (FCOJ), 6) 100% NFC orange juice (NFC). In the Chinese market, OJD 10% is the most popular types of orange juice product currently; FCOJ is gaining in popularity due to its high percentage of juice content; and NFC is very new with very small market share despite that NFC is the most popular orange juice product in most western developed countries.

CHAPTER 4 MODEL

Regression models estimated with ordinary least square methods (OLS) were used to determine the factors that have significant impacts on consumer knowledge, consumption patterns and WTP. For the knowledge of fruit and orange juice, the expenditure on orange juice last month and WTP for different types of orange juice, the underlying response models are:

$$K_i = X_i\beta_i + \varepsilon_i \quad (4-1)$$

$$Expenditure_i = S_i\gamma_i + \varepsilon_i \quad (4-2)$$

$$WTP_i = D_i\delta_i + \varepsilon_i \quad (4-3)$$

Where

$$X = (Gender, Age, Edu, Income, \# \text{ of Kids}, Frequency)$$

$$S = (Gender, Age, Edu, Income, \# \text{ of Kids}, Perception)$$

$$D = (Gender, Age, Edu, Employment, Income, \# \text{ of Kids}, K, expenditure \text{ on orange juice last month}, Perception)$$

And K_i is the knowledge index of fruit juice for consumer i . Gender, Age, Education, Income, number of kids in the family (*# of Kids*) are consumer demographics; *Frequency* and *Expenditure* are the frequency and expenditure of consuming orange juice in the last month before the survey was taken, respectively; and WTP is consumer stated willingness to pay for different types of orange juice products; ε_i is unobservable random component. Only WTP models (equation 4-3) of OJD 10%, FCOJ and NFC are estimated because these three products are the major types of orange juice products currently in the Chinese market.

For the variables in the regression model, dummy variables were created for gender (1 for Males and 0 for Females) and for education (if primary school and below, EDUC1=1, otherwise EDUC1=0; if high school or equivalent, EDUC2=1, otherwise EDUC2=0; if university or

equivalent, EDUC3=1, otherwise EDUC3=0; if postgraduate EDUC4=1, otherwise EDUC4=0).

For age, employment, income, an index corresponding different levels were created and used.

For kids in the family and expenditure on orange juice, original numbers were used. For

knowledge and perceptions of fruit and orange juice, a numeral index was created corresponding

to their answers to the relative questions and its accuracy which would be displayed in detail in

Chapter 5.

CHAPTER 5 RESULTS

Demographics of Participants

After data cleaning, about 980 respondents were eligible for the statistical analysis because not all the people answered the same questions. Females accounted for 62.4% of the total respondents, which is reasonable because the survey targeted at household shoppers and females are the primary shoppers for household products in China. Most participants in the sample were less than 40 years old, with the majority in the range of 16-25 years old. About 93% of the participants had at least one child in the family: most (67%) had one, while few (9%) had three or more children. People with four-year college degrees or higher (48.21%) made up the largest proportion of participants. The largest group of the participants had a full-time job (41%) while the second largest is full-time students (38%). Most of the participants had a monthly household income ranging from 2,500 RMB (\$401.5) to 15,000 RMB (\$2409). The medium income in the survey falls in the range from 5,000 RMB (\$804) to 7,000 RMB (\$1126), which seems higher compared to the national average 2,679.5 RMB (\$430.33). This is plausible because three of the cities (Beijing, Shanghai and Shenzhen) surveyed are the first-tier cities in China with the highest living standard (Table 5-1). Respondents' average monthly expenditure on orange juice last month was about 53 RMB (\$8.50). Respondents' frequency of consuming orange juice last month is displayed in Figure 5-1.

Consumer Knowledge of Orange Juice

Most respondents (86.49%) agreed that there is difference between fruit juice and fruit juice drink. Chinese consumer knowledge of fruit juice was determined by asking their agreement/disagreement with the statements listed in Table 5-2, and results are shown in Figure 5-2. Overall, a majority (52.58%) of consumers did not agree with the correct statement that

fruit juice must have 100% juice, and they believed water or other ingredients could be added; However, nearly half of the consumers (about 50.69%) did not agree with the correct statement that juice drinks could be made by adding ingredients such as sweeteners and preservatives. Interestingly 46.04% of the respondents were not sure whether most fruit juice drinks in the market had more than 10% juice content although 10% OJD had the largest market share in Chinese market. These results indicate that Chinese consumers' knowledge of fruit juice was generally very limited and they may not even tell the differences between 100% orange juice and juice drinks. Despite their desire to drink healthier beverages, they had little knowledge to distinguish healthy juice from unhealthy ones.

Consumers' knowledge of different types of orange juice products was also tested by asking whether they thought the four definitions listed in Table 5-3 were correct. The survey was designed to present incorrect definitions of NFC and fresh squeezed juice while present the correct definitions of concentrate juice and juice drinks. Outcomes (Figure 5-3) show that over half of respondents (54.67%) mistakenly thought the definition of fresh squeezed juice was correct. Although 43.65% of the consumers realized the definition of NFC juice, was wrong, it was still the most unfamiliar type of juice product compared with concentrated juice and juice drink. For all four juice products, around 20% to 30% of respondents were uncertain about the definitions provided in the survey (Figure 5-3)

The ability to recognize different kinds of orange juice products was tested by asking participants to identify several juice products that were available in the market. Images of four popular orange juice products in China were presented to participants. The images were Huiyuan 100% FCOJ, Minute Maid OJD, Tropicana OJD and Great Lake 100% FCOJ. The respondents were asked to indicate whether each product shown was *NFC*, *Fresh Squeezed*, *From*

Concentrate, or Juice Drink. They could also choose “I Do Not Know” if they were not sure about the type of juice products presented. The specific survey questions and images are below.

The results showed that about 29.41% and 28.29% of respondents answered the first and last question correctly, compared to about 61.05% and 46.26% who answered the second and third question correctly. This indicates that Chinese consumers were more familiar with *OJD* than 100% *FCOJ*. This is consistent with the current situation in China—orange juice drink is one of the most popular beverage products in the market, while reconstituted 100% *FCOJ* and *NFC* are relatively new orange juice products and thus have a much smaller market share.

The sum of correct answers of the above three set of questions was used as an index to measure consumer “knowledge” of fruit and orange juice. To make the index reflect the actual knowledge more accurately, according to the previous study, different weights were assigned to different questions according to their difficulty. More specifically, if the question was easy, more weight (score of 2) was assigned, while if the question was difficult, less weight (score of 1) was assigned. If the participants were not able to answer the question and choose “*I do not know*” as the answer, they would score 0 for that question. For example, the answer to the question “do you think fruit juice and fruit juice drink are the same” is “no”. If the participants answered “No” or “Yes” to this question, they would gain a score of 2 and -2, respectively, while they would be assigned 0 for “I don’t know”. For questions in Table 5-2, if the participants strongly agree/disagree with a true statement, they will get a score of 2 and -2 respectively.

Agree/disagree with a true statement will lead to a score of 1 and -1 respectively. If the participants answer “Neither agree nor disagree”, they would get a zero score. For questions testing consumers’ knowledge of different types of orange juice in Table 5-3, if the participants answer “Correct/Wrong” to the first two false definitions, they would gain a score of -1 and 1.

The same method of accounting scores of knowledge works for the last two true definitions. For the recognition of the four brands of popular orange juice (Figure 5-9), if the participants recognize the juice and choose the correct answer successfully, they would gain one point; otherwise, they would get nothing. In this way of calculating scores of knowledge, the maximum possible score of this index is 24 (if a respondent answered all questions right), and the minimum possible score of this index is -24 (if a respondent answered all questions wrong). The distribution of the knowledge index is shown in Figure 5-5. Although the graph of distribution of knowledge looks like “bell shape”, after adopting the Anderson-Darling test, we gain a p-value which is much less than 0.005. Hence we reject the null hypothesis and conclude that the knowledge index is normally distributed.

Consumer Perception and Attitudes toward Orange Juice

Participants were asked about their agreement/disagreement with the statements in Table 5-4 to investigate their perceptions of fruit juice compared with other beverages, with results shown in Figure 5-6. Over 30% of the respondents at least agreed that fruit juice was healthier and more nutritious than other types of beverages. About half of the participants at least agreed that fruit juice tasted better and could be easily found in the market. However, about 40% of the respondents at least disagreed that fruit juice was safer than other beverages. In addition, about 67% respondents were not sure or unwilling to pay more for fruit juice than other types of beverages. These results indicate that although Chinese consumers had positive attitudes towards fruit juice, they need more stimulation to change their attitude into purchasing power. Like some other food products in China, fruit juice products are also subject to the problem of consumers' insufficient confidence in food product safety (Figure 5-6).

Consumers' perception of orange juice was determined by asking about their agreement/disagreement with the statements in Table 5-5, with results displayed in Figure 5-7.

The data showed that over 41% of the respondents at least disagreed with the claim that orange juice had more nutritional value than other fruit juice, and over 80% of the respondents disagreed or not sure that orange juice was safer than other juices. A minority of the respondents (about 20%) agreed that orange juice was a good choice for diet and can boost energy. About 30% of the respondents at least agreed that orange juice could improve the appearance of skin. About 54.31% of the respondents at least agreed that there were more brands of orange juice than other kinds of fruit juice and over 70% thought that it was quite easy to find orange juice in the market. In addition about 25% of the respondents would pay more for orange juice than other fruit juices (Figure 5-7). The results indicated that Chinese consumers considered orange juice and other juice almost equivalent regarding safety, nutrition and taste. The obvious advantages of orange juice are that it is widely available and has more brands.

WTP for Different Kinds of Orange Juice

Consumers were asked about the prices they are willing to pay for different types of orange juice with different juice percentages. The container size of 450 mL was used because it is the most popular size of juice drinks in the Chinese market, and juice drinks with juice content higher or equal to 10% account for most of the sales of juice and juice-related drinks.

Overall, the WTP (Figure 5-8) for each kind of juice/juice drink increased as the juice content increased. For an orange juice drink containing at least 10% juice, the average price people were willing to pay was 3.34 RMB (\$0.57). The average price increased to 3.83 RMB (\$0.62) when the juice content increased to 25%, to 4.69 RMB (\$0.75) for 50% and 5.81 RMB (\$0.93) for 75%. The 100% reconstituted orange juice received an offered price of 6.83 RMB (\$1.10) and the WTP for 100% NFC orange juice was 8.69 RMB (\$1.40) for a 450mL (0.12 gallon) bottle (Figure 5-8).

Factor Affecting Consumer Knowledge, Expenditure on Orange Juice and WTP

Statistical Analysis Software (SAS) was used to analyze the model presented in Chapter 4 and results were reported in Table 5-7 to Table 5-11.

For the regression of knowledge, the estimated parameter is displayed in Table 5-7; all coefficients are statistically significant at level of $\alpha = 0.10$. Knowledge is an index of the score each participant got for answering the questions regarding the consumer's knowledge of fruit and orange juice. Higher value indicates better knowledge of fruit and orange juice. The results indicate that consumers' knowledge of orange juice is significantly affected by Gender, Income and freqOJ. Models with other demographic variables, such as age, education and etc. were also estimated. However, results in Table 5-6 show that we cannot reject the null hypothesis that all other variables are jointly equal to zero.

Based on the rule of parsimony, only the three variables with significant coefficients are included in the final model. The positive and significant coefficient for male implies that on average, males gained more scores in answering the questions than females. In addition, consumers who had a higher income and those who consumed juice more frequently had a better knowledge of fruit juice.

The outcomes of the regression of expenditure on fruit juice/juice drink in the month before the survey are provided in Table 5-8. All of the variables are significant at the $\alpha = 10\%$ level. Among all the demographics, the influence of *Income* and *Kids* on juice/juice drink expenditures is significant. The coefficient of male is about -12.42 which means males on average spent 12.42 RMB (\$2.00) less than females on juice/juice drink. The outcomes also show that *Income* and *Kids* have significant positive impacts on juice/juice drink expenditure. For one level increase in income, there would be an average increase of 3.03 RMB (\$0.49) in juice/juice drink expenditure. With one more child in the family there was about 5.07 RMB

(\$0.82) more spending on juice/juice drink. Education also plays a negative role in juice/juice drink expenditure. The more advanced education one consumer received, the relatively less they spent on juice/juice drink in that month.

There were three perception variables, *SaferFruit*, *Paymore* and *Easyfound* that have significant influence on the expenditure. *SaferFruit* implies participants' agreement of statement whether juice/juice drink is safer than other beverages. *Paymore* reflects people's agreement of statement whether they would pay more for orange juice. *Easyfound* indicated people's agreement of whether orange juice is easy found in the market compared with other fruit juice. The result comes as no surprise that people who thought the fruit juice/juice drink was safer than other foods and agreed that they would pay more for orange juice did spend more on the juice/juice drink last month. However, although also very significant, the influence of the variable *Easyfound* turned out to have a very negative effect. People who thought orange juice was easily found in the market, turned out to spend less on average for juice/juice drink in the last month.

The results of regressions of WTP are displayed in Table 5-9 for 10% OJD, in Table 5-10 for 100% FCOJ and in Table 5-11 for NFC. Results in Table 5-9 show that demographics seem to have nearly no significant influence on the WTP for 10% OJD. Income turns out to be the most insignificant variable in this model because it has the lowest P value. This might indicate that the price of 10% OJD in China is relatively low and become most common so that consumers can easily afford it. Hence, income as well as other demographics has no obvious influence on the WTP for 10% OJD since almost every consumer could afford it no matter what their age, income level, education and etc are. On the other hand, knowledge, perception and consumption habits have significant impact on consumer WTP for 10% OJD. Knowledge, which

has a coefficient of about -0.16, has a very strong negative influence on the WTP. Consumer with more knowledge of juice products would rather pay less for the 10% OJD, which makes sense because orange juice drink is actually not very healthy and nutritious. The coefficient of expenditure of orange juice is significant positive at 0.009, which implies that participants who spent one RMB more on juice/juice drinks last month would be willing to pay 0.009 RMB more for 10% OJD. The only perception variable that shows a significant impact on the WTP is *Easymixed*. Participants who thought orange juice was easier to be mixed with other fruit juice tended to pay more for the 10% OJD.

Regarding WTP for 100% FCOJ, results in Table 5-10 show that only gender and juice expenditure of last month have significant positive impacts on consumer WTP for 100% FCOJ. Gender plays a significant role in influencing the WTP for 100% FCOJ. The coefficient of 1.25 of *Male* indicates that males are in average willing to pay about 1.25 RMB (\$0.20) more for 100% FCOJ than females. The juice expenditure of last month has a coefficient of about 0.03 which means that respondents who spent 1 RMB (\$0.16) more on juice products last month are on average willing to pay 0.03 RMB (\$0.005) more for 100% FCOJ.

The last regression model aims to determine the factors that have a significant impact on consumer WTP for 100% NFC orange juice. The results in Table 5-11 show that only gender and juice expenditure of last month have significant positive impacts on consumer WTP for 100% NFC, which is similar to the results of WTP for 100% FCOJ. The coefficient of *Male* is 1.72, which indicates that males are generally willing to pay about 1.72 RMB (\$0.28) more for the 100% NFC orange juice than females. The results also indicate that participants who spent 1 RMB (\$0.16) more on juice products last month would on average be willing to pay 0.022 RMB (\$0.004) more for the 100% NFC orange juice.

Comparing the results across the Table 5-9 to Table 5-11, the results show that although better knowledge of juice and juice products lead to lower WTP for 10% OJD, this knowledge does not transfer to a higher WTP for healthier 100% FCOJ and NFC. Larger juice expenditure is associated with higher WTP for all the three juice products, but in general, juice expenditure has larger impacts on consumer WTP for 100% FCOJ and NFC. In addition, males are willing to pay more for healthier juice products such as 100% FCOJ and NFC, while there is no significant difference in consumer WTP for 10% OJD between males and females. All the results indicate that 10% OJD is a very popular and common product that can be afforded by most Chinese consumers while consumers with more knowledge of juice products start to realize its negative characteristics. However, consumers may still not be able to differentiate the healthy 100% FCOJ and NFC from the unhealthy OJD because better knowledge of juice product is not associated with higher WTP for FCOJ and NFC.

To study the marginal WTP for those three types of orange juice, $\text{MarginalWTP1} = \text{WTP100} - \text{WTP10}$ and $\text{MarginalWTP2} = \text{WTPNFC} - \text{WTP100}$ are adopted and analyzed by regression. The results are in Table 5-12 and Table 5-13. From the results in Table 5-12, the knowledge stands out as the most significant variable that affects the marginal WTP. With the positive sign, it means that the people who have better knowledge of fruit/orange juice would probably have larger gaps between the WTP for 10% OJD and 100% FCOJ. *Male* and *expjuice* are the other two significant variables. Males tender to offer higher marginal price than females. People who spent more on fruit juice last month are likely to have larger gaps between WTP for 10% OJD and 100% FCOJ. In the Table 5-13, only *expjuice* has significant influence on the marginal WTP between WTP for 100% FCOJ and 100% NFC. The slightly negative sign

of the variable indicates that people who spent more on fruit juice last month tender to have smaller gaps between WTP for 100% FCOJ and 100% NFC.

Table 5-1. Sample demographic descriptive statistics

Variable	Variable Description	Sample % (N=993)
Gender	Female	62.4
	Male	37.6
Age	<=25	52.0
	26-40	34.0
	>40	15.0
Kids in family	One	67.0
	Two	17.0
	More than three	16.0
Education	Less than some college	28.5
	Some college	22.4
	College and more	48.2
Employment	Student	38.0
	Full time	41.0
	Others	21.0
Household income (RMB)	Less than 2,500	19.2
	2,500-5,000	19.1
	5,000-7,500	17.1
	7,500-10,000	17.7
	10,000-15,000	11.33
	15,000-20,000	6.85
	20,000-25,000	3.51
	25,000-30,000	2.11
Over 30,000	4.65	

Table 5-2. Statement testing knowledge of fruit juice

Label	Statement
1	Fruit juice must have 100% juice content and no water or other ingredients can be added. (True)
2	Fruit juice can be made from concentrated juice that is reconstituted with water. (True)
3	Fruit juice can have less than 100% percent juice and sweetener and preservative can be added. (False)
4	Fruit juice drinks have less than 100% of juice and ingredients such as sweetener and preservative can be added. (True)
5	Most fruit juice drinks in the market have more than or equal to 10% juice content. (True)

Table 5-3. Statement testing consumers' knowledge of orange juice

Label	Statement
1	NFC Juice: Juice that is squeezed from fresh fruit and packaged in paper cartons, glass or plastic containers without being pasteurized and without additional water or other ingredients being added. (False)
2	Fresh Squeezed Juice: Juice that is processed and pasteurized by flash heating immediately after squeezing the fruit without removing the water content from the juice. (False)
3	Concentrated Juice: Juice that is obtained by removing the water, through evaporation, from the orange juice of fresh, ripe oranges that have been squeezed in extraction machines. (True)
4	Juice Drink: Drink that is made from concentrated juice with water being added. (True)

Table 5-4. Statement testing consumers' perceptions of fruit juice

Label	Statement
1	Fruit juice is healthier than other beverages
2	Fruit juice has more nutritional value than other beverages
3	Fruit juice is safer than other beverages (e.g. more hygienic)
4	Fruit juice tastes better than other beverages
5	I will pay more for fruit juice than for other types of beverages
6	I can easily find fruit juice at the market place

Table 5-5. Statement testing perceptions of orange juice

Label	Statement
1	Orange juice has more nutritional value than other juices
2	Orange juice is safer than other juices (e.g. less pesticide)
3	Orange juice tastes better than other juices
4	I will pay more for orange juice than other types of juice
5	Orange juice is easy to find in the market
6	Orange juice is easy to mix with other juices
7	With careful planning orange juice is a good choice for dieting and weight loss
8	Orange juice can boost energy
9	Orange juice can improve the appearance of my skin
10	Orange juice is less expensive than other juices
11	Orange juice has more brand varieties than other juices

Table 5-6. Result for testing significance of variables

Source	Mean Square	F Value	Pr > F
Numerator	7.821	0.53	0.712
Denominator	14.677		

Table 5-7. Parameter results of regression of consumer knowledge

Variable	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1.975	0.561	3.52	<0.001***
Male	1.391	0.248	5.60	<0.001***
Income	0.104	0.046	2.25	0.025**
FreqOJ ¹	0.124	0.070	1.79	0.074*

Number of Observations Used: n=983.

Adj R-Sq: 0.0343

“*”: Significant at 10% “**”: Significant at 5%

“***”: Significant at 1%

¹ Frequency of consuming orange juice last month

Table 5-8. Parameter results of regression of expenditure on juice/juice drink last month

Variable	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	33.470	15.083	2.22	0.0267**
Male	-12.063	3.751	-3.22	0.0013***
Income	3.069	0.709	4.33	<.0001***
Kids	5.030	1.276	3.94	<.0001***
SaferFru	6.122	2.229	2.75	0.0061***
Paymore	5.137	1.954	2.63	0.0087***
Easyfound	-4.980	2.053	-2.43	0.0155**
EDUC1	5.929	11.933	0.50	0.6194
EDUC2	-1.563	9.610	-0.16	0.8708
EDUC3	-7.169	9.098	-0.79	0.4309
EDUC4	0	.	.	.

Number of Observations Used: n=988.

Adj R-Sq: 0.0667

“*”: Significant at 10% “**”: Significant at 5% “***”: Significant at 1%

Table 5-9. Parameter results of regression of WTP for 10% OJD

Variable	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	4.667	1.247	3.74	<0.001***
Paymore	0.249	0.171	1.46	0.146
Male	-0.439	0.330	-1.33	0.184
Income	-0.031	0.064	-0.50	0.620
Knowledge	-0.160	0.041	-3.86	<0.001***
Expjuice	0.008	0.003	2.82	0.005***
Easymixed	0.398	0.184	2.16	0.031**
EDUC1	-0.889	1.085	-0.82	0.413
EDUC2	-1.518	0.872	-1.74	0.082*
EDUC3	-1.503	0.826	-1.82	0.069*
EDUC4	0	.	.	.

Number of Observations Used: n=948.

Adj R-Sq: 0.0325

“*”: Significant at 10% “**”: Significant at 5% “***”: Significant at 1%

Table 5-10. Parameter results of regression of WTP for 100% FCOJ

Variable	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	4.473	2.302	1.94	0.052
Paymore	0.364	0.316	1.15	0.250
Male	1.361	0.614	2.21	0.027**
Income	-0.081	0.118	-0.69	0.492
Knowledge	0.058	0.077	0.76	0.450
Expjuice	0.030	0.005	5.62	<.0001***
Easymixed	0.059	0.341	0.17	0.862
EDUC1	-2.148	2.003	-1.07	0.284
EDUC2	-2.248	1.595	-1.41	0.159
EDUC3	-1.338	1.507	-0.89	0.375
EDUC4	0	.	.	.

Number of Observations Used: n=960.

Adj R-Sq: 0.0328

“*”: Significant at 10% “**”: Significant at 5% “***”: Significant at 1%

Table 5-11. Parameter results of regression of WTP for 100% NFC

Variable	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	5.211	2.624	1.99	0.047
Paymore	0.302	0.358	0.84	0.399
Male	1.850	0.693	2.67	0.008***
Income	-0.138	0.133	-1.04	0.297
Knowledge	0.011	0.086	0.12	0.903
Expjuice	0.023	0.006	3.85	<0.001***
Easymixed	0.292	0.385	0.76	0.449
EDUC1	-1.723	2.269	-0.76	0.448
EDUC2	-1.155	1.839	-0.63	0.530
EDUC3	-0.316	1.746	-0.18	0.857
EDUC4	0	.	.	.

Number of Observations Used: n=968.

Adj R-Sq: 0.0162

“*”: Significant at 10% “**”: Significant at 5% “***”: Significant at 1%

Table 5-12. Parameter results of regression of marginal WTP between 10% OJD and 100% FCOJ

Variable	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1.438	1.060	1.36	0.175
Paymore	-0.275	0.198	-1.38	0.167
Male	1.009	0.384	2.63	0.009***
Income	0.056	0.072	0.77	0.441
Knowledge	0.232	0.048	4.81	<.001***
Expjuice	0.012	0.003	3.64	<.001***
Easymixed	-0.324	0.215	-1.51	0.131

Number of Observations Used: n=968.

Adj R-Sq: 0.0162

“*”: Significant at 10% “**”: Significant at 5% “***”: Significant at 1%

Table 5-13. Parameter results of regression of marginal WTP between 100% FCOJ and 100% NFC

Variable	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1.762	1.132	1.56	0.120
Paymore	0.003	0.213	0.01	0.990
Male	0.340	0.411	0.83	0.409
Income	-0.077	0.077	-1.00	0.318
Knowledge	0.007	0.052	0.13	0.897
Expjuice	-0.010	0.004	-2.86	0.0044***
Easymixed	0.218	0.229	0.95	0.343

Number of Observations Used: n=968.

Adj R-Sq: 0.0162

“*”: Significant at 10% “**”: Significant at 5%

“***”: Significant at 1%

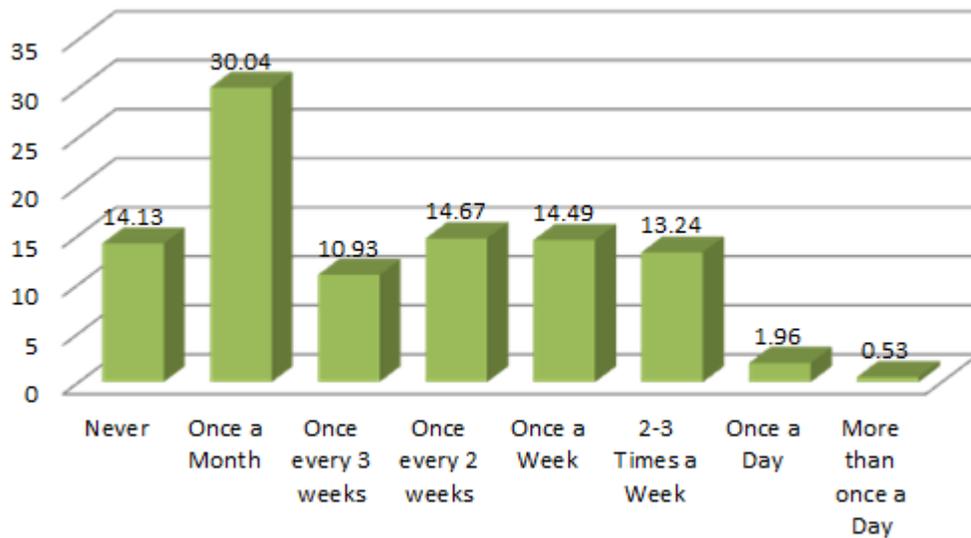


Figure 5-1. Frequency of consuming orange juice last month (percentage)

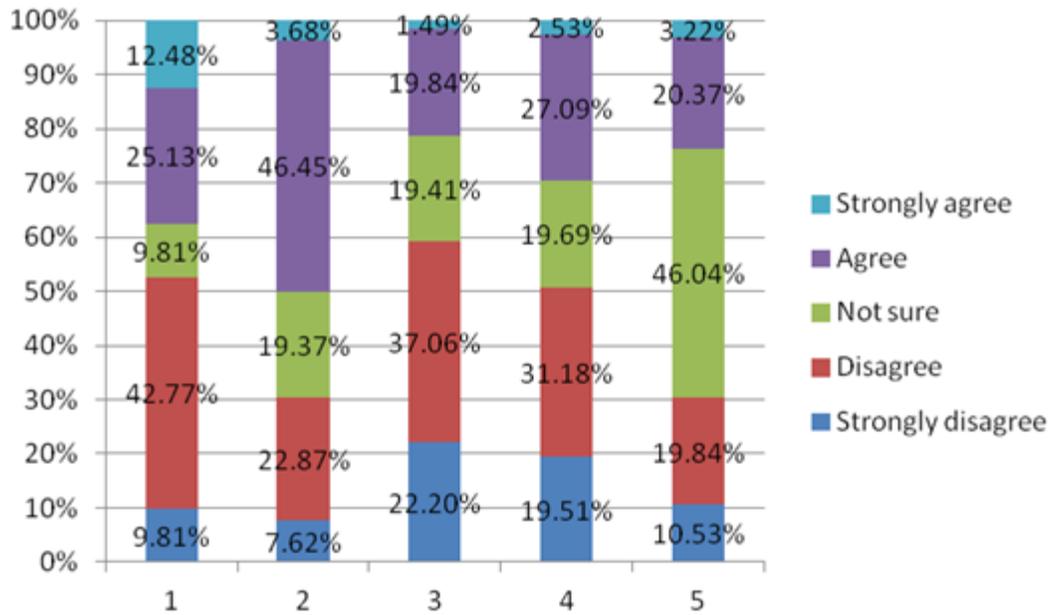


Figure 5-2. Basic knowledge of fruit juice

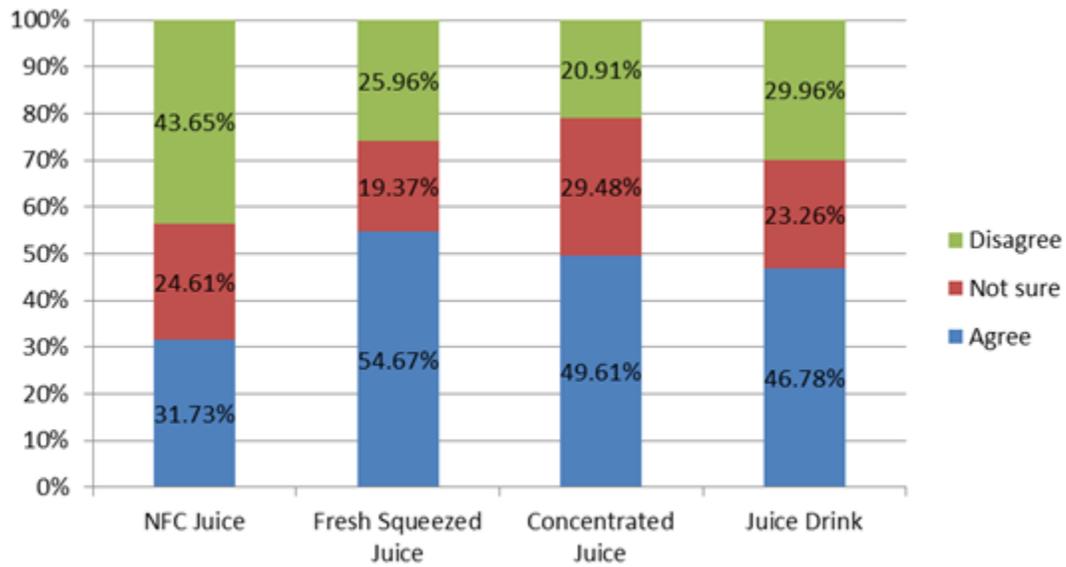


Figure 5-3. Basic knowledge of definition of different types of orange juice

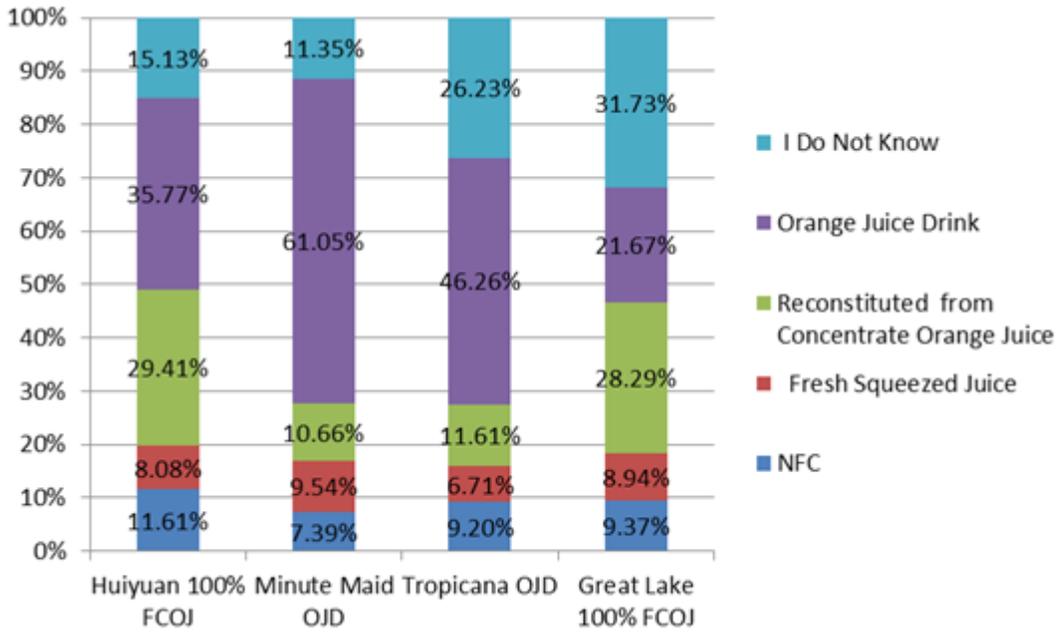


Figure 5-4. Answers of recognition of orange juice

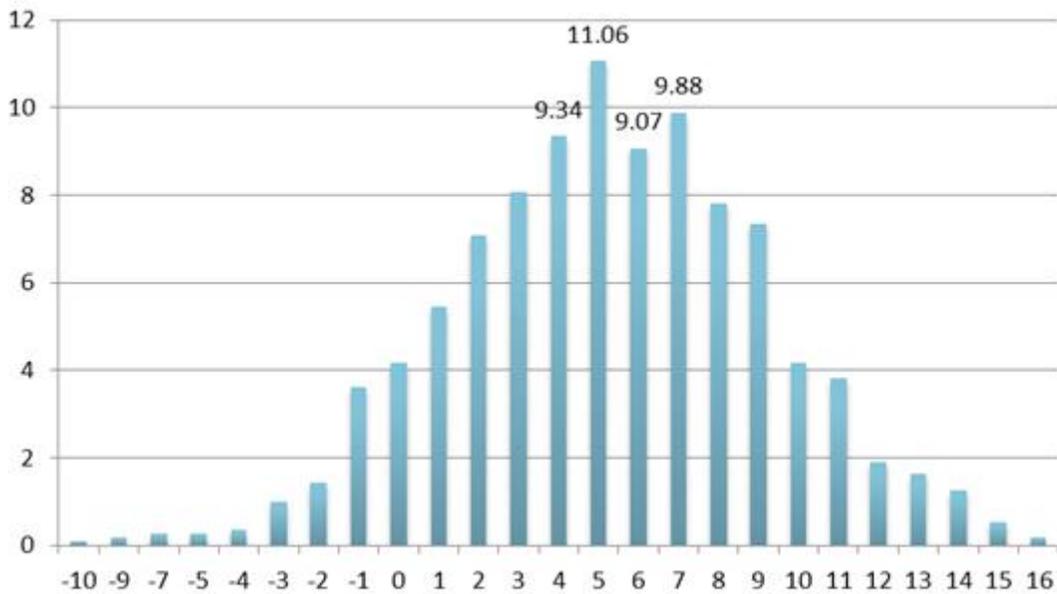


Figure 5-5. Distribution of index of knowledge

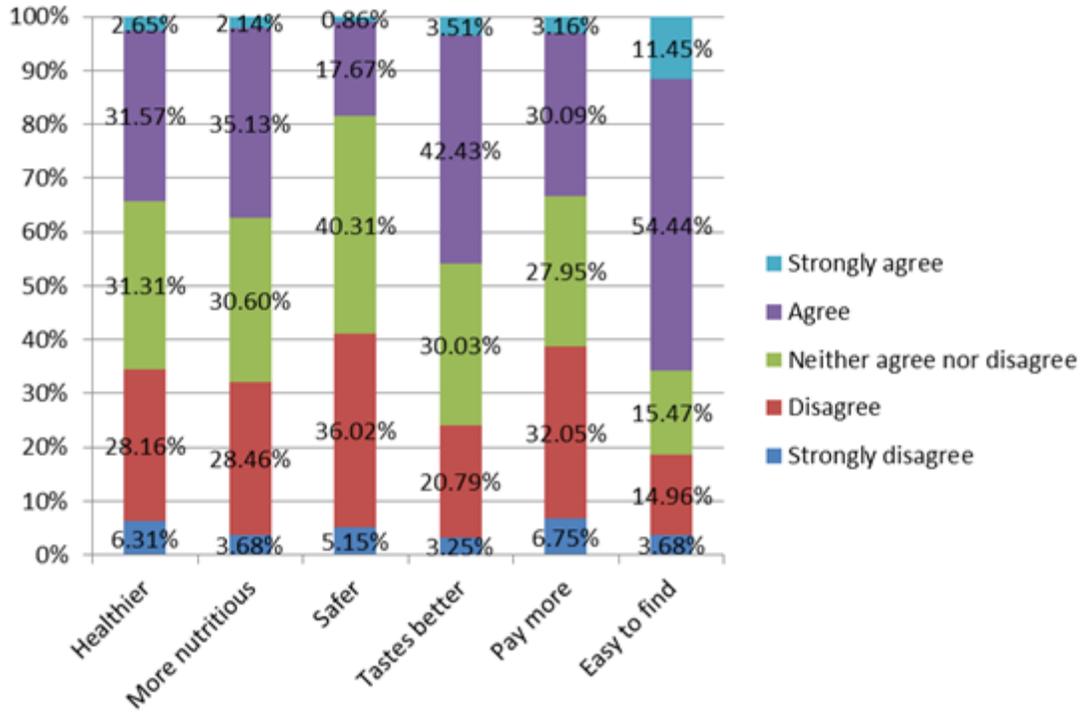


Figure 5-6. Perceptions of fruit juice

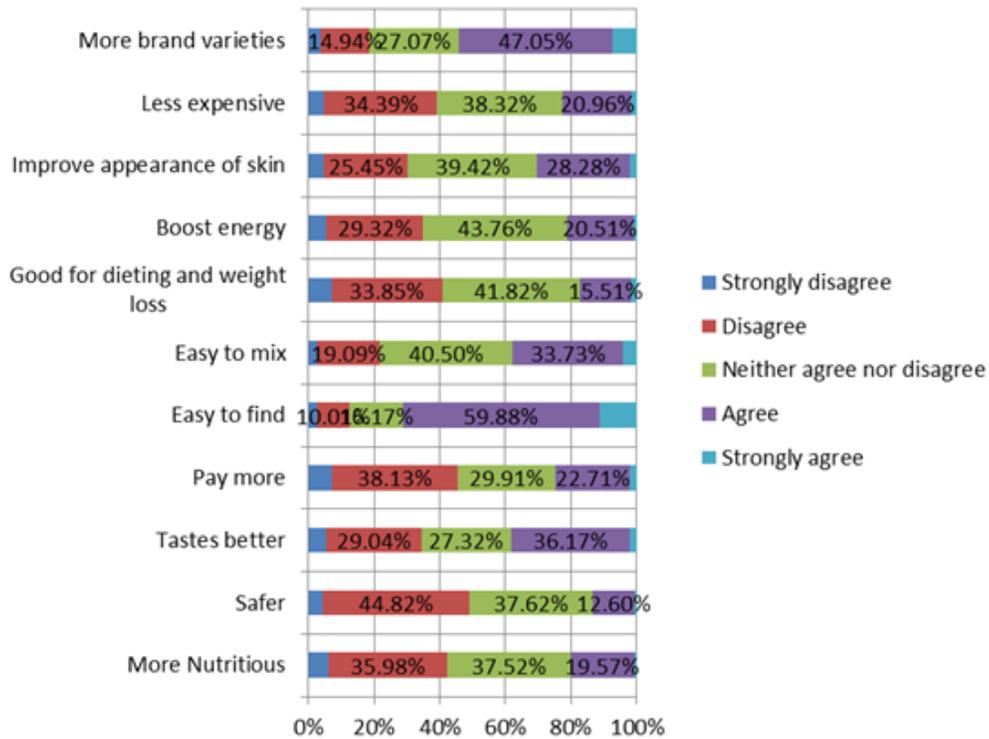


Figure 5-7. Perceptions of orange juice

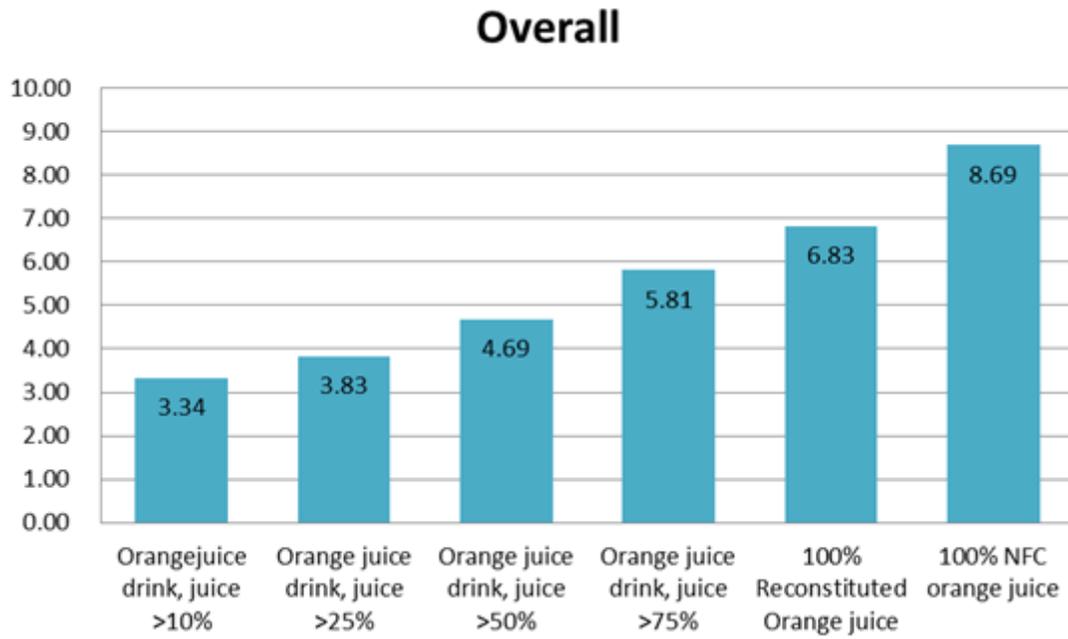


Figure 5-8. Average WTP for each type of orange juice (RMB)



- NFC
- Fresh Squeezed Juice
- Reconstituted Juice from Concentrate
- Fruit Juice Drink
- I Do Not Know



- NFC
- Fresh Squeezed Juice
- Reconstituted Juice from Concentrate
- Fruit Juice Drink
- I Do Not Know



- NFC
- Fresh Squeezed Juice
- Reconstituted Juice from Concentrate
- Fruit Juice Drink
- I Do Not Know



- NFC
- Fresh Squeezed Juice
- Reconstituted Juice from Concentrate
- Fruit Juice Drink
- I Do Not Know

Figure 5-9. Recognition of orange juice

CHAPTER 6 CONCLUSION

This study investigates Chinese consumer preferences for western food through a case study on consumer knowledge, perception and WTP for different types of orange juice products. As the characteristics in knowledge, perceptions, and consumption patterns become diverse, the demand and consumers willingness to pay for orange juice in China will be significantly different, and thus lead to a great difference in the consumption of orange juice. The results in this study show that Chinese consumers' knowledge of juice products is relatively low and is largely influenced by gender, income and frequency of consuming juice products. Males, high-income consumers and those who purchased juice products more frequently generally have better knowledge of juice. It is not surprising that richer people and people who purchased juice more frequently have more chance to obtain the information on different types of juice products. Regarding the expenditure on juice products, it is obvious that young females with relatively lower education tend to spend more on juice and juice products. In addition, consumers with higher income, more kids in the family, and those who agree to pay more for orange juice and those think fruit juice is safer than other kinds of beverages would also spent more on juice and juice products. The results are reasonable because Chinese orange juice market is currently made up mainly of juice drink, one type of juice product with added sugar and other ingredients. Consumers with higher education levels may have other better alternative beverages to substitute for juice drinks. In addition, these results also reflect the fact that the major consumers of juice drinks are youth and children, who just use the juice drinks as an alternative of water, with the idea that the juice drinks are at least better than water because they at least have some "juice" in the product. Interestingly, consumers who thought orange juice were easily found in the market

spend less on juice products, which indicates that all brands of different orange juice may hold consumers back from purchasing more juice products.

The results of consumer WTP for 10% OJD, 100% FCOJ and NFC reflect the dynamic nature of the current juice product market. On one hand, more knowledge of juice products is associated with smaller WTP for 10% OJD, which is in fact a less healthy juice product. On the other hand, Chinese consumers may still be confused with different types of juice products, because more knowledge does not result in high WTP for 100% FCOJ and NFC, which is healthy and used as the major resource of vitamins in some western developed countries. From a marketing perspective, it is very difficult to differentiate the market of 10% OJD by demographics, because Chinese consumers are very familiar with these types of juice product and it is a low price and low-end product. Increasing sales of this type of products depends on the growth in the total expenditure on all juice products and thus should focus on the expansion in the second or third tier cities or rural sides of China. In addition, the producers of all types of juice products should target consumers that normally spend more on juice products. The producers of 100% FCOJ and NFC should pay particular attention to those consumers because juice expenditure has a much larger impact on consumer WTP for 100% FCOJ and NFC. In addition, males also should be targeted as future consumers of 100% FCOJ and NFC because they are more likely to spend more money on these types of juice products

The major focus of this research is basically focused on knowledge, perception and WTP for orange juice. Although the some results of the study like consumers WTP for orange juice do not have enough significant variables, there still might be some appealing implications to both the industries and academics.

This study might be useful to the world food exporters and juice makers such like the Florida citrus industries who are interested in the Chinese market. It has been proven by the historical data that the Chinese market is a potential market for western food and new types of orange juice. For western food industries, to provide Chinese consumers with the safe foods and service is very important. To indicate whether there is a potential market of NFC orange juice in China, the actual market price and consumers' WTP are compared. The Chinese consumers' current WTP for 100% NFC orange juice is averagely 9.21 RMB (\$1.48) for a volume of 450mL while the actual price from 15 RMB (\$2.41) to 20 RMB (\$3.22) for the same volume. Although the Chinese consumers' WTP already exceeds the average market price of NFC in the United States, which is \$0.85 for the same volume, the market price in China still highly exceeds consumers' willingness to pay. Unless the orange juice producers and exporters could eventually lower the market price of NFC in China as low as that in the United States or at least lower than the consumers' WTP, there is little possibility to open the market for 100% NFC under current Chinese consumers' knowledge, perception and level of WTP. Considering the current level of consumers' WTP and actual high market price of NFC due to high production cost, NFC is not as competitive as 10% OJD in current Chinese market. To exploit the market of 100% NFC juice in China in the future, besides to lower the market price by cutting down the cost, more attention is also suggested to placed on males who spend more on fruit juice/juice drinks. A few more studies are also needed to provide base for sales strategies. One drawback of current research is that it did not take the market conditions into consideration, such as the price effect of pre-existing orange juice (OJD and 100% FCOJ) on the relatively new coming orange juice (100% NFC) in China. Since the current market is most made up of OJD, and it is quite cheap compared with 100% NFC due to the lower juice contents, the cross-price effect should have a significant

effect on consumers WTP for 100% NFC. Future research might adopt contingent valuation to study this cross-price effect. In addition, to provide the industry with more current information of Chinese citrus market, attributes that consumers consider important should also be investigated and summarized. It would be also interesting to adopt choice experiments to specifically study consumers WTP for orange juice with different attributes.

This study might be also useful for further research on consumers' behavior on western food and orange juice in China. For instance, the western brand effect might be an interesting topic to study. In order to evaluate the western brand effect the WTP for both western brands such like Minute Maid and domestic brands such like Huiyuan might to be estimated and compared.

LIST OF REFERENCES

- Abbott, J. C. (1990). Supply and Marketing Organization for Agricultural Processing in the Developing Countries. *Journal of International Food & Agribusiness Marketing*, 1(3-4), 31-43.
- Bhandari, R., & Smith, F. J. (2000). Education and food consumption patterns in China: household analysis and policy implications. *Journal of Nutrition Education*, 32(4), 214-224.
- Block, G., Dresser, C. M., Hartman, A. M., & Carroll, M. D. (1985). Nutrient sources in the American diet: quantitative data from the NHANES II survey I. Vitamins and minerals. *American Journal of Epidemiology*, 122(1), 13-26.
- Brown, Mark, Lee, Jonq-Ying. "Coupon Redemption and the Demand for Frozen Concentrated Orange Juice: A Switching Regression Analysis." *American Agricultural Economics Association* (1985): 647-653.
- Brown, M. G., & Lee, J. Y. (1999). Health and Nutrition Advertising Impacts on the Demand for Orange Juice in Fifty Metropolitan Regions. *Journal of Food Products Marketing*, 5(3), 31-47.
- Curtis, K. R., McCluskey, J. J., & Wahl, T. I. (2007). Consumer preferences for western-style convenience foods in China. *China Economic Review*, 18(1), 1-14.
- Davis, A., Gunderson, M. A., Brown, M. G., & House, L. (2008). The Effect Demographics Have On The Demand For Orange Juice. In *2008 Annual Meeting, February 2-6, 2008, Dallas, Texas* (No. 6794). Southern Agricultural Economics Association.
- Dooley, R., Eales, J., & Binkley, J. (2000). The Demand for Nutritionally-Enhanced Varieties and Implications for Food Product Competition: The Case of Orange Juice. In *2000 Annual meeting, July 30-August 2, Tampa, FL* (No. 21802). American Agricultural Economics Association (New Name 2008: Agricultural and Applied Economics Association).
- Fan, S., & Agcaoili-Sombilla, M. (1997). Why projections on China's future food supply and demand differ. *The Australian Journal of Agriculture and Resource Economics*, 41(2), 169-190.
- Global Agricultural Information Network [Internet]. Citrus Annual. Washington: USDA Foreign Agricultural Service (US); [updated 2012 Dec 17; cited 2013 May]. Available from: http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Citrus%20Annual_Beijing_China%20-%20Peoples%20Republic%20of_12-17-2012.pdf.
- Granato, D., Branco, G. F., Nazzaro, F., Cruz, A. G., & Faria, J. A. (2010). Functional foods and nondairy probiotic food development: trends, concepts, and products. *Comprehensive Reviews in Food Science and Food Safety*, 9(3), 292-302.

- Guo, Z., Mroz, T. A., Popkin, B. M., & Zhai, F. (2000). Structural change in the impact of income on food consumption in China, 1989–1993. *Economic Development and Cultural Change*, 48(4), 737–760.
- Hu, J., Duval, Y. L., & Wahl, T. I. (2003). An analysis of household food consumption of Chinese expatriates in the US: implications for future food consumption in China. *Journal of Food and Produce Marketing*, 1, 41-47.
- International Agricultural Trade Service [Internet]. China Emerges as the Second Largest U.S. Agricultural Export Market. Washington: USDA Foreign Agricultural Service (US); [updated 2010 Dec 20; cited 2013 May]. Available from: <http://www.fas.usda.gov/China%20Import122010.pdf>.
- International Agricultural Trade Service [Internet]. Orange Juice: Production, Supply and Distribution in Selected Countries. Washington: USDA Foreign Agricultural Service (US); [updated 2013 Jan 24; cited 2013 May]. Available from: <http://www.fas.usda.gov/psdonline/psdReport.aspx?hidReportRetrievalName=Orange+Juice%3a+Production%2c+Supply+and+Distribution+in+Selected+Countries+++++++&hidReportRetrievalID=2181&hidReportRetrievalTemplateID=8>.
- Jussaume Jr, R. A. (2001). Factors associated with modern urban Chinese food consumption patterns. *Journal of Contemporary China*, 10(27), 219-232.
- Kinnucan, H. W., Miao, Y., Xiao, H., & Kaiser, H. M. (2001). Effects of advertising on US non-alcoholic beverage demand: Evidence from a two-stage Rotterdam model. *Advances in Applied Microeconomics*, 10, 1-29.
- Kohls, R. L., & Uhl, J. N. (1990). *Marketing of agricultural products* (No. Ed. 7). Macmillan publishing company.
- Marr, J., & Hatfield, A. (2001). Shanghai snack market geared to young buyers: USDA-FAS. Available online at <http://www.fas.usda.gov>.
- Morrison, W. M. (2009, December). China's economic conditions. LIBRARY OF CONGRESS WASHINGTON DC CONGRESSIONAL RESEARCH SERVICE.
- Pollack, S. L. (2001). Consumer demand for fruit and vegetables: the US example. *Changing Structure of Global Food Consumption and Trade*, 6, 49-54.
- Pollack, S. L., Lin, B. H., & Allshouse, J. E. (2003). *Characteristics of US orange consumption*. US Department of Agriculture, Economic Research Service.
- Shono, C., Suzuki, N., & Kaiser, H. M. (2000). Will China's diet follow western diets?. *Agribusiness*, 16(3), 271-279.
- Sklair, L. (1994). In C. J. ShultzII, R. W. Belk, & G. Ger (Eds.), *The culture-idealogy of consumerism in urban China*:

Some findings from a survey in Shanghai, research in consumer behavior, Vol. 7. Greenwich, CT: JAI.

Tacconelli, W., & Wrigley, N. (2009). Organizational Challenges and Strategic Responses of Retail TNCs in Post - WTO - Entry China. *Economic Geography*, 85(1), 49-73.

Veeck, A., & Veeck, G. (2000). Consumer segmentation and changing food purchase patterns in Nanjing, PRC. *World Development*, 28(3), 457-471.

Watson, J. (Ed.). (2006). *Golden arches east: McDonald's in East Asia*. Stanford University Press.

Zheng, Y., & Kaiser, H. M. (2008). Advertising and US nonalcoholic beverage demand. *Agricultural and Resource Economics Review*, 37(2), 147-159.

BIOGRAPHICAL SKETCH

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