



Zhang-Yue Zhou • Hongbo Liu • Lijuan Cao

# FOOD CONSUMPTION IN CHINA

The Revolution Continues



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## Preface

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In 1999, Edward Elgar published a book by Yanrui Wu, entitled *China's Consumer Revolution*. In that book, Wu examined general patterns of Chinese household demand for a variety of consumer goods such as foods, durables, housing and health care. Following his evaluation of the impacts of economic and social factors on household consumption, he predicted that the outlook for growth in Chinese household consumption was bright, and he went on, "China's consumer revolution has just begun". He was right. Since the publication of his book, enormous changes have taken place in China's household consumption, and indeed, China's consumer revolution has continued.

The consumer revolution has had an enormous impact not only on China's but also on global demand and supply due to the sheer size of demand by the Chinese consumers. Thus, unfolding what has happened since Wu's book and also forecasting what may happen in the future can generate valuable implications for government policy formation and trade strategy development. This book has this purpose although it focuses on food consumption only.

This book originated from a study of China's food consumption we conducted during 2011–12 for the Australian Department of Agriculture, Fisheries and Forestry (DAFF). Wherever possible, all the information and facts have been updated. We thank DAFF for its financial support and for its kind permission for us to use the findings of the study in this book. We also wish to acknowledge the financial support from the Faculty of Law, Business and the Creative Arts of James Cook University in Australia, China's National Natural Science Foundation (No.71203096), and Research Funds of China's Ministry of Education (No.20120097120042), that enabled us to update and enrich our research work.

Food consumption changes in China have been most dynamic in recent years and have drawn much attention from traders, government officials and researchers around the globe. Major changes include not only the rising demand for food in aggregate but also demand for a more diverse range of food, demand for higher protein and higher quality food, and the growth of away-from-home food consumption. On the other hand, constrained by limited and degrading agricultural resources, China's ability



to produce domestically to meet the changing and increasing demand for food has been declining. It has been generally held that China's domestic supply will not be able to meet the rising demand for food in the future.

China's food imports have been on the increase in recent years. China became a net food importer rather than net food exporter in the early 2000s. In 2012, China's agricultural imports, most of which are foods, were US\$111.4 billion and exports US\$62.5 billion. This represents a trade deficit of US\$48.9 billion, an increase of 45 per cent compared to 2011; in 2011 the deficit was US\$33.8 billion.

Clearly, insights into China's food consumption and its trends should be most valuable in understanding this potentially enormous food market. Such insights will help both China and food exporting countries to better understand how food consumption may evolve in the coming years and how they can work collaboratively to meet the rising needs for food in China. This book examines China's food consumption, focusing on the period of 2000–12. It also sheds light on how the food consumption trends may develop into the future.

We have written the book for anyone who is interested in the dynamics of Chinese food consumption. Food traders, leaders of agri-food industries, food trade officials, and food market researchers should, in particular, find this book of great relevance. Those who are interested in the development of the broad Chinese consumer market may also find the book of interest – food is an important part of the market and changes in food consumption affect the demand for other consumer goods.

The book will also be a valuable reference for university students at both undergraduate and postgraduate levels. It will be useful as supplementary reading in courses that deal with food consumption trends, food demand and supply, food trade and broad agricultural trade around the globe in general and in China in particular.

We would like to thank the staff at Edward Elgar Publishing for their professional and skilful support in bringing the book to publication. In particular, we thank commissioning editor Laura Mann, originating editor Tori Nicols, desk editor Dr Madhubanti Bhattacharyya, and copy editor Antonia Hebbert, for their guidance, patience and support during the whole process of this project. We also wish to thank Professor John Mullen for reading our manuscript and giving us valuable comments and suggestions to improve the book.

Zhang-Yue Zhou, Hongbo Liu, Lijuan Cao,  
Wei-Ming Tian and Ji-Min Wang  
15 August 2013

# Foreword

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Zhang-Yue Zhou and I grew up a world apart in completely different cultures but we share many common experiences encountered in our early lives. We both lived and worked in farming communities and developed a strong connection with agriculture and food production. In professional life this has led to a continuing interest in agricultural research and development and trade that focuses on sustainable domestic and world markets. I first met Zhou earlier this year at a National Forum to establish food safety research, development and extension priorities across the entire food chain in Australia and we quickly established a rapport and a realisation that we share a common passion for food quality, safety and security as well as rural development and agribusiness.

I have spent over 40 years in senior management roles within the Australian food industry working in areas of agricultural production, food manufacturing, sales, marketing and research and have had a long involvement with company boards, committees and associations all dedicated to the advancement of a sustainable food industry for Australia. Now, as Chairman of Food Innovation Australia Limited (FIAL), my objective is to build collaborative networks between businesses, research institutions and governments to create the critical mass for future growth of the Australian food industry. The goal is to help businesses develop a continuous innovation cycle, produce higher value-added products, increase margins and also increase the number of exporting Australian firms and their foreign market share. For FIAL to achieve its objectives, particularly increasing Australia's food export capability, we must have two critical inputs – detailed and accurate knowledge of our target markets and deep consumer insights to guide our innovation and product offerings. This book is a valuable source giving both knowledge and insights into what will be our most significant future market of China and I commend it to all those with an involvement in the food industry.

Zhou and his co-authors have a unique understanding of Australia's capabilities in food production that is perfectly balanced with a deep understanding of China's current food consumption, and they have great insights into future trends and demands. It is this understanding of the changes in Chinese demographics and the analysis of future trends that



make this book so valuable to the food industry and the direction innovation must take.

For most of our modern history, Australia has been a major producer of a wide range of agricultural and manufactured food products where exports far outweigh domestic consumption. It is in the Australian mind set to look to markets overseas. Our focus was once on Britain and Europe but has been shifting to Asia since the 1950s. The most significant and dynamic opportunity for Australia is the rapid growth and development of China since the 1990s and the opportunities this creates for Australian food producers who can deliver consistently high quality and safe products. China is growing so rapidly and the dynamic of the different demands across China is so confusing and the opportunities so large that it is difficult for a casual observer to interpret and comprehend. This book provides clarity that cannot be obtained merely by examining the statistics and data currently available from multiple Chinese government and international sources. It is not sufficient for Australian food producers and manufacturers to continue to export what we have always produced, particularly on the commodity markets. We must understand the specific consumer needs within the different segments in the Chinese marketplace and innovate in what we produce and how we supply our products to satisfy real consumer needs. Australia does not have the capacity to be a dominant food supplier to China. Zhou and I agree, therefore, that Australia's contribution to China's future food needs must focus on higher margin, value-added food products that exploit our well-earned reputation as a producer of consistent high quality foods with an exemplary reputation for food safety. Australia's strength is its ability to innovate new offerings of value-added foods for the emerging middle class and wealthy consumers of China.

This book provides extremely valuable information and insights into the changing food consumption in China. It predicts future consumption patterns and illuminates the dynamic difference between rural and urban Chinese and between different socio-economic groups. The analysis of future agricultural outputs and the assessment of future Chinese import needs is a valuable planning tool and guide for potential participants in the food industry of Australia and elsewhere.

Peter R. Schutz  
BSc (Hons), B App Sc, FAIFST, FAICD  
Chairman, Food Innovation Australia Ltd  
Sydney, 26 October 2013

# 1. Introduction

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China has experienced remarkable economic growth in the past three decades. This has resulted in a sustained increase in consumer income, which in turn has led to important changes in food consumption. Notable changes include not only higher demand for food, but also a demand for greater diversity and higher quality, and growing consumption of food away from home.

Constrained by limited and degrading agricultural resources, China has become unable to produce enough food domestically to meet the changing and increasing demand. In 2004, for the first time, China's food imports exceeded food exports. Since 2008, food imports have been increasing. In 2008, the food trade deficit was US\$14 billion. By 2011, it had increased to almost US\$22 billion, growing at a rate of 15 per cent per annum (UN Comtrade Database 2013).

Growing imports of foods into China have attracted the attention of the commercial world and governments alike in China and elsewhere around the globe. Insights into trends in China's food consumption are important in helping to understand future opportunities. Such insights will help both China and food exporting countries to better understand how food consumption may develop in the coming years and how they can work collaboratively to meet the rising needs for food in China. This book examines the recent trends in food consumption by Chinese consumers and undertakes analysis of how these trends may develop into the future.

## 1.1 WHY THIS BOOK

A number of studies have shown that the increase in consumer income in fast-growing developing countries, such as China, India and Malaysia, tends to induce important changes in the amount and composition of food consumption (Garnaut and Ma 1992, Cranfield et al. 1998, Coyle et al. 1998, Wu 1999, Regmi et al. 2001, Jones et al. 2003, Ishida et al. 2003, Liu et al. 2009, and Gandhi and Zhou 2010).

The implications of changes in China's food consumption have been examined from various perspectives (see, for example, Halbrendt et al.

1994, Fan et al. 1995, Brown 1995, Wu and Li 1995, Huang and Rozelle 1998, Wan 1998, Wu 1999, Guo et al. 2000, Gould 2002). Studying China's food consumption is often challenging due to many peculiarities. As such, past studies have not been uniform in their findings. Some possible causes for discrepancies are discussed in Fan and Agcaoili-Sombilla (1997) and Zhou et al. (2008).

Despite these challenges, earlier studies have nonetheless made important contributions to understanding food consumption in China including the estimation of parameters such as income and price elasticities of demand for various food items. Useful findings include:

1. demand is price-inelastic for most of the commonly consumed food items (that is, changes in the price of foods will not result in as large a change in food consumption);
2. there is a tendency to shift away from coarse grains to fine grains, and in some regions from rice to wheat, or in others from wheat to rice, as income increases;
3. Chinese consumers will consume more meats as their income increases; and
4. away-from-home food consumption is increasing as a result of changes in lifestyle and income.

It is noted, however, that the findings of earlier studies may be somewhat "outdated". In recent years, food consumption has experienced some rapid changes, driven chiefly by increased consumer income. As such, parameters derived using "old" data and information are less adequate for understanding China's *current* food consumption; new parameters need to be generated.

Several other recent developments have also had significant impacts on food consumption in China and point to the need to examine this issue using the latest data and information. These developments include:

1. *Quality and safety of foods* Unsafe foods and foods of dubious quality are widespread in China today. Concerns over food safety and quality can affect the demand for domestically produced foods and lead to the substitution of domestically produced food by imported foods.
2. *Changes in supply chains* Food supply chains in China have in recent years become increasingly integrated and advanced. This will make foods available in locations and at times that would have otherwise not been possible, particularly perishable foods. This also affects the quantity of food consumed.

3. *Rural migration and urbanisation* Each year a large number of rural people move into the urban system, which results in changes in where foods are consumed. Composition of food consumption and manners of consumption (e.g., methods of cooking) will also change.
4. *The ageing population* China's population is ageing and the absolute number of aged citizens is increasing rapidly. Older people's demand for food, in terms of quantity, quality and variety, is different from that of people of other age groups.
5. *The tastes of younger consumers* Younger generations, with increased levels of education and more exposure to foreign cultures, tend to be more prepared to try foreign foods and the consumption styles of other cultures. Parents in China, income permitting, are generally keen to satisfy their children with what they demand due to the one-child-per-family policy.
6. *Increasing demand for foods of premium quality* Increased disposable income coupled with small family size leads to increased demand for foods of premium quality. Foreigners in China (tourists and expatriates) also demand premium quality foods.

This book examines food consumption in China using the latest available data and information. Its main objective is to assess China's current food consumption and the outlook for the near future. Specific objectives are to:

1. Examine the overall developments in food consumption in China since 2000.
2. Evaluate changes in food consumption between urban and rural areas, between the rich and poor, and between consumers of different regions, and identify key drivers behind such changes.
3. Analyse the consumption trends of major food items consumed in China.
4. Provide an outlook for China's food consumption, production and trade to 2020.

## 1.2 THIS BOOK AND EXISTING STUDIES

Books in English specifically addressing China's food consumption are still scarce. The pioneering book on China's general consumption by Yanrui Wu, *China's Consumer Revolution: The Emerging Patterns of Wealth and Expenditure*, was published in 1999 by Edward Elgar. Wu's book examined general patterns of Chinese household demand for a variety of consumer goods such as foods, durables, housing and health

care. It compared consumption between different consumer groups. It also compared China with other countries in household demand for consumer goods. While Wu's book remains a valuable reference for understanding China's consumer market, the data used in it went only up to 1997. Since then, dramatic changes have occurred in China: consumer income has further increased and substantial changes have occurred to both quantity and composition of food consumption. As such, this present book updates and complements Wu's work. It analyses China's food consumption *only* with a focus on the time period since 2000. Further, this book provides the reader with valuable judgements about China's likely net imports of various foods by 2020.

There are a few books in Chinese addressing China's food consumption and production issues, e.g., Chen (2004), *China's Food: Supply, Demand and Projections*, by China Agricultural Press; Shi and Chang (2004), *China's Food Consumption: Analysis and Forecast*, China Agricultural Press; Li (2005), *Food Consumption in Rural and Urban China: Theoretic Models, Empirical Analyses and Policy Implications*, China Economic Press; and Research Group for Food Consumption and Security (2007), *Food Consumption in Rural China*, China Agricultural Press. These publications are largely for Chinese readers. There are also some other studies concerning China's food consumption; some of the important ones will be discussed in the next chapter.

### 1.3 DATA

Data collected by China's State Statistical Bureau (SSB) from household surveys is used to examine China's food consumption trends. It must be noted that the SSB data does not include away-from-home consumption. Eating away from home has become a major phenomenon in China. When reading this book, it is imperative to keep this point in mind; that is, the SSB data underestimates food consumption in China, particularly for foods of animal origin. Box 1.1 at the end of this chapter provides further details related to food consumption data for China. Where appropriate, references are made to findings of available studies on away-from-home consumption or judgements are made about the adequacy of data and information used in this book.

Data and forecasts on China's production, consumption and trade in foods and other agricultural products were obtained from various sources, including governments, research institutions, and international organisations such as China's State Statistical Bureau (SSB), the United States Department of Agriculture (USDA), the Food and Agricultural Policy



Research Institute (FAPRI), the Food and Agriculture Organization (FAO) of the United Nations, and the Organisation for Economic Co-operation and Development (OECD).

## 1.4 KEY FEATURES

This book contains the following important features:

- The latest assessments on, and insights into, food consumption trends in China since 2000, focusing on foodgrains, meats and other animal products, fruits and vegetables, and aquacultural products.
- A systematic examination of China's food consumption with particular attention to factors peculiar to China that affect food demand and supply.
- Projections of China's food consumption and food imports by 2020 by incorporating findings of existing studies and authors' own knowledge and expertise on China's food consumption research.
- The estimation of time-varying income elasticities for major food items consumed in China, providing valuable indication about the changes in these elasticities over time.

## 1.5 ORGANISATION

This book has seven chapters. After this introductory chapter, Chapter 2 surveys key literature that deals with China's food consumption issues, especially those studies that examine China's food consumption since the 2000s.

Chapter 3 details food consumption trends in China. An overview of food consumption changes at the national level since the early 1980s is first provided. This sets the scene to help the reader appreciate the speed and scope of recent changes in food consumption. Then, the consumption of major food items since the year 2000 by rural and urban residents, by the rich and poor, and by residents in different regions is analysed and contrasted.

To understand why changes have happened to China's food consumption, it is essential to find out factors that have led to such changes. To predict how China's food consumption may evolve into the future, it is equally imperative to understand such factors. Hence, Chapter 4 is devoted to identifying key drivers behind food consumption dynamics in China and discussing their likely role in shaping China's future food consumption.



Based on the consumption analyses in the previous chapters, Chapter 5 provides an outlook for the consumption and import needs of various major foods by China in 2020. The approach adopted in providing this outlook takes into account existing projections by other studies, conditions peculiar to China, and the authors' own research experience and expertise over the past 30 years. In Chapter 6 are presented some further discussions on issues that have the potential to cause some major increases or decreases in China's future net food imports, resulting in prediction uncertainties.

A summary and conclusions are provided in Chapter 7, the final chapter. Policy and trade implications are discussed for China and for the broad international communities.

### BOX 1.1 FOOD CONSUMPTION DATA FOR CHINA

China's State Statistical Bureau (SSB) publishes data on per capita consumption of major foods by both rural and urban residents. Such consumption data is based on household surveys.

Aggregated household survey data is made available through a number of publications by SSB. Preliminary and limited data about household consumption covering the previous year are made available in around June each year in the *China Statistics Highlights*. Then, by about October, further data is made available in the *China Statistical Yearbook*. By the end of each year, more detailed data is published in the two publications: *Yearbook of Rural Household Surveys in China* and *Statistical Yearbook of Price and Urban Income and Expenditure in China*. In these two publications, data on consumption of individual food items at various income levels is made available.

Data available from SSB for urban food consumption (in quantity terms) includes only *the quantity of foods purchased* by consumers for consumption at home and does not include *away-from-home consumption*. For rural areas, consumption data (in quantity terms) includes both purchased food and food produced and consumed by the household on the farm. But, again, *away-from-home consumption* is not included.

Away-from-home consumption, however, is a major phenomenon in China today, especially in urban areas. Non-inclusion of away-from-home consumption by urban dwellers makes the reported quantity purchased a significant underestimate of food consumption for urban consumers. Though away-from-home

consumption in rural areas would be significantly lower than that in urban areas, it is also increasing fast. Thus, when reading consumption data published by SSB, it is imperative to keep in mind that they are underestimates of food consumption by the Chinese, with the problem of understatement being more acute for urban consumption.

SSB also publishes food consumption expenditure data for urban areas. It is claimed that the expenditure data includes away-from-home consumption. However, such data is of minimal use for gauging the quantity consumed of a food item due to the complication caused by different prices and quality of the food. Further, such data is unlikely to be accurate because those who have consumed foods paid for by public money are unlikely to report such consumption in the surveys.

The underestimation problem with SSB data could be overcome by undertaking a separate survey to measure away-from-home consumption. This, however, would be a very expensive exercise considering the size of China and SSB is probably the only institution capable of doing it. It is also not realistic to survey only one region in China as consumption in different parts of China varies considerably. A survey in one region would likely only be good for explaining food consumption in that region and could not be considered representative of China.

Separate surveys to collect away-from-home consumption data are also unlikely to happen in the future as it is not realistic to ask respondents to recall and report accurate information about their away-from-home consumption quantity. A dish will have several ingredients and when several dishes are eaten, it is difficult to obtain an accurate calculation of the quantity of each of the ingredients consumed.

Another large-scale survey that collects consumption information is the China Health and Nutrition Survey (CHNS). This is an ongoing international collaborative project between the University of North Carolina and the National Institute of Nutrition and Food Safety at the Chinese Center for Disease Control and Prevention. The survey was designed to examine the effects of health, nutrition, and family planning policies and programs implemented by national and local governments and to see how the social and economic transformation of Chinese society is affecting the health and nutritional status of its population. The first survey was conducted in 1989. It is carried out every two to three years. The

survey takes place over a three-day period using a multistage, random cluster process to draw a sample of about 4,400 households with a total of 26,000 individuals in nine provinces that vary substantially in geography, economic development, public resources, and health indicators. The latest CHNS 2009 data is available for public use. Because the survey collects food consumption data of individuals by age, sex, education, and various other information, useful analyses can be carried out about food consumption trends. However, due to the fact that the data only covers three days, it is of limited use in inferring the exact consumption levels of individuals over a year.