



Retail channel and consumer demand for food quality in China



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ABSTRACT

In the wake of the supermarket revolution, consumer concerns over food safety in China have resulted in an accelerated change towards the procurement of food products from modern retail channels. We employ discrete choice experiments to assess consumer preferences for food quality attributes across various retail channels using primary data from Beijing, China. Results suggest that consumer willingness to pay for food safety is retail channel invariant, while preferences for organic and Green Food certification are product and retail channel specific. We find evidence of emerging consumer preferences for animal welfare attributes. Implications for food retail managers and agribusinesses are discussed.

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1. Introduction

China's economic reforms and integration into the world market have brought significant economic growth and development to the country. Moreover, the privatization of the food marketing system and investments in food processing have accelerated the structural change of food demand (Dong & Fuller, 2010). As China continues to develop, food markets will continue to shift from fragmented, local markets to larger centralized distribution systems with modern retail channels, a process common to most developing countries. This transition tends to occur in grains and dry goods first, and later in fresh products such as meat, fish, eggs and milk (Reardon, Timmer, Barrett, & Berdegué, 2003). China's "supermarket revolution" which began in the late 1990s, has continued and is driving changes in consumer food purchasing decisions (Reardon, Timmer, & Minten, 2010). More recently, online food shopping is also emerging in urban areas as various companies have invested in efficient delivery systems in China (Lee, 2009).

Consumer concerns for food safety in Asia have resulted in an accelerated change towards the procurement of food products from supermarkets (Gorton, Sauer, & Supatpongkul, 2011; Moustier, Tam, Anh, Binh, & Loc, 2010; Reardon et al., 2010). With the rapid increase in incomes, Chinese consumers are becoming increasingly concerned about food quality (Zheng & Henneberry, 2010), and the alarming rate of food safety incidents has created consumer distrust in the Chinese food system (Chen, 2013; Huang & Gale, 2009; Ortega, Wang, Wu, & Olynk, 2011). While various studies have assessed Chinese consumer preferences for food quality assurances, aside from anecdotal evidence, little is known about demand for food quality across various food retail channels. An assessment

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of Chinese consumer demand for food quality attributes and preference for procurement location will increase the understanding of how Chinese consumers view the quality and safety of food products across various outlets. This information will assist supermarket managers and agribusinesses in making better food procurement decisions in a response to consumer demand, and will aid policy makers in implementing food policy that specifically addresses consumer needs.

Applied economists have conducted various revealed and stated preference studies to model consumer decision processes and elicit demand for various product-specific characteristics (e.g., Adamowicz, Boxall, Williams, & Louviere, 1998; Adamowicz, Louviere, & Williams, 1994). Choice modeling and related experimental methods can be applied to non-market goods, such as food quality, for which marginal valuations are difficult or impossible to measure in the marketplace. These methods have been used extensively for analyzing consumer preferences for food safety attributes (e.g., Ifft, Roland-Holst, & Zilberman, 2012; Loureiro & Umberger, 2007; Ortega, Wang, & Olynk Widmar, 2014a; Ortega et al., 2011; Ubilava & Foster, 2009), organic and “Green Food” certification in China (Yu, Gao, & Zeng, 2014a; Yu, Yan, & Gao, 2014b), animal welfare assurance (Lagerkvist & Hess, 2011; Norwood & Lusk, 2011; Olynk & Ortega, 2013; Tonsor, Olynk, & Wolf, 2009), producer behavior (Ortega, Wang, Olynk Widmar, & Wu, 2014b; Schulz & Tonsor, 2010; Ward, Ortega, Spielman, & Singh, 2014), and for estimating welfare effects of various agricultural and food policies (Lusk, Norwood, & Pruitt, 2006; Ortega, Wang, Olynk, Wu, & Bai, 2012; Tonsor et al., 2009). While research on food retail has been conducted since the emergence of the supermarket revolution in China (see Bai, Wahl, & McCluskey, 2008; Goldman, 2000, 2001; Hu, Reardon, Rozelle, Timmer, & Wang, 2004; Mai & Zhao, 2004; Reardon et al., 2010), research linking consumer demand for food quality and retail channel is missing from the literature.

In this study, a choice experiment approach is used to estimate Beijing consumers' willingness-to-pay (WTP) for select food quality attributes in three different food products: pork, chicken and eggs. Specifically, we evaluate demand for food safety, animal welfare assurance and organic food product certifications across three types of retail channels found in Chinese urban centers: traditional wet markets, domestic supermarkets and international supermarkets. The remainder of this article is organized as follows. In the next section we describe the experimental design and data used in this study. We then present the econometric model and estimation procedure. The main results are summarized and we conclude by highlighting the relevance of our research findings for researchers, policy makers and food industry managers.

2. Experimental design and data

Choice experiments have been widely used in the consumer and agricultural economics literature and their use in development economics is gaining popularity. Experimental choice modeling is used in this study to analyze consumer preferences for food quality attributes and retail channels across various products. The advantages of utilizing choice experiments as an alternative to analysis of revealed preferences have been documented in the literature and include the ability to perform ex ante analysis of demand for hypothetical goods or non-market valuation as well as elicit valuations for multidimensional changes of attributes bundled into a good (Hanley, Mourato, & Wright, 2001).¹ The food products chosen for the study represent three commodities with different inherent characteristics. Pork, the staple meat in the Chinese diet, was selected because of the key role that it plays in China's food culture. Chicken and eggs were included in the study because, while originating from the same animal, consumers evaluate the products differently when making purchasing decisions. Moreover, all three food products are readily available in the three types of retail channels of interest.

For the choice experiment, key quality attributes and their corresponding levels were identified through a detailed review of the literature, discussions with scientific experts, consumer focus groups, and pre-testing of the choice experiment. Retail location, food safety, animal welfare, and organic certification were selected as the attributes to be evaluated in the choice experiment. Product price was included to allow for the estimation of money metric measures for WTP comparisons. The choice sets, comprised of two product alternatives and an opt-out or no purchase option, were created using a D-optimal design created from the full-factorial candidate set using a modified Federov search algorithm (Kuhfeld, Tobias, & Garratt, 1994). Inclusion of a no purchase or baseline alternative is important for the interpretation of respondent choices in terms of welfare economics and is consistent with demand theory (Louviere, Hensher, & Swait, 2000). To keep the length of the questionnaire to a reasonable length, each respondent was randomly assigned to complete a CE experiment for one of the three products of interest (pork, chicken or eggs). Furthermore, to reduce the probability of respondent fatigue, the choice sets were blocked into four groups, with each survey participant evaluating no more than ten choice sets.

Retail channel was included in the choice experiment to assess consumer preferences for food quality attributes across specific retail locations: wet markets, domestic supermarkets and international supermarkets. Food safety is acknowledged to be the most important quality attribute considered by consumer when making food-purchasing decisions in China. Animal welfare was identified as an emerging urban consumer issue that is linked to specific food products. Since demand for organic food is surging in China, we included two certifications associated with organic food products in our choice experiment: a certification authorized by the China Organic Food Certification Center and the Green Food certification overseen by the China Green Food Development Center (Yu et al., 2014a,b). Product price (RMB/jin) was included to allow for economic welfare comparisons. A summary of the attributes included in the choice experiment is presented in Table 1, and a sample choice set is provided in Fig. 1.

The choice experiments simulated food shopping scenarios; however, the exchange of real food products or money did not occur. The instructions to the participants stated, “Research has shown that individuals tend to overestimate the amount they are willing to pay. It is important that you make your selections like you would if you were actually facing these choices in your retail purchase

¹ Readers are pointed to Louviere et al. (2000) and Hensher, Rose, and Greene (2005) for an introduction to choice experiments, as well as a discussion on the advantages and limitations of the method.

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