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No.05: FOOD SECURITY AND THE CHANGING LANDSCAPE OF FOOD RETAILING IN NANJING, CHINA

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FOOD SECURITY AND THE CHANGING LANDSCAPE OF FOOD RETAILING IN NANJING, CHINA

by Zhenzhong Si and Jonathan Crush

Key Points

- The expansion of supermarkets and online food markets are changing the complexion of food retailing in Nanjing. At the same time, traditional forms of retail display considerable resilience.
- Nanjing has low levels of food insecurity overall as measured by the HFIAS and HDDS. The one in five households who are food insecure are primarily low-income and female-centred.
- Concerns over food safety are a major characteristic of all consumers in Nanjing irrespective of income and food security status.
- Policy implications include ensuring food access for households with higher levels of food insecurity, promoting trustworthy food sources in the food retailing system, intensifying support for wet market development, and monitoring the development of newer and emerging retail outlets.

Introduction

The changing food retailing landscape in China involves new actors such as supermarkets and online food markets. The rise of supermarkets in China since the 1990s is part of the third wave of global expansion (Hu et al 2004, Reardon and Gulati 2008, Reardon et al 2012). The process accelerated with the emergence of international supermarket chains such as Carrefour and Walmart in the 2000s. In just two decades, supermarkets have become prominent actors in food retailing in Chinese cities. Supermarket expansion has taken market share from traditional food outlets including wet markets[1], informal markets[2], small food shops, and street vendors (Wang 2002). In most cities, however, wet markets continue to dominate the urban food retailing landscape, particularly for fresh produce and meat (Bai et al 2008, Zhang and Pan 2013, Si et al 2018). Reasons for the persistence of wet markets include cheaper prices, easy access for daily purchase of fresh produce, and the attractions of social interaction between vendors and consumers.

In recent years, online food markets are further reshaping the landscape of food retailing in China. Since the establishment of Taobao in 2003, e-commerce has rapidly

1. Wet markets (known as *caishichang* in Chinese), are markets located near urban residential areas, mainly selling fresh produce, meat, fish and some processed dried food. These markets, comprised of many small vendors, are owned and operated by either the state or private companies. The floor is always wet due to water spraying the vegetables, cleaning of meat and fish, and food waste.
2. Informal markets are found on streets in suburban areas of cities in China, where groups of food vendors gather and sell food in the open air.

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transformed traditional business sectors. Between 2012 and 2016, e-grocery experienced a compound annual growth rate of 53% and China became the largest e-commerce market in the world (Agriculture and Agri-Food Canada 2017). In addition to the growth of online food sales, online food delivery, particularly from restaurants to consumers, had a market volume of almost USD21 billion in 2018 (Statista 2018). Although food sold through e-commerce still represents a small share of the total food retailing in China, e-commerce of food has great future growth potential.

The changing food retailing landscape of Chinese cities is also denoted by the recent proliferation of alternative food networks, largely driven by food safety concerns among the growing middle-class in major cities (Krul and Ho 2017, Si et al 2015). In Nanjing, better-off consumers are seeking to reconnect with ecological and organic farms through ecological farmers markets, community supported agriculture, and buying clubs. The purpose of these reconnections is to access safe, trustworthy, and high-quality food.

Changes to the food retailing sector in the city of Nanjing have been accompanied by changes in the management of the urban food system including the development of food policies that target wholesale markets, wet markets, supermarkets, and small food vendors. Government has played an active role in ensuring the accessibility and affordability of healthy food by establishing and upgrading wet markets, subsidizing vendor fees, and requiring supermarkets to dedicate business space for selling vegetables. These policies have been working well in terms of ensuring household food security (Zhong et al 2018). However, the changing landscape of food retailing in Nanjing presents a new set of challenges for policymakers.

Findings

The Hungry Cities Partnership (HCP) and Nanjing University conducted a city-wide, representative survey of households in Nanjing in July 2015. The survey results provide unprecedented insights into the state of household food security in the city and the food purchasing behaviour of consumers (Si and Zhong 2018). The survey used standard indicators to assess levels of household food security including the HFIAP (Household Food Insecurity Access Prevalence) scale and the HDDS (Household Dietary Diversity Score) (Swindale and Bilinsky 2006).

The HFIAP indicator suggests that about 79% of households are food secure (Figure 1) (Si and Zhong 2018). Only 2% of households are severely food insecure, with another 19% experiencing some degree of food insecurity. These households are mainly female-centred, have no formal-wage worker, and only have one member. The most food insecure households have a low monthly income of less than CNY5,000 (USD803).

The HDDS indicates a high level of dietary diversity in Nanjing: the mean household HDDS was 7.8 out of a possible 12 (meaning that the average household consumed food from nearly 8 of 12 different food groups in the 24 hours prior to the survey) (Figure 2). Only 10% of households had an HDDS of 4 or less.

Despite the high levels of food security and dietary diversity, serious food safety concerns constitute a critical part of the food security calculus of Nanjing residents. According to the survey, three-quarters of respondents worry about food safety on a daily basis. The foods perceived as most unsafe are pork and vegetables, which are staples in the

FIGURE 1: Food Security Status of Nanjing Households

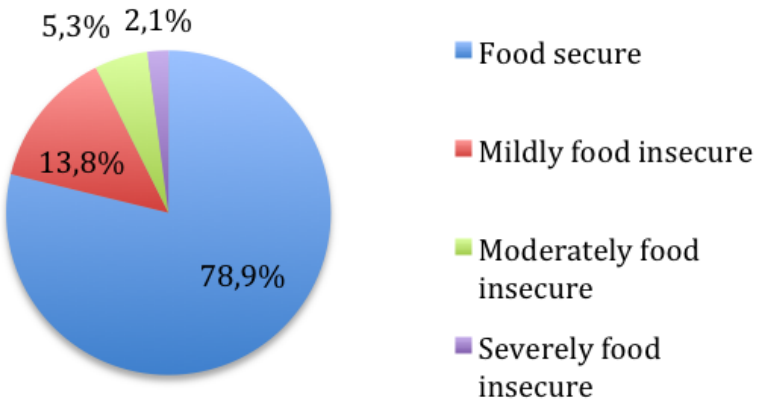


FIGURE 2: Household Dietary Diversity in Nanjing

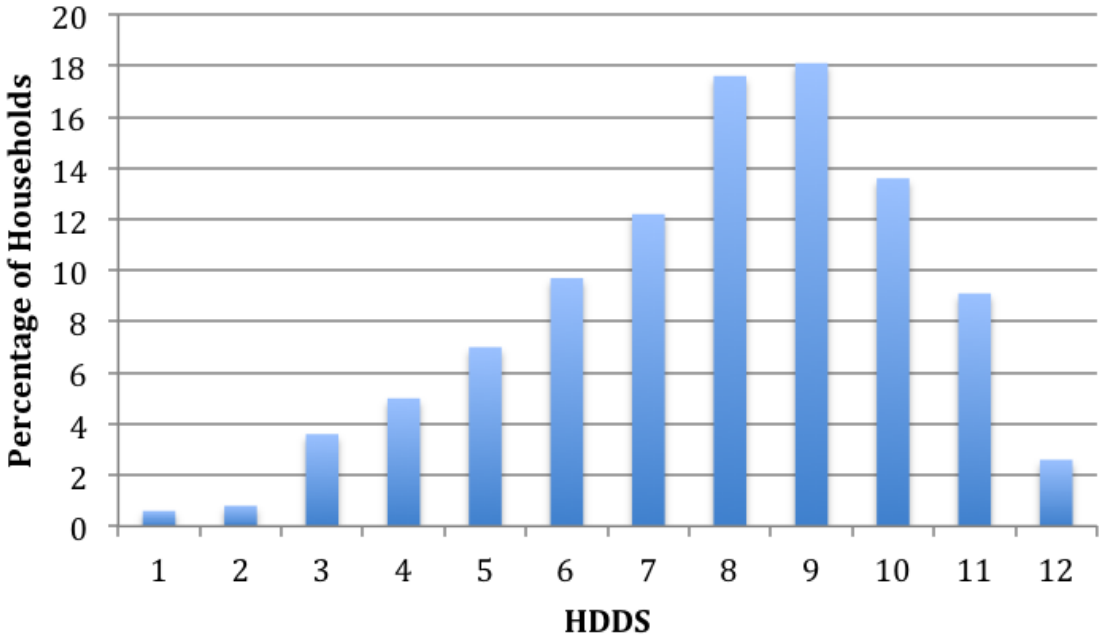


TABLE 1: Perceptions of Most Serious Food Safety Problems

	No.	% of total households
Pesticide and herbicide residues in fresh produce	652	55.7
Hormone and antibiotic residues in meat	534	45.6
Illegal food additives in processed food	523	44.7
Hormones residues in fresh produce	303	25.9
Use of gutter oil[3]	277	23.7
Food adulteration in food (fake rice, fake eggs, etc.)	225	19.2
Sub-standard hygienic conditions of production and/or processing	204	17.4
Bacteria in food	174	14.9
Contamination of heavy metal and other chemicals from the soil	159	13.6
Genetically modified food	120	10.2
Water contamination	108	9.2
Excessive use of synthetic fertilizer	83	7.1
Other	65	5.5

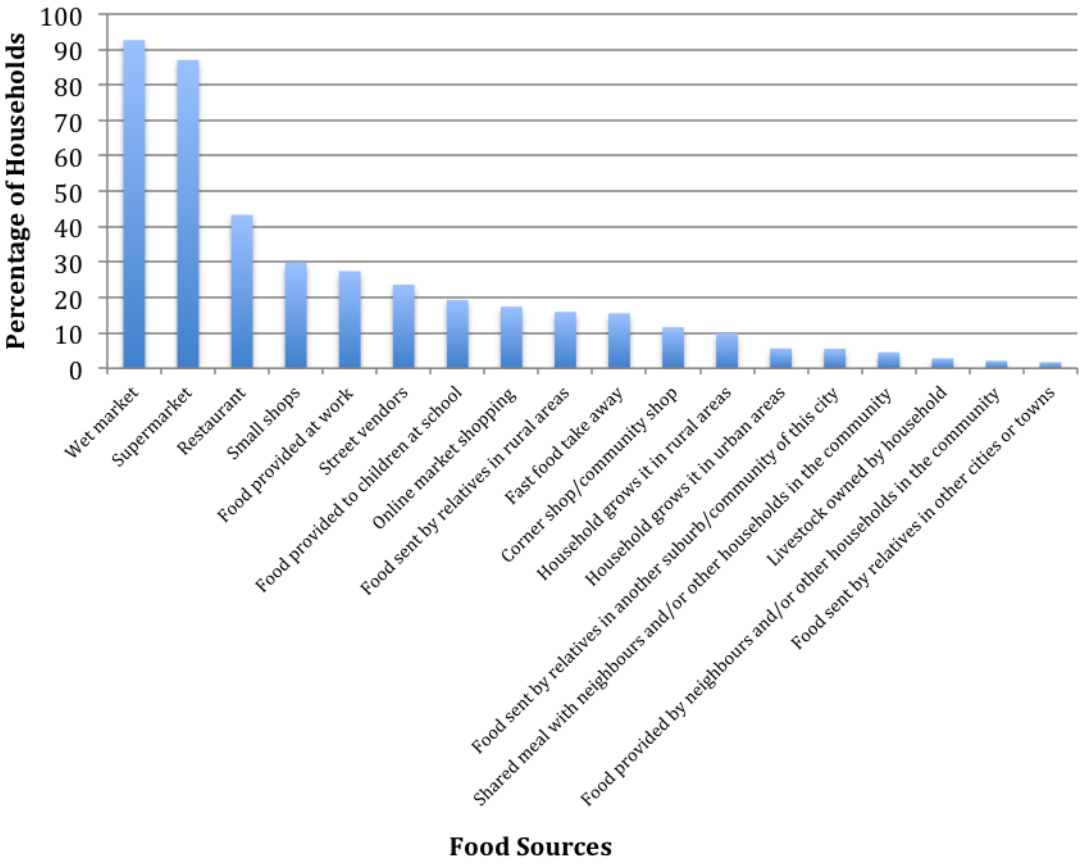
Note: respondents could choose up to three problems
Source: Si and Zhong (2018)

diet of most households. The most significant perceived food safety problems were pesticide and herbicide residues in fresh produce, hormone and antibiotic residues in meat, and illegal food additives in processed food (Table 1). Food safety anxiety strongly shapes people's food purchasing and preparation behaviour (Si et al. 2018).

Figure 3 shows the patronage levels of different types of food retail source by Nanjing households. Conventional food sources continue to play a major role in the food system: wet markets were patronized by over 90% of households in the 12 months prior to the survey, restaurants by 43%, small shops by 30%, informal street vendors by 24%, and corner/community stores by 12%. However, newer forms of retail are also making their mark. Supermarkets, in particular, were patronized by 87% of households. Other sources indicative of the changing urban food system

3. Gutter oil (known as *digouyou* in Chinese) refers to recycled cooking oil from food waste from restaurants, sewer drains, grease traps and abattoir waste.

FIGURE 3: Food Sources of Nanjing Households



included online market shopping (17% of households), and fast food/takeaway (16% of households). Only 6% of households sourced food from urban agriculture in the city.

Policy Implications

The findings of the HCP survey have several implications for the governance of the food system in Nanjing (and potentially other Chinese cities as well). Overall food security is extremely good and dietary diversity high, suggesting the existence of a food system that works well for the majority of the city's residents. However, 20% of the population still experience some degree of food insecurity and nearly 20% have a low dietary diversity (HDDS of 5 or less). The major concern of the population is not the amount and diversity of food they access, but its quality. These findings suggest that policy priorities for food security in Nanjing are threefold: to improve conditions for food insecure households, to reduce food safety anxiety, and to maintain high levels of food availability and accessibility. The context for policy is the changing landscape of food outlets, exemplified by the development of supermarkets, the persistence and government support for wet markets, and the emergence of e-commerce in food retailing. The main policy implications of the analysis include:

Ensuring food access for households with higher levels of food insecurity. Although the overall status of household food security in Nanjing is good, it is important to explore potential governmental schemes or programs to ensure food access for female-centred households and households with no formal-wage workers, particularly in low-income neighbourhoods. Financial support in the form of food stamps would provide a solution for at-risk households and further advance food security conditions in Nanjing. The development of affordable food stores should also be supported in areas where at-risk households are clustered. Cross-department collaborations will be necessary to identify these households, channel more public resources to in their direction, and enhance the accessibility and affordability of food outlets in their neighbourhoods.

Promoting trustworthy food sources in the food retailing system. Chemical residues in vegetables and antibiotic residues in meat were the top two food safety concerns expressed by Nanjing residents. Consumers need to be assured that the food they consume is safe to eat. Governing food safety in Nanjing is not merely an issue of rigorous monitoring and inspection of food from outside the municipality. A significant proportion of vegetables and meat in Nanjing markets are produced in the jurisdiction of Nanjing municipality. Wider adoption of ecological farming approaches on farms in Nanjing should be promoted to reduce the usage of chemicals in vegetables and meat production. In addition, food safety regulations should consider the problems of illegal food additives in processed food, which was rated the third most serious food safety problem.

Intensifying support for wet market development. Due to their various advantages, wet markets have been – and will continue to be – the most visited food outlets for vegetables and meat in Nanjing. The Nanjing government has implemented various policies (e.g. subsidies to wet markets) and regulations (e.g. building new wet markets in newly constructed residential complexes) to facilitate the role of wet markets in the urban food supply. Supporting the expansion, operation, and improvement of wet markets should remain one of the top priorities for urban food system governance. Heightened food safety concerns demand more stringent and effective approaches to controlling the quality of food channelled through wholesale markets to wet markets. Quality control should be a key focus in the future development of wet markets.

Monitoring the development of newer and emerging retail outlets. The rapid expansion of supermarkets and the online food sector are also reshaping the urban food system as they continue to gain popularity with the population. Monitoring their growth will provide first-hand information for policy-making, including knowledge regarding food sources, vendor information, and quality control of food channelled through these markets and food delivery platforms. It is also imperative to understand the challenges facing the online food sector in order to create a favourable policy environment for its future development. The monitoring system could be approached through mechanisms such as annual self-reporting, data sharing of online food platforms, and random surveys.

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