



Global Meat Complex: The China Series

Fair or Fowl?

Industrialization of Poultry Production in China

By Chendong Pi with Zhang Rou and Sarah Horowitz

Edited by: Shefali Sharma and Ben Lilliston

Institute for Agriculture and Trade Policy

February 2014

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ACKNOWLEDGEMENTS

When we embarked on this project to examine China's role in the Global Industrial Meat Complex, we had intended to produce only one report. Fairly quickly into the research, we realized—given the complexity of China, the scale and scope of production and the rapid rate at which different meat segments in China are evolving—individual sectors such as feed, pork, dairy and poultry merited their own stories. This large endeavor could not have been achieved without the help of numerous people that were involved from the conception, research, drafting, translation and editing phases of the project.

First, we'd like to thank Jim Harkness, IATP's president for 7 years (2006–2013) as the person who conceived this project as a critical contribution to the debate on the expansion of industrial meat production, its increasing concentration and its implications for social and environmental justice. Our interviews, conducted in May 2013, in China would not have been as rich without Jim's excellent contacts, his Chinese language skills and his 16 years of experience living and working in China. His editorial input, suggestions and revisions throughout the process have been invaluable.

IATP is also grateful to Mindi Schneider for being the lead author of our report: *China's Pork Miracle? Agribusiness and Development in China's Pork Industry*. We are indebted to her for being generous with her knowledge, in-depth research and analysis on China's "pork miracle," the role of government policies and the emergence of Chinese corporations in the meat and feed industries.

Several other people contributed with hours of research and writing that helped shape these reports. We thank Sophia Murphy, Sarah Martin and Sarah Horowitz who contributed heavily in the early stages of the project and whose research contributed to the content of the final reports. Assistance with translations of documents and interviews was adeptly provided by Jiang Tuo and Yuan Miao-zhu.

Lastly, but definitely not least in the writing process, Zhang Rou and Chendong Pi spent numerous hours researching, writing and revising various drafts of the dairy and poultry reports, respectively. We are grateful for their hard work and efforts. Ben Lilliston also provided important editorial input throughout the process and IATP's communications team worked around the clock to deliver a beautiful final product.

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A final caveat: The project has been an enormously enriching process of learning about how China is grappling with its choices to consume and produce more meat and what this means for social and environmental issues within and outside China. It is by no means intended to be a definitive account—an impossible task for a country as complex and vast as China. We hope however, that it will be an important contribution to an evolving debate and process.

—Shefali Sharma

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THE GLOBAL INDUSTRIAL MEAT COMPLEX: UNDERSTANDING CHINA'S MEAT REVOLUTION

When the Chinese company Shuanghui International Holdings announced its intention to purchase Smithfield Foods, it got the attention of the U.S. Congress and the media. The idea of a foreign firm owning a giant U.S. pork producer, and an influential player in the U.S. food system, raised a government debate about the links between food security and national security.¹ The purchase was just the latest in the growing consolidation in the global industrial meat complex—where long supply chains include feed production, genetics and breeding span the globe and blur national identity. Shuanghui's recent name change to WH Group Limited exemplifies this global branding and reach.²

Aside from operating in the U.S., the global meat industry is increasingly interlinked with emerging economies. China and Brazil are now not only big agricultural producers and consumers, they have spawned a new set of agribusinesses, shaping the global meat complex. Their governments have embraced the factory-style meat production promoted by U.S. agribusiness companies. They are also adopting Western diets, including rising meat consumption.

In 2013, the U.S. was the top global importer of beef, and top exporter of pork; Brazil was the top exporter of beef and poultry. China is the world's largest producer and consumer of pork, the second largest producer of poultry and the world's largest soybean (for animal feed) importer. Brazil is increasingly filling the global need for meat, while the U.S. and Brazil compete for China's soy market. With the purchase of Smithfield, Shuanghui/WH Group becomes the largest pork enterprise in the world. Brazilian based JBS is now the world's largest meat company. U.S.-based Tyson remains one of the world's largest poultry companies, competing with JBS's acquisitions in the poultry industry. In short, industrialized meat production, processing and consumption has truly become a global phenomenon with global implications.

U.S.-based corporations, and their model of industrial animal production, have certainly been a major catalyst in the growth of industrial meat production around the world. Over the last 50 years, the rise of industrial meat production in the U.S. has been nothing short of astounding.

Animal production has shifted from a decentralized family farm system to a more concentrated system with fewer companies producing and large numbers of animals in confined spaces. These operations standardized feed for weight gain, genetic selection and the mechanization of feeding and watering.

Six years ago, a commission sponsored by the Pew Foundation examined the industrial meat production in the United States. The Pew Commission issued a series of recommendations, including the phase out of non-therapeutic use of antibiotics in animal production, stronger regulations to manage waste, the shift away from intensive confinement toward more humane treatment, vigorous enforcement of antitrust laws and increased funding for public research on alternative approaches for animal production. "Failure to address these issues will only result in a further lack of confidence in the animal agriculture industry, increased environmental damage, worsening public health, dismal animal welfare, and a grave outlook for rural communities," concluded the commission.³

For the U.S. farm economy, the industrial meat system has pushed out nearly all independent poultry and pork producers, while independent beef producers continue to hang on against all odds. Over 13 years ago, IATP documented the transformation of U.S. hog production in *The Price We Pay for Corporate Hogs*. In a period of 30 years (1950–1980), the number of U.S. hog farms declined by nearly 80 percent, while the average farm size increased six-fold. By 1999, 50 percent or more of the farmers were under some sort of contractual arrangement and four companies (including Smithfield) controlled 20 percent of the production. In the last decade, this process has only further intensified. By 2007, four companies controlled 66 percent of the production—at a great cost to U.S. farmers, consumers, the environment and public health. Further, working conditions at industrial meat processing facilities are considered some of the most dangerous in the U.S.⁴

In response to the numerous problems associated with industrial meat production in the U.S., rural communities, farm groups, environmental and public health organizations around the country have opposed the industrial meat system on a number of different fronts, in many cases winning important battles. But while U.S. meat consumption per capita has declined over the last four years,⁵ U.S. meat production continues to rise, linked to increasing U.S. meat exports. There are clear lessons to be learned from the U.S. experience.

Like most agricultural commodities, the meat industry is not local, regional or national—it is global. And the multinational companies that dominate this industry, from production to feed to processing and distribution, are set on exporting this industrial model of production around the globe. The industry is aided by trade agreements that threaten to lower worker safety, health and environmental standards while further empowering the legal standing of corporations to challenge national regulations.

It is becoming increasingly clear that addressing the economic, environmental and health downsides of the global industrial meat system will have to include an international dimension. Certainly, the health threats associated with industrial meat production—avian influenza, Mad Cow disease, H1N1 (swine flu), antibiotic-resistant bacteria, melamine poisoning—do not recognize national boundaries.

Will countries such as China, Brazil and India continue down the same path of the U.S. on industrializing their meat production? Or, is a different path possible?

In this first phase of our research on the global industrial meat complex, we examine the role of China. We look in depth at four sectors within China associated with animal production: feed, pork, dairy and poultry. It is an endeavor to understand and share how China's transformation towards a U.S. agribusiness model is both a common story of industrial meat production anywhere but is also specific to China. Further, it is an attempt to show how China's story, like the U.S.'s, is a global one, with global links and global impacts.

Understanding how Chinese companies are “going out” to develop their supply chains and how major U.S. and other international livestock and dairy companies are “going in” to China better prepares us to address the global nature of this industrial complex and its impacts—domestic and global. It can help us to get beyond big headlines in the paper about China's growing meat consumption and dig deeper into how and why it is taking place and imagine a different pathway towards fairness, nutrition, public health, environmental protection in food production—lessons that are readily available from the U.S. experience.

The global trend points to ever greater consolidation of fewer and more powerful corporations controlling scarcer water and land resources to feed millions of animals in confined spaces to produce more cheap meat. How citizens and governments deal with the externalities of this sector

and its endemic global ramifications merit careful thought. China—as the largest producer of pork, the second largest producer of poultry, the largest feed importer in the world and the fourth largest dairy producer—is a critical piece of this global puzzle.

Endnotes

IATP, Food and national security: The Shuanhui-Smithfield merger revisited, September 12, 2013, <http://www.iatp.org/blog/201309/food-and-national-security-the-shuanghui-smithfield-merger-revisited>.

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EXECUTIVE SUMMARY

Poultry meat and eggs were not traditionally an important part of the Chinese diet. They were considered luxury goods for consumption on special occasions. Over the past three decades, however, China's per capita poultry consumption has increased from barely 1kg to over 9kg per year. Today, the poultry industry in China is dominated by chicken production which comprises 70 to 80 percent of all poultry production. On a macro level, by 2011 the country was already the second largest producer of poultry meat and eggs in the world and the size of the industry continues to expand.

This report tracks the growth of the Chinese poultry industry during the past three decades and the implications of this development. China's poultry industry is going through rapid industrialization, characterized by intensification of farming, horizontal consolidation and vertical integration. Both the size of the industry and changes in poultry production practices (in conjunction with development in the livestock sector as a whole) have significant implications for public health, the environment, rural livelihoods and animal welfare.

The poultry industry is, in some ways, the most vertically integrated and industrialized system of livestock production in China. The policy emphasis in this sector (like all other meat sectors in China) is on scaling up and further intensification. The sector has a large number of firms competing over low prices with low profit margins, leading to immense pressure by firms to cut costs. At the same time, to remain competitive and meet production and consumption targets, firms are dramatically increasing production—raising more and more birds in confined spaces.

Population growth, rising income and urbanization are commonly seen as the main drivers of poultry demand in China. However, government policy choices, growth and marketing of quick service restaurants (QSRs) and super markets, food safety concerns, costs of production (labor, land and feed) and environmental limitations (including feed, land and water constraints) have and will continue to shape demand in the livestock sector and poultry is no exception.

With rising concentrations of poultry in production facilities, more food safety scandals are coming to light. Scandals such as the KFC “instant chicken” scandal where more than 18 different antibiotics and other chemicals were found in retail chicken and epidemics such as the

recent avian flu outbreak in 2013 lead to sharp drops in poultry demand. And they are changing the way poultry is marketed and consumed. The cost-cutting practices are also leading to serious worker safety issues as demonstrated by the fire that killed a 120 people in the Jilin Baoyuanfeng Poultry Plant last summer.

Food safety concerns, in turn, are driving the government and consumers to demand greater control of the supply chain, slowly shifting consumer habits towards more processed poultry bought in supermarkets. Currently, most livestock products in China are distributed by many small traders. Outside tier-one cities, the cold chain is still fragmented, supporting wet markets as the major distribution channel. However, the biggest future shift seems to be the expansion of organized retail in marketing poultry products—taking away the share from wet markets. And retail outlets are capitalizing on food safety concerns as a way to increase their market share and will contribute to shifting production practices by exerting greater control over the supply chain.

However, wet markets and consumer preferences for fresh meat will continue to dominate the Chinese market in the coming decade. Wet markets are being singled out as a major source of disease epidemics; while “specialized” producers, much smaller and weaker than the firms that contract with them, are being blamed for food safety issues. Food safety concerns are also facilitating major global powers such as Tyson to acquire farms in China and control the entire production process through a “grow out” model that owns and manages the entire supply chain—providing organized retail with a “traceable” supply of industrial poultry, building consumer confidence that the product is “safe.” Tyson, Cargill and Brazil's Marfrig and BRF are all integrating themselves in the Chinese market. Meanwhile, the top Chinese companies such as Wens are producing close to a billion birds a year, through contracts with farmers, to meet Chinese demand. Specialized (smaller farms) are either rapidly disappearing or consolidating into much larger scale of production to remain competitive. All signs indicate that this process is set to intensify in the years to come as both poultry production and consumption are expected to grow.

China is a net importer of poultry meat in terms of volume and a major importer of poultry by-products, such as wings and feet and internal organs which are considered offal in the rest of the world. However, China's poultry imports have been very volatile in the last 15 years because of frequent trade disputes, particularly with the U.S. In 2011,

three-fourths of China's poultry imports were from Brazil and more Brazilian processors are receiving certification to export to China contingent on food safety standards. Brazilian companies are competing with U.S. ones for top export spot for various poultry parts. Imports of chicken feet from Brazil have declined, while those from the U.S. have dramatically increased since April 2011. Brazil is China's biggest wing exporter. Despite a declining overall trend in imports in recent years, Rabobank believes that China's poultry imports will increase because of China's complementary market for offal compared to the rest of the world. Chinese companies are also expected to invest more overseas in Brazil, Argentina and the U.S. to secure poultry supply for the Chinese market.

The industrial model of production continues to present significant challenges to China's food safety, public health, environment and viable rural livelihoods. The report demonstrates that a much more systemic analysis is needed to examine the true costs of this model and the costs and benefits of consuming poultry produced in this manner. A finer look at the structure of the market, firm behavior and price competition is urgently needed to understand the perverse incentives this model is creating to cut costs upstream. This "race to the bottom" is leading to a host of problems related to food safety, worker health and posing significant challenges in building a remunerative and regenerative agriculture system that involves small producers. The current model, as in the U.S., continues to externalize the true costs of this production at the expense of much healthier and agroecological choices. However, deliberate policy choices have the potential to alter this system towards a more sustainable pathway in the coming decade. Some alternatives such as Beijing's organic market and community supported agriculture projects are already underway as Chinese urban consumers are waking up to the health and ecological costs of this mode of production. It is hoped that this report contributes to such a rethink on alternatives to the current approach.

INTRODUCTION

Poultry meat and eggs were not traditionally an important part of the Chinese diet.¹ They were considered luxury goods for consumption on special occasions.² Over the past three decades, however, China's per capita poultry consumption has increased from barely 1kg to over 9kg per year.^{3,4} On a macro level, by 2011 the country was already the second largest producer of poultry meat and eggs in the world and the size of the industry continues to expand.⁵ This report tracks the growth of the Chinese poultry industry during the past three decades and the implications of this development. China's poultry industry is going through rapid industrialization, characterized by intensification of farming, horizontal consolidation and vertical integration. Both the size of the industry and changes in poultry production practices (in conjunction with development in the livestock sector as a whole) have significant implications for public health, the environment, rural livelihoods and animal welfare. Though the poultry sector includes domesticated chickens, ducks, geese and turkeys, the report focuses on broiler chicken. Research for this report is based on secondary data including white papers, journal articles and media reports and interviews conducted in China in May 2013.

I. EVOLUTION OF CHINA'S POULTRY INDUSTRY

Today, the poultry industry in China is dominated by chicken production which comprises 70 to 80 percent of all poultry production.^{6,7} In 2011, chicken was the second largest protein sector after pork (Figure 1).

From 1961 to 2009, China's broiler industry has gone through three developmental stages.⁸ The first stage (1961–1978) is considered "Slow Growth."⁹ Annual production of broiler chicken, for example, increased from 0.49 million metric tons (mmt) in 1961 to 1.08 mmt in 1978, with a compound annual growth rate (CAGR) of 4.78 percent.¹⁰ However, poultry production was primarily part of backyard farming for subsistence during this period.¹¹

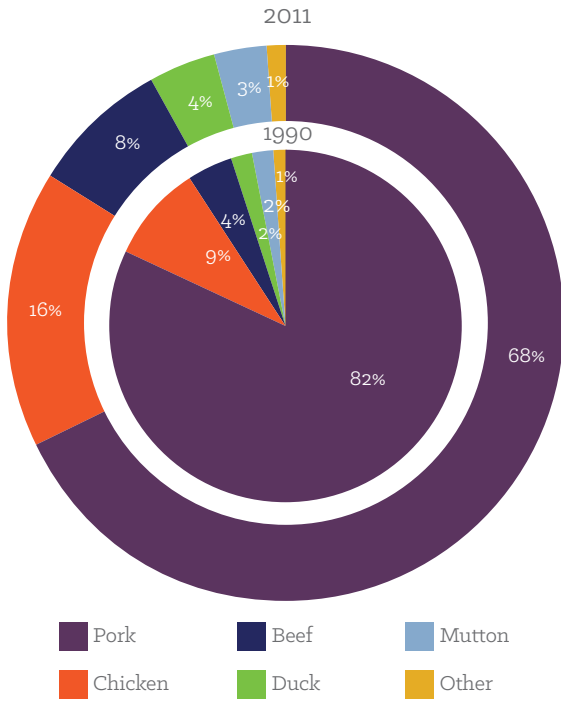
The second stage (1979–1996) is considered "Fast Growth."¹² The introduction of the household responsibility system and the market economy facilitated rapid growth of annual production.¹³ (The household responsibility system replaced people's communes as the system to organize and

remunerate agricultural production. Prior to 1978 under the commune system, individuals were put into production teams and earned fixed wages regardless of output. After 1978, people's communes were dismantled and land use rights were given to households.) Households became the basic units of production and earned directly from the market. Agricultural production increased rapidly after this transition. In the following years, broiler output experienced phenomenal growth—increasing from 1.08 mmt to 4.54 mmt with a CAGR of 10.15 percent.¹⁴

Industrialization of the poultry sector started in 1984 with the introduction of foreign capital, technology and management expertise.¹⁵ The landscape of poultry production began to dramatically change from primarily independent backyard farming for both subsistence and cash income toward more "specialized" commercial production (the main farming activity becoming poultry production for income). The sector also started to become more intensified, consolidated and integrated.^{16,17} This process accelerated in the third stage (1997–2009) of "Standardization and Scaling-up."¹⁸ "Standardization" in the Chinese livestock sector includes standardized feeds, breeds, medicine, production facilities, growth environment, slaughtering/processing facilities and food safety inspection.¹⁹ In these 12 years, annual production of broiler increased by 5.306 mmt with a CAGR of 4.91 percent.²⁰

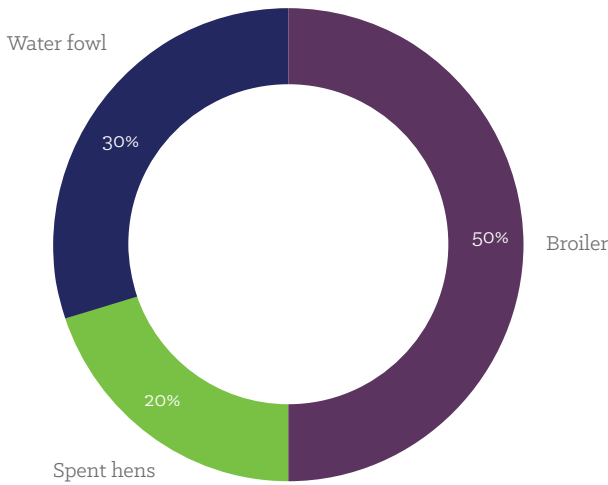
Since 2010, the broiler industry has entered a fourth stage of "Restructuring and Upgrading."²¹ This stage is characterized with a focus on food safety control, the continued push for standardization and scaling-up.²²

Figure 1: Change of China's meat production structure from 1990 to 2011



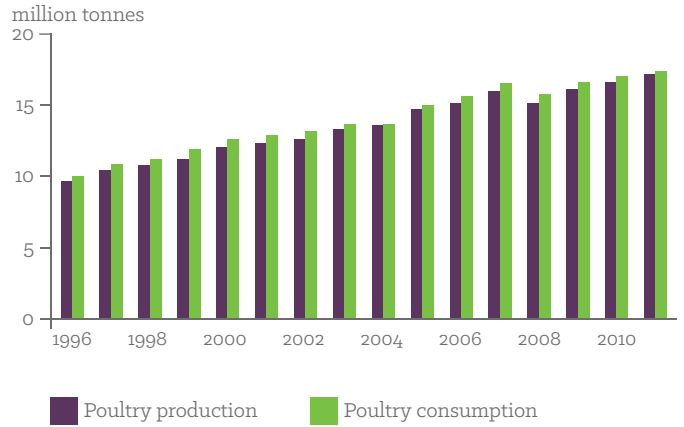
Translated in English from: 陈志坚, 圣农发展深度报告: 量增价升, 盈利周期反转(武汉: 长江证券, 2013), 6°

Figure 2: China's poultry market structure



Source: Chenjun Pan, *Can China's Poultry Move Out of Pork's Shadow? Still on the Road to Industrialization* (Utrecht: Rabobank, 2013), 2.

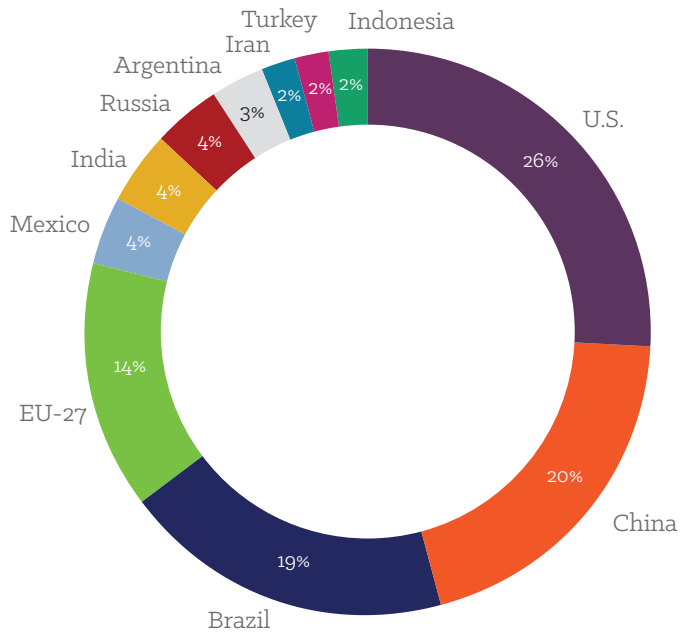
Figure 3: Poultry production and consumption in China, 1996–2011



Source: Chenjun Pan, *Can China's Poultry Move Out of Pork's Shadow? Still on the Road to Industrialization*, (Utrecht: Rabobank, 2013), 1.

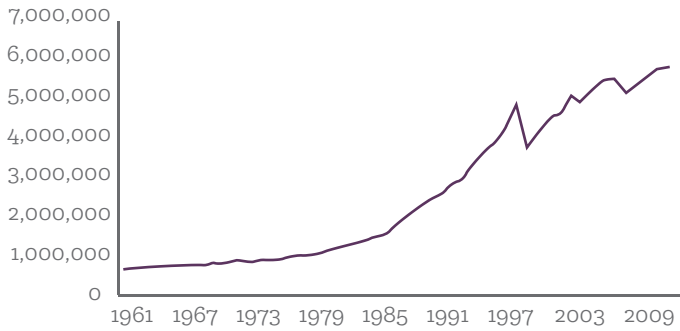
Figure 4: Major broiler producers and their share of total production

The total in this chart is the total broiler production of these 11 world's largest producers, not world broiler production.



Source: 王燕明, "2011年全球肉鸡产业发展形式及2012年预测," 中国畜牧杂志48(2012): 37°

Figure 5: Poultry birds stocks (1,000 head) of China from 1961 to 2009



Produced by Zhang Rou based on FAO data: faostat.fao.org.

II. GROWTH, CONSUMPTION PATTERNS AND DEMAND DRIVERS

Poultry has been the fastest growing protein sector in China since the 1990s.^{23,24} Since 1996 or so, China's poultry consumption has matched its production with a CAGR of 3.9 percent (see Figure 3). And import/export has been less than 5 percent of the country's total poultry consumption/production. In 2011, China was already the world's second largest poultry producer after the U.S., with an annual output of 17 mmt and accounting for 18 percent of world production (Figure 4). Figure 5 shows the growth of China's poultry stock from 1961 to 2009. It is worth noting the periods of sharp decline in poultry stock after the first outbreak of avian flu in 1996, though the trend in growth remains upwards.²⁵

Box 1: China's waterfowl production

China's waterfowl (ducks and geese) production is around 5.5 mmt annually, which accounts for two-thirds of the world's production.²⁶ Before the 1980s, ducks were mainly raised for eggs but today, meat ducks dominate the waterfowl sector.²⁷ Duck production grew with a CAGR of 3% in the past five years (2008–13), slightly faster than the 2.5 percent growth of broiler during the same period.²⁸ Industrial duck meat costs less than broiler, which has driven increased consumption in factories and school cafeterias.²⁹ The Chinese also increasingly perceive duck meat as healthier than other meats (with less fat and cholesterol).³⁰ Duck meat is therefore also experiencing rapid industrialization.³¹ Ducks are produced in both extensive semi-intensive and indoor factory farms and many companies have a production capacity of 5 to 10 million ducks per year.³² Production and processing is rapidly being integrated.³³ Since 2005, the Chinese government has particularly encouraged indoor intensive production of ducks because of the belief that this mitigates the risk of avian influenza.³⁴ BR Group (Thailand) is a major player in breeding and producing ducks on factory farms in China.³⁵

Box 2: China's egg production

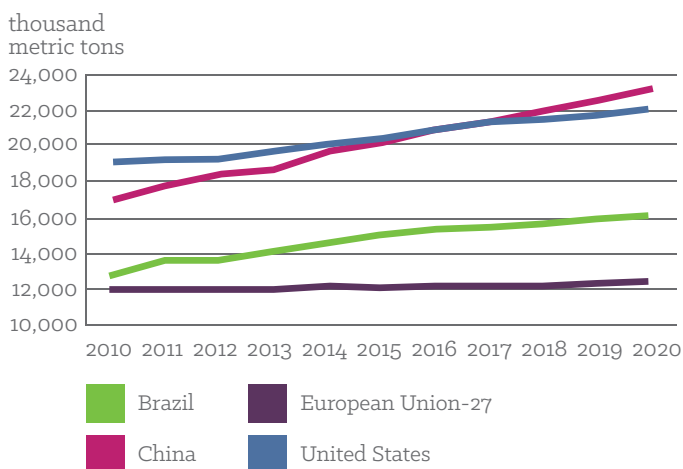
Already by 1984, China had become the largest poultry egg producer in the world (40 percent of the world's production).³⁶ In 2009, chicken eggs accounted for 87 percent of total egg output in China.³⁷ China produced 28.11 mmt poultry eggs in 2011.³⁸ The provinces with the largest poultry egg output are Henan, Shandong, Hebei, Liaoning, Jiangsu, Sichuan, Hubei, Anhui, Heilongjiang and Jilin, respectively.³⁹ The majority of the chicken eggs (over 95 percent) are consumed as table eggs and the remaining are processed.⁴⁰ Poultry egg production is predicted to grow with a CAGR of 2 percent or higher from 2013 to 2017.⁴¹ Egg farming is more intensified and integrated than broilers, with 70 percent of eggs in 2005 coming from the largest factory farms which comprise nearly 2 percent of all egg producers.⁴² CP Group is a major player in China's egg production.⁴³

A number of sources predict that China's poultry industry will continue to grow in the next decade (see Figures 6, 7 and 8). Rabobank (2013) and USDA (2013)'s predictions are shown in Figure 7 and 9. We compared the 2020 production predictions made by OECD-FAO (2013), Rabobank (2013), USDA (2013) and ANZ (2013). Their predictions are generally consistent with some variations (Figure 6). As a reference, Rabobank (2011) predicts world poultry production to grow with a CAGR of 2.4 percent over the next two decades from 2010 to 2030.⁴⁴ China's growth rate therefore is more or less the same as the world average.

Figure 6: Comparison of 2020 poultry production predictions from three sources

SOURCE	2020 PRODUCTION PREDICTION (MMT)	CAGR (OWN CALCULATION, ASSUMING A BASE OF 17MMT IN 2011) ^{45,46}
OECD-FAO (2013)	20.69	2.21%
Rabobank (2011) ⁴⁷	~21.25	~2.51%
USDA (2013) ⁴⁸	~23.00	~3.42%
ANZ (2013) ⁴⁹	21	

Figure 7: Poultry meat production, select countries



Source: USDA, *International Egg and Poultry Review January 29 2013* (Washington: USDA, 2013), 1.

Morgan Stanely 2011 and USDA 2010 also predict production growth for broilers specifically. Because the two predictions are using different time frames, we compare their assumed CAGR (Figure 8). Their predictions are also more or less consistent.

Figure 8: Comparison of broiler growth predictions from two sources

SOURCE	AVERAGE CAGR	TIMEFRAME
Morgan Stanley, 2011 ⁵⁰	3%	2011–2015
USDA, 2010 ⁵¹	2.75% (own calculation)	2010–2020

Demand drivers

Population growth, rising income and urbanization are commonly seen as the main drivers of poultry demand in China. However, government policy choices, growth and marketing of quick service restaurants (QSRs) and super markets, food safety concerns, costs of production (labor,

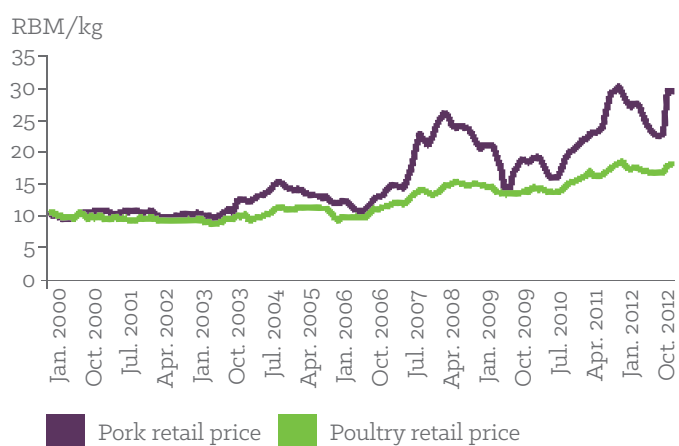
land and feed) and environmental limitations have and will continue to shape demand in the livestock sector and poultry is no exception.

Incomes, urbanization and prices

Rising income drives China's poultry consumption through both an income and substitute effect. As the Chinese become richer, their diet is changing from grains and vegetables to much more protein. According to Rabobank (2013) which has an interest in livestock-related investments, China's per capita income and per capita poultry consumption are still far lower than Taiwan (which has a similar dietary preference) and thus with potential for further growth.⁵² Although overall per capita poultry consumption is rising in China, there exists a significant urban-rural disparity. Urban population's consumption of poultry is substantially higher than rural in all income segments.⁵³

Within the meat protein sector, the Chinese are gradually substituting pork with poultry, which is perceived as healthier than pork.⁵⁴ According to ANZ (2013), per capita consumption of poultry rises more quickly than pork when per capita income rises.⁵⁵ Figure 9 shows that while pork prices have fluctuated quite significantly in the last decade, poultry prices have remained comparatively stable and much lower at times. The demand of poultry is thus influenced by both the pork price and the gradual acceptance of poultry being a healthier meat.⁵⁶

Figure 9: Retail prices of pork and poultry in China, 2000–2012



Source: Chenjun Pan, *Can China's Poultry Move Out of Pork's Shadow? Still on the Road to Industrialization*, (Utrecht: Rabobank, 2013), 4.

The higher feed-conversion rate of poultry production compared to pork is cited as another driver for the industry's growth.^{57,58} It requires 1.8 kg of feed to produce 1 kg of white-feathered chicken (see section on industrialization), 2.5 kg of feed to produce 1 kg of yellow-feathered chicken, compared to 3 kg of feed to produce 1 kg of pork.⁵⁹ When feed prices rise (dependent on prices of corn and soybean), the higher feed-conversion efficiency of industrial poultry production gives it an economic cost advantage over pork production, making the meat cheaper for consumers.⁶⁰ Rising feed prices and labor costs are key constraints for future growth of poultry production and the livestock industry in general in China.⁶¹

Food safety

Food safety is becoming an important factor in shaping China's demand in the livestock sector. Scandals such as the KFC "instant chicken" scandal (see section on impacts) and epidemics such as the recent avian flu outbreak in 2013 lead to sharp drops in poultry demand, and are also changing the way poultry is marketed and consumed.

The Chinese government is trying to discourage purchasing poultry from live markets while encouraging purchases of chilled or frozen poultry meat produced from centralized, organized and industrial producers.⁶² The State Council (China's highest policy-making body) stated that local governments should guide consumers to change their consumption habits from fresh meat to processed chilled meat (Figure 15).⁶³ The media and scholars are also encouraging consumption of chilled poultry cuts, frozen and processed meats as more hygienic instead of fresh poultry meat.⁶⁴ Currently, hypermarkets (a very large retail outlet that is a combination of a department store and a grocery store) and supermarkets (large grocery stores) are the main distributors of frozen and processed products.⁶⁵

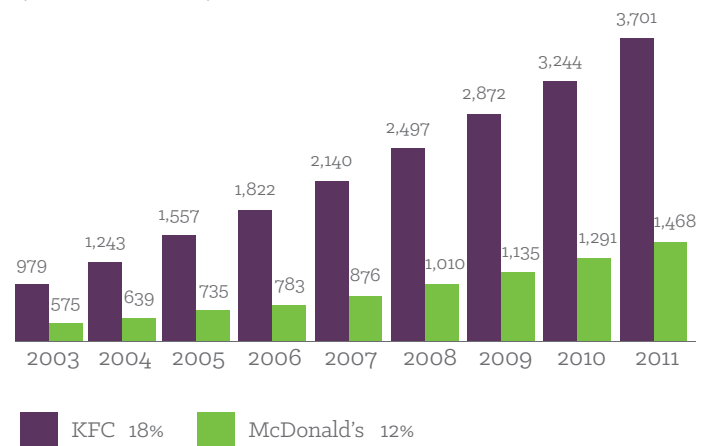
Given that there is a vast network of producers and traders across a large country and consumers that prefer fresh meat, there has naturally been resistance to such decrees that ban wet markets.⁶⁶ Customers in the south strongly prefer selecting live birds and asking sellers to slaughter them on the spot.⁶⁷ In Shanghai, for example, out of the annual 190 million chickens consumed, 120 million are chickens slaughtered and sold at wet markets.⁶⁸ In the spring of 2013, Shanghai and Hangzhou temporarily closed all live poultry markets after the outbreaks of H7N9. Two

months later, the two cities reopened the markets.⁶⁹ The city, however, has the intention to gradually reduce the number of live poultry markets.⁷⁰

Quick service restaurants (QSRs)

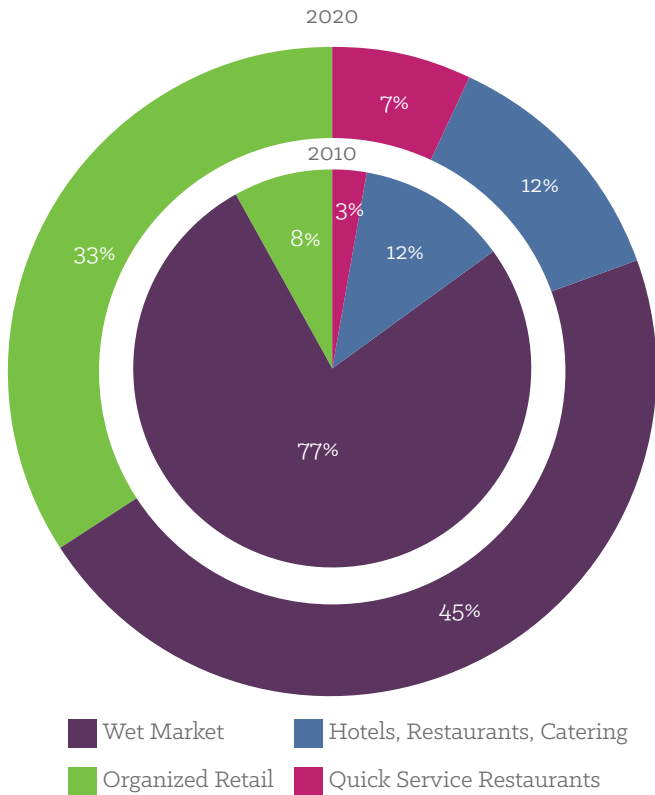
Though wet markets are (and will remain) the main source of poultry marketing in China between 2010-2020 (see Figure 11), an important driver has been the expansion of QSRs. The largest two QSR brands in China, KFC and McDonald's, opened their first stores in China in 1987 and 1990 respectively.⁷¹ From 2003 to 2011, KFC had a CAGR of 18 percent and McDonald's 12 percent in terms of numbers of stores opened (Figure 10). KFC plans to open 400 new outlets every year and McDonald's plans to increase their number of outlets to 2,000 by 2013.⁷² Growth of QSRs has played an important role in creating consumption because poultry is the major item on the menu of both western QSRs and some locally branded QSRs.⁷³ Rabobank (2013), however, believes that the impact of QSRs is declining because their expansion rates have peaked.⁷⁴ ANZ (2013)'s prediction seems to agree with Rabobank (2013). However, the share of QSRs in distribution of poultry products is still predicted to increase from 3 percent in 2010 to 7 percent in 2020 (Figure 11) due to continued urbanization and QSR's being marketed and perceived by consumers as part of a "modern" urban life style.

Figure 10: Recent growth of global food service chains in China (number of stores)



Source: Marfrig Group, *Institutional Presentation July 2013* (Sao Paulo: Marfrig Group, 2013), 15.

Figure 11: How poultry products are distributed in China in 2010 and 2020 (forecast)



Source: ANZ, Feeding the dragon: The modernisation of China's food industry, (Melbourne: ANZ, 2013), 9.

Supermarkets and hypermarkets

Currently, most livestock products in China are distributed by many small traders.⁷⁵ Outside tier-one cities (such as Guangzhou, Shenzhen, Shanghai and Beijing), the cold chain is still fragmented, supporting wet markets as the major distribution channel.⁷⁶ However, the biggest future shift seems to be the expansion of organized retail in marketing poultry products—taking away the share from wet markets (Figure 11). And retail outlets are capitalizing on food safety concerns as a way to increase their market share and will contribute to shifting production practices by exerting greater control over the supply chain (see section: “Vertical Integration: Contract Farming and the Grow-Out Model”).

Rabobank (2013) expects the retail market for frozen and prepared products to be a growth area when [if] consumer preferences change.⁷⁷ Currently, non-branded and unpackaged chilled cuts dominate wet markets and supermarkets.⁷⁸ The share of frozen chicken is still very small in both

markets.⁷⁹ People do not like frozen chicken because there is a general preference for fresh meat and frozen meat is more difficult to cook.⁸⁰ Rabobank (2013) believes that consumer preferences will change and frozen and prepared poultry products will become more accepted.⁸¹ These outlets are starting to become a major channel to replace wet markets for marketing poultry products to end consumers. ANZ (2013) predicts that by 2020, organized retail will be marketing 33 percent of all poultry products, compared to only 8 percent in 2011 (Figure 11). The share of wet markets in the distribution channel is predicted to decline from 77 percent in 2010 to 45 percent in 2020.

According to Rabobank (2011), both large supermarkets and QSRs prefer sourcing homogenous “high-quality” products at “competitive” prices.⁸² They prefer suppliers that have high controllability of the value chain and provide high traceability of products.⁸³ Large integrators are better able to satisfy this demand from both QSRs and large supermarkets.⁸⁴ Therefore, it is likely that over time, organized retail and QSRs will attempt to shift the supply chain away from wholesale markets (where more independent smaller-scale farmers market their products) to large-scale integrators (i.e., Dragon Head Companies). The process has already been underway for quite some time.

III. IMPORTS AND EXPORTS

China is a net importer of poultry meat in terms of volume⁸⁵ and a major importer of poultry by products, such as wings and feet and internal organs which are considered offal in the rest of the world.^{86,87} In fact, 61 percent of total poultry imports in 2010 were chicken feet (0.5 mmt out of a total of 0.82 mmt).⁸⁸ However, China's poultry imports have been very volatile in the last 15 years because of frequent trade disputes (Figure 13 and Box 3 and 4).

Three-fourths of China's poultry imports in 2011 were from Brazil, from 24,000 tons in 2009 to a massive increase of 196,000 tons in 2011.⁸⁹ More Brazilian processors are receiving certification to export to China contingent on food safety standards.⁹⁰ Brazilian companies are competing with U.S. companies for top export spot for various poultry parts. Imports of chicken feet from Brazil have declined, while those from the U.S. have dramatically

increased since April 2011.⁹¹ Brazil is China's biggest wing exporter.⁹² Imports of byproducts overall increased in 2012, despite declining imports of other chicken parts.⁹³

Despite a declining overall trend in imports in recent years, Rabobank (2013) believes that China's poultry imports will increase because of China's complementary market for offal compared to the rest of the world. Chinese companies are also expected to invest more overseas in Brazil, Argentina and the U.S. to secure poultry supply for the Chinese market.⁹⁴

In 2010, China imported 0.82 mmt (direct imports plus re-exports from Hong Kong, including chicken feet) of poultry meat, accounting for 6 percent of China's total consumption; and exported 0.35 mmt, accounting for 3

percent of China's total production.⁹⁵ Because China's exports are of higher value than its imports, China is a net exporter in terms of value.⁹⁶ OECD-FAO (2013) predicts that China's poultry imports will increase from 0.49 mmt in 2013 to 0.56 mmt in 2022, while its poultry exports will decrease from 0.58 mmt in 2013 to 0.53 mmt in 2022. In the shorter run, Morgan Stanley (2011) projects that China's broiler imports (excluding chicken feet) will gradually decline from 0.29 mmt in 2010 to 0.2 mmt in 2015.⁹⁷ China's broiler exports (excluding chicken feet) declined from 0.46 mmt in 2000 to 0.38 mmt in 2010,⁹⁸ but are expected to return to 2000 levels by 2014–2015.⁹⁹

Box 3. China's anti-dumping duties on U.S. poultry imports and Brazil's take over

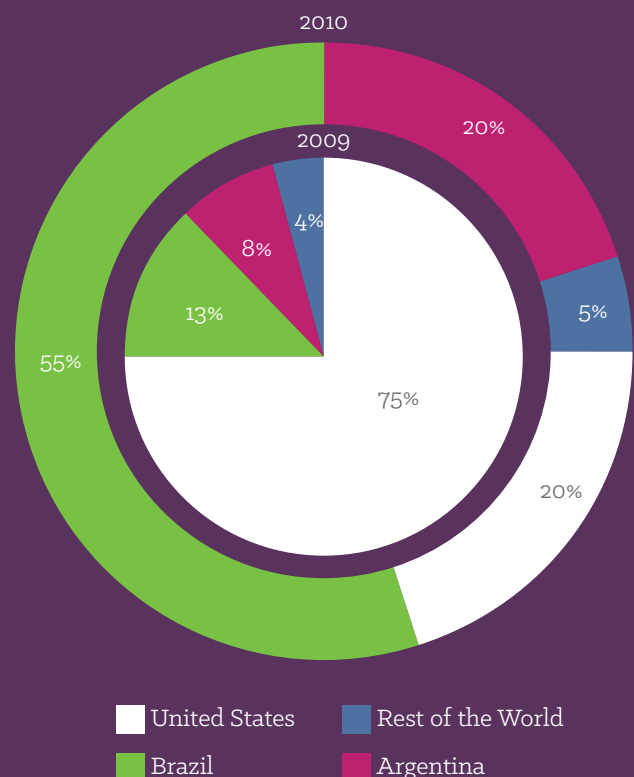
Prior to 2010, the U.S. was the largest poultry exporter to China.¹⁰⁰ In 2009, the U.S. contributed to 75 percent of China's total broiler meat imports (Figure 12). China imposed anti-dumping duties on U.S. imports in February 2010, and countervailing duties in October 2010.¹⁰¹ China alleged that U.S. poultry producers were benefiting from subsidies and exporting to China at unfair prices.¹⁰² As a result, U.S. imports decreased dramatically while Brazil's rose to become the largest (Figure 12). Brazil was responsible for 55 percent of China's total imports in 2010, while the U.S. share declined to 20 percent. Argentina's share also increased from 8 percent in 2009 to 20 percent in 2010. By 2011, 74 percent of total imports were from Brazil. It is important to note, however, that China's total poultry imports decreased significantly from 2009 to 2010 (Figure 13) in spite of the shift to imports from South America.

In 2011, the U.S. appealed to the WTO on China's anti-dumping duties.¹⁰³ On Aug 3, 2013, the WTO ruled that Beijing's anti-dumping duties on U.S. broiler imports are unjustified and violate WTO rules.^{104,105} Chinese officials have decided not to appeal the ruling and therefore, China is obligated to remove the duties.¹⁰⁶ It remains to be seen if the ruling will help the U.S. restore the U.S. share of exports to China.^{107,108} The U.S. poultry industry of course welcomed the WTO ruling.¹⁰⁹

China's imposition of duties on U.S. chicken must be seen in the context of broader trade conflict between the two countries. China announced its investigation of U.S. dumping of poultry products a week after the U.S. decided to slap duties on tires from China.¹¹⁰ The duties on Chinese tires were also viewed as a political move due to pressures on newly elected President Obama to deliver on his promise to labor unions to protect manufacturing jobs at home in the wake of the economic crisis.¹¹¹ The U.S. National Chicken Council (whose member companies account for 95 percent of the chicken sold in the U.S.) believed that

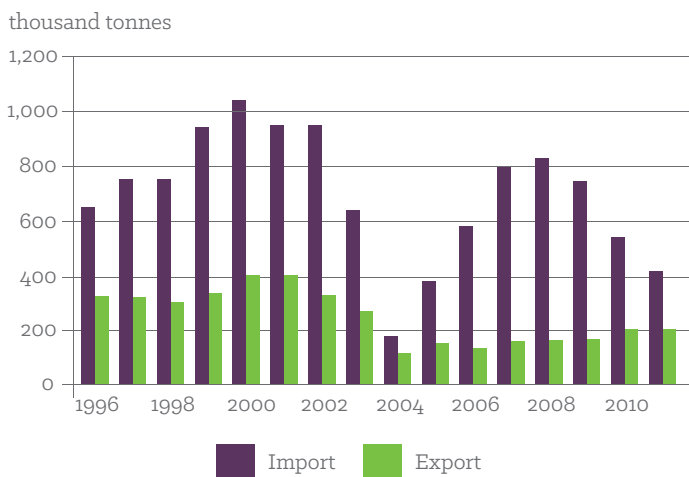
in addition to the tire dispute, chicken was also specifically targeted because of U.S. Congress's appropriations provisions that prohibited the United States Department of Agriculture (USDA) from assessing whether China's cooked poultry products could be imported into the U.S. (see next Box 4).^{112,113}

Figure 12: China direct broiler meat imports by country for 2009 and 2010 (by volume)



Source: USDA FAS, China - People's Republic of, Poultry and Products Annual 2011, (Washington: USDA FAS, 2011), 10.

Figure 13: Poultry import and export, 1996–2011.

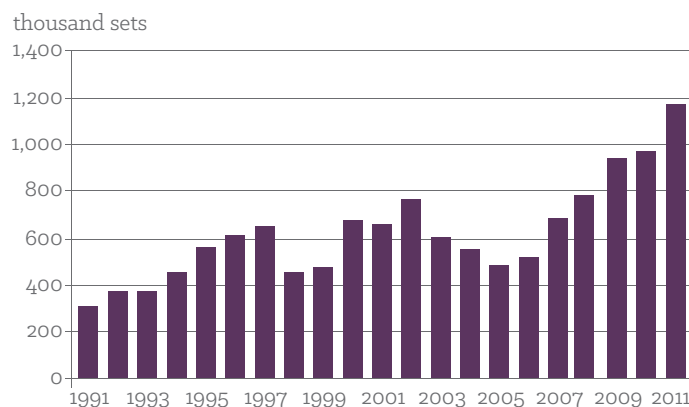


Source: Chenjun Pan, *Can China's Poultry Move Out of Pork's Shadow? Still on the Road to Industrialization*, (Utrecht: Rabobank, 2013), 1.

Imports of grandparent breeders

In addition to chicken meat, China's imports of "Grandparent" breeders (grandparents of broilers: it takes four generations to breed) are also increasing rapidly, which indicates the scaling up of industrialized production of white-feathered birds. This is because white-feathered Grandparents breeds are genetically produced for factory farm production. In 2011, imports of Grandparent breeders exceeded one million sets (Figure 14).

Figure 14: Import of grandparent breeders, 1991–2011



Source: Chenjun Pan, *Can China's Poultry Move Out of Pork's Shadow? Still on the Road to Industrialization*, (Utrecht: Rabobank, 2013), 8.

Chinese exports

China's exports, on the other hand, are mainly fresh or frozen whole chickens, mainly to Japan and Hong Kong (See Figure 15 for China's broiler export markets).¹³⁹ China is also a major world exporter of labor-intensive poultry products, including skewered products, ready-made meals and deboned meat.¹⁴⁰ However, China's export competitiveness is declining because of rising labor and input costs as well as the appreciation of the yuan.¹⁴¹

Figure 15: China broiler meat exports, 2009–2011 (Year-to-date; metric tons)

DESTINATION	JAN–DEC		JAN–JUL		JAN–JUL
	QUANTITY		QUANTITY COMPARISON		% CHANGE
	2009	2010	2010	2011	2011/10
World	291,272	378,716	203,796	239,388	17.46%
Japan	134,377	180,558	98,452	121,746	23.66%
Hong Kong	113,279	136,981	72,760	74,588	2.51%
Malaysia	17,041	23,553	13,002	17,677	35.96%
Bahrain	4,137	5,639	3,091	3,363	8.80%
Iraq	1,403	2,152	1,635	3,585	119.27%
Kyrgyzstan	4,459	3,958	1,835	3,246	76.89%
Netherlands	2,447	1,999	869	2,560	194.59%
United Kingdom	1,295	4,483	1,522	2,386	56.77%
Korea South	3,570	4,126	2,341	2,308	-1.41%
Macau	3,095	2,863	1,629	1,610	-1.17%
United Arab Emirates	995	2,875	1,848	627	-66.07%
Armenia	421	1,300	403	605	50.12%
Afghanistan	602	2,433	1,183	520	520.0%
Other	4,151	5,796	3,226	4,567	

Source: USDA FAS, China - People's Republic of, Poultry and Products Annual 2011, (Washington: USDA FAS, 2011), 12.

Box 4. The history of the U.S. ban on China's poultry

On August 29, 2013, the U.S. officially approved processed poultry imports from China—certifying that China had an equivalent poultry processing inspection regime as the U.S. and effectively removing a ban that has been in place since 2004.¹¹⁴ China can now export cooked processed poultry that is slaughtered in the U.S. or in a country certified to have a U.S.-equivalent inspection regime (for instance, Australia, Canada, Chile, France, Great Britain, Mexico and New Zealand).¹¹⁵ In order to export, Chinese firms will have to certify that the birds they cook and process have come from USDA approved countries with USDA inspections only taking place once the processed meat enters U.S. borders.^{116,117} No USDA inspectors will be present in Chinese plants, but USDA will periodically review both China's poultry processing inspection system and certified poultry exporters.^{118,119} Because the meat will be processed, the U.S. will not require Country of Origin Labeling for individual products once the imports enter the country—consumers will therefore not know where their chicken was processed.

Food safety advocates and Congressional representatives have spoken out against the removal of the ban given China's ongoing food safety problems.^{120,121} Senators Charles Schumer and Sherrod Brown and Representative Rosa Delauro have sought assurances from USDA that food imports from China will be safe.¹²² The quality of on-site audits done by the U.S. in China is being questioned as well.¹²³ Economists such as Chris Hurt at Purdue University acknowledge that the ban removal will help the U.S. poultry industry utilize lower labor costs in China.¹²⁴ Given the ongoing challenges to enforce stronger environmental and labor standards on the U.S. poultry industry, American companies will have the potential to export externalities of the business—like environmental damage and poor treatment of workers—to China.

There is concern that this removal is just a first step towards opening the floodgates to cheap Chinese poultry products.¹²⁵ China will, however, have to get USDA approval of its slaughtering inspection system in order to export raw poultry products to the U.S..¹²⁶ This continues to be a long-standing conflict between the two countries.

The history of the ban must be understood in the context of powerful meat industry interests (and trade wars) between the two countries as well as the politics around food safety issues. China had banned U.S. beef imports in 2003 due to a U.S. case of mad cow disease;¹²⁷ whereas, the H5N1 avian flu outbreak in 2004 (see box on avian flu below) led both countries to impose import bans of poultry on each other in February 2004.^{128,129} Both countries agreed to lift the ban a few months later at the Sino-U.S. Joint Commission on Commerce and Trade;¹³⁰ however, while China removed its ban on U.S. imports in November 2004,^{131,132} the U.S. refused to do so because of food safety concerns regarding China's slaughtering facilities. In 2006, USDA's Food Safety and Inspection Service (FSIS) "determined that China's system for processed poultry was equivalent to that of the U.S. system, but denied China's eligibility to export slaughtered poultry."¹³³ However, China was interested in exporting its own birds, rather than processing birds from the United States.

In December 2007, the U.S. Congress intervened and prohibited the USDA from spending any money to implement or propose any regulations that would permit China to export processed poultry products to the U.S.. China did not challenge this provision then, but when the prohibition continued in 2009 (in section 727 of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act (AAA)),¹³⁴ China filed a complaint with the WTO which ruled in favor of China in Sept 2010.¹³⁵

Until the U.S. approves China's slaughtering system as U.S.-equivalent, Chinese birds will be prevented from being processed and exported to the U.S.. However, in 2009, the U.S. meat industry lobby had already started advocating against the extension of Section 727 for 2010.¹³⁶ It did so, in large part, in the hope that China would then remove its ban on U.S. beef (beef consumption is rapidly rising in China).¹³⁷

After the decision in August 2013, Tom Super, spokesman for the National Chicken Council suggested that the U.S. poultry industry is not looking for more imports but hoping that lifting the ban will create a more favorable environment for U.S. chicken and other agriculture exports to China.¹³⁸

IV. SHIFTING PRODUCTION PATTERNS AND THE SUPPLY CHAIN

Government policy in the mid-1980s catalyzed the adoption of capital-intensive technologies and opened up the poultry sector to foreign investment.¹⁴² Thailand's CP Group was one of the first to introduce contract farming and made use of capital-intensive technologies in the poultry sector in China. Many Chinese companies, such as Wens, quickly imitated CP Group's model.¹⁴³ Similar to the dairy and pork industry, intense competition and cost

pressure amongst thousands of companies has shaped the poultry supply chain and put immense pressure on cutting production costs. This is one of the key factors contributing to food safety issues in China (see more below), but the discourse has largely focused on the production end thus far rather than the top of the value chain.

Industrialization accelerated in the late 90s because of immense cost pressure from rising feed and energy prices, labor shortage, oversupply of poultry products (i.e., actual output is much higher than demand, driving price below cost of production).¹⁴⁴ Rapid urbanization and growth of village enterprises lured rural people to better-paid

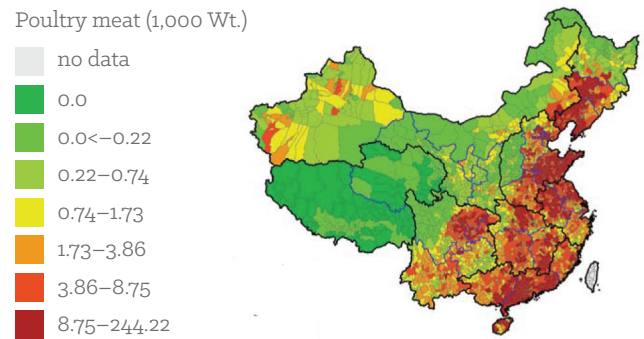
off-farm employment both in villages and in cities, causing rural labor shortages.¹⁴⁵ Scarcity of agricultural land provided further incentives for the poultry industry to adopt capital-intensive technologies and scale up their production. At the same time, economies of scale of larger-scale farms further drove down the price for poultry products and forced smaller-scale farmers either to scale-up themselves or get out of business. Small-scale backyard poultry farming became economically unappealing.¹⁴⁶ The data below reflects these dramatic changes.

The Chinese government's policy of industrializing the whole agricultural sector played an important role in catalyzing this process through incentives for Dragon Head Enterprises (DHEs) (for more analysis on the role of DHEs in shaping the livestock sector and contract farming, see IATP's *China's Pork Miracle? Agribusiness and Development in China's Pork Industry*). A Dragon Head company is an agricultural company designated by local, provincial or central governments based on criteria of production scale, management and level of technology.¹⁴⁷ They are regarded as the driving force for China's national plan of agricultural industrialization. Dragon Head companies agree to integrate the value chain by providing farmers with inputs, credit, market access and technology.¹⁴⁸ Government investment in transportation infrastructure¹⁴⁹ and the consequent rapid expansion of railways and highways also reduced the economic cost of transporting large volumes of feed grain and poultry products via rail and roads.¹⁵⁰

Production patterns

Geographically, poultry production in China is concentrated in central and eastern regions (Figure 16). More than 60 percent of China's poultry production and majority of exports are produced in China's eastern region while the western region produces only about 10 percent of the country's total production and the central region 30 percent.¹⁵¹ Higher density of poultry production is correlated to higher population density and income per capita. Central China has labor cost advantages over the eastern region.¹⁵² Yet because the largest demand is in the wealthier coastal region and China's underdeveloped cold chain limits transport, most production is still done in the coastal region.

Figure 16: Poultry-meat output 2010



Source: Jikun Huang, Xiaobing Wang and Huangguang Qiu, *Small-scale farmers in China in the face of modernisation and globalisation*, (Beijing: Chinese Academy of Science, 2012), 15.

Industrialization

By 2012, the poultry industry was the most industrialized protein segment in the country.¹⁵³ Foreign-introduced white-feathered chickens are quickly replacing domestic yellow-feathered breeds.¹⁵⁴ White-feathered breeds are used for industrial production because of their much shorter growing periods—putting on more weight more quickly.¹⁵⁵ In 2011, about 59 percent of China's broilers were white-feathered chickens.¹⁵⁶ The remaining 41 percent of China's broilers were yellow-feathered domestic breeds, which have lower weight and longer growing periods.¹⁵⁷

Because white-feathered birds are much cheaper and easier to process, they dominate the market in the north and are used widely throughout the country in cafeterias and factories and in QSRs.¹⁵⁸ In the south, however, there is a strong taste preference for yellow-feathered birds, which are traditionally stewed or cooked in soup.¹⁵⁹ Because white-feathered chickens are cheaper, demand for yellow-feathered birds is expected to gradually decline, eventually becoming a niche market.¹⁶⁰ All of China's white-feathered Grandparent breeders are imported.¹⁶¹ However, it is worth noting that many yellow-feathered chickens are also raised on intensive farms, like those contracted with Wens Food Group, a private Chinese company that is the largest producer of broilers in China.¹⁶²

Consolidation and scaling-up

China's poultry sector has dramatically and rapidly consolidated towards fewer and larger privately owned operations. By 2006 there were no state-owned poultry companies in China.¹⁶³ Up until the mid-1980s, poultry production was a minor sideline activity for rural households to supplement other farming activities.¹⁶⁴ Millions of small farmers produced a few to, at most, several dozen chickens.¹⁶⁵ With the exception of a few state farms operating outside big cities, there were no large-scale commercial poultry farms.¹⁶⁶ Between 1985 and 2005, 70 million small poultry farmers left the sector.¹⁶⁷ Within a period of fifteen years (1996–2011), the total number of broiler farms in China decreased by 75 percent (Figure 17).

Figures 17, 18 and 19 demonstrate these changes. The percentage of “small-sized” broiler farms (classified by the Ministry of Agriculture (MoA) as producing less than 2,000 birds annually)¹⁶⁸ decreased markedly from 62 percent of total poultry farms in 1998 to 30 percent in 2009 (Figure 19). In 2007–2009 alone, they declined by 2 million, though they continued to be the majority of all poultry farms (Figure 178). In the same two years, the number of broiler farms producing more than 1 million birds annually rose by nearly 60 percent (Figure 18).

By 2009, intensive broiler farms (defined by MOA as producing 2,000 birds or more annually) were responsible for nearly 70 percent of China's broiler supply—although they only accounted for two percent of the total number of farms (Figure 18 and 19). In spite of these dramatic figures, the degree of horizontal consolidation in China is still relatively lower compared to that of the U.S. (Figure 20). In the U.S., the majority of poultry production takes place at farms with an annual output of more than 100,000 birds whereas in China the bulk of production is done by farms that produce less than a 100,000 birds a year.

Figure 17: Changes in number of broiler farms in selected provinces of China

REGION	TOTAL NUMBER OF FARMS 2011	TOTAL NUMBER OF FARMS 1996	2011 FIGURE AS PROPORTION OF 1996 (%)
China	25,599,741	104,068,000	24.60%
Hebei	85,671	2,893,000	2.96%
Shanxi	29,409	1,153,000	2.55%
Jiangsu	490,149	6,272,000	7.81%
Shandong	254,951	6,596,000	3.87%
Henan	349,249	8,371,000	4.17%
Hainan	1,202,383	666,000	180.54%
Xinjiang	576,323	397,000	145.17%

Source: 国家统计局, 中国畜牧业统计年鉴2011 (北京: 中国农业出版社, 2012); 国家统计局, 中国畜牧业统计年鉴1996 (北京: 中国农业出版社, 1997)。

Figure 18: Number of Chinese broiler farms at different flock sizes, 2007–2009

	2007	2008	2009	% CHANGE 2009/08
ANNUAL SLAUGHTER (BIRD)	FARMS	FARMS	FARMS	FARMS
1–1,999	28,613,036	27,127,006	26,609,204	-1.91%
2,000–9,999	388,233	358,688	348,327	-2.89%
10,000–49,000	131,087	136,833	155,017	13.29%
50,000–99,999	10,204	12,405	14,802	19.32%
100,000–499,999	2,161	2,623	3,531	34.62%
500,000–999,999	192	344	369	7.27%
1,000,000 and above	128	147	202	37.41%

Source: USDA FAS, China – *People's Republic of, Poultry and Products Annual 2011* (Washington: USDA FAS, 2011), 3.

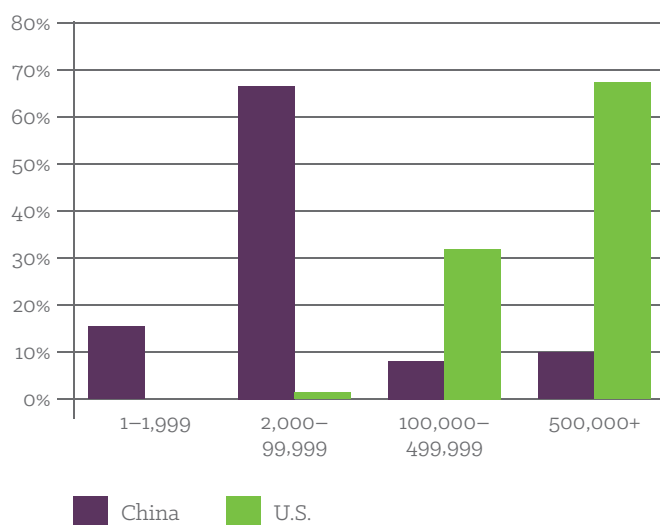
Horizontal consolidation took place in almost all the provinces from 1996 to 2011 with the exception of Hainan and Xinjiang (Figure 17). The speed of consolidation varied significantly by province during this period. The most rapid consolidation took place in Hebei, Jiangsu, Shanxi, Shandong and Henan (North-Central, North-East China).

Figure 19: Changes in aggregate annual output of broiler farms by farm size in China.

AGGREGATE ANNUAL OUTPUT (NUMBER OF BIRDS) OF BROILER FARMS BY FARM SIZE (MEASURED BY NUMBER OF BIRDS SOLD EACH YEAR)	1998 (IN MILLIONS)	1998 PERCENTAGE OF TOTAL OUTPUT IN CHINA	2000 (IN MILLIONS)	2000 PERCENTAGE OF TOTAL OUTPUT IN CHINA	2005 (IN MILLIONS)	2005 PERCENTAGE OF TOTAL OUTPUT IN CHINA	2009 (IN MILLIONS)	2009 PERCENTAGE OF TOTAL OUTPUT IN CHINA
1-1,999	4,238.50	61.93%	5260.1	64.95%	4929.1	52.27%	3195.5	30.12%
2,000-9,999	1,413.70	20.66%	1482.7	18.31%	1751.1	18.57%	1792.1	16.89%
10,000-49,999	671.5	9.81%	817.6	10.10%	1687.3	17.89%	3095	29.17%
50,000-99,999	174.8	2.55%	208.1	2.57%	386.3	4.10%	953.4	8.99%
100,000-499,999	132.1	1.93%	139.3	1.72%	322.5	3.42%	679.8	6.41%
500,000-999,999	80.5	1.18%	63.7	0.79%	119.1	1.26%	235.1	2.22%
1 million or more	132.7	1.94%	127.1	1.57%	235.5	2.50%	658.6	6.21%
Total production from intensive farms (with an annual output larger than 2,000 birds)	2,605.30	38.07%	2838.5	35.05%	4501.8	47.73%	7414	69.88%
Total	6843.8	100.00%	8098.6	100.00%	9430.9	100.00%	10609.5	100.00%

Source: 刘春芳, 王济民, “中国肉鸡产业发展历程及趋势,” 农业生产展望8 (2011): 38.

Figure 20: Share of poultry production farms with different scales in total poultry output in China and the U.S.



Source: 陈振志, 全球肉鸡产业经营模式之演进与比较(上海: 东方证券, 2013), 18.

Many small- and medium-sized specialized farms are also raising animals in crowded conditions and using antibiotics and other drugs that are standard features of intensive livestock operations.¹⁶⁹ According to an expert working in the livestock additive industry in China, there are no real cage-free chicken products in the main market today.¹⁷⁰ However, IATP was able to visit a few community-supported agriculture (CSA) farms outside of Beijing that were raising free-range, organically fed chickens to supply to Beijing’s increasingly popular weekly organic market and their expanding CSA base.

Vertical integration: Contract farming and the grow-out model

The poultry industry of China is also heavily vertically integrated. Traditionally, poultry was raised by independent farmers and sold to local slaughterhouses that marketed the products through small traders at wet markets.¹⁷² Over the past 30 years, however, this value-chain model has given way to a much more integrated model of contract farming with the critical growth of Dragon Head companies (DHEs).¹⁷³

Under contract farming, a Dragon Head company contracts production with farmers and provides them with standardized chicks, feeds and medicine at a price.¹⁷⁴ Farmers raise them and sell grown chickens back to the company at the contract price.¹⁷⁵ The Dragon Head company then slaughters the chickens, processes the meat and sells it to retailers, restaurants and institutional buyers (hotels and cafeterias in schools and factories).¹⁷⁶ Some Dragon Head companies directly sign contracts with farmers while others sign with a cooperative that represents farmers.¹⁷⁷ These farmers are usually located in the same village and form a production “base” (基地) and hence these models are often termed as the “company + base” model or “company + base + farmer” model. The prices of chicks, feeds and medicine could be higher or lower than market prices.¹⁷⁸

Box 5: Difficulties of promoting cage-free and organic chicken in China

IATP interviewed an expert associated with the additive industry working in the livestock supply chain. He described the various challenges in promoting real organic and/or cage-free chicken in China today:¹⁷¹

With large numbers of chickens in a concentrated space (even if cage-free), the soil is polluted within five years and no longer suitable for chicken rearing. There are some cage-free chicken farms but they cannot be scaled up because of limited land. Theft is a problem and bad weather can hurt farmers without good chicken houses.

“Organic” eggs sold in China are from special breeds that produce smaller-sized eggs than conventional layer hens. Many of these breeds are also raised on intensive farms and are falsely labelled as “organic,” creating a problem for real organic producers.

Some chicken producers add pigments to feed to make yolk look more yellowish so consumers think they are organic and pay a higher price. Others purchase chickens from factory farms and market them as organic for urban tourists who come to the countryside to enjoy organic meat. Spent hens (layer hens who are no longer productive after intensive production) are also marketed by restaurants and meat producers at a premium as organic chicken because the texture of spent hens is similar to that of organic chickens.

Because consumers have a difficulty differentiating real from fake organic eggs, real cage-free chicken farmers find it difficult to compete since their costs are much higher than fake cage-free chicken producers. The lack of organic farming standards, credible accreditation systems and limited purchasing power also prevent the growth of organic chicken farming in China.

Increasingly, Dragon Head companies prefer to contract with fewer larger scale farms, instead of numerous small producers—this has further encouraged scaling up.^{179,180}

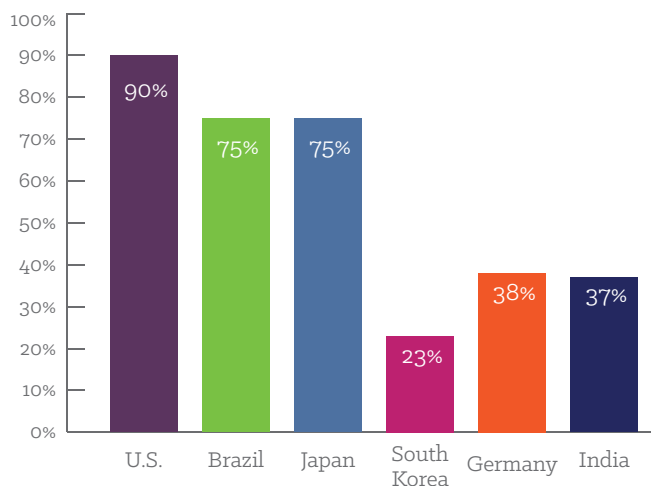
Another emerging value chain model is the “grow-out” model, in which a Dragon Head company owns and manages the whole process from feed production, breeding, hatching, fattening to slaughtering and processing.¹⁸¹ Under a grow-out model, “farmers” do not own any of the production facilities. They are wage employees hired by poultry companies.¹⁸² This “grow-out” model is even more integrated than contract farming and an extension of the systems adopted in the U.S. and Japan. For instance, in these countries, companies who start vertically integrating the value chain are originally in the businesses of feed production, hatching, broiler raising, slaughtering or meat processing.¹⁸³ Changjiang Securities

(2013), Orient Securities (2013) and Rabobank (2013) think that a large increase in the number of “grow-out” companies is unlikely.^{184,185,186} According to them, establishing and managing a fully vertically integrated model requires substantial management expertise, financial capital and ability to acquire land. These conditions create barriers for companies to fully integrate and therefore the investment banks do not think full vertical integration will be the dominant value chain model in China’s poultry sector in the near future.

Nonetheless, after the KFC “instant chicken” scandal (see Box 8), food safety concerns are also pushing for more and more control over the value chain, thereby concentrating power in the hands of the large value chain integrators.¹⁸⁷ After the scandal, KFC terminated contracts with all of its smaller suppliers, giving preferences to suppliers who use a “grow-out” model (see Box 8).¹⁸⁸ KFC’s three largest chicken suppliers are three large integrators: Dachan Food, Fujian Shengnong and Shandong Xinchang.¹⁸⁹ They are responsible for more than 50 percent of all KFC’s chicken supplies.¹⁹⁰ Dachan Food produced 200 million birds and Fujian Shengnong produced 120 million in 2012 (WATTAgNet).¹⁹¹ According to an expert at China Agriculture University, since the KFC scandal, “the contract farming model has collapsed” in China and the “grow-out” model will dominate large-scale poultry production.¹⁹² He estimated that medium-sized professional producers will gradually exit the market.¹⁹³ The poultry sector will be characterized by very large-sized, fully vertically integrated companies and small ecological niche farmers, according to this expert. Driven by QSRs and large organized retail on top of the value chain, the whole poultry sector will further evolve towards the industrial farming model.

Globally, countries have different value chain models that dominate. Contract farming dominates in the U.S., Brazil, Japan (Figure 21), as well as in France, Germany, Italy and Spain.¹⁹⁴ In Poland, Belgium and The Netherlands the poultry sector is characterized by more independent feed producers, hatchers, broiler growers, slaughters and processors. In South Korea, grow-out companies dominate.¹⁹⁵ In Thailand, contract farming is the most popular model; but since the avian flu in 2004, many companies have switched to the grow-out model.¹⁹⁶

Figure 21: Percentage of contract farming in the poultry sector of selected countries in terms of output



Source: 陈振志，全球肉鸡产业经营模式之演进与比较(上海：东方证券，2013)，12。

Government support and policies regarding the Poultry Sector

The Chinese government has been critical in developing China's livestock industry (an in-depth discussion of this is covered in *China's Pork Miracle? Agribusiness and Development in China's Pork Industry* in this series) and poultry is no exception. In 2006, the Chinese government budgeted 70 million yuan to construct poultry facilities and one million yuan for breeder-chicken facilities.¹⁹⁷ The subsidies and new standards favored larger poultry farms (with a stock of 10,000 chickens or more) with the goal of increasing production efficiency and yields.¹⁹⁸ Such transfer payments have incentivized poultry farms to consolidate, intensify and scale-up.

In the wake of the severe 2013 avian flu outbreak, the Chinese government gave out subsidies of 600 million yuan (\$96.77 million) to support the poultry sector. It is estimated that the industry suffered a loss of over 40 billion yuan (\$6.5 billion) from the influenza outbreak.¹⁹⁹ Major poultry-processing companies also received short-term subsidized loans from state-owned banks.²⁰⁰ Provincial governments provided their own set of supports. In Anhui Province, for example, the government decided to subsidize grandparent poultry-breeding farms with 30 yuan per unit and parent generation poultry-breeding farms with 10 yuan per unit from April to July 2013.²⁰¹ The Anhui government also reduced by half the interests on loans incurred by Dragon Head poultry companies, postponed loan repayments and

reduced or exempted income tax, VAT, quarantine fee, waste-discharge fee and pollution-treatment fees owed by poultry companies.²⁰² The provincial government also subsidized poultry meatpacking factories by 50 yuan per mt of poultry products procured and stored from April to May.²⁰³ Direct subsidies and tax exemptions for large farms were offered by Zhejiang and Jiangsu Provincial authorities as well.²⁰⁴ For instance, the Zhejiang Provincial government provided a subsidy of 1 yuan per bird to medium and large broiler and duck meat farms.²⁰⁵

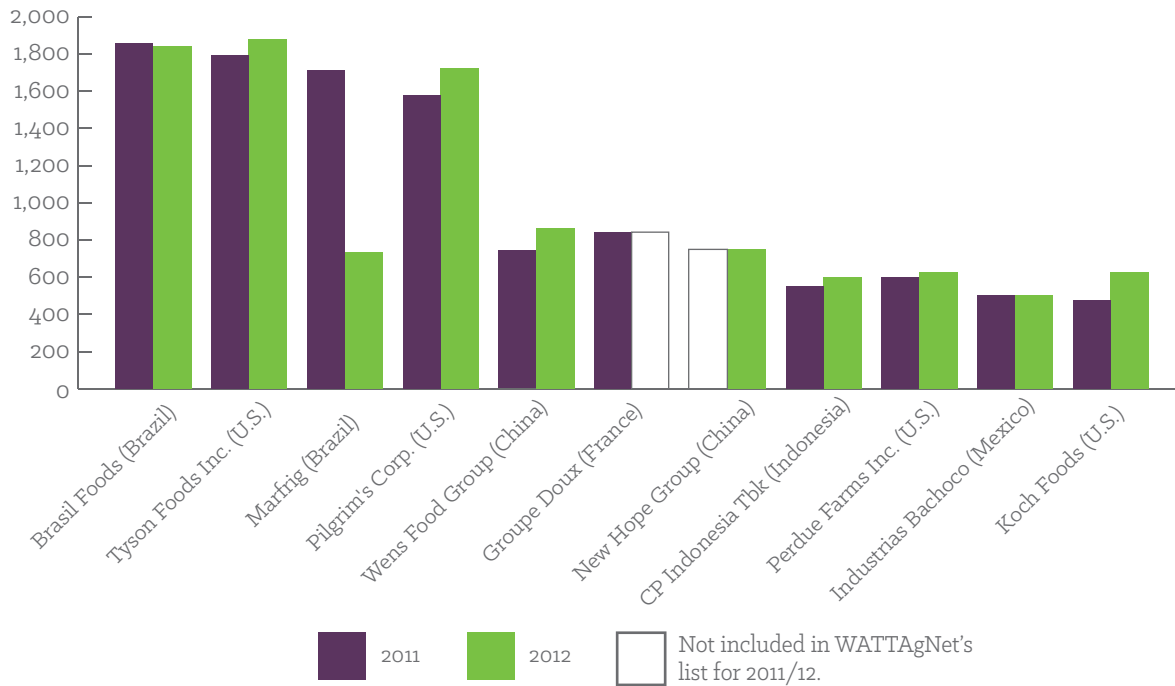
Rabobank (2011) projects that the Chinese government will support the growth of the poultry sector because the better feed-conversion ratio of poultry (compared to pork and beef) will help the country better maintain its goal for self-sufficiency in grains (maize in particular)—an agricultural policy priority of China (see IATP's *The Need for Feed: China's Demand for Industrialized Meat and Its Impact* in this series).²⁰⁶

Food safety and government policy

Food-safety scandals and the need to reduce impacts of epidemics in the livestock industry is motivating the Chinese government to further support industrialized poultry production (and of all livestock production). Policy incentives for horizontal and vertical integration, large-scale commercialized poultry farms and standardized procedures for feed, vaccines and rearing, slaughtering and processing of animals, are in part a response to food safety.²⁰⁷ This, in turn, is leading to much larger concentrations of white-feathered birds (with much weaker genetic capacity to be able to deal with disease) in confined spaces.

And as noted above, the government is making a concerted effort to phase out wet markets. In 2006, the State Council issued an opinion paper that demands better local regulation of live poultry markets, or wet markets.²⁰⁸ In addition to more stringent regulation of existing live poultry markets and new entry requirements, the paper required that live poultry markets move out of populated areas in large and medium-sized cities.²⁰⁹ It also recommended that local governments gradually close live poultry markets in large cities. The government's tax structures are also making it more difficult for wet markets to operate.²¹⁰ The intention of all these recommendations is to address food safety by reducing human contact with live birds and therefore decreasing the risk of infection by avian influenza. The International Trade Commission (2011) notes

Figure 22: Production volumes of world's largest poultry-meat companies, 2011 and 2012



Source:

Poultry International, "2012 World's Top Poultry Companies," WATTA's AgNet.com, October, 2012, <http://www.poultryinternational-digital.com/poultryinternational/201210#pg1> (accessed October 20, 2013).

Poultry International, WATT Research. "Top 50 poultry producers worldwide," WATTA's AgNet.com, <http://www.wattagnet.com/Marketdata/topcompanies/globalpoultry/?id=154296> (accessed October 20, 2013).

that the implementation of such national policies is very much dependent on implementation by local governments, which varies significantly.²¹¹

Foreign direct investment (FDI)

The Chinese government does not have restrictions on FDI with two exceptions: breeding and cultivation of China's rare and unique species; development or production of transgenic poultry breeds. The government encourages FDI in poultry product processing, with tax benefits and devolution of approval from the central government to provincial governments if the total investment is less than \$300 million USD.²¹² Industries in the "encouraged" category do not face difficult approval requirements and restrictions on foreign shareholding as those listed under "restricted."²¹³

V. FOREIGN PLAYERS IN THE POULTRY SUPPLY CHAIN

Both industrial broiler and chicken egg production in China are dependent on foreign breeding companies that are global oligopolies. Four companies control the global production of great grandparent generations of the industrial white-feathered broiler breed.²¹⁴ Commercial broiler breeders purchase grandparent generation chickens for every new batch of production.²¹⁵ In China, these birds are mostly imported from the U.S. company, Cobb Vantress Inc., which is owned by Tyson Foods Inc.²¹⁶ The Beijing Poultry Breeding Company (BPBC) is an exclusive distributor of Cobb Vantress's grandparent broilers, supplying 80 percent of Chinese poultry farms.²¹⁷ Industrial layer hen breeds are controlled by Erich Wesjohann (EW) Group (Germany) and Hendrix Genetics (The Netherlands).²¹⁸

Box 6: Major global players in China's poultry sector

Tyson

Tyson started its poultry business in China in 2001. Rather than relying on contract farming like it does worldwide, Tyson is spending millions of dollars investing in building its own farms in China, including the construction of roads, bridges and electrical lines with the payoff expected by 2015 when the company is expected to earn \$1.1 billion from its China operations alone.²²¹ (Its global revenues were \$34 billion in 2013.) Tyson plans to increase its international annual sales by 12 percent—China is a key component of that plan.²²² With 20 farms today, Tyson hopes to own 90 farms by 2015, doubling production to 3 million birds a week for supermarkets and restaurants—feeding into the supply chain of domestic and other foreign firms in China such as Wal-Mart and KFC.²²³ In comparison, as the largest poultry processor in the U.S., Tyson contracts with 4,000 U.S. farmers growing around 100,000 birds each.²²⁴

The company hopes to build a “safe” brand identity to respond to growing food safety concerns of Chinese consumers. The company currently has two wholly owned businesses in China: Jiangsu Tyson Foods Co., Ltd. and Tyson Shandong, and one joint venture: Shandong Tyson Dalong Food Co., Ltd. with Shandong Zhucheng Waimao Co., Ltd in Shandong and Jiangsu Provinces.²²⁵ Tyson Foods Co. is a fully integrated poultry facility, including breeder production, hatchery, broiler and feed production.²²⁶ It has a production capacity of 50 million birds a year.²²⁷ Tyson Shandong has a production capacity of more than 100 million birds per year, with one fully integrated chicken operation (Tyson Rizhao) and one partially integrated (Tyson Weifang).²²⁸ Tyson Shandong serves QSRs and retail outlets and also exports fully-cooked products to Japan and Korea.²²⁹ The two Shandong businesses (Tyson Shandong and Tyson Dalong Food Co.) are selling fried chicken and frozen poultry products to wholesale channels and the Jiangsu plant is marketing fresh packaged chicken products to retailers in Eastern China.²³⁰ Tyson also plans to open new plants in Guangzhou, Chongqing and Beijing.²³¹

Marfrig and Chinwhiz

In 2011 Marfrig announced that it would start a joint venture in China through its meat-processing subsidiary Keystone Foods.²³² Keystone is one of the largest global food companies supplying to fast food restaurants such as McDonalds in Asia and the U.S.. The joint venture Shandong Mingji Zhonghui Food Co. 山东铭基中慧食品公司 is 60 percent held by Keystone and 40 percent by Chinwhiz 山东亚太中慧集团.²³³ The joint venture is a fully-integrated poultry operation which has a capacity of processing 200,000 birds per day and supplies 50 percent of the raw material needs of Keystone's processing unit in China.²³⁴ Keystone's major customers are restaurants in Hong Kong, China and Japan.²³⁵

According to Marfrig, Keystone's processing factory in China already served 2,600 restaurants in 2011, but the joint venture would increase meat supply to meet half of Keystone's processing needs in China.²³⁶ Marfrig's second

joint-venture is with COFCO (45 percent Keystone and 55 percent COFCO) in food logistics and distribution services in China. The \$300 million USD investment over ten years will open up six major distribution centers across China's major urban centers: Beijing, Shenzhen, Shanghai, Wuhan, Chengdu, Shenyang.²³⁷

A NOTE ABOUT JBS: In June 2013, JBS announced the acquisition of indebted Marfrig's poultry and pork unit Seara, pushing JBS to number one global poultry producer after acquiring U.S.-based Pilgrim's Pride in 2009.²³⁸ Marfrig's overseas assets, including Keystone Foods, are not included in this deal.²³⁹ Whether JBS moves into China's poultry scene next, remains to be seen.

Cargill

Cargill opened its first poultry production project in September 2013 through a joint venture, Cargill Animal Protein (Anhui) Co., Ltd. with a county government in Anhui Province.²⁴⁰ The production base is located in Chuzhou, Anhui Province and has an annual capacity of processing 65 million chickens and 176,000 tons of poultry products, which is roughly one percent of China's total poultry production.²⁴¹ This production base is a fully integrated model with 12 broiler breeder plants, 35 chicken farms, one slaughterhouse, one feed plant and two chicken processing factories.²⁴² The production base is intended to serve the cities in Eastern China, such as Nanjing, Hefei, Hangzhou and Shanghai.²⁴³ The plant will supply domestic and international QSRs, food manufacturers and potentially supermarket chains in the future.²⁴⁴

Brasil Foods (BRF) and Dah Chong Hong

On February 14, 2012, BRF created a joint venture (Rising Star Food Company Limited) with Dah Chong Hong Holdings Limited (a Hong Kong-listed food and vehicles distributor) to distribute chilled poultry, pork and beef products in China.²⁴⁵ The new joint venture (50-50 by each holding company) is aimed at establishing branded frozen and chilled food products (called Sadia), develop local meat processing, and expand its distribution network covering retail and food service channels in Hong Kong, Macau and mainland China.²⁴⁶ The joint venture will meet demand from the growth of global fast food chains in China.²⁴⁷

In mainland China, Sadia chilled products are marketed at Carrefour stores in Shanghai, Metro Cash and Carry (a German self-service wholesaler, serving hotels, restaurants, caterers and other businesses) stores in major Chinese cities, City Shop (a Shanghai-based high-end supermarket chain), Parkson (a Malaysian-owned department store chain) stores in Shanghai and Huijin (Shanghai-based department store chain).²⁴⁸ In the first year the joint venture was expected to sell more than 140,000 mt of meat products and 300,000 mt in five years.²⁴⁹ China now accounts for about 10 percent of BRF's revenue.²⁵⁰ The joint venture initiated feasibility studies for building a \$120 million USD poultry and pork processing plant in China using raw materials imported from Brazil or purchased locally.²⁵¹ The construction of the plant is scheduled to start by the end of 2013, but the production capacity and location is still not known.²⁵²

Perdue Farms and Dah Chong Hong

In 1998 Perdue Farms created a joint venture Shanghai DCH Jiangnanfeng Co., Ltd. 上海大昌江南凤有限公司 with Dah Chong Hong and Shanghai Agricultural Commission.²⁵³

The joint venture established a fully integrated poultry processing complex near Shanghai to grow yellow-feathered chickens and sell both live birds and fresh processed chickens to the Shanghai market.²⁵⁴ The products are also exported to Hong Kong and Japan.²⁵⁵ There is no information about the complex's production capacity and major distributors. In a document released by Dah Chong Hong (unknown date), however, Perdue Farms is not listed as a substantial shareholder of the joint venture.²⁵⁶ Therefore it is possible that Perdue Farms has relinquished its share in this chicken operation.

Fujian Shengnong and OSI

In 2010, Fujian Shengnong set up a joint venture Fujian Ousheng Nongmu Fazhan Co., Ltd. 福建欧圣农牧发展有限公司 with OSI Group (an Illinois-based privately held meat processing company). The joint venture will be able to produce 600 million birds per year.²⁵⁷ It is one of the three direct suppliers of McDonald's, the other two being Shandong Mingji Zhonghui Food Co. and OSI.²⁵⁸

Shineway and Nippon Ham

Shineway (Shuanghui) is establishing several wholly-integrated poultry production facilities through a joint venture with Nippon Ham, Japan.²⁵⁹ The facility has a capacity to produce 50 million broiler birds per year.²⁶⁰ Nippon Ham will provide the technology, while Shineway will be marketing the products under its own brand.²⁶¹

Goldman Sachs

Goldman Sachs purchased ten poultry farms in China in 2008 to secure the company's position in China's livestock industry.²⁶² This happened after Goldman Sachs already took a stake in the downstream meat processing and branding industries, including 13 percent stake in China Yurun Food Group and 60 percent stake in Shuanghui Investment and Development.²⁶³ The management of the ten poultry farms were outsourced to third parties.²⁶⁴

IFC—World Bank Group

The World Bank Group's International Finance Corporation (IFC) provided \$2.76m to Beijing Deqingyuan Agriculture Technology Co. Ltd to expand its egg production facilities west of Beijing in 2006. Deqingyuan is one of the largest egg producers in China today.

The EW Group claims to have 60 percent of the Chinese market share, their breeds imported by Shandong Yisheng Livestock & Poultry Breeding Co.²¹⁹

Brazilian and Chinese firms, however, are helping to rapidly change the global landscape of top poultry producers (figure 22). Between 2011 and 2012, Brasil Foods (BRF) replaced Tyson to become the world's biggest poultry meat producer. China's Wens rose from number 6 to number 4. Another Chinese conglomerate, the New Hope Group (which is a major feed Dragon Head), appeared in the top 10 list of poultry producers for the first time in 2012. New Hope was not even listed in the top 40 in 2011. On the other hand, Brazil's Marfrig's shrank production from 1.7 billion birds in 2011 to 732.2 million in 2012. French Group Doux, once the fifth largest producer in the world, disappeared from the top 10 list of 2012.

Investment from global firms, such as Tyson, Marfrig's Keystone Foods, Illinois-based OSI and Cargill, is facilitating the transition to grow-out models and mechanized processing lines, capitalizing on marketing "stronger food safety systems."²²⁰ Box 6 presents a snapshot of the global firms present in China's poultry sector.

VI. IMPACTS

Industrial and intensified poultry production, combined with similar processes of production of pork, beef and dairy, has created serious challenges related to public health (including antibiotic resistance), environmental degradation and corporate control of the food system in industrialized countries. In China, in addition to the sheer volumes of livestock being produced, it is this rapid shift towards a massively large-scale industrialized system of production characterized by intense price competition amongst livestock firms, resource intensity of scarce water and land, industrialized feed use and the top-down control of the entire value-chain that merits scrutiny. These issues related to soil, water and environmental degradation and public health concerns are highlighted in IATP's other reports in this series on Feed, Pork and Dairy and thus will not be elaborated on here.

Yet, as one of the fastest growing livestock sectors in China, the poultry industry's contribution to concerns regarding public health, environment and agriculture sustainability remain significant. This section highlights key scandals in China's poultry industry in just the last two years, demonstrating problems related to worker health and safety, food safety and disease epidemics. It also discusses the impacts

that this highly vertically integrated model has on small rural producers and their prospects for more sustainable production. One systemic and critical cross-cutting issue affecting all of the problems below is cost of production (including externalities) and the intense price competition amongst livestock firms that create serious incentives towards a “race to the bottom” given thin profit margins of the whole industry and government policy incentives to scale up. The current dominant discussion seems to focus on blaming small producers or “greedy farmers”—with the policy solution to focus on rapid consolidation of the industry rather than addressing these systemic issues in a more holistic manner.

Box 7: Worker health and safety

In June 2013, a raging fire in the Jilin Baoyuanfeng Poultry Plant killed over 120 workers.²⁶⁵ The cause was attributed to an ammonia leak that ignited into a fast-spreading fire that compounded causalities due to several locked areas in the factory, trapping workers inside.²⁶⁶ Apparently, the doors were locked to prevent workers from stealing and for ease of monitoring. Medical workers onsite also found that workers had died due to ammonia poisoning.²⁶⁷ The poultry enterprise that owned the plant had been recognized as one of the “top 100” agricultural firms in Jilin Province.²⁶⁸

The conditions that led to the fire speaks to an endemic problem of the livestock value chain with companies cutting costs in a highly price-competitive livestock industry, leading many to massively increase production in a period of a few years to remain competitive. This is also leading to massive food safety problems across the entire livestock industry. In the case of this particular firm, the company had grown in just a period of four years (founded in 2009) with an increase of nearly \$30 million USD in sales between 2010 and 2011.²⁶⁹ The company had plans to add “two automatic slaughtering and processing lines that could handle 100,000 chickens a day, or 67,000 tons annually, for distribution nationwide.”²⁷⁰

Food safety and public health

The industrialization of poultry production in China and its impact on food safety and public health is a critically needed debate. Vertical integration of the value chain is argued to improve control and management and thus contribute to the reduction of public health hazards according to public authorities and popular discourse. On the other hand, the reoccurrence of food scandals and epidemic diseases in recent years has raised important food safety concerns that point to larger systemic issues around the competitive behavior and incentive systems for firms in the industry. Box 8 and 9 illustrate these

Box 8: KFC “Instant Chicken” Scandal

According to a report on December 18, 2012 by China’s central television network (CCTV), some poultry farms in Shandong province with contracts for white-feathered broilers with the Shandong Liuhe Group and Yingtai Co. (both KFC suppliers) were found feeding their chickens with anti-viral drugs and hormones to accelerate the birds’ growth.²⁷¹ These chickens, dubbed as “instant chicken” by Chinese media, can grow to 5lbs in 40 days and are kept in confined spaces with thousands of broilers. Some operations were found to give chickens as many as 18 antibiotics to keep them alive.²⁷² In spite of the national regulations on medicine and inspection (Animal Epidemic Prevention Law, 肉鸡饲养管理准则 Broiler Feeding and Management Standards (own translation)), slaughter houses operated by Shandong Liuhe Group Co., Ltd. (owned by New Hope Group) could not prove that they had done sufficient testing and documentation. Chinese regulations require chicken producers to keep detailed records on daily use of medications, chickens’ health status, the sale date and purchases of inputs.^{273,274}

On the retail side, Yum! Brands, the company that operates KFC restaurants in China also admitted that excessive drug residues were found in some chicken supplied by Liuhe in 2010, but asserted that KFC had terminated its supply contract with the Liuhe Group^{275,276} and declared later that “it would end ties with smaller chicken suppliers that have not modernized their operations.”²⁷⁷ The scandal prompted outrage from the Chinese media and a widespread fear of eating KFC chicken, which caused a plunge in KFC’s sales. Local authorities launched an investigation on chicken farms in Shandong province. Two farms and two slaughterhouses operated by Liuhe and Wintech were found guilty and shut down.²⁷⁸

Yum! Brands, which was blamed for concealing inspection results was not fined by the government. In early 2013, after an apology for the scandal, Yum! Brands cut supplies from more than 1000 small chicken farms to “enhance quality control.”²⁷⁹ A campaign was also initiated by KFC China to support the “grow-out” production model among suppliers, attempting to regain consumers’ confidence.²⁸⁰ Sam Su, the chairman of Yum! China emphasized that “we will immediately drop any supplier that lacks the determination or the ability to manage breeding well.”²⁸¹

According to Fred Gale, a senior economist at the USDA and an expert on China’s livestock industry, the other major player in the scandal, Liuhe Group, “did not get as much publicity as...Yum.”²⁸² Following the scandal, Liuhe blamed small farmers for adding the antibiotics, instead of company contracts and practices. Liu Yonghao, the founder of New Hope Group which owns Liuhe, commented: “Some producers used too much antibiotics or medicines. These non-standard materials got into the supply chain, and the media reported on it.”²⁸³

Box 9. Avian Flu

In 1996, the first strain of avian flu, known as H5N1, was found in farmed geese in Southern China, in Guangdong Province.²⁸⁴ The first outbreak coincides with the year that Chinese poultry production started to accelerate at a CAGR of 3.9 percent (Figure 3). The flu is a highly infectious type of influenza virus that causes severe respiratory disease in birds. Since then, different strains of the virus have spread to over 60 countries. According to WHO records, the first human infection was reported in Hong Kong in 1997.²⁸⁵

China has reported cases of avian flu every year since 2003 with the exception of 2011. In April 2012, 95,000 chickens were killed in Ningxia Autonomous Region (Northwest China) and in July 2012, another 150,000 culled in Xinjiang Autonomous Region (Northwest China) to prevent the spread.²⁸⁶ The most recent large-scale outbreak of avian flu occurred in spring 2013 in major cities including Beijing and Shanghai. This was the second major outbreak in the country in seven years.²⁸⁷ According to the World Health Organization (WHO), this strain, called the H7N9, is very different from previously seen H7N9 strains.²⁸⁸ By August 2013, the virus had resulted in 44 deaths in a total of 135 reported cases of human infection.²⁸⁹

According to Xinhua News Agency, this outbreak has given the “hardest hit in a decade” to China’s poultry industry.²⁹⁰ Consumers stopped buying chicken and poultry prices declined dramatically. One poultry company in Zhejiang Province said that it lost up to 100 million Yuan in just the first two weeks of April.²⁹¹ The government responded by ordering the closure of live poultry markets and the mass

culling of poultry to curb the virus. Some local governments provided aid to the industry through purchasing agreements and subsidies.²⁹²

In July 2013, the Ministry of Finance appropriated 300 million Yuan to help the industry recover. The Ministry of Agriculture and other departments also launched assistance measures.²⁹³ Regardless of these measures, the industry suffered a massive economic setback. The National Poultry Industry Association estimates that the total losses for the sector exceeded \$92 billion USD by the end of June.²⁹⁴ According to the latest financial report released in October, Yum! Brands’ profits plunged 68 percent in the third quarter of fiscal year 2013, which was mainly caused by the poor performance of the company’s China units.²⁹⁵ The net profit of New Hope Liuhe also dropped 15 percent in the first six months of 2013 and the CEO, Liu Yonghao, described the outbreak as a “natural disaster.”²⁹⁶

A recently published study in *Nature* suggests that wet markets in China are a major source of human infections of avian influenza because “domestic ducks seem to act as key intermediate hosts by acquiring and maintaining diverse influenza viruses from migratory birds” which then pass on the virus to chickens via live markets. However, without systematically examining the production model and the problems with its entire supply chain: the speed and scale with which duck and chicken production has industrialized, the genetic weakness of white-feathered chickens combined with concentrated breeding and rearing of a large number of birds and extreme price competition amongst firms and pressures to cut costs—a narrow focus on wet markets will be inadequate to solve the problem.²⁹⁷

challenges as the 2012 KFC “Instant Chicken” scandal and the 2013 outbreak of avian flu dealt a heavy blow to profits in the poultry industry and brought public attention to its health impacts.

Ellis and Turner (2007) note, “policy makers and industry leaders in China are often attracted by the idea that large concentrated animal feeding operations guarantee better monitoring and information.” A modernized “western-style” farm is associated with development. However, evidence since 2003 has shown a different picture. According to Shane (2003), Brighter Green (2008) and Li (2009), although intensive farming in China has increased production, it has also encouraged excessive use of antibiotics and accelerated the spread of diseases.^{298,299,300} In 2008, FAO warned about the impacts of factory farming for epidemics such as avian flu: “Excessive concentration of animals in large scale industrial production units should be avoided and adequate investments should be made in heightened biosecurity and improved disease monitoring to safeguard public health.”

According to a study by a Beijing-based consulting firm, more than half of China’s antibiotics go to livestock, which is “a trend that coincides with the industrialization and scaling up of those farms.”^{301,302} High-intensity production sickens chickens. According to a former manager of Dachan Food Asia (who spoke on the condition of anonymity), illegal use of antibiotics and additives is rampant in the industry.³⁰³ Producers continue feeding poultry drugs, antibiotics and additives in order to keep them alive and accelerate their growth, despite the regulation that medicines should not be given in the seven-day period before slaughtering.³⁰⁴ China does not lack laws, regulations or certification requirements regarding food safety. The sheer scale, expanse of operations across China and the power of the industry makes government inspection and enforcement challenging, allowing overdosed chickens to circulate in the market. The long-term public health problems are weak food safety and growing antibiotic resistance. In addition to these public health hazards, not much attention has been given to the health and working conditions of workers who are exposed to pollutants and pathogens in poultry factories. Such problems faced by

workers, including repetitive strain injury, and exposure to toxic fumes due to intense chemical use remain critical in the U.S. poultry industry as well.

Small producers in the supply chain

Similar to the 2008 melamine scandal in China's dairy industry, small chicken farmers in the "company + farmer" model were blamed for misuse of additives in the KFC scandal. The solution proposed in both dairy and poultry was to assume tighter control over the supply chain through large agricultural firms. Different stakeholders in the supply chain are beginning to question the "company + farmer" or "company + base + farmer" model. In an interview, a vice manager from the company Fujian Sunner (which adopted the grow-out model to supply to KFC) attributed the KFC scandal to the inherent risk in the contract farming model. He emphasized the "uncontrollable risk" and difficulty of inspecting and monitoring the production process of thousands of small farms.

However, a more systemic analysis is needed. Firms in China fail to carry out the requisite inspections and implement food safety laws in order to cut costs and maximize profits. They also transfer risks to farmers mimicking the global poultry industry which widely uses the contract farming model to cut costs and transfer risk. In China too, contract farmers have virtually no bargaining power with Dragon Head companies—like U.S. poultry producers and their bargaining power with powerful meatpacking companies.^{305,306} Companies decide the terms of contract, the distribution of benefits and risks.³⁰⁷ Profit margins for contract farmers have been shrinking because of rising costs of feed, labor, coal (for heating) and electricity.³⁰⁸ Dragon Head companies often shift these risks onto farmers.³⁰⁹ According to some companies, they do so to incentivize farmers to improve their quality and efficiency.³¹⁰ In practice, many companies delay the purchase of fully grown chickens when the market price is low.³¹¹ Thus, farmers assume the risk of loss even when it is due to factors outside their control, such as market volatility and manipulation.³¹² Faced with uncertainty, some farmers sell their chickens to third parties at the risk of breaking their contract with the companies.³¹³ In case of losses due to extreme weather, some companies will provide some compensation and financial help to farmers, although they are under no obligation to do so under contractual arrangements.³¹⁴ Many farmers lack legal knowledge and agree to contracts without understanding how risks are shared.³¹⁵

As the number of small producers continues to decline sharply, cooperatives are being encouraged to address this problem of power; however, farm sizes are increasing dramatically to meet the needs of a rapidly consolidating industry, thereby also increasing risks.

Many producers acknowledge that the highly-intensive farming conditions forced by low profit margins endemic to the industry is a major incentive to misuse and overuse antibiotics and other additives because chickens do not possess adequate immunity under such extreme conditions. According to a chicken farmer in Shandong, the profit from one broiler is 1 RMB on average. In order to make more money, producers have to produce more chickens in a limited space.^{316,317,318} In Chengde County (near Beijing), many farmers left chicken production because of shrinking profit margins.³¹⁹

CONCLUSION

This report has looked at the evolution, trends and structure of the Chinese poultry industry which is continuing to go through dramatic structural changes. The study also provides a snapshot of the major domestic and foreign actors and government policies shaping the direction this sector will take in the coming years. Moreover, it has highlighted systemic concerns that are leading to problems associated with food safety, disease, worker safety and empowerment of small producers.

The poultry industry is, in some ways, the most vertically integrated and industrialized system of livestock production in China. The policy emphasis in this sector (like all other meat sectors in China) is on scaling up and further intensification. The sector has a large number of firms competing over low prices with low profit margins, leading to immense pressure by firms to cut costs. At the same time, to remain competitive and meet production and consumption targets, firms are dramatically increasing production—raising more and more birds in confined spaces.

Food safety concerns, in turn, are driving the government and consumers to demand greater control of the supply chain, slowly shifting consumer habits towards more processed poultry bought in supermarkets. However, wet markets and consumer preferences for fresh meat will continue to dominate the Chinese market in the coming decade. Wet markets are being singled out as a major source

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of disease epidemics; while “specialized” producers, much smaller and weaker than the firms that contract with them, are being blamed for food safety issues. Food safety concerns are also facilitating major global powers such as Tyson to acquire farms in China and control the entire production process through a “grow-out” model that owns and manages the entire supply chain—providing organized retail with a “traceable” supply of industrial poultry, building consumer confidence that the product is “safe.” Meanwhile, the top Chinese companies, such as Wens, are producing close to a billion birds a year through contracts with farmers, to meet Chinese demand. Specialized, smaller farms are either rapidly disappearing or consolidating into much larger scale of production to remain competitive. All signs indicate that this process is set to intensify in the years to come as both poultry production and consumption are expected to grow.

However, this model continues to present significant challenges to China’s food safety, public health, environment and viable rural livelihoods. The report demonstrates that a much more systemic analysis is needed to examine the true costs of this production model and the costs and benefits of consuming poultry produced in this manner. A finer look at the structure of the market, firm behavior and price competition is urgently needed to understand the perverse incentives this model is creating to cut costs upstream. This “race to the bottom” is leading to a host of problems related to food safety, worker health and posing significant challenges in building a remunerative and regenerative agriculture system that involves small producers. The current model, as in the U.S., continues to externalize the true costs of this production at the expense of much healthier and agroecological choices.

However, deliberate policy choices have the potential to alter this system towards a more sustainable pathway in the coming decade. Some alternatives, such as Beijing’s organic market and community supported agriculture projects, are already underway as Chinese urban consumers are waking up to the health and ecological costs of this mode of production. It is hoped that this report contributes to such a rethink on alternatives to the current approach.

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