



Chinese consumers' preferences and willingness to pay for traceable food quality and safety attributes: The case of pork

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ABSTRACT

A survey was conducted among 1489 consumers in seven pilot cities designated by the Chinese Ministry of Commerce for constructing a meat circulation traceability system. This study set four attributes for pork: traceability information, quality certification, appearance, and price. The preferences and willingness to pay (WTP) of consumers for traceability information, quality certification, appearance attributes, and influencing factors were investigated using choice experiments. According to results from both mixed logit and latent class models, quality certification was the most important characteristic, followed by appearance, and traceability information. "Government certification," "very fresh-looking," and "traceability information covering farming, slaughter and processing, circulation and marketing" were the most preferred levels of quality certification, appearance, and traceability information, respectively. Significant heterogeneity was observed in the consumer preferences for these attributes. The preferences and WTP of consumers for traceability information and quality certification were significantly influenced by age, monthly family income, and education level.

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1. Introduction

Meat is one of the basic foods worldwide, and is also one of the foods with the fastest growing consumption rate. The growth rate of global meat consumption has risen to more than 13% over the past decade, and the consumption of pork has increased by 10.71%.¹ China is a large producer and consumer of pork. In 2012, China had a pork production of 53.55 million tons, which accounted for approximately 64% of the total domestic production of meat and approximately 45% of the total production of pork in the world. In 2012, the pork consumption of China, with a per capita pork consumption of 38.7 kg, accounted for more than 60% of domestic meat consumption and approximately 50.2% of the global pork consumption.² China is also an important pork exporter in the world. In 2013, China exported 73,394.76 tons of pork, which amounted to \$ 325 million. A total of 71,532.26 and 1862.5 tons of pork were exported to Asia and Europe, respectively.³ The quality and safety of pork in China therefore affects not only the health and safety of Chinese consumers but also the quality and safety of pork markets worldwide, particularly in Asia and some European countries.

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¹ Source: FAOSTAT (<http://faostat.fao.org/>).

² Source: China Statistical Yearbook 2013, FAOSTAT (<http://faostat.fao.org/>).

³ Source: UN Comtrade (<http://comtrade.un.org/>).

In China, pork is a food that frequently suffers from safety problems, such as clenbuterol, excessive antibiotic residues, and the selling of pork from diseased or dead pigs. The dumping of dead pigs into the Huangpu River in Shanghai, China in early March 2013 had widespread effects and was derided as “free pork soup.” In the ensuing months, floating dead pigs were also found in other areas of China. This series of pork safety incidents indicates great potential risks in the pork production, supply, and consumption in the country.

Food safety risks are a worldwide problem, the essential characteristic of which is information asymmetry (Sarig et al., 2003). The inclusion of labels concerning credence attributes of food, such as traceability, quality and safety information, and quality certification, helps bridge the information gap between market players and reduce inefficiencies arising from asymmetric information (Ortega, Wang, Widmar, & Wu, 2014). A food traceability system can monitor food production and distribution by providing a reliable and continuous flow of information in the supply chain, identify the source of problems, and recall related products through traceability; therefore, such a system is considered a major tool for the fundamental prevention of food safety risks (van Rijswijk, Frewer, Menozzi, & Faioli, 2008). Traceable meat has been popular in Europe and America since the 1990s, and China has been exploring the possibility of building food traceability systems since 2000. After the major food safety incident of the Sanlu milk powder scandal in 2008, the Ministry of Commerce and the Ministry of Finance have exerted improved efforts to construct meat traceability systems in several pilot cities.⁴ However, for more than ten years, no substantial progress has been made in constructing traceable meat market systems (Wu, Xu, & Wang, 2010). The main reasons for this lack of progress are as follows: (1) The safety information of traceable food in the market is not complete and cannot cover the major safety risk processes. (2) The additional cost of traceable food exceeds the range that enterprises can bear, thereby driving the price of traceable food beyond the acceptability of consumers. (3) Consumers are skeptical whether or not the products that implement traceability systems are really safe. Whether the traceable pork market of China can be effectively developed may be related to consumer attitudes toward the related attributes and on the resulting demand. The traceable pork quality and safety attributes investigated in this study are traceability information, quality certification, and appearance.

In this study, different levels of quality and safety attributes of pork were set based on the risk points in the entire pork supply chain system and on the realities of China. In considering the heterogeneity of consumer preferences, the preferences and willingness to pay (WTP) of consumers for the attributes of pork were intensively investigated using choice experiments. This study is structured as follows: Section 2 is a literature review; Section 3 describes the theoretical framework; Section 4 provides the experimental design and statistical description; Section 5 provides the model results; and Section 6 proposes the main conclusions and policy recommendations.

2. Literature review

Food quality and safety has been the focus of food policies of the World Health Organization and Governments, and is also a hot research topic, especially after food safety incidents, such as the bovine spongiform encephalopathy (BSE or “mad cow disease”) crisis and the dioxin contamination of livestock feed, and the consequent consumer scares. Food safety⁵ is a credence attribute. When consumers' health is impaired, they sometimes cannot immediately or definitely attribute the disease to a certain food. Hobbs (2004) suggested that the food quality attribute is a broader concept that includes physical characteristics of the product (eg, flavor and nutrients), and attributes related to the production process (eg, organic production, animal welfare, and non-GMO). Grunert (2005) believed that the food safety attribute was, in some ways, a part of the food quality attribute. However, there are differences between food safety attributes and other food quality attributes, which are mainly related to affecting consumers' food choices. In this study, traceability information and quality certification are food safety attributes, and appearance is a food quality attribute. Specifically, when consumers were scared or were worried about the pork production process, traceability information and quality certification had a greater influence on consumer choice over appearance. Both food safety and quality attributes are closely related to the food traceability system. Hobbs (2004) summed up the significance of establishing food traceability systems as ex ante and ex post information functions. Ex post information function primarily refers to reactive function and liability function, which can quickly recall risky foods and determine risk responsibility after the food safety incident, so as to minimize the number of people affected, thus minimizing negative externality effects. Ex ante information function mainly refers to providing information of confidence attribute relating to food safety as a label, which is equivalent to converting the confidence attribute into a search attribute, thus reducing search costs for consumers to find a reliable supplier.

Traceability information and quality certification labels are believed to be an important means of restoring consumer confidence in food safety (Verbeke, 2001). Dickinson, Hobbs, and Bailey (2003) evaluated the preferences and WTP of American and Canadian consumers for red-meat traceability, enhanced quality assurances, and animal welfare using experimental auctions. They found

⁴ Since 2010, a meat and vegetable circulation traceability system has been ongoing in 35 pilot cities, including Shanghai, Chongqing, and Dalian, in three batches with the support of the Chinese Ministry of Commerce and Ministry of Finance to explore market management using information technology and strengthen the industrial management of food safety in circulation. On the basis of the pilot project, the project construction was expanded with 15 cities, including Qinhuangdao, Baotou, Shenyang, and Jilin, in 2013 (Chinese Ministry of Commerce Website, http://traceability.mofcom.gov.cn/static/zy_gongzuodongtai/page/2013/12/1386040135787.html).

⁵ Food safety can be defined in a broad or in a more narrow way (Ritson & Mai, 1998). In the narrow sense, food safety can be defined as the opposite of food risk, i.e. as the probability of not contracting a disease as a consequence of consuming a certain food. In a broad sense, food safety can be viewed as also encompassing nutritional qualities of food and more wide ranging concerns about the properties of unfamiliar foods, such as many European consumers' uneasiness about genetically modified food.

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