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Original Article

Factors affecting households' meat purchase and future meat consumption changes in China: a demand system approach

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The aim of this study was to evaluate factors that affect households' meat purchase and to estimate future meat consumption changes in China. This study was based on primary data collected from a consumer survey in Guangzhou city in 2014. A total of 617 completed questionnaires were obtained from the consumer survey. An advanced linear approximated almost ideal demand system was used for data analysis. The results indicated that the average household monthly purchase of pork, chicken, beef, and mutton was 2.90 kg, 1.47 kg, 0.77 kg, and 0.33 kg, respectively. Estimated expenditure elasticities for each meat item were 0.78, 1.02, 1.34, and 1.83, respectively. The uncompensated own price elasticities for each corresponding meat item were -0.79 , -0.75 , -0.70 , and -0.25 , respectively. The compensated own price elasticities were -0.44 , -0.47 , -0.46 , and -0.14 , respectively. High-income households purchased more meat, especially pork, chicken, and mutton, than low-income households. Meat consumption pattern will be affected by income changes. Collectively, these results suggest that there will be a potential meat market expansion in China and that pork consumption will increase at a quantity much larger than other meat items in the near future, assuming that consumer income will continue to increase. China's projected increase in meat demand will eventually stimulate greater meat imports, which may have a significant influence on meat-exporting countries in the world.

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1. Introduction

China is the world's largest meat market, consuming 46% of the pork, 11% of the beef, 18% of the chicken, and 48% of the mutton produced worldwide. The per capita annual total meat consumption was 13.62 kg in 1980, which increased to 61.05 kg in 2013 [1]. Today, China's influence on world meat trade is significant. Meat imports rose to an annual total of 1,883,690 tons in 2013. Currently, China is the world biggest pork importer [2]. If consumption of meat in China continues to grow, there will likely be greater business opportunities for meat producers both in and outside of China. As a result, meat exporting countries such as the United States may be influenced by changes in meat consumption in China. A better

understanding of future meat demand in China will benefit both producers and exporters.

Many agricultural researchers and international food analysts have researched food consumption changes in China [3,4]. Ren et al [5] reported that as income increases, demand for more nutritious and healthy food also increases in China. Hovhannisyan and Gould [6] noted that urban Chinese food preferences for meat products have undergone a structural change between 2005 and 2010. There is a trend that high-income households prefer higher quality food products, such as organic food [7]. Chinese consumers perceive that imported food is safer to eat and has higher nutritional value than food produced domestically [8]. However, these previous studies usually focused on the broader segment of food consumption and did not evaluate the consumption pattern for each meat item [9]. In addition, earlier studies usually used national survey data, which cannot identify zero expenditure on certain meat items [10,11]. Thus in some cases, quality of data from a national survey may be questionable [12,13].

In economics, demand elasticity analysis can tell us how consumption responds to changes in income level (or purchasing

Abbreviation: Almost ideal demand system, AIDS.

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power) and prices for each meat item [14]. Information about demand elasticity can be used to predict consumption of each meat item. In studies of demand elasticity, either a single equation, such as Working–Leser model [15,16], or a systems analysis, such as an almost ideal demand system (AIDS; Deaton and Muellbauer [14]) is usually used. Particularly, AIDS was well applied for studies that focused on meat demand elasticities. Previous studies usually conducted consumer surveys which were designed for AIDS and collected data related to household meat purchases. Then, based on those meat purchase data, AIDS was applied for estimating expenditure elasticities and price elasticities. Based on the demand elasticities, future meat consumption changes could be predicted [17,18]. For instance, using AIDS, Basarir [17] indicated that as total meat expenditure increases, consumption of camel and goat meat will increase much faster than other meat items in the United Arab Emirates. Likewise, Jabarin [18] concluded that consumers in Jordan will increase their consumption of beef and mutton more than other meat items as their total meat expenditure increases. Taljaard et al [19] reported that consumers in South Africa prefer to buy more beef and mutton than other meat items as their total meat expenditure increases. Karagiannis et al [20] indicated that in Greece as consumers' total meat expenditure increases, their demand for beef and chicken would likewise increase faster than other meat items. Since there is no report on using AIDS to analyze China's meat consumption, the objectives of this study were to assess factors that affect meat purchase and to predict changes in future meat consumption in China. To achieve the objectives, we conducted a consumer questionnaire survey and applied the AIDS model for data analysis.

2. Materials and methods

2.1. Traditional food in Guangzhou

The study was conducted in Guangzhou city, the capital city of Guangdong province (Fig. 1). With a population of 15 million, Guangzhou is the oldest and largest port city in China. The southern part of Guangzhou city has become the largest free trade zone in China, where no tax is levied on both imported and exported goods. This has contributed to increased consumption of imported meat in the city.

The city of Guangzhou has a diverse population, consisting of 56 distinct ethnic groups. A recent influx of foreigners who choose to live there has added to that diversity. However, it is populated largely by the Han (ethnic group), while the other ethnic minorities and foreigners represent only a tiny portion of its population (Fig. 2). Guangzhou's cuisine varies from spicy food to fresh seafood. Meat soup is a favorite dish of the Han community, so due to the relative ethnic homogeneity (mostly Han) in Guangzhou, meat soup has become a traditionally famous food in Guangzhou.

Meat soup in Guangzhou is also called old fire soup or “*lou fo tong*”. It is a broth prepared from meat and other ingredients over low heat for several hours (Fig. 3). There are two ways that are most commonly used to make old fire soup. The first is to put the ingredients and water in the pot and heat it directly on fire, which is called “*bou tong*”. The second way, called “*dun tong*”, is to put the ingredients and water in a small pot and put that small pot into a bigger pot filled with water, then heat the bigger pot over fire. The second way will take more time to cook, but it will keep the original taste of ingredients in the soup. Meat soup is the most famous traditional food in Guangzhou, and there are a lot of soup chain stores or delivery outlets in this city that offer it on a daily menu.

2.2. Development of questionnaire and survey

To develop the questionnaire for the survey, focus groups which consisted of local government officials, economists from Guangdong Academy of Social Sciences, and consumer survey experts from the Intelligence Agency of Guangdong Province met and identified key areas of the questionnaire. Then an initial questionnaire was developed. To investigate changes in meat-consumption patterns in Guangzhou, a two-section questionnaire was designed according to the methods used by de-Magistris and Gracia [21]. The first section consisted of questions regarding respondents' monthly household at-home meat expenditure (unit: yuan; meat for at-home consumption) over the last 12 months, and the quantity (unit: kg) of each meat item including pork, chicken, beef, and mutton they purchased. The unit value (price) of each meat item purchased was estimated by dividing expenditure by quantity. The second section of the questionnaire concerns demographic and socioeconomic information of the respondents, including gender, age, education level, family size, and income.



Fig. 1. Old city and new city of Guangzhou. The old city is represented as the green area. The new city is represented as the green and gray area. Total area of new city is 7,434 km². Distance between Guangzhou and Hong Kong is 120 km. Distance between Guangzhou and Macao is 110 km.

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