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## **Opportunities for Western Food Products in China: The Case of Orange Juice Demand**

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# **Opportunities for Western Food Products in China: The Case of Orange Juice Demand**

Xuqi Chen, Zhifeng Gao, and Lisa House

**Abstract** The rapid income per capita of Chinese consumers and increasing demand for nearly all agricultural products have attracted western food industries to focus on this booming and huge market. This research investigated the perspectives of western food products in China's market, with focus on one representative western food-orange juice, by studying the Chinese consumer knowledge, perceptions, and willingness to pay (WTP) for different types of orange juice products. Though the Chinese consumers' willingness to pay for 100% juice exceeded the 10% juice as expected, it would not have been persuasive to conclude meaningful to develop the 100% juice market in China unless the WTP is around the actual market price.

**Key words:** Western food products, orange juice, demand, attitude, willingness to pay.

## **Introduction**

With a huge population of over one billion and a rapidly growing economy, the People's Republic of China offers great opportunities for western food. The increasing purchase power and China's population indicate 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 food companies convenient access (Tacconelli et al. 2009).

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 American-made agricultural products (International Agricultural Trade Service, 2010). Demand for food products in China is not only growing, but it is evolving. One obvious change is that Chinese people are

consuming more high-fat foods like dairy, 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 fast food restaurants and pre-prepared food like pizza from supermarket (Veeck & Veeck, 2000). Fast food chains such like McDonalds, KFC and Pizza Hut that serve western-style convenience foods have successfully opened their market in China. For instance, as of 2012, KFC, the most popular western fast food chain in China, and now has over 3,000 locations in China. Even Pizza Hut, which entered the Chinese market the latest among those three, now has over 560 locations. The increasing opening and success of those restaurants indicted great changes have occurred in Chinese consumers' consumption patterns and life-styles, which might bring some new opportunities to the western fast food industry (Bhandari & Smith, 2000).

Other changes in food consumption are being seen in China. For instance, although China is still the world's largest consumer of fresh oranges, the pattern is changing., Consumption of orange juice in China has increased by 42.86% from 2007 to 2012, while the consumption of fresh orange only increased by 21.72% in this period. Despite the fast increase in orange juice consumption, the annual consumption per capita in China is only 10.1 liters, much lower than Russia (20.1 liters per person) and the United States (30.3 liters per person). Even so, among all the fruit juices in China, orange juice continues to lead in market share (though this share has decreased from 57% in 2008 to 47.2% in 2011) (Global Agricultural Information Network, 2012).

The increasing consumption of western food in China is likely to be the result of a combination of factors, for example, increasing income, changes in lifestyle, convenient access to a variety of brand options (Abbott 1990). Orange juice is an example of a food or beverage whose demand may be impacted by these types of factors. Increases in income, changes in lifestyle (move to more convenience in food), interest in replacing less healthy drinks (i.e. soft drinks) with healthier drinks (Granato et al. 2010), and the popularity of western foods may all lead to increased opportunities for orange juice in the Chinese market. Production of frozen concentrated (FCOJ) and not from concentrate (NFC) orange juice 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 were still inadequate to meet the nation's demand for orange juice, especially FCOJ, which accounted for about 75% of total juice consumption (116,000 Metric Tons at 65 Degrees Brix) in China (International Agricultural Trade Service 2013). As a result, China's juice market depends largely on imports. Orange juice companies were expected to source more imported FCOJ to accommodate the escalating demand for juice and juice beverages in China.

With such large imports, and the potential for growth, countries that produce orange juice, such as the United States and Brazil, might see China as an attractive market. To be successful as exporters to China, exporters would need to understand what type of products is preferred by Chinese consumers.

One point of differentiation in orange juice is the way it is produced. Orange juice products are typically classified into four groups: fresh squeezed orange juice (FSOJ), NFC,

FCOJ, and orange juice drinks with less than 100% juice (OJD<sup>1</sup>). Although consumers may or may not know the difference between these products, production and shipping cost differ significantly. For example, in the United States, NFC orange juice has gained an increasing share of the market in recent years. However, exporting NFC incurs higher production and shipping costs compared to FCOJ. The higher quality of NFC leads to higher demand for the product in higher income countries and regions such as the United States, European Union, Japan and Canada (Figure 1). Although there may be a market for NFC in China, it may also be the case that income, though rising, is not at the point to create demand for NFC compared to FCOJ. For exporters to be successful, a better understanding of Chinese consumers' current knowledge, attitude and WTP for those different types of orange juice products is needed. The objective of the study is to investigate consumers' knowledge, perception and WTP for different types of orange juice in China.

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<sup>1</sup> 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.

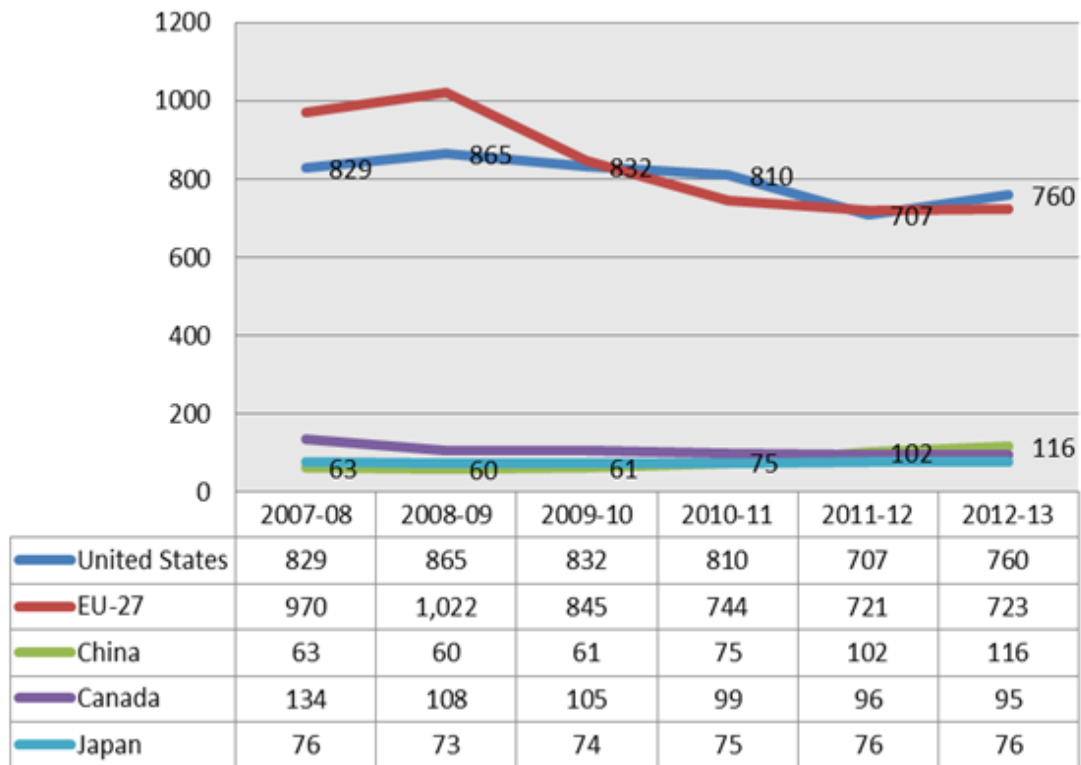


Figure 1. Total orange juice consumption of major countries (Unit: 1,000 metric tons at 65 degrees brix)

### Previous Research on Western Food in China

A number of studies have investigated preference for Western foods in China. Veeck and Veeck (2000) used survey data of 150 household primary shoppers in Nanjing, China collected in 1993 and found three clusters of shopper types. One, which was mostly younger, single, primarily male adults with above average incomes, purchased more convenience foods than the other two groups.

Sklair (1994) and Watson (2006) argued that the trend for western convenience food is the combined result of both increased incomes and the easy access to a larger variety of food options. They also pointed to social atmosphere as another reason. More specifically, western

food and culture were “in fashion” because Chinese consumers viewed foreign brands as symbols of social status and an indicator of “modern” life.

After Sklair’s (1994) analysis of the symbolic meaning of imported brands in China, Jussaume (2001) conducted a study of 542 households in Qingdao, China to study the household food consumption patterns. In this study, Jussaume divided the sample into two categories: modern and traditional, according to their consumption pattern of meat and fresh fruits (using the assumption that meat and fresh fruits were modern and superior foods in China at that time). They found people with higher income were more likely to buy both a higher percent of meat and higher quality fresh fruits. Consistent with this conclusion, Bhandari and Smith (2000) also concluded that there was a significant relation between income and consumption patterns. Both 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 in China.

Marr and Hatfield (2001) conducted a survey in Shanghai and concluded that brand loyalty was also 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.

Curtis et al. (2007) investigated the consumer preference for western-style convenience foods through a survey of 599 consumers in Beijing, China. The study focused on three kinds of representative western-style convenience food: french fries, potato chips and mashed



potatoes. The results showed that significant factors that influenced french fry 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 perception on taste superiority of western foods leads to the increased consumption of all three potato products.

In summary, the growth of Western food in China can be attributed to convenience, as well as factors related to the image of consuming this type of food and demographics.

### **Previous Research on Demand for Orange Juice**

Factors influencing people's demand for orange juice has been investigated extensively, though largely in the United States. For example, Davis et al. (2008) used the ACNielsen data to determine the impact of demographics on consumer demand for orange juice, concluding that income, price of orange juice and substitutes were significant factors. Some demographics were significant, such as ethnicity.

Other studies have focused on the impact of advertising on the demand for orange juice. Kinnucan et al. (2001) found juice advertising had the largest influence within the nonalcoholic beverage group compared with other beverages. However, a study conducted by Zheng & Kaiser (2008) found the opposite. They concluded that advertising positively affects demand for milk, soft drinks, and coffee/tea, but not for juice or bottled water. Zheng & Kaiser also concluded that local customs and culture that may affect beverage demand. For

instance, they found the focus of fitness and healthy eating was one of the reasons that NFC is the most popular orange juice in the United States (Zheng & Kaiser 2008).

This study will add to the literature by considering factors that influence orange juice demand, as well as those that influence consumption of western foods in China.

## **Data and Methods**

A qualitative study of consumers' attitudes towards different types of orange juice was conducted 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.

In the survey, each participant was asked thirty-five questions regarding their knowledge, preferences, attitudes and WTP for different types of orange juices, 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 second part of the survey asked

participants' agreement/disagreement with 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 currently a very popular type of orange juice product; FCOJ is gaining in popularity due to its high percentage of juice content; and NFC is very new with very small market share. The basic summary of sample demographics is shown in Table 1.

Table 1. Sample demographic descriptive statistics

Variable	Variable Description	Sample % (N=993)
Gender	Female	62.4
	Male	37.6
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
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

### Model Specification

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:

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

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

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

Where

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

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

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

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, respectively; and WTP is consumer stated willingness to pay for corresponding types of orange juice products;  $\varepsilon_i$  is unobservable random component. For WTP (equation 3),

models are estimated for OJD 10%, FCOJ and NFC because these three products are the major types of orange juice products existing currently in the Chinese market.

## **Results**

### *Demographics of Respondents*

A total of 980 respondents were included in the final statistical analysis. The results show that 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. About 93% of the respondents 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 respondents. Most of the respondents had a monthly household income ranging from 2,500 RMB (\$401.5) to 15,000 RMB (\$2409). The medium income in the survey fell in the range from 5,000 RMB (\$804) to 7,000 RMB (\$1126), which seemed higher compared to the national average 2,679.5 RMB (\$430.33). This is plausible because three of the cities (Beijing, Shanghai and Shenzhen) in the survey are the first-tier cities in China with the highest living standard. 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 2.

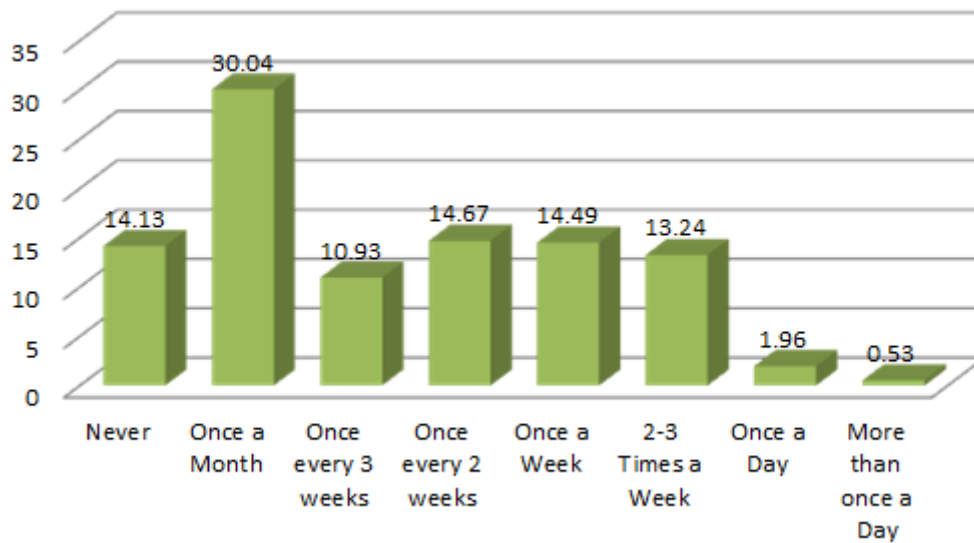


Figure 2. Frequency of consuming orange juice last month (percentage)

#### *Consumer Knowledge of Orange Juice*

Most respondents (86.49%) agreed that there is difference between fruit juice and fruit juice drink. Chinese consumers' knowledge of fruit juice was determined by asking their agreement/disagreement with the statements listed in Figure 3, as well as results. 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. Half of the consumers (50.69%) did not agree with the correct statement that juice drinks could be made by adding ingredients such as sweeteners and preservatives. Interestingly, about 46.04% of the respondents were not even sure whether most fruit juice drinks in the market had more than 10% juice content or not, although 10% OJD is currently very popular in Chinese market. These results indicate that Chinese consumers' knowledge of fruit juice is still rather limited. Despite their desire to drink healthily, they probably have little knowledge to determine which juice is healthier.

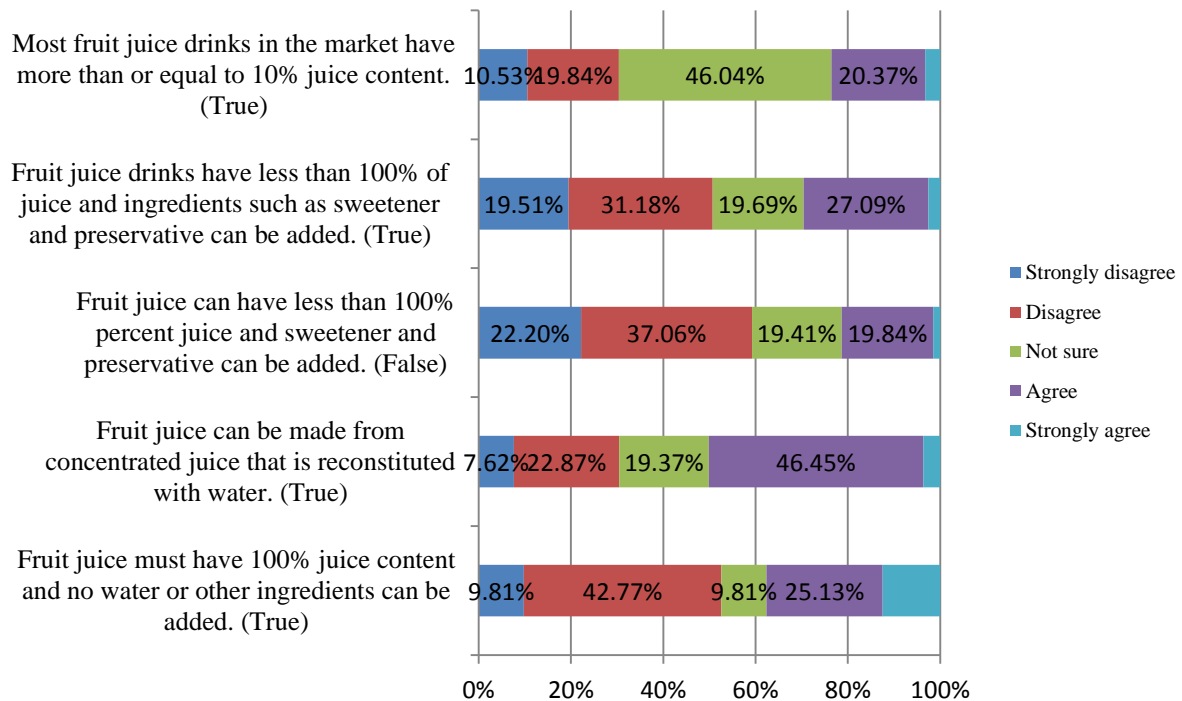


Figure 3. Basic knowledge of fruit juice

Consumers' knowledge of different types of orange juice products was also tested by asking whether they thought the four definitions listed in Figure 4 were true or false. The survey was designed to present incorrect definitions of NFC and fresh squeezed juice and correct definitions of concentrate juice and juice drinks. Many respondents (54.67% and 31.73%) mistakenly agreed with the incorrect definition of fresh squeezed juice and NFC juice, respectively (Figure 4). For each of the four juice products, around 20% to 30% of respondents were uncertain about the definitions provided in the survey (Figure 4).

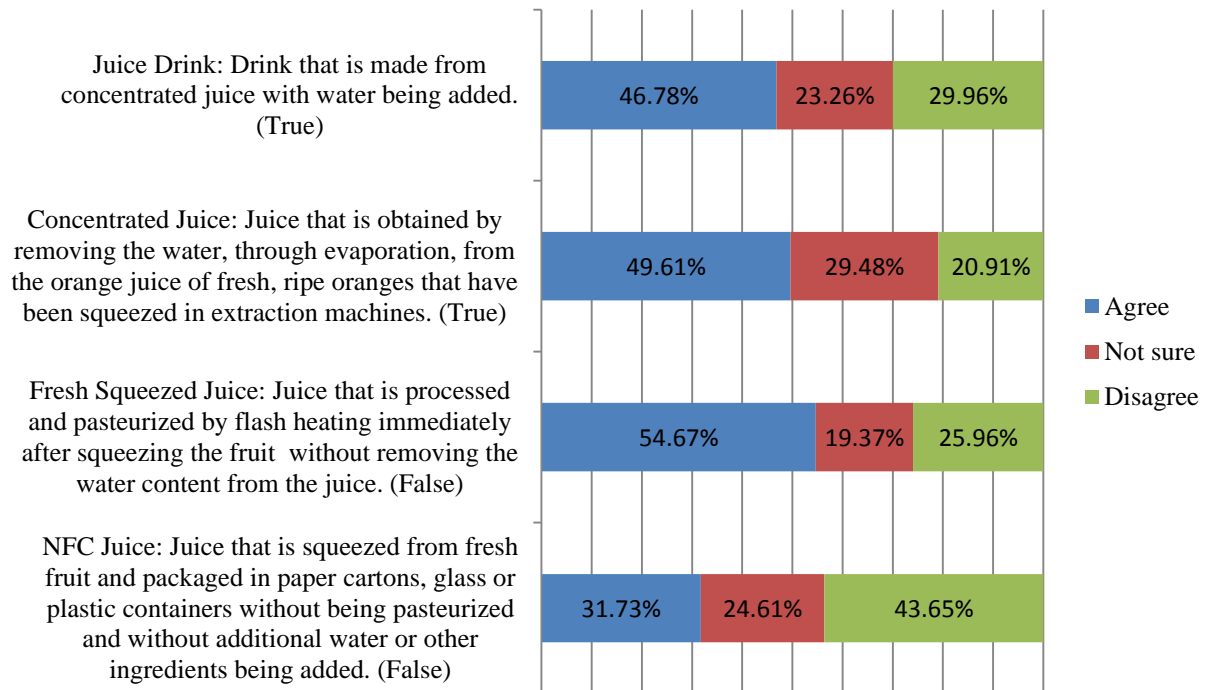


Figure 4. Basic knowledge of definition of different types of orange juice

The ability to recognize different kinds of orange juice products was tested by asking respondents to identify several juice products that were available in the market. Images of four popular orange juice products in China were presented to respondents. For each product, respondents were asked to choose among *NFC*, *Fresh Squeezed*, *From Concentrate*, *Juice Drink*, and *I don't know*, to indicate which category they thought the product belonged to.

The results show that about 29.41% and 28.29% of respondents correctly identified the two frozen concentrate juices, while 61.05% and 46.26% correctly identified the two orange juice drinks. This verifies that Chinese consumers are more familiar with the more commonly seen *OJD* than with 100% *FCOJ*.

An weighted index was created using the set of questions on definitions of orange juice types, recognition of orange juice brands, and a single question, “do you think fruit juice and fruit juice drink are the same” to represent consumer “knowledge” of fruit and orange juice.



Different weights were assigned to different questions according to their difficulty (score of 2 for easier questions and 1 for difficult questions). Positive values were given for correct answers, negative for incorrect, and 0 for “don’t know,” creating a maximum possible score is 20 (if answered all the questions correctly), and a minimum of -20 (if a respondent answered all questions wrong). The distribution of this knowledge index is shown in Figure 5. After adopting the Anderson-Darling test, the knowledge index was concluded not normally distributed.

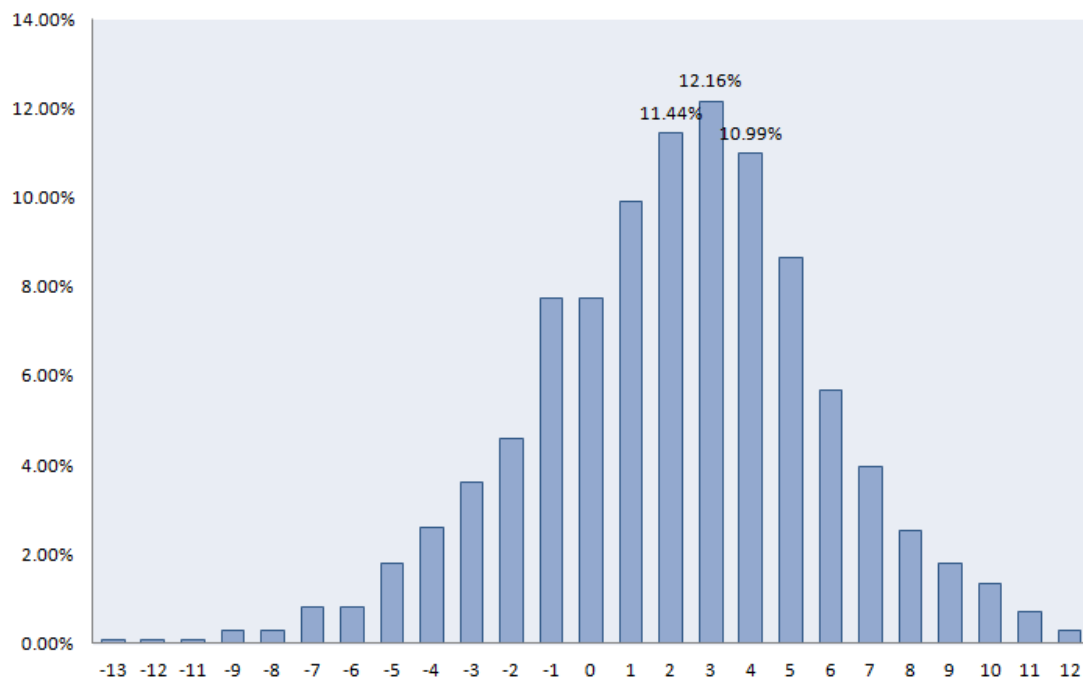


Figure 5. Distribution of index of knowledge

### *Consumer Perception and Attitudes toward Orange Juice*

Respondents were asked about their agreement/disagreement with the statements related to juice perceptions (shown in Figure 6). Over 30% of the respondents at least agreed that fruit juice is healthier and more nutritious than other types of beverages (Figure 6). About half of the respondents at least agreed that fruit juice tastes better and can be easily found in

the market. However, about 40% of the respondents at least disagreed that fruit juice is 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 turn their positive attitudes into purchases. Like some other food products in China, fruit juice products are also subject to the problem of consumers' insufficient confidence in food safety.

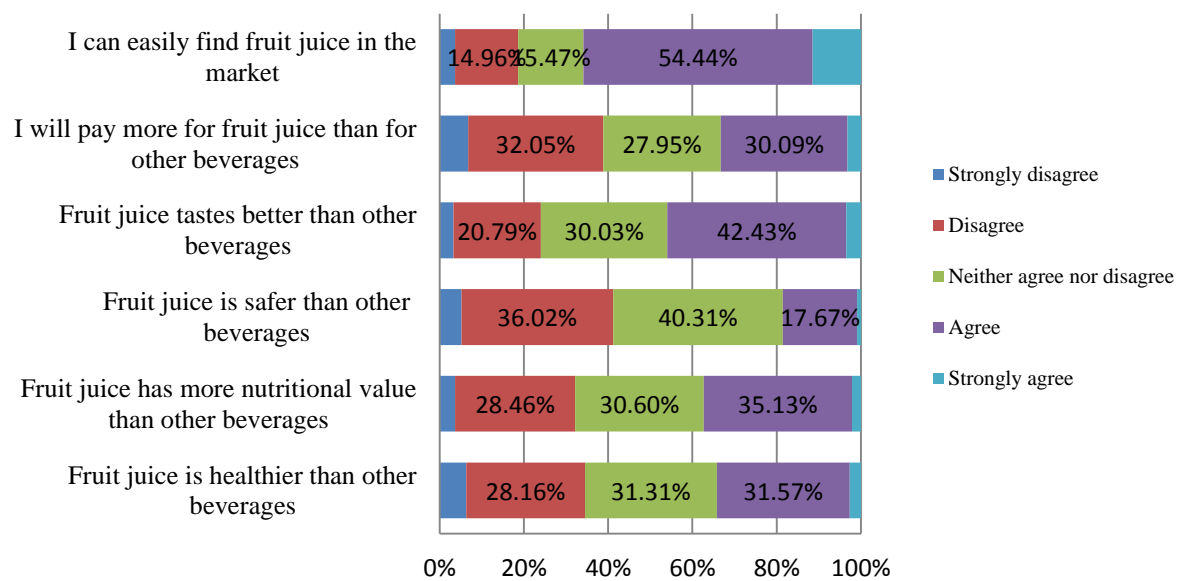


Figure 6. Perceptions of fruit juice

Consumers' perception of orange juice was determined by asking about their agreement/disagreement with a second set of statements specifically about orange juice (Figure 7). The data showed that over 41% of the respondents at least disagreed with the claim that orange juice has more nutritional value than other fruit juice, and over 80% of the respondents disagreed or were not sure whether orange juice is safer than other juices or not. A minority of the respondents (about 20%) agreed that orange juice is a good choice for diet and can boost energy and 30% at least agreed that orange juice can improve the appearance

of skin. About 54.31% of the respondents at least agreed there are more brands of orange juice than other kinds of fruit juice and over 70% agreed that it is quite easy to find orange juice in the market. In addition, about 25% of the respondents indicated they would pay more for orange juice than other fruit juice (Figure 7). The results indicate that Chinese consumers considered orange juice and other fruit juice almost equivalent when regarding safety, nutrition and taste.

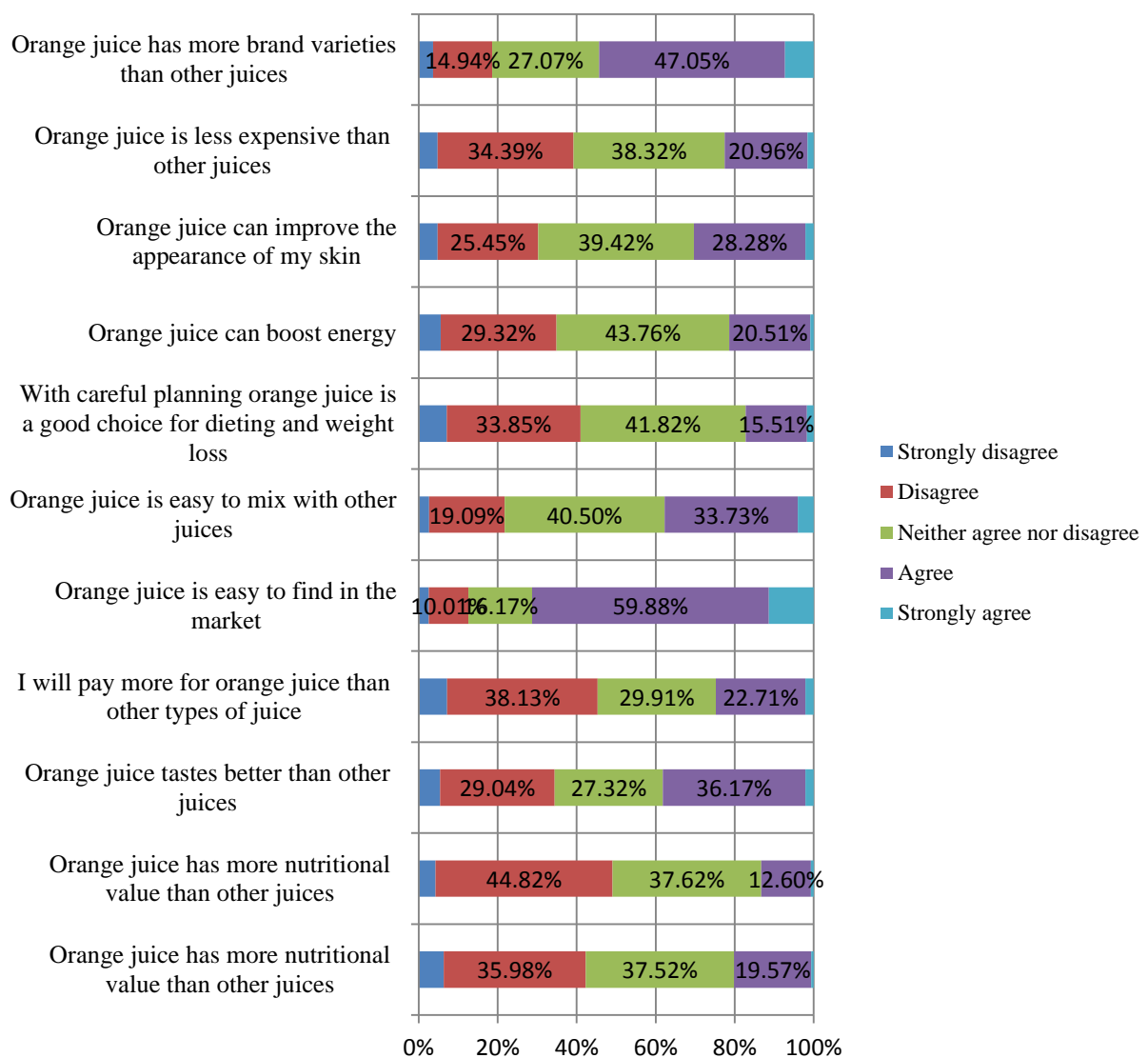


Figure 7. Perceptions of orange juice

### *WTP for Different Kinds of Orange Juice*

Consumers were asked about the prices they were willing to pay for 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 current Chinese market. Overall, the WTP (Figure 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 8).

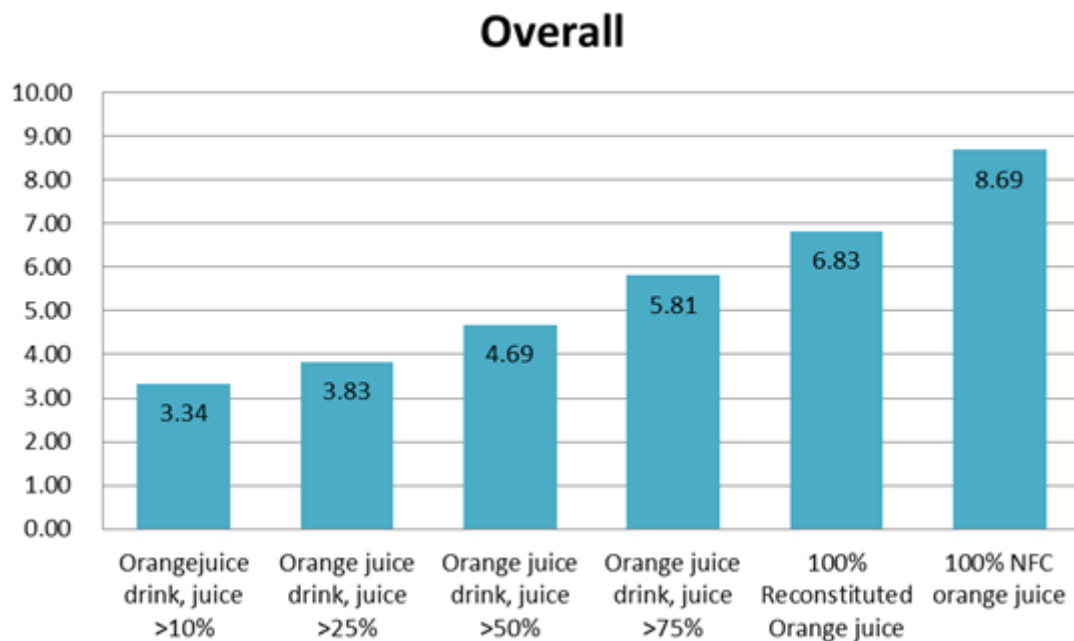


Figure 8. Average WTP for each type of orange juice (RMB)

### *Factor Affecting Consumer Knowledge, Expenditure on Orange Juice and WTP*

Statistical Analysis Software (SAS) was used to analyze equations 1-3 results are reported in Tables 2, 3, and 4.

Results for the model with knowledge as the dependent variable are shown in Table 2. The results indicate that knowledge is significantly affected by Gender, Income and frequency of consumption of orange juice.

Table 2. 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 <sup>2</sup>	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%

The positive and significant coefficient for male implies that on average, males had higher knowledge scores than females. In addition, consumers who had a higher income and those who consumed juice more frequently had a better knowledge of fruit juice.

Results from the model with expenditure on fruit juice/juice drink as the dependent variable are shown in Table 3. Among all the demographics, *Income* and *Kids* are significant. The coefficient of male is about -12.42 which means males spent 12.42 RMB (\$2.00) less on average 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 estimated 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.

<sup>2</sup> Frequency of consuming orange juice last month

Table 3. Parameter results of regression of expenditure on juice/juice drink last month

Variable	Parameter Estimate	Pr >  t
Intercept	33.470	0.0267**
Male	-12.063	0.0013***
Income	3.069	<.0001***
Kids	5.030	<.0001***
SaferFru	6.122	0.0061***
Paymore	5.137	0.0087***
Easyfound	-4.980	0.0155**
EDUC1	5.929	0.6194
EDUC2	-1.563	0.8708
EDUC3	-7.169	0.4309
EDUC4	0	.

Number of Observations Used: n=988. Adj R-Sq: 0.0667

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

Three perception variables included in the model, *SaferFruit*, *Paymore* and *Easyfound* also had a significant influence on expenditures. The result comes as no surprise that people who thought the fruit juice/juice drink is safer than other foods (*SaferFruit*) and agreed that they would like to pay more for orange juice (*Paymore*) did spend more on the juice/juice drink in the month before the survey. However, those who said orange juice was easy to find (*Easyfound*) did not spend as much on orange juice/drink. Although this may seem unexpected, perhaps it is because they view the product as common (see it everywhere) and not as something special to purchase.

The results of regressions on WTP are displayed in Tables 4 for 10% OJD, 100% FCOJ and NFC, respectively. Demographics have nearly no significant influence on the WTP for 10% OJD, including income. This might indicate that the price of 10% OJD in China is relatively low and it has become so common that whoever could easily afford it. On the other hand, knowledge, perception and consumption habits have significant impacts on consumer WTP for 10% OJD. Knowledge 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 is

expected as it is the least healthy of the three orange drinks. The coefficient of expenditure of orange juice is significant positive at 0.009, which implies that respondents who spent 1 RMB (\$0.16) more on juice/juice drinks last month would be willing to pay 0.009 RMB (\$0.0015) more for the 10% OJD. The only perception variable that shows a significant impact on the WTP is *Easymixed*. Respondents who thought orange juice was easier to be mixed with other fruit juice tended to pay more for the 10% OJD.

Table 4. Parameter results of regression of WTP for 10% OJD

Variable	Parameter Estimate	Pr >  t
Intercept	4.667	<0.001***
Paymore	0.249	0.146
Male	-0.439	0.184
Income	-0.031	0.620
Knowledge	-0.160	<0.001***
Expjuice	0.008	0.005***
Easymixed	0.398	0.031**
EDUC1	-0.889	0.413
EDUC2	-1.518	0.082*
EDUC3	-1.503	0.069*
EDUC4	0	.

Parameter results of regression of WTP for 100% FCOJ

Variable	Parameter Estimate	Pr >  t
Intercept	4.473	0.052
Paymore	0.364	0.250
Male	1.361	0.027**
Income	-0.081	0.492
Knowledge	0.058	0.450
Expjuice	0.030	<.0001***
Easymixed	0.059	0.862
EDUC1	-2.148	0.284
EDUC2	-2.248	0.159
EDUC3	-1.338	0.375
EDUC4	0	.

Parameter results of regression of WTP for 100% NFC

Variable	Parameter Estimate	Pr >  t
Intercept	5.211	0.047
Paymore	0.302	0.399
Male	1.850	0.008***
Income	-0.138	0.297

Knowledge	0.011	0.903
Expjuice	0.023	<0.001***
Easymixed	0.292	0.449
EDUC1	-1.723	0.448
EDUC2	-1.155	0.530
EDUC3	-0.316	0.857
EDUC4	0	.

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Number of Observations Used: n=948. Adj R-Sq: 0.0325  
 “\*”: Significant at 10%    “\*\*”: Significant at 5%    “\*\*\*”: Significant at 1%

Regarding WTP for 100% FCOJ, only gender and juice expenditure of last month have significant positive impacts on consumer WTP. Male respondents were willing to pay about 1.25 RMB (\$0.20) more for 100% FCOJ than females on average. 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. 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 respondents 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 models, although better knowledge of juice and juice products lead to lower WTP for 10% OJD, it does not translate to a higher WTP for healthier 100% FCOJ and NFC, indicating promotional efforts promoting the health benefits may not influence willingness to pay. However, marketing to males may be successful, as males tended to be willing to pay more for 100% FCOJ and NFC than females, while no significant difference appeared in



WTP for 10% OJD. 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.

## **Conclusions and Implications**

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. The results 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 people with higher incomes and people who purchased juice more frequently have more chance to obtain the information on juice products.

For the expenditure on juice products, 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 spend more on juice and juice products. The results are reasonable because the Chinese orange juice market is currently made up largely of juice drink, one type of juice product with added sugar and other ingredients. Consumers with higher education levels may have better alternative beverages to substitute for juice drinks. Furthermore, these results also reflect the fact that the major consumers of juice drinks are youth and children.

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 lower WTP for 10% OJD, which is, in fact, a less healthy juice product. On the other hand, Chinese consumers may still understand different types of juice products, because more knowledge does not result in high WTP for 100% FCOJ and NFC. From a marketing perspective, the market of 10% OJD China is already well developed and highly competitive. To increase the sales of this type of product, it might be a wise way to put more effort on expansion to the second or third tier cities or rural towns in China. For 100% FCOJ and NFC, more attention might need to be paid to some “juice lover” consumers because juice expenditure has a larger impact on WTP for 100% FCOJ and NFC. In another way, males also might be specially targeted as future consumers because they are more likely to spend more money on them.

The major focus of this research is on knowledge, perception and WTP for orange juice. For juice industries such like the Florida citrus industries, to understand the potential for NFC in China, the actual market price and consumers’ WTP needs to be compared. According to the result of this study, the Chinese consumers’ current WTP for 100% NFC orange juice averages 9.21 RMB (\$1.48) for a volume of 450mL while the actual price ranges 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 (about \$0.85 for the same volume), the market price in China currently exceeds consumers’ willingness to pay. Unless orange juice producers and exporters find ways to decrease the market price of NFC in China, or increase consumers’ WTP, there is little possibility to popularize 100%

NFC under the current levels of knowledge and perceptions of NFC. To exploit the market of 100% NFC juice in China in the future, attention is suggested to place on specific populations like males who spend more on fruit juice/juice drinks.

A limitation of this research is 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 consists mostly of OJD, and it is quite cheap compared with 100% NFC due to the lower juice content, the cross-price effect would probably have a significant effect on consumers' WTP for 100% NFC. Future research might adopt choice experiments to specifically study consumers' WTP for orange juice with different attributes.

## 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.
- 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.
- 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.

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.

Marr, J., & Hatfield, A. (2001). Shanghai snack market geared to young buyers: USDA-FAS. Available online at <http://www.fas.usda.gov>.

Sklair, L. (1994). In C. J. ShultzII, R. W. Belk, & G. Ger (Eds.), The culture-idealology 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.