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Factors Affecting Chinese Consumer Awareness and Acceptance of Japanese Rice

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This paper investigated consumers' awareness and acceptance of the Japanese rice in Beijing area. Data was collected through a face-to-face interview survey to consumers in six supermarkets in Beijing during December 2008 and January 2009. A total sample of 400 consumers participated in the survey. Data included socio-demographics and questions regarding their cognition, attitude and purchasing behavior on Japanese rice. The results obtained from the survey showed that consumers had relatively low cognition and acceptance on Japanese rice and only 14.8% of the respondents had purchasing experience on Japanese rice. Although Japanese rice maintained high quality property, high price, lack of purchasing motivation, and sufficient and satisfying rice supply from domestic market obstructed the good sales record of Japanese rice in China. The bivariate probit model results showed that consumer's gender, education level, monthly expense on foods, and time pressure significantly positively affected the consumers' cognition level on Japanese rice, while consumers' age and quantity concern degree negatively and significantly affected their awareness. As far as the purchasing behavior of consumers on Japanese rice, consumer's gender, education level, family size, quantity and nutrition concern degrees significantly and positively affected the consumers' purchasing behavior on Japanese rice, while their monthly expense on food and quality concern degree negatively affected their purchase significantly. This finding provides contribution to strengthening marketing strategy that increase awareness and acceptance of Japanese rice in Chinese rice market.

Key words: acceptance, awareness, china, consumer, Japanese rice

INTRODUCTION

Since arice trade agreement between China and Japan was signed in 2007, Japanese rice has been exported to Chinese market for almost five years. High labor costs in Japan and high tariff level resulted in the price of Japanese rice were over 15 times higher than domestic rice, i.e. a rice with brand name of "Koshihikari" has a price at 99 RMB/kg, and Miyagi's rice called "Love at first sight" costs 94 RMB/kg. Japanese rice was regarded as a luxurious food for Chinese families. However, we found that Japanese rice in the Chinese supermarket has maintained a good sales record during the past four years. For example, in January 2009, 24 tons of Japanese rice was sold out quickly. This phenomenon has attracted our attention and interest to investigate the extent of Chinese consumers' awareness and acceptability of Japanese rice.

Consumers' purchase behavior on foods has been well studied (Ippolito *et al.*, 1990; Gila *et al.*, 2000; Sedjo and Swallow, 2002; Soregarol *et al.*, 2003; Cranfield and Magnusson, 2003; Matsumoto *et al.*, 2004; Wu and Fu, 2007; Yang and Wang, 2010). Many researchers have analyzed how different demographic characteristics of

consumers (such as age, gender, income, education level, race, family size, region, etc) influence their cognition and acceptability for the certain food products in the market (Gao, 1993; Buzby *et al.*, 1995; Thompson *et al.*, 1998). The research on Chinese consumer's awareness and purchase behavior mainly focused on food safety aspects (Wang, 2003; Zhang *et al.*, 2004; Zhou, 2004; Chen, 2006; Zeng *et al.*, 2007). Li and Guo (2007) studied the cognition and purchase behavior of consumers in Nanjing city of China on safe rice and showed that consumers' education level, household income, and cognition of safe rice played a significant role on their purchase decision on safe rice. However, there are as yet few studies which focused on rice specifically on imported Japanese rice. The scarcity of empirical studies concerning purchase behavior on Japanese rice and its relevance for market justify addressing this as a research topic.

The objectives of this study were to identify the situation of Chinese consumers' cognition and acceptance on Japanese rice and to analyze the factors that significantly affected their purchase behavior.

METHODS

Data collection

The data was collected through a questionnaire survey in Beijing conducted between December 2008 and January 2009. Respondents were recruited through face-to-face interview from random consumers in six supermarkets in Haidian District, Beijing. A total of 420 consumers participated in the survey and 400 valid

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questionnaires were obtained. Data collected, in order, included: consumer characteristics, consumer's purchasing behavior on rice and factors affecting this behavior, and consumer's awareness, attitudes and perceptions toward Japanese rice.

The survey collected data concerning consumers' purchasing behavior. Respondents were first asked their rice purchase frequency and place. And then they were required to rate four characteristics – quantity, nutrition, price and quality and safety – according to their importance affecting food purchasing decision making, and eight characteristics – price, freshness, washing-free, appearance, taste, nutrition, brand and safety – according to their level of importance in purchasing rice, specifically. Consumers' awareness, attitude and purchasing behavior of Japanese rice in the domestic market were then measured. The rate of consumers' awareness extent of Japanese rice was based on three levels of "know it well", "know", and "not familiar". And their attitudes toward Japanese rice were based on a four-point Likert scale, including "like", "indifferent", "dislike" and "dislike very much". To understand the relationship between consumers' acceptability and purchasing behavior on Japanese rice, each respondent was requested to indicate whether s/he had purchasing behavior of Japanese rice before and his/her reasons of

purchasing or not purchasing it, whether they agree that "Japanese rice is better than domestic rice".

Statistical analysis

To address the issue of the factors affecting the consumer's awareness and past purchasing behavior of Japanese rice, the current study employed a bivariate probit model. In this study, the bivariate probit model estimated the following joint model of awareness of the Japanese rice (Eq.1) and purchasing behavior of Japanese rice (Eq.2).

$$\begin{cases} Y_{1i}^* = X_{1i}\beta_1 + \mu_{1i} \\ Y_{2i}^* = X_{2i}\beta_2 + \mu_{2i} \end{cases} \quad (1)$$

$$(2)$$

Where Y_{1i}^* is a continuous latent variable for the indicator variable of whether consumer know about Japanese rice in Chinese market ($Y_{1i}=1$, if $Y_{1i}^*>0$, otherwise 0) and Y_{2i}^* is a continuous latent variable for the indicator variable of whether consumer has ever purchased Japanese rice ($Y_{2i}=1$, if $Y_{2i}^*>0$, otherwise 0). X_i denotes a set of independent variables, and μ_{1i} and μ_{2i} are coefficients for corresponding variables in the models and their relationship followed the bivariate normal distribution.

Table 1. Summary statistics of variables

Variable (code)	Definition of variable	Mean	Standard deviation
Whether know about Japanese rice	Yes=1, otherwise 0	0.21	0.41
Whether consumer has ever purchased Japanese rice	Yes=1, otherwise 0	0.15	0.36
Gender	Male=1, female=0	0.49	0.51
Age	30=1, 31–49=2, 50=3	1.62	0.61
Education	Primary and below=1, Secondary school and high school=2, College/university=3, Graduate school and above=4	2.50	0.80
Monthly food expenditure (EXP)	<500=1, 500–999=2, 1000–1499=3, 1500–1999=4, 2000–2499=5, 2500–2999=6, 3000=7	3.78	0.95
Life pressure (PRESSURE)	No pressure=0, a little bit pressure=1, some pressure=2, a lot of pressure=3, huge pressure=4	2.70	1.20
Family size (FAMILY)	1 person=1, 2 persons=2, 3 persons=3, 4 persons=4, 5 persons=5, over 5 persons=6	2.51	0.77
Rice category (CATEGORY)	Long-grained nonglutinous rice=0, Round-grained nonglutinous rice=1,	0.82	0.38
Rice purchase frequency (FREQUENCY)	Once or twice per month=1, once or twice per week=2, three or four times per week=3	1.77	0.49
Quantity concern (QUANTITY)	Very weak=1, weak=2, normal=3, strong=4, very strong=5	3.29	1.03
Price concern (PRICE)	Very weak=1, weak=2, normal=3, strong=4, very strong=5	3.76	1.05
Quality concern (QUALITY)	Very weak=1, weak=2, normal=3, strong=4, very strong=5	4.13	1.01
Nutrition concern (NUTRITION)	Very weak=1, weak=2, normal=3, strong=4, very strong=5	3.95	0.97

$$\begin{aligned}
E(\mu_{1i}) &= E(\mu_{2i}) = 0 \\
Var(\mu_{1i}) &= Var(\mu_{2i}) \\
Cov(\mu_{1i}, \mu_{2i}) &= \rho
\end{aligned}$$

The joint probability density functions of Y_{1i} and Y_{2i} meet the following equation:

$$\begin{aligned}
Pr(Y_{1i} = 1, Y_{2i} = 1) &= \phi_2(X_{1i}\beta_1, X_{2i}\beta_2, \rho) \\
Pr(Y_{1i} = 1, Y_{2i} = 0) &= \phi(X_{1i}\beta_1) - \phi_2(X_{1i}\beta_1, X_{2i}\beta_2, \rho) \\
Pr(Y_{1i} = 0, Y_{2i} = 1) &= \phi(X_{2i}\beta_2) - \phi_2(X_{1i}\beta_1, X_{2i}\beta_2, \rho) \\
Pr(Y_{1i} = 0, Y_{2i} = 0) &= 1 - \phi(X_{1i}\beta_1) - \phi(X_{2i}\beta_2) + \phi_2(X_{1i}\beta_1, X_{2i}\beta_2, \rho)
\end{aligned}$$

Where $\phi(X_i)$ is a function with univariate normal distribution, and $\phi_2(X_i)$ follows bivariate normal distribution containing the parameter ρ .

The analysis included the following twelve independent variables: gender, age, education level; household monthly food expenditure, life pressure, family size; rice purchasing category, rice purchasing frequency; the extent of caring about the food quantity, price, quality, and nutrition aspects during purchasing foods. The specific categories used and their mean and standard

deviation are shown in Table 1.

RESULTS AND DISCUSSION

Consumers' socio-demographic profile

The socioeconomic characteristics of the sample are presented in Table 2. Nearly half of the sample of consumers ($n=400$) were women (50.8%), 70.5% were married, and 68.8% lived in rural areas, indicating most of the respondents had rice-purchasing behavior. 93.5% of the respondents were less than 50 years old. Over half of the respondents had higher education (college or university degree) (59.2%), whereas 26.3% had secondary school education, and 14.5% primary school education. 97% of the respondents had jobs and their monthly expense on foods mainly stayed at average level in Beijing: 34% spent 1000–1499 RMB per month on food consumption and 46.8% spent 1500–1999 RMB/month. 87.8% of the respondents had a family size of 2–3 members, and 66.0% could make their own purchasing decision. Most of the respondents (86.8%) thought they had good health status.

Table 2. Socio-demographic profile of respondents ($n=400$)

Characteristics	Category	Percent (n)
Female respondents		50.8 (203)
Married respondents		70.5 (282)
Living in the rural area		68.8 (275)
Age	<30	45.0 (180)
	30–50	48.5 (194)
	>50	6.5 (26)
Education levels	Primary	14.5 (58)
	Secondary	26.3 (105)
	College/university	59.2 (237)
Average expense on foods (RMB/month)	500–999	5.0 (20)
	1000–1499	34.0 (136)
	1500–1999	46.8 (187)
	2000–2499	8.8 (35)
	≥2500	5.4 (22)
Family size (number of household)	1	5.5 (22)
	2	47.0 (188)
	3	40.8 (163)
	4	4.5 (18)
	5	2.2 (9)
Purchasing decision-making power	Self-determination	66.0 (264)
	Spouse-determination	21.0 (84)
	Codetermination	13.0 (52)
Health status	Excellent	14.8 (59)
	Good	23.2 (93)
	Normal	48.8 (195)
	Bad	9.5 (38)
	Very bad	3.7 (15)

Table 3. Information on respondents rice-purchasing behavior (n=400)

Characteristics	Category	Percent (n)
Frequency on rice purchase	3–4 times/week	2.8 (11)
	1–2 times/week	70.8 (283)
	1–2 times/month	26.3 (105)
Purchasing place	Supermarket	75.0 (300)
	Fresh market	10.5 (42)
	Wholesale market	11.0 (44)
	Street vendor	0.5 (2)
	Door-to-Door	0.5 (2)
Purchasing rice type	Round-grained nonglutinous rice	82.0 (328)
	Long-grained nonglutinous rice	18.0 (72)
Factors influencing rice purchasing decision	Price	65.0 (260)
	New and fresh	12.0 (48)
	Nutrition	9.0 (36)
	Safety	8.0 (32)
	Taste	2.5 (10)
	Brand	2.0 (8)
	Appearance	1.0 (4)
	Washing-free	0.5 (2)

Consumers' rice purchasing behavior

Consumers' behavior on purchasing rice was investigated in the survey. As shown in Table 3, 70.8% of the respondents purchased rice 1 to 2 times per week. This indicates that current Chinese consumers' rice purchasing behavior have changed --- from the traditional ways through purchasing large amount of rice one time and storing it with a long time period, to the style of treating rice like other fast consuming foods through increasing purchasing frequency but decreasing the quantity at each shopping time. Food convenience and freshness have become the main characteristics contributing to their purchasing decision making. Japanese rice was usually packed with 2 kilograms per bag which met the small amount requirement under the current shopping habit. Our survey showed that 75% of the respondents purchased rice from supermarkets, indicating that most of our respondents had access to the Japanese rice since supermarket is their main purchasing location.

In the survey, 82% of the consumers preferred to the round-grained nonglutinous rice, indicating that Japanese rice belonging to the round-grained type meets most of the consumers' taste. Consumers were asked to rate factors which influenced their rice-purchasing behavior, 65% of the respondents chose "price" as the first consideration factor, 12% and 9% of the respondents considered about their "freshness" and "nutrition", and only 8% cared about the "safety" property, which was different from the caring situation for the most of the food. This was because that firstly, in Chinese market, rice maintains a stable quality with few safety issues; secondly, rice is a principle food in China with large consumption, consumers have to consider more about the price. Since price was the first factor consideration

when Chinese consumers purchase rice, the sales of Japanese rice with higher price might get affected.

Consumers' cognition, acceptance and willingness to pay for Japanese rice

Table 4 shows consumer awareness and attitude toward Japanese rice. The results illustrate, of all the consumers interviewed, 78.7% of the respondents were never aware of the Japanese rice at Chinese market and 69.5% were not familiar with the information of Japanese rice, which indicate that during the past four years, Chinese consumers still had relatively low cognition and awareness on Japanese rice, partly due to the limited supermarkets providing Japanese rice. In terms of consumer's attitude toward Japanese rice, we found that only 3.5% of the respondents expressed their preference toward Japanese rice, 35.8% didn't show their like/dislike opinion, while the rest of the respondents (60.7%) expressed a negative attitude towards it. Consumers' attitude toward Japanese rice directly influenced their purchasing behavior. According to our survey, only 14.8% of the respondents had purchasing experience on Japanese rice.

There are three reasons for the situation of few consumers purchasing Japanese rice. Firstly, high price of Japanese rice significantly affected consumers' willingness to pay for it. As reported above, price was the first factor that influenced Chinese consumers' purchasing decision on rice. Our study showed that among the respondents who never purchased Japanese rice, 53.1% of them rated the "high price" as the first factor affecting their decision. Compared to current market price nearly 100 RMB/kg, 85% of the consumers showed that they were willingness to pay for Japanese rice if they were

Table 4. Consumers' cognition, acceptance and willingness to pay for Japanese rice (n=400)

Characteristics	Category	Percent(n)
Whether know about Japanese rice	Yes	21.3 (85)
	No	78.7 (315)
Cognition on Japanese rice	Know it well	5.5 (22)
	Know	25.0 (100)
	Not familiar	69.5 (278)
Attitude toward Japanese rice	Like	3.5 (14)
	Indifferent	35.8 (143)
	Dislike	21.5 (86)
	Dislike very much	39.2 (157)
Consumers who had purchased Japanese rice		14.8 (59)
Agree with "Japanese rice is better than domestic rice"	All respondents	7.8 (31)
	Respondents who had eaten Japanese rice	27.1 (16)
	Respondents who had not eaten Japanese rice	4.4 (15)
Reasons of purchasing Japanese rice (only for 59 respondents who had purchasing experience)	Recommendation from sellers	49.2 (29)
	Influenced by others	22.0 (13)
	Worthwhile to purchase	15.3 (9)
	Purchase as a gift	5.1 (3)
	Others	8.5 (5)
Reasons of not purchasing Japanese rice (only for 341 respondents who don't have purchasing experience)	High price	53.1 (181)
	Know little about it	35.2 (120)
	Not necessary	29.0 (99)
Willingness to pay (RMB/kg)	10	85.0 (340)
	15	10.5 (42)
	20	4.5 (18)

offered at a lower price (10 RMB/kg), which was even 2 times higher than the price of the domestic rice (Table 4). Secondly, the motivation of purchasing Japanese rice lack of continuity. Among the consumers who had purchasing experience, their purchasing motivation mainly came from the recommendations from sellers or others (71.2%), or as a gift resource (5.1%). Based on that, we would not be able to know whether they would continue to buy it or not later. This could explain why Japanese rice could not keep the quick sold-out record. Thirdly, sufficient and satisfying rice supply from the domestic market already could meet the needs from consumers. According to our survey, most of the respondents did not think Japanese rice was better than domestic rice. Among the respondents who had eaten Japanese rice, only 27.1% of them thought Japanese rice was better than domestic rice, while for respondents who had not eaten it, even only 4.4% agreed with that. This indicates again that Chinese consumers did not have strong motivation for purchasing Japanese rice.

Factors influencing consumer's awareness and acceptance of Japanese rice

This study analyzed 400 consumers' data by bivari-

ate probitmodel and explored factors which significantly affected the consumer's awareness and acceptance of Japanese rice. Twelve factors were selected as independent variables and the bivariate probitmodel results were shown in Table 5.

According to the results, consumer's gender, education level, monthly expense on foods, and time pressure significantly positively affected the consumers' cognition level on Japanese rice, while consumers' age and quantity concern degree negatively and significantly affected their awareness. These results were fit for our anticipation. Consumers with higher education level, higher monthly expense and limited relax time stood for the middle-class groups who own more opportunity to access Japanese rice in the supermarket at the higher consumption level. Relatively speaking, women, especially housewives were more caring about the cost performance on grocery shopping than men. Meanwhile, women, aged people and consumers concerning more on the quantity property were more realistic and relatively lack of the inclination to learn the new things.

As far as the purchasing behavior of consumers on Japanese rice, consumer's gender, education level, family size, quantity and nutrition concern degreesignifi-

Table 5. Bivariate probit model of awareness and acceptability of Japanese rice (n=400)

Variables	Coefficients	Standard error	Z value	P> Z
<i>Whether know about Japanese rice</i>				
Gender	3.4474	0.4633	7.44	0.000**
Age	-0.9841	0.2271	-4.33	0.000**
Education	0.4742	0.1649	2.88	0.004**
EXP	0.3041	0.1114	2.73	0.006**
PRESSURE	0.4517	0.1124	4.02	0.000**
FAMILY	-0.2598	0.1466	-1.77	0.076*
CATEGORY	-0.2596	0.2391	-1.09	0.278
FREQUENCY	-0.1989	0.1859	-1.07	0.285
QUANTITY	-0.4199	0.1469	-2.86	0.004**
PRICE	-0.1093	0.1292	-0.85	0.397
QUALITY	0.1920	0.1279	1.50	0.133
NUTRITION	-0.0949	0.1334	-0.71	0.477
_cons	-2.8225	1.0678	-2.64	0.008
<i>Whether consumer has ever purchased Japanese rice</i>				
Gender	-3.2410	0.5565	-5.82	0.000**
Age	-0.2964	0.2376	-1.25	0.212
Education	0.8563	0.2079	4.12	0.000**
EXP	-0.6675	0.2170	-3.08	0.002**
PRESSURE	-0.0631	0.0996	-0.63	0.526
FAMILY	0.6256	0.1753	3.57	0.000**
CATEGORY	-0.1060	0.2703	-0.39	0.695
FREQUENCY	-0.2129	0.2205	-0.97	0.334
QUANTITY	1.5663	0.2532	6.19	0.000**
PRICE	-0.0615	0.1261	-0.49	0.626
QUALITY	-0.6333	0.1483	-4.27	0.000**
NUTRITION	0.7499	0.1900	3.95	0.000**
_cons	-5.9313	1.6427	-3.61	0.000
Rho	-0.7870	0.2117	3.72	0.000
Likelihood-ratio test of rho=0			chi2(1)=9.5609	Prob>chi2=0.0020
Number of obs			400	
Wald chi2(24)			135.32	
Prob> chi2			0.000	
Log likelihood			-194.968	

Note: Statistical significance is indicated at **1% and *10% levels.

cantly and positively affected the consumers' purchasing behavior on Japanese rice, while surprisingly, their monthly expense on food and quality concern degree negatively affected their purchase significantly. Firstly, similar to the explanation above, male consumers with higher education level were more aware of Japanese rice and also more intended to buy it. Secondly, the families with more members and consumers concerning more about the food quantity property usually maintained a higher frequency for the grocery shopping than families with one or two people, which increased the opportunity to purchase Japanese rice. Meanwhile, Japanese rice with good nutrition property appealed to the groups

who cared about the nutrition aspect. Thirdly, the reason that consumers with high expense on food would less intend to purchase Japanese rice was mainly because of its high price, which might further increase the burden of the life. Finally, it was surprising that consumers who concern more about the quality aspect of rice would less intend to purchase Japanese rice. Our explanation is in Chinese market, there did exist quite a few brands of rice maintaining high quality similar to Japanese rice, such as the rice originally from the north-east part of China, which could act as a replacement of Japanese rice with good quality characteristics.

CONCLUSIONS

This case study investigated the consumers' awareness and acceptance of Japanese rice at Beijing area. The results obtained from the survey showed that consumers had relatively low cognition and acceptance on Japanese rice and only 14.8% of the respondents had purchasing experience on Japanese rice. Although Japanese rice maintained high quality property, high price, lack of purchasing motivation, and sufficient and satisfying rice supply from domestic market obstructed the good sales record of Japanese rice in China. We used the bivariate probit model to explore the factors which significantly affected consumers' awareness and purchasing behavior. The results showed that consumer's gender, education level, and monthly expense on foods, and time pressure significantly positively affected the consumers' cognition level on Japanese rice, while consumers' age and quantity concern degree negatively and significantly affected their awareness. As far as the purchasing behavior of consumers on Japanese rice, consumer's gender, education level, family size, quantity and nutrition concern degrees significantly and positively affected the consumers' purchasing behavior on Japanese rice, while their monthly expense on food and quality concern degree negatively affected their purchase significantly. This finding provides contribution to strengthening marketing strategy that increase awareness and acceptance of Japanese rice in Chinese rice market.

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