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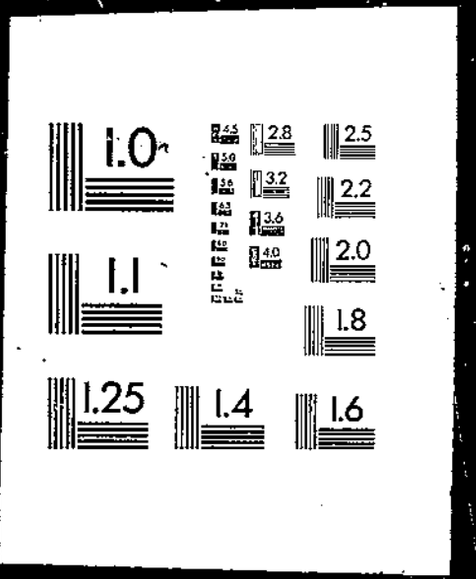
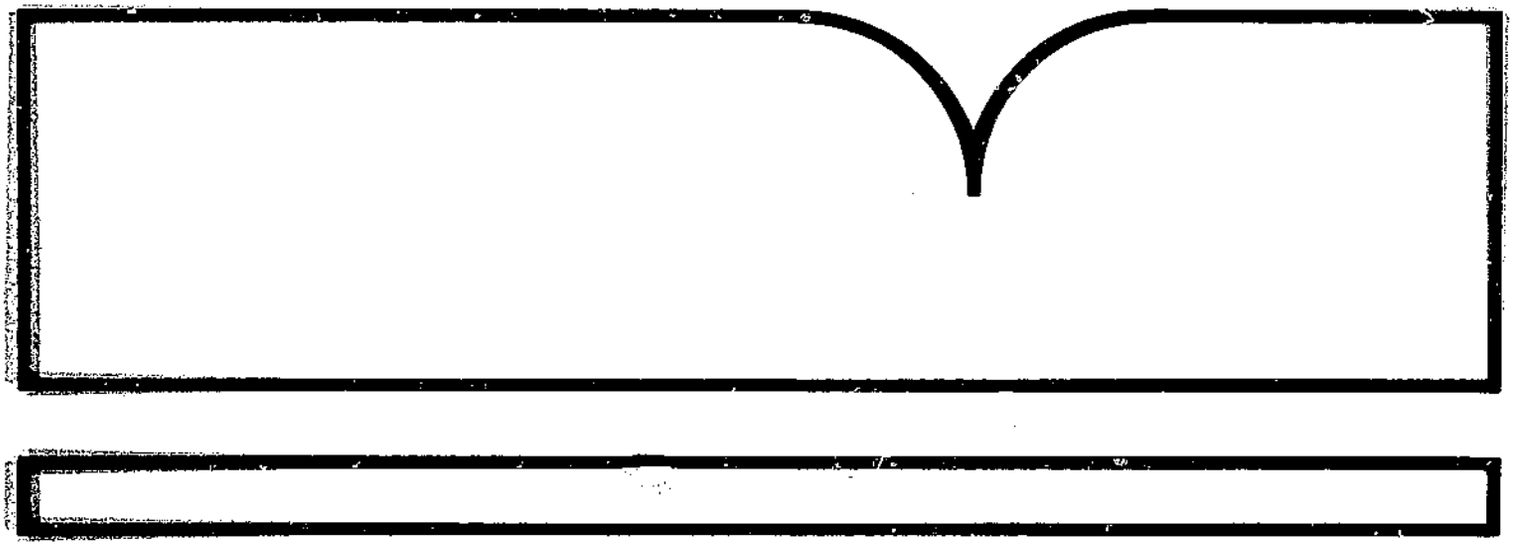


PB87-197851

China's Livestock Sector

(U.S.) Economic Research Service, Washington, DC

Apr 87



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China's Livestock Sector

Francis C. Tuan

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Conversion Chart

Chinese	Metric	English
1 jin (catty)	0.5 kilogram = 0.0005 ton	1.1023 pounds
1 dan (100 jin)	50.0 kilograms = 0.05 ton	110.23 pounds
1 dun (ton)	1,000.0 kilograms = 1.00 ton	2,204.6 pounds
	1.0 kilometer = 1,000 meters	0.61237 mile
	1.0 hectare = 10,000 square meters	2.471 acres

Exchange Rates

$1.00 =

In	1984, 2.32 yuan	In	1980, 1.50 yuan
	1983, 1.98 yuan		1979, 1.56 yuan
	1982, 1.89 yuan		1978, 1.69 yuan
	1981, 1.71 yuan		

Notes: Metric tons are used throughout this report. Chinese words used in this report follow the Pinyin system of romanization.

China's Livestock Sector. By Francis C. Tuan, International Economics Division, Economic Research Service, U.S. Department of Agriculture. Foreign Agricultural Economic Report No. 226.

Abstract

China increased the per capita red meat supply by 40 percent to 14.9 kilograms (kg) annually in 1979-84 by boosting meat yields per animal and the number of slaughter animals. Pork provides more than 90 percent of the meat protein consumed by most Chinese. China's 14-kg per capita meat consumption compares with 70 kg per U.S. consumer. China's inadequate transportation and marketing systems, cold storage facilities, and feed manufacturing constrain meat production and marketing. China also needs improved livestock breeds. Imported breeding stock, feedstuffs, manufacturing and processing machinery, and transportation and storage equipment promise marketing opportunities for the United States.

Keywords: China, livestock production, procurement, marketing system, statistics, policy, feed, prices, trade, quarantine.

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Contents

Summary

China increased the per capita red meat supply by 40 percent to 14.9 kilograms (kg) annually in 1979-84 by boosting meat yields per animal and the number of slaughter animals. Pork provides more than 90 percent of the meat protein consumed by most Chinese. China's 14-kg per capita meat consumption compares with 70 kg per U.S. consumer. China's inadequate transportation and marketing systems, cold storage facilities, and feed manufacturing constrain meat production and marketing. China also needs improved livestock breeds. Imported breeding stock, feedstuffs, manufacturing and processing machinery, and transportation and storage equipment promise marketing opportunities for the United States.

Pork accounted for 14 kg of the 14.9 kg of meat available per person in 1984. The rest was split almost evenly between beef and mutton. Per capita consumption of all forms of red meat, including imported meat, was only 14 kg in 1983, about a fifth of the U.S. per capita consumption that year.

Much of the increase in meat production resulted from Government policy changes which encouraged private ownership and feeding of livestock, increased Government procurement prices, expanded land available for private use, and expanded output of the domestic feed industry. Poor roads and insufficient numbers of refrigerated vehicles have hampered movement of meat from sparsely settled rural areas to urban markets.

China has embarked on an ambitious livestock-improvement plan to produce as much as 120 million tons of livestock feed by the year 2000, up from 5.1 million tons in 1982, and to import high-quality breeding stock, advanced machinery for feed manufacturing, and appropriate biotechnology. These programs should ensure many trading opportunities for the United States and other countries doing business with China.

China's Livestock Sector

Francis C. Tuan*

Introduction

China's livestock sector, in terms of inventories, has long been one of the world's largest. Recent expansion and development of the sector, following policy changes imposed since the late 1970's, have made China the world's leading pork producer and the second biggest producer of red meat, behind only the United States. Growth of the livestock sector in China should continue because livestock raising is currently one of the Government's top priorities for agriculture.

Until recently, little has been known about how China developed its livestock industry because the Chinese Government did not publish statistics between the late 1950's and the late 1970's. Past studies on China's livestock production and trip reports (*14, 24, 27, 38*) rarely used many official statistics from China.[1] The release of statistical publications, resumed in 1979, has provided a growing amount of information of livestock production, particularly yearend inventories of livestock and annual meat output. The statistics, although limited by western standards, permit us to identify major features of China's livestock sector. This study:

- Describes the major characteristics of China's livestock sector and outlines major policies imposed on livestock programs in recent years;
- Analyzes the development of national and provincial livestock production during 1979-84;
- Organizes livestock-related statistics, from both English and Chinese publications, into a data file that can serve as a foundation for further statistical analyses or econometric modeling; and
- Identifies the problems that the Chinese livestock sector faces and implications for its future development.

The limitations of this study, like many other studies on China's agricultural production, still lie in the scarcity of data. The Chinese Government has published very little information on poultry and dairy production. Poultry feeding remains largely a household backyard activity, despite the increasing number of large poultry farms established around large cities; the Government has just begun to collect data about this activity. Nevertheless, a fairly comprehensive picture of the development of hog, large animal, sheep, and goat production is now possible.

Livestock Sector Features

Chinese records trace livestock raising back more than 3,000 years. The livestock sector, one of the five major components of China's agricultural production as defined by the State Statistical Bureau, raises animals, including those fed by farmers and those put out to graze but excluding all aquacultural production. The other four subsectors are cropping, forestry, fisheries, and sideline occupations, such as picking wild-grown medicinal or fiber plants.

Despite a long history of livestock raising, the structure of the livestock industry is rather simple. Unlike the United States, China does not possess the specialized segments concerned with feed, feeding, slaughtering, and distributing. Livestock products in China do not go through the highly organized slaughtering and marketing process as they do in the United States. The Chinese Government procured about 75 percent of the total hogs slaughtered in each of the last few years.

The contribution of the livestock sector, in value terms, to total agricultural production is still low. Despite recent growth, the importance of livestock raising to China's crop-dominated agriculture has changed little over the years. The contributions of the livestock sector generally may be classified as follows:

- Animal products, such as meat, milk, and eggs, provide high-quality protein that can help improve the population's traditional low-protein diet.

*The author is an agricultural economist in the International Economics Division, Economic Research Service, U.S. Department of Agriculture.

[1]Italicized numbers in parentheses identify items listed in the References at the end of this report.

- Draft animals—mainly water buffalo, yellow cattle (a general name for all Chinese native cattle), horses, mules, and donkeys—supply a great portion of the draft power used in farming and rural transportation.

- Livestock output, such as meat, hair, and hides, supplies the raw materials for China's processing industry.

- Livestock manure, particularly from hog production, constantly adds large amounts of nutrients to China's crop cultivation and soils, much of which are deficient in potassium and phosphate. This deficiency persists because nitrogen is the chemical fertilizer most used in recent years.

- Sales of animals raised in individual household sideline production provide an important supplemental source of income, although peasants' incomes have become more diversified in the last few years, according to surveys of rural household expenditures (*19*).

- Sales of live animals and livestock products, such as bristles, animal hides, and rabbit meat to foreign countries, help earn foreign exchange. The export value of livestock products and live animals has accounted for about 5-10 percent of total exports in recent years.

Geographical Distribution

China is slightly larger than the United States, with a land area of about 9.6 million square kilometers. Although much of the country's continent is located in subtropical and temperate climate zones, the southernmost area of China extends into the tropical zone. Livestock raising, therefore, like crop production, varies from place to place in China. Animal distribution in different regions generally depends on natural endowment, farming systems, and population density.

China's land mass generally can be divided into two distinct agricultural regions, grazing and farming, based on agricultural production activities, types of livestock raised, and feed used in raising animals. The grazing region has huge pasture areas and large herds. Most of the land in the farming region, however, is planted to crops, with only scattered pastureland. Livestock raising in the farming region is different, because animals are fed with more grains, grain byproducts, and oilseed byproducts. The average number of animals fed by each household in the farming region is small.

One can draw a line to separate China's two agricultural regions based on the characteristics discussed above (fig. 1). The line is a broad belt, starting from east of Da Hinggan Ling in Heilongjiang and the upper and middle reaches of the Liao He in Liaoning, extending along the Yin Shan Range and the Ordous Terrace (excluding the Hetou Plains) in Nei Monggol to the Qilian Shan Range (except Hexi Corridor) in Gansu, and ending at the Qingzang Terrace located in Qinghai province and Xizang autonomous region; that swath of land mixes cropland and grazing land. The southeastern portion of the country below this transitional area is the farming region and the portion above the transitional area, the grazing region.

During the history of China's agricultural development, the line had been pushed northward to the current position because of advances in land use for crop production. The line, however, essentially stablized during the Ming dynasty (1368-1644) (*10*, pp. 284-88).

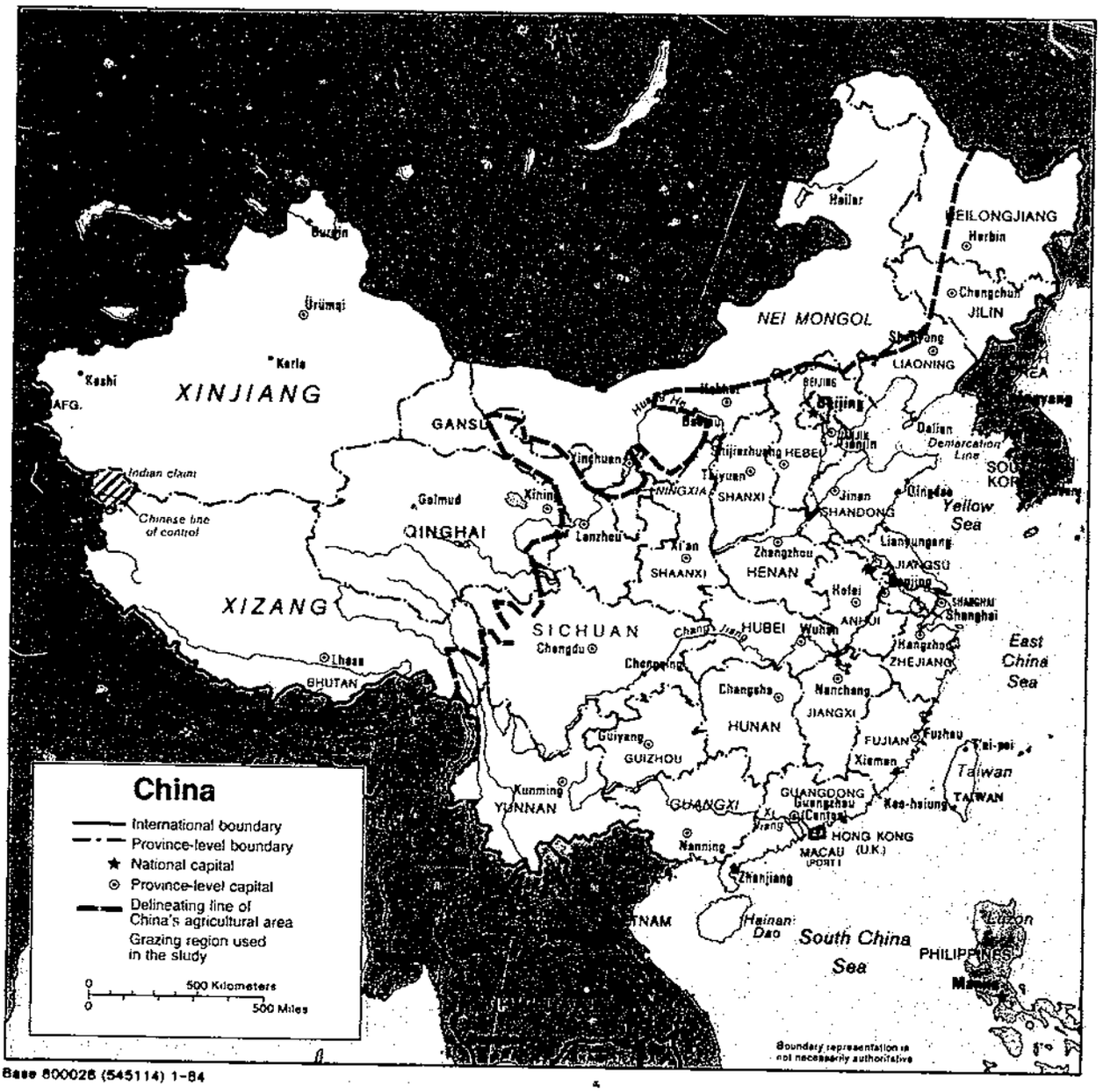
Data, however, cannot be clearly separated for analytical purposes because the line crosses many provinces, and data are published on a provincial rather than prefectural or county basis. Thus, to provide an alternative measure, I have grouped the six northwestern provinces—Gansu, Ningxia, Nei Monggol, Xinjiang, Qinghai, and Xizang—for the study to roughly form the "grazing region"; the rest of the provinces are the "farming region." This delineation is not ideal; Sichuan and Heilongjiang, for example, both have large grazing and farming areas. Part of Nei Monggol, particularly the Hetou Plains, should also be included in the farming region.[2] Nevertheless, the delineation used in this study generally illustrates the common natural characteristics of the two regions.

The grazing region, although only 6 of China's 29 provinces, autonomous regions, and municipalities, possesses more than half of China's total land area (table 1). That region's cropland, however, equals only about 9 percent of the national total. Individual households in the grazing region mostly raise pasture and range animals, such as horses, cattle, and sheep.

Therefore, beef and mutton output and cow milk production are higher than in other parts of the country, at least on a per capita basis. In contrast, farmers in the farming region concentrate on hogs. Large animals raised in the farming region, such as water buffaloes, horses, mules, and donkeys, are used mainly for field preparation work and for hauling activities.

[2]The grazing and the farming regions actually overlap. The examples given here are simply part of the transitional areas between the two distinct regions.

Figure 1



Ownership of Livestock

Livestock raising was not consistently promoted in either the collective or the state farm systems in the last 35 years of China's agricultural development. Before 1979, central Government policies encouraged both private and state hog and poultry farms, but the Government discouraged private feeding of large animals, sheep, and goats.

Private ownership of all kinds of animals has been growing since 1979, after the Fourth Plenary Session of the 11th Chinese Communist Party Central Committee approved a document entitled "Some Questions Concerning the Acceleration of Agricultural Development." The document specifies that private or family raising of all livestock should be vigorously encouraged.

The latest statistics indicate that over 94 percent of all hogs in China were raised privately by commune members in 1981, up from 80 percent in 1978 (table 2). In 1981, commune households raised more than 50 percent of all sheep and goats, up 21 percentage points from 1978. But, in 1980, commune members

Table 1—China: Features of two agricultural regions, 1981

Item	Share of national total	
	Grazing region[1]	Farming region[2]
	Percent	
Land area	54.5	45.5
Area sown to crops	8.7	91.3
Total population	6.1	93.9
Hogs	3.7	96.3
Cattle	25.5	74.5
Water buffaloes	0	100.0
Yellow cattle	34.2	65.8
Dairy cattle	41.3	58.7
Horses	36.9	63.1
Mules	40.0	60.0
Donkeys	20.0	80.0
Camels	99.8	.2
Sheep	70.2	29.8
Goats	29.1	70.9
Pork output	2.8	97.2
Beef output	43.9	56.1
Mutton output	47.4	52.6
Cow milk	33.1	66.9

[1]Gansu, Ningxia, Nei Monggol, Qinghai, Xinjiang, and Xizang provinces.
[2]All other provinces.

Sources: (*1*, *21*).

owned only 29 percent of all cattle, about 21.4 million head. Before 1980, large animals were mostly owned by collectives because of their use as a means of production. The portion of large animals, particularly cattle, that are privately owned grew rapidly in 1980 and 1981 because household contract systems were implemented in rural areas. This trend will continue. Cattle have been sold in rural markets, and ownership of draft animals has been transferred from collectives to individual households throughout rural China.[3]

Production Facilities and Technology

In the grazing region, animals, such as horses, cattle, sheep, goats, and camels, are put out to graze mainly on open grassland. Only a few animals have been raised on fenced pastureland. Herders in most areas do not have well-built shelters to protect animals during cold winters; winter mortality rates, therefore, have been high in the grazing region.

[3]The commune system was basically dismantled by the end of 1984. The demand for large animals continues because household contract systems still prevail in rural areas. The rural household contract systems make the household the basic production unit and the centerpiece of the new system. The new system creates an environment in which farm households could initiate production activities, make economic decisions, and allocate resources.

Table 2—China: Livestock ownership

Livestock/ownership	1978	1979	1980	1981
	Percent			
Hogs:				
Privately owned	80.0	85.3	90.5	94.1
State and collectively owned	20.0	14.7	9.5	5.9
Cattle:				
Privately owned	5.0	NA	12.0	29.1
State and collectively owned	95.0	NA	88.0	70.9
Sheep and goats:				
Privately owned	33.0	38.8	46.0	54.0
State and collectively owned	67.0	61.2	54.0	46.0

NA = Not available.

Source: (*19*).

Most livestock in the farming region, however, are generally kept in drylots or covered shelters. Only ducks and geese forage in open fields to glean grain after harvest.

The livestock production shelters are usually built with brick, stone, concrete, and adobe. Some steel is used to construct larger facilities, but wood is seldom used because of lumber shortages.

Draft animals, once assigned to commune households and now increasingly owned by household members, are usually kept in enclosed areas. Dairy herds are mostly kept in buildings run by collectives or state farms and often are located around large cities. Dairy farms often use drylot systems, including exercise yards, open-sided sheds, and stanchion-type milking barns. Bunkers or trench-type silos are usually used, although upright silos are found on some farms. In the last few years, household raising of milk cows has also been promoted, for example, in Heilongjiang. Little is known about production facilities for household raising of dairy cows, which undoubtedly vary widely.

Hogs, owned and finished for slaughter by farm families, either run free or are kept in small pig sties that are partially roofed and hold one or several hogs. Finishing units on communes (or now townships or villages) and state farms are bigger and usually consist of enclosed buildings with access doors to paved lots. Feeding is often done manually in outside pens. Some collective or state farms have technically advanced facilities with partially slotted floors, mechanical distribution of feed, automatic waterers, and electrically powered fan ventilators. These finishing units are in some ways similar to full confinement facilities seen in the United States. This type of unit handles only a fraction of the 5-6 percent of China's hogs currently raised on collective or state farms.

Sheep and goats in China's farming region are confined either in small pens or are tethered or herded along the sides of the roads and edges of fields. The majority of the privately owned goats are raised for milk and meat.

Poultry raising remains largely a household backyard activity, although most of the poultry raised by collectives is semiconfined with access to outdoor runs. Buildings are usually of durable construction, and brick walls and cement tile roofs are common in northern China. Collective poultry farms seldom use mechanical ventilation or insulation, and refrigeration is not available for market eggs on the farms. Modern poultry facilities and complete confinement systems have been observed on state farms, particularly around big urban centers. For example, one poultry farm near Beijing annually produces 1 million broilers.

Feed Industry

The feed industry has developed rapidly in recent years, but the industry is still in its infancy. Output of mixed and compound feed has increased sharply since 1980, largely because of significant production increases around large cities such as Beijing and Shanghai. Actual mixed and compound feed output reached about 12 million tons in 1984. Chinese reports often refer to two different kinds of feed: compound feed (peihe siliao) and mixed feed (hunhe siliao). Compound feed apparently refers to a well-prepared, nutritionally balanced feed processed for specific kinds of animal feeding. Mixed feed, on the other hand, is a more general term indicating any mixture of two or more feed ingredients. Mixed feed would mean a local mix of whatever feed ingredients are available, with little regard for uniformity or proportions, particularly in rural areas.[4] Mixed and compound feed output rose to 12 million tons in 1984 (table 3), according to the statistics disclosed by various sources.

By the end of 1984, 93 feed processing plants, each with an annual output of over 10,000 tons, and over 1,500 plants capable of producing over 2,000 tons of output had been built throughout China (*18*, Sept. 11, 1985, p. 5).

Pasture Area

Low pastureland productivity and quality, along with shortages of feed grains, have been the principal reasons for the limited scale of China's ruminant meat output. Although China has 357 million hectares of grassland, of which 287 million are classified as usable, only 2.1 million hectares were improved or well-managed pastureland in 1981 and 3.3 million hectares in 1983.[5] Table 4 illustrates the total grassland area, usable grassland area, and improved grassland area of 10 key pastureland provinces. According to Chinese officials, usable grassland means the area can be used for grazing; improved grassland has been seeded, irrigated, or fenced.

An effective way to improve the ruminant livestock subsector in China is to increase the areas of its improved or well-managed pastureland. To this end, China has started developing pastures, restructuring mountain pastures, and improving grasslands with the aid of advanced technology from other countries. Some examples are the Nanshan Livestock Farm built

[4]For a more detailed description of China's feed industry and feed terminology, please see (29).

[5]Total and usable grassland areas were from (*10*). These data are the numbers most often used in Chinese publications, although the 1983 *China's Statistical Yearbook* carries 319 and 225 million hectares (*20*). The 1981 improved grassland area was from (*19*, 1982, p. 143) and the 1983 figure was from (*19*, 1985, p. 27).

Table 3—China: Mixed and compound feed output

Year	Total	Data from— Ministry of Commerce system	Ministry of Agriculture system
		Million tons	
1980	NA	1.10	NA
1981	NA	1.85	NA
1982	5.10	3.00	2.10
1983	7.08	4.08	3.00
1984	12.00	NA	NA

NA = Not available.

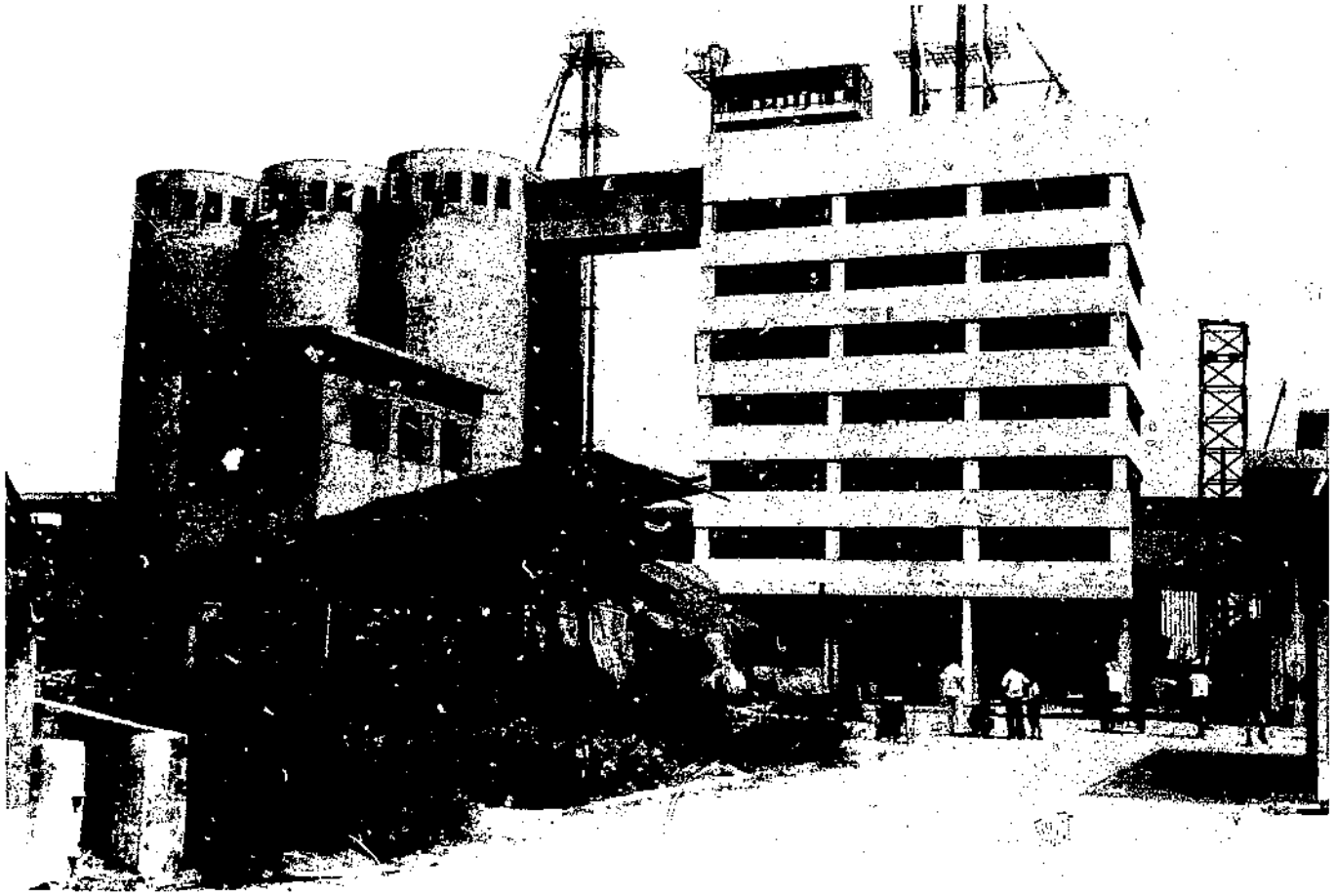
Sources: (*8*, *18*, Jan. 4, 1984, p. 2, and *20*)

Table 4—China: Pasture area in 10 key pastureland provinces, 1978

Province	Pasture area	Usable pasture area	Improved pasture area
		1,000 hectares	
Sichuan	12,904	9,100	10
Xizang	60,000	55,000	3
Gansu	13,004	12,123	10
Qinghai	53,333	35,470	67
Ningxia	8,800	8,000	60
Xingjiang	80,000	50,400	185
Nei Monggol	33,733	31,000	43
Liaoning	5,983	4,508	61
Jilin	6,437	6,157	133
Heilongjiang	11,933	10,255	23
Total[1]	286,128	222,013	596

[1]Totals may not add due to rounding.

Source: (2).



This modern feed-grain facility in Beijing, above, is typical of such plants being constructed in many major cities.

Trenches such as the one below are used to store silage on state-run dairy farms.

in Hunan province (in cooperation with Australia), the Qianjiang Livestock Farm in the Guangxi Zhuang Autonomous Region (with New Zealand), and the Ongniud Banner Livestock Farm in Nei Monggol (aided by the United Nations Development Program).[6] China planned to expand its improved pastureland to 6.6 million hectares by 1985. Actual improved pastureland area data for 1985 are not yet available.

Consumption of Livestock Products

China's livestock sector is characterized by its low supply rates of animal products, even though yearend inventories of hogs, sheep, goats, and cattle are among the world's largest. Per capita consumption of red meat, poultry, and eggs is low, although consumption has grown greatly since 1978. Per capita consumption of animal products for urban households is generally more than double that of rural households, despite the fact that rural areas produce the majority of livestock products (table 5).

Comparing the U.S. and Chinese Livestock Sectors

Although China has one of the largest livestock inventories in the world, its livestock sector generates less than one-fourth of the value of the output of its crop sector. Table 6 clearly indicates the inefficiency of China's livestock production, particularly with respect to meat output in relation to the huge yearend inventory of various kinds of animals. The length of time required to feed hogs from farrow to finish indicates low feeding efficiency of slaughter hogs. Finally, the low dressing rate for slaughtered hogs suggests vast potential for improving China's hog breeding and feeding. This potential is also shown in data presented later in this report on ratios of lean meat to carcass weight.

Livestock Policy

Since 1949, China has adopted various measures to promote livestock production along with its primary goal of increasing crop cultivation in both the collective and the State farm systems. Discussions of livestock policy will concentrate largely on the measures that have been imposed since 1979.

Pre-1979 Policies

Livestock policies prior to 1979 were generally recognized as successful in terms of encouraging increases in animal numbers. For example, yearend hog inventories quadrupled and sheep and goat numbers tripled between 1949 and 1979. These policies were detailed in documents such as "1956-1967 Summaries for National Agricultural Development" and "The Resolution Concerning the Problems of People's Communes" passed in the Eighth Plenary Session of the 6th Chinese Communist Party Central Committee (*25*). Although placing primary stress on crop cultivation, the documents also generally emphasized livestock production, encouraged both private and collective feeding of hogs and poultry, promoted disease control and protection of animals, and strengthened research on breeding various animals.[7] Large animals such as water buffalo and yellow cattle, used mostly for draft work, did not increase as rapidly as hogs, sheep, and goats because of inconsistent policies on cattle raising over the years. Regulations formulated in the early 1950's, including "no cattle are allowed to be slaughtered or culled before 15 years of age," accel-

[6] More about creating new pastureland can be seen in (*17*).

[7] A somewhat detailed description of the policies can be seen in (*25*).

Table 5—China: Per capita consumption of major livestock products

Item	1952	1957	1965	1978	1979	1980	1981	1982	1983	1984
					Kilograms					
Country average:										
Pork	5.9	5.2	6.3	7.7	9.7	11.2	11.2	11.8	12.3	13.0
Eggs	1.0	1.3	1.4	2.0	2.1	2.3	2.4	2.5	3.0	3.9
Ruminant meat	.9	1.1	1.1	1.5	1.6	1.6	1.7	1.8	1.8	2.5
Poultry	.4	.5	.4	.4	.6	.8	.8	1.0	1.2	1.4
Rural households:										
Poultry	5.5	4.4	5.4	6.4	8.0	9.4	9.7	10.4	11.0	11.7
Eggs	.9	1.1	1.3	2.0	1.9	2.1	2.3	2.4	2.8	3.2
Urban households:										
Pork	6.9	9.0	10.4	13.7	17.4	18.0	17.0	17.6	18.0	18.7
Eggs	1.6	2.0	2.1	2.0	2.7	3.0	3.0	3.2	3.7	7.0

Sources: 1952-83 data from (*22*); 1984 data from (*23*).

Table 6—Comparing the U.S. and Chinese livestock sectors, 1983

Item	Unit	China	United States
Ratio of value of livestock production over value of crops and livestock production	Percent	19.1	49.9[1]
Yearend inventories:			
Hogs	Million head	298.5	55.8
Cattle	do.	78.1	114.0
Dairy cows	do.	1.0	11.1
Sheep	do.	98.9	11.4
Goats	do.	68.0	NA
Animal products:			
Red meat	Million tons	14.0	19.6
Pork	do.	13.2	7.6
Beef	do.	.3	11.8
Mutton	do.	.5	.2
Poultry	do.	1.2[2]	8.5
Cow milk	do.	2.2	70.0
Eggs	do.	3.3	4.0[3]
Per capita consumption:			
Red meat	Kilograms	13.5[4]	70.1
Poultry	do.	1.2[4]	29.8
Eggs	do.	3.0	15.0
Milk	do.	2.1[4]	97.7
Hog production:			
Farrow to finish	Months	8-18	6
Slaughter rate	Percent	68.7	163.3
Slaughter weight	Kilograms	111.7[5]	110.5
Dressed weight	do.	63.6[6]	78.6
Dressing rate	Percent	57.0[7]	71.1

NA = Not available.
[1]Total cash receipts for livestock and crop output. [2]Estimated from consumption and trade statistics. [3]A dozen eggs weighing 1.567 pounds was used to obtain the output. [4]Estimated from household expenditure survey statistics contained in (*19*, 1984) and (*21*, 1984). [5]Derived from dressed weight and dressing rate. [6]Pork output divided by number of slaughtered. [7]1979 dressing rate.

Sources: (*32*, *19*, *21*).

erated growth of cattle numbers (*25*). The collectivization program for livestock in the late 1950's, however, discouraged peasants from feeding livestock, particularly cattle. This policy continued through the early 1960's. In 1962, the Central Government promulgated "The Draft of the Revised Regulations for Work of Rural People's Communes" which again permitted private raising of cattle (*25*). Total numbers of cattle for the country as a whole gradually recovered and, in 1965, reached the 1956 level.

During the Cultural Revolution (1966-76), Government programs again were unfavorable for raising large animals. Policies emphasized agricultural mechanization and discouraged raising draft animals. No plans encouraged farmers to raise either beef cattle or dairy cows, and cattle raising by commune households was virtually prohibited (*25*). As a result, the cattle inventory in 1976 barely surpassed that of 1956.

Hog and poultry production developed somewhat differently. Livestock policy from 1949-79 generally allowed private feeding of hogs and poultry, although farm households were discouraged from raising livestock during the Cultural Revolution. Since hog manure has always been an important fertilizer for the country's crop cultivation, hog feeding in the collective and the State systems had often been integrated into China's annual agricultural production plans. As a result, hog inventories grew rapidly in the 30-year period before 1979.

Post-1979 Policies

Modifying livestock policies since 1979 greatly contributed to the recent impressive progress in livestock production. A brief description of the major changes follows.

Liberalized Ownership and Trading of Livestock. Liberalized livestock policies, such as eliminating restrictions on household members' raising livestock (particularly draft animals) and on slaughtering beef cattle and the revival of livestock trading markets, contributed to the upsurge of farmers' incentives for private feeding of hogs, cattle, sheep and goats, rabbits, and poultry. Yearend livestock inventories posted great increases immediately after the new policies were put into effect.

Higher Procurement Prices. Increased procurement prices for live animals and livestock products, officially announced in November 1979, dramatically stimulated sales, particularly of hogs. Actual price increases reportedly started before mid-1979 in many rural areas. Increases in livestock sales, in terms of Government purchases and retail sales, will be discussed in later sections. The average increases in procurement prices for live animals and livestock products in 1979 were significant, particularly if compared with those in the 1960's and through 1978 (table 7). For instance, the average procurement price of live hogs rose more than 26 percent in 1979 over the previous year, and the prices for beef cattle and sheep increased 39.4 percent and 34 percent.

Changes in Performance Indicators. New statistical reporting items, such as annual pork, beef, and mutton output figures, were added to the old indicators in 1980 to show the performance of annual animal production (*31*). In the past, basically only yearend inventories were included in the reports. Numerous reports

Table 7—China: Procurement prices of major livestock products[1]

Item	1952	1957	1962	1966	1971	1978	1979
				Yuan/100 kilograms			
Live hogs	53.00	73.14	92.64	94.38	95.12	98.92	125.06
Cattle	69.42	80.00	92.04	104.30	104.64	132.60	184.84
Sheep and goats	79.20	105.98	141.04	131.70	133.52	153.02	205.08
Eggs	62.00	94.20	166.40	128.00	128.80	137.80	168.00
Yellow cattle hides	2.66	2.60	2.74	2.86	1.88	1.88	4.18
Buffalo hides	1.30	1.30	1.46	1.58	1.60	1.60	2.40
Sheep hides	9.08	9.08	9.08	9.08	9.08	9.22	9.22
Goat hides	4.64	4.64	4.62	4.56	4.56	5.96	5.96

[1]All prices except for eggs are weighted average procurement prices. Egg prices are quota prices.

Sources: Egg data from (2); all other data from (21).

indicated that commune leaders often asked farmers as well as commune hog producers not to sell hogs, particularly at the end of a year, so that they could show an increase in yearend inventory numbers. The new additional reporting items encouraged livestock producers to concentrate on producing more meat rather than on larger yearend inventories. The changes also probably led production units to pay more attention to production costs, breeding stock numbers, adopting better breeds, and improving production and feeding technology.

Expanded Private and Fodder Plots. Regulations now allow for expanding private plots and fodder plots from about 7 percent to a maximum of 15 percent of total cultivated land on collective farms, permitting households to grow more feed grains for livestock.[6] This policy, as announced in 1981, was designed to raise incomes in poor regions. Private plots have been the main base for household sideline production. Relaxing private plot controls and reviving rural free markets have stimulated both household livestock output and diversification of rural production.

Specialized Household Production Units. New policies permit individual households to specialize in raising livestock, just as some farm households specialize in grain production. These policies have encouraged livestock production by farm households and helped develop livestock feeding operations run by collectives and State breeding farms. Now collective and State breeding farms reportedly supply bigger and better young animals to specialized households. One type of specialized household has evolved from a previous sideline production which has now become a principal activity and is usually found in suburbs of large cities. A second type specializes in feeding animals, such as cattle and poultry, under contract from collectives or state livestock breeding farms and is typically located in rural areas. Both types of specialized households offer the following benefits: (1) better use of surplus labor in rural areas, (2) higher commercial or procurement rates due to increased use of grains, (3) more independent production activities and decisionmaking by households, and (4) greater incentives because all income generated flows to the specialized households. Although the exact number of these types of specialized households is not officially published, their number has been growing rapidly. One source revealed in 1984 that households specializing in raising livestock expanded from about 2 million in 1982 to about 5.5 million in 1983 (*12*, Jan. 26, 1985, p. 1).

Rewards for Hog Producers. A bonus system encourages farm households to raise more hogs. Different provinces or autonomous regions set different criteria for rewarding hog producers, most often with bonuses of grains or chemical fertilizers, supplied either free or at discount prices (*2*, pp. 764-66). These measures have greatly increased farmers' incentives to raise hogs.

Planned Expansion of Feed Industry. Compound feed for livestock is very new for the country as a whole and by 1983 probably accounted for less than 10 percent of the annual total quantity of grains fed to livestock, But, the development of the feed industry has significantly increased feed supplies for suburban areas, boosting pork and poultry production, particularly around large urban centers such as Beijing and Shanghai. Therefore, with the growth of the feed industry, the increased number of households specializing in livestock, and changing feed consumption patterns,

[6]Private plots are often marginal land that farm households may use to grow what they need. Fodder plots are usually distributed by the collectives for raising more livestock and are restricted to grain cultivation.

livestock raising—at least around big cities—has begun to shift from traditional to modernized production.

Elimination of Pork Prices. Beginning in early 1985, the Government eliminated fixed pork prices and reformed the state hog procurement system. Low hog procurement prices in recent years encouraged farmers to sell grain to the Government rather than feed it to hogs, especially in the northeastern provinces. Although provincial statistics are not available to confirm this, national hog-to-grain price ratios, which are calculated from the average live hog procurement prices and average grain prices, have steadily declined since 1980 (fig. 2). A few months after the new pricing policy was imposed, pork prices increased an average of about 30 percent in the 22 provinces that have carried out the policy.

National Livestock Production

The Government generally discouraged the private production of livestock, except hogs and poultry, during the two decades prior to 1979. China's livestock policy shifted to emphasize and expand the private ownership of all animals, including cattle, as early as late 1978. Total meat output increased rapidly and, beginning in 1980, pork was no longer rationed in most parts of China. The annual total value of livestock has steadily increased, and the share of livestock production in the annual gross value of agricultural output (GVAO) also has expanded gradually in recent years.[9]

Yearend Inventories and Livestock Procurements

Since the beginning of 1979, China's animal husbandry sector has made impressive progress in increasing livestock output, in both numbers and value. The overall growth rate of livestock production was particularly rapid in the late 1970's but rates slowed after 1980. This trend can be partly illustrated by the changes in yearend inventories and in procurement numbers of major livestock categories (table 8). Hog inventories actually began to decline in 1980, although in 1982 and 1984 the hog numbers increased somewhat (fig. 3). Except for 1981 and 1983, procurement numbers have grown faster since 1979 than the long-term average annual growth rate during 1952-78. The decline of inventory and slowdown in procurement after 1979 were mainly due to limited Government storage and lack of transportation.

[9]Procedures for calculating the value of annual livestock production are included in appendix A. The procedures are different from the cash receipts concept that is used in the United States to show U.S. livestock production.

Figure 2
Hog-to-grain price ratio

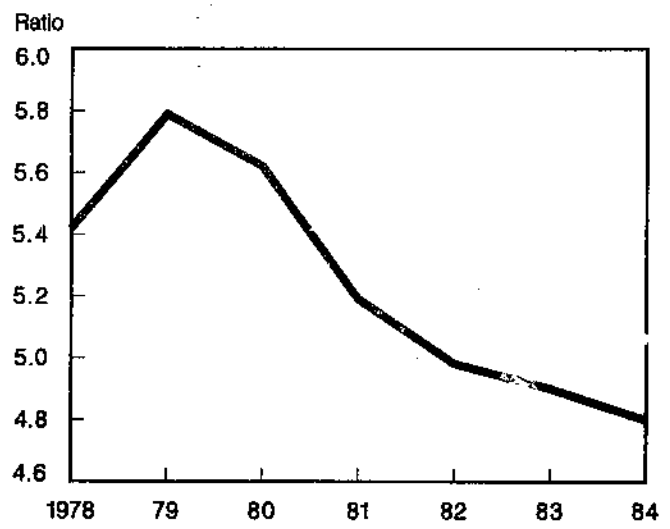
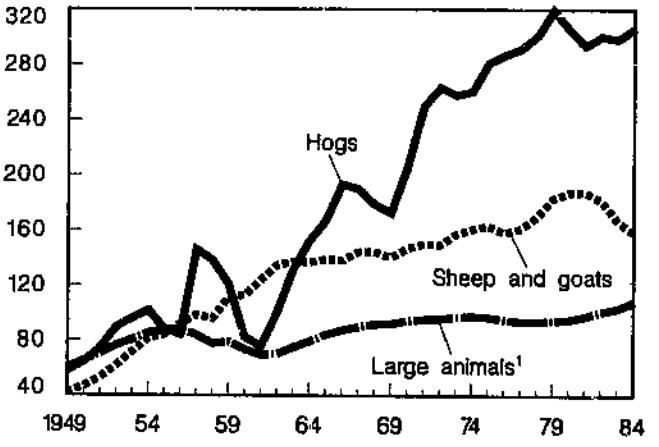


Figure 3
Changes in yearend livestock inventories



1/ Large animals are cattle, water buffaloes, horses, mules, donkeys, and camels. Source: (19).

Table 8—China: Growth of animal yearend inventories and procurement numbers

Year	Annual change in—					
	Yearend inventory			Procurement numbers		
	Hogs	Cattle	Sheep and goats	Hogs	Cattle	Sheep and goats
	Percent					
1952-78	4.8	0.9	4.0	4.2	0.4	2.5
1979	6.1	.9	7.8	23.9	35.2	34.6
1980	−4.5	.5	2.3	5.2	16.4	25.0
1981	−3.8	2.3	.2	−3.7	8.9	23.1
1982	2.4	3.8	−3.2	5.4	−3.0	−12.0
1983	−.7	2.6	−8.2	−1.0	16.0	9.4
1984	2.7	5.2	−5.1	6.5	9.2	21.1

Sources: Calculated from app. tables 1, 2, and 21.

Relatively rapid development in draft cattle numbers beginning in 1981 indicates the impact of the recently imposed rural household contract systems, especially in southern China, where further agricultural mechanization has been put off indefinitely. Lower cattle procurement and higher yearend inventories in 1982 suggest that owners have retained cattle for draft purposes in the last several years (table 8). The growth of sheep and goat production in recent years is reflected by the rate both annual inventory numbers and procurement numbers have increased, peaking in 1979 and slowing thereafter. Although goat numbers declined in 1981 and 1982, milk goat development has been emphasized in the last several years. Milk goats numbered over 2.4 million in 1983 (*12*, May 21, 1985, p. 2). Shaanxi province, the major goat milk producer, produced 7,350 tons of goat milk powder, two-thirds of China's national total output in 1983 (*12*, May 2, 1984, p. 2).

A good way to measure how increases in procurement prices have affected the livestock marketing pattern is to compare changes in ratios of total number of animals procured through the Government system with total animals slaughtered. Data needed to calculate these ratios, however, are available only for recent years. The ratios of animals procured through the Government system almost all increased significantly immediately following the rise in procurement prices in 1979. This effect, however, leveled off after 2 or 3 years as the ratios, in some cases, even dropped (table 9).

Expansion of Meat Output

Total meat output has increased continuously since 1978 (table 10). Although the rapid growth of meat production achieved in the late 1970's slowed in the early 1980's, total meat output increased almost 80 percent during 1978-84. Per capita meat availability rose about 67 percent (app. table 3). This 6-year gain was much greater than the total increase of 51 percent registered between 1952 and 1978.

Pork production contributed almost all the meat increase during the last several years; pork grew about 83 percent between 1978 and 1984. Pork output now accounts for about 94 percent of total red meat output (app. table 3).

Output of Other Livestock Products

Milk and wool production have also increased since 1978. Statistics for milk and wool are missing for the years before 1978. However, per capita milk consumption and wool use in China never have been high (app. table 4). For example, China's total milk output was less than 2.6 million tons in 1984, or only about 2.5 kilograms of milk available per person.

China vigorously promotes dairy production. Households are encouraged to raise dairy cows, particularly around big cities. Heilongjiang province, for instance, has set up new regulations to allot roughly 0.1 hectare of fodder land to households for each cow raised. In addition, for every 4 jin of cow milk delivered to procurement stations, the province will supply households with 1 jin of concentrate feed. As a result, dairy cows raised by households in Heilongjiang accounted for more than 85 percent of the total number of cows in the province in 1985. China's total dairy cow numbers and milk production are shown in appendix tables 4 and 9. Statistics on other dairy products, such as butter, are not available, but China consumes only about 1,000 tons of butter and margarine a year (6, Nov. 1984, p. 1).

Table 9—China: Changes in ratios of the number of live animals procured by the Government to the total slaughtered

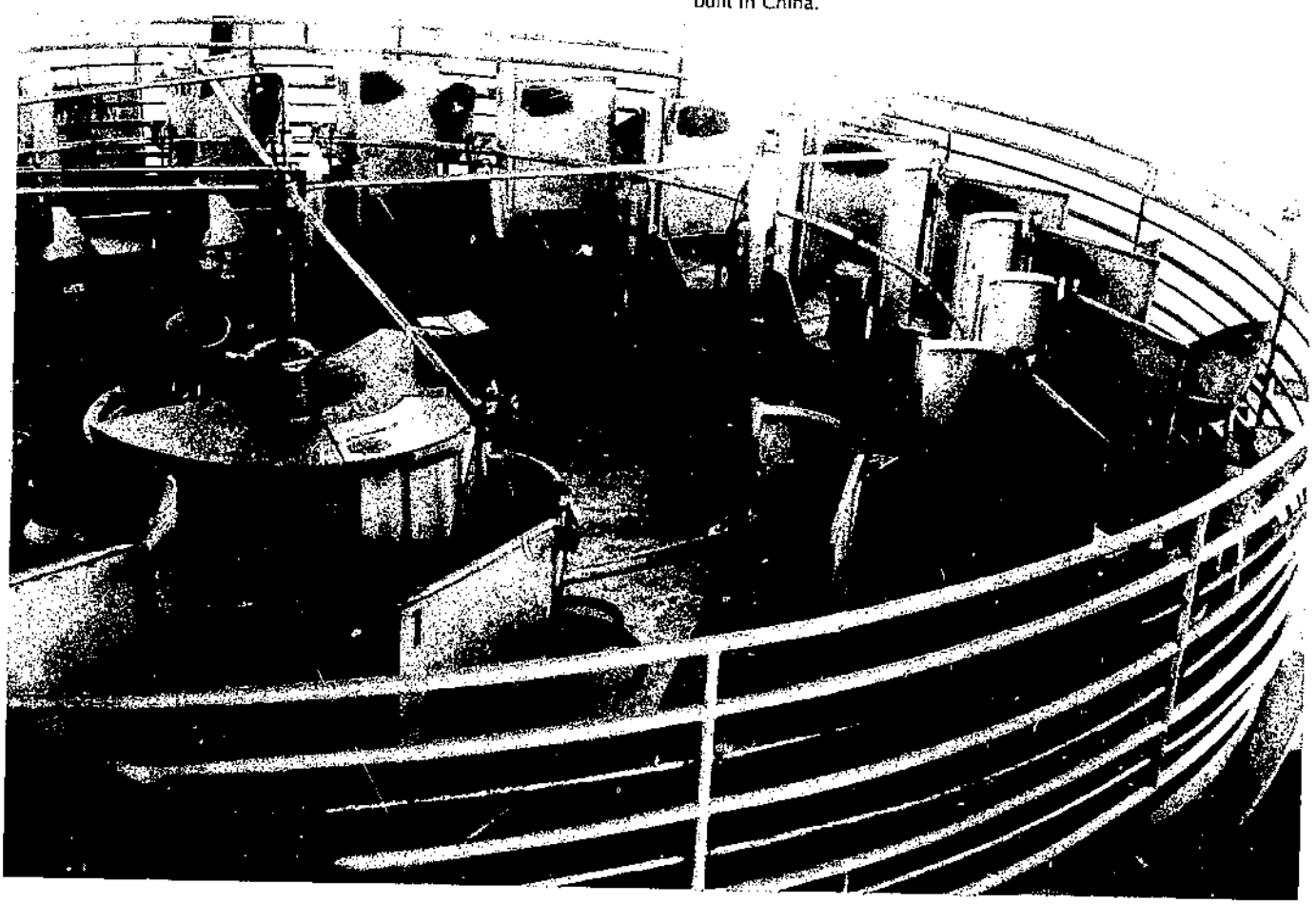
Year	Number of animals procured by the Government			Total slaughtered			Ration of animals procured to slaughtered		
	Hog	Cattle	Sheep and goats	Hog	Cattle	Sheep and goats	Hog	Cattle	Sheep and goats
	1,000 head						*Percent*		
1978	109,365	1,408	9,983	161,000	NA	NA	68	NA	NA
1979	135,365	1,903	13,439	187,675	2,968	35,437	72	64	38
1980	142,500	2,216	16,802	198,607	3,322	42,419	72	67	40
1981	137,238	2,414	20,682	194,947	3,016	44,814	70	80	46
1982	144,633	2,341	18,197	200,627	3,096	48,742	72	76	37
1983	143,147	2,716	21,725	206,614	3,472	49,237	69	78	44
1984	152,387	2,965	26,334	220,471	3,869	50,805	69	77	52

NA = Not available.

Sources: App. tables 1, 10, 12, 21.

This dairy barn interior, above, is typical of a state-run farming operation.

The rotating milking parlor below is capable of handling 400 cows per day. Found only in Shanghai, this mechanism was designed and built in China.



Egg statistics have just become available since 1982 (app. table 4). Production of eggs and poultry meat reportedly increased significantly since then. Much of China's manufactured feed has been used by the expanding poultry subsector (*30*). This growth is particularly rapid around medium and large cities.

Output Value of Livestock Production

Livestock production is one of the five components of China's gross value of agricultural output (GVAO), an indicator often used in China to monitor development of the farm sector. In value terms, annual growth rates of the livestock output in the last 6 years were all higher than the long-term annual growth rates, either for 1952-70 or for 1971-78 (table 11). Except for 1983, annual growth rates of livestock production were also higher than for the entire agricultural sector during 1978-84. Although the ratio of livestock production to crop output is still low, it has increased to about 1:4. The ratio was about 1:5 in 1978 and 1:7 in 1952. The new ratio of 1:4, however, is still far from the 1:1 ratio of the United States.

Table 10—China: Growth of meat output and per capita availability

Year	Growth in meat output				Per capita meat availability[1]
	Total	Pork	Beef	Mutton	
			Percent		
1952-78	3.0	NA	NA	NA	1.6
1979	24.1	26.9	−25.8	5.6	22.5
1980	13.4	13.3	17.0	17.1	12.8
1981	4.6	4.8	−7.4	7.0	3.3
1982	7.1	7.0	6.8	10.1	4.7
1983	3.8	3.5	18.6	4.0	3.0
1984	9.9	9.8	18.4	7.5	8.8

NA = Not available.
[1]Includes exported meat.

Source: Calculated from app. table 3.

Table 11—China: Annual growth rates of gross value of agricultural output (GVAO) and the output value of the livestock sector[1]

Year	Annual growth in—		Ratio of livestock production value to crop output value
	GVAO	Value of livestock production	
	------- *Percent* -------		*Ratio*
1952-70	3.1	3.7	12/88 – 15/85
1971-78	3.0	2.0	16/84 – 16/84
1979	7.6	14.6	17/83
1980	1.4	7.0	18/82
1981	5.9	5.9	19/81
1982	11.1	13.2	20/80
1983	7.9	3.9	19/81
1984	11.6	13.5	20/80

[1]GVAO's of 1971-84 used for calculating percentages do not include rural industrial output values generated by brigade- and team-run enterprises. Values of 1952-70 used for calculating percentages of growth rate were based on 1957 constant prices, 1971-80 based on 1970 constant prices, and 1981-84 based on 1980 constant prices. However, percentages of growth rate for 1980 and 1981 were calculated by using comparable prices as published by the Chinese Government.

Source: Calculated from app. table 19.

Regional and Provincial Livestock Production

China published provincial livestock statistics for the first time in 1980. Since then, the Ministry of Agriculture, Animal Husbandry, and Fisheries has annually issued yearend animal inventories, number of livestock slaughtered, and red meat output. Provincial livestock statistics are important because they show how various kinds of livestock are distributed geographically, what characteristics of regional livestock production are, and how the livestock sector developed in different areas in China.

Hogs

The hog inventory for the country as a whole peaked in 1979, and annual inventories in recent years seemed to have stayed around 300 million head. Provincial statistics for the last few years show that inventories of hogs rose in the south and southwest, but dropped or grew slowly in most other regions (app. table 5). The grazing region's shares of hog inventories have shrunk slightly since 1979 (table 12).

The number of hogs slaughtered has risen slowly and steadily since 1979. The share of hogs slaughtered from the grazing region, like the share of hog inventories, also declined slightly (table 12). The growth of provincial slaughter numbers generally followed the national pattern, except in Heilongjiang, where numbers decreased 4 consecutive years between 1979 and 1983 (app. table 5). The continuous growth of the country's total number of hogs slaughtered has been attributed to increased grain fed and other policy changes, such as increased procurement prices.

Hog development in China, at least in the past few years, has made rapid progress in raising the slaughter rate (number slaughtered/beginning inventory), particularly in big cities such as Beijing, Shanghai, and Tianjin, and in east coast provinces, such as Jiangsu and Zhejiang. Annual hog slaughter rates in these big cities and provinces, as shown in appendix table 5, are generally higher than the national average. In Shanghai, for instance, the hog slaughter rate has increased more

Table 12—China: Regional shares of yearend hog inventories and number slaughtered

Region	Yearend hog inventories						Number slaughtered					
	1979	1980	1981	1982	1983	1984	1979	1980	1981	1982	1983	1984
	Percent											
Grazing region	4.0	3.8	3.7	3.5	3.4	3.4	3.4	3.5	3.1	3.1	3.1	3.0
Farming region	96.0	96.2	96.3	96.5	96.6	96.6	96.6	96.5	96.9	96.9	96.9	97.0

Source: Calculated from app. table 5.

than 140 percent since 1982, approaching the rates observed in many western countries.

Although no official statistics have been published, hog carcass weights are low. The average weight of pork produced per hog, which can be calculated from total pork output and the number of hogs slaughtered, was only 53.4 kilograms for the country in 1979. The average has increased since then and reached 65.5 kilograms in 1984. In terms of provincial production, the average meat produced per hog varies significantly, from as high as 84.5 kilograms of pork per hog in Jilin to only 47.7 kilograms per hog in Xizang in 1984 (app. table 6). Many factors affect the carcass weight of slaughter hogs: local differences in breeds, length of time hogs are kept in pens, the types and amount of feed or grains fed, and feeding methods. Hogs raised in Shanghai, for example, are probably fed with more grain or mixed feed than elsewhere, but because they are fed for a shorter period of time and because of the nature of the region's native hogs, the 1984 weight of pork per hog averaged only 52.3 kilograms, far below the typical slaughter weight in western countries, and considerably lower than the national average of 65.5 kilograms. In Jiangsu province, both the average hog carcass weight and the slaughter rate vary even within the province because of differences in local feeding methods and breeds. In northern Jiangsu, for instance, hogs are kept in sties for 12 months or more to reach a slaughter weight of 110-120 kilograms; in southern Jiangsu, however, hogs are fed for only 5-6 months and slaughtered with a live weight of about 70 kilograms (*30*).

Pork production contributes about 94 percent of the total red meat in China, but the pork share varies by region. In the farming region, pork constitutes almost 97 percent of total meat output, but only about 50 percent in the grazing region (app. table 7).

All grazing region provinces have a lower share of pork to total meat production than the national average. Xizang, however, had the lowest percentage, less than 5 percent during 1979-84, and Xinjiang and Qinghai recorded less than 30 percent for the same period (app. table 7). The major cause is the low grain availability associated with these provinces. Religion, for example, a bigger Moslem population in the northwestern provinces, may also contribute to the lower pork consumption in the grazing region.

Large Animals

The grazing region, which includes six provinces or autonomous regions, has a large share of China's large animal stock. The region raises about 28 percent of the country's total large animals, compared with only about 4 percent of hogs in the last few years. Five of the six provinces in the grazing region, all except Ningxia, are among the top provincial producers of large animals in terms of yearend inventory numbers (app. table 9).

Although provinces of the grazing region produce 28 percent of the nation's large animals, they account for a much smaller share of draft animals, only about 15 percent. Conversely, the farming region raises proportionally more large animals for draft purposes. Another sharp contrast between the two regions is that all water buffaloes are raised in the farming region and practically all of the camels in the grazing region (app. table 9).

Cattle in the grazing region account for about 25 percent of cattle inventories but over 40 percent of the total number of cattle slaughtered and of national beef production (table 13). The slaughter share is greater than the inventory share because of the region's higher slaughter rate (app. table 10). In 1980, cattle slaughter rates in the grazing region were over 10 percent, compared with the national average of only 4.7 percent, also indicating the limited importance of large animals for draft purposes in the grazing region.

The average amount of beef produced per head of cattle in the grazing region is not noticeably higher than in the farming region. Beef production has improved over the national average in most of the prov-

inces in northern and northeastern China, but the best per head beef output has come from Heilongjiang and Shandong provinces, and in Tianjin city (app. table 11).

Because cattle are more important in the grazing region, beef provides more than 16 percent of the regional total meat production, compared with only about 2 percent for the country as a whole (table 14).

In 1979, China classified only 882,000 of its 71.3 million head of cattle as better bred (mostly crossbred) beef cattle. Of this small number, 692,000, or nearly 80 percent, were fed in the grazing region. Nei Monggol alone raised 507,000 head in 1979 (app. table 10).

Finally, the grazing region also raises a bigger proportion of China's horses, donkeys, and camels (app. table 9).

Sheep and Goats

The grazing region clearly dominates in raising sheep and goats, accounting for more than half of the country's total sheep and goats in recent years (table 15). In fact, five of the six provinces included in the grazing region—Nei Monggol, Xinjiang, Xizang, Qinghai, and Gansu—are the top sheep and goat producing provinces (app. table 12).

Provincial slaughter rates of sheep and goats in the grazing region are not particularly impressive and the region has generally encountered a declining share of the number of sheep and goats slaughtered (table 15). The highest provincial sheep and goat slaughter rates are found in Anhui, Jiangsu, Jiangxi, and Shandong provinces, all in the farming region.

Despite the lower slaughter rates, the mutton output from the grazing region equaled approximately half of the nation's total mutton production (table 16). The main reason is higher meat output per sheep or goat raised in the grazing region, particularly in Qinghai (app. table 13). Higher meat output per sheep or goat is also found in Guangdong and Jiangxi provinces in the farming region.

The contribution of mutton output to regional total meat production is highly significant for the grazing region, where mutton is second only to pork output. Table 16 indicates that while mutton output consists of only 2 percent of total meat output in the farming region, it contributes more than 33 percent of total meat production of the grazing region. Particularly in the Qinghai and Xinjiang autonomous regions, mutton contributes about 50 percent of the total meat production (app. tables 14 and 15).

Table 13—China: Share of yearend inventories of cattle and number slaughtered in grazing and farming regions

Region	Yearend cattle inventories						Number slaughtered					
	1979	1980	1981	1982	1983	1984	1979	1980	1981	1982	1983	1984
	Percent											
Grazing region	24.6	NA	25.5	NA	NA	NA	40.0	42.6	43.1	43.6	46.8	44.1
Farming region	75.4	NA	74.5	NA	NA	NA	60.0	57.4	56.9	56.4	53.2	55.9

NA = Not available.

Sources: Calculated from app. tables 9 and 10.

Table 14—China: Regional share of beef output to national total and the contribution of beef to total meat output

Region	Share of beef output to national total						Contribution of beef output to total meat output					
	1979	1980	1981	1982	1983	1984	1979	1980	1981	1982	1983	1984
	Percent											
Grazing region	41.4	43.8	43.9	45.2	47.3	43.6	16.3	18.2	16.2	16.2	19.0	19.0
Farming region	58.6	56.2	56.1	54.8	52.7	56.4	1.3	1.3	1.2	1.1	1.1	1.1

Source: Calculated from app. table 14.

Per Capita Meat Availability

Average meat availability per person in the grazing region is slightly lower than that in the farming region (table 17). But, Xizang and Qinghai of the grazing region have the highest per capita total meat availability in the country, with quantities about double the national average. In the farming region, Sichuan, Hunan, and Jiangsu lead in per capita meat availability. The per capita mutton availability in Qinghai and per capita beef and mutton availabilities in Xizang were each almost as big as or bigger than the average total meat available per person for the country as a whole (app. table 16).

Pork output is the predominant component of total meat production in both grazing and farming regions, although beef and mutton are relatively more important in the grazing region. This relationship can be seen in per capita meat availability (table 17). The availability of pork per person in the grazing region averaged only half of that in the farming region. However, quantities of beef and mutton available per person in the grazing region, although small, were 15-20 times as much as those in the farming region.

Other Livestock Products

Because of the number of sheep and goats raised in the grazing region, major wool, mohair, and cashmere producers have all been located in the region, particularly in Nei Monggol, Xinjiang, Qinghai, and Xizang provinces. On a provincial basis, Heilongjiang, Nei Monggol, and Sichuan are the leaders in producing cow milk, and Shaanxi, Xizang, and Shandong are major goat milk producers. For the first time, China published its provincial egg output for 1982 in 1984. Shandong, Jiangsu, Sichuan, and Hubei are the major egg producing provinces (app. table 17).

Livestock Marketing

For the last 30 years, China's livestock sector has mainly sought to increase animal inventories. Although agricultural policies have increased stress on meat and animal product output since 1979, marketing of livestock products has generally been neglected and the entire marketing system remains relatively simple. But Government planners have recognized the importance of marketing and have begun to strengthen the system because of increases in the number of animals slaughtered and the rise in output of livestock products, such as meat, eggs, milk, and animal hides.

Information on livestock marketing, like marketing information on other agricultural commodities, has been very scarce. Using available statistics, I will briefly describe a few livestock marketing features in China, including livestock procurement, retail sales, free market sales, prices, storage, and transportation.

Table 15—China: Regional share of yearend inventories of sheep and goats and number slaughtered

Region	Yearend inventory						Number slaughtered					
	1979	1980	1981	1982	1983	1984	1979	1980	1981	1982	1983	1984
	Percent											
Grazing region	51.8	51.3	53.0	53.1	54.2	56.8	45.3	43.8	39.6	42.6	41.9	42.0
Farming region	48.2	48.7	47.0	46.9	45.8	43.2	54.7	56.2	60.4	57.4	58.1	58.0

Sources: Calculated from app. tables 12 and 13.

Table 16—China: Regional share of mutton output to national total and the contribution of mutton to total meat output

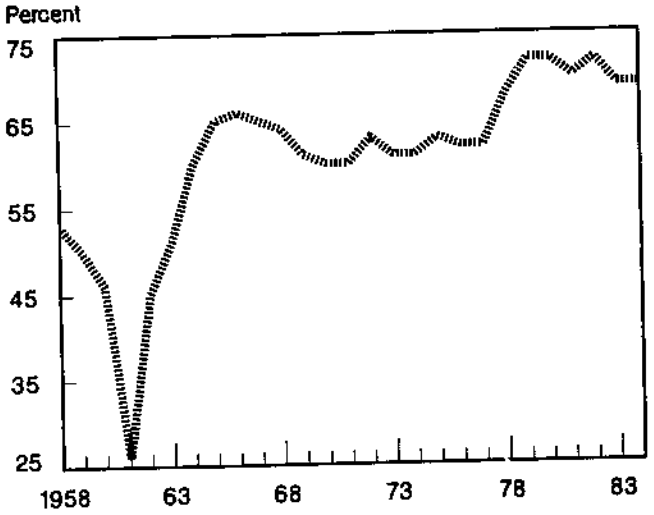
Region	Share of mutton output to national total						Contribution of mutton output to total meat output					
	1979	1980	1981	1982	1983	1984	1979	1980	1981	1982	1983	1984
	Percent											
Grazing region	51.5	49.8	47.4	48.7	47.9	48.5	33.4	34.2	33.5	34.4	33.3	33.2
Farming region	48.5	50.2	52.6	51.3	52.1	51.5	1.8	2.0	2.1	2.1	2.1	2.1

Source: Calculated from app. table 14.

Livestock Procurement

China's farmers can sell their live animals and livestock products either through the Government procurement system or on local rural markets after they secure a slaughtering permit. Between 1965 and 1977, the Government procured 60-66 percent of the annual total slaughter of hogs; the price increase in 1979 evidently encouraged farmers to sell more to the Government and the percentage has since risen to 69-72 percent, a record level (fig. 4). Most of the balance was slaughtered locally and consumed on-farm. A small but increasing part was sold on local rural markets in recent years.

Figure 4
Annual sales of hogs through the Government procurement system



Retail Sales

The Chinese system allows two kinds of retail sales of livestock products: Government resale after animals and livestock products have entered the Government system, and rural market retail sales by farmers who obtain slaughter permits from Government procurement stations. In some provinces, farmers have part of the meat returned to them, particularly pork, from animals after they sell to Government procurement stations. The meat can be either consumed onfarm or sold to other consumers at the nearby rural markets.

Government retail sales take place mainly in urban areas. Quantities of sales have generally been rising and are related to the quantities that have been procured by the Government. In the case of hogs, retail sales of pork increased 3.9-fold between 1952 and 1984 (table 18).

Table 17—China: Regional per capita red meat availability

Region	Total red meat						Pork					
	1979	1980	1981	1982	1983	1984	1979	1980	1981	1982	1983	1984
	Kilograms											
Grazing region	9.9	10.8	11.0	12.0	12.5	13.5	5.0	5.1	5.5	5.9	5.9	6.5
Farming region	11.0	12.4	12.8	13.4	13.7	15.0	10.6	12.0	12.3	13.0	13.3	14.5
National average	10.9	12.3	12.7	13.4	13.6	14.9	10.3	11.5	11.9	12.6	12.8	14.0
	Beef						Mutton					
	1979	1980	1981	1982	1983	1984	1979	1980	1981	1982	1983	1984
	Kilograms											
Grazing region	1.6	2.0	1.8	1.9	2.3	2.6	3.3	3.3	3.7	3.6	4.2	4.5
Farming region	.1	.2	.1	.2	.2	.2	.2	.2	.3	.3	.3	.3
National average	.2	.3	.2	.3	.3	.4	.4	.5	.5	.5	.5	.6

Source: Calculated from app. table 14.

Information on retail sales by farmers is not available for years prior to 1978. Much of the retail sales of livestock or livestock products by farmers has been reportedly to nonfarm buyers or residents. These sales have all increased remarkably (table 19). The number of hogs sold by farmers to nonfarm residents in 1984 was more than 18.6 million head compared with only 1.5 million in 1978 a twelvefold increase in just 6 years.[10] Retail sales of other livestock products all rose ninefold to tenfold during the same period.

Prices

Two kinds of livestock product prices were important to farmers who raised animals before 1985: the procurement price and the retail sale price. Procurement prices were the prices farmers received from the Government when they delivered their animal products to State procurement stations. Procurement prices were infrequently adjusted in China. The most recent changes of procurement prices were an average increase of about 25 percent on most livestock products in 1979. Table 7 lists procurement prices of major livestock products; appendix table 22 lists a series of the composite average procurement prices of major livestock products. The Government procurement system has not generally graded livestock products especially if compared with the standards used in the United States. Thus, prices did not vary among regions based either on quality or season.

The Government abolished the fixed procurement and retail prices for hog production in early 1985. Procurement prices are now replaced by contract prices. Farmers without contracts can sell hogs without having to go through the Government procurement system to fulfill any quota. The price of hogs is now determined by the market demand and supply. Quality-based price differentials are also more often observed in the market.

Two different sets of retail sale prices for animal products also exist: retail prices fixed by the Government and retail prices prevailing in rural free markets. Government-fixed retail prices were not changed frequently before 1985; the most recent increases in retail prices of livestock products took place in 1979 (table 20). Beginning in 1985, the Government stopped controlling retail prices of pork sold through the Government channels.

Before 1984, pork was the most expensive meat at retail. Beef prices, for the first time, surpassed the pork price in 1984.

The retail sales prices of livestock output in the free market, just like other commodities sold on the market, are negotiable between the buyers and the farmers who sell the products. The price negotiation should fall into a range set by the Government. The price ranges of various livestock products, however, are not available.

[10] *China's Statistical Yearbook* (21) reports only number of hogs sold by farmers to nonfarm residents. No meat equivalent is reported. Nonfarm residents may include restaurants and institutional cafeterias.

Table 18—China: Hogs slaughtered and procured and retail sales of pork by the Government

Year	Number slaughtered	Number procured	Retail sales of pork
	1,000 head		*1,000 tons*
1952	65,450	37,427	1,704
1958	88,000	46,732	1,399
1965	121,670	78,595	2,777
1970	125,930	75,621	2,874
1971	147,980	88,166	3,152
1972	165,980	105,263	3,858
1973	166,840	101,959	3,976
1974	162,440	98,434	3,973
1975	162,300	102,810	4,259
1976	166,500	103,506	4,176
1977	167,870	104,166	3,990
1978	161,100	109,365	4,675
1979	187,680	135,455	5,980
1980	198,610	142,500	7,045
1981	194,950	137,238	7,100
1982	200,630	144,633	7,525
1983	206,610	143,147	7,975
1984	220,470	152,387	8,445

Source: (21).

Table 19—China: Retail sales of major livestock products by individual farmers to nonfarm residents

Item	Unit	1978	1979	1980	1981	1982	1983	1984
Hogs	1,000 head	1,500	4,350	7,050	10,000	12,000	14,270	18,550
Cattle	do.	140	205	450	580	715	920	1,150
Sheep and goats	do.	1,000	1,550	3,500	4,100	5,200	6,651	8,143
Poultry	1,000 birds	40,000	73,000	112,000	125,000	150,000	225,000	305,000
Eggs	1,000 tons	45	111	181	225	280	332	445

Source: (21).

Table 20—China: Average retail prices of major livestock output for Government sales

Year	Pork	Beef	Mutton	Eggs	Poultry
	---------- *Yuan/100 kilograms*[1] ----------				*Yuan/bird*
1952	92.0	83.0	89.0	75.8	NA
1958	118.0	100.0	102.4	140.0	1.5
1965	162.4	116.0	116.0	165.0	1.7
1966	160.0	116.0	116.0	160.0	1.7
1967	160.0	116.0	116.0	160.0	1.7
1968	160.0	116.0	116.0	160.0	1.7
1969	160.0	116.0	116.0	160.0	1.7
1970	160.0	116.0	116.0	160.0	1.7
1971	160.0	116.0	116.0	160.0	1.7
1972	160.0	116.0	116.0	160.0	1.7
1973	160.0	116.4	116.0	161.0	1.7
1974	160.0	117.2	120.6	163.8	1.8
1975	160.8	119.6	119.2	163.8	1.8
1976	161.8	116.6	115.4	165.8	1.8
1977	162.2	119.2	117.2	165.8	1.8
1978	162.4	119.2	117.4	167.2	2.0
1979	177.6	139.6	133.8	174.8	2.1
1980	202.2	176.0	164.8	207.8	2.5
1981	210.8	188.4	170.2	215.2	2.6
1982	212.0	201.6	171.0	216.8	2.9
1983	218.6	205.2	178.2	224.8	3.2
1984	228.2	249.8	221.0	236.4	3.1

NA = Not available.
[1]In meat weight.

Source: (21).

Storage and Transportation

China does not record official statistics on either cold storage capacity for livestock products or transportation facilities, but both are in very short supply. The inability of procurement stations to handle the sudden surge of hog deliveries following the procurement price increases of 1979 was obviously due to limited holding pens and storage and the lack of transportation facilities. Although China expanded cold storage capacity by over 100,000 tons annually during the early 1980's, the Government still could not manage peak sales of hogs in the summer.[11]

China's road system is underdeveloped and rural roads are generally poorly maintained. A large portion of the road system is unpaved. Rural roads are distributed unevenly throughout the country, with greater density in coastal provinces. Animal or human labor carries roughly 80 percent of total freight moving on rural roads; trucks and tractors transport the rest (*11*).

Although poor transportation facilities are largely responsible for the inability to move livestock products from surplus areas to deficit localities, other factors, such as the absence of price differentials among regions and the lack of seasonal variation in procurement prices, were also responsible for the Government's failure to efficiently handle the increases in hog purchases in the early 1980's. Finally, prohibiting private transportation of agricultural commodities in the past also hampered the transit of agricultural products from production surplus areas to key consumer or production-deficit areas.

[11]See the economic commentary on China's infrastructure in (26).

Live Animal and Livestock Product Trade

Exports of live animals and livestock products account for a significant part of China's annual total agricultural exports. According to China's customs statistics, the export value of livestock and products amounted to about 5-10 percent of annual total exports in recent years. Statistics assembled from China's trading partners show the same results (table 21). Imports of livestock products, in both quantity and value terms, are small.

Quantities of Exports

Exports of live animals and livestock products, such as hogs, cattle, fresh and frozen poultry, canned pork, rabbit meat, and eggs, have gradually increased in the past three decades, although exports of frozen pork in recent years still lag behind the level of the mid-1950's. While live hog and poultry exports grew slowly in recent years, cattle exports rose rapidly (app. table 23). After stagnating at about 100,000 head for about 10 years prior to 1974, shipments have risen to over 200,000 head annually. Shipments rose because in 1978 China began selling improved-breed beef cattle to Hong Kong. In earlier years, only old or culled native cattle of poor beef quality were exported. Exports of cattle, however, have gradually declined since 1982, largely because of the mounting domestic demand for draft animals induced by the household responsibility system. Nevertheless, China reportedly started exporting beef cattle to Japan in 1985.

Live hog exports to Hong Kong also encountered quality problems. Chinese native hogs produce less lean meat than hogs shipped from Southeast Asian countries. The problem has been partially corrected in recent years because of the joint-venture livestock farms that have been set up in the Shenzhen Special Economic Zone and in other areas of south China. For example, the lean Belgian hog raised in the Guangming Overseas Chinese Livestock Farm, located in the Shenzen Special Economic Zone, yields 62 percent lean meat. This ratio is comparable to those of western standards and is much higher than native hogs raised in China.

Table 21—Major animal product and total agricultural trade

Item	1970	1975	1978	1979	1980	1981	1982	1983
				1,000 dollars				
Exports:								
Live animals	68,277	215,359	258,288	262,558	340,136	376,139	340,247	296,978
Meat and meat products	103,000	236,746	277,616	303,792	386,240	377,028	416,190	425,325
Dairy products and eggs	30,935	66,995	81,190	88,839	89,660	95,474	95,730	79,409
Hides, skins, and furskins	17,177	24,578	55,351	82,404	76,983	80,098	84,461	94,398
Silk	76,486	128,504	245,587	313,992	274,977	208,417	309,697	354,534
Wool and other animal hair	22,558	39,278	106,607	136,133	214,938	257,053	191,772	245,719
Animal oil and fats	27	42	100	159	200	305	420	318
Subtotal livestock	318,460	711,502	1,024,739	1,187,877	1,383,134	1,394,514	1,438,517	1,496,681
Total agricultural commodities	934,581	2,574,207	3,103,750	3,604,395	4,231,527	4,557,555	4,262,584	4,520,910
All commodities	2,163,125	7,120,634	10,169,520	13,651,911	18,919,801	21,510,991	22,955,139	23,688,154
Imports:								
Live animals	37	28	1,330	357	2,408	2,884	2,627	2,218
Meat and meat products	56	73	518	381	1,122	719	2,958	3,093
Dairy products and eggs	157	395	14,794	11,635	5,306	11,362	45,402	12,968
Hides, skins, and furskins	452	5,089	7,843	9,079	46,829	22,092	24,512	14,970
Silk	0	0	216	56	0	36	381	196
Wool and animal hair	5,101	10,141	31,588	77,724	145,574	190,788	316,275	224,488
Animal oils and fats	1,175	18,824	42,283	66,114	62,207	18,305	27,059	12,891
Subtotal livestock	6,978	34,550	98,672	165,346	263,446	246,186	419,214	270,824
Total agricultural commodities	513,304	1,341,459	2,484,431	3,432,333	5,241,379	5,045,796	4,863,413	3,577,033
All commodities	2,051,141	6,818,344	10,331,095	14,363,344	19,303,162	18,053,394	16,712,899	18,306,145

Source: (4).

Rabbit meat exports grew gradually during the last decade and reached 300,000-450,000 tons a year in the 1980's. A large portion of the exports were shipped to European markets. The United States also has imported limited amounts of rabbit meat from China for more than a decade.

Livestock Imports

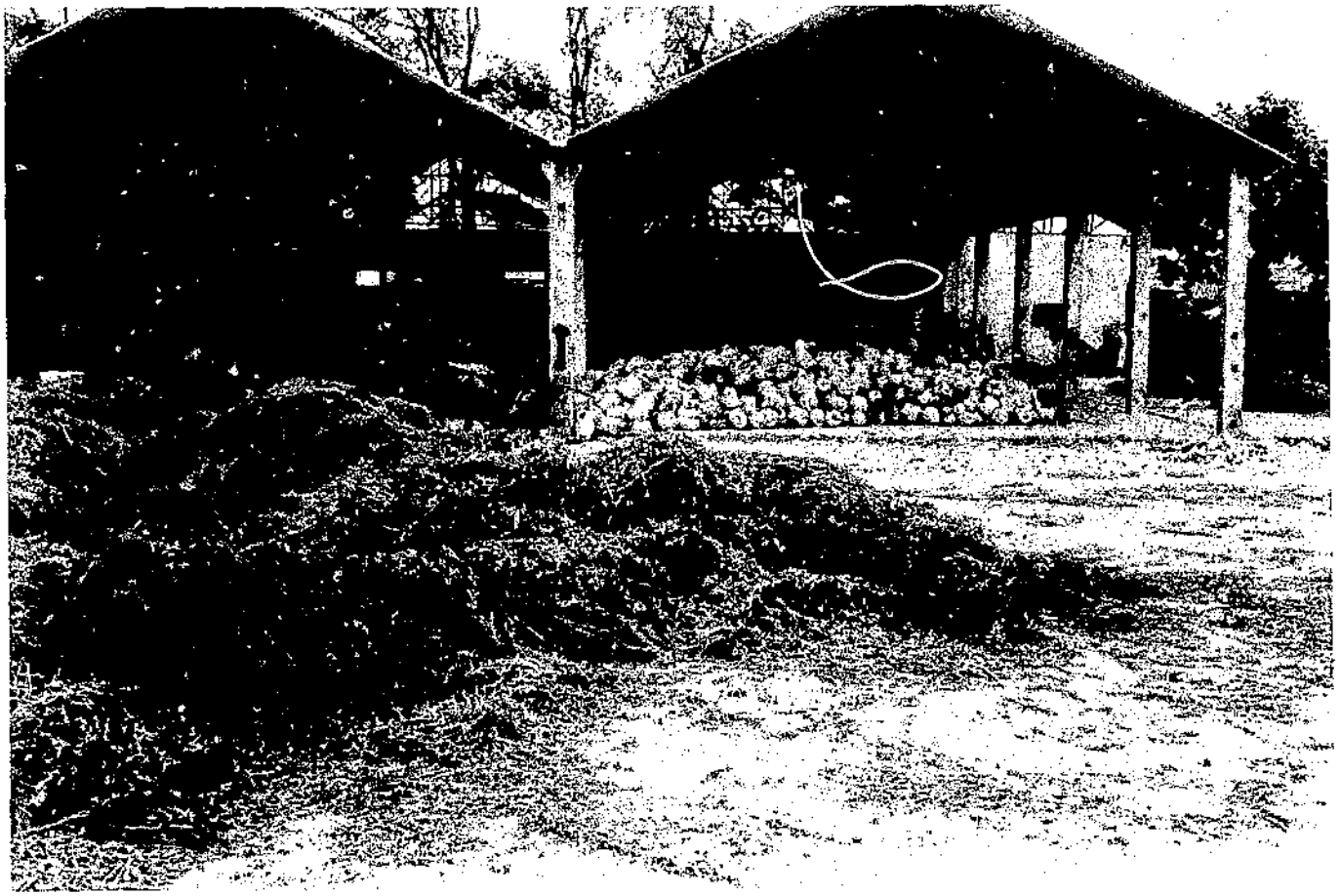
China's statistical yearbooks indicate that only two livestock products, wool and animal fatty acid, have been imported to China in significant amounts since the 1950's (app. table 23). Wool imports have picked up since 1980, when they surpassed the previous high of nearly 30,000 tons recorded back in 1959. A rapidly developing textile industry is the main reason for the growth of wool imports to over 70,000 tons in 1982 and 1983. Most imports originate from Australia and New Zealand.

Animal fatty acid has been the other significant import item since the early 1960's. The imports peaked in 1980, surpassing 130,000 tons, and then dropped back to the 50,000-ton level in 1981 and 1982. Why the imports were higher in the late 1970's and peaked in 1980 is unclear; however, part of the imports have been used in China for manufacturing products such as soaps and cosmetics.

Statistics from China's trading partners show that China also imported live animals, meat and meat products, dairy products, animal hides, and even silk in recent years (table 21). Imports of breeding animals, particularly hogs and dairy cattle, were small in terms of quantity in recent years. However, these imports are rising and will have a critical effect on China's efforts to improve livestock product quality.

Foreign Aid in the Livestock Sector

The World Food Program (WFP) helps China's livestock sector in several ways. To alleviate the increasing demand for fluid milk in big cities, WFP provided 40,000 tons of skimmed milk powder and 13,330 tons of butteroil to six large cities (Beijing, Shanghai, Tianjin, Wuhan, Nanjing, and Xian) for a 5-year dairy development project which began in 1984. The total value of this aid amounts to $60 million. The first shipment of 4,000 tons of skimmed milk powder and 1,333 tons of butteroil arrived in China in May 1984. The products were reconstituted into fluid milk and sold in the six cities. The 1985 supplies of fluid milk for the six cities will probably increase by about 50 percent because of the aid. The project will also help China increase the number of dairy cows; expand milk collection, processing, and distribution facilities; and improve the technical level of the dairy industry in the six cities



Chinese farmers still feed large quantities of vegetation to livestock. For example, the open shed at right stores pumpkins on a dairy farm near Nanjing.

(*12*, Aug. 16, 1984, p. 1). Recent reports indicate that the project has progressed well and that the WFP is considering expanding the project. Some joint ventures that also were set up in 1979 to help develop China's livestock sector are described in (*13*).

Feed and Livestock Raising

"Raising cattle for field plowing and feeding hogs for more animal manure to be used as fertilizer in crop cultivation" has long been a slogan that describes why Chinese farmers keep cattle and hogs. The quantities and kinds of grains and vegetation that have been fed Chinese livestock, particularly hogs, are therefore quite different from those used to feed animals for meat output in western countries. In China, cattle, sheep, and goats are mainly fed with grasses. Hogs also consume a large amount of vegetation such as water plants, vegetable leaves, tubers, carrots, pumpkins, and various crop stalks. Hogs are also fed different kinds of grains, depending on localities. Grains for feed may be corn, wheat, barley, broken rice, and oats. Grain byproducts, such as brans and hulls, are often used. Meal products from soybeans, peanuts, and small amounts of cottonseed and rapeseed, and fish, cocoons, and bone meal or powder are also used as supplemental sources of protein or minerals.[12] However, China's hogs have been fed a much smaller proportion of feed grains and protein meal than is usual with the more advanced feeding methods adopted in developed countries. A hog reportedly consumes from several hundred to more than 1,000 kilograms of water plants, vegetables, tubers, crop residues, and table scraps from household meals before it is slaughtered. In the last 2-3 years, hog feeding, particularly around big cities, has changed. More grains have been used to raise hogs because of record grain crop harvests.

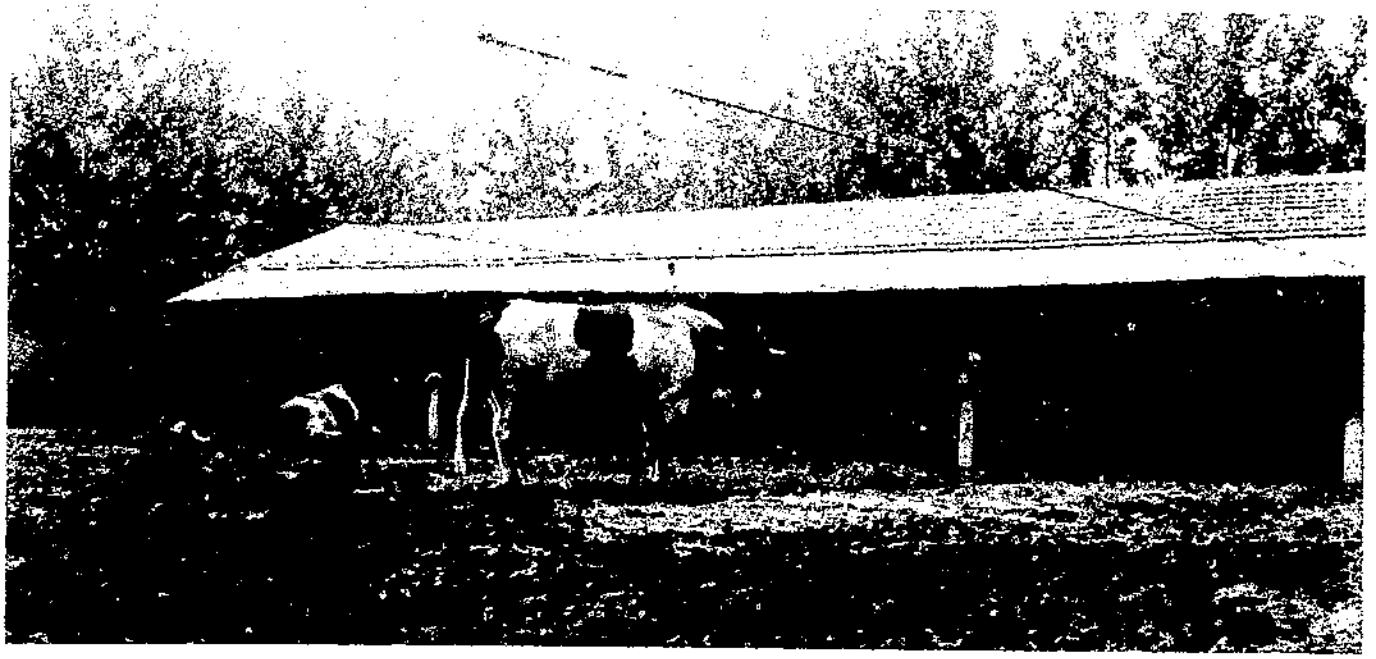
Feeding of Grains

Feeding of grains to livestock in China has been generally competitive with human grain consumption.

[12]Details on feed used in China's feeding of hogs can be seen in (*5* and *16*). Both references are written in Chinese and have not been translated into English.

This brood sow, above, is representative of imported breeding livestock being used to improve output.

This bull station in Beijing, below, houses imported livestock to improve the dairy industry's productivity.



This situation has changed somewhat in some areas because of bumper harvests reaped in the early 1980's. However, feeding a large quantity of grains to animals is not yet widely practiced in China, except, perhaps, around big urban areas.

The sources of feed grains available for collective and private raising of livestock differ. Collective raising of livestock mainly depends upon feed grain supplied by the collective reserve system. For private feeding, livestock-raising households may obtain feed grains in three ways. The first is from the collective system which distributes extra grain as rewards for household members who deliver livestock products to the state. The bonus grain is either free or, depending on provincial incentive systems, is sold at below-market prices. Rural households may also get feed grains by growing grains on private or fodder plots which are assigned by the collective system. The ratio of private and fodder plots to total cultivated area in some provinces can now be as high as 15 percent, a significant expansion compared with only about 7 percent reported in the late 1970's. Although no official statistics indicate the volume of grains coming from the private and fodder plots, the amount produced from these plots is probably only a small share of the total grain production. The contribution of this small share of grain to livestock raising in rural areas may have been critical in the rise of hog slaughter weights in the early 1980's.

Rural households may also acquire feed grains from the rural free markets. This source has become increasingly important in the last few years because more grains are now available in these markets. Although the prices paid by farmers for this grain may still be higher than the state-listed retail prices, the free-market prices are low enough to allow some farmers, such as those raising chickens, to make a reasonable profit.

Hog Development and Total Grain Availability. Livestock inventories, particularly inventories of hogs consuming relatively large amounts of feed grains, should be related to the annual variation of per capita grain availabilities.[13] Available data permit a statistical analysis of the relationship between net growth of hog inventories and grain availabilities. The results clearly show the expected relationship. Hog development in China has been closely associated with the per capita grain availability of both the previous year and the current year; the correlation coefficients are 0.87 and 0.91, respectively, using the data for 1961-82.[14] These coefficients imply that China's new pig crops, or net growth of hog inventory, are positively related to the country's annual per capita availability of grains. While this relationship is useful in explaining the historical changes of hog inventories, it is probably less accurate for recent years. Changes in policy to stress efficiency and to increase availability of grain for livestock use have probably dampened hog inventory fluctuations.

Amount of Total Grain Fed to Livestock. Official statistics on the amount of grain fed to livestock are unavailable. Several different articles on China's grain production and livestock strategies reveal that the total amount of various kinds of grains fed to livestock reached about 50 million tons in 1980.[15] Of the 50 million tons, about 35 million were either grains withheld by production teams for livestock feed use or grains awarded by the state for sales of fattened hogs to the Government procurement system. The remaining 15 million tons of various kinds of grain were provided by private-plot output and surplus food grain rations.

A commentary published in *Jingji Ribao (Economic Daily)* revealed that total grain distributed through the Government system for feed use totaled about 13 percent of the 387.3 million tons of grain produced in 1983 (*12*, Sept. 25, 1984, p.1). This percentage implies roughly 50 million tons of grain. This figure, along with an estimated 15-20 million tons of grains supplied by private plots or fodder plots, indicates that China's total grain fed to livestock in 1983 amounted to approximately 70 million tons, or an increase of about 20 million tons in 3 years.[16]

Feeding of Protein Meal

Use of protein meal in livestock feed has not been extensively promoted in China. Unofficial statistics indicate that China has used more than half of the residue of oilseed processing as fertilizer in crop cultivation (6, Mar. 13, 1984, p. 3). Many reports indicate that only about 10 percent of rapeseed and cottonseed meal has been used as livestock feed.[17] Most of the remainder has been directly applied in fields as fertilizer, although reportedly over 250,000 tons of rapeseed meal have been exported annually in the mid-1980's. A major reason for the low use rate is the lack of the technology needed to process and eliminate toxic substances in cottonseed and the high content of glucosinolates in rapeseed meal.

[13]Net growth of hog inventory equals yearend inventory plus the number slaughtered minus the previous year's yearend inventory.

[14]Total grain statistics have been used for the calculation because China's hog production uses a variety of grains including tubers, rice bran, and wheat in addition to coarse grains.

[15]One source, indicating that 50 million tons of grain were used as livestock feed, appeared in an article by Lou Jingbo (*18*, Dec. 28, 1982, p. 3).

[16]A later source, *China Daily*, Oct. 27, 1984, also indicated that the total demand for feed in China is some 60 million tons a year (6).

[17]The total includes meal output from cottonseed, rapeseed, peanuts, soybeans, sunflowerseed, sesame, and other minor oilseeds.

Protein meal becomes more important as compound feed production grows. In 1984-85, China produced an estimated 9-10 million tons of meals annually, with half of the total coming from cottonseed and rapeseed crushes (7, Apr. 24, 1983, p. 3). In 1980, 2.2 million tons, about 30 percent of the 7.4-million-ton total, of protein meal or cakes were used to feed livestock (9). The planned increase in compound feed manufacturing should parallel growth of domestic need and use of protein meal.

China also produces other protein feed supplements such as fishmeal, mineral supplements such as powdered calcium and phosphorus, and microelements such as vitamins or drugs. However, production of this kind of feed supplement is low and some supplements, particularly microelements, have mainly been imported.

Grain Requirements by 1990

Feed grain needed for the livestock sector for the next few years can only be roughly estimated. Because relevant statistics do not exist, we cannot adopt sophisticated statistical methods to forecast China's demand for feed grains.

However, alternative ways can be developed to assess the quantities of grain and protein meal that will be required. The measure that is employed in this section is constructed basically by using information on output targets, or likely output levels, and feeding rates and requirements from sources such as Chinese agricultural economics journal articles, official statistics, and media reports.[18] The major procedure of the method is to sum up the feed and protein meal that will be needed to produce all quantities of major livestock products in the next several years, or mathematically, for annual total grains required,

$$TFG_i = \sum_{j}^{5} GRCVS_{ij} * LSPRT_{ij}, \quad (1)$$

and similarly for annual protein meal required;

$$TML_i = \sum_{j}^{5} MLCVS_{ij} * LSPRT_{ij}, \quad (2)$$

where

i = year 1, 2, 3, . . ., or 18 (corresponding to 1983, 1984, . . ., or 2000),

j = commodity 1, 2, . . ., or 5 (in this case, pork, ruminant meat, poultry meat, eggs, and milk, respectively),

TFG = Total feed grain required,

TML = Total meal required,

GRCVS = Grain conversion ratio (kilograms of grain required per kilogram of livestock product),

MLCVS = Meal conversion ratio (kilograms of meal required per kilogram of livestock product), and

LSPRT = Quantity of livestock product or meat output.

The estimation includes five major livestock products: pork, ruminant meat, poultry meat, eggs, and milk. The timespan of the projection extends to the year 2000. The year 1983 was used as a base to start the estimating process. The output of pork, ruminant meat, milk, and eggs for 1983 are either official statistics or unofficial numbers as announced by Chinese officials; the poultry output is estimated.[19]

Grain-meat, grain-poultry, and grain-egg conversion rates are the typical ratios that have been reported in various Chinese-language sources.[20] The grain-ruminant meat ratio is close to the rate Chinese used for beef production, while the grain-milk ratio is adopted from the *Agricultural Technical Economics Handbook* for an average Chinese milk cow that produces 10-15 kilograms of milk a day (2).

The annual output estimates of livestock products for the years up to 2000 are assumed after examining past performance and represent the likely growth in the next few years after taking into account the livestock program policies. For example, I assumed an average 3-percent annual increase in pork production and an 8.5-percent annual increase in ruminant meat production. These assumptions yield total red meat output for 1985 of about 17.55 million tons, and for 1990 and 2000 about 20.8 million tons and 28.3 million tons, respectively. These assumptions are reasonably close to China's preliminary report of 1985 total red meat output and the seventh 5-year and year 2000 economic plan targets. Because China plans to vigorously develop its poultry and dairy cattle output, production levels of poultry meat, eggs, and milk are assumed to be close to the targets presented in the year 2000 report (*12*, Nov. 9, 1985, p. 3).

[18]Another similar measure, mainly baseline forecasting, was developed by the author and can be seen in (*31*).

[19]Chinese agricultural officials visiting the United States gave an estimate of 1 million tons of poultry output for the early 1980's.

[20]For example, see *People's Daily (Renmin Ribao)*, Apr. 16, 1983, p. 2 (*18*).

China are probable in the coming years depending on the pace of the livestock sector development in the region and the availability of foreign exchange.

Meal Requirements by 1990

The procedure for estimating the demand for protein meal and the mathematical representation for the procedures are the same as those for grains. However, estimating the meal-meat conversion rates is more difficult because of very limited information. This analysis assumes that about 3.5 million tons of oilseed meals or cakes, were fed to livestock in 1983. Furthermore, if we assume that 1 million tons out of the 3.5 million tons of oilseed meal are used for China's manufacturing of compound feed, which is directed mainly to poultry meat and egg production around urban centers, and further assume that only a small amount of the 1 million tons of protein meal used in feed manufacturing goes to milk production and that the balance is then split evenly between the poultry and egg outputs, then results indicate the meal-poultry conversion rate and the meal-egg conversion rate are both at 0.183 (table 22). Finally, if we assume that 95 percent of the rest of oilseed meal, 2.5 million tons, goes to pork production and the remainder to ruminant meat production, then the meal-pork conversion rate is estimated at 0.18 and the meal-ruminant meat conversion rate at 0.145.

The meal-pork and meal-ruminant meat conversion rates are expected to increase as more grains are fed to hogs and to ruminant animals in order to gain higher slaughter rates. Similarly, the meal-poultry meat and meal-egg conversion rates will gradually rise because more and more compound feed will be used (table 22). The expected changes in meal use together with the projected growth of livestock product output generate an increase in the demand for meal for raising livestock of about 350,000 tons annually. Meal use will rise to about 6.8 million tons by the end of 1990 and to more than 14 million tons by the end of 2000, almost 3.3 million tons and 10.8 million tons over the 1983 level, respectively.

China should be capable of providing the additional meal and oilseed cakes needed for livestock development, at least by the end of this decade, if we assume that part of the meals for fertilizer use can be released for feed use and exports of meals can be reduced. The greatest challenge facing China's oilseed meal manufacturing is acquiring the advanced technology necessary to eliminate the toxic substances in cottonseed and rapeseed. Failure to accomplish that task in the near future means that China will face difficulties in developing its feed industry and will have to gradually increase meal imports to support its livestock programs, particularly if the cropland planted to soybeans is not expanded through the end of the century.

Livestock Sector Problems

Although China's livestock sector has made significant progress since the late 1970's, particularly in terms of increased meat output, the sector still faces a diverse set of problems. Some of the problems have arisen from the new policies; others are longstanding. These problems can be categorized as institutional, economic and managerial, and technical.

Institutional Problems

Policy and structural changes imposed by the Chinese Government since 1979 have had both positive and negative effects on China's livestock sector.

Unstable Policies. Unstable policies have often been the greatest concern for households raising livestock, especially hogs. The enthusiasm of farm households for raising livestock increased greatly after the procurement prices for livestock were raised in November 1979. However, the situation did not last long. Many provinces started lowering procurement quotas, eliminating bonuses for sales of heavy and fattened hogs, and reducing bonus grain rewards for selling slaughter hogs. Because of limited storage capacity and the lack of transportation facilities, many procurement stations had to turn down farmers who wanted to sell hogs. Those who failed to sell fattened hogs to the Government had to turn them over to local butchers after a slaughter permit was granted. These farmers then sold the carcasses in nearby rural markets and usually earned less profit because of lower market prices and loss of bonuses. As a result, the yearend inventory of hogs declined for several years after 1979 and the size of breeding herds also started shrinking.

Poorly Planned Organizational or Structural Changes. The decline in the number of breeding sows and boars was also partly caused by the structural transformation of hog production in rural areas. As more hog-raising activities were gradually transferred from collectives to individual households, the task of raising and maintaining a proper proportion of sows and boars, formerly a primary activity of the collectives, was not well planned.

Another example of the structural changes that also affected hog-raising activities was the imposition of the household contract system. When agricultural production teams contracted for cropland with individual households in rural areas, livestock-raising activities which usually were included in the annual production plans of the team were often neglected. Many house-

Finally, ruminant animal inventories will probably rise slightly and hog inventories will probably remain relatively stable through 1990. The projected increases in pork and beef production will, therefore, come from gradual increases in slaughter rates, grain utilization, and other improved production practices. However, because the use of compound feed is growing rapidly in poultry and egg production, grain conversion ratios will probably gradually decrease (table 20), and grain-milk ratios will probably stabilize or decrease slightly due to higher milk productivity per cow.

The results generated from the estimating procedures, as previously described by the formulas above, are shown in table 22. For 1983, total grain fed to livestock is estimated at about 76.5 million tons, slightly higher than the total as mentioned by the Chinese officials. This discrepancy should not be a serious concern, because the quantity of grains provided by private rural households in raising livestock is not completely clear and could actually vary from year to year. The 76.5-million-ton estimate, in fact, can be accepted as a reasonable approximation.

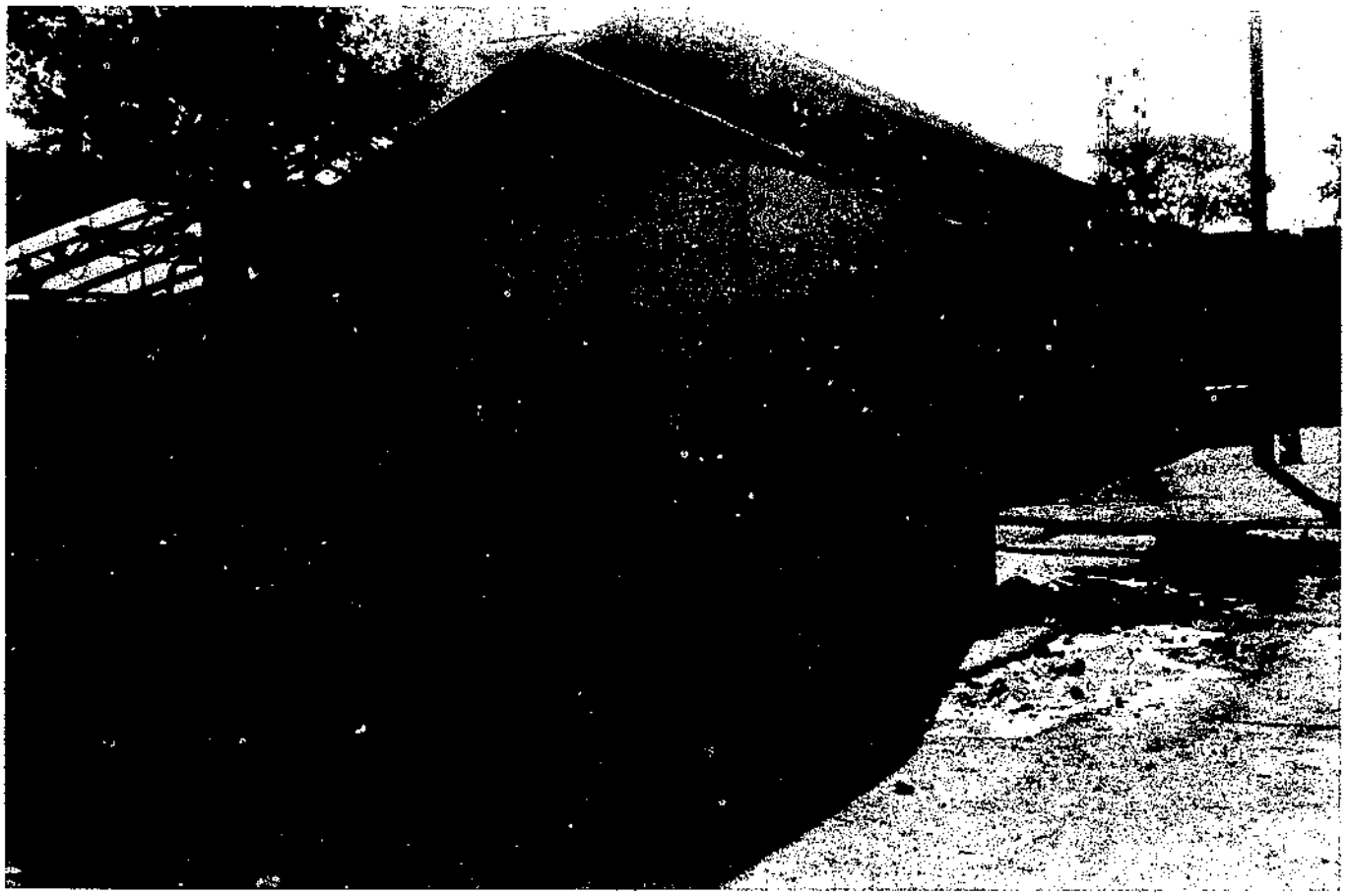
The results in table 22 show for the rest of the 1980's a pattern of average increases of about 6 million tons in annual total grain used for livestock production. The projection also implies that, by the end of the decade, total grain fed to livestock will be about 45 million tons over the 1983 level and could exceed the 120-million-ton mark. This quantity is about 20 percent above the 100 million tons of grains proposed by the Beijing Nutrition Institute for livestock feed use in 1990. The estimated 182 million tons of grains needed for livestock production in 2000 is also about 20 percent higher than the 150 million tons of grains set aside for livestock feed in the year 2000 report (*37*).

The magnitude of the annual increases in grain use for livestock raising seems to be moderate, particularly if compared with the recent growth of grain output in China. However, the increased demand for feed grain all over China, especially around large cities, will create regional or local difficulties because grain for feed use will, in many areas, compete with grain needed for human consumption and industrial demands. And because of the poor infrastructure, particularly transportation, China's capacity to ship grains from surplus areas to deficit regions will still be limited. In Guangdong province, for example, corn was in short supply in 1985 and 1986, but surplus corn in the northeast region could not be transported to the southern areas because of export commitments with Japan and the Soviet Union (*30*). In 1984, southern China, including Guangdong, Guangxi, and Fujian provinces, produced about 13.5 percent of the national pork output but only 1.5 percent of the national corn production. Imported corn will be inevitable to keep the meat supply stable in the long run. Therefore, small shipments of feed grains, especially corn, to southern

Table 22—China: Projected grain and protein meal requirements

Item	Unit	1983	1984	1985	1990	2000
Pork	Million tons	13.161	14.450	16.350	18.954	24.263
Grain-meat conversion ratio	Ratio	4.000	3.990	3.980	3.930	3.880
Meal-meat conversion ratio	do.	.180	.182	.184	.194	.214
Ruminant meat	Million tons	.860	.956	1.200	1.804	4.080
Grain-meat conversion ratio	Ratio	6.000	6.010	6.020	6.120	6.320
Meal-meat conversion ratio	do.	.145	.150	.155	.180	.230
Poultry	Million tons	1.200	1.400	1.600	2.297	4.734
Grain-meat conversion ratio	Ratio	4.000	3.930	3.860	3.510	2.810
Meal-meat conversion ratio	do.	.183	.190	.195	.220	.270
Eggs	Million tons	3.323	4.316	5.300	5.865	12.087
Grain-egg conversion ratio	Ratio	4.000	3.920	3.840	3.440	2.640
Meal-egg conversion ratio	do.	.183	.190	.195	.220	.270
Milk	Million tons	1.850	2.210	2.500	5.599	22.652
Grain-milk conversion ratio	Ratio	.330	.330	.329	.324	.314
Meal-milk conversion ratio	do.	.100	.100	.101	.106	.116
Total grain fed to livestock	Million tons	76.507	86.551	99.648	121.584	181.740
Increase over 1983	do.	n.a.	10.045	23.147	45.077	105.234
Total meal fed to livestock	do.	3.506	4.080	4.792	6.775	14.271
Increase over 1983	do.	n.a.	.574	1.286	3.268	10.764

n.a. = Not applicable.



The container in the foreground is a mobile cold storage facility sometimes found on state-run farms.

holds then concentrated only on crop production and other sidelines yielding higher returns and gave up livestock-raising activities. The number of hogs and sows raised in rural areas in northern and northeastern provinces dropped significantly in the early 1980's.

Economic and Managerial Problems

For many years, the Chinese Government has relied heavily on administrative orders to accomplish production targets. The Government therefore paid little attention to the economic measures, market development, and pricing of agricultural commodities.

Underdeveloped Marketing System. Deficiencies in China's livestock marketing system, such as the lack of holding pens and cold storage and limited transportation facilities, were a major bottleneck leading Government procurement stations to limit their purchases of live animals in the early 1980's. Government purchases of livestock have expanded recently and now account for about 70 percent of all slaughter hogs, about 80 percent of cattle, and more than 40 percent of sheep and goats. A better marketing system for slaughter hogs, however, could help solve the distribution problems that lead consumers in some parts of China to complain about inadequate meat supplies while in other areas farmers cannot market all that they produce.

Irrational Pricing System. Prices set for livestock products, particularly procurement prices, generally do not reflect supply and demand conditions. For instance, hog procurement prices are set according to the live weight of animals delivered to the state; the heavier the hog, the higher the procurement price paid. However, according to Chinese researchers, heavy native hogs produce more fatty meat, and the lean meat ratio of Chinese breeds drops rapidly as carcass weight increases. Thus, the pricing method used to determine procurement prices is impractical because people now prefer to consume more lean meat. This irrational pricing system is reportedly under reform. For example, Heilongjiang province has restructured hog weight categories since August 1985. Hogs with more lean meat command premium prices (*30*).

Livestock prices vary little by season or region. The insignificant regional price variations prevent livestock output from flowing between geographic regions, and the lack of adequate procurement price differentials during a year also fail to direct producers to market their products evenly throughout the year.

Technical Problems

Before 1979, Chinese researchers concentrated mainly on how to increase grain production. Research into livestock breeding, grass varieties, and agricultural economics has generally lagged behind.

Research on Livestock Breeding Lags. Low dressing rates of livestock carcasses and shifts in consumer consumption patterns to better quality livestock products indicate an urgent need for more research on breeding and feeding programs. Meat output per head of hog, cattle, and sheep slaughtered all trail far behind those of western countries. This lag implies that better breeding methods would improve dressing rates.

As meat supplies and incomes have increased, consumer preferences have shifted to leaner meat, especially in larger cities where incomes are higher. Native hog breeds, however, are poorly suited to these new preferences. Lean meat averages 35-45 percent of total carcass weight for most of China's native hogs compared with an average of over 60 percent for grade A carcasses in the United States. China's Ministry of Agriculture, Animal Husbandry, and Fisheries has admitted that, since the 1960's, the hog breeding subsector has not made much progress in increasing lean meat production. The improved hog breeds—such as Xinjin, Beijing Black, and Shanghai White—produce an average lean meat ratio of only 46-52 percent (3). China has recently vigorously promoted the improvement of hog breeds and has reported some improved hogs producing an average lean meat ratio of 58 percent in Beijing, Shanghai, Zhejiang, and Hubei (*18*, July 17, 1983, p. 2). Even these ratios are so low that China must continue its efforts in developing new breeds.

Mismanagement of Pastureland. China has vast pastureland, of which only a small fraction has been well managed. The results are large and growing herds, overstocking, and high winter and spring kill of China's ruminant animals because of inadequate hay and shelters, particularly in the northwestern provinces. Some provinces in the grazing region, such as Nei Monggol, have already imposed the household contract system. They have tentatively promulgated a draft grassland law that permits families to keep collective and private animals, along with the pastureland that households have leased from collectives. However, serious technical problems facing the livestock-raising families remain: grass seeding, irrigation systems, technological assistance on animal breeding, disease control, and grassland management. Intensified extension work and demonstration farms that are being set up with foreign assistance in the northwest and in farming regions may encourage livestock-raising families to adopt new technology. Government assistance, both technical and financial, in expanding improved pastureland in the farming region, along with the growing grain production in the region, should also help expand ruminant animal production in the coming years.

Uneven Development of Feed Industry. China's feed production grew very slowly until the early 1980's. Total compound feed output still accounts for only about 10 percent of the total grains fed to livestock. Poor availability of feed grains and trace elements used in mixing feed and the lack of new machinery and blending technology have been the major obstacles in developing the feed manufacturing industry. The rapid growth of the feed industry thus far has taken place around large cities or urban centers.

The uneven distribution of feed manufacturing leaves China's rural area lagging far behind in improving livestock feeding techniques. Because most of the country's livestock farming is still in rural areas, development of feed manufacturing in rural areas must parallel the development of households specializing in livestock-raising activities.

The increasing demand for feed and large increases in grain output in 1983 and 1984 apparently stimulated development of a very ambitious long-term feed plan at the end of 1984. The plan calls for 50 million tons of mixed and compound feed to be produced by 1990 and more than 100 million tons by the turn of the century.[21] The plan also discusses locations of feed mills, manufacturing technology, product quality control, and future supplies and purchases of raw materials. The plan, however, is vague in terms of exactly how mixed and compound feeds are to be produced. The grains and protein meal needed to develop the feed industry will probably be met largely by domestic supplies, if China can switch part of its oilseed meal and cakes from fertilizer to feed use. Feed manufacturing machines, computer software for blending feed, and feed additives such as minerals, antibiotics, and hormones will largely depend on imports.

[21]More on animal feed plans can be seen in *China Daily*, Oct. 27, 1984, p. 2 (6) or in *Economic Daily*, Oct. 1, 1985, p. 2 (12).

Scarce Economic Analyses. Economic analyses of China's overall livestock sector are particularly hard to find. Although an increasing volume of statistics on livestock inventory and meat output is being released, data on feed consumption and costs of production are still scarce. The lack of information relevant to investment and profit margins of livestock raising has resulted in little systematic analysis of the livestock industry at either the national or provincial level. This dilemma has been one of the major problems associated with the slow growth of the sector and is, in part, why China's animal husbandry sector is still generally plagued by big inventories and relatively small amounts of meat output. Although analysis of livestock raising has gradually picked up in recent years, systematic studies of specific types of livestock production are infrequent and need to be vigorously encouraged. Economic studies on the livestock sector should indicate the productivity of the sector and show what improvements are needed for further development of the sector.

Conclusions

Although recent progress has been impressive, China's livestock sector experienced uneven growth in meat output in the last several years, with the biggest contribution coming from the hog subsector. Pork in recent years constituted more than 96 percent of the total meat increases, although hog inventories stayed at about the same level. The sudden surge in pork production, however, brought about procurement problems because of limited cold storage and the lack of transportation facilities. Development of the ruminant animal subsector has been slower, except that the number of draft animals, such as water buffaloes, picked up in the last few years because the Government instituted a household contract incentive system. Demand for ruminant meat, fluid milk, and poultry and eggs has reportedly grown rapidly in big cities, but the current production capability has been unable to fulfill that demand.

Overall growth significantly slowed after 1982, especially if compared with that of the late 1970's and the first 2 years of the 1980's. Although eliminating official pork prices, both procurement and retail, in 1985 tentatively stimulated farmers' incentives to feed more hogs, growth will still be hampered by the problems that are currently faced by the sector which are not expected to be solved quickly. As incomes continue to rise, consumer demand for livestock products should also keep growing, both quantitatively and qualitatively. However, native breeds of hogs, cattle, dairy cows, and poultry are unsuitable for the requirements of a modernizing system. Thus, imports of foreign breeds for herd improvement will be an important action to produce quality products that can better meet consumer needs. Furthermore, although the livestock sector that developed around large urban centers could enjoy a faster growth because of more feed supplies and better feeding methods, the slow growth of the rural livestock sector will not permit China to maintain the same overall rate as in the late 1970's. Stable supplies of processed feed, or even unprocessed feed grains, are also extremely important in the initial stage of the livestock program. A severe shortfall in grain production in the next few years could create problems in the hog production cycle, for example. The cycle is often hard to correct in a short time, particularly since the Government has relaxed the price policies.

China's entire livestock marketing system—including storage, pricing practices, processing capacity, and transportation and distribution facilities—must be modernized to accommodate the increased production. Foreign technology associated with feed manufacturing, livestock feeding, and veterinary medicine will be critical to overcoming many of China's livestock problems, as will the growth of China's research and extension efforts in all aspects of the livestock sector.

Toward the end of this decade, China may have to gradually step up its feed grain imports unless obstacles to domestic transfer of surplus feed grains from one region to another can be quickly overcome. Also, if China cannot expand its area of soybean cultivation or cut its dependency on meal for fertilizer use and if it cannot reduce the toxic byproducts generated by cottonseed and rapeseed meal, the country will also probably start to import meal.

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Appendix A:

Procedures for Calculating the Gross Value of Annual Livestock Production[1]

The gross value of annual livestock production is the sum of values calculated from the following four categories:[2]

1. Animal propagation, growth, and weight gain (including large animals, hogs, sheep, and goats),

2. Poultry feeding,

3. Livestock products (such as milk, eggs, wool, and hides), and

4. Raising of other animals (silk cocoons, bees, and deer).

Detailed procedures or formulas used to compute each of the above four categories are as follows:

1. Livestock propagation, growth, and weight gain;

a. Value of large animal (cattle, horses, mules, donkey, and camels) propagation, growth, and weight gain:

$$VLA = \sum_i VLA_i$$

$$= \sum_i \sum_j (NLA_{ij} * PDLA_{ij})$$

$$= \sum_i (NLA_{i1} * PDLA_{i1} + NLA_{i2} * PDLA_{i2} + NLA_{i3} * PDLA_{i3} + NLA_{i4} * PDLA_{i4})$$

for j = 1, 2, 3, and 4

where i = kind of large animals (for example, cattle, horses,. . .)

j = age group of large animal, 1 representing animal less than 1 year old, 2 for animal 1-2 years old, 3 for 2-3 years old, and 4 for 3-4 years old,

NLA = number of large animals

PDLA = for j = 1, price of animal; for j = 2, 3, or 4, price differential between the age groups.

For cattle and mules, the calculation of value stops when j = 3; for horses and donkey, the calculation stops at j = 4.

b. Value of hog propagation, growth, and weight gains;

$$\text{Value of production} = \left(\text{Net increase in hog numbers} / 2 + \text{Number of hogs slaughtered}\right) * \text{Hog price}$$

c. Value of sheep or goat propagation, growth, and weight gain;

$$\text{Value of sheep or goat propagation} = \left(\text{Net increase in numbers} + \text{Number slaughtered} + \text{Number of deaths} / 3\right) * \text{Sheep or goat price}$$

The item in parentheses, the number of deaths divided by 3, indicates that three dead sheep or goats are treated as an adult sheep or goat.

2. Poultry feeding:

Generally, poultry production is estimated by the sum of poultry prices multiplied by the prospective number of each kind of poultry. Or, if data are available, the following formula is used:

$$\text{Value of each kind of poultry production} = \left(\text{Net increase in numbers} + \text{Number slaughtered or sold} - \text{Number brought in or bought in the year}\right) * \text{Average price of the poultry}$$

3. Livestock products:

All values are calculated by the prices and prospective quantities of output.

4. Raising of other animals:

All values are computed by the prices and prospective quantities of output.

[1]All information and procedures described in this appendix were adapted from (39).

[2]U.S. livestock production includes only cash receipts from different types of livestock products. Inventory changes are included only as part of the farm income and are not calculated as part of the cash receipts.

Appendix B:

Quarantine and Health Requirements for Cattle Exported from the United States to the People's Republic of China[1]

1. The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), shall be responsible for the implementation of quarantine procedures and the issuance of certificates.

2. The Chinese side shall send veterinarians to the farms of export cattle, related isolation premises, testing laboratories, and quarantine facilities to cooperate with U.S. veterinarians in making the inspection and quarantine.

3. The cattle to be exported shall be clinically examined within 24 hours of export and found to be healthy and free of signs of infectious and contagious diseases.

4. The United States of America officially confirms that it is free from foot-and-mouth disease (FMD), rinderpest (RP), contagious bovine pleuropneumonia, and bovine lumpy skin disease.

5. The cattle to be exported shall be selected from farms in those States where: (a) there are no competent vectors of bluetongue; (b) there has been no clinical case of bluetongue in all ruminants; and (c) for the past 12 months in all ruminants no bluetongue virus has ever been isolated. (The States allowed are Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, West Virginia, Pennsylvania, Ohio, Michigan, Indiana, Wisconsin, Iowa, Minnesota, and North Dakota.)

6. The export cattle shall originate from such farms in which:

6.1 The animals have been born and reared in, or, if not born and reared in the herd, they have resided in the herd for at least 12 months.

6.2 For the last 2 years, there have been no imports of bovine or ovine animals to the farm from farms under quarantine for animal diseases, or affected by enzootic bovine leucosis, bluetongue, or paratuberculosis.

6.3 For the last 3 years, the herds of origin have been free of tuberculosis (TB) and brucellosis.

6.4 For the last 2 years, there has been no clinical evidence or positive diagnoses of paratuberculosis, vibrionic abortion, trichomoniasis, toxoplasmosis, or other serious infectious diseases.

For the last 2 years, there has been no clinical evidence of enzootic bovine leucosis in the herd of origin. If there have been limited serologic responses in the herd of origin, the selecting Chinese veterinarian will determine if the herd will qualify for selection for shipment.

For the last 2 years there has been no clinical evidence of IBR, BVD, or leptospirosis in the herd of origin.

6.5 All animals at the farm of origin shall have been vaccinated against BVD (inactivated vaccine) and IBR.

7. The animals to be exported shall not be vaccinated with any vaccines for diseases except IBR, BVD (with inactivated vaccine), or if so desired against leptospirosis and brucellosis. The whole procedure of shipment and quarantine shall be made within the effective period of immunity. Meanwhile, the animals shall be tested according to the testing methods stipulated in this agreement.

8. Before isolation, the animals to be exported shall be subjected to close clinical examinations and to the following examinations for the corresponding diseases with negative results:

8.1 IBR:	a. SN test (p 37 24) with titration starting from undiluted serum. Report titers found.
	b. For bulls over 1 year of age, a virus isolation test of semen is required.
8.2 BVD:	a. Examination for virus in blood serum, two passages on tissue culture shall be performed, cultures checked for virus by immunofluorescence test.
	b. SN test with titration starting from undiluted serum. Report titers found.
8.3 Tuberculosis:	Intradermal test using avian and bovine PPD in the caudal fold with no reaction or in cervical area with reaction not to exceed 2-millimeter increase in thickness.

[1]All information is adapted from (33). The effective date for the quarantine and health requirements is December 1985.

8.4 Enzootic bovine leucosis: a. Negative AGID (p 24 gp).
b. Showing no enlargement of lymphatic glands.

8.5 Bluetongue: a. AGID test.
b. Virus isolation by VERO cell culture
c. SN test for the five types of bluetongue in the United States at 1:5 dilution.

8.6 Paratuberculosis: CF test at 1:8 dilution.

9. Prior to the shipment, the animals shall be quarantined for at least 30 days in isolation facilities approved by USDA, APHIS. The animals for exportation shall be kept isolated from animals not intended for export to the People's Republic of China. During the preembarkation quarantine period, the animals shall be subjected to close clinical examinations and to the following tests with negative results:

9.1 Bluetongue: a. Complement fixation test negative with less than 50-percent fixation at 1:5 dilution.

b. Negative AGID test.

9.2 Enzootic bovine leucosis: AGID test (p 24 gp) at least 30 days after test in 8.4. If there have been limited serologic responses, the seropositive animals shall be eliminated and not affect the rest of the group.

9.3 Brucellosis: Tube agglutination test with titer less than 30 I.U. (negative on STT at 1:50) and CF less than 50-percent fixation at 1:10 dilution.

9.4 IBR: a. SN test (p 37 24) with titration starting from undiluted serum. Report titers found. Only animals showing no increase in titer can be exported. Samples shall be taken at least 21 days after samples in 8.1

b. Bulls over 1 year of age require a virus isolation test of semen.

9.5 BVD: a. Examination for virus in blood serum. Two passages on tissue cultures shall be done and cultures to be checked by immunofluorescence test.

b. SN test with titration starting from undiluted serum. Report titers found. Only animals showing no increase in titer can be exported. Samples shall be taken at least 21 days after samples in 8.2.

9.6 Paratuberculosis: Intradermal test in cervical area using johnin or avian PPD tuberculin with reaction not to exceed 2 mm.

9.7 Vibrionic abortion: Culture of preputial washings or vaginal mucus for Campylobacter fetus. (Bulls that have not been used for service, unbred heifers, or heifers bred by artificial insemination will not be required to be tested).

9.8 Anaplasmosis: A negative CF test at 1:5 dilution.

10. The animals to be exported shall be treated against internal and external parasites with an effective parasiticide and with 25 mg/kg of dihydrostreptomycin for leptospirosis under the supervision of a USDA-accredited veterinarian.

11. All the crates, vehicles, and ship or aircraft to be used for transportation of the animals to China shall be cleaned, disinfected, and treated with a USDA-approved disinfectant.

12. The health certificate shall have detailed information on the clinical diagnosis, health status, test methods, dates, and results of tests for each animal and the type of vaccines used, date of vaccination, the name and dosage of drugs used in treatment of parasites, and disinfectants used in disinfection.

13. Feeds and bedding to be used during the quarantine and the transportation shall not originate from epizootic disease-infected areas and meet applicable veterinary hygienic requirements.

14. During the quarantine period and during transport from the isolation premises to the port of shipment and through to the Chinese port of entry, the animal shall not pass through serious epizootic disease-infected areas and shall not have contact with animals not of the same consignment.

15. All tests and shipment of cattle shall be done in the nonvector season of November 1-April 15.

Appendix C:

Quarantine and Health Requirements for Swine Exported from the United States to the People's Republic of China

1. The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), shall be responsible for the implementation of quarantine procedures and the issuance of certificates.

2. The Chinese side shall send veterinarians to the farms of export swine, related isolation premises, testing laboratories, and quarantine facilities to cooperate with U.S. veterinarians in making the inspection and quarantine.

3. The animals to be exported shall be clinically examined within 24 hours of export and found to be healthy and free of signs of infectious and contagious diseases.

4. The United States of America officially confirms that it is free from foot-and-mouth disease (FMD), African swine fever (ASF), infectious swine vesicular disease, and Teschen disease.

5. The animals to be exported shall originate from such farms in which:

5.1 For the last 3 years, the premises of origin have been free from brucellosis; and for the last 12 months free from swine pseudorabies and, based on reports of slaughter, free from tuberculosis.

5.2 For the last 12 months, the herds of origin have been free from contagious swine pleuropneumonia, hemagglutinating encephalomyelitis, and transmissible gastroenteritis, and the adjacent farms have had no reported clinical evidence of the three named diseases.

5.3 For the last 3 years, the herds of origin have had no clinical evidence of or no positive laboratory test results during regular examinations for Treponema hyodysenteriae.

5.4 For the last 12 months, there has been no clinical evidence of leptospirosis, infectious atrophic rhinitis, toxoplasmosis, mycoplasma pneumonia, or other serious contagious diseases.

5.5 Animals selected for export must have clinical evidence of any infectious diseases and be negative to the following tests conducted at the farm of origin prior to entering the preembarkation isolation.

5.5.1 Swine dysentery:	Pathogen isolation (fecal culture swabs) for Treponema hyodysenteriae. In case any animals are positive to swine dysentery test during the farm isolation, none of the animals in the group will be allowed to enter the preembarkation isolation premises.
5.5.2 Brucellosis:	Tube agglutination test (titer less than 30 international units per milliliter (IU/ml) or negative at 1:25 dilution).
5.5.3 Mycoplasma pnuemonia:	X-ray examination or complement-fixation test negative at 1:8 dilution.
5.5.4 Pseudorabies:	Serum neutralization test at 1:4 dilution or negative by ELISA test.
5.5.5 Transmissible gastroenteritis (TGE)	Serum neutralization test negative at 1:8 dilution or direct immunofluorescence test on material from tonsil biopsy.
5.5.6 Tuberculosis:	Intradermal test using both bovine and avian PPD tuberculin. Animals positive to avian tuberculin will be withdrawn from the shipment, and the negative animals will be allowed to move. If any animals are positive to bovine PPD, none of the animals will be eligible for export.

6. Before actual exportation from an isolation premises approved by APHIS, USDA, at least a 30-day quarantine shall be conducted. The animals to be exported shall be kept isolated from animals not intended for the export to China. During the isolation period, the animal shall be subjected to close clinical examination and the above-mentioned tests (see items 5.5.2 through 5.5.6 above). The animals shall be treated with a U.S. Government-approved drug for Treponema hyodysenteriae and dihydrostreptomycin to prevent leptospirosis. The test interval between tests for TGE shall be at least 21 days.

7. The animals to be exported shall be vaccinated for parvovirus before entering the quarantine facility but shall not be vaccinated for the above-mentioned diseases. (Date of vaccination, dosage, type of vaccine, and manufacturer shall be specified).

8. The animals to be exported, while in the quarantine facility, shall be treated against internal and external parasites with effective antiparasitic drugs under the supervision of a USDA-accredited veterinarian.

9. All the crates, vehicles, ships, or aircraft to be used for transportation of the animals to China shall be cleaned, disinfected, and treated with an effective disinfectant approved by USDA.

10. The health certificate shall have detailed information on the clinical diagnosis, health status, test methods, dates, and results of tests, for each animal and the type of vaccines used, date of vaccination, and the name and dosage of drugs used in treatment of parasites and disinfectants used in disinfection.

11. Feeds and bedding to be used during the quarantine and the transportation shall not originate from epizootic disease-infected areas and shall meet applicable veterinary hygienic requirements.

12. During the quarantine period and during transport from the isolation premises to the port of shipment and through to the Chinese port of entry, the animal shall not pass through serious epizootic disease-infected areas and shall not have contact with animals not of the same consignment.

Appendix table 1—China: Yearend inventories of hogs, sheep, and goats

Year	Hogs		Sheep and goat inventory		
	Yearend inventory	Number slaughtered	Total	Goats	Sheep
			1,000 heads		
1949	57,750	NA	42,350	16,130	26,220
1950	64,010	NA	46,730	18,210	28,520
1951	74,400	NA	52,870	20,980	31,890
1952	89,770	65,450	61,780	24,900	36,880
1953	96,130	69,260	72,020	29,200	42,820
1954	101,720	74,150	81,300	33,150	48,150
1955	87,920	64,250	84,220	34,010	50,210
1956	84,030	61,570	91,650	38,550	53,100
1957	145,900	71,310	98,580	45,150	53,430
1958	138,290	88,000	95,680	45,330	50,350
1959	120,420	67,860	111,650	49,760	61,890
1960	82,270	43,460	112,810	51,170	61,640
1961	75,520	33,000	123,870	63,120	60,750
1962	99,970	43,000	134,650	70,530	64,120
1963	131,800	78,000	137,470	67,730	69,740
1964	152,470	105,000	136,690	62,240	74,450
1965	166,930	121,670	139,030	60,770	78,260
1966	193,360	131,870	138,080	NA	NA
1967	190,060	133,780	144,330	NA	NA
1968	178,630	131,140	144,210	NA	NA
1969	172,510	126,200	140,210	NA	NA
1970	206,100	125,930	147,040	61,410	85,630
1971	250,350	147,980	150,110	62,780	87,330
1972	263,680	165,980	149,320	61,340	87,980
1973	257,940	166,840	157,280	64,100	93,180
1974	260,780	162,440	160,870	66,170	94,700
1975	281,170	162,300	163,370	68,040	95,330
1976	287,250	166,500	158,170	65,460	92,710
1977	291,780	167,870	161,360	67,830	93,530
1978	301,290	161,100	169,940	73,540	96,400
1979	319,710	187,680	183,140	80,570	102,570
1980	305,430	198,610	187,310	80,680	106,630
1981	293,700	194,950	187,730	78,260	109,470
1982	300,780	200,630	181,790	75,220	106,570
1983	298,540	206,610	166,950	68,030	98,920
1984	306,790	220,470	158,400	63,210	95,190

NA = Not available.

Source: (21).

Appendix table 2—China: Yearend inventory of large animals

Year	Yearend number		Cattle	Horses	Mules	Donkeys	Camels
	Total	Draft animals[1]					
				1,000 head			
1949	60,020	NA	43,936	4,875	9,494	1,471	247
1950	65,380	NA	48,103	5,217	10,317	1,497	246
1951	70,410	NA	52,088	5,486	11,016	1,553	266
1952	76,460	51,420	56,600	6,130	11,806	1,637	285
1953	80,760	54,790	60,083	6,512	12,215	1,645	301
1954	85,300	57,240	63,623	6,939	12,700	1,717	320
1955	87,750	55,710	65,951	7,312	12,402	1,723	357
1956	87,730	54,740	66,601	7,372	11,686	1,711	363
1957	83,820	53,680	63,612	7,302	10,864	1,679	365
1958	77,680	49,920	59,069	6,893	9,773	1,571	373
1959	79,120	46,600	61,094	7,058	9,030	1,547	387
1960	73,360	41,240	57,443	6,585	7,527	1,427	381
1961	69,490	38,180	55,005	6,211	6,565	1,332	378
1962	70,200	40,180	55,717	6,320	6,454	1,324	386
1963	75,050	40,330	59,680	6,865	6,746	1,335	402
1964	79,430	41,520	63,158	7,394	7,048	1,403	425
1965	84,210	43,220	66,951	7,921	7,438	1,447	448
1966	87,400	NA	NA	NA	NA	NA	NA
1967	89,820	NA	NA	NA	NA	NA	NA
1968	91,790	NA	NA	NA	NA	NA	NA
1969	92,280	NA	NA	NA	NA	NA	NA
1970	94,360	49,350	73,583	9,648	8,400	2,245	487
1971	95,370	49,900	73,986	9,926	8,513	2,444	505
1972	95,760	51,450	73,866	10,341	8,353	2,682	515
1973	97,180	51,400	74,676	10,730	8,350	2,923	500
1974	97,530	51,910	74,554	11,103	8,233	3,139	504
1975	96,860	51,220	73,547	11,299	8,127	3,354	535
1976	94,980	50,420	71,693	11,438	7,766	3,536	545
1977	93,750	49,790	70,398	11,447	7,630	3,715	564
1978	93,890	50,230	70,724	11,245	7,481	3,868	574
1979	94,590	50,290	71,346	11,145	7,473	4,023	604
1980	95,250	50,880	71,676	11,042	7,748	4,166	614
1981	97,640	54,710	73,301	10,972	8,415	4,325	628
1982	101,127	58,333	76,073	10,981	8,999	4,464	610
1983	103,500	61,250	78,084	10,806	9,449	4,593	564
1984	108,390	64,030	82,130	10,980	9,962	4,790	531

NA = Not available.
[1]"Draft animals" includes those used for field preparation and hauling.

Source: (21).

Appendix table 3—China: Total red meat output and per capita red meat availability

Year	Red meat output				Per capita red meat availability
	Total	Pork	Beef	Mutton	
	1,000 tons				Kilograms
1952	3,385	NA	NA	NA	5.9
1953	NA	NA	NA	NA	NA
1954	NA	NA	NA	NA	NA
1955	NA	NA	NA	NA	NA
1956	NA	NA	NA	NA	NA
1957	3,985	NA	NA	NA	6.2
1958	NA	NA	NA	NA	NA
1959	NA	NA	NA	NA	NA
1960	NA	NA	NA	NA	NA
1961	NA	NA	NA	NA	NA
1962	1,940	NA	NA	NA	2.9
1963	NA	NA	NA	NA	NA
1964	NA	NA	NA	NA	NA
1965	5,510	NA	NA	NA	7.6
1966	NA	NA	NA	NA	NA
1967	NA	NA	NA	NA	NA
1968	NA	NA	NA	NA	NA
1969	NA	NA	NA	NA	NA
1970	7,970	NA	NA	NA	7.2
1971	NA	NA	NA	NA	NA
1972	NA	NA	NA	NA	NA
1973	NA	NA	NA	NA	NA
1974	NA	NA	NA	NA	NA
1975	5,965	NA	NA	NA	8.7
1976	7,805	NA	NA	NA	8.4
1977	7,800	NA	NA	NA	8.3
1978	8,563	7,890	310	360	8.9
1979	10,625	10,014	230	380	10.9
1980	12,054	11,341	269	445	12.3
1981	12,609	11,884	249	476	12.7
1982	13,508	12,718	266	524	13.3
1983	14,021	13,161	315	545	13.7
1984	15,406	14,450	373	586	14.9

NA = Not available.

Source: (21).

Appendix table 4—China: Other livestock products

Year	Cow milk	Goat milk	Wool	Mohair	Cashmere	Eggs
			Tons			
1978	883,290	88,102	137,675	10,151	3,912	NA
1979	1,070,188	236,568	153,170	10,961	3,659	NA
1980	1,141,043	225,841	175,728	11,687	4,005	NA
1981	1,291,000	258,000	189,000	14,000	4,000	NA
1982	1,618,000	341,000	202,000	13,000	4,000	2,808,548
1983	1,845,000	373,694	194,000	11,000	3,561	3,323,360
1984	2,186,000	410,135	182,800	10,600	3,421	4,316,300

NA = Not available.

Sources: (19, 21).

Appendix table 5—Hogs: Yearend inventory, number slaughtered, and slaughter rates, China, by region and province or city

Location	Yearend number					
	1979	1980	1981	1982	1983	1984
			1,000 head			
Northeast:						
Heilongjiang	7,983	7,167	6,154	6,086	5,028	4,858
Liaoning	11,889	10,575	10,463	10,699	9,932	8,929
Jilin	5,857	5,929	5,480	5,189	4,135	4,120
North:						
Shandong	21,176	21,125	19,011	17,262	15,627	16,815
Hebei	13,522	12,934	12,165	12,271	11,757	12,078
Beijing	2,468	2,325	2,109	2,064	1,903	1,618
Tianjin	1,008	1,009	843	748	672	715
Henan	15,923	14,742	13,865	13,103	11,957	13,270
Shanxi	5,586	5,312	4,531	4,031	3,682	3,376
Northwest:						
Shaanxi	8,223	7,605	6,665	6,397	6,638	5,993
Gansu	4,400	4,239	4,090	3,957	3,938	4,448
Nei Monggol	5,546	5,185	4,683	4,609	4,271	4,128
Ningxia	649	559	518	481	479	496
Xinjiang	1,037	846	728	700	695	657
Qinghai	763	683	666	682	673	724
East:						
Zhejiang	15,500	14,038	13,447	13,832	13,873	13,262
Jiangsu	23,561	20,894	19,352	19,780	18,742	18,132
Shanghai	3,424	2,609	2,662	2,609	2,301	2,082
Anhui	11,319	11,141	10,340	10,311	10,136	11,366
Central:						
Hubei	17,488	15,893	15,146	16,086	16,429	17,466
Hunan	21,205	20,338	19,635	20,781	22,330	23,371
Jiangxi	10,047	10,180	10,066	10,233	10,794	11,388
South:						
Guangdong	20,095	19,146	19,708	21,728	20,962	20,472
Guangxi	11,030	10,341	11,253	12,842	13,553	13,500
Fujian	6,988	6,870	6,963	7,340	7,509	7,796
Southwest:						
Sichuan	50,922	51,463	50,229	51,900	53,613	56,699
Guizhou	8,751	8,957	9,025	9,451	10,024	10,889
Yunnan	13,098	13,130	13,747	15,457	16,749	17,016
Xizang	247	196	158	154	134	125
Total	319,705	305,431	293,702	300,783	298,536	306,792

Continued—

Appendix table 5—Hogs: Yearend inventory, number slaughtered, and slaughter rates, China, by region and province or city—Continued

Location	Number slaughtered					
	1979	1980	1981	1982	1983	1984
			1,000 head			
Northeast:						
Heilongjiang	4,721	4,460	3,967	3,695	3,920	3,743
Liaoning	5,929	6,563	6,643	7,113	7,101	6,852
Jilin	2,822	3,177	3,282	3,477	3,174	2,995
North:						
Shandong	10,475	12,416	12,968	12,132	11,592	12,840
Hebei	6,767	7,169	7,438	7,560	7,164	8,385
Beijing	1,996	2,290	2,168	2,124	2,250	2,194
Tianjin	774	894	847	763	697	780
Henan	8,072	6,846	6,117	6,618	5,942	6,634
Shanxi	2,615	2,773	3,029	2,622	2,502	2,837
Northwest:						
Shaanxi	4,014	4,007	4,032	3,705	3,700	3,850
Gansu	2,553	2,583	2,542	2,742	2,672	2,988
Nei Monggol	2,565	2,570	2,271	2,348	2,608	2,480
Ningxia	285	327	308	324	325	331
Xinjiang	646	673	552	454	455	460
Qinghai	336	357	355	359	351	365
East:						
Zhejiang	12,717	14,238	12,623	12,558	12,469	12,470
Jiangsu	18,322	20,684	18,876	20,295	20,718	20,381
Shanghai	4,176	3,507	3,310	3,734	3,665	3,407
Anhui	6,916	6,924	6,497	6,758	6,703	7,407
Central:						
Hubei	10,267	10,486	9,969	10,487	10,819	11,910
Hunan	15,899	17,252	17,054	17,382	18,501	21,289
Jiangxi	6,537	7,000	7,143	7,137	7,365	8,028
South:						
Guangdong	11,092	10,916	10,504	11,105	12,471	13,103
Guangxi	6,832	5,647	5,147	6,102	6,916	7,435
Fujian	3,738	4,015	4,151	4,337	4,598	5,154
Southwest:						
Sichuan	27,360	31,273	33,270	33,756	35,891	38,744
Guizhou	3,977	4,255	4,516	4,873	5,244	5,918
Yunnan	5,209	5,240	5,319	6,017	6,758	7,443
Xizang	63	65	49	50	43	48
Total	187,675	189,607	194,947	200,627	206,614	220,471

Continued—

Appendix table 5—Hogs: Yearend inventory, number slaughtered, and slaughter rates, China, by region and province or city—Continued

Location	Slaughter rate					
	1979	1980	1981	1982	1983	1984
	Percent					
Northeast:						
Heilongjiang	56.5	55.9	55.4	60.0	64.4	74.4
Liaoning	50.1	55.2	62.8	68.0	66.4	69.0
Jilin	48.5	54.2	55.4	63.4	61.2	72.4
North:						
Shandong	52.6	58.6	61.4	63.8	67.2	82.2
Hebei	54.3	53.0	57.5	62.1	58.4	71.3
Beijing	80.4	92.8	93.2	100.7	109.0	115.3
Tianjin	77.1	88.7	83.9	90.5	93.2	116.1
Henan	46.8	43.0	41.5	47.7	45.3	55.5
Shanxi	45.2	49.6	57.0	57.9	62.1	77.1
Northwest:						
Shaanxi	50.9	48.7	53.0	55.6	57.8	58.0
Gansu	53.7	58.7	60.0	67.0	67.5	75.9
Nei Monggol	46.6	46.3	43.8	50.1	56.6	58.1
Ningxia	39.6	50.4	55.1	62.5	67.6	69.1
Xinjiang	62.5	64.9	65.2	62.4	65.0	66.2
Qinghai	39.9	46.8	52.0	53.9	51.5	54.2
East:						
Zhejiang	95.3	91.9	89.9	93.4	90.1	89.9
Jiangsu	84.8	87.8	90.3	104.9	104.7	108.8
Shanghai	114.2	102.4	126.9	140.3	140.5	148.1
Anhui	59.3	61.2	58.3	65.4	65.0	73.1
Central:						
Hubei	60.2	60.0	62.7	69.2	67.3	72.5
Hunan	85.9	81.4	83.9	88.5	89.0	95.3
Jiangxi	69.2	69.7	70.2	70.9	72.0	74.4
South:						
Guangdong	56.0	54.3	54.9	56.3	57.4	62.5
Guangxi	65.8	51.2	49.8	54.2	53.9	54.9
Fujian	58.2	57.5	60.4	62.3	62.6	72.3
Southwest:						
Sichuan	64.2	61.4	64.6	67.2	69.2	72.3
Guizhou	50.5	48.6	50.4	54.0	55.5	59.0
Yunnan	40.1	40.0	40.5	43.8	43.7	44.4
Xizang	25.4	26.3	25.0	31.6	27.9	35.8
Total	62.3	62.1	63.8	68.3	68.7	73.9

Source: (*19*).

Appendix table 6—Pork production and meat output per hog, China, by region and province or city

Location	Pork production					
	1979	1980	1981	1982	1983	1984
	1,000 tons					
Northeast:						
Heilongjiang	349	348	307	276	286	291
Liaoning	333	422	484	551	540	540
Jilin	198	236	240	270	252	252
North:						
Shandong	707	862	914	895	866	967
Hebei	327	404	452	460	472	594
Beijing	112	129	130	136	147	130
Tianjin	52	60	56	53	49	55
Henan	500	494	443	476	437	496
Shanxi	129	162	191	170	160	176
Northwest:						
Shaanxi	189	223	247	222	222	225
Gansu	113	123	123	135	128	150
Nei Monggol	115	116	144	162	173	183
Ningxia	12	15	15	17	17	19
Xinjiang	32	33	33	29	31	32
Qinghai	21	20	21	22	22	24
East:						
Zhejiang	560	688	620	662	676	678
Jiangsu	920	1,038	1,031	1,221	1,149	1,211
Shanghai	192	164	169	203	195	178
Anhui	483	494	459	517	496	546
Central:						
Hubei	519	541	529	592	618	729
Hunan	768	914	987	987	1,036	1,240
Jiangxi	294	362	393	423	425	508
South:						
Guangdong	615	668	740	822	910	960
Guangxi	366	397	426	504	564	618
Fujian	204	237	270	298	320	370
Southwest:						
Sichuan	1,441	1,643	1,819	1,902	2,141	2,340
Guizhou	219	255	305	336	375	434
Yunnan	240	292	335	377	453	499
Xizang	2	2	2	2	2	2
Total	10,014	11,341	11,884	12,717	13,161	14,447

Continued—

Appendix table 6—Pork production and meat output per hog, China, by region and province or city—Continued

Location	Meat output per hog					
	1979	1980	1981	1982	1983	1984
	Kilograms					
Northeast:						
Heilongjiang	73.9	78.0	77.3	74.7	72.9	77.9
Liaoning	56.2	64.3	72.9	77.5	76.0	78.8
Jilin	70.2	74.3	73.1	77.7	79.5	84.5
North:						
Shandong	67.5	69.4	70.5	73.8	74.7	75.3
Hebei	48.3	56.4	60.8	60.8	65.9	70.9
Beijing	56.1	56.3	60.0	64.0	65.2	59.3
Tianjin	67.2	67.1	66.6	69.5	70.0	70.2
Henan	61.9	72.2	72.4	71.9	73.5	74.8
Shanxi	49.3	58.4	62.9	64.8	63.8	62.1
Northwest:						
Shaanxi	47.1	55.7	61.2	59.9	59.9	58.4
Gansu	44.3	47.6	48.4	49.2	48.1	50.2
Nei Monggol	44.8	45.1	63.2	69.0	66.4	73.9
Ningxia	42.1	45.9	50.0	52.5	52.4	57.4
Xinjiang	49.5	49.0	59.8	63.9	67.1	69.6
Qinghai	62.5	56.0	58.0	61.3	62.0	65.1
East:						
Zhejiang	44.0	48.3	49.1	52.7	54.2	54.4
Jiangsu	50.2	50.2	54.6	60.2	55.5	59.4
Shanghai	46.0	46.8	51.0	54.4	53.3	52.3
Anhui	69.8	71.3	70.6	76.5	74.0	73.2
Central:						
Hubei	50.6	51.6	53.1	56.5	57.2	61.2
Hunan	48.3	53.0	57.9	56.8	56.0	58.3
Jiangxi	45.0	51.7	55.0	59.3	57.7	63.3
South:						
Guangdong	55.4	61.2	70.4	74.0	73.0	73.2
Guangxi	53.6	70.3	82.7	82.6	81.6	83.1
Fujian	54.6	59.0	65.2	68.7	69.6	71.7
Southwest:						
Sichuan	52.7	52.5	54.7	56.3	59.7	60.4
Guizhou	55.1	59.9	67.4	69.0	71.6	73.3
Yunnan	46.1	55.7	63.1	62.7	67.0	67.0
Xizang	31.7	30.8	36.3	40.0	38.5	47.7
Total	53.4	59.8	61.0	63.4	63.7	65.5

Source: (19).

Appendix table 7—Total red meat production and pork production shares, China, by region and province or city

Location	Total red meat production					
	1979	1980	1981	1982	1983	1984
	1,000 tons					
Northeast:						
Heilongjiang	363	370	327	299	303	309
Liaoning	341	429	491	560	549	549
Jilin	205	246	251	283	263	262
North:						
Shandong	729	901	963	950	945	1,044
Hebei	342	421	478	486	511	642
Beijing	114	131	132	138	149	134
Tianjin	54	61	58	55	51	59
Henan	530	530	482	526	478	548
Shanxi	139	173	205	187	182	214
Northwest:						
Shaanxi	198	232	257	235	239	244
Gansu	129	140	141	157	148	179
Nei Monggol	208	238	239	274	304	322
Ningxia	16	19	20	23	23	27
Xinjiang	107	119	132	141	153	170
Qinghai	75	84	84	87	90	96
East:						
Zhejiang	569	698	628	672	685	688
Jiangsu	946	1,069	1,059	1,248	1,178	1,241
Shanghai	194	166	170	205	196	180
Anhui	509	518	487	547	524	581
Central:						
Hubei	532	554	540	602	628	739
Hunan	775	924	997	996	1,047	1,251
Jiangxi	302	371	396	425	427	512
South:						
Guangdong	624	677	748	832	921	974
Guangxi	374	402	433	511	572	627
Fujian	209	242	276	303	326	376
Southwest:						
Sichuan	1,502	1,715	1,890	1,975	2,209	2,413
Guizhou	228	267	316	347	386	448
Yunnan	259	309	352	394	469	516
Xizang	51	48	57	61	65	62
Total	10,624	12,054	12,609	13,508	14,020	15,406

Continued—

Appendix table 7—Total red meat production and pork production shares, China, by region and province or city—Continued

Location	Pork production as a share of total red meat production					
	1979	1980	1981	1982	1983	1984
	Percent					
Northeast:						
Heilongjiang	96.1	93.9	93.9	92.3	94.3	94.3
Liaoning	97.6	98.4	98.6	98.4	98.4	98.4
Jilin	96.7	96.2	95.6	95.3	95.8	96.5
North:						
Shandong	96.9	95.6	94.9	94.2	91.6	92.6
Hebei	95.6	95.9	94.6	94.5	92.3	92.6
Beijing	98.6	98.7	98.5	98.6	98.2	97.0
Tianjin	97.4	98.5	96.6	97.0	96.4	92.4
Henan	94.3	93.3	91.9	92.3	91.4	90.6
Shanxi	93.2	93.4	93.2	91.4	87.9	82.5
Northwest:						
Shaanxi	95.5	96.2	96.1	94.7	92.8	92.2
Gansu	87.8	87.9	87.2	86.0	87.0	83.5
Nei Monggol	55.4	48.6	60.3	59.2	57.0	56.8
Ningxia	78.5	78.3	75.0	73.1	74.7	70.8
Xinjiang	29.5	27.6	25.0	20.9	19.9	18.8
Qinghai	28.2	23.3	25.0	25.5	24.2	24.7
East:						
Zhejiang	98.4	98.6	98.7	98.7	98.6	98.5
Jiangsu	97.2	97.0	97.4	97.8	97.6	97.6
Shanghai	99.1	99.0	99.4	99.3	99.5	99.2
Anhui	94.9	95.3	94.3	94.5	94.7	94.0
Central:						
Hubei	97.6	97.7	98.0	98.3	98.4	98.6
Hunan	99.2	98.9	99.0	98.9	98.9	99.2
Jiangxi	97.5	97.8	99.2	99.5	99.5	99.1
South:						
Guangdong	98.6	98.6	98.9	98.3	98.8	98.5
Guangxi	97.9	98.7	98.4	98.9	98.7	98.5
Fujian	97.4	97.8	97.8	98.2	98.2	98.4
Southwest:						
Sichuan	96.0	95.8	96.2	96.3	96.9	97.0
Guizhou	95.8	95.4	96.2	96.7	97.3	96.9
Yunnan	92.5	94.6	95.2	95.6	96.5	96.7
Xizang	3.7	5.0	3.5	3.3	2.5	3.7
Total	94.3	94.1	94.3	94.2	93.9	93.8

Source: (19).

Appendix table 8—Number of sows, China, by region and province or city

Location	Number of sows					
	1979	1980	1981	1982	1983	1984
			1,000 head			
Northeast:						
Heilongjiang	974	739	628	694	523	631
Liaoning	1,158	936	917	954	579	605
Jilin	695	658	550	460	346	464
North:						
Shandong	1,606	1,334	1,098	1,000	1,072	1,278
Hebei	1,107	926	790	828	726	762
Beijing	264	218	186	177	159	146
Tianjin	97	64	59	54	54	48
Henan	1,089	1,008	860	838	783	1,128
Shanxi	507	434	314	294	283	256
Northwest:						
Shaanxi	561	395	341	362	436	484
Gansu	275	266	251	253	237	351
Nei Monggol	466	370	297	331	295	287
Ningxia	45	27	28	31	34	41
Xinjiang	126	82	72	77	74	71
Qinghai	66	51	41	44	54	60
East:						
Zhejiang	1,151	844	810	910	836	800
Jiangsu	2,206	1,659	1,360	1,491	1,240	1,105
Shanghai	307	252	238	289	230	190
Anhui	628	585	473	551	649	758
Central:						
Hubei	1,274	1,067	1,018	1,182	1,166	1,519
Hunan	1,615	1,202	1,237	1,618	1,662	1,574
Jiangxi	705	648	616	687	748	773
South:						
Guangdong	1,507	1,377	1,663	1,901	1,644	1,519
Guangxi	570	594	875	1,028	1,052	973
Fujian	503	437	445	496	449	443
Southwest:						
Sichuan	4,311	3,470	3,254	3,548	3,917	3,979
Guizhou	924	759	831	914	881	825
Yunnan	1,166	1,166	1,324	1,531	1,498	1,442
Xizang	45	52	40	35	23	24
Total	25,948	21,620	20,616	22,562	21,666	22,120

Continued—

Appendix table 8—Number of sows, China, by region and province or city—Continued

Location	Sows as a share of yearend hog inventory					
	1979	1980	1981	1982	1983	1984
	Percent					
Northeast:						
Heilongjiang	12.2	10.3	10.2	11.4	10.4	13.0
Liaoning	9.7	8.9	8.8	8.9	5.8	6.8
Jilin	11.9	11.1	10.0	8.9	8.4	11.3
North:						
Shandong	7.6	6.3	5.8	5.8	6.9	7.6
Hebei	8.2	7.2	6.5	6.7	6.2	6.3
Beijing	10.7	9.4	8.8	8.6	8.4	9.0
Tianjin	9.6	6.3	7.0	7.2	8.0	6.7
Henan	6.8	6.8	6.2	6.4	6.5	8.5
Shanxi	9.1	8.2	6.9	7.3	7.7	7.6
Northwest:						
Shaanxi	6.8	5.2	5.1	5.7	6.6	6.9
Gansu	6.3	6.3	6.1	6.0	6.4	7.9
Nei Monggol	8.4	7.1	6.3	7.2	6.9	7.0
Ningxia	6.9	4.8	5.4	6.4	7.1	8.3
Xinjiang	12.2	9.7	9.9	11.0	10.6	10.8
Qinghai	8.7	7.5	6.2	6.5	8.0	8.3
East:						
Zhejiang	7.4	6.0	6.0	6.6	6.0	6.0
Jiangsu	9.4	7.9	7.0	7.5	6.6	6.1
Shanghai	9.0	9.7	8.9	11.1	10.0	9.1
Anhui	5.5	5.3	4.6	5.3	6.4	6.7
Central:						
Hubei	7.3	6.7	6.7	7.3	7.1	6.3
Hunan	7.6	5.9	6.3	7.8	7.4	6.7
Jiangxi	7.0	6.4	6.1	6.7	6.9	6.8
South:						
Guangdong	7.5	7.2	8.4	8.7	7.8	7.4
Guangxi	5.2	5.7	7.8	8.0	7.8	7.2
Fujian	7.2	6.4	6.4	6.8	6.0	5.7
Southwest:						
Sichuan	8.5	6.7	6.5	6.8	7.3	7.0
Guizhou	10.6	8.5	9.2	9.7	8.8	7.6
Yunnan	8.9	8.9	9.6	9.9	8.9	8.5
Xizang	18.2	26.5	25.3	22.7	17.2	19.2
Total	8.1	7.1	7.0	7.5	7.3	7.2

Source: (19).

Appendix table 9—Yearend inventory of large animals, China, by region and province or city

Location	1979									1980[2]
	Large animals	Draft animals[1]	Yellow cattle	Water buffaloes	Milk cows	Horses	Mules	Donkeys	Camels	
	1,000 head									
Northeast:										
Heilongjiang	2,739	1,713	1,010	—	64	1,555	64	46	—	2,578
Liaoning	2,839	1,883	1,321	—	23	613	384	498	—	2,791
Jilin	2,343	1,468	1,087	—	20	866	229	141	—	2,368
North:										
Shandong	3,441	2,849	2,153	56	6	369	249	608	—	3,435
Hebei	3,469	2,604	1,263	—	15	799	608	782	2	3,411
Beijing	310	204	83	—	18	75	72	62	—	299
Tianjin	224	188	42	—	7	70	57	48	—	211
Henan	5,215	4,004	3,076	311	7	510	522	789	—	5,420
Shanxi	2,225	1,591	1,071	—	11	216	446	481	—	2,240
Northwest:										
Shaanxi	2,451	1,593	1,723	29	8	118	234	339	—	2,473
Gansu	3,726	2,107	2,091	—	17	413	304	835	66	3,924
Nei Monggol	6,853	1,803	3,399	—	141	1,853	333	764	363	6,813
Ningxia	555	366	182	—	2	55	87	223	6	575
Xinjiang	4,671	1,431	2,296	—	71	1,109	17	1,038	140	4,826
Qinghai	5,565	437	4,880	—	5	428	74	151	27	5,539
East:										
Zhejiang	848	606	423	411	14	—	—	—	—	830
Jiangsu	1,204	954	361	687	11	43	11	91	—	1,122
Shanghai	61	31	3	34	24	—	—	—	—	60
Anhui	2,644	2,125	1,090	1,078	4	164	50	258	—	2,915
Central:										
Hubei	3,368	2,255	1,764	1,487	11	36	8	62	—	3,200
Hunan	3,297	2,313	1,587	1,696	4	4	2	4	—	3,251
Jiangxi	2,121	1,608	1,139	976	6	—	—	—	—	2,093
South:										
Guangdong	3,832	2,511	1,309	2,506	17	—	—	—	—	3,949
Guangxi	4,332	2,662	1,944	2,207	4	170	6	1	—	4,294
Fujian	995	704	564	422	6	1	1	1	—	994
Southwest:										
Sichuan	9,477	3,822	5,759	3,333	24	312	23	26	—	9,541
Guizhou	4,158	2,735	2,451	1,237	4	460	6	—	—	4,288
Yunnan	6,548	2,848	3,598	1,907	14	678	225	126	—	6,789
Xizang	5,080	877	4,742	—	—	228	11	99	—	5,017
Total	94,591	50,292	52,411	18,377	558	11,145	4,023	7,473	604	95,246

Continued—

See notes at end of table.

Appendix table 9—Yearend inventory of large animals, China, by region and province or city—Continued

Location	1981									1982[2]	1983[2]	1984[2]
	Large animals	Draft animals[1]	Yellow cattle	Water buffaloes	Milk cows	Horses	Mules	Donkeys	Camels			
	1,000 head											
Northeast:												
Heilongjiang	2,503	1,516	934	—	99	1,359	61	50	—	2,534	2,641	2,827
Liaoning	2,656	1,733	1,152	—	24	598	403	479	—	2,556	2,613	2,847
Jilin	2,318	1,452	1,077	—	28	818	237	158	—	2,344	2,457	2,796
North:												
Shandong	3,513	2,895	2,080	45	12	356	269	751	—	3,460	3,820	4,031
Hebei	3,297	2,478	1,076	—	21	720	646	833	1	3,463	3,737	4,110
Beijing	387	192	71	—	24	72	77	43	—	277	278	267
Tianjin	197	167	32	—	9	58	60	38	—	190	209	230
Henan	6,070	4,989	3,232	292	9	649	640	1,248	—	6,715	7,047	7,947
Shanxi	2,187	1,689	1,050	—	15	190	477	455	—	2,247	2,392	2,502
Northwest:												
Shaanxi	2,441	1,686	1,680	30	11	114	238	368	—	2,445	2,438	2,448
Gansu	4,129	2,421	2,281	—	14	447	316	1,004	67	4,256	4,420	4,717
Nei Monggol	6,789	1,920	3,388	—	159	1,788	335	739	380	7,080	6,947	6,981
Ningxia	605	446	188	—	2	57	102	252	4	638	635	676
Xinjiang	4,977	1,637	2,535	—	102	1,061	18	1,113	148	5,116	5,100	5,122
Qinghai	5,699	453	5,000	—	11	423	81	156	28	5,884	5,940	6,009
East:												
Zhejiang	827	591	410	398	19	—	—	—	—	827	806	784
Jiangsu	1,074	846	296	617	16	47	12	86	—	1,035	989	893
Shanghai	62	26	2	30	30	—	—	—	—	63	67	68
Anhui	3,337	2,840	1,642	1,116	5	194	72	308	—	3,645	3,858	4,138
Central:												
Hubei	3,054	2,191	1,523	1,447	12	24	5	43	—	3,084	3,104	3,158
Hunan	3,270	2,462	1,508	1,746	4	5	2	5	—	3,289	3,247	3,360
Jiangxi	2,096	1,672	1,130	959	7	—	—	—	—	2,132	2,226	2,335
South:												
Guangdong	4,267	3,045	1,513	2,735	19	—	—	—	—	4,604	4,799	5,032
Guangxi	4,470	3,043	1,954	2,325	4	180	6	1	—	4,800	5,040	5,433
Fujian	1,038	766	591	438	6	1	1	1	—	1,086	1,092	1,151
Southwest:												
Sichuan	9,598	3,947	5,967	3,237	20	324	20	30	—	9,571	9,630	9,725
Guizhou	4,498	3,085	2,657	1,331	4	499	5	—	—	4,792	4,938	5,231
Yunnan	6,964	3,331	3,829	2,024	12	717	228	154	—	7,334	7,706	8,257
Xizang	5,418	1,146	5,033	—	—	271	14	100	—	5,480	5,320	5,314
Total	97,641	54,705	53,833	18,770	698	10,972	4,325	8,415	628	101,127	103,496	108,389

— = None or negligible.
[1]"Draft animals" includes those used for field preparation and hauling.
[2]Breakdowns f ir specific animal groups not available.

Source: (19).

Appendix table 10—Cattle: Yearend inventory, number slaughtered, and slaughter rates, China, by region and province or city

Location	Yearend number						
	1979						
	Total	Beef cattle	1980	1981	1982	1983	1984
	1,000 head						
Northeast:							
Heilongjiang	1,074	43	NA	1,035	NA	NA	NA
Liaoning	1,344	35.4	NA	1,176	NA	NA	NA
Jilin	1,107	14.3	NA	1,105	NA	NA	NA
North:							
Shandong	2,215	6	NA	2,137	NA	NA	NA
Hebei	1,278	24.7	NA	1,097	NA	NA	NA
Beijing	101	2	NA	95	NA	NA	NA
Tianjin	49	—	NA	41	NA	NA	NA
Henan	3,394	7	NA	3,533	NA	NA	NA
Shanxi	1,082	22	NA	1,065	NA	NA	NA
Northwest:							
Shaanxi	1,760	4.6	NA	1,721	NA	NA	NA
Gansu	2,108	—	NA	2,295	NA	NA	NA
Nei Monggol	3,540	507	NA	3,547	NA	NA	NA
Ningxia	184	5	NA	190	NA	NA	NA
Xinjiang	2,367	180	NA	2,637	NA	NA	NA
Qinghai	4,885	—	NA	5,011	NA	NA	NA
East:							
Zhejiang	848	—	NA	827	NA	NA	NA
Jiangsu	1,059	1	NA	929	NA	NA	NA
Shanghai	61	—	NA	62	NA	NA	NA
Anhui	2,172	—	NA	2,763	NA	NA	NA
Central:							
Hubei	3,262	—	NA	2,982	NA	NA	NA
Hunan	3,287	—	NA	3,258	NA	NA	NA
Jiangxi	2,121	—	NA	2,096	NA	NA	NA
South:							
Guangdong	3,832	—	NA	4,267	NA	NA	NA
Guangxi	4,155	2	NA	4,283	NA	NA	NA
Fujian	992	—	NA	1,035	NA	NA	NA
Southwest:							
Sichuan	9,116	24	NA	9,224	NA	NA	NA
Guizhou	3,692	3	NA	3,994	NA	NA	NA
Yunnan	5,519	1	NA	5,865	NA	NA	NA
Xizang	4,472	—	NA	5,033	NA	NA	NA
Total	71,346	882	71,676	73,301	76,073	78,084	82,128

See notes at end of table.

Continued—

Appendix table 10—Cattle: Yearend inventory, number slaughtered, and slaughter rates, China, by region and province or city—Continued

Location	Number slaughtered					
	1979	1980	1981	1982	1983	1984
	1,000 head					
Northeast:						
Heilongjiang	80	118	113	91	55	55
Liaoning	89	53	47	55	39	30
Jilin	61	85	98	101	85	58
North:						
Shandong	67	88	115	106	189	184
Hebei	50	54	54	32	39	81
Beijing	4	4	3	4	6	10
Tianjin	3	3	3	2	2	6
Henan	80	98	63	55	97	171
Shanxi	20	21	24	20	27	53
Northwest:						
Shaanxi	40	46	42	34	45	66
Gansu	61	73	80	77	70	113
Nei Monggol	302	506	368	326	409	438
Ningxia	7	5	5	5	4	7
Xinjiang	191	242	261	316	409	434
Qinghai	338	356	330	307	379	409
East:						
Zhejiang	44	49	28	34	38	42
Jiangsu	46	45	36	39	52	53
Shanghai	4	7	4	9	5	9
Anhui	54	78	61	83	104	159
Central:						
Hubei	100	75	62	50	54	56
Hunan	63	83	84	120	119	101
Jiangxi	100	110	46	30	27	56
South:						
Guangdong	116	113	95	117	124	157
Guangxi	85	50	65	71	76	91
Fujian	36	32	26	25	25	26
Southwest:						
Sichuan	379	487	483	491	455	491
Guizhou	66	69	45	50	64	82
Yunnan	200	139	121	127	119	116
Xizang	282	233	255	319	355	315
Total	2,968	3,322	3,016	3,096	3,472	3,869

See notes at end of table.

Continued—

Appendix table 10—Cattle: Yearend inventory, number slaughtered, and slaughter rates, China, by region and province or city—Continued

Location	Slaughter rates					
	1979	1980	1981	1982	1983	1984
	Percent					
Northeast:						
Heilongjiang	NA	11.0	NA	NA	NA	NA
Liaoning	NA	3.9	NA	NA	NA	NA
Jilin	NA	7.7	NA	NA	NA	NA
North:						
Shandong	NA	4.0	NA	NA	NA	NA
Hebei	NA	4.2	NA	NA	NA	NA
Beijing	NA	4.0	NA	NA	NA	NA
Tianjin	NA	6.1	NA	NA	NA	NA
Henan	NA	2.9	NA	NA	NA	NA
Shanxi	NA	1.9	NA	NA	NA	NA
Northwest:						
Shaanxi	NA	2.6	NA	NA	NA	NA
Gansu	NA	3.5	NA	NA	NA	NA
Nei Monggol	NA	14.3	NA	NA	NA	NA
Ningxia	NA	2.7	NA	NA	NA	NA
Xinjiang	NA	10.2	NA	NA	NA	NA
Qinghai	NA	7.3	NA	NA	NA	NA
East:						
Zhejiang	NA	5.8	NA	NA	NA	NA
Jiangsu	NA	4.2	NA	NA	NA	NA
Shanghai	NA	11.5	NA	NA	NA	NA
Anhui	NA	3.6	NA	NA	NA	NA
Central:						
Hubei	NA	2.3	NA	NA	NA	NA
Hunan	NA	2.5	NA	NA	NA	NA
Jiangxi	NA	5.2	NA	NA	NA	NA
South:						
Guangdong	NA	2.9	NA	NA	NA	NA
Guangxi	NA	1.2	NA	NA	NA	NA
Fujian	NA	3.2	NA	NA	NA	NA
Southwest:						
Sichuan	NA	5.3	NA	NA	NA	NA
Guizhou	NA	1.9	NA	NA	NA	NA
Yunnan	NA	2.5	NA	NA	NA	NA
Xizang	NA	4.9	NA	NA	NA	NA
Total	4.2	4.7	4.2	4.2	4.6	5.0

NA = Not available.
— = None or negligible.

Source: (19).

Appendix table 11—Beef production and average meat output per head, China, by region and province or city

Location	Beef production					
	1979	1980	1981	1982	1983	1984
	1,000 tons					
Northeast:						
Heilongjiang	8.99	15.76	11.65	10.55	6.70	7.23
Liaoning	6.57	4.63	4.62	5.02	4.43	4.08
Jilin	5.20	7.56	8.57	9.93	8.53	5.94
North:						
Shandong	5.04	8.88	12.24	12.02	24.28	27.69
Hebei	4.50	4.05	4.05	2.41	4.69	10.26
Beijing	.30	.31	.24	.31	.58	1.03
Tianjin	.39	.32	.30	.20	.21	1.04
Henan	5.91	6.93	6.02	5.18	8.81	18.34
Shanxi	1.45	1.57	1.98	1.76	1.79	3.80
Northwest:						
Shaanxi	4.00	2.47	2.35	2.33	3.14	4.50
Gansu	3.70	4.67	5.41	5.15	5.34	8.76
Nei Monggol	30.23	45.52	31.15	33.88	44.00	49.97
Ningxia	.35	.29	.35	.40	.34	.66
Xinjiang	19.22	21.47	25.99	31.36	38.82	42.96
Qinghai	20.62	24.92	23.10	22.96	28.73	30.67
East:						
Zhejiang	4.40	4.92	2.75	3.47	3.61	4.55
Jiangsu	4.08	4.15	3.33	3.86	5.50	6.19
Shanghai	.29	.43	.24	.60	.36	.79
Anhui	4.63	5.69	5.15	7.05	8.99	16.86
Central:						
Hubei	6.48	4.87	3.91	3.21	3.45	3.80
Hunan	4.04	5.47	6.03	7.65	8.23	7.49
Jiangxi	7.15	7.87	3.33	1.76	1.79	3.80
South:						
Guangdong	7.81	8.10	7.00	8.57	9.74	13.05
Guangxi	5.27	3.43	5.01	5.81	6.07	7.53
Fujian	2.90	2.66	2.17	2.09	2.17	2.04
Southwest:						
Sichuan	28.82	35.63	36.63	38.38	37.67	41.70
Guizhou	4.39	4.73	3.36	3.94	4.73	6.67
Yunnan	12.00	10.23	8.97	9.26	9.25	9.34
Xizang	21.15	20.91	23.06	26.17	31.76	29.71
Total	229.86	268.70	248.41	265.56	314.83	372.96

Continued—

Appendix table 11—Beef production and average meat output per head, China, by region and province or city—Continued

Location	Average meat output per head					
	1979	1980	1981	1982	1983	1984
	Kilograms					
Northeast:						
Heilongjiang	112.4	133.6	103.1	116.0	121.8	131.5
Liaoning	73.8	87.4	98.2	91.3	113.7	135.9
Jilin	85.2	88.9	87.5	98.3	100.4	102.4
North:						
Shandong	75.2	100.9	106.4	113.4	128.4	150.5
Hebei	90.0	75.0	75.0	75.3	120.1	126.6
Beijing	75.0	77.5	79.8	77.3	95.8	103.3
Tianjin	130.0	106.7	100.0	100.0	105.8	173.0
Henan	73.9	70.7	95.5	94.3	90.9	107.3
Shanxi	72.5	74.8	82.7	88.2	66.3	71.6
Northwest:						
Shaanxi	100.0	53.7	55.9	68.5	69.7	68.2
Gansu	60.7	64.0	67.6	66.9	76.3	77.5
Nei Monggol	100.1	90.0	84.6	103.9	107.6	114.1
Ningxia	50.0	58.0	69.6	79.3	86.0	94.7
Xinjiang	100.6	88.7	99.6	99.3	94.9	99.0
Qinghai	61.0	70.0	70.0	74.8	75.8	75.0
East:						
Zhejiang	100.0	100.4	98.2	101.9	94.9	108.3
Jiangsu	88.7	92.2	92.4	99.0	105.7	116.9
Shanghai	72.5	61.4	58.8	66.7	71.5	87.8
Anhui	85.7	76.4	84.4	84.9	86.4	106.0
Central:						
Hubei	64.8	64.9	63.1	64.1	63.9	67.9
Hunan	64.1	65.9	71.8	63.8	69.1	74.2
Jiangxi	71.5	71.5	72.3	58.8	66.3	67.8
South:						
Guangdong	67.3	71.7	73.7	73.2	76.7	83.1
Guangxi	62.0	68.6	77.0	81.9	79.9	82.8
Fujian	80.6	83.1	83.5	83.7	86.9	78.5
Southwest:						
Sichuan	76.0	73.2	75.8	78.2	82.8	84.9
Guizhou	66.5	68.6	74.7	78.8	73.9	80.9
Yunnan	60.0	73.6	74.1	72.9	77.7	80.5
Xizang	75.0	89.7	90.4	82.0	89.5	94.3
Total	77.4	80.9	82.4	85.8	90.7	96.3

Source: (19).

Appendix table 12—Sheep and goats: Yearend inventory, number slaughtered, and slaughter rates, China, by region and province or city

Location	Yearend inventory				
	1979			1980	1981
	Total	Sheep	Goats		total
			1,000 head		
Northeast:					
Heilongjiang	2,457	2,236	221	3,030	3,430
Liaoning	1,671	1,357	314	1,947	2,104
Jilin	1,493	1,379	114	1,709	1,679
North:					
Shandong	9,258	3,015	6,243	10,413	10,256
Hebei	7,288	3,129	4,159	8,148	8,424
Beijing	573	85	488	560	579
Tianjin	266	85	181	363	526
Henan	11,078	3,791	7,287	11,477	10,811
Shanxi	9,208	3,646	5,562	9,099	8,240
Northwest:					
Shaanxi	6,493	1,782	4,711	6,569	6,124
Gansu	11,126	7,903	3,223	11,875	11,676
Nei Monggol	26,323	18,488	7,835	25,534	26,700
Ningxia	3,196	2,025	1,171	3,224	3,011
Xinjiang	20,147	16,429	3,718	21,054	22,567
Qinghai	15,960	14,296	1,664	16,128	16,176
East:					
Zhejiang	3,456	2,389	1,067	3,240	2,886
Jiangsu	6,157	1,147	5,010	5,458	5,297
Shanghai	452	141	311	411	384
Anhui	3,631	850	2,781	3,833	3,160
Central:					
Hubei	1,775	116	1,659	1,690	1,592
Hunan	877	3	874	849	768
Jiangxi	105	10	95	108	91
South:					
Guangdong	408	—	408	356	328
Guangxi	875	3	872	803	780
Fujian	688	—	688	718	733
Southwest:					
Sichuan	10,921	3,709	7,212	10,886	10,632
Guizhou	2,074	292	1,782	2,018	1,970
Yunnan	7,021	1,772	5,249	7,468	7,362
Xizang	18,165	12,490	5,675	18,253	19,450
Total	183,142	102,568	80,574	187,311	187,730

See notes at end of table.

Continued—

Appendix table 12—Sheep and goats: Yearend inventory, number slaughtered, and slaughter rates, China, by region and province or city—Continued

Location	Yearend inventory				
	1981				
	Sheep	Goats	1982	1983	1984
	1,000 head				
Northeast:					
Heilongjiang	3,044	386	3,818	3,166	2,482
Liaoning	1,742	362	2,078	2,077	1,939
Jilin	1,559	120	1,611	1,525	1,526
North:					
Shandong	3,551	6,705	9,895	9,018	7,539
Hebei	3,749	4,675	9,150	8,167	7,253
Beijing	104	475	629	622	492
Tianjin	173	374	648	611	568
Henan	3,489	7,322	9,300	7,398	6,784
Shanxi	3,569	4,671	7,999	6,982	5,073
Northwest:					
Shaanxi	1,081	4,323	6,006	5,201	4,128
Gansu	8,546	3,130	10,387	9,299	8,834
Nei Monggol	19,588	7,112	27,350	24,179	23,773
Ningxia	2,015	996	2,722	2,475	2,696
Xinjiang	18,408	4,159	23,553	24,443	24,447
Qinghai	14,526	1,650	15,163	14,097	13,992
East:					
Zhejiang	1,993	893	2,626	2,293	1,979
Jiangsu	1,033	4,264	5,294	4,780	4,068
Shanghai	113	271	352	333	269
Anhui	704	2,456	2,494	2,062	2,115
Central:					
Hubei	88	1,504	1,543	1,402	1,298
Hunan	3	765	750	698	639
Jiangxi	5	36	84	75	65
South:					
Guangdong	0	328	356	341	364
Guangxi	2	778	798	765	717
Fujian	0	733	718	624	627
Southwest:					
Sichuan	3,189	6,813	10,026	9,583	9,381
Guizhou	303	1,667	1,898	1,776	1,621
Yunnan	1,825	5,537	7,113	7,026	7,456
Xizang	13,714	5,736	17,439	15,933	16,245
Total	109,466	78,264	181,790	166,951	158,400

See notes at end of table.

Continued—

Appendix table 12—Sheep and goats: Yearend inventory, number slaughtered, and slaughter rates, China, by region and province or city—Continued

Location	Number slaughtered					
	1979	1980	1981	1982	1983	1984
	1,000 head					
Northeast:						
Heilongjiang	409	480	671	754	949	776
Liaoning	182	210	249	409	398	450
Jilin	147	156	250	287	245	293
North:						
Shandong	2,286	3,775	4,607	5,216	6,163	5,191
Hebei	1,392	1,749	2,444	2,693	3,067	3,570
Beijing	132	138	131	163	205	304
Tianjin	77	63	96	143	152	310
Henan	2,151	2,891	3,328	3,505	3,015	3,202
Shanxi	912	1,004	1,299	1,350	1,893	3,016
Northwest:						
Shaanxi	666	661	873	1,098	1,560	1,600
Gansu	883	941	923	1,320	1,066	1,646
Nei Monggol	4,908	7,686	6,425	7,498	7,486	6,911
Ningxia	307	429	424	716	536	577
Xinjiang	4,079	4,778	5,212	5,860	6,195	7,155
Qinghai	2,120	2,481	2,515	2,445	2,468	2,445
East:						
Zhejiang	476	513	425	433	486	477
Jiangsu	2,756	3,540	3,249	2,993	2,884	2,837
Shanghai	152	144	122	110	89	53
Anhui	2,287	2,281	2,956	2,780	2,239	2,117
Central:						
Hubei	505	587	542	549	483	495
Hunan	333	405	345	311	276	288
Jiangxi	24	41	59	38	20	50
South:						
Guangdong	88	93	92	101	92	104
Guangxi	160	151	142	126	103	119
Fujian	197	211	240	270	269	299
Southwest:						
Sichuan	2,998	3,720	3,626	3,513	2,955	2,829
Guizhou	323	514	561	545	437	546
Yunnan	745	527	472	589	556	532
Xizang	3,742	2,250	2,526	2,927	2,920	2,613
Total	35,437	42,419	44,814	48,742	49,237	50,805

Continued—

See notes at end of table.

Appendix table 12—Sheep and goats: Yearend inventory, number slaughtered, and slaughter rates, China, by region and province or city—Continued

Location	Slaughter rate					
	1979	1980	1981	1982	1983	1984
	Percent					
Northeast:						
Heilongjiang	NA	19.5	22.1	22.0	24.9	24.5
Liaoning	NA	12.6	12.8	19.4	19.2	21.7
Jilin	NA	10.4	14.6	17.1	15.2	19.2
North:						
Shandong	NA	40.8	44.2	50.9	62.3	57.6
Hebei	NA	24.0	30.0	32.0	33.5	43.7
Beijing	NA	24.1	23.4	28.2	32.6	48.9
Tianjin	NA	23.7	26.4	27.2	23.5	50.7
Henan	NA	26.1	29.0	32.4	32.4	43.3
Shanxi	NA	10.9	14.3	16.3	23.7	43.2
Northwest:						
Shaanxi	NA	10.2	13.1	17.9	26.0	30.8
Gansu	NA	8.5	7.8	11.3	10.3	17.7
Nei Monggol	NA	29.2	25.2	28.1	27.4	28.6
Ningxia	NA	13.4	13.2	23.8	19.7	23.3
Xinjiang	NA	23.7	24.8	26.0	26.3	29.3
Qinghai	NA	15.5	15.7	15.1	16.3	17.3
East:						
Zhejiang	NA	14.8	13.1	15.0	16.8	20.8
Jiangsu	NA	57.5	59.5	56.5	54.5	59.4
Shanghai	NA	31.9	29.7	28.6	25.3	15.9
Anhui	NA	62.8	77.1	88.0	89.8	102.7
Central:						
Hubei	NA	33.1	32.1	34.5	31.3	35.3
Hunan	NA	46.2	40.6	40.5	36.8	41.3
Jiangxi	NA	39.0	54.6	41.8	23.8	66.7
South:						
Guangdong	NA	22.8	25.8	30.8	25.8	30.5
Guangxi	NA	17.3	17.2	16.2	12.9	15.6
Fujian	NA	30.7	33.4	36.8	38.0	47.9
Southwest:						
Sichuan	NA	34.1	33.3	33.0	29.8	29.5
Guizhou	NA	24.8	27.8	27.7	23.0	33.7
Yunnan	NA	7.5	6.3	8.0	7.8	7.5
Xizang	NA	12.4	13.8	15.0	16.7	16.4
Total	20.8	23.2	23.9	26.0	27.1	30.4

NA = Not available.
— = None or negligible.

Source: (17).

Appendix table 13—Mutton production and average meat output per sheep or goat, China, by region and province or city

Location	Mutton production					
	1979	1980	1981	1982	1983	1984
	1,000 tons					
Northeast:						
Heilongjiang	5.25	6.94	8.19	12.41	10.67	10.49
Liaoning	1.46	2.19	2.36	3.91	4.12	4.66
Jilin	1.53	1.75	2.70	3.30	2.46	3.30
North:						
Shandong	17.47	30.58	36.55	43.00	55.32	49.31
Hebei	10.44	13.11	22.00	24.24	34.46	37.53
Beijing	1.32	1.38	1.31	1.63	2.05	3.04
Tianjin	.99	.59	1.19	1.43	1.62	3.46
Henan	24.31	28.85	33.58	34.60	32.47	33.13
Shanxi	8.05	9.90	12.84	14.08	19.07	31.29
Northwest:						
Shaanxi	4.99	6.39	7.45	10.15	14.12	14.40
Gansu	12.02	12.22	12.69	16.76	13.92	20.83
Nei Monggol	62.82	76.86	63.87	77.84	86.87	89.20
Ningxia	2.99	3.82	3.99	5.83	5.42	7.15
Xinjiang	56.47	64.77	72.59	80.42	83.71	95.48
Qinghai	33.39	39.70	40.40	41.86	39.49	41.57
East:						
Zhejiang	4.76	5.19	5.04	5.08	5.81	5.48
Jiangsu	21.98	27.44	24.84	23.53	23.04	23.29
Shanghai	1.54	1.28	.78	.82	.72	.53
Anhui	21.28	18.17	22.51	23.32	18.64	17.98
Central:						
Hubei	6.31	7.90	6.85	7.08	6.55	6.50
Hunan	2.50	4.53	4.11	3.55	3.05	3.03
Jiangxi	.26	.47	.73	.38	.27	.80
South:						
Guangdong	.74	1.15	1.44	1.67	1.46	1.78
Guangxi	2.75	1.88	1.78	1.77	1.46	1.64
Fujian	2.55	2.73	3.44	3.34	3.55	3.87
Southwest:						
Sichuan	31.56	36.89	35.74	34.07	29.97	30.93
Guizhou	5.18	7.31	8.21	7.35	5.69	7.40
Yunnan	7.45	6.44	6.85	8.20	7.10	7.58
Xizang	28.07	24.24	32.06	32.33	31.58	30.10
Total	380.41	444.75	476.07	523.93	544.66	585.75

Continued—

Appendix table 13—Mutton production and average meat output per sheep or goat, China, by region and province or city—Continued

Location	Average meat output per sheep or goat					
	1979	1980	1981	1982	1983	1984
	Kilograms					
Northeast:						
Heilongjiang	12.8	14.5	12.2	16.5	11.2	13.5
Liaoning	8.0	10.4	9.5	9.5	10.3	10.3
Jilin	10.4	11.2	10.8	11.5	10.1	11.3
North:						
Shandong	7.6	8.1	7.9	8.2	9.0	9.5
Hebei	7.5	7.5	9.0	9.0	11.2	10.5
Beijing	10.0	10.0	10.0	10.0	10.0	10.0
Tianjin	12.9	9.4	12.3	10.0	10.7	11.2
Henan	11.3	10.0	10.1	9.9	10.8	10.3
Shanxi	8.8	9.9	9.9	10.4	10.1	10.4
Northwest:						
Shaanxi	7.5	9.7	8.5	9.3	9.1	9.0
Gansu	13.6	13.0	13.7	12.7	13.1	12.7
Nei Monggol	12.8	10.0	9.9	10.4	11.6	12.9
Ningxia	9.7	8.9	9.4	8.1	10.1	12.4
Xinjiang	13.8	13.6	13.9	13.7	13.5	13.3
Qinghai	15.8	16.0	16.0	17.1	16.0	17.0
East:						
Zhejiang	10.0	10.1	11.9	11.7	12.0	11.5
Jiangsu	8.0	7.8	7.6	7.9	8.0	8.2
Shanghai	10.1	8.9	6.4	7.4	8.1	10.0
Anhui	9.2	8.0	7.6	8.4	8.3	8.5
Central:						
Hubei	12.5	13.5	12.6	12.9	13.6	13.1
Hunan	7.5	11.4	11.9	11.4	11.1	10.5
Jiangxi	10.8	11.5	12.4	10.0	13.5	16.0
South:						
Guangdong	8.4	12.4	15.6	16.5	15.9	17.1
Guangxi	17.2	12.5	12.5	14.0	14.2	13.8
Fujian	12.9	12.9	14.3	12.4	13.2	12.9
Southwest:						
Sichuan	10.5	9.9	9.9	9.7	10.0	10.9
Guizhou	16.0	14.2	14.6	13.5	13.0	13.6
Yunnan	10.0	12.2	14.5	13.9	12.8	14.2
Xizang	7.5	10.8	12.7	11.0	10.8	11.5
Total	10.7	10.5	10.6	10.7	11.1	11.5

Source: (*19*).

Appendix table 14—Meat production, China, by region and province or city

Location	Total meat					
	1979	1980	1981	1982	1983	1984
	1,000 tons					
Northeast:						
Heilongjiang	363	370	327	299	303	309
Liaoning	341	429	491	560	549	549
Jilin	205	246	251	283	263	262
North:						
Shandong	729	901	963	950	945	1,044
Hebei	342	421	478	486	511	642
Beijing	114	131	132	138	149	134
Tianjin	54	61	58	55	51	59
Henan	530	530	482	526	478	548
Shanxi	139	173	205	187	182	214
Northwest:						
Shaanxi	198	232	257	235	239	244
Gansu	129	140	141	157	148	179
Nei Monggol	208	238	239	274	304	322
Ningxia	16	19	20	23	23	27
Xinjiang	107	119	132	141	153	170
Qinghai	75	84	84	87	90	96
East:						
Zhejiang	569	698	628	672	685	688
Jiangsu	946	1,069	1,059	1,248	1,178	1,241
Shanghai	194	166	170	205	196	180
Anhui	509	518	487	547	524	581
Central:						
Hubei	532	554	540	602	628	739
Hunan	775	924	997	996	1,047	1,251
Jiangxi	302	371	396	425	427	512
South:						
Guangdong	624	677	748	832	921	974
Guangxi	374	402	433	511	572	627
Fujian	209	242	276	303	326	376
Southwest:						
Sichuan	1,502	1,715	1,891	1,975	2,209	2,413
Guizhou	228	267	316	347	386	448
Yunnan	259	309	352	394	469	516
Xizang	51	48	57	61	65	62
Total	10,624	12,054	12,609	13,508	14,021	15,406

Continued—

Appendix table 14—Meat production, China, by region and province or city—Continued

Location	Pork production					
	1979	1980	1981	1982	1983	1984
	1,000 tons					
Northeast:						
Heilongjiang	349	348	307	276	286	291
Liaoning	333	422	484	551	540	540
Jilin	198	236	240	270	252	253
North:						
Shandong	707	862	914	895	866	967
Hebei	327	404	452	460	472	594
Beijing	112	129	130	136	147	130
Tianjin	52	60	56	53	49	55
Henan	500	494	443	476	437	496
Shanxi	129	162	191	170	160	176
Northwest:						
Shaanxi	189	223	247	222	222	225
Gansu	113	123	123	135	128	150
Nei Monggol	115	116	144	162	173	183
Ningxia	12	15	15	17	17	19
Xinjiang	32	33	33	29	31	32
Qinghai	21	20	21	22	22	24
East:						
Zhejiang	560	688	620	662	676	678
Jiangsu	920	1,038	1,031	1,221	1,149	1,211
Shanghai	192	164	169	203	195	178
Anhui	483	494	459	517	496	546
Central:						
Hubei	519	541	529	592	618	729
Hunan	768	914	987	987	1,036	1,240
Jiangxi	294	362	393	423	425	508
South:						
Guangdong	615	668	740	822	910	960
Guangxi	366	397	426	504	564	618
Fujian	204	237	270	298	320	370
Southwest:						
Sichuan	1,441	1,643	1,819	1,902	2,141	2,340
Guizhou	219	255	305	336	375	434
Yunnan	240	292	335	377	453	499
Xizang	2	2	2	2	2	2
Total	10,014	11,341	11,884	12,718	13,161	14,447

Continued—

Appendix table 14—Meat production, China, by region and province or city—Continued

Location	Beef production					
	1979	1980	1981	1982	1983	1984
			1,000 tons			
Northeast:						
Heilongjiang	8.99	15.76	11.65	10.55	6.70	7.23
Liaoning	6.57	4.63	4.62	5.02	4.43	4.08
Jilin	5.20	7.56	8.57	9.93	8.53	5.94
North:						
Shandong	5.04	8.88	12.24	12.02	27.69	24.69
Hebei	4.50	4.05	4.05	2.41	4.69	10.26
Beijing	.30	.31	.24	.31	.59	1.03
Tianjin	.39	.32	.30	.20	.21	1.04
Henan	5.91	6.93	6.02	5.18	8.81	18.34
Shanxi	1.45	1.57	1.98	2.02	1.79	3.80
Northwest:						
Shaanxi	4.00	2.47	2.35	2.33	3.14	4.50
Gansu	3.70	4.67	5.41	5.15	5.34	8.76
Nei Monggol	30.23	45.52	31.15	33.89	44.00	49.97
Ningxia	.35	.29	.35	.40	.34	.66
Xinjiang	19.22	21.47	25.99	31.36	38.82	42.96
Qinghai	20.62	24.92	23.10	22.96	28.73	30.67
East:						
Zhejiang	4.40	4.92	2.75	3.47	3.61	4.55
Jiangsu	4.08	4.15	3.33	3.86	5.50	6.19
Shanghai	.29	.43	.24	.60	.36	.79
Anhui	4.63	5.96	5.15	7.05	8.99	16.86
Central:						
Hubei	6.48	4.87	3.91	3.21	3.45	3.80
Hunan	4.04	5.47	6.03	7.65	8.23	7.49
Jiangxi	7.15	7.87	2.83	1.46	1.79	3.80
South:						
Guangdong	7.81	8.10	7.00	8.57	9.74	13.05
Guangxi	5.27	3.43	5.01	5.81	6.07	7.53
Fujian	2.90	2.66	2.17	2.09	2.17	2.04
Southwest:						
Sichuan	28.82	35.63	36.63	38.38	37.67	41.70
Guizhou	4.39	4.73	3.36	3.94	4.73	6.64
Yunnan	12.00	10.23	8.97	9.26	9.25	9.34
Xizang	21.15	20.91	23.06	26.17	31.76	29.71
Total	229.86	268.70	248.41	265.56	314.83	372.96

Continued—

Appendix table 14—Meat production, China, by region and province or city—Continued

Location	Mutton production					
	1979	1980	1981	1982	1983	1984
	1,000 tons					
Northeast:						
Heilongjiang	5.25	6.94	8.19	12.41	10.67	10.49
Liaoning	1.46	2.19	2.36	3.91	4.12	4.66
Jilin	1.53	1.75	2.70	3.30	2.46	3.30
North:						
Shandong	17.47	30.58	36.55	42.99	55.32	49.31
Hebei	10.44	13.11	22.00	24.24	34.46	37.53
Beijing	1.32	1.38	1.31	1.63	2.05	3.04
Tianjin	.99	.59	1.19	1.43	1.62	3.46
Henan	24.31	28.85	33.58	34.60	32.47	33.13
Shanxi	8.05	9.90	12.84	14.06	19.07	31.29
Northwest:						
Shaanxi	4.99	6.39	7.45	10.15	14.12	14.40
Gansu	12.02	12.22	12.69	16.76	13.92	20.83
Nei Monggol	62.82	76.86	63.87	77.84	86.87	89.20
Ningxia	2.99	3.82	3.99	5.83	5.42	7.15
Xinjiang	56.47	64.77	72.59	80.42	83.71	95.48
Qinghai	33.39	39.70	40.40	41.87	39.49	41.57
East:						
Zhejiang	4.76	5.19	5.04	5.08	5.81	5.48
Jiangsu	21.98	27.44	24.84	23.53	23.04	23.29
Shanghai	1.54	1.28	.78	.82	.72	.53
Anhui	21.28	18.17	22.51	23.32	18.64	17.98
Central:						
Hubei	6.31	7.90	6.85	7.06	6.55	6.50
Hunan	2.50	4.63	4.11	3.56	3.05	3.03
Jiangxi	.26	.47	.73	.38	.27	.80
South:						
Guangdong	.74	1.15	1.44	1.67	1.46	1.78
Guangxi	2.75	1.88	1.78	1.77	1.46	1.64
Fujian	2.55	2.73	3.44	3.34	3.55	3.87
Southwest:						
Sichuan	31.56	36.89	35.74	34.07	29.97	20.93
Guizhou	5.18	7.31	8.21	7.35	5.69	7.40
Yunnan	7.45	6.44	6.85	8.20	7.10	7.58
Xizang	28.07	24.24	32.06	32.33	31.58	30.10
Total	380.41	444.75	476.07	523.93	544.66	585.75

Source: (19).

Appendix table 15—Meat production, China, by region and province or city

Location	Pork production					
	1979	1980	1981	1982	1983	1984
	Percent					
Northeast:						
Heilongjiang	96.1	93.9	93.9	92.3	94.3	94.3
Liaoning	97.6	98.4	98.6	98.4	98.4	98.4
Jilin	96.7	96.2	95.5	95.3	95.8	96.5
North:						
Shandong	96.9	95.6	94.9	94.2	91.6	92.6
Hebei	95.6	95.9	94.6	94.5	92.3	92.6
Beijing	98.6	98.7	98.8	98.6	98.2	97.0
Tianjin	97.4	98.5	97.4	97.0	96.4	92.4
Henan	94.3	93.3	91.8	92.3	91.4	90.6
Shanxi	93.2	93.4	92.8	91.4	87.9	82.5
Northwest:						
Shaanxi	95.5	96.2	96.2	94.7	92.8	92.2
Gansu	87.8	87.9	87.2	86.0	87.0	83.5
Nei Monggol	55.4	48.6	60.2	59.2	57.0	56.8
Ningxia	78.5	78.3	78.0	73.1	74.7	70.8
Xinjiang	29.5	27.6	25.1	20.9	19.9	18.8
Qinghai	28.2	23.3	24.5	25.5	24.2	24.7
East:						
Zhejiang	98.4	98.6	98.8	98.7	98.6	98.5
Jiangsu	97.2	97.0	97.3	97.8	97.6	97.6
Shanghai	99.1	99.0	99.4	99.3	99.5	99.3
Anhui	94.9	95.3	94.3	94.5	94.7	94.0
Central:						
Hubei	97.6	97.7	98.0	98.3	98.4	98.5
Hunan	99.2	98.9	99.0	98.9	98.9	99.2
Jiangxi	97.5	97.8	99.1	99.5	99.5	99.1
South:						
Guangdong	98.6	98.6	98.9	98.8	98.8	98.5
Guangxi	97.9	98.7	98.4	98.5	98.7	98.5
Fujian	97.4	97.8	98.0	98.2	98.2	98.4
Southwest:						
Sichuan	96.0	95.8	96.2	96.3	96.9	97.0
Guizhou	95.8	95.5	96.3	96.7	97.3	96.9
Yunnan	92.5	94.6	95.5	95.6	96.5	96.7
Xizang	3.7	5.0	3.5	3.3	2.5	3.7

Continued—

Appendix table 15—Meat production, China, by region and province or city—Continued

Location	Beef production					
	1979	1980	1981	1982	1983	1984
	Percent					
Northeast:						
Heilongjiang	2.5	4.3	3.6	3.5	2.2	2.3
Liaoning	1.9	1.1	1.0	.9	.8	.7
Jilin	2.5	3.1	3.4	3.5	3.2	2.3
North:						
Shandong	.7	1.0	1.2	1.3	2.6	2.7
Hebei	1.3	1.0	.8	.5	.9	1.6
Beijing	.3	.2	.2	.2	.4	.8
Tianjin	.7	.5	.5	.4	.4	1.8
Henan	1.1	1.3	1.2	1.0	1.8	3.3
Shanxi	1.0	.9	1.0	1.1	1.6	2.9
Northwest:						
Shaanxi	2.0	1.1	1.0	1.0	1.3	1.8
Gansu	2.9	3.3	3.8	3.3	3.6	4.9
Nei Monggol	14.5	19.1	13.1	12.4	14.5	15.5
Ningxia	2.3	1.5	1.8	1.7	1.5	2.5
Xinjiang	17.9	18.0	19.7	22.2	25.4	25.2
Qinghai	27.4	29.6	27.5	26.4	31.9	32.0
East:						
Zhejiang	.8	.7	.4	.5	.5	.7
Jiangsu	.4	.4	.3	.3	.5	.5
Shanghai	.2	.3	.1	.3	.2	.4
Anhui	.9	1.2	1.1	1.3	1.7	2.9
Central:						
Hubei	1.2	.9	.7	.5	.5	.5
Hunan	.5	.6	.6	.8	.8	.6
Jiangxi	2.4	2.1	.7	.4	.4	.7
South:						
Guangdong	1.3	1.2	.9	1.0	1.1	1.3
Guangxi	1.4	.9	1.2	1.1	1.1	1.2
Fujian	1.4	1.1	.8	.7	.7	.5
Southwest:						
Sichuan	1.9	2.1	1.9	1.9	1.7	1.7
Guizhou	1.9	1.8	1.1	1.1	1.2	1.5
Yunnan	4.6	3.3	2.6	2.4	2.0	1.8
Xizang	41.4	44.0	40.5	43.2	48.9	47.8

Continued—

Appendix table 15—Meat production, China, by region and province or city—Continued

Location	Mutton production					
	1979	1980	1981	1982	1983	1984
	Percent					
Northeast:						
Heilongjiang	1.4	1.9	2.5	4.1	3.5	3.4
Liaoning	.4	.5	.5	.7	.8	.8
Jilin	.7	.7	1.1	1.2	.9	1.3
North:						
Shandong	2.4	3.4	3.8	4.5	5.9	4.7
Hebei	3.1	3.1	4.6	5.0	6.7	5.8
Beijing	1.2	1.1	1.0	1.2	1.4	2.3
Tianjin	1.8	1.0	2.0	2.6	3.2	5.8
Henan	4.6	5.4	7.0	6.7	6.8	6.0
Shanxi	5.8	5.7	6.3	7.5	10.5	14.6
Northwest:						
Shaanxi	2.5	2.8	2.9	4.3	5.9	5.9
Gansu	9.3	8.8	9.0	10.7	9.4	11.6
Nei Monggol	30.1	32.3	26.8	28.4	28.6	27.7
Ningxia	19.3	20.2	20.2	25.2	23.8	26.7
Xinjiang	52.6	54.4	55.2	56.9	54.7	56.0
Qinghai	44.4	47.1	48.0	48.1	43.9	43.3
East:						
Zhejiang	.8	.7	.8	.8	.8	.8
Jiangsu	2.3	2.6	2.3	1.9	2.0	1.9
Shanghai	.8	.8	.4	.4	.4	.3
Anhui	4.2	3.5	4.6	4.3	3.6	3.1
Central:						
Hubei	1.2	1.4	1.3	1.2	1.0	.9
Hunan	.3	.5	.4	.3	.3	.2
Jiangxi	.1	.1	.2	.1	.1	.2
South:						
Guangdong	.1	.2	.2	.2	.2	.2
Guangxi	.7	.5	.4	.3	.3	.3
Fujian	1.2	1.1	1.2	1.1	1.1	1.0
Southwest:						
Sichuan	2.1	2.2	1.9	1.7	1.4	1.3
Guizhou	2.3	2.7	2.6	2.1	1.5	1.7
Yunnan	2.9	2.1	1.9	2.1	1.5	1.7
Xizang	54.9	51.0	56.3	53.4	48.6	47.8

Source: Calculated from app. table 14.

Appendix table 16—Annual per capita meat availability, China, by region and province or city

Location	Total meat					
	1979	1980	1981	1982	1983	1984
	Kilograms					
Northeast:						
Heilongjiang	11.5	11.6	10.1	9.1	9.2	9.4
Liaoning	9.9	12.3	13.9	15.6	15.1	15.0
Jilin	9.4	11.1	11.3	12.5	11.6	11.5
North:						
Shandong	10.1	12.4	13.0	12.7	12.5	13.7
Hebei	6.7	8.2	9.1	9.1	9.4	11.7
Beijing	13.0	14.8	14.6	15.0	16.0	14.4
Tianjin	7.3	8.1	7.6	7.1	6.4	7.4
Henan	7.4	7.3	6.5	7.0	6.3	7.2
Shanxi	5.7	7.0	8.2	7.3	7.1	8.2
Northwest:						
Shaanxi	7.1	8.2	9.0	8.1	8.1	8.2
Gansu	6.8	7.3	7.3	7.9	7.4	9.9
Nei Monggol	11.3	12.7	12.5	14.2	15.6	16.2
Ningxia	4.3	5.1	5.1	5.8	5.7	6.6
Xinjiang	8.6	9.3	10.1	10.7	11.6	13.7
Qinghai	20.2	22.4	22.0	22.1	22.9	23.9
East:						
Zhejiang	15.0	18.2	16.2	17.1	17.3	17.2
Jiangsu	16.1	18.0	17.6	20.5	19.2	20.1
Shanghai	14.8	17.5	18.6	17.4	16.4	14.9
Anhui	10.6	10.6	9.8	10.9	10.4	11.4
Central:						
Hubei	11.5	11.8	11.4	12.5	13.0	15.2
Hunan	14.8	17.5	18.6	18.3	19.0	22.5
Jiangxi	9.3	11.3	12.0	12.7	12.6	15.0
South:						
Guangdong	11.0	11.7	12.7	13.9	15.2	15.8
Guangxi	10.8	11.4	12.0	13.9	15.3	16.5
Fujian	8.5	9.6	10.8	11.6	12.3	14.0
Southwest:						
Sichuan	15.4	17.5	19.1	19.7	21.9	23.9
Guizhou	8.4	9.6	11.2	12.1	13.3	15.3
Yunnan	8.3	9.7	10.9	12.0	14.1	15.3
Xizang	27.9	25.7	30.7	32.2	33.7	31.6
Total	10.9	12.3	12.7	13.4	13.7	14.9

Continued—

See notes at end of table.

Appendix table 16—Annual per capita meat availability, China, by region and province or city—Continued

Location	Pork production					
	1979	1980	1981	1982	1983	1984
	Kilograms					
Northeast:						
Heilongjiang	11.0	10.9	9.5	8.4	8.6	8.8
Liaoning	9.7	12.1	13.7	15.3	14.9	14.8
Jilin	9.1	10.7	10.8	12.0	11.1	11.1
North:						
Shandong	9.8	11.8	12.4	11.9	11.5	12.7
Hebei	6.4	7.8	8.6	8.6	8.7	10.8
Beijing	12.9	14.6	14.5	14.8	15.7	13.7
Tianjin	7.1	8.0	7.4	6.8	6.2	6.9
Henan	7.0	6.8	6.0	6.3	5.8	6.5
Shanxi	5.3	6.5	7.6	6.7	6.2	6.8
Northwest:						
Shaanxi	6.7	7.9	8.6	7.6	7.6	7.6
Gansu	6.0	6.4	6.3	6.8	6.5	7.4
Nei Monggol	6.2	6.2	7.7	8.4	8.9	9.2
Ningxia	3.3	4.0	4.0	4.3	4.3	4.7
Xinjiang	2.5	2.6	2.5	2.2	2.3	2.4
Qinghai	5.7	5.2	5.4	5.6	5.5	5.9
East:						
Zhejiang	14.8	18.0	16.0	16.9	17.1	17.0
Jiangsu	15.6	17.5	17.2	20.1	18.7	19.6
Shanghai	17.0	14.3	14.3	17.2	16.3	14.8
Anhui	10.1	10.1	9.3	10.3	9.8	10.7
Central:						
Hubei	11.2	11.6	11.2	12.3	12.8	14.9
Hunan	14.7	17.3	18.4	18.1	18.8	22.3
Jiangxi	9.1	11.1	11.9	12.6	12.6	14.8
South:						
Guangdong	10.8	11.6	12.8	13.7	15.0	15.6
Guangxi	10.6	11.2	11.8	13.7	15.1	16.2
Fujian	8.2	9.4	10.6	11.4	12.1	13.8
Southwest:						
Sichuan	14.8	16.7	18.3	19.0	21.3	23.1
Guizhou	8.0	9.2	10.8	11.7	12.9	14.8
Yunnan	7.6	9.2	10.4	11.5	13.6	14.8
Xizang	1.0	1.3	1.0	1.1	.9	1.2
Total	10.3	11.5	11.9	12.5	12.9	14.0

See notes at end of table.

Continued—

Appendix table 16—Annual per capita meat availability, China, by region and province or city—Continued

Location	Beef production					
	1979	1980	1981	1982	1983	1984
	Kilograms					
Northeast:						
Heilongjiang	0.3	0.5	0.4	0.3	0.2	0.2
Liaoning	.2	.1	.1	.1	.1	.1
Jilin	.2	.3	.4	.4	.4	.3
North:						
Shandong	.1	.1	.2	.2	.3	.4
Hebei	.1	.1	.1	—	.1	.2
Beijing	—	—	—	—	.1	.1
Tianjin	.1	—	—	—	—	.1
Henan	.1	.1	.1	.1	.1	.2
Shanxi	.1	.1	.1	.1	.1	.2
Northwest:						
Shaanxi	.1	.1	.1	.1	.1	.2
Gansu	.2	.2	.3	.3	.3	.4
Nei Monggol	1.6	2.4	1.6	1.7	2.3	2.5
Ningxia	.1	.1	.1	.1	.1	.2
Xinjiang	1.5	1.7	2.0	2.4	2.9	3.2
Qinghai	5.5	6.6	6.1	5.8	7.3	7.6
East:						
Zhejiang	.1	.1	.1	.1	.1	.1
Jiangsu	.1	.1	.1	.1	.1	.1
Shanghai	—	—	—	.1	—	.1
Anhui	.1	.1	.1	.1	.2	.3
Central:						
Hubei	.1	.1	.1	.1	.1	.1
Hunan	.1	.1	.1	.1	.1	.1
Jiangxi	.2	.2	.1	—	.1	.1
South:						
Guangdong	.1	—	.1	.1	.2	.2
Guangxi	.2	.1	.1	.2	.2	.2
Fujian	.1	.1	.1	.1	.1	.1
Southwest:						
Sichuan	.3	.4	.4	.4	.4	.4
Guizhou	.2	.2	.1	.1	.2	.2
Yunnan	.4	.3	.3	.3	.3	.3
Xizang	11.6	11.3	12.4	13.8	16.4	15.1
Total	.2	.3	.2	.3	.3	.4

Continued—

See notes at end of table.

Appendix table 16—Annual per capita meat availability, China, by region and province or city—Continued

Location	Mutton production					
	1979	1980	1981	1982	1983	1984
	Kilograms					
Northeast:						
Heilongjiang	0.2	0.2	0.3	0.4	0.3	0.3
Liaoning	—	.1	.1	.1	.1	.1
Jilin	.1	.1	.1	.1	.1	.1
North:						
Shandong	.2	.4	.5	.6	.7	.6
Hebei	.2	.3	.4	.5	.6	.7
Beijing	.1	.2	.1	.2	.2	.3
Tianjin	.1	.1	.2	.2	.2	.4
Henan	.3	.4	.5	.5	.4	.4
Shanxi	.3	.4	.5	.6	.7	1.2
Northwest:						
Shaanxi	.2	.2	.3	.3	.5	.5
Gansu	.6	.6	.7	.8	.7	1.0
Nei Monggol	3.4	4.1	3.4	4.0	4.4	9.0
Ningxia	.8	1.0	1.0	1.5	1.4	1.8
Xinjiang	4.5	5.1	5.6	6.1	6.3	7.1
Qinghai	9.0	10.5	10.6	10.7	10.1	10.4
East:						
Zhejiang	.1	.1	.1	.1	.1	.1
Jiangsu	.4	.5	.4	.4	.4	.4
Shanghai	.1	.1	.1	.1	.1	—
Anhui	.4	.4	.5	.5	.4	.4
Central:						
Hubei	.1	.2	.1	.1	.1	.1
Hunan	.1	.1	.1	.1	.1	.1
Jiangxi	.1	—	—	.1	—	—
South:						
Guangdong	—	—	—	.1	—	—
Guangxi	.1	.1	—	—	—	.1
Fujian	.1	.1	.1	.1	.1	.1
Southwest:						
Sichuan	.3	.4	.4	.3	.3	.3
Guizhou	.2	.3	.3	.3	.2	.3
Yunnan	.2	.2	.2	.2	.2	.2
Xizang	15.3	13.1	17.3	17.1	16.4	15.3
Total	.4	.5	.5	.5	.5	.6

— = None or negligible.

Source: Calculated using app. table 15 and population figures published in (*19*).

Appendix table 17—Selected other livestock products, China, by region and province or city

Location	Cow milk					Goat milk					Mohair		
	1979	1981	1982	1983	1984	1979	1981	1982	1983	1984	1979	1981	1984
							Tons						
Northeast:													
Heilongjiang	120,830	151,403	310,250	378,518	400,000	30,720	16,052	19,668	26,183	31,532	—	36	68
Liaoning	43,000	58,035	63,225	73,468	92,012	530	19,785	18,575	17,903	13,646	110	244	204
Jilin	22,327	26,835	31,152	33,598	44,497	5,486	4,010	3,545	4,646	4,600	30	16	40
North:													
Shandong	12,968	13,830	15,640	19,720	25,275	63,335	38,600	72,080	95,060	127,260	865	935	1,051
Hebei	22,993	26,713	34,670	40,696	54,623	9,129	15,358	20,379	24,210	23,076	544	652	770
Beijing	59,722	76,250	89,383	105,885	125,990	—	538	1,763	2,835	2,555	195	190	182
Tianjin	19,600	26,104	29,195	33,730	38,959	7	182	1,355	370	591	31	9	29
Henan	8,782	10,464	13,449	14,106	17,462	11,237	14,965	17,865	20,152	20,908	686	830	562
Shanxi	17,125	26,732	35,577	45,504	60,559	4,510	15,165	23,258	24,584	21,544	960	1,006	765
Northwest:													
Shaanxi	15,959	17,122	21,755	27,088	43,012	44,265	53,755	88,542	95,000	88,506	706	826	474
Gansu	20,217	27,359	26,907	29,553	34,477	1,318	1,317	991	1,159	1,194	906	915	689
Nei Monggol	106,720	118,798	151,854	166,606	199,617	10,742	9,214	17,813	12,652	12,414	1,873	2,948	1,554
Ningxia	3,676	4,309	5,013	5,873	8,116	329	481	96	108	30	326	313	197
Xinjiang	56,424	70,645	77,525	104,462	125,917	13,375	11,873	13,664	17,906	24,116	881	3,001	1,563
Qinghai	95,960	121,432	122,663	130,341	134,580	2,840	3,377	6,564	2,334	2,923	396	420	437
East:													
Zhejiang	30,800	41,443	54,514	71,557	90,360	8,000	1,975	2,712	1,982	1,906	297	149	76
Jiangsu	24,293	34,850	41,318	48,307	64,927	—	507	995	347	384	337	131	183
Shanghai	69,738	81,277	92,544	102,623	125,155	—	—	—	—	—	335	72	57
Anhui	4,745	8,346	9,650	12,432	14,735	—	19	9	14	27	120	103	59
Central:													
Hubei	21,965	25,534	28,505	30,832	33,766	—	—	38	63	12	125	25	20
Hunan	6,491	8,571	9,506	10,239	11,213	—	—	—	—	—	133	29	22
Jiangxi	7,540	11,574	10,532	14,492	16,055	—	—	—	—	—	13	5	—
South:													
Guangdong	19,945	27,045	29,925	33,070	41,255	270	190	205	365	365	—	—	—
Guangxi	2,670	5,134	4,363	5,054	6,024	—	—	—	86	127	10	—	13
Fujian	12,328	16,918	19,532	23,940	35,370	296	296	256	230	310	48	—	—
Southwest:													
Sichuan	127,700	142,473	161,121	177,617	198,845	1,545	1,992	2,081	2,420	2,920	175	168	157
Guizhou	5,278	5,543	5,713	5,940	6,427	—	45	1	4	—	24	9	12
Yunnan	17,491	20,617	27,843	27,443	37,100	159	192	214	458	1,610	51	92	130
Xizang	92,905	85,107	96,144	73,014	100,035	28,478	47,969	29,062	22,629	27,604	799	949	1,239
Total	1,070,188	1,290,607	1,618,352	1,845,243	2,186,356	236,568	257,851	341,378	373,694	410,135	10,961	14,070	10,588

See notes at end of table.

Continued—

Appendix table 17—Selected other livestock products, China, by region and province or city—Continued

Location	Wool					Cashmere			Eggs		
	1979	1981	1982	1983	1984	1979	1981	1984	1982	1983	1984
						Tons					
Northeast:											
Heilongjiang	6,500	10,576	12,897	12,736	12,919	—	25	2	178,500	195,950	170,000
Liaoning	3,394	5,143	6,216	5,239	5,263	47	51	58	152,388	175,061	217,826
Jilin	3,951	5,209	4,916	5,109	5,215	1	1	2	73,530	73,826	100,322
North:											
Shandong	9,132	9,755	10,250	9,190	7,167	129	130	91	343,032	410,655	622,834
Hebei	4,638	5,799	6,898	7,560	6,570	190	269	208	144,598	166,725	231,656
Beijing	253	104	120	141	129	14	13	6	56,243	88,905	122,265
Tianjin	451	105	145	195	163	2	8	2	26,320	44,933	71,949
Henan	11,192	12,806	11,805	9,055	5,611	46	52	67	155,625	214,082	237,810
Shanxi	3,292	3,531	4,130	3,966	3,360	325	376	271	46,294	32,096	38,741
Northwest:											
Shaanxi	2,625	3,100	3,500	3,478	3,100	400	365	350	57,403	75,430	109,118
Gansu	8,883	8,734	8,701	8,453	8,972	187	167	136	20,956	22,968	36,099
Nei Monggol	28,481	47,399	52,125	51,801	48,816	1,494	1,459	1,380	43,133	51,512	68,252
Ningxia	3,020	2,545	2,467	2,534	2,713	160	124	88	4,258	5,587	8,912
Xinjiang	27,925	34,099	37,720	37,969	38,832	299	291	337	29,557	31,145	35,545
Qinghai	15,488	16,694	16,549	15,549	15,338	95	107	155	2,603	3,399	8,414
East:											
Zhejiang	4,422	4,381	4,237	4,230	3,711	—	—	—	104,857	127,734	162,302
Jiangsu	2,369	2,447	2,407	2,006	1,429	—	—	—	262,064	321,011	475,982
Shanghai	204	145	145	144	118	—	—	—	77,471	77,600	85,190
Anhui	3,745	3,351	3,094	1,930	1,556	—	1	—	154,709	155,067	192,998
Central:											
Hubei	370	128	193	126	125	—	10	1	200,696	245,048	273,601
Hunan	6	4	1	—	—	—	—	—	174,265	181,312	227,025
Jiangxi	—	—	—	—	—	—	—	—	75,000	81,940	94,814
South:											
Guangdong	—	—	—	—	—	—	—	—	69,900	79,485	107,400
Guangxi	10	—	2	3	1	1	—	—	28,110	32,906	38,741
Fujian	—	—	—	—	—	2	—	—	43,398	46,300	72,340
Southwest:											
Sichuan	2,365	2,642	2,544	2,494	2,340	—	—	3	209,319	264,433	298,194
Guizhou	428	395	392	410	448	—	—	1	29,145	35,529	47,997
Yunnan	1,478	1,502	2,282	1,506	1,445	1	—	—	40,245	52,000	56,280
Xizang	8,553	8,420	8,121	8,273	7,491	270	317	266	932	716	1,033
Total	153,170	189,062	201,837	194,093	182,776	3,659	3,762	3,421	2,808,548	3,323,360	4,316,266

— = None or negligible.

Source: (19).

Appendix table 18—Ownership of selected livestock, China, by region and province or city, 1979

Location	Hogs			Sheep and goats		
	Total	Owned by collectives	Owned by household members	Total	Owned by collectives	Owned by household members
			1,000 head			
Northeast:						
Heilongjiang	7,983	1,056	5,783	2,457	1,384	756
Liaoning	11,889	1,982	9,409	1,671	959	660
Jilin	5,857	633	4,956	1,493	876	515
North:						
Shandong	21,176	3,055	18,050	9,258	885	8,364
Hebei	13,522	1,781	11,660	7,288	3,218	3,995
Beijing	2,468	1,083	1,280	573	389	184
Tianjin	1,008	275	720	266	32	233
Henan	15,923	506	15,336	11,078	1,304	9,760
Shanxi	5,586	511	5,021	9,208	6,288	2,880
Northwest:						
Shaanxi	8,223	626	7,524	6,493	3,909	2,535
Gansu	4,400	192	4,124	11,126	7,558	3,331
Nei Monggol	5,546	238	4,916	26,323	17,978	6,522
Ningxia	649	104	468	3,196	1,978	1,035
Xinjiang	1,037	97	262	20,147	10,200	3,721
Qinghai	763	69	570	15,690	14,145	1,305
East:						
Zhejiang	15,500	1,831	13,502	3,456	98	3,351
Jiangsu	23,561	6,740	16,490	6,157	633	5,479
Shanghai	3,424	1,988	1,280	452	35	417
Anhui	11,319	236	10,971	3,631	54	3,562
Central:						
Hubei	17,488	3,094	13,578	1,775	425	1,313
Hunan	21,205	2,573	18,161	877	88	805
Jiangxi	10,047	540	8,907	105	2	88
South:						
Guangdong	20,095	1,875	17,535	408	170	210
Guangxi	11,030	922	9,797	875	250	612
Fujian	6,988	448	6,283	688	44	638
Southwest:						
Sichuan	50,922	5,582	45,145	10,921	5,426	5,246
Guizhou	8,751	161	8,511	2,074	570	1,497
Yunnan	13,098	641	12,175	7,021	5,979	995
Xizang	247	74	152	18,165	16,926	1,090
Total	319,705	38,913	272,566	183,142	101,783	71,099

Continued—

Appendix table 18--Ownership of selected livestock, China, by region and province or city, 1979—Continued

Location	Hogs			Sheep and goats		
	Total	Owned by collectives	Owned by household members	Total	Owned by collectives	Owned by household members
			Percent			
Northeast:						
Heilongjiang	100.0	13.2	72.4	100.0	56.3	30.8
Liaoning	100.0	16.7	79.1	100.0	57.4	39.5
Jilin	100.0	10.8	84.6	100.0	58.7	34.5
North:						
Shandong	100.0	14.4	85.2	100.0	9.6	90.3
Hebei	100.0	13.2	86.2	100.0	44.2	54.8
Beijing	100.0	43.9	51.9	100.0	67.9	32.1
Tianjin	100.0	27.3	71.4	100.0	12.0	87.6
Henan	100.0	3.2	96.3	100.0	11.8	88.1
Shanxi	100.0	9.1	89.9	100.0	68.3	31.3
Northwest:						
Shaanxi	100.0	7.6	91.5	100.0	60.2	39.0
Gansu	100.0	4.4	93.7	100.0	67.9	29.9
Nei Monggol	100.0	4.3	88.6	100.0	68.3	24.8
Ningxia	100.0	16.0	72.1	100.0	61.9	32.4
Xinjiang	100.0	9.4	25.3	100.0	50.6	18.5
Qinghai	100.0	9.0	74.7	100.0	88.6	8.2
East:						
Zhejiang	100.0	11.8	87.1	100.0	2.8	97.0
Jiangsu	100.0	28.6	70.0	100.0	10.3	89.0
Shanghai	100.0	58.1	37.4	100.0	7.3	6.8
Anhui	100.0	2.1	96.9	100.0	1.5	98.1
Central:						
Hubei	100.0	17.7	77.6	100.0	23.9	74.0
Hunan	100.0	12.1	85.6	100.0	10.0	91.8
Jiangxi	100.0	5.4	88.7	100.0	1.9	83.8
South:						
Guangdong	100.0	9.3	87.3	100.0	41.7	51.5
Guangxi	100.0	8.4	88.8	100.0	28.6	69.9
Fujian	100.0	6.4	89.9	100.0	6.4	92.7
Southwest:						
Sichuan	100.0	11.0	86.7	100.0	49.7	48.0
Guizhou	100.0	1.8	97.3	100.0	27.5	72.2
Yunnan	100.0	4.9	93.0	100.0	85.2	14.2
Xizang	100.0	30.0	61.5	100.0	93.2	6.0
Total	100.0	12.2	85.3	100.0	55.6	38.8

Source: (19).

Appendix table 19—China: Gross values of agricultural output (GVAO)

Year[1]	GVAO	Cropping	Forestry	Animal husbandry	Fisheries	Sideline production	
						Total	Brigade- and team-run enterprises
				Billion yuan			
1949	27.18	22.43	0.16	3.37	0.06	1.16	NA
1952	41.70	34.66	.29	4.79	.13	1.83	NA
1957	53.67	43.26	.93	6.90	.29	2.29	NA
1965	58.96	44.68	1.20	8.27	1.01	3.80	NA
1970	71.63	53.48	1.60	9.26	1.09	6.20	NA
1971	109.01	81.86	2.78	16.13	1.52	6.72	3.88
1972	108.80	79.63	3.03	16.70	1.66	7.78	4.78
1973	117.90	87.23	3.32	17.10	1.70	8.55	5.25
1974	122.80	90.53	3.63	17.33	1.85	9.46	6.22
1975	128.50	93.24	3.71	17.94	1.91	11.70	8.26
1976	131.74	91.35	4.29	18.34	1.93	15.83	11.96
1977	133.92	90.40	4.21	18.39	2.03	18.89	14.74
1978	145.88	98.86	4.44	19.30	2.03	21.25	17.01
1979	158.43	105.96	4.50	22.12	1.96	23.89	19.80
1980	164.59	105.40	5.05	23.67	2.11	28.36	24.02
1980	222.30	141.53	9.45	33.96	3.88	33.48	24.76
1981	236.92	149.83	9.84	35.96	4.05	37.24	27.78
1982	263.23	165.30	10.68	40.70	4.55	42.00	30.47
1983	288.40	178.94	11.77	42.30	4.94	50.45	37.62
1984	337.70	196.25	13.73	48.02	5.76	73.94	57.65
	(280.5)[2]					(16.29)[2]	

NA = Not available.

[1]Values of output for 1949-70 are based on 1957 constant prices, those for 1971-80 are based on 1970 constant prices, and values for 1980-84 are based on 1980 constant prices. The first row of 1980 is based on 1970 constant prices and the second row is based on 1980 constant prices.

[2]The figures in parentheses exclude output value of village-run industries, which is now classified as industrial output.

Source: (*21*).

Appendix table 20—China: Composition of gross values of agricultural output (GVAO),[1]

Year	Cropping	Animal husbandry	Forestry	Fisheries	Sideline production
			Percent		
1949	82.5	12.4	0.6	0.2	4.3
1950	83.0	11.9	.5	.3	4.3
1951	83.9	11.0	.6	.3	4.2
1952	83.1	11.5	.7	.3	4.4
1953	81.8	12.6	.7	.3	4.6
1954	81.5	12.9	.8	.3	4.5
1955	83.4	10.8	1.0	.4	4.4
1956	82.7	10.8	1.7	.3	4.5
1957	80.6	12.9	1.7	.5	4.3
1958	80.7	11.8	2.6	.9	4.0
1959	79.8	8.8	3.2	1.9	6.3
1960	80.2	6.0	3.4	2.7	7.7
1961	81.2	7.9	1.7	1.9	7.3
1962	78.9	10.3	1.7	1.8	7.3
1963	76.1	13.3	1.9	1.8	6.9
1964	76.0	13.9	1.9	1.7	6.5
1965	75.8	14.0	2.0	1.7	6.5
1966	76.1	14.2	1.9	1.7	6.1
1967	76.4	14.0	2.0	1.6	6.0
1968	76.1	14.1	2.1	1.5	6.2
1969	75.4	13.7	2.2	1.7	7.0
1970	74.7	12.9	2.2	1.5	8.7
1971	77.9	15.3	2.6	1.4	2.7
1972	76.6	16.1	2.9	1.6	2.9
1973	77.4	15.2	2.9	1.5	2.9
1974	77.7	14.9	3.1	1.6	2.8
1975	77.5	14.9	3.1	1.6	2.9
1976	76.2	15.3	3.6	1.6	3.2
1977	75.9	15.4	3.5	1.7	3.5
1978	76.7	15.0	3.4	1.6	3.3
1979	76.4	16.0	3.2	1.4	3.0
1980	75.0	16.8	3.6	1.5	3.1
1981	71.6	17.2	4.7	1.9	4.5
1982	71.0	17.5	4.6	2.0	4.9
1983	71.3	16.9	4.7	2.0	5.1
1984	70.1	17.1	4.9	2.1	5.8

[1]Values of output for 1949-70 are based on 1957 constant prices, those for 1971-80 are based on 1970 constant prices, and values for 1981-84 are based on 1980 constant prices. The GVAO of 1971-84 used for calculating the percentages excludes production value generated by the rural brigade- and team-run enterprises.

Source: (21).

Appendix table 21—China: State procurement of live animals and livestock products

Year	Hogs	Cattle	Sheep and goats	Eggs	Wool and mohair
	1,000 head			*1,000 tons*	
1952	37,427	1,258	5,227	194	33
1953	43,842	1,418	6,316	230	35
1954	48,557	1,600	7,366	262	41
1955	41,857	2,297	7,722	278	45
1956	39,729	2,566	9,524	333	51
1957	40,500	2,439	9,669	390	49
1958	46,732	2,462	13,670	405	62
1959	33,998	2,429	11,297	160	65
1960	19,913	2,087	9,605	142	68
1961	8,701	898	8,388	130	47
1962	19,298	626	10,878	219	54
1963	40,151	696	14,168	375	72
1964	62,667	845	13,642	443	78
1965	78,595	1,244	12,674	488	82
1966	86,448	1,481	11,356	539	84
1967	87,493	1,327	9,148	480	86
1968	83,470	1,371	10,618	381	85
1969	76,611	1,703	10,397	417	89
1970	75,621	1,651	11,276	453	97
1971	88,166	1,601	10,909	483	102
1972	105,263	1,636	9,858	468	104
1973	101,959	1,524	8,924	478	118
1974	98,434	1,500	9,957	453	131
1975	102,810	1,697	10,579	461	137
1976	103,506	1,610	10,135	450	136
1977	104,166	1,500	11,122	469	138
1978	109,365	1,408	9,983	560	146
1979	135,455	1,903	13,439	935	157
1980	142,500	2,216	16,802	991	169
1981	137,238	2,414	20,682	989	176
1982	144,633	2,541	18,197	1,086	187
1983	143,147	3,516	21,725	1,177	184
1984	152,387	3,965	26,334	1,496	160

Source: (21).

Appendix table 22—China: Average procurement prices of major livestock products

Year	Hogs	Cattle	Sheep and goats	Hides			Eggs	Wool	Mohair	Cashmere
				Cattle	Sheep	Goat				
	Yuan/head			Yuan/sheet			Yuan/100 kilograms			
1952	32.6	49.1	8.8	9.4	3.5	2.1	62.0	208	132	698
1953	36.9	62.2	11.2	10.1	3.8	2.2	73.4	238	152	630
1954	38.4	64.7	10.7	10.6	3.9	2.3	80.8	238	152	630
1955	38.4	59.4	9.6	10.4	4.0	2.3	81.6	228	144	626
1956	41.4	55.1	9.6	8.3	4.0	2.3	81.0	216	138	630
1957	47.7	61.2	9.9	9.6	3.9	2.3	94.2	216	148	648
1958	45.0	57.7	8.5	11.3	3.8	2.3	98.6	222	124	730
1959	42.4	60.8	10.8	11.3	3.8	2.3	115.0	224	152	730
1960	34.0	63.8	11.0	11.3	3.8	2.3	123.8	232	162	730
1961	55.0	70.0	15.0	12.0	3.8	2.7	162.6	232	162	730
1962	56.7	86.8	16.3	[illegible]	3.1	2.4	166.1	224	170	756
1963	60.0	92.0	17.0	12.[illegible]	3.0	2.5	150.0	224	170	756
1964	60.0	92.0	16.0	11.3	4.4	2.8	126.6	218	190	746
1965	60.0	98.0	16.0	13.0	4.0	2.4	128.0	218	192	760
1966	60.0	98.0	13.3	13.0	4.0	2.4	128.0	300	192	760
1967	60.0	98.0	13.3	13.0	4.0	2.4	128.0	300	192	780
1968	60.0	98.0	13.3	13.0	4.0	2.4	128.0	300	192	780
1969	60.0	98.0	13.3	13.0	4.0	2.4	128.0	300	192	780
1970	63.0	98.0	13.3	13.0	4.0	2.4	128.0	300	192	800
1971	63.0	99.0	13.3	13.0	4.0	2.4	128.8	300	192	800
1972	63.0	112.0	13.3	13.0	4.0	2.5	128.8	300	192	800
1973	68.0	115.0	14.2	13.7	4.0	2.4	136.0	288	192	800
1974	69.0	122.0	15.2	13.5	4.0	2.7	136.0	306	204	816
1975	71.0	122.0	14.0	14.0	3.7	2.7	138.0	306	204	816
1976	69.6	122.0	13.5	14.0	3.7	2.7	138.0	312	212	816
1977	70.3	98.8	13.5	14.3	3.8	2.8	135.8	328	214	816
1978	74.5	100.9	14.7	14.9	4.2	3.0	137.8	340	214	820
1979	102.1	120.8	17.7	15.3	4.5	3.3	168.0	340	230	1,070
1980	115.7	154.3	21.7	24.2	4.5	4.1	171.4	343	241	1,111
1981	120.7	175.4	25.6	21.8	4.7	4.2	184.0	348	242	1,059
1982	123.8	226.7	26.0	24.2	4.7	4.3	186.4	358	209	1,051
1983	122.5	225.0	27.8	23.1	4.7	4.0	188.6	366	194	1,133
1984	124.2	249.9	29.0	38.8	5.3	4.6	197.6	373	204	1,398

Source: (27).

Appendix table 23—China: Animal and animal product exports and imports

Year	Exports					
	Live animals			Frozen meat		
	Hogs	Cattle	Poultry	Pork	Poultry	Rabbit
	1,000 head			*1,000 tons*		
1950	580.0	28.6	5,850	7.9	0.1	—
1951	763.0	11.4	11,430	6.1	.1	—
1952	779.0	27.0	11,070	28.8	.1	—
1953	537.6	19.2	12,580	70.8	1.1	—
1954	486.7	39.0	11,390	138.1	2.4	—
1955	654.7	83.5	9,130	134.5	3.0	—
1956	544.6	107.2	8,380	122.3	4.5	—
1957	507.4	87.6	12,220	54.1	5.9	0.2
1958	791.4	135.0	14,550	118.1	9.6	.8
1959	718.7	115.5	6,120	109.6	4.2	.7
1960	787.5	94.8	8,240	74.3	4.8	.9
1961	379.2	11.2	4,920	9.3	3.1	.6
1962	817.9	16.4	6,590	3.4	2.2	2.3
1963	1,301.9	24.6	10,440	15.4	3.0	3.6
1964	1,646.7	49.8	16,580	62.1	3.9	2.4
1965	1,718.6	93.3	21,410	142.5	4.0	2.7
1966	1,759.5	126.8	26,350	150.0	5.5	5.2
1967	1,492.9	103.6	16,300	[illegible]	6.9	8.5
1968	1,552.9	106.8	15,260	91.5	9.2	17.5
1969	1,622.6	107.4	13,050	60.8	9.5	17.5
1970	1,704.5	87.0	12,170	80.5	13.1	17.1
1971	2,028.6	88.8	16,050	118.3	17.8	18.8
1972	2,280.6	105.2	19,470	140.1	24.4	23.3
1973	2,178.3	107.4	19,810	121.2	28.7	27.1
1974	2,178.6	105.6	17,730	52.9	23.1	21.6
1975	2,308.2	144.7	19,300	61.2	33.8	33.6
1976	2,310.8	139.6	19,280	38.4	28.5	28.5
1977	2,313.0	134.1	19,480	26.2	23.4	27.8
1978	2,462.8	134.2	18,850	42.8	34.6	39.3
1979	2,422.1	187.6	17,460	44.9	43.1	43.5
1980	2,468.2	237.4	19,010	63.8	43.9	38.6
1981	2,574.2	232.4	21,340	67.2	41.8	31.5
1982	2,649.6	223.7	21,640	96.8	44.6	40.4
1983	2,620.6	208.9	19,730	95.6	50.2	33.8
1984	2,492.4	185.3	20,950	91.7	39.0	34.3

See note at end of table.

Continued—

Appendix table 23—China: Animal and animal product exports and imports—Continued

Year	Exports			Imports	
	Canned pork	Eggs	Rabbit hair	Wool	Animal fat
			1,000 tons		
1950	—	23.6	—	1.3	—
1951	—	22.6	—	1.1	—
1952	—	20.1	—	2.2	—
1953	—	21.7	—	6.2	—
1954	3.7	19.5	—	4.9	—
1955	9.8	23.4	—	8.5	0.1
1956	9.6	21.3	—	11.8	—
1957	10.1	30.3	—	14.4	—
1958	32.0	38.4	0.1	20.6	—
1959	28.8	13.4	.4	28.1	—
1960	14.1	13.1	.4	21.1	14.8
1961	8.9	11.1	.3	21.6	15.2
1962	5.7	20.8	.3	14.4	30.5
1963	13.8	29.9	.6	18.8	26.3
1964	32.6	31.9	.5	12.9	21.3
1965	35.1	37.6	.4	8.5	21.4
1966	35.5	42.2	.4	7.7	3.6
1967	23.4	34.2	.4	11.4	12.8
1968	23.5	35.3	.8	8.4	9.9
1969	28.3	28.4	1.3	6.8	.5
1970	21.5	33.1	.8	4.6	6.7
1971	26.0	38.3	.6	4.3	18.4
1972	36.7	42.5	2.3	8.7	68.8
1973	52.0	39.2	1.5	10.8	24.7
1974	27.0	38.1	.3	12.1	54.9
1975	24.6	37.3	2.1	3.5	59.2
1976	27.8	34.9	2.0	7.1	59.4
1977	20.9	33.8	1.9	10.1	84.5
1978	29.5	40.6	2.3	10.3	78.3
1979	37.1	49.8	2.7	16.9	81.2
1980	48.0	52.8	4.2	37.4	130.4
1981	49.4	55.1	4.6	34.9	46.2
1982	66.6	54.3	3.4	70.3	56.2
1983	76.3	54.1	7.6	71.5	36.3
1984	88.0	52.7	7.7	57.2	39.5

— = None or negligible.

Source: (*21*).

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