China Economic Review 41 (2016) 148–158

Contents lists available at ScienceDirect

China Economic Review

Chinese preferences for sustainable attributes for food away from home: A rank-ordered model

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ARTICLE INFO

Article history:
Received 20 December 2015
Received in revised form 9 September 2016
Accepted 9 September 2016
Available online 10 September 2016

1. Introduction

Chinese recent fast growing middle class and remarkable urbanization have created a demand for high-quality food products. Particularly, with consumers' rising affordability of animal protein food, the total meat consumption grew from 8.4 million tons per year in 1978 to 77.6 million tons in 2013, more than twice the consumption of the world second largest consumer, the United States (Earth Policy Institute, 2014). Although pork is the major meat consumed by Chinese, poultry is gaining popularity in consumers' diets. During 1990–2012, China's urban per capita poultry (i.e. domesticated birds including chicken, duck, goose, turkey, etc.) consumption increased from 3.4 to 10.8 kg per year, outpaced the pork increase from 18.5 to 21.2 kg per year at the same period (National Bureau of Statistics of China, 2015). Chinese consumers are gradually substituting pork with poultry due to the price effects and the recognition of poultry as a healthier meat (Pi, Zhang, & Horowitz, 2014).

The income growth and urbanization not only lead to food structure changes but also dramatically boost the food-away-from-home (FAFH) consumption. Using household survey data, Min, Bai, Seale, and Wahl (2015) found that FAFH accounts for 30% of meat consumption for urban households in China, while Liu, Wahl, Seale, and Bai (2015) found 83% of the households consume FAFH with an average weekly expenditure of 177 Yuan (in 2010 value, about 26 USD) and projected that FAFH expenditure in urban China will continue to increase through 2050 due to China's strong income growth and expected rapid urbanization.

Nevertheless, the consumption patterns changing towards more animal protein component and increased FAFH affect the sustainability of food consumption in China. First, interacted with huge population, the change imposes challenges to the natural resources and ecological environment because meat products are among the most energy-intensive, ecologically burdensome and ethically concerned foods (Yu, 2015) and FAFH cause severe food waste (Bai, Wahl, Lohmar, & Huang, 2010). Individual consumer's meat consumption pattern and preference play an important role in constructing a sustainable consumption culture across the country. This is especially true for FAFH consumption when food waste is more likely to incur as the food ingredients are selected and prepared by others instead of the consumers themselves. Second, sustainable food consumption is to satisfy food demand not only in quantity, but also in quality. Particularly, food safety has become an increasingly important measure of food quality in terms of sustainable consumption. The increasing consumption of animal protein food and FAFH results in a longer and

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http://dx.doi.org/10.1016/j.chieco.2016.09.003
1043-951X/

more complex supply chain, and leads to a higher level of information asymmetry on preference between consumers and suppliers, a critical contributing factor to food safety issues.

There exists a good amount of literature on consumer preference for food quality attributes including intrinsic and extrinsic attributes (Melton, Huffman, Shogren, & Fox, 1996; Lusk, Roosen, & Fox, 2003; Resurreccion, 2004; Ngapo, Martin, & Dransfield, 2007; Lusk & Briggeman, 2009). However, most of them choose retail foods which consumers purchase for at-home cooking and consumption, and focus on extrinsic attributes, such as traceability of imported beef in Korea (Lee, Han, Nayga, & Lim, 2011), certification for US beef (Loureiro & Umberger, 2007), and country of origin labels for onions in multiple countries (Ehmke, Lusk, & Tyner, 2008) and for seafood in the US (Wang, Zhang, Ortega, & Widmar, 2013). There are also studies focusing on food safety attributes of meat, seafood, dairy, and oil products in China, such as Zhang, Bai, Lohmar, and Huang (2010), Ortega et al. (2011, 2012), Xu, Zeng, Fong, Lone, and Liu (2012) and Zhang, Bai, and Wahl (2012). Very few studies focus on attributes of FAFH.

FAFH is a popular topic with many studies investigating the contributing factors to FAFH, such as household expenditures and other household demographic characteristics using data from the US (McCracken & Brandt, 1987; Byrne, Capps, & Saha, 1996) and China (Min, Fang, & Li, 2004; Ma, Huang, Fuller, & Rozelle, 2006; Curtis & McCluskey, 2007; Bai et al., 2010), personal preferences, and time constraints (Mancino, Todd, & Lin, 2009). However, few studies have investigated consumers' preference for attributes of FAFH or dining out food. Due to various reasons to dine out, consumer's preference for food attributes can be very different from the preference for attributes of food consumed at home. Dining out to enjoy the choice of food lacking on home menu or to enjoy the service and entertainment for special events, consumers may emphasize taste, presentation and environment more than nutrition facts of the food (Tefft, 1995; Namkung & Jang, 2007). Meanwhile, restaurant chefs and managers are also likely to prioritize taste over health and adjust their preference for ingredient attributes to boost food taste.

In this paper, we investigate consumer's preference for attributes of duck dish consumed in restaurants to gain an understanding on the preference difference between FAFH and food at home. We also elicit preferences from restaurant managers, because they are the ones connecting the terminal consumers' preference to the attributes of commodities provided by the industry.

Duck, the second largest poultry category after chicken (about 70% of production), accounts for around 15% of production in China's poultry market and has experienced fast growth (Ke & Han, 2007; FAOSTAT, 2015). Due to the complications in preparing and cooking, duck has been often consumed in restaurants or purchased in ready-to-eat forms from restaurants or deli counters in grocery stores. This makes it a better candidate than chicken to be studied in the context of FAFH. As the world's largest producer and consumer, China dominates world duck production with about three million metric tons production in 2013 which is about 70% of world production. China is followed by France, Malaysia, Myanmar and Viet Nam from far behind with duck production of 0.277, 0.114, 0.107 and 0.102 million metric tons in 2013, respectively (FAOSTAT, 2015). Since 1990, the duck production in China has increased five times as a result of the rapid industrialization in the poultry sector (Pi et al., 2014), with huge investments of large breeding companies, such as Cherry Valley from UK, Maple Leaf from US and Grimaud Freres from France, and integrated domestic enterprises (Tai & Tai, 2001). The foreign investors often bring the duck genes they researched and developed in their home countries, while raise the ducks in China.

There are various factors affecting Chinese consumers' preference for duck meat, such as intrinsic physical and sensory attributes and extrinsic quality and safety attributes. Consumers' preference for duck meat served in restaurants or commercial kitchens is expected to be different from their preference for the corresponding food cooked and consumed at home. The duck dish attributes we include in the study are bird size, lean meat content (relative to fat), tenderness, biotech country of origin (country of origin for the duck breed), and safety certification (such as “Hazard free food”, “Green food” and “Organic food”)[1] which are selected based on the literature. The objectives of this paper are: 1) to estimate preference for attributes through rank ordering assigned by consumers; 2) to assess and compare differences in preference between restaurant dining out consumers and food service industry managers, i.e. suppliers in the industry; and 3) to provide one of the first empirical consumer studies on duck as a specialty poultry in China. It is important for food service industry to gain a good understanding of consumer's preference for attributes of food served in restaurant and compare the consumer's preference with the service provider's. If there is inconsistency in the preferences, the food service industry, primarily restaurants, may consider to adjust their decisions on ingredient selection according to consumer's preference and to reveal the information on the attributes valued by consumers on the menu.

2. Survey and data

A consumer study survey was conducted in the summer of 2013 at four representative cities in China including Beijing, Shanghai, Guangzhou and Chengdu. Graduate students from China Agricultural University, Donghua University, Jinan University, and Southwest University of Finances and Economics were trained to conduct the survey by interviewing respondents in person. In each city, we first randomly selected five districts, two in urban center and three in nearby suburbs. Then we randomly selected

[1] Hazard free good, green food and organic food are three types of safety certification in China which are certified by different authorities with different criteria. The criteria for organic food are the strictest, followed by those for green food and hazard free food (Liu, Pieniak, & Verbeke, 2013). For hazard free food, controlled and limited use of synthesized pesticide, veterinary drugs, fertilizer and feed additive are allowed. Green food is divided into A and AA levels. Controlled and limited use of synthesized materials are allowed in Level A green food but not allowed in level AA green food. Other materials which harm environment and health are not allowed in level AA green food, which is equivalent to organic food. No use of artificially synthesized pesticide, fertilizer, growth hormone, feed additive and gene engineering technology is allowed in organic food (Zhanjiang Food and Drug Administration).