



# Where have all the pigs gone? Inconsistencies in pork statistics in China<sup>☆</sup>



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## ABSTRACT

Official agricultural statistics for China are subject to major inconsistencies and have long been questioned by researchers. The major problem with Chinese meat statistics is that reported meat supply is far greater than consumption, and this is particularly true for pork. Factors contributing to the gap between pork supply and consumption include production over-reporting, loss and waste in the pork supply chain, pork consumed away from home (FAFH), and 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). Our estimates indicate that over-reporting of pork production has declined substantially since 2003, but it is still significant and is the largest contributor to the gap between reported supply and consumption. Our estimates also indicate that pork consumption is significantly under-estimated because of FAFH and the rural mismatch between food and mouths. Reforms to the agricultural statistical system should be considered that increase the incentives to report accurate production statistics. Statistics are currently based on reports from local officials who have incentives to inflate production figures so as to improve their performance reviews and prospects for promotion, or they are overseen by local statistical personnel appointed by local governments.

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## 1. Introduction

Valid and reliable agricultural statistics are vital for analyzing farmer welfare, consumer welfare, nutritional status, agricultural trade, food security, and environmental issues related to agriculture. However, the official agricultural statistics for China, particularly for meat products, are subject to major inconsistencies and have long been questioned by researchers (Fuller, Hayes, & Smith, 2000; Lu, 1998; Ma, Huang, & Rozelle, 2004). Recent meat-related issues in China include food safety concerns (both domestically produced and imported meat products), livestock diseases, water pollution from livestock operations, and food price volatility and inflation. For these issues and others, valid and reliable statistics are essential to good policy design and implementation.

For instance, pork meat carries a substantial weight in the Consumer Price Index (CPI) calculation in China. Even though the weights of various products in the CPI are not officially published by the National Bureau of Statistics of China (NBSC), it is believed that pork's weight could be well above 6%, as the expenditure share of meat products was around 10% for urban households in 2010 and more than

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60% of meat products were pork products. Inaccurate pork statistics could hence lead to erroneous macroeconomic policies. Another example is that increasing and intensifying pig farming activities carry environmental and health risks. Inappropriate disposal of pig manure or pig carcasses can cause water pollution and spread infectious diseases. Inaccurate pig statistics could cause government regulations to be too stringent or too mild, or to be targeted at the wrong areas of the country or the wrong categories of producers.

In company with economic growth and institutional change, meat products are playing a more important role in the Chinese agricultural economy and consumers' daily lives. Chinese consumers are in the midst of a nutritional transition, switching from a traditional diet intensive in vegetable-fiber products to a more westernized diet intensive in meat and dairy products (Tian & Yu, 2013; Yu, 2012; Yu & Abler, 2009). NBSC statistics indicate that per capita meat consumption in urban areas increased from 25.3 kg in 1990 to 35.3 kg in 2011, and in rural areas from 12.6 kg in 1990 to 20.9 kg in 2011.<sup>2</sup>

The major problem with Chinese meat statistics is that reported meat production is far greater than consumption (Fuller et al., 2000; Ma et al., 2004). According to 2011 NBSC statistics, per capita meat supply was around 59 kg, while as noted above per capita consumption was only 35.3 kg and 20.9 kg, respectively, for urban and rural China (implying an average per capita consumption for China as a whole of about 28 kg). Apparently more than half of the meat supply disappeared in the statistics. In the case of pork, NBSC statistics show that per capita pork supply was 37.8 kg in 2011, while per capita consumption was only 20.7 kg and 14.4 kg, respectively, for urban and rural households (an average per capita consumption for China as a whole of 17.6 kg). As with meat in the aggregate, reported pork supply is more than double the reported pork consumption.<sup>3</sup>

Where has the meat gone? The large gap between production and consumption would suggest that there are significant biases in the current meat statistical system. Quite a few studies have investigated this issue, although they were generally published at least a decade ago and rely on data from the 1980s and 1990s (Colby, Zhong, & Giordano, 1999; Fuller et al., 2000; Lu, 1998; Ma et al., 2004). The main structure of China's current statistical system was built up before the 1990s, and yet since 2000 China has experienced dramatic structural changes both economically and socially. Hundreds of millions of people have left rural areas to live and work in cities, and as we argue in this paper their food consumption is very difficult to capture in the current NBSC statistical system. At the same time, the traditional structure of meat production, characterized by small "backyard" farms, is giving way to large-scale commercial producers. Thus there is a need to reassess biases in Chinese meat statistics and possible corrections for them.

The objectives of this paper are to: (1) describe the evolution and present status of the statistical system for meat in China; (2) derive approximate corrections for biases in the official meat production and consumption statistics with a focus on pork, as pork is the major meat consumed in China; and (3) discuss revisions to the statistical system for meat that could reduce these errors and omissions.

## 2. Meat statistical system in China

There are two agencies that report meat and pork production statistics for China: the National Bureau of Statistics of China (NBSC) and the Ministry of Agriculture (MOA). NBSC is the official statistical agency in China and is in charge of all national socioeconomic statistics, including meat production and consumption. However, MOA also collects and reports on many agricultural statistics, including meat statistics. While there is no direct overlap between the statistics reported by NBSC and those reported by MOA, and therefore no direct discrepancies between the two agencies' statistics, there are inconsistencies as discussed below.

Before 1996, national statistics for meat production were obtained by aggregating reported numbers from local government officials. It was called the Total Statistical Approach (*Quan Mian Tong Ji*) and was administered by MOA, with the results published in the *Annual Livestock Report* (Yu, 2012). This statistical system was generally viewed as reliable during the period of collectivized agriculture. The government controlled production, distribution, and marketing, which facilitated centralized collection of data and put a premium on data quality for decision-making purposes (Fuller et al., 2000; Gale, Marti, & Hu, 2012). However, market liberalization beginning in the 1980s caused this system to break down. Production, distribution, and marketing decisions moved into the hands of private farms and firms, meaning that reported numbers from local officials were no longer based on activities directly under their control. Local officials began to inflate livestock production figures in order to improve their performance reviews and prospects for promotion (Fuller et al., 2000). Compared with grain production statistics, which are difficult to manipulate as they are tied to land area, livestock statistics are easier to overstate.

The Chinese government was aware of this problem prior to the mid-1990s but lacked effective tools in order to improve its statistics until the first Agricultural Census in 1997, which collected data for 1996. The results of the Agricultural Census indicated a substantial gap between the Census data and statistics from the Total Statistical Approach. Based on the Census data, NBSC began adjusting its red meat production statistics for 1996 and onward. No adjustments were made to the statistics prior to 1996, so there is a break in the data series. NBSC did not revise its poultry and egg production statistics either, even though these also exhibited significant over-reporting (Hansen, Fuller, & Hsu, 2003).

After the *Statistical Act of China* came into force in 1996, NBSC became the only government agency authorized to officially publish national-level statistics (Article 23). Following that, NBSC began to build its own statistical system for livestock production. Diverging from MOA's Total Statistical Approach, NBSC began a "Survey Approach" in 1999 that involved calculating meat production in selected regions of China based on surveys of pig, cattle, sheep, poultry, and other livestock farms. For regions

<sup>2</sup> Source: *China Yearbook of Household Survey* (2011).

<sup>3</sup> Meat consumption in NBSC household surveys is measured by the weight of equivalent fresh meat. Bacon, jerky and other processed meat products are converted to the weight of equivalent fresh meat in the survey. Therefore, the measure of meat in consumption is comparable to that in production.

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