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Does Animal Welfare Matter to Consumers in Developing Countries? The Case of China

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Abstract:

Modern agricultural technologies have focused on improving the production efficiency, resulting in some animal treatment methods in the livestock, dairy and poultry farming sector that cause public concerns. Such technologies and concerns have been adopted and recognized widely in developed countries but not so in developing countries. We use pork, the staple meat in China, as an example to investigate Chinese urban consumers' preferences for animal welfare. Choice experiment surveys in the three top cities, Beijing, Guangzhou, and Shanghai, were collected in 2014, and random parameter logit models are applied to estimate consumers' willingness-to-pay (WTP) for the animal welfare attribute of pork, together with environmental stewardship, food safety and country of origin. We also attempt to separate consumers' preference for animal welfare from their own consumption concern of the meat quality and safety resulting from animals treated better or their actual care about the animals. Results show that Chinese consumers are willing to pay a price premium for the animal welfare attribute, and they generally believe animals treated better will yield better taste and safer meat. However, the latter does not affect their WTP, which implies they care about the animals irrespective to the yielded meat quality and safety.

Key Words:

Chinese pork, animal welfare, food safety, country of origin, willingness to pay, choice experiment

Copyrighted by the authors, 2018. Contact author email is wanghong@purdue.edu. Here are the introduction, Data and Conclusion sections only. The full version of the paper is not allowed to release at this date. Please contact the author for citation need.

Does Animal Welfare Matter to Consumers in Developing Countries? The Case of China (Only Introduction, data and Conclusion Sections)

1. Introduction and Background

The development of modern agricultural technologies has focused on improving the efficiency of the supply chain, from saving resource input, increasing the output quantity and quality, and reducing postharvest waste. In animal production sector such as dairy, livestock, poultry, and aquaculture, this means to improve feed-meat ratio, to shorten animal growing time, to reduce death, injury and sickness to save land, human and other resources. However, such technologies have brought controversial issues of animal welfare including treating animals properly without their sufferings (Hewson, 2003).

Many commonly adopted methods by commercial farms have caught the public attention and concerns. For example, debeaking in egg production, gestation crates in swine farrowing, and tail docking in hog production affect animals only, while application of growth hormone and veterinary drugs may affect both animals and the quality and safety of food products from them. Confinement for cattle and caging hens in small space is also considered violating animal rights and cause policy intervention, such as the Californian Standards for Confining Farm Animals. These methods are widely adopted in developed countries and so are the concerns. However, in developing countries, consumers have recent memories of food, especially animal protein food, shortage. They tend to consume a wide variety of animal products, and ensure sufficient animal based food has been their top priority. As these technologies are transferred to developing countries, will consumers there care the same way as their counterparts in developed countries?

On the other hand, food safety has been an issue in developing countries because of the poor hygienic infrastructure, substandard regulations, and weak legal reinforcement (Pouliot and Wang, 2018). Because the animal production method is closely related to food safety and

environment, these issues are often interrelated to each other. Furthermore, consumers in developing countries tend to believe that the imported food from developed countries have higher quality (Knight et al, 2008), in a same way as their counterparts in developed countries (Ortega et al, 2014; Alfnes, 2004). However, because the animal welfare issues are originated from the industrialized production method and also publicized by proactive organizations in developed countries, the public in developing countries has no clear consensus whether imported animal based food is better or worse in terms of animal welfare than domestic produced food.

Consumers preferences for particular food characteristics are often studied using the measurement of willingness-to-pay (WTP) on specific attributes. Animal welfare and environmental stewardship are characteristics that consumers are willing to pay (Liljenstolpe, 2008; Magnier, Schoormans, & Mugge, 2016; Lagerkvist & Hess, 2011; Ortega, & Wolf, 2018). All the aforementioned studies are for developed countries in Europe and North America, and very few are found for developing countries. An exception is the study by Schnettler et al (2009), who found Chilean beef consumers were NOT willing to pay for animal welfare attribute, opposite to that from developed countries.

Furthermore, irrespective to whether from developing or developed countries, consumers often have unapproved ideas that food from animals treated well may yield meat, eggs, and milk that is safer, more nutritious, and better tasting (Ingenbleek & Immink, 2011). This draws into question whether consumers pay for such attributes are for the resulting of safer and better tasting products or for the welfare of animals and the environment, a question has not been studied in literature.

China is the largest developing country with a fast income growth supporting a quick upgrading from plant based diet to including a bigger share of animal protein (Ortega, Wang &

Chen, 2015). Their huge appetite for meat and dairy is satisfied mostly with domestic production supplemented by imported products. The generation of middle aged and older still remember when food was scarce and meat was hardly affordable not so long ago, while they and younger generations start to face the choices of animal protein food with all concerns on food safety, taste, environmental effect, animal welfare, and country of origin. There emerged many food safety scandals and consumers demand for food safety is supported by their WTP for such attributes (Ortega et al 2012; Ortega et al, 2015; Ortega, et al 2011; Wang, Mao, & Gale, 2008).

Two famous brands, Green Bird Hen eggs from free range layers and Black Mountain Pig pork from free range hogs are marketed in Chinese supermarkets with a significant price premium over conventional eggs and pork. Many Chinese consumers believe that when animals are treated well like these, food yielded from them tastes better than conventional products. Similarly, in regards to food safety and environmental stewardship, some consumers may feel these products are safer and more eco-friendly, and thus are willing to pay more for the product.

In this study, we use Chinese consumer demand as an example to examine empirically 1) whether consumers in such fast developing economies are willing to pay for animal welfare, and 2) to disentangle the actual preference for animals' welfare from the preference of their own benefit of consuming good taste and safety attributes. We include such product characteristics as food safety, environmental stewardship, and country of origin in this study. Because pork is the staple meat for Chinese consumers, accounting for over 40% of all meat and poultry (Hansen & Gale, 2014), it is chosen as the commodity in this empirical study.

2. Method

No show on purpose.

3. Data and Descriptive Analysis

In the summer of 2014, we administered an in-person survey to pork shoppers in supermarkets in the three first-tier cities in China, Beijing, Shanghai and Guangzhou. Graduate students were recruited from universities in each of the cities and trained to be the enumerators for the in-person interviews. In each of the cities, four or five districts were randomly chosen and then two to three stores were chosen in each district from the list of all large chained supermarkets, like Walmart, Carrefour, Lianhua and Tesco. About 20 shoppers from each of the stores were randomly interviewed at different times throughout the day. Large supermarkets in these cities were employed because shoppers there tend to be more representative for Chinese new middle class who have access to imported pork. A total of 700 surveys were collected for a full completion of the questions, among whom 221 were from Shanghai, 220 from Guangzhou, and 259 from Beijing.

The five attributes we consider in the choice experiment are explained in Table 1. There are four levels of price, three levels of country of origin, and two levels of the other three attributes. Price is expressed in RMB Yuan/500 grams or 1.10 pounds, and 1 USD is approximately 6.20 RMB as of July 8, 2014. Other than the price, the four variables are qualitative and entered the linear utility equation as five dummy variables keeping the pork imported from other countries and without any claims as the default. Because in the choice experiment we allow an alternative to opt out, we include a dummy variable OptOut in the utility. All other qualitative attribute variables take value one if the corresponding attribute is present and negative one if not for the effects coding, except we leave the zero to the OptOut dummy variable for the non-opt out alternatives.

Table 1 Attribute Description in Choice Experiment

Attribute	Levels	Description
Price (RMB Yuan/500grams)	20, 30, 40, 50	Price expressed in RMB Yuan per 500 grams of boneless pork loin
Country of Origin	China, US, Other Countries	The location of origin where the pork was produced: mainland China, imported from U.S., or imported from other Countries.
Food Safety	Yes, No	Yes, indicates this product has claims indicating the use of food safety practices that will reduce your likelihood of becoming ill. For example: organic certification, green food certification, additive information and traceability. No means no such claims.
Animal Welfare	Yes, No	Yes, indicates this product has claims regarding the use of animal welfare practices. For example: type of production, standards and procedures to ensure that pigs are treated without cruelty and are fed with food of a certain quality.
Environment Stewardship	Yes, No	Yes, indicates this product has claims regarding environmental standards on the pig farms. For example: water quality, soil quality, standards for limiting the carbon footprint and for maintaining a sustainable ecosystem.

The complete combination of the five attributes with two to four levels would give 96 possible alternatives, and the putting any two alternatives plus a third alternative of opt out would yield 9,216 possible choice sets. This is an impossible job for one survey respondent. Therefore, we use a D-optimal fractional factorial design allowing for estimation of all main and two-way interaction main effects to a reduced number of choice sets at 40. These choice sets were furthermore blocked into 4 groups of 10 choice sets for each survey respondent only makes the choice from the 10 sets to make the job feasible for individual survey respondents. Prior to participation, instructions and a cheap talk script were provided to survey participants to reduce hypothetical bias (Ferris, 1994; Lusk, 2003).

Making the choice in the experiment is like a real shopping decision when alternative options are available. Consumers were asked to consider a simulated shopping situation without real transactions: making purchasing choices among the given alternative options with various product attributes. Figure 1 shows an example of a choice set. An opt out option is allowed if

neither Alternative 1 nor Alternative 2 is preferred by the consumer and s/he would rather walk out without buying anything.

Choice Block	Alternative 1	Alternative 2	Alternative 3
Price	20Yuan/500g	50Yuan/500g	I don't want to buy the pork of either Alternative 1 or Alternative 2.
Country of Origin	Other Countries	US	
Food Safety	Yes	Yes	
Animal Welfare	Yes	No	
Environmental Stewardship	Yes	No	
I would buy:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 1 Sample choice blocks one from survey instrument in English. Chinese shoppers were supplied with translated versions in Mandarin.

Demographic information was collected and shown in Table 2. The average age of survey participants was 33, 37 and 43 years for Beijing, Guangzhou and Shanghai, respectively, and the corresponding average family monthly income is 10,776, 96,27 and 10,394 Yuan RMB. About two thirds of the shoppers we recruited were females as expected. On average, they household size was 3.3, 3.7 and 3.4, and they consumed 2.86, 3.05 and 2.81 units of 500 grams of pork weekly. The education levels were similar across the three cities with Beijing slightly higher at 15 years.

Table 2 Summary Statistics for Demographic Variables

	Beijing	Guangzhou	Shanghai
Sample size	259	220	221
Male	37%	35%	32%
Age	33	37	43
Education Years	15	14	14
Monthly Household Income	10,776	9,627	10,394
Household Size	3.3	3.7	3.4
Weekly Pork Consumption (500grams)	2.86	3.05	2.81
<i>Animals Treated Well Taste Better (TWT)</i>			
Agree	70%	65%	71%
Disagree	30%	35%	29%
<i>Animals Treated Well Are Safer (TWS)</i>			
Agree	65%	66%	74%
Disagree	35%	34%	26%

<i>Chinese Care about the Environment (CCE)</i>			
Agree	43%	64%	66%
Disagree	57%	36%	34%
<i>I Care about the Environment (ICE)</i>			
Agree	83%	91%	94%
Disagree	17%	9%	6%

Several questions were asked with regard to the consumers' perception about animal welfare, and environment stewardship, as listed in Table 2. We asked the survey participants their perception about the linkage between the taste and safety qualities of pork products and the animal welfare practices. Consumers were asked to rate the items on a scale from '1' meaning 'Don't Agree' to '5' meaning 'Totally Agree.' Responses between '4' and '5' were combined into 'Agree' and the remaining responses were combined into 'Disagree.'

Consumers in the three cities show a high level of homogeneity in their opinions about animal welfare. Across all three cities, about two thirds of consumers agreed there are connections between the animal welfare and the quality of meat including both taste and safety, leaving only one third showing either don't know or disagree. This belief may entangle consumers' preference of animal welfare with that of food safety and quality.

However, they have slightly different opinions on the environment. Especially, Beijing consumers tend to disagree on that Chinese people in general care about the environment relative to those in Guangzhou and Shanghai. More of them also admit that they themselves don't quite care about the environment. The former can be explained by the overall poorer environment quality in Beijing than in the other two cities, especially the very visible air quality, which would make people suspect the general public is not environmental responsible. The latter is not surprising, revealing the positively correlation between one's own attribute for a public good with everyone else'. Self-claimed caring about the environment is very high, 83% in Beijing, 91% in Guangzhou and 94% in Shanghai.

We also asked questions about how frequent the survey respondents pay attention to the attributes about animal welfare and environmental stewardship. These results are shown in Figure 2. Looking at each attribute separately, we can see that Consumers in Guangzhou pay more attention to the two attributes than their Shanghai counterparts, and both pay more attention than consumers in Beijing. Comparing the two attributes, we find that across all three cities, consumers pay less attention to animal welfare than environmental stewardship, or the former is less of a priority than the latter which implies the animal welfare is a newly recognized concept among these consumers.

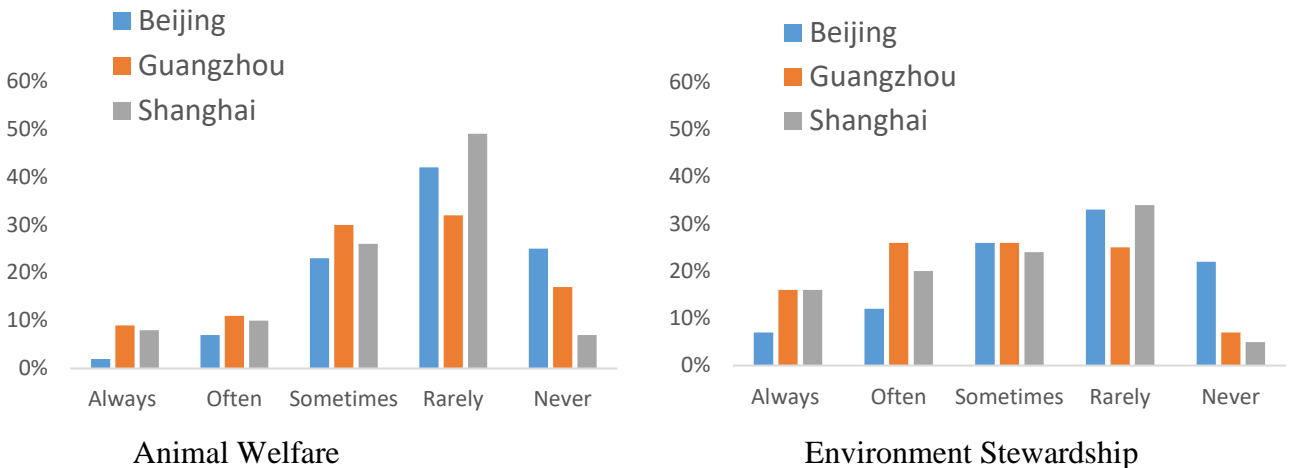


Figure 2. Frequency attention paid to animal welfare and environment attributes

Expanded from equation (2) where the explanatory variables include all from table 1 and TWT, TWS, CCE and ICE in table 2. We run the model from each city separately. The baseline model is established as the following: the 'OptOut' dummy variable represents occasions when the alternative of not to purchase either of the products was selected by an individual, and then the default is for pork imported from other countries, without any attribute labels, and for consumers disagreeing to all statements provided. The interest here is to examine the marginal

contributions on utility from labeling regarding food safety, animal welfare, environmental information, and country of origin information. Interactions between animal welfare with the claims that link animal welfare with taste and safety, and interactions between environment with their attitudes about environment can also provide insights on preferences for animal welfare inform.

4. Results

No show on purpose.

5. Summary and Conclusion

Based on a survey of 700 shoppers in Chinese three topline cities, Beijing, Guangzhou and Shanghai, we found Chinese urban consumers become aware of animal welfare and express a willingness to pay for this attribute in pork. Together with environment stewardship, these two attributes do not necessarily impact the nutritional or sensational value directly to consumers but create an altruistic value. Results show that although two-third of these consumers believe that better treated animals yield meat safer and tastier, their willingness to pay for the animal welfare values are not affected by their beliefs. That indicates they are truly willing to pay for the altruistic reasons.

Demographic and other factors are also found to contribute to the consumers' willingness to pay for animal welfare and environment stewardship. Shanghai consumers place higher values to all the attributes than Beijing consumers, while Guangzhou consumers have the highest preference for animal right. It is not just the geographic factors but more of a cultural difference among the cities. Also, education brings higher consumer willingness to pay for them.

As an early study of consumers' attitude about animal welfare outside the developed countries, it provides empirical evidence that as economic growth consumers in emerging

countries can catch up with those in developed countries with such issues. This will be informative to the industry as they make their marketing and future production strategies.

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