Chinese consumers' perception of imported versus domestic pork quality

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Abstract

Economic globalization has opened up international markets for U.S. food products, especially new markets in emerging economies. While opportunities for increased demand for U.S. pork in China look promising, little is known about this emerging market. The objective of this study is to provide a thorough analysis of Chinese consumer's perception and attitudes towards multiple pork attributes along with an evaluation of the potential for U.S. pork in China. To achieve this goal, an empirical model is constructed to identify the relationship between Chinese consumer's pork quality perception and their attitudes towards various pork characteristics, including search, experience, and credence attributes. A system of equations is used to identify differences in consumers' valuation of pork quality from different countries. The model is applied to survey data from consumers in three major cities in mainland China and Hong Kong, and is estimated using a seemingly unrelated regression estimation method. Our results indicate that food safety is the most important criterion of food quality for both mainland and Hong Kong consumers. The main difference is that, for mainland consumers, food safety is equally important when evaluating domestic and imported pork quality; but Hong Kong consumers are more concerned about food safety issues of domestic pork. Furthermore, we assess the effects of patriotism on consumer perception of food quality and find that they negatively impact mainland consumer's view of pork from the U.S. Food marketing and agribusiness implications of our findings are discussed.

Keywords: China, emerging markets, pork, consumer perceptions, patriotism

Introduction

Economic globalization has opened up international markets for U.S. food products,

especially new markets in emerging economies. China, with one-fifth of the world's

population and a significant share of its citizenry entering the middle class, has become a

major customer for high quality products. Pork, as the staple meat in China, accounts for

over 50% of total meat expenditures (Ortega et al. 2009). The Chinese pork market has

been historically self-sufficient. However, due to the recent price fluctuation of domestic

pork and increased demand for safe and high quality pork, China has become a net pork

importer since 2008. In 2011, China (including Hong Kong) became the third largest

export destination for U.S. pork accounting for 910 million USD and 483 thousand metric tons of product—a new record. With increased production costs as well as rising concerns over food safety, animal disease epidemics and environmental challenges, China's status as a major pork importer will likely keep growing. While the Chinese market looks promising for U.S. pork suppliers seeking to expand business and growth, an understanding of how Chinese consumers perceive and evaluate the quality of pork from the U.S. is essential to better assess market potential.

Food quality is typically viewed as a subjective concept, since consumers rely on numerous intrinsic and extrinsic product cues to evaluate a product. As a result, the delivery of quality information from suppliers to consumers may not be efficient (Morgan 1985). Therefore, a user-oriented approach that emphasizes the consumer perspective is important. Researchers employing this approach believe that the valuation of (subjective) quality by consumers is dependent on their perceptions, needs and goals (Garvin 1984, Steenkamp 1989). As such, we evaluate Chinese consumer's perception of pork quality as well as their preferences for various pork characteristics.

Food quality is a complex and multi-faced concept, which is determined by multiple quality attributes. Product-specific attributes such as appearance, food safety assurances, animal welfare and environmental certifications will play an increased role in determining consumers' perception of pork quality and will affect their purchasing decisions (Meuwissen et al. 2007; Issanchou 1996). Researchers and economists traditionally categorized food product characteristics as search, experience and credence attributes (Nelson 1970; Caswell and Mojduszka 1996). A search attribute is one that consumers can recognize before purchase. For pork products, price, expiration date and

appearance are examples of search attributes. Experience attributes such as taste and tenderness are evaluated after consumption. Researchers define credence attributes as those that cannot be discerned even after consuming the product; examples include food safety, animal welfare, environmental impact and country of origin.

Previous research has investigated consumer preferences for pork-specific quality attributes (Grunert 2005; Bernués et al. 2003; Cicia and Colantuoni 2010). According to these studies, consumers may rely on multiple characteristics to judge product quality, but the relative importance of these attributes for consumers may differ between countries. For example, food safety certifications have acquired price premiums from consumers in both developed and developing countries (Loureiro and Umberger 2007; Ubilava and Foster 2009), but the premium consumers are willing to pay is different depending on their level of trust and food safety perception. Several empirical studies have been conducted to understand Chinese consumer preferences for quality attributes (Ngapo et al. 2007; Balestrini and Gamble 2006; Wong et al. 2008). Specifically, Balestrini and Gamble (2006), identify the importance that country of origin plays on consumer's decision-making. Additionally, Ngapo et al. (2005) found that search attributes such as color and fat cover were the most important appearance characteristics for Chinese consumers when assessing pork quality. While these studies shed some light on Chinese consumer behavior, the role of other quality characteristics (including search, experience, and credence attributes) on consumer's quality perception still remains uncertain.

Food quality is also a dynamic concept, where the importance of quality attributes to consumers is continuously changing (Issanchou 1996; Grunert and Valli 2001). Latouche et al. (1998) note that consumers will rely more on food safety attributes to

evaluate food quality after they become exposed to a food safety scare. Moreover, while consumer awareness of animal welfare and the environment are on the rise, such concerns may negatively impact consumer's quality perception of food that is not animal or environmentally-friendly (Wandel and Bugge 1997; Mayfield et al. 2007). Therefore, it is necessary to assess current Chinese consumer perceptions of pork quality; especially after recent food safety incidents were exposed in China. The current situation raises the following questions: Will Chinese consumers pay more attention to food safety aspects when they assess pork quality? Given that animal welfare issues are gaining consumer awareness in China, is this trend associated with the quality of pork products? Will the increasing concern on pollution among Chinese consumers lead them to care more about the environmental aspects of pork production? How do Chinese consumers evaluate the quality of imported pork? The present study seeks to answer these questions.

This study is innovative in three aspects. First, it provides a thorough analysis of the relationship between pork quality perception and search, experience, and credence attributes. Second, it sheds light on China as a U.S. pork importer by assessing how Chinese consumers evaluate domestic versus imported pork quality. Finally, this study identifies the effect that patriotism has on influencing consumer's perception of food product quality, which could be crucial since U.S. pork is a foreign product for Chinese consumers.

Data

The data utilized in this study was collected in summer 2014 via consumer interviews in four major cities in China: Beijing, Shanghai, Guangzhou and Hong Kong. These four tier one cities are the wealthiest in China. Beijing being the capital, is the second largest

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city by urban population (after Shanghai), and is the political and educational center of China. Shanghai is the economic and financial center. Guangzhou, the third largest city in China, is the key transportation hub and trading center in the south. Hong Kong, a special administrative region of China, is known for its low taxation and free trade and is viewed as a 'world city'.

The surveys were conducted through in-person interviews with consumers, and the questionnaires were executed at point of purchase. A multi-stage sampling procedure was used to construct the sample. First, in each city, we randomly selected 3 to 5 districts that had supermarkets selling imported meat products. For example, in Shanghai 5 districts (Yangpu, Xuhui, Pudong, Minhang and Changning) were randomly selected from a total of 18 districts. In the second stage, various food retail outlets were randomly selected from a roster compiled by the researchers that included domestic and international supermarkets in each district. Within each store, consumers were selected using a quasi-random technique that entailed intercepting every 3rd customer upon completion of a questionnaire. In each city, we surveyed 200 respondents and local university students were hired and trained to conduct the interviews.

Descriptive statistics of the survey data is shown in Tables 1 and 2. Table 1 presents demographic statistics of respondents by region[3]. The average age of the respondents in mainland China (Beijing, Shanghai and Guangzhou) is 37.5, and the average age of the respondents in Hong Kong is 41.7 years. Approximately 30 percent of respondents are male in both regions; this is expected, as women are the primary food shoppers. As for the education level, about 33% of mainland respondents completed a

[3] We pooled the data in Beijing, Shanghai, and Guangzhou together as the data representing mainland China. However, as these three cities are only the tier-one cities in China, the results and conclusions made for mainland China in this article can only represent the average level of these three cities.

university degree; the most frequent level in our sample. Secondary school is the most frequent education level among Hong Kong respondents, accounting for 46.23%. In both regions, over 60 percent of respondents are married and the average household size is approximately 3.5 individuals. The average monthly household income level of mainland respondents is in the range of 8000 to 10000 RMB (1282 to 1603 USD[4]), and the average level of Hong Kong respondents is between of 20000 to 25000 HKD (2580 to 3225 USD[5]).

Information regarding food and pork shopping behaviors is presented in Table 2. As expected, almost all of the respondents consume pork, the staple meat in the Chinese diet. The majority of respondents indicated walking as their primary method of transportation to purchase pork, and the average travel time to a supermarket or wet market for mainland respondents was 17 minutes, while Hong Kong respondents indicated a significantly lower travel time (approximately 9.9 and 10.9 minutes to reach a supermarket and wet market, respectively). Nineteen percent of mainland respondents indicated having purchased imported pork and 6% of them noted having purchased U.S. pork in the past. Fifty one percent of Hong Kong respondents indicated having purchased imported pork and 27% of them noted purchasing U.S. pork. In both regions, most of the respondents frequented wet markets as the primary procurement channel for pork, and the share of frozen pork purchased was relatively low (10% in mainland and 7% in Hong Kong). The average prices of fresh chilled pork loin that mainland and Hong Kong respondents recently purchased were 17.78 RMB and 35.13 HKD, respectively. Domestic Chinese pork was the most purchased product for both mainland and Hong Kong

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[4] USD to CNY exchange rate in 2014 June was 6.239.
[5] USD to HKD exchange rate in 2014 June was 7.752.

respondents in the previous month, accounting for 95% and 54% of pork purchases, respectively. In terms of quality cues, our survey data indicates that 56% of pork purchased by mainland respondents contained a food safety claim, followed by an environmental-friendly claim (21%) and an animal welfare claim (12%). Similarly, for Hong Kong respondents, 28% of pork purchased possessed a food safety claim, followed by an environmental-friendly claim (11%) and an animal welfare claim (8%).

Methodology

A system of linear equations is used to analyze Chinese consumers' perception of pork quality, Y.

(1) $\qquad Y_{ij} = X_{ij}^{'} \beta_j + u_{ij}$

where i denotes individual; j=1, 2,..., m, indicates the jth equation; $X_{ij}^{'}$ is individual i's independent variable vector of the jth equation; and u_{ij} is the error term.

With the assumption that the error terms have zero mean and independence across individuals and homoskedasticity, we stack the system of equations into a seemingly unrelated regression (SUR) model as follows:

(2) $\qquad \begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_m \end{bmatrix} = \begin{bmatrix} x_1 & 0 & \cdots & 0 \\ 0 & x_1 & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & x_1 \end{bmatrix} \begin{bmatrix} \beta_1 \\ \beta_2 \\ \vdots \\ \beta_m \end{bmatrix} + \begin{bmatrix} u_1 \\ u_2 \\ \vdots \\ u_m \end{bmatrix}$

Based on the framework above, we specify the following empirical model given in equation 3.

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$$Y_{CN} = X'_{C,CN}\beta_C + X'_P\beta_P + C'\delta_C + \delta_P P + \delta_F F + \delta_I I + u_{CN}$$

(3) $\quad Y_{US} = X'_{C,US}\beta_C + X'_P\beta_P + C'\delta_C + \delta_P P + \delta_F F + \delta_I I + u_{US}$

$$Y_{EU} = X'_{C,EU}\beta_C + X'_P\beta_P + C'\delta_C + \delta_F F + \delta_I I + u_{EU}$$

As our interest is not only to reveal the quality perception of Chinese pork, but also to compare the difference in quality perceptions across Chinese and other imported pork, multiple equations with respect to individual countries are developed. The countries/regions under consideration include the major players in the Chinese pork market: China (CN), the United States (US) and European Union (EU). All three equations have the same independent or explanatory variables except for the E.U. equation which does not incorporate the patriotism variable (denoted by P), as this is measured on a relative scale between China and the U.S.

In this context *Y* are the country-specific dependent variables, indicating consumer's quality perception of pork from different countries. This variable is measured by asking respondents to rate the pork quality score on a scale from 1 to 5, where 1 is the lowest rating and 5 is the highest. X'_C is a 3x1 vector of country-specific scores of pork regarding credence attribute claims including food safety, animal welfare and environmental issues. Likert-scale questions such as " how would you rate the food safety standard of pork produced in China/the United States/the European Union" were asked to obtain such information. X'_P (which is not country specific) is a 10 x1 vector of scores for search and experience attributes including color, fat cover, drip, marbling, freshness, packaging, price, taste, tenderness and origin. C' is a vector of basic demographic variables including gender, age, household size, education , children, senior, income and

city dummies to control the city fixed effects[6,7]. P is a variable that captures the relative level of patriotism and is defined as $P = CN/US$, where CN is the score of consumer's 'love'[8] for China (on a Likert scale) and US is the score of consumers' 'love' for the US (on the same Likert scale). We use P as a proxy to measure the relative level of patriotism of Chinese consumers, and use this as a control variable in our quality models as we hypothesize that Chinese consumer's level of patriotism will potentially influence the perception of domestic vs US pork. I is a dummy variable indicating consumers past experience on imported pork (where a value of 1 denotes that respondent have purchased imported pork in the past) and F is a variable capturing the share of frozen pork purchased.

Data summary

Table 3 presents information about Chinese consumer's evaluation of pork attributes as well as the patriotism score and past experience regarding imported pork purchases. Two observations are worth noting. First, for both mainland China and Hong Kong consumers, their evaluations of Chinese pork are much lower than U.S. and E.U. pork in terms of food safety, animal welfare and environmental attributes. Thus, how these evaluations relate to consumer's perception of pork quality is of particular interest given our objective. Second, the patriotism score of consumers in mainland China is 2.46, indicating that their stated 'love' for China is much higher than that for U.S. As such, we explore how

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[6] While we run the mainland regression, city dummy is included in this vector to control the fixed city effects.

[7] A description of these variables can be found in Table 1.

[8] More precisely we used a Chinese character that represents a patriotic feeling when conveying this question.

patriotism affects Chinese consumer's attitude towards pork from both countries in this study.

Estimation method

Given the basic structure of models that have multiple equations and categorical dependent variables, it is appropriate to employ a multivariate ordered logit/probit to estimate the empirical model. The advantage of using a multivariate approach rather than a single equation approach is that we can conduct tests of coefficients across equations to test whether the coefficients on our variables of interest are significantly different among countries. Such hypothesis test will help us understand the difference in Chinese quality perception among pork from different countries. Nevertheless, given the complexity of implementing a multivariate ordered logit/probit model, we use an alternative SUR method to achieve the same goal.

As an estimation method dealing with a linear equation system, SUR requires dependent variables to be continuous. Although the dependent variables, in our case, are ordered scores generated from Likert-scale questions, we can employ SUR as a substitute or proxy for multivariate ordered regression given the compatibility between the two approaches. To illustrate this compatibility, we show that the results generated by SUR and multivariate ordered logit/probit are similar in terms of significant variables and average partial effects-- the main indicators of interest.

Since the average partial effect is one of the main indicators we are using to test for compatibility, it is worth noting that the coefficients from the result of the ordered logit regression are log odds ratios, rather average partial effects. To illustrate this, suppose we have an ordered response model as:

(4) $\qquad Y = X'\beta + u$

Where Y is the ordered dependent variable whose value is ranging from m_1 (1) to m_j (5)

and X is a vector of independent variables. The coefficients of the regression using the

ordered logit are:

(5) $\qquad \dfrac{\partial P(y = m_1 \mid x)}{\partial X_k}, \ \dfrac{\partial P(y = m_2 \mid x)}{\partial X_k}, \ ..., \ \dfrac{\partial P(y = m_j \mid x)}{\partial X_k}$

whose standard interpretation is that for one unit increase in the predictor, the response

variable level is expected to change by its respective regression coefficient in the ordered

log-odds scale (while all other variables in the model are held constant). The average

partial effect we desire can be computed as follows:

(6) $\qquad \dfrac{\partial E(y \mid x)}{\partial X_k} = m_1 \dfrac{\partial P(y = m_1 \mid x)}{\partial X_k} + m_2 \dfrac{\partial P(y = m_2 \mid x)}{\partial X_k} + ... + m_j \dfrac{\partial P(y = m_j \mid x)}{\partial X_k}$

Therefore, we calculate the average partial effect based on (5) before comparing these

two estimation methods. Table 4 shows the result of the comparison between the OLS

and ordered logit regressions. Taking the regression results of the Hong Kong data as an

example, we can see that significance levels of variables in both estimation methods are

the same and the average partial effects are very similar. We therefore find it appropriate

to employ SUR instead of multivariate ordered regression to estimate the models in this

case. One advantage of using such continuous linear estimation method is that it is

computationally simple to conduct hypothesis tests directly with the model coefficients,

which inherently are the average partial effects we desire, and are more straightforward to

interpret and compare.

Results and Discussion

We apply the empirical model to both mainland China and Hong Kong data, in order to identify consumer's preferences in both regions. Comparison among mainland China and Hong Kong will help to understand preference heterogeneity among Chinese consumers. Estimation results for mainland China and Hong Kong are presented in Tables 5 and 6.

Pork Credence Attributes

In terms of credence attributes (food safety, animal welfare, and environmental issues), food safety is the most important criterion for both mainland and Hong Kong consumers when evaluating pork quality. This result is not surprising given their exposure to numerous food incidents in China over the past decade. Through hypothesis testing we find that, for mainland consumers, the relationships between food safety and quality are not significantly different among pork produced in the three regions. This indicates that mainland consumers have strong preference for food safety attributes in pork regardless of origin. For Hong Kong consumers, however, the role of food safety is more important when evaluating the quality of pork from China. This is evidenced by the hypothesis test, where the relationship between food safety and quality of Chinese pork is significantly higher than for pork from developed countries. As Hong Kong consumers perceive that the safety of Chinese pork is worse than that of other developed countries pork (see Table 3), their preference for safe pork explains why Hong Kong consumers are not satisfied with the quality of pork imported from mainland China.

The role of environmental issues is also observed in the mainland regression, where the relationships between environment and quality are significant for pork from all three regions. The hypothesis test indicates that the relationship for Chinese pork is

significantly stronger than for pork produced in the U.S. and the E.U. This finding

indicates that environmental issues play a more important role in determining the quality

of domestic pork. Given that consumer rating of Chinese pork in terms of environment is

much lower than that of U.S. and E.U. pork (Table 3), this result reveals that

environmental concern is another reason why mainland consumers perceive domestic

pork to be of lower quality. In contrast, Hong Kong consumers do not relate

environmental issues to pork quality, and this could be attributed to the fact that pork

from all these regions is imported, which has a lesser impact on the local environment.

For mainland consumers, the relationship between animal welfare and quality are

significant for U.S. and E.U. pork (which is not significant for Hong Kong consumers),

indicating that mainland consumers recognize foreign animal-friendly production. For

consumers who support animal-friendly production, animal welfare is an important

production process attribute used to evaluate pork quality. However it is worth noting that

this result only applies to imported but not domestic pork.

Pork Search and Experience Attributes

In terms of pork search and experience attributes, freshness and packaging are significant

in the mainland regression, while there is no significant attributes (search and experience)

in Hong Kong regression. The result can be interpreted as follows: the more mainland

consumers prefer freshness, the more likely they are to perceive pork to be of higher

quality. This result is plausible since for mainland consumers, Chinese pork means

domestic production and freshness, whereas pork from other countries means long-

distance transportation and often frozen or chilled product. Moreover, the more

consumers care about packaging, the more likely they are to attribute higher quality to pork from developed countries. This can be explained by the fact that imported pork can only be purchased in high-end supermarket in the mainland, which are often sold pre-packaged.

As there is little pork production in Hong Kong, pork from all these three regions is imported, which explains why freshness and packaging are no longer significant in the Hong Kong model. Moreover, search/experience attributes are not significant, indicating that Hong Kong consumer's preferences for these attributes do not affect their quality perception.

Patriotism Effect

The significant effect of patriotism is revealed in the mainland regression. The more mainland consumers 'love' China, the more likely they are to give a low quality score to U.S. pork, even though their level of patriotism does not affect their perception of domestic pork. This is due primarily to the fact that Chinese patriotism or nationalism is affected by political and economic issues; that is, the political affairs or the economic conflict between China and other countries will give rise to a negative impression of foreign products for Chinese consumers (Sean 2013).

This patriotism effect is also present for the Hong Kong regression, but in a slightly different form. Patriotism is found to have a positive effect on Chinese pork quality perception, but does not negatively affect the perception of US or E.U. pork products. This can be attributed to the fact that Hong Kong is often viewed as an international metropolis, where people are used to consuming products from all over the

world. Also, as Hong Kong had a long history of being a British colony, consumers there could be relatively more 'world-minded'; they welcome cultures as well as products from all over the world. Thus, consumer's patriotism is not likely to induce a negative impression on foreign product, but rather a positive impression on their own product.

Demographic Impacts

In the mainland China regression, education has a significantly negative effect on the quality perception of Chinese pork and a positive effect on the quality perception of U.S. and E.U. pork, indicating that more educated consumers in mainland China are more likely to perceive pork produced in developed countries (U.S. and E.U.) to be of higher quality. This is due to the fact that more educated consumers are more likely to know and understand that pork from developed countries is produced under strict and well-organized systems. Past experience consuming imported pork also significantly influences consumers' perception of pork quality, which has a negative effect on Chinese pork quality and a positive effect on U.S. and E.U. pork. This indicates that for consumers who have purchased (and therefore consumed) imported pork, they are more familiar with pork produced in developed countries and place a higher quality value on them.

In the Hong Kong regression, income has a significantly negative effect on the quality perception of Chinese pork and a significantly positive effect on U.S. pork. One potential explanation is that, for Hong Kong consumers, they always make purchasing decisions among imported pork including both Chinese pork and U.S. pork. Consumers with higher income are more likely to purchase U.S. pork, which is often more expensive.

As a result, they are more familiar with the quality of U.S. pork and thus perceive it to be of higher quality. However, for mainland China consumers, pork from developed countries is less accessible as it can only be found in limited international supermarket or high-end markets, and domestic pork is much popular and dominant in mainland China. Therefore, even though some mainland consumers with high income can afford imported pork, they are not as familiar with imported pork products. This can also help explain why the income effect in mainland China is insignificant.

Conclusions

Consumers in mainland China and Hong Kong exhibit different preferences for pork, in terms of both tangible and intangible pork attributes. Specifically, among the three credence attributes evaluated, food safety is the most important criteria for consumers in mainland and Hong Kong to evaluate pork quality, no matter whether the pork is domestic or imported. Therefore, for foreign pork suppliers, their advantages on food safety control and quality management may help them explore sales in China. In addition, due to the rising concerns over the domestic environment, the environmental aspect of pork production is likely to influence mainland consumer's perception of domestic pork quality.

In terms of tangible attributes (search and experience attributes), mainland consumers care more about the freshness and packaging of pork while they compare the quality of pork from China and other countries, while Hong Kong consumer's preferences for these attributes are not related to their quality perception. We attribute the insignificance of other physical pork characteristics to the fact that mainland consumers

are not familiar with foreign pork. With this understanding, freshness and package, which are the more tangible attributes under consideration, play a larger role in shaping mainland consumer's perception of pork quality.

The role of patriotism in determining pork quality is also identified in this study; the more patriotic mainland consumers are, the more likely they are to perceive foreign pork to be of lower quality while patriotic Hong Kong consumers are more likely to perceive Chinese pork to be of higher quality. This suggests that, U.S. pork suppliers should promote U.S. pork carefully-- labeling U.S. pork could potentially help boost sales in China if marketing efforts promote the safety aspect of the product, however, these advantages may be neglected by consumers who are more patriotic.

Acknowledgement

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Tables

Table 1: Demographic statistics

Variable	Description	Mean (SD) or distribution (%)	
		Mainland China	Hong Kong
Age	Age as of June 2014	37.51 (13.71)	41.74 (14.90)
Gender (%)	share of male	34.57	31.13
Education (%)	Primary school	3.44	14.62
	Secondary school	29.56	46.23
	Two-year college	25.97	8.49
	University	33.00	27.83
	Graduate school	8.03	2.83
Marital Status (%)	Married	68.01	63.33
	Single	30.70	32.86
	Other	1.29	3.81
Household size	Number of family members	3.47 (1.30)	3.83 (1.14)
Children	Number of children < 6 years old	0.62 (0.79)	0.72 (0.80)
Senior	Number of persons> 60 years old	0.75 (0.94)	0.47 (0.74)
Monthly household income (%)	First range is for mainland and unit is in RMB. Number in "()" is for Hong Kong and unit is in HKD		
	< 2,000 (5,000)	2.16	1.89
	2,000-4,000 (5,000-10,000)	12.50	7.08
	4,000-6,000 (10,000-15,000)	16.38	13.68
	6,000-8,000 (15,000-20,000)	13.22	21.70
	8,000-10,000 (20,000-25,000)	14.94	15.57
	10,000-12,0000 (25,000-30,000)	13.36	8.96
	12,000-14,000 (30,000-35,000)	6.61	8.49
	14,000-16,000 (35,000-40,000)	4.17	5.19
	16,000-18,000 (40,000-45,000)	4.17	1.42
	18,000-20,000 (45,000-50,000)	4.74	5.19
	20,000-22,000 (50,000-55,000)	3.59	2.36
	> 22,000 (55,000-60,000)	4.17	1.89
	(>60,000)		6.60

Table 2: Purchasing behavior statistics

Variable	Description	Mean (SD) or distribution (%)	
		Mainland China	Hong Kong
Food purchaser (%)	Equal to 1 if yes	72.43	55.19
Food preparer (%)	Equal to 1 if yes	72.78	56.13
Pork eater (%)	Equal to 1 if yes	99.28	99.53
Supermarket time	Travel time to supermarket (min)	17.12 (14.18)	9.88 (8.40)
Wet market time	Travel time to wet market (min)	16.99 (15.12)	10.89 (5.60)
Supermarket Mode (%)	Walk	63.45	95.92
	Bike	13.53	0
	Car	8.06	2.04
	Public transportation	14.96	2.04
Wet market Mode (%)	Walk	68.7	93.94
	Bike	16.38	0
	Car	6.52	2.53
	Public transportation	8.41	3.54
Imported pork purchase (%)	Equals 1 if purchased imported pork in past	18.71	51.18
US pork purchase (%)	Equal 1 if purchased U.S. pork in past	5.71	27.49
Purchase location (%)	Wet market	48.35	56.73
	Specialized Meat Store	8.44	9.62
	Low-end domestic supermarket	10.3	29.33
	High-end domestic supermarket	28.76	14.9
	International supermarket	8.44	3.85
	Other	2.26	0.96
Chilled (%)	Share of chilled pork	51.94	25.67
Fresh (%)	Share of fresh pork	39.86	67.38
Frozen (%)	Share of frozen pork	8.2	6.95
Information on purchased pork			
Price	Price of pork purchased last month	17.78 (5.94)	35.13 (11.23)
Country of Origin (%)	China	94.55	54.25
	US	0.86	6.6
	IO	0.14	2.83
	Do not know	4.45	36.32
Food safety claim (%)	Equal to 1 if purchased pork with food safety claim	55.67	28.3
Animal welfare claim (%)	Equal to 1 if purchased pork with animal welfare claim	12.2	8.49
Environmental-friendly claim (%)	Equal to 1 if purchased pork with environment-friendly claim	20.63	10.85

Table 3: Perception statistics

Variable		Description	Mean (SD) or distribution (%)	
			Mainland China	Hong Kong
Search and experience attributes				
Color		5 if highest importance	4.66 (0.61)	4.45 (0.70)
Fat Cover		1 if lowest importance	4.30 (0.87)	4.23 (0.78)
Drip			4.23 (0.93)	3.81 (1.05)
Marbling			3.92 (1.04)	3.70 (1.05)
Fresh			4.37 (0.89)	4.68 (0.58)
Packaging			3.45 (1.20)	3.19 (1.14)
Price			4.16 (1.00)	4.26 (0.88)
Taste			4.52 (0.79)	4.12 (0.95)
Tenderness			4.52 (0.83)	4.09 (0.95)
Origin			3.61 (1.28)	3.47 (1.09)
Credence attributes				
Food safety				
	China	5 if highest score	3.39 (1.10)	2.79 (1.01)
	U.S.	1 if lowest score	3.77 (0.96)	4.00 (0.69)
	E.U.		3.88 (0.91)	3.91 (0.77)
Animal welfare				
	China	5 if highest score	3.00 (1.23)	2.51 (1.02)
	U.S.	1 if lowest score	3.66 (0.92)	3.64 (0.82)
	E.U.		3.76 (0.92)	3.74 (0.77)
Environment				
	China	5 if highest score	2.91 (1.23)	2.32 (1.04)
	U.S.	1 if lowest score	3.70 (0.94)	3.71 (0.81)
	E.U.		3.82 (0.94)	3.78 (0.80)
Quality				
	China	5 if highest score	3.57 (1.05)	3.19 (1.00)
	U.S.	1 if lowest score	3.68 (0.92)	4.01 (0.67)
	E.U.		3.82 (0.91)	3.85 (0.71)
Other variables				
Patriotism		China/U.S.	2.46 (1.49)	1.30 (0.97)
Imported pork purchase (IPP) (%)		1 if purchased imported pork	18.71	51.18
Frozen (%)		The share of frozen pork	8.20	6.95

Table 4: Comparison between ordered logit regression and OLS

Quality China	Regression result		Average partial effect	
	Ordered Logit	OLS	Ordered Logit	OLS
Gender	0.25(0.32)	0.10(0.11)	0.08	0.10
Age	0.00(0.01)	0.00(0.01)	0.00	0.00
Household Size	-0.01(0.01)	0.00(0.01)	0.00	0.00
Education	0.19(0.17)	0.07(0.06)	0.06	0.07
Children	-0.12(0.28)	-0.02(0.10)	-0.04	-0.02
Senior	-0.33(0.32)	-0.10(0.11)	-0.11	-0.10
Income	0.00(0.01)	0.00(0.01)	0.00	0.00
Patriotism	0.33**(0.16)	0.12**(0.05)	0.11	0.12
Food Safety	1.91***(0.26)	0.58***(0.07)	0.62	0.58
Animal Welfare	0.20(0.25)	0.09(0.08)	0.07	0.09
Environment	0.15(0.23)	0.06(0.08)	0.05	0.06
IPP	-0.67**(0.29)	0.31**(0.14)	-0.30	-0.31
Frozen	-0.01(0.01)	0.00(0.01)	0.00	0.00
Color	0.02(0.22)	-0.04(0.11)	0.01	-0.04
Fat Cover	-0.31(0.22)	-0.12(0.10)	-0.14	-0.12
Drip	0.25(0.17)	0.10(0.08)	0.11	0.10
Marbling	0.41**(0.17)	0.20**(0.08)	0.18	0.20
Fresh	0.11(0.30)	0.10(0.13)	0.05	0.10
Package	0.07(0.15)	0.02(0.07)	0.03	0.02
Price	0.34*(0.18)	0.16*(0.08)	0.15	0.16
Taste	-0.07(0.23)	-0.01(0.11)	-0.03	-0.01
Tenderness	0.25(0.24)	0.07(0.11)	0.11	0.07
Origin	-0.13(0.16)	-0.04(0.08)	-0.06	-0.04
Observations	200	200		

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Mainland China regression

VARIABLES	China	U.S.	E.U.
Male	-0.07(0.06)	0.05(0.05)	-0.05(0.05)
Age	-0.00(0.01)	-0.00(0.01)	-0.00(0.01)
Household Size	-0.01(0.02)	0.00(0.02)	0.02(0.02)
Education	-0.06*(0.03)	0.03(0.03)	0.08***(0.03)
Children	-0.08(0.06)	-0.09*(0.05)	-0.09*(0.05)
Senior	0.04(0.06)	0.05(0.05)	0.06(0.05)
Income	0.01*(0.01)	0.00(0.01)	-0.00(0.01)
CityBJ	-0.00(0.07)	0.05(0.06)	0.09(0.06)
CitySH	-0.11*(0.07)	-0.07(0.06)	-0.05(0.06)
Patriotism	-0.01(0.02)	-0.05***(0.01)	
IPP	-0.08(0.07)	0.17***(0.06)	0.06(0.06)
Frozen	-0.00(0.02)	0.00(0.01)	0.00(0.01)
Color	-0.05(0.05)	0.02(0.04)	-0.01(0.04)
Fat Cover	-0.04(0.03)	-0.03(0.03)	-0.03(0.03)
Drip	-0.01(0.03)	-0.02(0.03)	-0.02(0.03)
Marbling	-0.02(0.03)	0.02(0.03)	0.01(0.03)
Fresh	0.11***(0.03)	-0.07**(0.03)	0.01(0.03)
Packaging	-0.06**(0.03)	0.06***(0.02)	0.02(0.02)
Price	0.01(0.03)	0.02(0.02)	0.02(0.02)
Taste	0.14***(0.05)	0.02(0.04)	0.06(0.04)
Tenderness	-0.00(0.04)	0.08**(0.04)	0.07*(0.04)
Origin	-0.01(0.03)	-0.01(0.02)	0.01(0.02)
Food Safety	0.54***(0.04)	0.47***(0.03)	0.48***(0.03)
Animal Welfare	0.05(0.04)	0.19***(0.03)	0.15***(0.04)
Environment	0.18***(0.04)	0.05(0.03)	0.14***(0.04)
Constant	1.00***(0.34)	0.66**(0.30)	0.03(0.29)
Observations	600	600	600
R-squared	0.614	0.604	0.624

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Hong Kong regression

VARIABLES	China	U.S.	E.U.
Male	0.10(0.11)	0.11(0.10)	0.14(0.09)
Age	-0.00(0.04)	0.00(0.01)	0.00(0.01)
Household Size	0.02(0.05)	-0.00(0.04)	-0.03(0.04)
Education	0.10*(0.06)	0.11**(0.05)	0.04(0.05)
Children	-0.08(0.10)	-0.04(0.09)	0.03(0.09)
Senior	-0.13(0.11)	-0.05(0.10)	-0.06(0.10)
Income	-0.00(0.01)	0.00(0.01)	-0.00(0.01)
Patriotism	0.12**(0.05)	-0.00(0.04)	
IPP	-0.11(0.10)	0.06(0.09)	-0.17**(0.08)
Frozen	-0.00(0.01)	-0.00(0.01)	0.01**(0.01)
Color	-0.02(0.08)	-0.08(0.07)	-0.09(0.07)
Fat Cover	-0.01(0.07)	-0.02(0.07)	0.00(0.06)
Drip	0.06(0.06)	-0.02(0.05)	0.03(0.05)
Marbling	0.08(0.06)	0.02(0.06)	-0.01(0.05)
Fresh	0.01(0.10)	-0.02(0.08)	-0.04(0.08)
Packaging	-0.03(0.05)	-0.03(0.05)	0.00(0.04)
Price	0.07(0.06)	0.08(0.05)	0.00(0.05)
Taste	0.02(0.08)	0.16**(0.07)	0.12*(0.07)
Tenderness	-0.12(0.08)	0.01(0.07)	-0.01(0.07)
Origin	0.00(0.06)	0.05(0.05)	0.08*(0.05)
Food Safety	0.55***(0.07)	0.24***(0.07)	0.34***(0.06)
Animal Welfare	0.12(0.09)	0.07(0.06)	-0.10(0.07)
Environment	0.06(0.08)	0.08(0.06)	0.32***(0.06)
Constant	0.73(0.56)	1.38***(0.53)	1.29***(0.50)
Observations	200	200	200
R-squared	0.582	0.252	0.415

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1