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Direct farm, production base, traceability and food safety in China



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Abstract

With the rapid growth of China's economy, rising demand for safety food has been accompanied by frequent food safety scandals. Given that China's farming is dominated by millions of small-scale farms, ensuring food safety is a major challenge facing the public and private sectors. The direct farm (DF) program, initiated in 2008, represents one of the government's major initiatives to modernize the distribution of fresh fruit and vegetables (FFV) and improve food safety. Under the DF program, participating national and international retailers are expected to establish more direct procurement relationships with farm communities. While it is often claimed that greater participation by retailers in the production and post-harvest processing implied the DF program will lead to improved quality, safety and traceability, systematic evidence remains elusive as existing studies are largely narrative, based on case studies, or theoretical inference. Little empirical evidence is available for a broader evaluation of the DF program. This paper aims to fill this gap by assessing the overall performance of a single retailer's DF experience with respect to the procurement and food safety of FFV. We use data from a survey of production managers of 35 DF production bases (PBs) spread across 11 provinces, 3 cities and 1 autonomous region in China. The results show a mixture of opportunities and challenges. On one hand, the DF program improves production practices and distribution channels of FFV produced on its PBs, thus facilitating the move of China's food system towards improved food safety compliance. On the other hand, significant heterogeneity in the traceability of food and the ability of DF to meet higher safety standards is evident both across major product categories and across household-operated vs. firm-operated PBs. The paper concludes with policy implications.

Keywords: direct farm, production base, marketing chain, traceability, food safety

1. Introduction

Rapid and sustained growth in the three decades since China's market-oriented economic reforms has placed China squarely in the group of upper-middle income countries, with a corresponding large and growing middle class that is increasingly concerned about and willing to pay for high quality, safe fresh produce. Unfortunately, a series of

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food safety scandals in recent years suggests that China's domestic supply side has failed to keep pace with this increased demand for food safety (Gale and Buzby 2009; Gale and Hu 2012). For instance, the illegal and carcinogenic chemical additive Sudan IV was detected in eggs in 2006, while adulterated infant formula led to six infant deaths and more than five thousands babies sickened in 2008 (Lam *et al.* 2013). In 2012, thousands of food safety related incidents were reported by the Ministry of Health of China (Lam *et al.* 2013).

The frequent reports of food scandals have caused significant concern by the Chinese public about food safety, prompting the government to accelerate the restructuring and modernization of the agri-food system. In 2007, the *Law of Professional Farmers' Cooperatives* was passed to facilitate cooperative members' access to key production services and further promote vertical coordination along the agri-food chain (Deng *et al.* 2010; Jia and Huang 2011). The Chinese government has also provided substantial subsidies for investment in cold chain and logistics, land consolidation, and production inputs for specific high-value sectors, including fresh fruits and vegetables (Niu and Xia 2000; Waldron 2009).

In recent years, much of these government resources have been channeled to promote the development of production bases (PBs, the special form of farm organizations that coordinate the choice and timing of crops planted and utilizes) and the direct farm (DF) program (a PB with direct-procurement relationships with downstream retailers who introduced DF procurement relationships in the mid-2000s) in order to promote the standardization of food production and to improve efficiency and traceability in the food supply chain. Among the many initiatives to modernize the agri-food system in China, PB development and the DF program are considered as key tools to tighten food safety management. With agricultural production dominated by millions of small-scale farms¹ and farm-gate marketing dominated by a large number of small brokers, ensuring the delivery of safe and traceable food represents an enormous challenge.

One might imagine that the "supermarket revolution" may be an important driver of change in the agri-food system in China. Yet while the supermarket sector in China has grown rapidly since the late 1990's, by 2007, this downstream retail revolution did not lead to significant upstream changes in either production practices or the structure of the supply chain (Huang *et al.* 2008). Farmers are essentially free of accountability after selling their products, and food traceability is almost impossible.

The location of PB may consist of the farms of all or a

subset of villagers from one or more villages or a land area leased by an outside agri-business firm. In the former case, the PB is run by the villagers themselves in a contract farming or outgrower scheme, while in the latter case the base is run by the outside firm using either wage labor or through sub-leasing or sharecropping arrangements with local residents or migrant farmers.

Seeing its potential to enhance food safety and improve supply-chain efficiency, in 2008, the Ministry of Agriculture of China (MOA) and Ministry of Commerce of China (MOC) launched a government sponsored DF program that tries to directly link supermarkets with producers by procuring fresh produce directly from farmers or farmers' cooperatives (Gale and Hu 2012). The DF program is expected to promote traceability and to increase farmers' income by eliminating intermediaries. A handful of large supermarkets including Carrefour, Lianhua, Metro, Nong Gong, and Walmart participated as "pioneer enterprises" in the initial pilot stage of the DF program.

While the emergence of PBs and DFs in China has potentially important implications for food safety, little systematic evidence exists about the new institutions; existing studies are either narrative with little empirical evidence or based on one or a few qualitative case studies. For example, a number of papers published in Chinese journals have stated that DFs can or should improve food safety, but lack rigorous supporting (Hu *et al.* 2006; Zhang and Hu 2009; Li 2013). To our knowledge, only two papers in English-language journals address the food safety implications of the DF program in China (Miyata *et al.* 2009; Gale and Hu 2012), yet again, the insights are largely descriptive and narrative. Case studies in Chinese-language journals often focus either on describing the degree of traceability of food procured by supermarkets through DF programs (Gu *et al.* 2011; Hu 2012) or understanding food quality control within farm cooperatives (Hu *et al.* 2006; Hu 2010; Shi *et al.* 2012; Niu 2014). In sum, relatively little systematic data are available to explore the implications of emerging DF programs on food safety in China. To fill this gap in the literature, data from a larger and more representative sample of PBs participating in DF programs are essential.

This paper provides an in-depth examination of the DF program of a specific retailer, namely Walmart-China, and the implications of the DF program on food safety. Our analysis utilizes data collected from nearly all of fresh fruit and vegetable (FFV) PBs participating in Walmart's DF program in 2012 to answer the following questions: How is production and marketing organized DF PBs? Have PBs improved the traceability of FFV? To what degree are PBs

¹ The average farm size in China is 0.6 hectares (NBSC 2013).

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