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Urban Chinese Consumers' Willingness to Pay for Pork with Certified Labels: A Discrete Choice Experiment

Jianhua Wang [1,2,*], Jiaye Ge [1] and Yuting Ma [3,4]

1 School of Business, Jiangnan University, Wuxi 214122, China; 6150909006@vip.jiangnan.edu.cn
2 Food Safety Research Base of Jiangsu Province, Jiangnan University, Wuxi 214122, China
3 School of Economics and Management, Wuhan University, Wuhan 430072, China; jade1016@whu.edu.cn
4 Economic Development Research Center, Wuhan University, Wuhan 430072, China
* Correspondence: jianhua.w@jiangnan.edu.cn

Received: 23 December 2017; Accepted: 21 February 2018; Published: 27 February 2018

Abstract: The paper aims to investigate Chinese consumers' willingness-to-pay (*WTP*) for pork characterized by four attributes, namely food safety certification labels, location-of-origin, "free from veterinary drug residues" label, and price, based on a choice experiment conducted among 844 consumers from Jiangsu and Anhui provinces, China. A Random Parameter Logit model was estimated to elicit consumers' *WTP*. The results showed that Jiangsu consumers' *WTP* for pork with a "Organic Food" certification (26.78 Yuan) was the highest among all attributes, followed by "Green Food" certification (20.22 Yuan), "free from veterinary drug residues" label (23.18 Yuan), and location-of-origin (12.77 Yuan). However, there was only a moderate preference for "Safe Food" certification (8.10 Yuan). In addition, respondents from the more developed region (i.e., Jiangsu) had significantly higher *WTP* for all attributes than respondents from Anhui, a less developed region. The Random Parameter Logit model shows that better educational attainment and higher income were two factors that were associated with a higher *WTP*. The main policy recommendations are that public awareness of the different types of verifications should be improved and that authorization of certification logos should be enforced strictly so that food with certification logos are always reflective of the standard being followed.

Keywords: Discrete Choice Experiment; willingness to pay; food safety

1. Introduction

Food safety is one of the most crucial issues faced by the agricultural sector. Consumers residing in the developing countries are paying an increasing attention to health, the environment, as well as food safety [1,2]. Meat consumption in China has been continuously increasing from 37.1 g per day in 1992 to 64.3 g per day in 2012 [3]. China currently consumes half of pork worldwide, making China world's largest pork consumer [4]. However, a series of recent food safety scandals in China (i.e., contaminated baby milk formula and pork produced using clenbuterol), have aroused tremendous attention among the media and the public. China's pork industry has been facing food safety challenges in its various stages of the supply chain. In response to those events, improving food safety has been a priority of the Chinese government.

Food safety risk is a result of information asymmetry where producers owning full information induce consumers to purchase their products, a purchase which would not have happened if the full information was exposed [5]. The quality of a food product is represented by its attributes, e.g., color, smell, taste, production process, nutritional status, and price etc. If these attributes can be exposed to consumers before the purchase by labeling on the package, the disadvantaged position that consumers are put in as a result of information asymmetry can be eliminated [6,7]. Consequently, labeling the quality of a food product is an important marketing strategy for producers to increase consumers' willingness to pay for foods with certified logos [8]. From the perspective of improving food safety, a well understanding of consumers' needs is necessary so that food producers will respond to consumers' needs by producing safe foods [9]. However, one should note that the price of a food product is expected to increase as a result of meeting the requirements of meeting specific standards (such as organic). Different consumers are likely to respond differently to certified-label products because they are heterogeneous in terms of their incomes, awareness of the certification labels, and perceived risks of food safety [10]. How to predict consumers' preferences and willingness to pay for label information is of interest only to food producers but also to academics as well as government policymakers [11].

Several studies have investigated consumers' willingness to pay for certified labels in the Chinese context. For instance, based on a survey of 257 consumers in Beijing, Ortega et al. (2016) investigated consumers' willingness to pay for beef with four attributes reflecting beef quality, namely food safety claims (*WTP*: 116 Yuan or $19.14), following animal welfare practice (no significant higher *WTP*), "Green Food" certification (*WTP*: 69 Yuan or $11.22), and "Organic Food" certification (25 Yuan or $4.13) [12]. Yu et al. (2014) surveyed 408 consumers from Hebei and Tianjin and reported that consumers were willing to pay an extra price of 47% for the vegetables with "Green Food" logo compared to conventional products, whereas the meat with "Green Food" logo received 40% more *WTP* [13]. Next, Liu et al. (2017) utilized an choice experiment to measure 435 Chinese consumers' preferences for eco-labeled rice and reported that the *WTP* for the four attributes of interest were: 1.11 Yuan/500 g for national branded rice compared to none, 2.35 Yuan/500 g for "Green Food" logo compared to no label, 2.97 Yuan/500 g for "Organic Food" logo compared to no label, and 2.31 Yuan/500 g for labelled geographical origin compared to without [14]. Furthermore, a *WTP* study on pork traceability information by Wu et al. (2016) reported that consumers from Wuxi, China were *WTP* 4.38 Yuan/500 g for the pork with traceable farming information, 1.57 Yuan/500 g for slaughter and processing information, 1.07 for distribution and marketing information, and 4.93 Yuan/500 g for government certification [15]. However, the studies did not investigate consumers' willingness to pay for a specific type of government certification, nor did they look at the *WTP* difference of residents from regions with different levels of economic development.

To fill this gap, the main objective of the paper is to investigate consumers' willingness to pay for three types of government certifications available on the market, as well as the location of origin, "free from veterinary drug residues" label, among 844 Chinese consumers surveyed in Jiangsu, a more economically developed province, and Anhui province, a less developed province. The rest of the paper is organized as follows. Section 2 reviews the literature on the design of attributes on meat products. Section 3 describes the method, i.e., choice experiment. Sample selection and data were introduced in Section 4 and results reported in Section 5. Policy recommendations and discussed are given in Section 6.

2. Literature Review

Certification provides a signal to consumers to eliminate the uncertainty that consumers are facing when purchasing food products [8,16,17]. Consequently, it is considered as a useful instrument to prevent unsafe foods. And consumers often trust it as a sign of a good-quality product [6,18]. Based on a survey of 1077 US consumers, Gao and Schroeder (2009) found that consumers' willingness to pay for the "Certified U.S. Product" beef steak attribute was significantly higher than that of other attributes such as guaranteed tender, guaranteed lean, and enhanced nutrition [11]. Similarly, Van Loo et al. (2011) reported that the willingness to pay of US consumers for organic chicken was much higher when the product had a "USDA certified organic" label than that of a general organic label [19]. In a study on the willingness to pay for organic yogurt, De Marchi et al. (2016) observed that, among the 173 US consumers surveyed, the willingness to pay for healthy and environmentally-friendly food labels was the highest for the "USDA organic" logo, followed by the willingness to pay for health attributes, i.e., diets low in saturated fat and cholesterol, and the environmentally-friendly label, i.e., carbon trust label [20]. In contrast, a sample of 334 Belgium surveyed consumers were not prepared to pay a higher price premium for a beer with an organic label, compared to a similar beer without the label [21]. Thus, we consider government certification labels as the main focus of the study.

Country-of-origin traceability of a product also plays an important role in consumers' decision-making during their purchase of products. In developed countries like the US, it is required to provide country-of-origin of food products such as shells, fresh vegetables, and fruits [17]. Loureiro and Umberger (2007) reported that US consumers were prepared to pay an extra of 1.90 dollars per lb. for the steak with a country-of-origin logo than without [22]. It was also reported that consumers were more inclined to purchase local products than products produced elsewhere [23,24]. For instance, Gracia (2014) found that Spanish consumers were prepared to pay 9% higher price for fresh lamb with a "locally grown" logo than without [25]. Wägeli et al. (2016) revealed that German consumers were willing to pay a price premium of 41–56% for local organic animal products produced with local feed [26]. The rationale behind this motivation is that the production processes are often transparent to consumers and that the short transportation distance ensures the freshness of the foods [27]. Another reason is that consumers are often included to support the local economy by purchasing foods produced locally [26]. However, a study in the Chinese context revealed that consumers were prepared to pay more for imported than domestic beef, although the willingness to pay for beef imported from countries suffered from bovine spongiform encephalopathy (BSE) outbreak was much lower [12].

Livestock feed is an important attribute to determine the quality of meat products, however, a few studies have taken it as an attribute in choice experiments. Although not a choice experiment study, Bernués et al. (2003) is an exemption who investigated consumers' preferences for proper animal feeding and found that it was even more important than the preference for origin/region of production [28]. Another study is Font i Furnols et al. (2011) who found that a proper feeding system was an important cue to determine a consumer's purchasing intention whereas price information was a minor factor for 391 European consumers [29]. Despite the little evidence, we argue that feed information is an important attribute in the Chinese context. This is because several notorious food safety outbreaks happened in China, i.e., the scandals that baby milk formula was contaminated by melamine, and that fresh pork contaminated by clenbuterol [30,31]. Other studies conducted in developed societies have also focused on animal welfare. For instance, Bernués et al. (2003) discovered that European consumers demanded information on animal welfare when purchasing meat. Based on data from 449 UK consumers [28], Erdem (2015) found that welfare-improved chickens received approximately seven times more *WTP* for better animal welfare than for conventional chickens [32]. However, we argue that Chinese consumers generally have a low awareness of animal welfare [33] and thus did not consider it as an attribute.

3. Methods: Discrete Choice Experiment

Lancaster (1966)'s Random Utility Theory suggested that a consumer's utility from a product is a function of attributes of the product [34]. Consumers subject to a budget constraint are expected to choose the set of attributes that maximize their utilities [35]. Following this rationale, consumers are hypothesized to maximize their utilities by making tradeoffs between the attributes of a pork product. Assuming a linear function, the utility of a consumer can be expressed as:

$$U_{ij} = \beta X_{ijk} + \varepsilon_{ij} \quad (1)$$

where U_{ij} represents the ith consumer's utility from pork j, X_{ijk} represents the kth attribute of pork j for consumer i, β is a vector of coefficients which are homogenous across consumers, and ε_{ij} is assumed to be an *i.i.d.* type I extreme value (EV1) distributed error term. Then, a consumer's utility associated with the alternative j can be written as:

$$U_{ij} = V_{ij} + \varepsilon_{ij} \quad (2)$$

where V_{ij} represents the utility determined by the pork attributes and ε_{ij} is a stochastic element. The probability that the alternative j is preferred by consumer i is expressed as:

$$P_{ij} = prob(V_{ij} + \varepsilon_{ij} > V_{is} + \varepsilon_{is}; \forall s, j \in T_{\rm i}, \forall s \neq j) \quad (3)$$

where $T_i = \{t_1, t_2, \ldots t_T\}$ represents the choice occasions faced by respondent i.

According to Loureiro and Umberger (2007) [22], the probability of consumer i choosing alternative j can be expressed by the multinomial logit (*MNL*) model:

$$P_{ij} = \frac{e^{V_{ij}}}{\sum_{j=1}^{J} e^{V_{ik}}} \quad (4)$$

Note that the *MNL* assumes that all consumers have the same preferences, which is likely to be violated [36]. This assumption is relaxed in the Random Parameter Logit model (*RPL*) which allows that consumers' preferences be heterogeneous across respondents [37,38]. In the Random Parameter Logit context, the deterministic component of the utility function takes the following form:

$$V'_{ij} = (\beta' + \sigma_i)X_{ijk} + \varepsilon_{ij} \quad (5)$$

where β' is a vector of attribute coefficients in the population level and σ_i is individual-specific deviation from the mean β'. When an *RPL* is assumed, the unconditional choice probability is the integral of the logit formula over all possible values of random parameters:

$$P_{ij} = \int \frac{e^{V'_{ij}}}{\sum\limits_{k=1}^{K} e^{V'_{ik}}} g(\beta|\theta) d\beta \quad (6)$$

where $g(\beta|\theta)$ denotes the joint density of random parameters. Next, the probability of consumer i's choices over the $T = \{t_1, t_2, \ldots t_T\}$ choice occasions, $P_{i_{(t_1,t_2,\ldots t_T)}}$, can be expressed as [39]:

$$P_{ij_{(t_1,t_2,\ldots t_T)}} = \int \prod_{t=1}^{T} \left[\frac{e^{V'_{ij}}}{\sum\limits_{k=1}^{K} e^{V'_{ik}}} \right] g(\beta|\theta) d\beta \quad (7)$$

4. Experimental Design and Sample Selection

4.1. Attributes

When it comes to the designing of a choice experiment, a reasonable number of attributes is necessary. Too many attributes cause fatigue and cognitive burden to respondents whereas too few attributes lead to attributes that are unrepresentative to a product in question [40]. The four attributes considered in this study include governmental certification, location-of-origin, "free from veterinary drug residues" label, and price. Governmental certification available in China's food market has four levels: no certification (*NOCERT* thereafter), "Safe Food" certification (*CERT1*), "Green Food" certification (*CERT2*), and "Organic Food" certification (*CERT3*). The "Safe Food" certification logo is issued by local authorities to be labeled on the raw or crude food that is produced by a process that meets the requirement of the national standards. Note that pesticides and fertilizers are allowed to produce foods with "Safe Food" certification logos, however highly-toxic types of pesticides with a high level of residues are not permitted. In theory, all foods sold in the market should meet this standard, however, in practice, this is not true. Next, foods with a "Green Food" logo indicates a production process with a higher safety standard and stricter quality control than "Safe Food". Similar to "Safe Food", the "Green Food" logo was closely watched by local authorities who take responsibilities to authorize the logos. Finally, the "Organic Food" logo, also known as "eco-foods", is labeled on the foods which are purely natural, no pollution, safe, and with ample nutrition. Foods with this logo have to strictly comply with the standards of organic farming where synthetic fertilizers are not used, and foods are not permitted to be processed using industrial solvents or synthetic food additives, nor are genetically modified foods considered as organic. In addition, organic farming also takes into consideration species diversity, sustainability of resources, and the balance of the ecological system etc. The definitions of the three labels had been shown to respondents before they made choices.

ORIGIN refers to a label which shows the information on the location where the pork is produced. *DRUG-FREE* means that the product has a label that shows that pork is free from veterinary drug residues and clenbuterol. The foods with Organic Food labels are indeed drug-free. Nevertheless, we expect consumers to have a higher willingness to pay for the food with both Organic Food and Drug-free labels than for Organic Food alone. The reason is that the more labels a food has, the more likely consumers believe the food is safer. To exclude the influences of other pork characteristics that are irrelevant to our study, the pork considered limits to hindquarter pork only. According to our observation of the local markets, an ordinary hindquarter pork is sold for approximately 25 Yuan/500 g, which is set as a baseline. In terms of the levels for the price attribute, we considered three levels (for 500 g pork): 15 Yuan, 25 Yuan, and 40 Yuan. The levels of the four attributes and effect coding are shown in Table 1.

Table 1. Four pork attributes, attribute levels, and effect coding.

Attributes	Levels	Description	Effect Coding
Government certification	"Safe Food" (*CERT1*) "Green Food" (*CERT2*) "Organic Food" (*CERT3*) No certification (*NOCERT*)	Has a logo that shows a certain certification	*CERT1* = 1; *CERT2* = 0; *CERT3* = 0 *CERT1* = 0; *CERT2* = 1; *CERT3* = 0 *CERT1* = 0; *CERT2* = 0; *CERT3* = 1 *CERT1* = −1; *CERT2* = −1; *CERT3* = −1
Location-of-origin	Yes (*ORIGIN*) No (*NOORIGIN*)	Has information on the location where the pork is produced	*ORIGIN* = 1 *NOORIGIN* = −1
Drug-free	Yes (*DRUG-FREE*) No (*NODRUG-FREE*)	Has a label that shows that pork is free from veterinary drug residues and clenbuterol	*DRUG-FREE* = 1 *NODRUG-FREE* = −1
Price	15 Yuan 25 Yuan 40 Yuan	Price per 500 g pork	*PRICE* = 15; *PRICE* = 25; *PRICE* = 40

4.2. Experimental Design

A full factorial design results in $(4 \times 2 \times 2 \times 3)^2 = 2304$ combinations of choice sets, making it infeasible to present all choice sets to respondents. It was reported that fatigue is likely to happen after being presented with approximately 15–20 choice sets [41]. To avoid systematic deviation from the attributes considered while ensuring efficiency, a fractional factorial design was used to obtain 12 choice sets using JMP 11.0 (SAS Institute, North Carolina, United States), based on D-error efficiency [42]. An example choice set is shown in Table 2. The D-efficiency value was 96.29, suggesting an acceptable design. Each choice set is composed of three alternatives, i.e., *Option A* and *Option B* offer a pork with certain levels of attributes, respectively, whereas Option C is an "opting out" choice. The design of an *Opting C* (*ASC* thereafter) choice makes sure that consumers are not forced to make choices which might not reflect their real preferences [43,44]. Respondents were also asked to answer some questions eliciting their socio-demographic information.

Table 2. An example choice set.

Option A	Option B	Option C
"Organic Food" certification	No certification	I chose neither Option A or Option B
No location-of-origin information	No location-of-origin information	
No label showing pork free from veterinary drug residues and clenbuterol	Has a label showing pork free from veterinary drug residues and clenbuterol	
Price: 40 Yuan/500 g	Price: 25 Yuan/500 g	
⊙	⊙	⊙

4.3. Data

A survey was conducted in Jiangsu and Anhui provinces, which are located in eastern China, with the former province more economically developed than the latter. We only focused on urban areas, where food markets are mature. To take into consideration the geographical location of the provinces, three cities (i.e., Suzhou, Wuxi, and Changzhou) from northern Jiangsu were selected, three cities (i.e., Nantong, Yangzhou, and Taizhou) from middle Jiangsu were selected, and three cities (i.e., Huaian, Suqian, and Xuzhou) from south Jiangsu were selected. For the Anhui province, one city (i.e., Bengbu) from the northern part of the province, one (i.e., Hefei) from the middle, and one (Xuancheng) from the south were selected. All enumerators had been trained to familiarize themselves with the questionnaire prior to the survey. Face-to-face surveys were conducted in July 2017 randomly in supermarkets, traditional food markets, and stores etc. (We do not anticipate that the socio-demographic characteristics of participants surveyed in one specific location are systematically differentiated than participants from the other locations.). Interviewees were randomly approached at different times of the day and were asked whether they are the ones who often buy pork for their families. Each interview took about 20–30 min. A total number of 984 consumers were interviewed, among which 844 questionnaires (475 from Jiangsu province and 369 from Anhui province) were intact and considered as valid responses (a response rate of 85.77%).

4.4. Sample Characteristics

Table 3 shows the socio-demographic characteristics of the sample. Female respondents account for 57.26% of the total number surveyed in Jiangsu province and 54.47% in Anhui, respectively. The fact that there are more female than male respondents is in line with the reality in China that females are more likely than males to do shopping for their families. Respondents aged 30 or younger and the respondents aged 40–49 account for more than half of total respondents, a figure consistent in both provinces. In terms of educational attainment, both provinces have similar percentages of respondents with secondary-school education or lower (about 28%), followed by high-school or vocational school (26%), and college education or higher (30%). Respondents in Jiangsu tended to be richer with 35.16% of respondents had a household income higher than 100,000 Yuan, in contract to Anhui with a percentage of 25.75%. This is in line with the economic status of the two provinces. A percentage of 53.26% of respondents from Jiangsu had children under 18, which is higher than that of Anhui (43.36%). In the Discrete Choice Experiment analysis, Gender was coded as 1 if a consumer is a male, and 0 if a female. Age was coded as 1 if a consumer was younger than 30 years old, 2 if between 31–39, 3 if between 40–49, 4 if 50–59, and 5 if older than 60 years old. Education attainment is denoted by *EDU*, which equals 1 if a consumer had secondary education or lower, 2 if high-school or vocational school, 3 if vocational college, 4 if bachelors' degree and 5 if Master's degree or higher. Household income of a consumer is denoted by *INCOME* which equals 1 if his/her household income is lower than 50,000 Yuan, 2 if 50,000–80,000 Yuan, 3 if 80,001–100,000 Yuan, and 4 if more than 100,000 Yuan.

Table 3. Sample characteristics.

Variables	Characteristics	Jiangsu		Anhui	
		N	%	N	%
Gender	Male	203	42.74	168	45.53
	Female	272	57.26	201	54.47
Age	≤30	141	29.68	114	30.89
	30–39	91	19.16	60	16.26
	40–49	127	26.74	96	26.02
	50–59	74	15.58	60	16.26
	≥60	42	8.84	39	10.57
Education attainment	Secondary school	137	28.84	111	30.08
	High school or vocational school	120	25.26	100	27.10
	Vocational college	62	13.05	53	14.36
	Bachelor's degree	130	27.37	90	24.39
	Master's degree and higher	26	5.47	15	4.07
Household income	<50,000 Yuan	64	13.47	48	13.01
	50,000–80,000 Yuan	116	24.42	98	26.56
	80,001–10,000 Yuan	128	26.95	128	34.69
	>100,000 Yuan	167	35.16	95	25.75
Whether the household has children (age < 18)	Yes	253	53.26	160	43.36
	No	222	46.74	209	56.64

5. Results

The estimation followed three stages. In the first stage, it was estimated a main effect model which did not include the interaction terms between attributes and the socio-demographics. In the next stage, a PRL model with interaction terms was estimated. Finally, the overall *WTP* for each of the attributes as well as the *WTP* estimates for sub-groups categorized by income and education were calculated and reported.

5.1. Main Effect Models

The Nlogit 5.0 software was used to estimate the RPL model. Because of the heterogeneity of the sample from the two provinces, two separate models were estimated respectively for each province. Table 4 presents the main effect model where interaction terms are absent. All attributes had significant coefficients, although the level of the coefficients differs. It can be seen that *CERT3* has the largest coefficient (0.6448) among all three types of certification, which is slightly higher than *CERT2* (0.6356) and much higher than *CERT1* (0.3294). This suggests that respondents in Jiangsu have similar preferences for *CERT2* and *CERT3*. In contrast, respondents from Anhui have a high preference for *CERT2* (0.6202), which is significantly higher than *CERT1* (0.1133) and slightly higher than *CERT3* (0.5607). Next, *ORIGIN* received a modest preference from respondents in both provinces (0.4040 and 0.4330, respectively), which was lower than *DRUG-FREE* (0.6451 for Jiangsu and 0.6574 for Anhui). These results suggest that *DRUG-FREE* is more preferred than *ORIGIN*.

5.2. RPL Model with Interaction Terms

In this section, the interaction terms between attributes and socio-demographic variables were added to the *RPL* model and results are reported in Table 5. It can be seen that the Pseudo R2 is higher in the models with interaction terms (0.2271 in the Jiangsu model and 0.2037 in the Anhui model) than without (0.2214 in the Jiangsu model and 0.2007 in the Anhui model), suggesting that the inclusion of interaction terms has increased model fit of both models. As a result, the prediction of *WTP* is based on the results in Table 5.

Table 4. Estimated RPL model (main effects).

Attributes	Jiangsu		Anhui	
	Coefficients	**S.E.**	**Coefficients**	**S.E.**
PRICE	−0.0474 ***	0.0023	−0.0481 ***	0.0026
ASC	−2.0211 ***	0.0681	−1.9077 ***	0.0755
CERT1	0.3294 ***	0.0438	0.1133 **	0.0506
CERT2	0.6356 ***	0.0423	0.6202 ***	0.0450
CERT3	0.6448 ***	0.0432	0.5607 ***	0.0423
ORIGIN	0.4040 ***	0.0271	0.4330 ***	0.0253
DRUG-FREE	0.6451 ***	0.0254	0.6574 ***	0.0352
Standard Deviation				
CERT1	0.4070 ***	0.0702	0.5062 ***	0.0691
CERT2	0.1880	0.1363	0.0005	0.3449
CERT3	0.4747 ***	0.0589	0.2326 **	0.0935
ORIGIN	0.3495***	0.0321	0.1100	0.0704
DRUG-FREE	0.1358 **	0.0597	0.4148 ***	0.0388
Sample size	475		369	
log likelihood	−4875.4582		−3888.1100	
McFadden Pseudo R^2	0.2214		0.2007	
AIC	9774.9		7800.2	

Note: ***, and ** indicate statistical significance at the 1%, and 5% levels, respectively.

Table 5. RPL model with interaction terms.

Attributes	Jiangsu		Anhui	
	Coefficients	**S.E.**	**Coefficients**	**S.E.**
PRICE	−0.0474 ***	0.0023	−0.0483 ***	0.0026
ASC	−2.0198 ***	0.0681	−1.9115 ***	0.0756
CERT1	0.1921	0.1929	0.1739	0.2912
CERT2	0.4793 ***	0.1808	0.4254 *	0.2529
CERT3	0.6350 ***	0.1809	0.4570 **	0.2301
ORIGIN	0.3027 ***	0.1171	0.2653 *	0.1426
DRUG-FREE	0.5496 ***	0.1058	0.3716 *	0.1938
Standard Deviation				
CERT1	0.3971 ***	0.0715	0.4936 ***	0.0699
CERT2	0.1401	0.1653	0.0033	0.3130
CERT3	0.4401 ***	0.0605	0.2150*	0.0992
ORIGIN	0.3254 ***	0.0324	0.1060	0.0728
DRUG-FREE	0.1327 ***	0.0604	0.4032 ***	0.0389
Interaction terms				
CERT1 × GENDER	−0.0389	0.0862	0.0133	0.1005
CERT1 × AGE	0.0279	0.0384	−0.0445	0.0500
CERT1 × EDU	0.0745 *	0.0412	−0.0949 *	0.0522
CERT1 × INCOME	−0.0365	0.0430	0.0985 *	0.0505
CERT2 × GENDER	0.0397	0.0810	−0.0534	0.0878
CERT2 × AGE	−0.0586	0.0358	0.0115	0.0435
CERT2 × EDU	−0.0304	0.0389	0.0165	0.0454
CERT2 × INCOME	0.1324 ***	0.0401	0.0488	0.0437
CERT3 × GENDER	0.0590	0.0806	−0.0195	0.0797
CERT3 × AGE	−0.0948 ***	0.0360	−0.0294	0.0397
CERT3 × EDU	0.0233	0.0385	−0.0310	0.0412
CERT3 × INCOME	0.0583	0.0402	0.0900 **	0.0398
ORIGIN × GENDER	0.0218	0.0524	0.0005	0.0495
ORIGIN × AGE	−0.0599 **	0.0233	0.0128	0.0246
ORIGIN × EDU	−0.0499 **	0.0251	0.0301	0.0256
ORIGIN × INCOME	0.1318 ***	0.0262	0.0187	0.0248
DRUG-FREE × GENDER	−0.0078	0.0472	−0.0491	0.0671
DRUG-FREE × AGE	0.0096	0.0210	−0.0115	0.0334
DRUG-FREE × EDU	−0.0098	0.0225	0.0015	0.0346
DRUG-FREE × INCOME	0.0355	0.0235	0.1107 ***	0.0336
Sample size	475		369	
log likelihood	−4840.1524		−3873.6442	
McFadden Pseudo R^2	0.2271		0.2037	
AIC	9744.3		7811.3	

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Among the Jiangsu respondents, the interaction terms with Age which had significantly negative coefficients were *CERT3* × *AGE* (−0.0948) and *ORIGIN* × *AGE* (−0.0599), suggesting that younger consumers had stronger preferences for *CERT3* and *ORIGIN*. Next, *CERT1* × *EDU* had a positive and significant coefficient (0.0745), indicating that better-educated consumers tended to prefer *CERT1* over no certification. However, *ORIGIN* × *EDU* had a negative and significant coefficient (−0.0499), which means that education was associated with a weaker preference for *ORIGIN*. Additionally, both *CERT2* × *INCOME* (0.1324) and *ORIGIN* × *INCOME* (0.1318) had positive and significant coefficients, suggesting that richer consumers were more likely to prefer *CERT2* and *ORIGIN*. Finally, all attributes interacting with gender had insignificant coefficients, indicating that the preferences for all attributes do not vary with gender. Next, we discuss the results based on the Anhui sample. We observed that *Income* played an important role. The coefficients of *CERT1* × *INCOME* (0.0985), *CERT3* × *INCOME* (0.0900), and *DRUG-FREE* × *INCOME* (0.1107) were all significant, suggesting that richer consumers from Anhui preferred *CERT1* and *CERT3* over no certification and that *DRUG-FREE* was preferred to no label. However, *CERT1* × *EDU* had a significantly negative coefficient (−0.0949), in contrast with the results reported using the Jiangsu data. Again, the attributes interacting with *Gender* had insignificant coefficients.

5.3. WTP Estimates

Based on the results in Table 6, the willingness to pay for a certain attribute is calculated using the following formula (Lim et al., 2013):

$$WTP_k = -2\frac{\beta_k}{\beta_{price}} \quad (8)$$

where β_k represents the main effect of the attribute k and β_{price} is the coefficient for *Price*. Because of the fact that effect coding was used, the formula was multiplied by 2 [42,43]. The 95% confidence interval was calculated by Krinsky and Robb (1986)'s parametric bootstrapping technique [44]. The results on *WTP* are reported in Table 6.

Table 6. *WTP* (Yuan) for the three attributes.

Attributes	Jiangsu		Anhui	
	WTP	**95% CI**	***WTP***	**95% CI**
CERT1	8.10	[7.37, 8.73]	7.21	[6.18, 8.43]
CERT2	20.22	[20.11, 20.29]	17.63	[17.62, 17.63]
CERT3	26.78	[25.94, 27.73]	18.94	[18.65, 19.18]
ORIGIN	12.77	[12.12, 13.59]	10.99	[10.86, 11.08]
DRUG-FREE	23.18	[23.04, 23.31]	15.40	[14.28, 16.50]

In general, consumers from Jiangsu province had higher *WTP* for all attributes than consumers from Anhui. This is in line with the income gap favoring respondents from Jiangsu. It can also be seen that consumers' *WTP* for certification matches the levels of standards. For instance, *CERT3* received higher *WTP* (26.78) than *CERT2* (20.22), which in turn received higher *WTP* than *CERT1* (8.10). A similar trend holds for Anhui: *CERT3* (18.94), *CERT2* (17.63), and *CERT1* (7.21). This indicates that consumers had a clear idea about what three certification logos were indicating and the food safety standards behind the certifications. This is in line with the results reported in Liu et al. (2013) [45]. Next, the pork with *DRUG-FREE* received an additional *WTP* of 23.18 (Jiangsu) and 15.40 (Anhui), which is close to the *WTP* figure for *CERT3*. This finding is probably because of the food scandals associated with pork happened in China in the past years. Additionally, consumers are willing to pay an extra of 12.77 (Jiangsu) and 10.99 (Anhui) for *ORIGIN*.

5.4. Sub-Group Analysis

Recall that several attributes interacting with income and education had significant coefficients (see Table 5), we now calculate the *WTP* for each of the attributes by sub-groups categorized by income and education. Following Lim et al. (2013) [46], the *WTP* for the *k*th attribute from sub-group *g* can be calculated as follows:

$$WTP_{k,g} = -2(\frac{\beta_k + \beta_{k\times g}}{\beta_{price}}), \text{where } g = [EDU, INCOME] \quad (9)$$

where β_k is the main effect, $\beta_{k\times g}$ is the coefficients of an interaction term between *EDU* (*INCOME*) and attribute *k*, and β_{price} is the coefficient for Price. Krinsky and Robb (1986)'s parametric bootstrapping technique was again used to calculate the 95% confidence intervals of the *WTP* estimates [47].

Tables 7 and 8 show the *WTP* for pork attributes among sub-groups in Jiangsu and Anhui, respectively. The high-income group had higher *WTP* for *CERT1* than the middle and low-income groups, among the highly educated and low educated respondents. In contrast, low-income respondents from the middle-educated group had higher *WTP* for *CERT1* than the middle and high-income respondents. For *CERT2*, high-income respondents from the high-education and middle-education groups had much higher *WTP* than their middle and low-income counterparts. However, the low-income respondents from the low-education group had much higher *WTP* than the middle and high-income respondents from the same group. For *CERT3*, high-income respondents from the high-education group, middle-income respondents from the middle-education group, and low-income respondents from the low-income group had much higher *WTP* than their counterparts from the corresponding sub-groups, respectively. For *ORIGIN*, high-income respondents in the middle-education group had the highest *WTP* (10.78 Yuan). Next, low-income respondents from the low-education group had the highest *WTP* (20.95 Yuan) for *DRUG-FREE* among all sub-groups.

Table 7. *WTP* (Yuan) for pork attributes among sub-groups (Jiangsu).

Sub-Groups	*CERT1*	*CERT2*	*CERT3*	*ORIGIN*	*DRUG-FREE*
Highly-Educated Sub-Group					
High-income	10.17 [9.44, 10.80]	14.89 [14.78, 14.96]	25.36 [24.52, 26,29]	9.56 [9.06, 10.19]	17.01 [16.87, 17.14]
Middle-income	8.10 [7.37, 8.73]	3.96 [3.86, 4.03]	16.27 [15.44, 17.20]	5.49 [5.05, 6.06]	10.09 [9.97, 10.23]
Low-income	5.37 [4.65, 6.01]	4.33 [4.23, 4.40]	15.94 [15.10, 16.88]	10.68 [10.22, 11.28]	11.27 [11.13, 11.41]
Middle Education Sub-Group					
High-income	4.31 [3.59, 4.95]	11.16 [11.06, 11.23]	17.78 [16.94, 18.70]	10.78 [10.30, 11.40]	15.93 [15.83, 16.04]
Middle-income	7.02 [6.29, 7.65]	9.02 [8.91, 9.09]	18.91 [18.07, 19.83]	8.53 [7.98, 9.22]	16.98 [16.82, 17.18]
Low-income	10.33 [9.60, 10.96]	5.24 [5.13, 5.31]	15.93 [15.09, 16.88]	8.61 [8.16, 9.18]	12.57 [12.43, 12.71]
Low Education Sub-Group					
High-income	4.16 [3.43, 4.79]	−1.28 [−1.39, −1.21]	8.64 [7.95, 9.37]	4.21 [3.78, 4.76]	9.62 [9.48, 9.75]
Middle-income	3.64 [2.91, 4.27]	4.05 [3.95, 4.13]	11.84 [11.14, 12.58]	9.73 [9.19, 10.38]	13.76 [13.62, 13.90]
Low-income	4.08 [3.36, 4.72]	14.52 [14.42, 14.60]	19.54 [18.71, 20.46]	2.63 [2.13, 3.25]	20.95 [20.81, 21.08]

Notes: High-income refers to the households whose income was larger than 100,000 Yuan, Middle-income refers to the households whose income was between 50,000 and 80,000, and the Low-income group refers to the households whose income was less than 50,000 Yuan. A respondent is defined to have received high-education if the years of schooling is more than 12 years, Middle-educated if 9–12 years, and Low-educated if less than 9 years.

Table 8. *WTP* (Yuan) for pork attributes among sub-groups (Anhui).

Sub-Groups	CERT1	CERT2	CERT3	ORIGIN	DRUG-FREE
High Education Sub-Group					
High-income	7.91 [6.93, 9.02]	12.51 [12.50, 12.51]	15.17 [14.89, 15.42]	6.26 [6.13, 6.35]	10.18 [9.34, 11.06]
Middle-income	5.18 [4.15, 6.40]	0.41 [0.40, 0.41]	8.22 [7.93, 8.47]	7.55 [7.43, 7.61]	6.15 [5.24, 7.08]
Low-income	6.13 [5.10, 7.34]	0.22 [0.21, 0.22]	8.16 [7.87, 8.40]	6.08 [5.95, 6.16]	5.89 [5.12, 6.70]
Middle Education Sub-Group					
High-income	11.14 [10.12, 12.37]	12.81 [12.80,12.81]	16.48 [16.19, 16.73]	4.45 [4.32, 4.53]	14.30 [13.28, 15.22]
Middle-income	8.65 [7.74, 9.68]	6.18 [6.17,6.18]	10.89 [10.60, 11.13]	3.37 [3.26, 3.41]	6.71 [5.80, 7.75]
Low-income	7.94 [7.11, 8.89]	13.89 [13.88,13.89]	13.16 [12.87, 13.41]	5.47 [5.34, 5.55]	5.30 [4.72, 5.95]
Low Education Sub-Group					
High-income	10.37 [9.43, 11.53]	−7.34 [−7.33, −7.34]	2.04 [1.75, 2.29]	3.60 [3.47, 3.68]	−4.49 [−5.25, −3.70]
Middle-income	11.60 [10.61, 12.79]	6.05 [6.04, 6.05]	11.64 [11.35, 11.88]	5.49 [5.37, 5.55]	2.88 [1.90, 3.89]
Low-income	12.59 [11.61, 13.79]	4.10 [4.09, 4.10]	12.11 [11.82, 2.35]	5.41 [5.27, 5.49]	8.39 [7.49, 9.31]

Now we discuss the results of the Anhui sample. We observed that the results are much more consistent in a way that high-income respondents from the high-educated respondents had reported consistently higher *WTP* for all certification attributes than the middle- and low-educated respondents. The same trend holds for the middle-education sub-group where high-income respondents and higher *WTP* for *CERT1* and *CERT3* than their middle- and low-income counterparts.

6. Conclusions and Policy Recommendations

Chinese consumers are paying an increasing attention to food safety issues, thus it is important to understand their willingness to pay for safe foods. This paper investigates consumer's *WTP* for pork with four attributes, namely government-certification, location-of-origin, "free from veterinary drug residues" label, and price, based on a choice experiment conducted among 844 consumers from Jiangsu and Anhui provinces in China. A Random Parameter Logit model was estimated to elicit consumers' *WTP* for the four attributes. The main conclusions are as follows.

Consumers have relatively high *WTP* for organic pork. In particular, respondents from Jiangsu had the highest *WTP* for pork with a "Organic Food" logo, followed by a "free from veterinary drug residues" logo, and a "Green Food" logo. Respondents from Anhui were prepared to pay a similar amount for pork with "Organic Food" and "Green Food" logos and a much lower amount for the "Safe Food" logo. We found that respondents from Jiangsu generally were willing to pay more for the four attributes than respondents from Anhui would. We argue that this is a result of the gap in economic development disadvantaging Anhui. Next, we also found that the *WTP* difference between "Organic Food" and "Green Food" labels among respondents from Jiangsu was much higher than that of respondents from Anhui. This indicates that Jiangsu consumers were aware of the difference between "Organic Food" and "Green Food" whereas Anhui respondents could not tell the difference between the two. The policy implications are that policymakers need to increase public awareness of the different types of verifications (especially in the less economically developed regions) which can be done by the dissemination using social media channels (e.g., Wechat) because of its high reachability to Chinese consumers. The authorization of certification logos should be enforced strictly so that food with certification logos are always reflective of the standard being followed. This is important to build trust among consumers such that a higher price is always associated with a better quality, i.e., no pesticides residues and organic, etc.

We found that consumers in both provinces were prepared to pay for labels showing location-of-origin and "free from veterinary drug residues". However, consumers' *WTP* for the two attributes are significantly less than that of "Organic Food". Next, we found that consumers had a small *WTP* for "Safe Food" in both provinces. The reason is that the standard for obtaining a "Safe Food" is relatively low, causing an impression to consumers that pork with a "Safe Food" logo has little difference with no certification. It could also be that the recent food scandals happened in Hebei where vegetables with "Safe Food" logos were found to have residues of highly-poisonous pesticides. The trust of the public may have been hampered by those events. It was also reported that the two socio-demographic variables associated with a higher *WTP* are income and education attainment. Labels to reflect "free from veterinary drug residues" and location-of-origin should be used to allow a transparent traceability to how the pork is produced. One possible drawback of the current study is that choice experiment is a stated preference method which might suffer from hypothetical bias. Future research should design incentive-compatible instrument, e.g., actions, to elicit consumers' willingness to pay estimates in real-life settings.

Acknowledgments: The research presented in this paper is supported by the National Natural Science Foundation of China (Project Approval Nos. 71673115, 71633002 and 71540008).

Author Contributions: Jianhua Wang and Jiaye Ge conceived and designed the experiments; Yuting Ma performed the experiments; Jiaye Ge and Yuting Ma analyzed the data; Jianhua Wang wrote the paper.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Alimi, B.A.; Workneh, T.S. Consumer awareness and willingness to pay for safety of street foods in developing countries: A review. *Int. J. Consum. Stud.* **2016**, *40*, 242–248. [CrossRef]
2. Zhou, J.; Liu, Q.; Mao, R.; Yu, X. Habit spillovers or induced awareness: Willingness to pay for eco-labels of rice in China. *Food Policy* **2017**, *71*, 62–73. [CrossRef]
3. He, Y.; Yang, X.; Xia, J.; Zhao, L.; Yang, Y. Consumption of meat and dairy products in China: A review. *Proc. Nutr. Soc.* **2016**, *75*, 385–391. [CrossRef] [PubMed]
4. Verbeke, W.; Liu, R. The impacts of information about the risks and benefits of pork consumption on Chinese consumers' perceptions towards, and intention to eat, pork. *Meat Sci.* **2014**, *98*, 766–772. [CrossRef] [PubMed]
5. Darby, M.R.; Karni, E. Free competition and the optimal amount of fraud. *J. Law Econ.* **1973**, *16*, 67–88. [CrossRef]
6. Gao, Z.; Schroeder, T.C.; Yu, X. Consumer willingness to pay for cue attribute: The value beyond its own. *J. Int. Food Agribus. Mark.* **2010**, *22*, 108–124. [CrossRef]
7. Risius, A.; Hamm, U. The effect of information on beef husbandry systems on consumers' preferences and willingness to pay. *Meat Sci.* **2017**, *124*, 9–14. [CrossRef] [PubMed]
8. Janssen, M.; Hamm, U. Product labelling in the market for organic food: Consumer preferences and willingness-to-pay for different organic certification logos. *Food Qual. Pref.* **2012**, *25*, 9–22. [CrossRef]
9. Hoek, A.C.; Pearson, D.; James, S.W.; Lawrence, M.A.; Friel, S. Healthy and environmentally sustainable food choices: Consumer responses to point-of-purchase actions. *Food Qual. Pref.* **2017**, *58*, 94–106. [CrossRef]
10. Wier, M.; O'doherty Jensen, K.; Andersen, L.M.; Millock, K. The character of demand in mature organic food markets: Great Britain and Denmark compared. *Food Policy* **2008**, *33*, 406–421. [CrossRef]
11. Gao, Z.; Schroeder, T.C. Effects of label information on consumer willingness-to-pay for food attributes. *Am. J. Agric. Econ.* **2009**, *91*, 795–809. [CrossRef]
12. Ortega, D.L.; Hong, S.J.; Wang, H.H.; Wu, L. Emerging markets for imported beef in China: Results from a consumer choice experiment in Beijing. *Meat Sci.* **2016**, *121*, 317–323. [CrossRef] [PubMed]
13. Yu, X.; Gao, Z.; Zeng, Y. Willingness to pay for the "Green Food" in China. *Food Policy* **2014**, *45*, 80–87. [CrossRef]

14. Liu, Q.; Yan, Z.; Zhou, J. Consumer choices and motives for eco-labeled products in China: An empirical analysis based on the choice experiment. *Sustainability* **2017**, *9*, 331. [CrossRef]
15. Wu, L.; Wang, H.; Zhu, D.; Hu, W.; Wang, S. Chinese consumers' willingness to pay for pork traceability information—The case of Wuxi. *Agric. Econ.* **2016**, *47*, 71–79. [CrossRef]
16. Zhang, M.; Jin, Y.; Qiao, H.; Zheng, F. Product quality asymmetry and food safety: Investigating the "one farm household, two production systems" of fruit and vegetable farmers in China. *China Econ. Rev.* **2017**, *45*, 232–243. [CrossRef]
17. Xie, J.; Gao, Z.; Swisher, M.; Zhao, X. Consumers' preferences for fresh broccolis: Interactive effects between country of origin and organic labels. *Agric. Econ.* **2016**, *47*, 181–191. [CrossRef]
18. Teas, R.K.; Agarwal, S. The effects of extrinsic product cues on consumers' perceptions of quality, sacrifice, and value. *J. Acad. Mark. Sci.* **2000**, *28*, 278–290. [CrossRef]
19. Van Loo, E.J.; Caputo, V.; Nayga, R.M.; Meullenet, J.F.; Ricke, S.C. Consumers' willingness to pay for organic chicken breast: Evidence from choice experiment. *Food Qual. Pref.* **2011**, *22*, 603–613. [CrossRef]
20. De Marchi, E.; Caputo, V.; Nayga, R.M.; Banterle, A. Time preferences and food choices: Evidence from a choice experiment. *Food Policy* **2016**, *62*, 99–109. [CrossRef]
21. Poelmans, E.; Rousseau, S. Beer and organic labels: Do belgian consumers care? *Sustainability* **2017**, *9*, 1509. [CrossRef]
22. Loureiro, M.L.; Umberger, W.J. A choice experiment model for beef: What US consumer responses tell us about relative preferences for food safety, country-of-origin labeling and traceability. *Food Policy* **2007**, *32*, 496–514. [CrossRef]
23. Zander, K.; Hamm, U. Consumer preferences for additional ethical attributes of organic food. *Food Qual. Pref.* **2010**, *21*, 495–503. [CrossRef]
24. Denver, S.; Jensen, J.D. Consumer preferences for organically and locally produced apples. *Food Qual. Pref.* **2014**, *31*, 129–134. [CrossRef]
25. Gracia, A. Consumers' preferences for a local food product: A real choice experiment. *Empir. Econ.* **2014**, *47*, 111–128. [CrossRef]
26. Wägeli, S.; Janssen, M.; Hamm, U. Organic consumers' preferences and willingness-to-pay for locally produced animal products. *Int. J. Consum. Stud.* **2016**, *40*, 357–367. [CrossRef]
27. Feldmann, C.; Hamm, U. Consumers' perceptions and preferences for local food: A review. *Food Qual. Pref.* **2015**, *40*, 152–164. [CrossRef]
28. Bernués, A.; OlAazola, A.; Corcoran, K. Labelling information demanded by European consumers and relationships with purchasing motives, quality and safety of meat. *Meat Sci.* **2003**, *65*, 1095–1106. [CrossRef]
29. I Furnols, M.F.; Realini, C.; Montossi, F.; Sanudo, C.; Campo, M.M.; Oliver, M.A.; Nute, G.R.; Guerrer-o, L. Consumer's purchasing intention for lamb meat affected by country of origin, feeding system and meat price: A conjoint study in Spain, France and United Kingdom. *Food Qual. Pref.* **2011**, *22*, 443–451. [CrossRef]
30. Zhang, L.; Wu, L.L.; Wang, Y.P.; Liu, A.M.; Zou, C.C.; Zhao, Z.Y. Melamine-contaminated milk products induced urinary tract calculi in children. *World J. Pediatr.* **2009**, *5*, 31–35. [CrossRef] [PubMed]
31. Qiao, G.; Guo, T.; Klein, K.K. Melamine and other food safety and health scares in China: Comparing households with and without young children. *Food Control* **2012**, *26*, 378–386. [CrossRef]
32. Erdem, S. Consumers' preferences for nanotechnology in food packaging: A discrete choice experiment. *J. Agric. Econ.* **2015**, *66*, 259–279. [CrossRef]
33. You, X.; Li, Y.; Zhang, M.; Yan, H.; Zhao, R. A survey of chinese citizens' perceptions on farm animal welfare. *PLoS ONE* **2014**, *9*, e109177. [CrossRef] [PubMed]
34. Lancaster, K.J. A new approach to consumer theory. *J. Political Econ.* **1966**, *74*, 132–157. [CrossRef]
35. Viegas, I.; Nunes, L.C.; Madureira, L.; Fontes, M.A.; Santos, J.L. Beef credence attributes: Implications of substitution effects on consumers' WTP. *J. Agric. Econ.* **2014**, *65*, 600–615. [CrossRef]
36. Hensher, D.A.; Greene, W.H. The mixed logit model: The state of practice. *Transportation* **2003**, *30*, 133–176. [CrossRef]
37. Chen, Q.; Anders, S.; An, H. Measuring consumer resistance to a new food technology: A choice experiment in meat packaging. *Food Qual. Pref.* **2013**, *28*, 419–428. [CrossRef]
38. Mcfadden, D.; Train, K. Mixed MNL models for discrete response. *J. Appl. Econ.* **2000**, *15*, 447–470. [CrossRef]
39. Train, K.E. *Discrete Choice Methods with Simulation*; Cambridge University Press: Cambridge, UK, 2009.

40. Verbeke, W. Consumer acceptance of functional foods: Socio-demographic, cognitive and attitudinal determinants. *Food Qual. Pref.* **2005**, *16*, 45–57. [CrossRef]
41. Allenby, G.M.; Rossi, P.E. Marketing models of consumer heterogeneity. *J. Econ.* **1998**, *89*, 57–78. [CrossRef]
42. Ferrini, S.; Scarpa, R. Designs with a priori information for nonmarket valuation with choice experiments: A monte carlo study. *J. Environ. Econ. Manag.* **2007**, *53*, 342–363. [CrossRef]
43. Lusk, J.L.; Schroeder, T.C. Are choice experiments incentive compatible? A test with quality differentiated beef steaks. *Am. J. Agric. Econ.* **2004**, *86*, 467–482. [CrossRef]
44. Hole, A.R. A comparison of approaches to estimating confidence intervals for willingness to pay measures. *Health Econ.* **2007**, *16*, 827–840. [CrossRef] [PubMed]
45. Liu, R.; Pieniak, Z.; Verbeke, W. Consumers' attitudes and behaviour towards safe food in China: A review. *Food Control* **2013**, *33*, 93–104. [CrossRef]
46. Lim, K.H.; Hu, W.; Maynard, L.J.; Goddard, E.U.S. consumers' preference and willingness to pay for country-of-origin-labeled beef steak and food safety enhancements. *Can. J. Agric. Econ.* **2013**, *61*, 93–118. [CrossRef]
47. Krinsky, I.; Robb, A.L. On approximating the statistical properties of elasticities. *Rev. Econ. Stat.* **1986**, *68*, 715–719. [CrossRef]