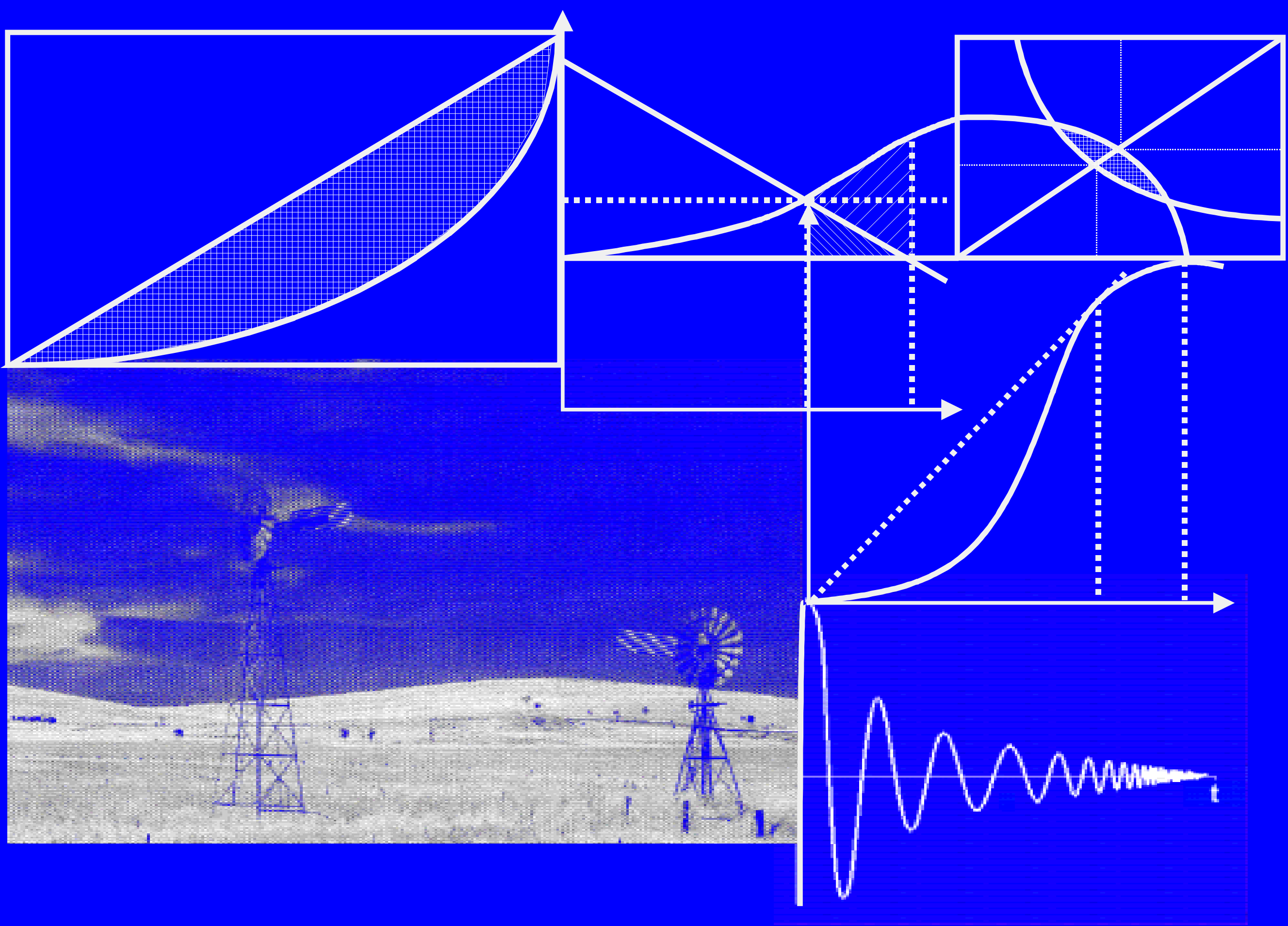
Agricultural and Natural Resource Economics Discussion Paper Series



School of Natural and Rural Systems Management
University of Queensland
St. Lucia 4072 Australia

Beef Consumption and the Beef Marketing Chain in China

Hu Dinghuan, Cai Haiou, and Ralph van Gelder

January 1998

Agricultural and Natural Resource Economics Discussion Paper 4/98

School of Natural and Rural Systems Management
University of Queensland
St. Lucia 4072
Australia

Beef Consumption and the Beef Marketing Chain in China[1]

Hu Dinghuan[2], Cai Haiou[3], and Ralph van Gelder[4]

Abstract: *Beef consumption in China and the degree to which participants in the post slaughter beef marketing chain are recognizing and adapting to this consumer demand are the focus of this paper. The subject provides a useful case study of Chinese agribusiness reforms which are currently of interest to Chinese and foreign industry groups. This study is also important to Chinese policy-makers looking for outlets to absorb China's large beef production capacity. The preliminary analysis reported in this paper is based on information gathered in three diverse Chinese provinces and survey data gathered in rural and urban areas of Anhui province, Beijing and Shanghai cities. The structure of post slaughter beef marketing chains- including beef distribution, wholesaling and retailing chains, beef grading, beef promotion and sanitation are discussed.*

Keywords: *China, beef, marketing chain*

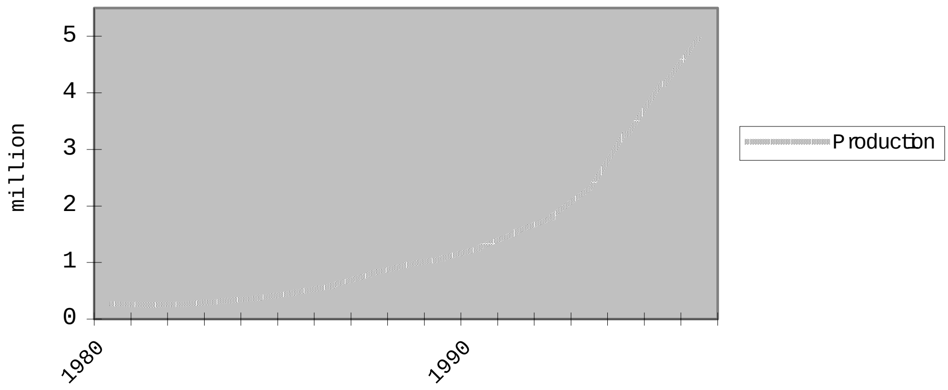
Introduction

China has the largest food consumption of any country in the world. As trade with foreign countries increases, Chinese food production and consumption changes will exert a large impact on international market prices. Although many papers about China's food production have been published, not much research has concentrated on food consumption and market chains. China has the potential to produce certain kinds of food, such as beef, but problems arise because there may not be the market to absorb this production capacity. This paper discusses beef consumption in China and the degree to which participants in the post-slaughter beef marketing chain are recognizing and adapting to consumer demand. The analysis is based on information gathered in three diverse Chinese provinces and survey data gathered in rural and urban areas of Anhui Province, Shanghai and Beijing. The structure of post-slaughter beef marketing chains, including beef distribution, wholesaling and retailing components, in different regions of China is outlined.

[1] Paper presented to the 42nd Annual Conference of the Australian Agricultural and Resource Economics Society held at the University of New England, Armidale, 19-21 January 1998. The paper draws upon research from Australian Centre for International Agricultural Research (ACIAR) and Meat Research Corporation (MRC) funded projects on an analysis of socio-economic and agribusiness developments in the Chinese cattle and beef industries. The projects involve collaboration between The University of Queensland, the Institute of Agricultural Economics within the Chinese Academy of Agricultural Sciences, the Rural Development Institute within the Chinese Academy of Social Sciences, and the Department of International Co-operation within the Chinese Ministry of Agriculture. Further details of the research projects can be found at http:\\ . The authors would like to thank the other collaborating scientists on the research projects for their help in preparing this paper and to ACIAR and MRC for their funding support.

[2] Institute of Agricultural Economics, Chinese Academy of Agricultural Sciences.
[3] The University of Queensland.
[4] The University of Sydney.

Figure 1 Beef Production and Consumption in China



Beef Production and Consumption in China

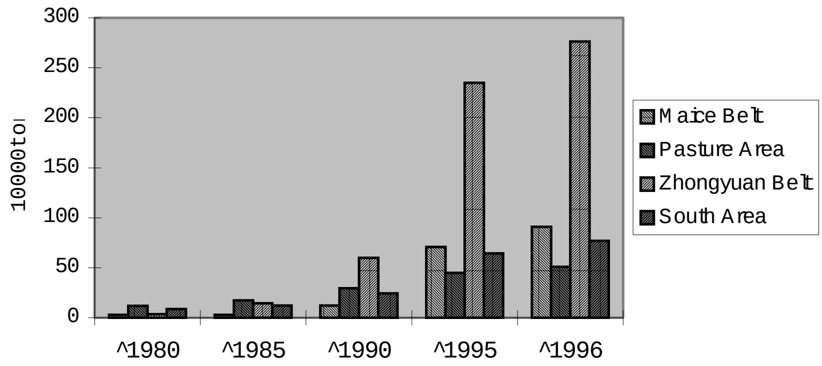
Although cattle have existed in China for thousands of years, their basic function was as draught animals. For this reason, the Chinese beef industry has a very short history. The economic reforms which began in the early 1980s aroused farm households' productive enthusiasm and promoted agricultural mechanization. The power of agricultural machinery increased from 14745.7kw in 1980 to 38546.9kw in 1996, while the number of mini-tractors increased from 1.9 million to 9.2 million over the same period. As agricultural mechanization occurs, the function of cattle has shifted from being a source of power to a source of meat.

The production of beef

Since the beginning of the 1980s, China's beef production has developed rapidly with the output of beef rising from 269kt in 1980 to 4,949kt in 1996 (Figure 1). The slaughtering rate of cattle rose from 4.2% in 1980 to 23.1% in 1996 and the average carcass weight increased from 81.0kg to 136.2kg. During this period, beef production increased at an annual average rate of 4.3 %. The growth rates differ across production areas. The beef production region can be divided into four areas according to locality, feed availability and natural resources. These
areas are the Maize belt, Pastoral area, Zhongyuan beef belt and Southern area. The Maize belt is in the northeast of China and includes Liaoning, Jilin and Heilongjiang provinces. The Pastoral area is in the northwest and includes Inner Mongolia, Tibet, Gansu, Qinghai, Ningxia, and Xinjiang provinces. The Zhongyuan beef belt is in the center of China and includes Beijing, Tianjin, Hebei, Shanxi, Anhui, Shandong, Henan, Hubei and Shanxi province. The Southern area includes the highly developed provinces and cities of Shanghai, Jiangsu, Zhejiang, Fujian, Jiangxi, Hunan, Guangdong, Guangxi, Hainan, Sichuan, Guizhou, and Yunnan.

Beef production in the Maize belt increased from 29kt in 1980 to 910kt ton in 1996, and increased its share of total beef production in China from 10.8 per cent to 18.4 percent of total beef production in China (Figure 2). In the Pastoral area, beef production rose from 118kt to 509kt between 1980 and 1996. However, its production as a proportion of total Chinese beef production fell from 43.9 per cent to 18.4 percent during this period. Of the four beef production areas, the Zhongyuan beef belt has experienced the most rapid development. Production rose from 35kt to 2,762kt in the sixteen years from 1980 and increased its share of China's beef production from 13 per cent to 55.8 percent. Beef production in the Southern area also increased from 87kt to 770kt, although its share of total beef production decreased from 32.3 per cent to 15.6 per cent during the period.

Figure 2 Beef production in Different Areas of China

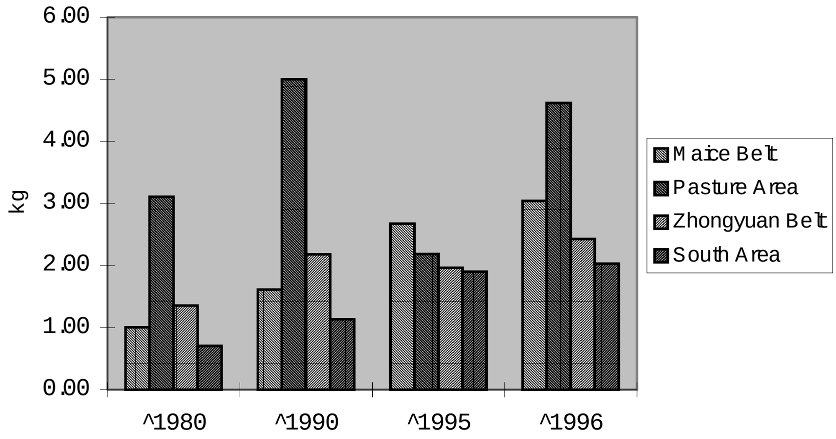


There are several factors that have promoted the growth of beef production in China. These include:

- Continuous income growth after 1980, promoting increasing demand for beef.
- Increased levels of grain production mean that farmers may have surplus to feed livestock.
- The popularizing of ammoniated straw techniques has tapped a new feed resource for beef production.
- Expanding agricultural mechanization has decreased reliance on cattle as sources of draught power, so the number of beef cattle is increasing.
- The spread of crossbreeding and AI has led to improvement in local cattle breeds. For example, the average weight of cattle has increased from 87kg to 135kg and meat yields have increased from 35 per cent to 42 per cent.
- The government's policy of promoting and subsidising the development of the beef industry has aroused the interest of local officials and farmers (for example, demonstration ammoniated straw counties started from 1992).
- The contract beef fattening production system, introduced by some slaughterhouses, provides a relatively stable market for farmers.
- Beef production may be able to utilize extra labor power available on the farm.

.

Figure 3 Per Capita Consumption of Beef in Urban Households



Beef consumption in China

Although per capita beef consumption in China has increased progressively since 1985, because most of China’s population belong to the Han nationality who traditionally eat pork in preference to beef and mutton, per capita consumption is still very low compared with other developing countries. From 1985 to 1996, the per capita beef consumption of urban households increased from 1.0kg to 3.04kg in the Maize belt, from 3.11kg to 4.62kg in the Pastoral area, from 1.36kg to 2.43kg in the Zhongyuan beef belt and from 0.70kg to 2.03kg in the the Southern area (Figure 3). During the same period, per capita beef consumption of rural households rose from 0.14kg to 0.47kg in the Maize belt, from 2.49kg to 2.05kg in the Pasture area, from 0.28kg to 0.39kg in the Zhongyuan beef belt and from 0.18kg to 0.35kg in the Southern area (Figure 4). Thus per capita beef consumption in the north is greater than that in the center and Southern area, and the growth of beef consumption in the relatively affluent coastal regions is faster than growth in inland China.

Beef distribution among the areas

Forms of beef distribution among the areas

There are four kinds of beef distribution currently in use: live cattle distribution, frozen beef distribution, fresh and chilled beef distribution and processed beef distribution. Live cattle distribution consists of transporting cattle from the production areas to the market by truck or train. Some of the cattle have a short fattening period and most cattle are slaughtered near the consumer market. The greatest problem with live cattle distribution is that China is the lack of good transport infrastructure. The transportation of live cattle is more risky than other beef distribution forms, and is more expensive. Frozen beef distribution involves sending frozen beef from the production area to the consumer market. Frozen beef distribution was common before the 1990s, but urban consumers prefer fresh and cold beef. Fresh beef distribution has two forms. One is cattle slaughtered a short distance from the consumer market and directly sold in private meat shops or by vendors. The other is chilled beef sent to retail shops (super markets) by cold storage vans. The first is cheaper, but the quality of beef can not be guaranteed, particularly in the hot season, because most private meat shops do not yet have cold systems. The quality of beef in the supermarket is guaranteed, but it is too expensive for ordinary consumers. The distribution of processed beef involves transporting cooked beef and dried beef in vacuum packaging.

The main beef distribution form in China today is fresh meat, because China does not have enough cold transport equipment and the cost of electricity is high. For this reason, the range of beef distribution is limited, and three level of beef markets have formed, namely (1) county level beef market, (2)province level beef market, (3) area level beef market. The county level beef market are county and town farm produce markets. This kind of market is mainly self-sufficient. The province level beef market are to be found in the provincial capital, and/or in the main industrial and commercial cities. The population in these cities is concentrated, and the per capita consumption of beef is more than that in rural counties. The area level beef market is centered around a large nucleus consumer city in the coastal area, and includes several big cities and their suburbs. This kind of beef market exists in the economically developed areas where beef production can only satisfy a small portion of demand. Most of the beef consumed in these markets comes from other beef production areas, or is imported from foreign countries. The Huabei (North China) area beef market is in Beijing and Tianjin. Huadong (East China) beef market can be found in Shanghai, Nanjing and Hangzhou. The Huanan (South China) area beef market is centred around Guangzhou .

Supply and demand of beef among different areas

Before the 1980s, the production of beef and mutton was concentrated in the pastoral areas in the northwest of China. At that time, according to the center government's mandatory planning, large consumption cities, such as Beijing, Shanghai and Guangzhou were allotted a small amount of beef from these areas to satisfy the needs of minority nationality residents.

Beef in the Huabei area market is mainly from Hebei province in the Zhongyuan beef belt. In 1996, beef production in Hebei province was 608kt. It accounts for 12.3 per cent of China's total beef production. The fattening system in Hebei province involves farm households buying cattle from Inner Mongolia and Jilin provinces to fatten. After a short period of fattening, the cattle are slaughtered and sent to the wholesale and retail beef markets in Beijing and Tianjin. At the same time, abattoirs in Inner Mongolia, Jilin, Liaoning, Henan, and Shandong provinces also sell fresh and frozen beef to the Huabei area markets.

In the Huadong area, the beef market mainly depends on Anhui, Shandong, and Henan provinces in the Zhongyuan beef belt. Three different types of beef distribution chain coexist. The first one involves the purchase of live cattle from Anhui, Henan and Shandong, short term fattening and/or slaughtering in Zhejiang and Jiangsu, and then selling the beef at farm produce markets in Shanghai and other big cities nearby. The second chain is state food companies setting up slaughter houses in nearby beef producing areas. The cattle are slaughtered and the beef packaged according to the needs of retail markets (supermarkets). The third channel is state food companies buying frozen beef from remote production areas such as Inner Mongolia and Gansu.
The Huanan area market in the South of China is less suitable for raising cattle. A small portion of the beef sold in this market is from Guangxi province nearby, but most beef consumed there is from Inner Mongolia, Jilin, Anhui and Henan province, where they send live cattle by train and truck.

Beef distribution chain and distribution margin

Beef distribution Chain

From 1958 to 1985, the beef distribution in China was controlled by the Ministry of Commerce of the central government. Farm cattle were the main animal power resource protected by the government. It was necessary to obtain government permission before slaughtering farm cattle. Basically, beef was only sold to food purchasing stations at the town and county level. The beef distribution chain was as shown in Figure 5.

The reform of farm and sideline production started in the 1980s. There are a variety of beef distribution systems which include State, collective, joint venture and private. China's beef marketing chain can be divided into three forms: (a) county and town level marketing chain,(b) Province level marketing chain, and (c) area level marketing chain.

Figure 5 Beef Marketing Chain Before the mid-1980s

The county and town level beef marketing chain is simple. It includes farm households, fattening households and farms, cattle dealers, private slaughter houses and butchers. Farm households directly, or through cattle dealers, sell their cattle for slaughter to local butchers for direct sale of beef to local consumers. In this beef market, only a few cattle are fattened by households and farms (Figure 6).

The province level marketing chain has three types, the first type is the same as county and town level beef marketing mentioned above. The second type is the state slaughter house that buys cattle from cattle dealers and fattening farms or households, and sells beef to either wholesale markets, food markets, or subordinate retail departments. The third beef distribution chain is cooked beef and dry beef produced in food processing factories (Figure 7).

The area level marketing chain also has three types. The first one is private slaughterers buying live cattle from other production areas, slaughtering them in the suburbs of large cities, and selling the beef at farm produce markets. The second is State food companies buying live cattle from other provinces, then after a short period fattening, slaughtering and selling the beef in associated retail departments and food markets including private butchers. Some state food companies have formed joint ventures with local governments in the cattle producing areas to set up slaughter houses in the production areas. This kind of slaughter produces a variety of beef for different demands. The third one is the marketing chain of super markets. Supermarkets in the large cities began selling fresh food only in the middle of the 1990s because the city government make regulation of every super market have to sell a certain proportion of fresh food(Shanghai). Although super markets have their own marketing chains, they do not own slaughter houses, so they buy beef from state food companies. Some of them buy large pieces of beef and pack them in processing houses, and some of them buy small packed beef directly (Figure 8).

The Margin of beef distribution stages

In analysing margins at different stages of beef distribution, China's beef marketing chain is divided into six stages. They are (a) live cattle stage, (b) fattening cattle stage, (c)live cattle dealing stage, (d) slaughtering and processing stage, (e) beef wholesale stage and (f) beef retail stage. The margins reported below were derived from information collected from fieldwork research in Inner Mongolia, Jilin, Anhui, Henan, Shanghai and Guangzhou, and information from newspapers such as " Livestock and Feed Price on country market" (Department of Animal Husbandry and Health, Ministry of Agriculture, various issues), and "The meat and egg price of province" (Department of Market Forecasting Commercial Information Centre, various issues). The results are presented in Table 1.

Table 1. The Prices of Live Cattle and Beef at Different Stages of the Marketing Chain

Distribution Stage	Distribution Place	Distribution Form	Owner	Price(Yuan/kg)
Cattle	Producing area	Live cattle	Farm household	2.50
Fattening Cattle	Producing area	Live cattle	Fattening farm	3.00
Cattle Trading	Producing area	Live cattle	Cattle trader	3.20
Cattle Slaughtering	Producing area	carcass	Slaughter house	5.50
Wholesale	Wholesale market	carcass	Wholesale merchant	6.00
Retail	Retail market (Producing area)	Boneless beef	Retail shop	6.50
Retail	Retail market (Beijing)	Boneless beef	Retail shop	7.00
Retail	Retail market (Shanghai)	Boneless beef	Retail shop	7.50
Retail	Retail market (Guangzhou)	Boneless beef	Retail shop	10.00
Retail(Super Market)	Super market (Shanghai) Super market (Shanghai)	Boneless beef	Super market	8.50
Retail(Super Market)	Super market (Shanghai)	Shredded beef	Super market	9.00
Retail(Super Market)	Super market (Shanghai)	Shredded beef with sauce	Super market	11.00
Cooked food	Cooked food shop (Shanghai)	Cooked beef	Food Shop	21.00

Conclusion

Per capita consumption levels of beef in China are not high, but the rate of increase from 1980 to 1997 has been rapid. A major challenge facing China is to improve its beef distribution channels to promote consumption. The supermarket has a very short history in China, but is an important market for beef retailing because it can guarantee the quality of beef and it can sell a variety of different kinds of beef including cooked beef. In this way, the consumer can save food preparation time. This will become more important as the Chinese economy develops and income levels increase.

However, China has some limitations on the production of high quality beef. As China has limited arable land and water resources, feed grain for livestock is limited. Straw and crop residues can produce beef but the nutritional value of such feeds is very low. The quality of beef produced by straw feeding regimes is low compared with beef produced by pasture grazing or feeding grains. Demands for different quality beef can be separated into three types. These are; grain fed beef, grass fed beef and straw fed beef. These correspond to high quality, medium quality and low quality beef, respectively. Income distribution in China is uneven, with coastal areas generally having a higher level of income than inland regions. In a similar fashion, there are a wide variety of consumer tastes in regard to food products, including beef. Apart from a small quantity of domestic production, high and medium quality beef in China is generally imported. The quantity of high and medium quality beef demanded will increase in the future as the economy develops, as has been the case in Japan in the past. In the future, low priced labor intensive Chinese straw fed beef may find a niche in the world market. The world beef market may become segmented into high medium and low quality categories with the USA, Canada and Europe providing top quality grain fed beef, Australia, New Zealand and Argentina exporting medium quality grass fed/ grain finished beef and China filling the market for low quality straw based beef.

The analysis of beef marketing and consumption in China reported here is only at a very preliminary stage. The next stage is to examine the three geographically distinct beef markets in China. These are the Huabei, Huadong and Huanan markets described earlier. The research will concentrate on the marketing, distribution channels and marketing margins. Consumption modeling will be done using data from surveys conducted in these three areas. This will enable differences in consumer behavior between different regions and income levels to be identified.