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RESEARCH ARTICLE

The puzzle of the missing meat: Food away from home and China's meat statistics

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Abstract

From 1985, an increasing gap has emerged between the official statistical measures of meat production and meat consumption in China, which has raised concerns from many researchers using such data. In this paper we report the results of 428 observations (survey of 107 urban and rural households×4 quarters) from 7 provinces conducted in 2010, and compare them with the official statistical data from the National Bureau of Statistics of China (NBSC). We conclude that the main reason for the discrepancy is due to the underreporting of consumption, which is due mainly to the omission of consumption away from home.

Keywords: China, meat production and consumption, discrepancy, consumption away from home, underreporting and overreporting

1. Introduction

According to the official data from the National Bureau of Statistics of China (NBSC), per capita meat output in 1996 was 37.5 kg in China, which was 50% higher than per capita consumption (24.3 kg). Per capita output of meat reached 61.9 kg, 86% higher than per capita consumption (33.3 kg)

in 2012. It has long been observed that there is a significant gap between meat production and consumption in China and as a consequence, much research has focused on trying to explain such a gap.

Many scholars (Zhong 1997; Lu 1998; Jia 1999; Fuller *et al.* 2000; Ma and Zhang 2000; Yuan and Wang 2001; Jiang 2002; Wang *et al.* 2004, 2005; Ma *et al.* 2006) have raised concerns about the accuracy of the official statistics on livestock output and consumption, and have concluded that the actual level of Chinese residents' meat consumption is underestimated, while the production is overreported. Zhong (1997) argued that China's official meat production statistics could have been artificially inflated by more than 50%. Furthermore, Lu (1998) argued that underestimation of consumption is a major contributor to the discrepancy between meat production and consumption statistics, because the statistics on urban and rural residents' consumption of

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animal products in the NBSC reports only the “at-home” consumption, while consumption “away-from-home” (AFH) (e.g., restaurants, guest consumption, and other food service outlets) is excluded. However, overreporting of production also contributes to the reported discrepancy where estimates suggest that the output of meat and poultry eggs in 1995 could be inflated by as much as 40% (Lu 1998).

By utilizing actual survey data on livestock product consumption from six provinces in China, Wang *et al.* (2000) proposed that the apparent gap between production and consumption could be attributed to a number of factors including; inflated production data, underestimated consumption data, net exports, non-food uses and statistical error. In particular, the meat consumption data for 1998 was significantly underestimated even taking account into 20% ‘lost’ from slaughter to retail. The output figures for poultry and egg tended to be inflated by approximately 25–30%. The output figures for other livestock, however, seemed to reflect actual production. Wang *et al.* (2005) conducted a large-scale household survey of animal product consumption in China, and their results showed that the Chinese real consumption of animal products was higher than that reported by the NBSC statistics, which appeared to underestimate actual consumption by as much as 30–60%.

Bai *et al.* (2010) conducted a study on urban AFH meat consumption and suggested that meat consumed AFH accounted for a large proportion of total meat consumption. Luo and Liu (2011) found that the volatility of meat price can be predicted according to the estimation results from a (G)ARCH model and proposed special attention given to the factors causing increases in meat prices, while Wang *et al.* (2014) investigated the determinants of pork consumption in urban western China and the different consumption patterns across income strata with respect to income elasticity and price elasticity of demand. Yu and Abler (2014) argued that the inconsistency of Chinese pork statistics was due to a range of factors including: production over-reporting, loss and waste in the pork supply chain, pork consumed away from home, a mismatch in the Chinese rural household survey between food and mouths (i.e., migrant workers and boarding students who are counted as rural household members but live in urban areas for much of the year), and inflated production figures by local government officers to improve their performance reviews and prospects of promotion.

As can be ascertained from the brief review presented above, the causes of the reported inconsistencies in the NBSC meat statistics are numerous and complicated with several researchers (e.g., Ma and Zhang 2000; Jiang 2002; Xin *et al.* 2003; Bai *et al.* 2010; Chen 2010) reporting reasons for, and adjustments to the statistics on meat production and consumption. However, to date, no single

adjustment method has been generally accepted in part, we would argue, because suggestions have not been based upon actual survey evidence, but some form of theoretical model.

In this paper, we seek to address such issues by conducting an explicit survey of 107 representative households, recording their actual, total, meat consumption, which is then be used to compare with the NBSC statistics. From this exercise, we are then able to explain why statistical inconsistencies arise in the reported data on meat statistics, and how the (generally omitted) AFH contributes to total consumption, allowing us to understand how much meat Chinese residents actually consume in total.

This issue will become more serious overtime as the share of meat consumed AFH will typically increase as income grows and the catering sector develops in China. Therefore, any agricultural and trade policy developments relevant to this area will be misinformed if we continue to ignore this rising share of meat consumption AFH (Ma *et al.* 2006).

For this regard, the paper is organized as follow: Next section describes official meat production statistics and consumption estimates; section 3 introduces our survey sample, and aggregates and disaggregates meat consumption by at home and AFH; section 4 compares our survey meat consumption with NBSC’s meat consumption estimates; Last section provides some concluding remarks.

2. Official meat statistics

Meat production and consumption have grown rapidly in China, however, the officially reported growth rate of meat consumption is much higher than that of meat production. As can be seen from Table 1, total meat production increased from 66.087 million tons in 2004 to 83.872 million tons in 2012, representing an increase of 126.9%. Among all types of meats, the growth rate of poultry was the highest over the period 2004–2012 (144.2%), followed by pork (123.1%). Ruminant meats (e.g., beef and mutton) had a lower reported growth rate (119% in total). Correspondingly, total reported meat consumption increased from 29.456 million tons in 2004 to 38.77 million tons in 2012 representing a growth rate of 131.6%, which exceeded meat production by 5%. Among all types of meats, the growth rate of poultry consumption was the highest over this period, reaching 181.7%, which was much higher than that of reported poultry production (144%). Ruminant meat consumption appeared to attain growth rates of 128.8% over the same period, which, again, was also higher than that of reported production, this time by 10%. The growth rate of pork consumption appeared to be the slowest (117.9%), which was apparently, less than that of pork production (123.1%).

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