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Effects of food additives information on consumers' risk perceptions and willingness to accept: Based on a random nth-price auction

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In this study, we used a random nth-price auction to estimate consumers' willingness to accept (WTA) when exchanging orange juice containing additives for freshly squeezed orange juice without additives. Also, we analyzed the effects of positive and negative information of orange juice additives on consumers' risk perceptions. In summary, three basic findings are obtained. a. Negative information of orange juice additives is given a higher weight by consumers; consumers with some knowledge about additives, rather than those without knowledge about additives, have a higher WTA. b. Consumers with the information processing capacity, concern about the health of themselves and their families, and the ability to foresee the consequences of information have a deep impact on their WTA. c. The initial bid has a significant anchoring effect on consumers' WTA. As a result, there are three effective approaches to eliminate consumer food scares. The first is to disclose information about food safety risks timely and accurately. The second is to prevent the misguidance by the media, especially the internet media. The third is to employ different communication strategies based on the differences among consumer groups.

Keywords: Food Safety; Risk Perception; Willingness to Accept; Food additives.

Introduction

A study on 1001 cases of food safety incidents during 2002 to 2011 in China has showed that more than 68.2% cases were caused by human behaviors in the supply chain (Wen and Liu, 2012). That is to say, food safety risk in China has become a social risk associated with human behaviors, rather than the result of natural factors (Wu, Zhong, and Shan, 2013). In order to assure the safety of the food products, Chinese government has introduced an array of national standards, certification systems, and requirements for food companies and industries. However, these are far from preventing the increasing public anxiety. Meanwhile, the public media has involved in and played an important role in disseminating the information of food safety incidents. While, since the public media generally unable to distinguish the truth from the false, some false information, even rumors are spreading on a large scale. According to the statistics, nearly 1.8 sorts of rumors were reported every day in 2012, and among them more than 60% are about food safety incidents (Tang, 2013). The prevailing of the negative information about food safety may affect consumer's food safety risk perception and escalate public anxiety, even lead to food scares (Knowles, Moody, and McEachern, 2007). Consumer food scares are closely associated with the unpredictability of the incidence (Zvolensky et al., 2000). The uncertainty of information is the main source of consumers' risk perception and the main cause of food scares (Wu, Zhang, and Tang, 2010). There are two reasons of the uncertainty of information, the first is the limitations of consumers' knowledge, which lead to misunderstanding information, the other is the obstacles of information

disseminating, which make information being covered and distorted (Fan, 2003). It is the same as the food safety information. Nowadays, the misleading information diffusing over the country, rumors of the food safety incidents make consumers overestimate the risk of food safety and unduly worried (Qu, 2015).

Food safety risk communication is an effective way to reduce public anxiety. Risk communication strategy is a system which connects scientists and managers with public, bridging the gap of understanding among different parts and help public understand the information of food safety scientifically. In this way, different parts can obtain specific risk information timely, thus enable to reduce public risk perception and improve the transparency of food safety risk management (Zhong et al., 2012; Cope et al., 2010). Risk communication can also be an effective way to change consumer's attitude about food production processed under specific technology, such as the irradiation food or genetic modified food (Frewer et al., 1996). It is a common practice to put the risk assessment and risk management into the risk communication system, and use the risk communication strategy to handle the risk of food safety problem internationally (Zhong et al., 2012). FDA (U.S. Food and Drug Administration) has developed a Strategic Plan for Risk Communication, while this communication strategy has just at the early stage in China.

It is difficult for us to directly measure the risk perception of consumers, but we can indirectly evaluate it through an intervening variable (Tolman, 1932). Based on the fact that consumers are willing to pay more to avoid the risk of health (Hole and Kolstad,

2012), willingness to pay (WTP) can be an appropriate intervening variable to evaluate the risk perception. Many researches have analyzed the impact of food safety risk information on consumers' purchase behavior as well as the willingness to pay. Dickinson and Bailey (2002) studied consumers' willingness to pay for three different information characteristics of TTA (traceability, transparency, and extra assurances) in red-meat products and compared the WTP for different attributes of two types of meat. The result showed that, whether for beef or for pork, the WTP for extra assurances of food safety is the highest, that is to say the extra assurances of food safety is the most influential characteristics in TTA. Rousu et al. (2004) used experimental auctions to show how information of genetically modified reduces consumer demand, they examined three types of information, they are from the industry perspective, the environmental group perspective and the third-party verifiable perspective. The result suggested that negative genetically modified product information supplied by environmental groups can significantly reduce consumers' demand, while consumers who received third-party information on agricultural biotechnology gave less weight to environmental group information.

Similarly, studies use Willingness To Accept (WTA) to value consumers risk perception is no more a new thing. Lusk et al. (2004) investigated the effect of information about potential benefits on consumers' willingness to accept of genetically modified foods. They provided consumers from United States, England, and France with three types of information, these are information on environmental benefits, on health

benefits and information benefits to the third world, they concluded that all types of information significantly decreased consumers' willingness to accept of genetically modified foods, and the effect of information varied by locations. Ward, Bailey, and Jensen (2005) studied the effect of BSE crisis on US and Canadian consumers' purchasing behavior and showed that the crisis has little effect on the overall beef consumption in American, while the crisis increases the risk of food safety. Therefore, it improves the willingness to accept of the beef with traceability in both countries.

Since people prefer avoiding losses to making gains, some studies concluded that consumers are common tend to averting losses. That is loss aversion (Kahneman and Tversky, 1979). Therefore, compared with the positive information, the negative information has bigger effect on consumers' willingness to pay. For example, Fox, Hayes, and Shogren (2002) examined the effects of favorable and unfavorable description of irradiation on consumers' willingness to pay for pork products under irradiation. They proved that favorable description increased willingness to pay, while the unfavorable description decreased, when consumers were given both descriptions, the negative description dominated. Tegene et al. (2003) studied consumers' willingness to pay for genetically modified labeled and standard labeled foods under different information regimes. The result showed that consumers have lower willingness to pay for the food labeled genetically modified, and were more affected by the negative information. Payne, Messer and Kaiser (2009) analyzed consumers' willingness to pay for the beef hamburger under the information of BSE crisis, and found consumers discounted beef products by an

average of 59% under the negative information. Lee et al. (2011) compared the effect of positive, negative and two-sided information of traceability on consumers' willingness to pay for imported beef. The result indicated that consumers placed a greater weight on negative information. Negative and two-sided information significantly reduced WTP, while the effect of positive information was insignificant.

As the moral deficiency of food manufacturers are very common, the abuse of food additives incidence has kept occurring in China. It has become one of the most public concerned risks of food safety. Based on the fact that food safety incidence caused by abusing food additives has become the main source of food safety problems, studying consumer's perception of food safety risk, exploring the strategy of food safety risk communication, would be the vital way to guard against food scares. Since the risk perception is a latent variable and difficult to directly measured, we used an experimental auction to identify consumers' risk perceptions of food additives. In fact, consumers' risk perception reduced the value of the food they consumed, so compensation should be added for them to accept the risky food (Wood and Scheer, 1996). That is, WTA can be appropriate to evaluate consumers' risk perception. Besides, compared with WTA, WTP is much susceptible to the subjective value, while the WTA is keep in line with the market price anchor (Simonson and Drolet, 2004). In this paper, we used the random nth price auction to estimate consumers' WTA of the orange juice with additives. We also compared the effect of different types of information on consumers' purchasing behavior, analyzed the effect of positive and negative information of additives on consumers'

willingness to accept the food contain additives. The aim of this paper is to figure out consumers risk perception and purchase behavior under the different types of information and propound precautionary measures for the policy maker.

Experimental and model design

Auction mechanism

Experiments use an auction design to truthfully reveal consumers' preferences, so the effective of the experimental auction depends on the auction mechanism. Generally speaking, Vickrey auction (Vickrey, 1961), Becker–De Groot–Marschak (BDM) mechanism (Becker, DeGroot, and Marschak, 1964), and the random nth price auction (Shogren et al., 2001) are the widely used auction mechanism in recent experimental auction studies. Vickrey auction is usually used in studying consumers' willingness to pay for the foods with different quality and safety attributes. In the repeated Vickrey auction, participants with low value may lose the interest of the auction due to the impossible to win, and the bidding will be “insincere”, so that the auction can't truly reveal consumers value (Robert et al., 1993). BDM mechanism is an auction that participants bidding with a random pricing machine, every participant have the same probability to win. Although BDM mechanism can avoid the “insincere” bidding effectively (Becker, DeGroot, and Marschak, 1964), this auction lack the real mark environment, so respondents have vague incentives to seriously evaluate the safety of food, therefore, it can't satisfy the incentive compatible requirement (Horowitz, 2006). Random nth price auction combines advantages of two mechanisms: the Vickrey auction and the BDM mechanism. The key

characteristic of the random nth price auction is a random but endogenously determined market clearing price. The endogenous price guarantees that the market clearing price is closely related to bidders' private values, which make sure the bid of bidders are sincere (Shogren et al., 2001). Meanwhile, in random nth price auction, consumers' willingness to pay or the willingness to accept of the public goods has the fastest convergence speed, which can reduce the number of auction round effectively, and save the experimental time (Lee et al., 2011).

Auction target

Additives are indispensable in food processing technology. They can improve the taste, aroma, texture, color, and nutrient of food, prolong the shelf life of food, so they were called "the soul of modern food industry". However, after a series food incidences caused by abusing additives and adding non-food substances to food illegally, consumers were confused food additives with illegal additives, and worried about the safety of all additives. In order to figure out consumers' risk perception of additives, we used the orange juice with additives as the target of our auction. The orange juice is a common drink for consumers, it usually contains some additives. While the freshly squeezed orange juice without additives is made on the spot. Using these two kinds of orange juice, consumers can easy to figure out which kind of juice has additives. We give participants the freshly squeezed orange juice which is without additives and ask them to exchange the orange juice with additives. Since the juice with additives increased the health risk of consumers, compensation should be given to them. In this way we can measure

consumers' WTA of the orange juice with additives.

We conducted our experiments in Suzhou China. To make sure the diversity of our samples, we randomly recruited participants from different regions in Suzhou. The auction was conducted in the lab of Suzhou University. In order to avoid the Non-participation Bias (Boström et al., 1993) about additives and food safety, the participants were told nothing but they can get ¥ 50 yuan as a rewarding during the recruiting.

Auction design

The auction was divided in 8 times. Each time has two groups, say group A and group B. For each group, participants are provided with different information. Each group has 20 participants. Following the design of Hayes et al. (1995) and Fox, Hayes, and Shogren (2002), 9 trials were conducted in each group. For group A, participants bided under no information for the first three trials, for the next three trials, positive information were provided, then negative information were provided for the last three trials. For group B, the first three trials were under no information, for the next three trials, participants were provided with negative information, and then were provided with positive information for the last three trials. The bidding can be zero or under zero, indicates that participants prefer orange juice with additives more than the freshly squeezed juice without additives.

The steps of random nth price auction were as follows:

Step1: Each participant was given an identification number and asked to complete a short questionnaire dealing with their beliefs about food additives and some demographic

information.

Step 2: In order to familiarize the participants with the random nth price auction, a practice auction was conducted. We used candy bar to educate the participants how the auction mechanism works. In this step, we should make sure that all the participants absolutely understand the random nth price auction and their best strategy is to bid on their true valuation for the target being auctioned.

Step 3: At the beginning of this step, two types of orange juice were shown to the participants. The freshly squeezed orange juice which is without additives were provided to the participants freely and the orange juice with additives were the target of this auction. After introduced these two items, we let participants use the orange juice without additives to change the juice with additives, and write down their WTA on the sealed bidding sheet.

Step 4: The monitor collected the bids and reordered the bids from low to high. Then the monitor randomly drew the number n from $2-K$ (K represents the number of participants). The n th participants' bid p_n , would be the reference price. The winners were the subjects whose bids under the n th bid. The ID numbers of the winners and their corresponding bids were then announced.

Step 5: After conducting three trials of auction, positive (negative) information of additives were provided. Then, before the last three trials, negative (positive) were provided.

Step 6: After the conclusion of 9 trials, a binding trial was randomly chosen. The

winners in that trial had to exchange their orange juice with the alternative orange juice and accept the compensation price determined in that trial (nth bid, p_n), then drank the juice with additives.

Model building

In order to further analysis the factors of consumer's WTA of the orange juice with additives, we define the utility of customer consume one unit freshly squeezed juice without additives and one unit orange juice with additives are U_{fki} and U_{aki} respectively, $k = +, -$, represent the positive and negative information. They follow:

$$(1) \quad U_{fki} - U_{aki} = \beta_k^T x_i + \varepsilon_{ki}$$

Here β_k is the parameter vector. x_i are the factors effect consumers utility, say demographic characteristics of consumers, the understanding of additives, the risk perception of additives etc. ε_{ki} is the random vector. Although U_{fki} can't be obtained directly, it can be derived from the exchange auction. According to the definition of WTA, suppose the WTA of consumer i is WTA_{ki} , which represent the minimum compensation of consumer i when he using the freshly squeezed orange juice without additives to change the orange juice containing additives, then we have:

$$(2) \quad WTA_{ki} = \beta_k^T x_i + \varepsilon_{ki}$$

The function (2) cannot exclude the possibility of $WTA_{ki} > 0$ or $WTA_{ki} \leq 0$. Where $WTA_{ki} \leq 0$ define that consumer i think the orange juice with additives is better than the orange juice without additives or at least they are indifference. In order to keep the

orange juice with additives, they are willing to pay some money, here WTA_{ki} is equal to WTP .

Assume $\varepsilon_k | x_k \sim Normal(0, \sigma_k^2)$, function (2) is multiple linear regression, and when $WTA_{ki} \leq 0$, means consumers lack risk perception of additives. Since we focused on the consumers' risk perception of food additives, Tobit is an appropriate model.

$$(3) \quad y_{ki} = \begin{cases} WTA_{ki} & WTA_{ki} > 0 \\ 0 & WTA_{ki} \leq 0 \end{cases}$$

For $WTA_{ki} \leq 0$, here is:

(4)

$$P(y_{ki} = 0) = P(WTA_{ki} < 0) = P(\varepsilon_{ki} < -\beta_k^T x_k) = \Phi(-\beta_k^T x_k / \sigma_k) = 1 - \Phi(\beta_k^T x_k / \sigma_k)$$

The Likelihood function for i is:

(5)

$$L_{ik}(\beta_k, \sigma_k) = 1(y_{ki} = 0) \log[1 - \Phi(\beta_k^T x_k / \sigma_k)] + 1(y_{ki} > 0) \log\left\{(1/\sigma_k) \phi\left[(y_{ki} - \beta_k^T x_k) / \sigma_k\right]\right\}$$

Results

Demographic characteristics of participants

310 participants were recruited in this auction, after dealing with the missing data, 298 samples were remained, with a valid sample rate of 96.12%. Table 1 revealed that the majority participants are among 26-45 years old, and have a family size of 3-5 people. Nearly half of the participants have attended a junior college, and more than 45% of them have an average monthly household income of more than ¥6000 Yuan.

Table 2 shows that most participants care about the food safety, but they are not

satisfied with the current food safety situation (with 95.97% participants care about the food safety and 77.18% not satisfied with the food safety situation). 41.61% of the participants don't have a good knowledge of food additives, and most of them (say 53.69%) don't trust the information in the food labels. For the source of information about additives, 47.65% of the participants get the information of additives from internet, which would increase the chance of getting the fake and false information.

Table 1 Demographic Characteristic of Participants

variables	categories	Number of Sample	Percentage (%)
Gender	Male	144	48.32
	Female	154	51.68
Age	Under 18	2	0.67
	18-25	76	25.50
	26-45	164	55.03
	45-60	36	12.08
	Above 60	20	6.72
Education	Elementary school	10	3.36
	Middle school	38	12.75
	High school	104	34.90
	Junior collage	82	27.52
	University	56	18.79
	Postgraduate	8	2.68
Family number	1	2	0.67
	2	24	8.05
	3	118	39.60
	4	36	12.08
	More than 5	118	39.60
Family Income	Under ¥2000	20	6.71
	¥2001~¥4000	68	22.82
	¥4001~¥6000	74	24.83
	¥6001~¥8000	54	18.12
	¥8001~¥10000	52	17.45
	Above ¥10001	30	10.07

Table 2 Food Safety and Information about Additives

variables	categories	Number of Sample	Percentage (%)
Care of Food Safety	Never care	12	4.03
	A little care	200	67.11
	Very care	86	28.86
Satisfaction of food safety	Don't satisfied	230	77.18
	A little satisfied	60	20.13
	Very satisfied	8	2.69
Knowledge of additives	None	124	41.61
	A little	164	55.03
	Most	10	3.36
Trust of information in labels of food	Don't trust	160	53.69
	Neutral	78	26.17
	Trust	60	20.14
Source of information about food additives	Paper or magazine	34	11.41
	TV or broadcast	86	28.86
	Web-media	142	47.65
	Authorities or official	10	3.36
	scholars or specialists	12	4.03
	families or friends	14	4.69

Bids of participants under different information

Figure 1 showed the mean bids across the three information treatments. As it revealed, the bids of the participants for the first 3 trials were without any information treatment, for group A and B, the WTA is nearly the same. However, when first provided by the positive information for group A, the WTA of these participants declined slightly. Then under the negative information treatment, the WTA of participants in group A increased sharply, from ¥2.01 yuan to ¥3.53 yuan. There was about 75.6% premium for the fresh juice without additives over similar juice with additives under negative information. For the group B, participants were first received the negative information, we can see that the WTA of these participants increased significantly from trial 4 to 6. However, when

provided by the positive information, the WTA of participants in group B declined gradually from trial 7 to 9. We can calculate that the WTA increased by a large margin, for about 80 %, while decreased by about 26 %, for a relatively small margin. Participants responded more sensitively to negative information than positive information. The 9 trials bids for different groups indicated that the negative information had a dominant effect on participants.

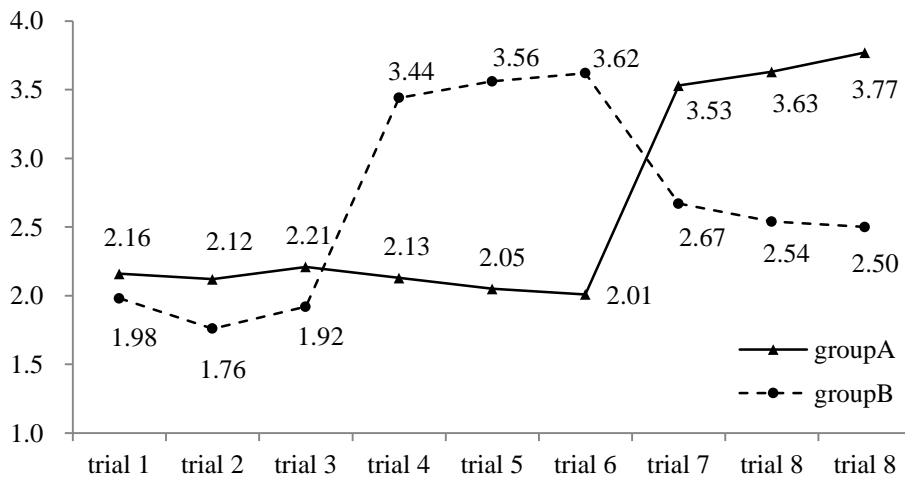


Figure 1 Mean Bids Across the Information Treatments

Variable index determination for the Tobit model

In order to further analyze the influence factors of consumers' risk perception of food additives, we used the bids from trail 4 to 6 of group A and group B as the dependent variables to regress the Tobit model. The bids of group A and group B represent the WTA under positive and negative information respectively. The definition of variables in this model was as table 3 shows.

Table 3 Variable Index Determination for the Tobit Model

Variable	Classification index	mean	S. D.
Dependent Variables	WTA under positive information	Mean bids of trial 4 to 6 in group A. (WTA ⁺)	2.409 1.666
	WTA under negative information	Mean bids of trial 4 to 6 in group B. (WTA ⁻)	3.592 2.437
Independent Variables	Gender	Male=0, Female=1. (GENDE)	0.517 0.501
	Age 26 to 45	No=0, Yes=1. (LAGE)	0.553 0.498
	Age 46 to 60	No=0, Yes=1. (MAGE)	0.121 0.326
	Age above 60	No=0, Yes=1. (HAGE)	0.074 0.251
	High school or vocational high school	No=0, Yes=1. (LEDU)	0.339 0.475
	Junior college or above	No=0, Yes=1. (MEDU)	0.403 0.491
	Master or above	No=0, Yes=1. (HEDU)	0.062 0.239
	Yearly family income ¥30-60 thousand yuan	No=0, Yes=1. (LINCOM)	0.132 0.341
	Yearly family income ¥60-100 thousand yuan	No=0, Yes=1. (MINCOM)	0.345 0.473
	Yearly family income above ¥100 thousand yuan	No=0, Yes=1. (HINCOM)	0.438 0.498
	Inclusion of dependent children in the family	No=0, Yes=1. (KID)	0.623 0.525
	Low knowledge about additives	No=0, Yes=1. (LKNOW)	0.423 0.494
	High knowledge about additives	No=0, Yes=1. (HKNOW)	0.547 0.498
	Care about the food safety	No=0, Yes=1. (CARE)	0.961 0.197
	Original bids	Mean bids of trial 1 to 3 in group A and B. (OWTA)	2.038 1.571

Note: sample number 298

Results of the Tobit model

Use STATA 11.0, we estimated the factors effect consumer's WTA under different information. Table 4 presents the parameter estimation results of Tobit model.

The coefficients of GENDE indicated that women were more sensitive to the information. As it was shown in table 4, under positive information of orange juice, the WTA of women were ¥0.2410 yuan lower than men, while under negative information,

the WTA of women were ¥0.4542 yuan higher than men. This conclusion was supported by the research of Ling and Chen in 2003, they indicated that women were more sensitive than men and more concern about the information around them. They tended to process the information which is beneficial to them. Moreover, Sun (2005) also pointed out that the degree of processing information determined the risk perception of different gender, thus made difference of risk perception between men and women. Under the negative information, consumers with higher education (HEDU) had a higher WTA. The reason is that, consumers with higher education could process the information in a higher level (Zhu, 2009). Therefore, the level of risk perception of these people was higher, and then led to a higher WTA.

The age variables (LAGE, MAGE, HAGE) under negative information significantly increased the WTA. WTA of consumers with age between 26 to 45, 46 to 60, and above 60, were ¥ 0.8043, ¥ 0.8322 and ¥ 0.9417 yuan more than those age under 26. Under negative information, the older consumers had a higher WTA, because the older people were more concern about their health. When provided with the negative information, the level of risk perception by them was higher than the young consumers and thus led to a higher WTA. The same reason can explain why consumers with children under 12 years old in family (KID) were more sensitive to the negative information and also had a higher WTA.

When provided with negative information, consumers who were more concerned about food safety (CARE) had a higher WTA. Interestingly, consumers with food

additives knowledge (LKNOW, HKNOW) needed a higher WTA than those without food additives knowledge. Since rumors about food additives are spreading on a large scale, the food additives knowledge of consumers was sometimes inaccurate and incomplete. When they were provided with the negative information, this information conflicted with the knowledge of their own. Thus increased the uncertainty of risk and enhanced the scares and then led to a higher WTA. This result was supported by the research of Slovic in 1987, in his research he concluded that the uncertainty and unknown of the information were the main causes of the food scares and the uncertainty of the information was more likely to increase the scares. Therefore, the essential way to eliminate the food scares is transmitting information accurately and effectively.

When provided with the positive information, consumers' WTA were significantly decreasing when they with a good knowledge of food additives (HKNOW). The reason may be that the positive information provided to them was similar to their own knowledge of food additives. Which made consumers sure about the risk of food additives, and then the WTA was decreasing accordingly.

When the initial bids increased 1 yuan, the WTA of consumers under positive and negative information would increase ¥ 0.8529 and ¥ 0.9604 yuan respectively. Consumers were more sensitive to the negative information, so the WTA under negative information was higher than those under positive information. Whenever under negative or positive information, the initial bids had a significant effect on the subsequent WTA, that is, the initial bids determine the final bids to some degree. It can be attributed to the

anchoring effect.

Table 4 Parameter Estimation Results of Tobit Model

Variables	Positive information		Negative information	
	Coefficient	t value	Coefficient	t value
GENDE	-0.2410*	0.0161	0.4542**	0.0083
LAGE	-0.0247	0.7271	0.8043**	0.0064
MAGE	-0.0398	0.5114	0.8322**	0.0027
HAGE	0.1821	0.1285	0.9417**	0.0005
LEDU	-0.0150	0.9231	0.1798	0.5911
MEDU	0.1942	0.1938	0.6830**	0.0072
HEDU	-0.3472*	0.0423	0.9856**	0.0000
LINCOM	-0.1080	0.2446	0.2071	0.1974
MINCOM	-0.0681	0.6829	0.2831	0.1526
HINCOM	-0.0902	0.5217	0.3579	0.0727
KID	0.2274	0.1258	0.4384*	0.0491
CARE	0.0274	0.8816	0.5160*	0.0365
LKNOW	0.1164	0.6272	0.4958*	0.0432
HKNOW	-0.5442**	0.0098	0.4131*	0.0458
OWTA	0.8529**	0.0000	0.9653**	0.0000
CONSTANT	-0.7182*	0.0371	0.8272**	0.0071
σ	0.3211		0.7906	
Sample number	148		150	

*,** and *** denote significance at 10%, 5% and 1% levels, respectively.

Conclusion and Implications

In this study, we took the additives of orange juice as the target of auction, and used a random nth-price auction to estimate consumers' willingness to accept when exchanging orange juice containing additives for freshly squeezed orange juice without additives. Also we analyzed the effects of positive and negative information of orange juice additives on consumers' risk perceptions. In summary, three basic findings are obtained. a. Negative information of food additives is given a higher weight by consumers. Consumers with some knowledge about food additives, rather than those without

knowledge about additives, have a higher WTA. b. Consumers with the information processing capacity, concern about the health of themselves and their families, and the ability to foresee the consequences of information have a deep impact on their WTA. c. The initial bid has a significant anchoring effect on consumers' WTA.

The results suggest important implications on how to build the food safety risk communication mechanism. There are three effective approaches. First, the main reason of food scares was the uncertainty of food safety risk information. Consumers with uncomprehensive and uncertainly knowledge about food safety were more vulnerable to the negative information. Therefore, to eliminate food scares, the government and social groups should disseminate information about food safety incidents timely and accurately. The basic of the food safety risk communication mechanism is the accuracy of information. Second, negative and false information had a great influence on consumers' food safety risk perception. How to prevent the misguidance by the media, especially the internet media is the biggest challenge faced by the Chinese governments. Third, the governments should eliminate the misleading effects of the false information timely and pointedly and employ different communication strategies based on the difference among consumer groups.

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