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Supply and Demand Levels for Livestock and Poultry Products in the Chinese Mainland and the Potential Demand for Feed Grains

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Abstract: The widening gap between the supply and demand levels for livestock and poultry products in the Chinese mainland poses a significant challenge to the secure supply of feed grains. Therefore, the accurate prediction of the demand potential for feed grains represents a key scientific issue for ensuring food security in the Chinese mainland. This study is based on an analysis of several factors, such as the Chinese mainland's output, trade volume, apparent consumption of livestock and poultry products, and two different scenarios for predicting the future demand for feed grains are assessed. The results indicate that output and consumption of livestock and poultry products, as well as the country's trade deficit and the pressure of the supply and demand balance with respect to these products, have been increasing in recent years. The analysis predicts that the demand for feed grains in the Chinese mainland will reach 425.5 or 389.6 million tons in 2030 based on the two scenarios. This finding indicates that with the increasing demand for livestock and poultry products in the Chinese mainland, the demand for feed grains will continue to increase, and the shortfall in feed grains and raw materials will expand further, especially dependence on external sources of protein-rich feed grains will remain high.

Key words: livestock and poultry products; changes in supply and demand; feed grains; demand prediction; the Chinese mainland

1 Introduction

Given the rapid growth of China's economy in the last few decades, both the output and consumption of livestock and poultry products have also grown continuously. From 1980 to 2018, the scales of production, trade, and consumption of meat, poultry, eggs, and dairy in the Chinese mainland have expanded rapidly, which is similar to the trends of development and change in many other countries and regions, such as the United States, Japan, South Korea, and Europe. That is, an improvement in the economic level of a country or region inevitably leads directly to a reduction in the con-

sumption of grains and an increase in the consumption of livestock and poultry products (Vasileska and Rechkoska, 2012; Mao et al., 2014). Growth in the production and consumption of livestock and poultry products has caused the Chinese mainland's feed grain production and consumption to also maintain growth at comparatively rapid rates (Zhou et al., 2008). Beginning in 2012, the production scale of corn as a feed grain had already exceeded that of rice, and it became the Chinese mainland's largest grain crop (Zhang, 2012). Obviously, changes in feed grains have a very large effect on the balance of grain supply and demand in the Chinese mainland. Therefore, studying the changing trends

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in the supply, demand, and consumption of livestock and poultry products to predict the feed grain demand situation under the scale of consumption of livestock and poultry products in the future is helpful for formulating grain supply strategies to ensure the Chinese mainland's food security.

At present, many scholars have carried out estimations and predictions of the Chinese mainland's feed grain consumption and its future demand. Chao et al. (2017) estimated that the grain consumption needed by meat production will increase from nearly 200 million tons in 2014 to 395 million tons in 2050, according to the adjusted total meat consumption data of residents combined with the feed conversion ratio. Ma and Niu (2009) used the principles and methods of system dynamics to simulate the Chinese mainland's demand for feed grains in 2010, 2015, and 2020, and found the values are 167.7, 174.0, and 180.3 million tons, respectively. Xin (2018) predicted that annual grain demand will be 227 kg per person when the Chinese mainland's meat consumption reaches its peak value in the future; and when the population is 1.45 billion, the total grain demand will be 329.3 million tons. These prediction results have a certain scientific significance for grasping the total demand for feed grains and formulating feed grain production strategies in the Chinese mainland. However, no consideration was given to the dressing percentage index in the predictions of the aforementioned studies, and the consideration given to feed grain consumption by livestock and poultry varieties was not comprehensive. These deficiencies have simultaneously caused deviations in the prediction results and a failure to distinguish between the energy feed grain and protein feed grain categories. In this study, the Chinese mainland's supply and demand situation with respect to livestock and poultry products is analyzed based on the output, trade status, and per capita share of such products. The changing trends in the consumption of livestock and poultry products in the Chinese mainland in the future are then predicted according to the changing trends in livestock and poultry consumption in other countries and regions. Additionally, the Chinese mainland's current and future demands for energy and protein feed grains are estimated according to relevant data such as the Chinese mainland's per capita consumption of livestock and poultry products, population levels, dressing percentages, and the feed-to-meat conversion ratio. This study remedies the lack of indicators and the issue of incomplete consideration of livestock and poultry varieties in previous studies, so it can provide a more scientific basis for the development of animal husbandry, grain production, and agricultural supply-side reform in the future.

2 Methods and data

2.1 Relevant concepts

In this study, the term "livestock and poultry products" re-

fers specifically to pork, poultry meats, and poultry eggs. In the Chinese mainland, industrially produced and processed feed grains are mainly used as feed for large-scale farming of these three types of livestock and poultry, whereas roughage (forage grass) is mainly used to feed cattle and sheep. The use of concentrates (feed grains) is relatively low, thus, it is ignored in the estimations in this study. The conversion coefficient used for measuring and calculating the feed grain consumption refers to the feed-to-meat (eggs) conversion ratio, that is, the amount of feed consumed in feeding livestock and poultry to gain one kilogram, which is related to various factors such as feed type, technology, and production scale. The dressing percentage (net meat percentage) refers to the ratio of the carcass weight after slaughter to the live weight of the livestock and poultry. The feed grains investigated in this study are primarily energy feed grains and protein feed grains. The energy feed mainly includes corn, barley, wheat, rice, wheat bran, and similar products, while the protein feed mainly includes soybean meal, cottonseed meal, rapeseed meal, fish meal, and other similar products.

2.2 Research methods

Two primary methods can be used to measure and calculate feed grains. The first is the demand method based on the output of livestock and poultry products, which mainly uses the output or consumption of livestock and poultry and the feed conversion ratio to obtain the demand for feed grains. The second is the supply method based on the total grain output. This method uses the total grain output and subtracts the ration consumption and industrial and other consumption, and the remainder is used as feed grain consumption. However, the range of the current domestic statistics on grain production has changed significantly, so using statistical data is very problematic. These two methods have their advantages and disadvantages. Previous research indicates that the differences in the results obtained from using different methods, data sources, and processing methods are striking. For more accurate measurement and calculation results, data on the per capita share of livestock and poultry products is combined with data such as the feed-to-meat (eggs) conversion ratio in this study to measure and calculate the demands for energy and protein feeds in the Chinese mainland, and consideration is given to factors such as population. See Table 1 for a series of relevant parameters, including energy and protein feed ratios, feed-to-meat (eggs) conversion ratio, and dressing percentage (Jiang and Nan, 2000; Guan et al., 2016; Xin et al., 2018). In the production of pigs, poultry eggs and poultry meats, energy feed and protein feed account for approximately 70%–75% and 20%–25% of the feed inputs, respectively. Because there is no fixed value, this study uses the average value for feed grain prediction. The inter-annual change of the feed-to-meat (eggs) conversion ratio is presumably small, so

this paper chooses a fixed value of this parameter for the predictions.

Table 1 Parameters relevant to the measurement and calculation of feed grains

Category	Feed-to-meat (eggs) conversion ratio	Dressing percentage (%)	Energy feed ratio (%)	Protein feed ratio (%)
Pork	2.8	70	73	22
Poultry meats	2.0	76	73	22
Poultry eggs	2.4	100	73	22

The demand for feed grains is estimated using parameters such as the per capita share of livestock and poultry, population, feed-to-meat (eggs) conversion ratio, and dressing percentage. The per capita share of livestock and poultry refers to either the carcass weight of livestock and poultry or the number of eggs. Therefore, these values should be converted into live weights according to the dressing percentage of each livestock and poultry type prior to calculating the demand for feed grains.

$$G_{fd} = \sum_{i=1}^3 \frac{P_{cqi} \times G_p}{D_{pi}} \times \delta_i$$

In the formula, G_{fd} is the demand for feed grains (kg); P_{cqi} is the per capita share (kg) of the i -th type of livestock or poultry; G_p is the total number of the population; D_{pi} is the dressing percentage (%) of the i -th type of livestock or poultry; and δ_i is the feed-to-meat conversion ratio of the i -th type of livestock or poultry.

2.3 Data sources

The data on the Chinese mainland’s livestock and poultry output and trade volumes and the data on other countries’ per capita apparent consumption of livestock and poultry products are from the Food and Agriculture Organization Corporate Statistical (FAOSTAT) database. The data on the population and per capita share of livestock and poultry products are from the National Bureau of Statistics of China database.

3 Results and analysis

3.1 Analysis of changes in the supply and demand of livestock and poultry products in the Chinese mainland

(1) Analysis of changes in the output of livestock and poultry products in the Chinese mainland

Given the rapid growth of the Chinese mainland’s economy, the scale of production of livestock and poultry products continues to expand (Fig. 1), and the Chinese mainland has quickly become a major power in the world for the production and consumption of livestock and poultry

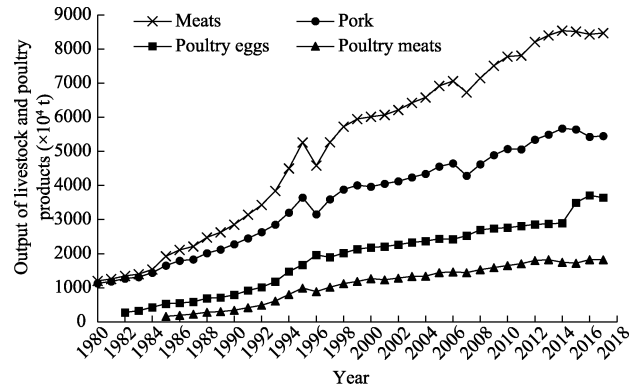


Fig. 1 Changes in the output of the main livestock and poultry products (Data source: FAOSTAT, 1980–2017)

products. In 2017, the Chinese mainland’s total meat output reached 84.69 million tons—ranking first in the world—which was an increase of more than seven-fold relative to the production scale of 12.05 million tons in 1980. Its global proportion increased from just under 11% to approximately 23%. In the last three decades, the production of pork increased by 5-fold, and the production of poultry meats and poultry eggs increased by 11-fold and 13-fold, respectively. Traditionally, the Chinese mainland’s pork production and consumption were the main component; but given the production scale expansion of animal husbandry and the effect of demand for consumption, the Chinese mainland’s meat production and consumption structures are changing quickly. In 1980, output from the Chinese mainland’s pork meat production was 11.34 million tons, accounting for 94% of the total meat output, and the ratio of poultry meats was only approximately 2%. In 2017, pork output increased to 54.52 million tons, but the proportion of pork in total meats declined to 64%, and the ratio of poultry meats increased to 22%. Therefore, the diversification of the meat production structure in the Chinese mainland is changing.

(2) Analysis of changes in the trade volume of the Chinese mainland’s livestock and poultry products

The import and export trade of livestock and poultry products can further reflect changes in the supply and demand for livestock and poultry products in the Chinese mainland (Fig. 2). Import and export data from 2007 to 2017 indicate that the Chinese mainland’s import volumes for meats, pork, and poultry were all greater than their export volumes. In addition, the import volume for meats displays a significant upward trend due to a substantial increase in the import volume for pork. The import volume for meats increased from 0.94 million tons in 2007 to 2.61 million tons in 2017, a 178% increase; however, the export volume did not change significantly (Fig. 2a). From 2007 to 2017, the import volume for pork increased by 1318.41% while the export volume decreased slightly, and the import

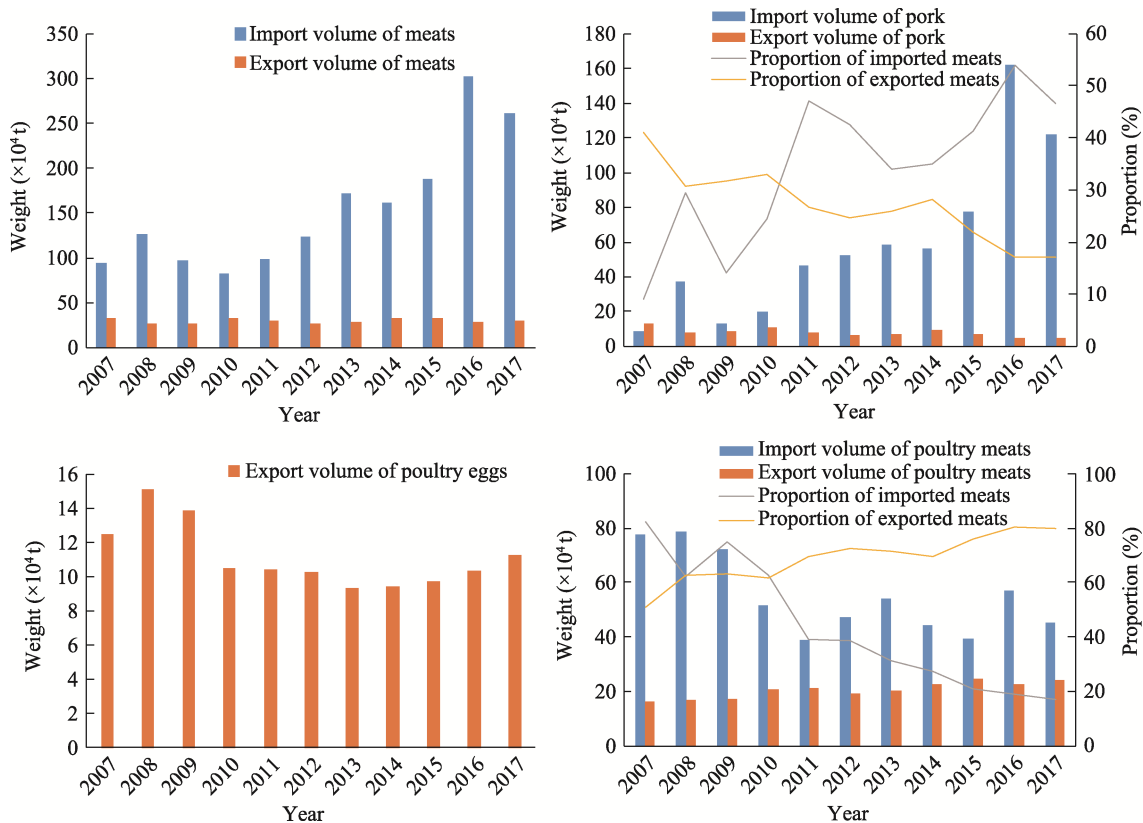


Fig. 2 Changes in the trade volume of the Chinese mainland's livestock and poultry products (Data source: FAOSTAT, 2007—2017)

volume for poultry meats decreased by 41.82% and displayed a downward trend. At the same time, the import and export structures for pork and poultry meats also changed. From 2007 to 2017, the import volume for pork increased from 0.09 to 1.22 million tons, the ratio increased from 9.13% to 46.57%, and the export volume decreased from 40.93% to 17.03%. Meanwhile, the import volume for poultry meats decreased from 0.80 to 0.45 million tons, the ratio decreased from 85.53% to 17.3%, and the export volume increased from 50.64% to 79.83% (Fig. 2b, 2d). Meats, pork, and poultry meats all had trade deficits, and the trade deficits for meats and pork are expected to continue to expand, whereas the trade deficit for poultry meats is expected to decline. The Chinese mainland's main export is poultry eggs, and the export volume for poultry eggs decreased by 9.55% from 2007 to 2017 (Fig. 2c). Although this export volume decreased slightly, the value of the exports gradually increased, and import volume was extremely small and with a gradually decreasing volume. The trade surplus for poultry eggs is expected to continue to expand.

(3) Analysis of the Chinese mainland's per capita share of livestock and poultry products and the balance between supply and demand

The changing per capita share of livestock and poultry products reflects the consumption of those products (Fig. 3). The Chinese mainland's per capita shares of meats, pork,

poultry meats, and poultry eggs have been increasing continuously in the last decade. The shares of meats, pork, poultry eggs, and poultry meats increased from 51.96, 32.60, 19.20, and 11.80 kg in 2007 to 62.00, 40.10, 22.30, and 15.40 kg in 2017, increases by 19.32%, 23.01%, 16.15%, and 30.51%, respectively. In order, the levels of the shares are pork>poultry eggs>poultry meats, with pork apparently being the main component of Chinese meat consumption. Among the growth rates of the different shares, that of poultry meats was the highest, followed by pork, while the growth rate of poultry eggs was the lowest.

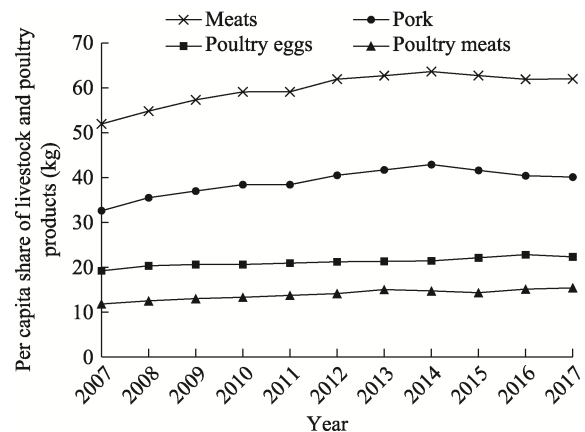


Fig. 3 Changes in the per capita share of livestock and poultry products in the Chinese mainland in the past decade

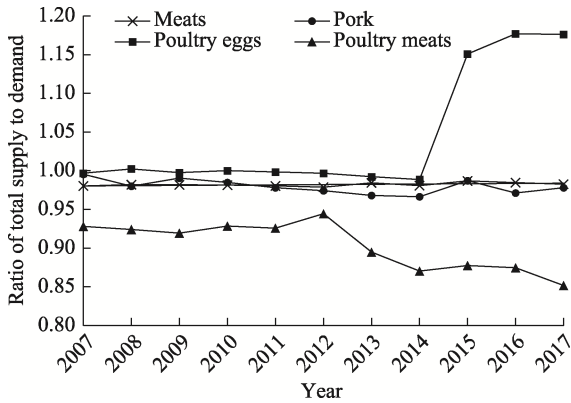


Fig. 4 Ratio of total supply to demand for the Chinese mainland's livestock and poultry products in the last decade

The ratios of the supply and demand volumes of the various livestock and poultry products can reflect changes in the supply and demand balance. The ratio of supply and demand for meat volumes increased slightly, so the pressure of the supply and demand balance displayed an upward trend. However, the ratios of supply and demand for pork, poultry meats, and poultry eggs each changed significantly. The ratios of supply and demand for pork and poultry meats decreased to 0.99 and 0.85 in 2017 from 1 and 0.93, respectively, in 2007. These decreases indicate that the Chinese mainland's pork and poultry meats were in short supply and that the pressure of the supply and demand balance was increasing. The ratio of supply and demand for poultry eggs

increased from 1 in 2007 to 1.18 in 2017, indicating a state of oversupply.

3.2 Comparison of the apparent consumption of livestock and poultry products: An analysis of future growth potential

Apparent consumption can generally reflect the changing trend of consumption growth in a country or region. Figure 5 shows the per capita apparent consumption of livestock and poultry products comparing the situation in the Chinese mainland with those in the United States, Japan, South Korea, and Taiwan of China. The Chinese mainland's per capita meat consumption increased continuously. In 2013, the Chinese mainland's per capita meat consumption was 61.10 kg, which already exceeded Japan's level (49.10 kg in 2013) and was comparable to that of South Korea (63 kg in 2013). Compared with the United States and Taiwan of China (115.50 kg and 77.20 kg, respectively), the Chinese mainland's per capita meat consumption was still comparatively low, but it was increasing relatively quickly. In terms of livestock and poultry types, the consumption of pork, poultry meat, and poultry eggs increased. By 2013, the consumption of pork and poultry eggs were already at comparatively high levels (38.43 and 18.76 kg, respectively) compared with those of other countries. Moreover, pork consumption was clearly higher than those of other livestock and poultry products, and it was the main proportion

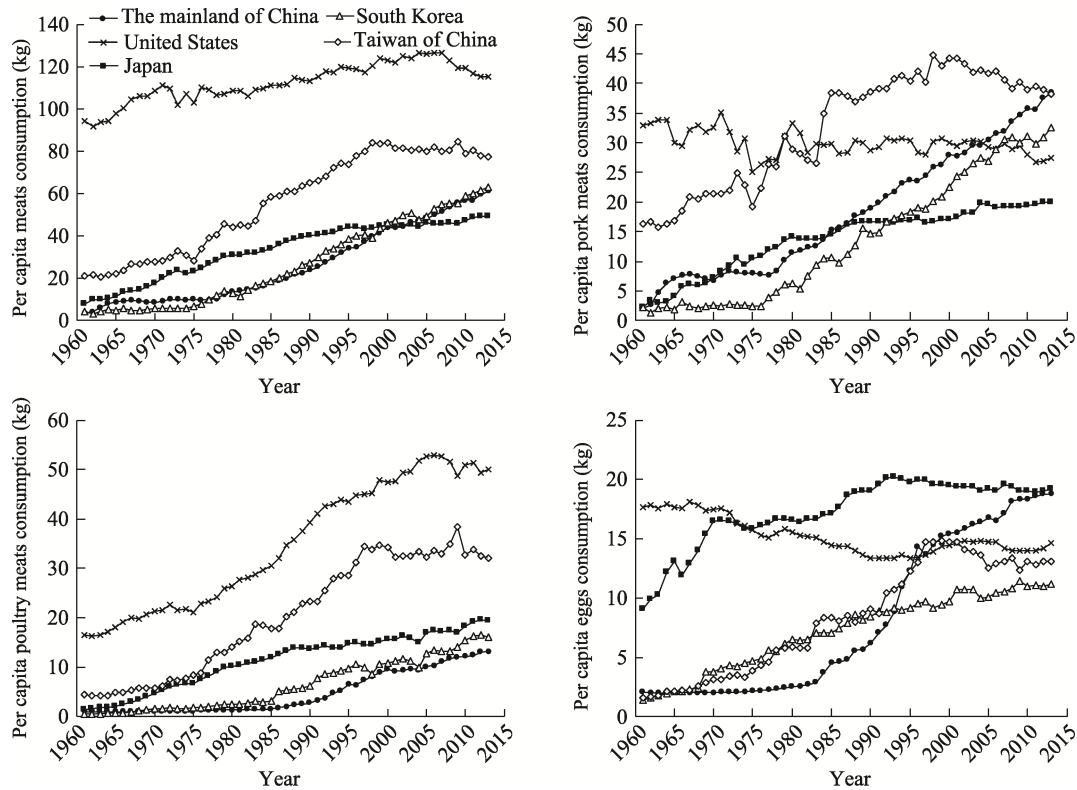


Fig. 5 Comparisons of per capita apparent consumption of livestock and poultry products (Data source: FAOSTAT, 1961–2013)

of residents' meat consumption. In view of the comparatively large differences in dietary habits between the Chinese mainland and the United States, the changing pattern of meat consumption in USA does not provide a strong reference for the Chinese mainland. Given geographical and environmental factors, Japan and South Korea had relatively high consumption of aquatic products and relatively low meat consumption.

Generally, the dietary patterns of the Chinese mainland and the Taiwan region are quite similar. According to the pattern of change in Taiwan's meat consumption upgrade, the per capita meat and egg consumption in the Taiwan region tended toward relative stability in the last 20 years, which was closely related to that country's stage of economic development. After entering a more affluent stage, food consumption entered an optimized state, and per capita meat and egg consumption was relatively stable, with meat consumption at close to 80 kg per person per year.

Based on the above analysis, this study predicts that the Chinese mainland's per capita meat consumption in the future is expected to be 80 kg when it reaches its peak value in approximately 2030 according to population and economic development. Mao et al. (2014) suggested that the Chinese mainland's future per capita consumption of grains and meats will approach 100 kg, and the total consumption of meats and aquatic products will also be approximately 100 kg. Xin (2018) indicated that the current food consumption of Taiwan region has reached a stable state, and the per capita consumption levels of meats and aquatic products are 75.70 kg and 35 kg, respectively. The Chinese mainland's future meat consumption is expected to be 78.30 kg when it reaches its peak value in 2026, which is in accord with the result of this study.

3.3 Future feed grain demand and prediction

(1) Measurement of current demand for feed grains in the Chinese mainland

In 2017, the total demand for feed grains calculated according to the per capita share of livestock and poultry products, dressing percentage, feed-to-meat (eggs) conversion ratio, and the population in that year was 336.0 million tons (Table 2). The demands for energy feed grains and protein feed grains were 258.2 and 77.8 million tons, respectively. The output of the main energy feed grain (corn) in the Chinese mainland was 259.1 million tons, and the output of the protein feed grain (soybean) was 18.4 million tons in 2017. These values indicate that the amount of corn produced in the Chinese mainland in 2017 could basically meet the energy feed grains needs, while the protein feed grain gap was large and external dependence was high.

(2) Prediction of future demand for feed grains in different scenarios in the Chinese mainland

The predictions presented in this study are based on the two scenarios of Taiwan region's current consumption of livestock and poultry products and the nutritional intake

Table 2 Current demand for feed grains

Category	Per capita share (kg)	Total share ($\times 10^4$ t)	Demand for energy feed grains ($\times 10^4$ t)	Demand for protein feed grains ($\times 10^4$ t)
Pork	40.1	5574.2	16276.7	4905.3
Poultry meats	15.4	2140.7	4112.4	1239.4
Poultry eggs	22.3	3099.9	5431.0	1636.7
Total	77.8	10814.8	25820.2	7781.4

target in the Outline of China's Food and Nutrition Development (2014–2020). Based on the current level of per capita apparent meat consumption in the Taiwan region, the Chinese mainland's future apparent peak value of meat consumption is predicted to reach approximately 80 kg, and the upper limit of poultry egg consumption is estimated according to the food consumption targets proposed in the Outline of China's Food and Nutrition Development (2014–2020). The total population is predicted to reach 1.5 billion by 2030, as calculated according to the National Population Development Plan (2016–2030) issued by the State Council. Therefore, the future demands for energy feed grains and protein feed grains obtained from this calculation are expected to be 327.0 million tons and 98.5 million tons, respectively, and the total amount of feed grains is expected to be 425.5 million tons. Based on population and the nutritional intake target in the Outline of China's Food and Nutrition Development (2014–2020), the Chinese mainland's future demand for feed grains is predicted to be 389.6 million tons, and the future demands for energy feed grains and protein feed grains obtained from this calculation are predicted to be 299.4 million tons and 90.2 million tons, respectively (Table 3).

According to the first scenario, the Chinese mainland's demand for feed grains is predicted to reach 425.5 million tons in 2030 based on Taiwan region's consumption of livestock and poultry products, and the demands for energy feed grains and protein feed grains in 2030 are expected to be 327.0 million tons and 98.5 million tons, respectively. These values mean larger gaps in demand for corn and soybeans in the future, which pose a significant challenge to the secure supplies of energy feed grains and protein feed grains. According to the second scenario, the Chinese mainland's demand for feed grains is predicted to reach 389.6 million tons in 2030 based on the nutritional intake target, and the demands for energy feed grains and protein feed grains in 2030 are expected to be 299.4 million tons and 90.2 million tons, respectively. In the future, the gap of corn-based energy feed grains will be small, while the gap of soybean-based protein feed grains will be large. A study by Cheng et al. (2016) predicted that the Chinese mainland's consumption of grains, feed grains, and meats will all reach peak values in 2030. The demand for feed grains will reach 519.7 million tons in 2030, which is 94.2 million tons higher than the demand for feed grains obtained from the first

Table 3 Future demands for feed grains in different scenarios

Scenarios	Category	Per capita share (kg)	Total share ($\times 10^4$ t)	Demand for energy feed grains ($\times 10^4$ t)	Demand for protein feed grains ($\times 10^4$ t)
Taiwan region's consumption of livestock and poultry products	Pork	47.5	6887.5	20111.5	6061.0
	Poultry meats	24.2	3509.0	7318.8	2205.7
	Poultry eggs	23.0	3335.0	5842.9	1760.9
	Total	94.7	13731.5	33273.2	10027.5
Nutritional intake target	Pork	43.7	6333.5	18493.7	5573.4
	Poultry meats	20.1	2916.0	5601.7	1688.2
	Poultry eggs	23.0	3355.0	5842.9	1760.9
	Total	86.8	12584.4	29938.3	9022.5

Note: Among the first scenario, the pork and poultry meat consumption structures are calculated according to the predictions of Cheng et al. (2016).

scenario, a difference that may be caused by the different approaches used in the two papers for meat consumption estimations, livestock and poultry product types, and grain consumption coefficients. According to the future per capita consumption of livestock and poultry products by residents in the Chinese mainland and the population, Liu et al. (2018) predicted that the demands for energy feed and protein feed in the Chinese mainland in 2030 will reach 332.0 million and 102.3 million tons, respectively, figures that are more consistent with the results of this study.

4 Conclusion and prospects

This study predicts the future demand for feed grains based on an analysis of changes in the supply and demand levels for Chinese livestock and poultry products. The study results are as follows. First, the scale of production of livestock and poultry products expanded rapidly, and the total meat output increased by 7-fold from 1980 to 2017. In addition, the production levels of pork, poultry meats and poultry eggs increased by 5-fold, 11-fold and 13-fold, respectively. Second, the Chinese mainland's per capita shares of these livestock and poultry products increased by 19.32%, 23.01%, 16.15%, and 30.51%, respectively, from 2007 to 2017. Additionally, the import volumes for meats and pork increased by 178% and 1318.41%, respectively, while the import volume for poultry meats decreased by 41.82%, and the export volume for poultry eggs decreased by 9.55% from 2007 to 2017. The ratios of supply and demand for pork and poultry meats decreased to 0.99 and 0.85 in 2017 from 1 and 0.93 in 2007, respectively. These values indicate that the pressure of the supply and demand balance is increasing. Third, this study shows that the patterns of change in meat consumption in the Chinese mainland and the Taiwan region are highly similar according to an analysis of changes in the per capita apparent consumption of livestock and poultry products in certain other countries and regions, such as the United States, Japan, and Taiwan of China. This study predicts that the Chinese mainland's per capita future meat consumption will be 80 kg when it reaches its peak value. Fourth, the Chinese mainland's demand for feed grains is predicted to reach either 425.5 million tons or

389.6 million tons in 2030, based on either the Taiwan region's current consumption of livestock and poultry products or the nutritional intake target, respectively. According to the analysis of these results, the Chinese mainland's present consumption of poultry eggs has nearly reached its peak value, and the growth rate will slow in the future; however, pork and poultry meat consumption are expected to maintain faster growth rates, and the pressure of the supply and demand balance will increase in the future. With the increasing demand for livestock and poultry products in the Chinese mainland, the demand for feed grains will continue to increase, and the shortfall in feed grain raw materials will further expand. In particular, the dependence on external sources of protein feed grains will remain high.

In the future, given the changes in the Chinese mainland's population, economic growth, and dietary patterns, the demand for livestock and poultry products will further expand. To satisfy the demand of the Chinese mainland's consumers, the conditions of the Chinese mainland's limited agricultural production resources and more guarantees for the domestic grain self-sufficiency rate to reach 95% will inevitably lead to either an increase in the import volume of livestock and poultry or an increase in the import volume of grains used for feed. Satisfying the demand of Chinese consumers, who account for one-fifth of the world's population, is a grim challenge, whether internationally or domestically. To this end, we can consider four possible solutions. First, the Chinese mainland can choose to appropriately import raw materials for feed, which is simultaneously conducive to increasing employment opportunities and improving farmers' incomes through the development of the country's livestock and poultry farming industries and also to an increase in the supply of livestock and poultry products. Second, in 2017, the Chinese mainland's import volumes for soybean and corn reached 95.53 million and 2.83 million tons (General Administration of Customs), respectively. If the domestic market is completely opened, the current price advantage in the international market will inevitably create a significant increase in the import volumes of soybean and corn, which will greatly reduce the Chinese mainland's grain

self-sufficiency rate, impact farmers' enthusiasm for cultivating land, and damage farmers' interests. Moreover, long-term imports of large quantities of soybean and corn will increase international prices and reduce the profits of the Chinese mainland's farming industry. Therefore, to safeguard the Chinese mainland's interests and to avoid overreliance on the international market, finding other substitutes for energy feed and protein feed is necessary. Third, the research results of Xiao et al. (2017) showed that the Chinese mainland's current shares of rice, wheat, corn, and potatoes are far higher than the actual or ideal consumption levels, and the grain surplus is comparatively large. However, the gap in raw materials for animal products is also comparatively large; therefore, the cultivation of agricultural products that are the raw materials for feed, such as silage corn, soybean, rapeseed, and so on, should be expanded under the premise of ensuring (feed) grain security. Fourth, soybean meal is the main raw material for protein feed. Since 2000, the Chinese mainland's import volume for soybeans has grown year after year. Most of the soybeans imported by the Chinese mainland are genetically modified to have characteristics such as low planting costs, high single yield, and high oil yield, which are more in line with market requirements. Therefore, accelerating the research and development of new soybean varieties in the Chinese mainland and improving the planting benefits and market competitiveness of domestically produced soybeans are necessary.

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中国大陆畜禽产品供求及未来饲料粮需求潜力研究

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摘要: 中国大陆畜禽产品供求差距的扩大给饲料粮安全供给带来了巨大的挑战。因此, 准确预测饲料粮需求潜力是保障我国粮食安全的关键科学问题之一。本研究基于中国大陆畜禽产品产量、贸易量及表观消费量变化等要素分析, 基于两种不同情景预测了未来饲料粮需求量。研究表明, 30 多年间肉类产量上涨了 7 倍多, 10 年间人均肉类消费量增加了 10.04 kg。目前猪肉和禽肉处于供不应求状态, 并且贸易逆差不断增大, 表明近年来中国大陆的畜禽产品产量、消费量、贸易逆差和供求平衡压力均呈增大趋势。基于两种情景预测到中国大陆 2030 年饲料粮的需求量将分别达到 42548.8 万 t 和 38960.8 万 t。由此可见, 随着中国大陆畜禽产品需求量不断增加, 未来饲料粮需求量也将继续增加, 饲料粮原料缺口将进一步扩大, 尤其是蛋白饲料对外依存度仍将保持高位。

关键词: 畜禽产品; 供求变化; 饲料粮; 需求预测; 中国大陆