

Implication of the Corn Fuel-ethanol Programs on China's Energy and Food Security

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Abstract:

Since implementation of the corn fuel ethanol scheme make the great effect on the global corn market and energy market, China has also tried to develop corn fuel ethanol industry. Researches about quantitative analysis method of China's corn fuel ethanol develop impact on supply and demand changes of domestic corn sub-region, and implement of corn fuel ethanol program in American, The macro-background for the current international corn prices rise. It is indicated that the interesting conclusion.

Keywords: *corn market, fuel ethanol, China*

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Introduction

Fuel ethanol stratagem will be great effect on global economy. Since the implementation of the scheme, corn market prices has increased by a big margin, rise to 75% in 2006, and caused global food price rise. In China, market price of corn rose rapidly in the past two years. The great adjustment of corn raw materials for the feed industry has given rise to food markup of nationwide.

Currently, hot debates exist in views on develop of bio-energy, especially with the use food development of bio-energy; even cause many people's protests in the many countries. Because of the energy will affect food security, and even environmental problems. We will pay special attention to: Corn fuel ethanol program has some effect on the Chinese corn market supply and demand relationship and price. What influences does the development of Chinese corn fuel ethanol bring about to the Chinese corn sub-region supply and demand relationship and change of price? Structure of this text: the first part of the corn industry summarize, including The World's corn Generation Industry and China's corn industry profiles; the second part of the supply and demand status of China corn sub-region; The third part of the study, including research of the model and data, and relevant forecast. The last part is conclusion.

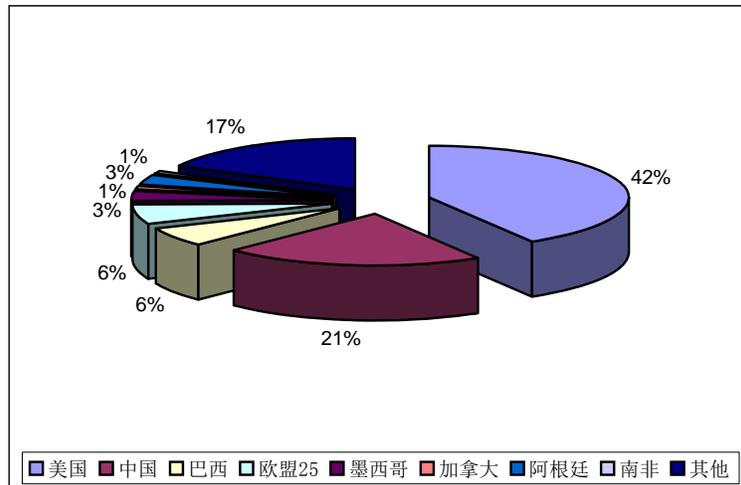
Corn Industry Summarize

1. Global corn industry outlined

1) Global Corn Production Status

Global corn productions were increasing; the amount of fluctuates with a little short-term. 2005/2006 global corn production is 659 million tons, 2006/2007 global corn production is 692 million tons, according to republish of International Grains Council (IGC) news, the global corn productions will be new breakthrough estimated to reach 733 million tons 2007/2008. Global corn mainly produced in the United States, China, Brazil, Mexico and the EU and other countries. Only the United States and China with two gold corn productions, accounting for 62% of global output. Follow by Brazil about 6%, about 6% of the EU. The global distribution of corn production may refer to Chart (1).

Chart (1) Global Corn Production



Source: USDA

2) Global Corn Trade Status

Two of the world's largest corn-producing countries are the United States and China. The United States and China corn production are substantial increase in 2006/2007. American corn exports have increased, Chinese corn exports have decreased than 2005/2006, Argentina corn exports also have decreased in 2006/2007. Japan, South Korea, Mexico and Russia, and other countries are the main importer of corn. Japan and Mexico increased imports 2006/2007 year, the overall trend has increased.

3) Global stocks of corn outlined

The global corn stock have great change, corn stocks began the decline in 1999, in 2003 less than 1 million tons. The stock is 125 million tons in 2005/2006; the stock is 88 million tons in 2006/2007, 44 days is enough consumption.

2. China's corn industry outline

1) China's corn production status

China is one of the world's leading gold corn production belt, is the world's second largest corn producer and consumer countries. From climate, China is temperate continental climate, suitable for growing corn. Chinese corn production has obvious geographical characteristics, production concentrated in the Northeast and the Huang - Huai region. Chinese corn total output is 139 million tons in 2005/2006, account for 21.06% of world output. In 2006/2007 China's corn total output is 144 million tons, account for 20.8% of world's output. China's corn harvest in three consecutive years, corn output made 2% increment. China corn has good trend of production and development.

2) Chinese corn demand situation

The main China corn demand includes two aspects: feed industry demand and process industry demand. Stockbreeding has been on the increase, the corresponding feed industry is nearly 5% growth. Feed Industry demand for corn output accounted for nearly 70%, thus promoting the growth of corn demand a significant force. Corn is

a high value-added product; its value could increase by process, deep processing development, but also promote demand for corn in industrial processing. Under influence of US fuel ethanol strategy, China has launched projects of corn ethanol fuel. In recent years substantial increase in the amount of industry corn, become a new power for improve growth of corn demand. China's corn supplies and demand balance, but there is still a lot of surplus processing capacity.

3) China corn trade situation

China implemented quota management to import-export corn. The main export country: Korea, Japan, and Russia. China's corn imports are mainly from the United States, Peru, Australia and some neighboring countries. According to the experts expected, China has trend of large imported amounts of corn.

3. Summary

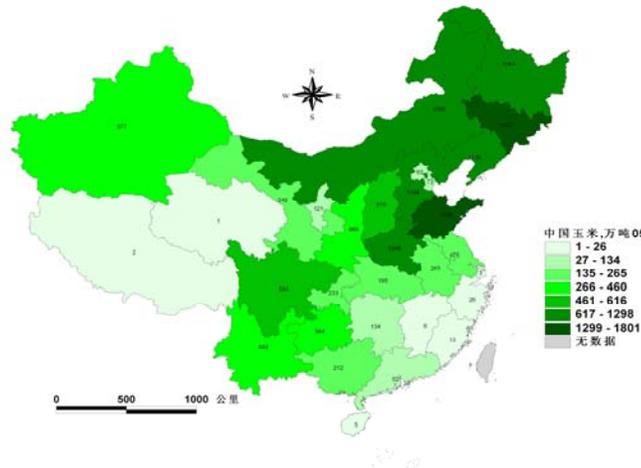
This section mainly through the global corn industry profiles and introduce of Chinese corn market, one background of current Corn situation are given. It can be seen China's rank is only inferior to the United States in the global corn industry. China has also large consumption country; the effect of Chinese corn production and consumption on world corn market is mark. Such influence in the Chinese market gradually opening up entirely background will become increasingly apparent. Such influence in the Chinese market gradually opening up entirely background will be increasingly obvious. China corn is very obvious geographical differences; this article focuses on the research of corn sub-regional supply demand balance.

China Sub-region Corn Production and Consumption

1. China sub-region corn production outline

The China distribution of corn production may refer to chart (2). Corn productions of 10 million tons are the eight provinces of Jilin, Shandong, Henan, Hebei, Liaoning, Inner Mongolia and Heilongjiang, mainly distribution in the Northeast and North in China. Corn yield are comparatively less in South and southwest. China's corn harvest in consecutive years, in some area faster growth and great potential Yield increase over one million tons of four provinces, followed by Henan, Shandong, Inner Mongolia and Heilongjiang. Xinjiang's corn has kept growth situation, and this trend is expected to continue, Xinjiang is great potential for corn production, transport to Sichuan.

Chart (2) Distribution of Corn Production in China



2. China sub-region corn consumption outline

China's consumption of corn is the main feed industry and the processing industry. Very little consumption of corn, seeds and food rations are relatively stable, wastage is gradually reduced. Feed industry is growing steadily; particularly the deep-processing industry is growing faster, in general, consumption growth faster than corn production. China corn market was still in supply demand balance in 2005/2006. But it has still bigger demand space. The existing relatively large regional of corn consumption, between different regions vary considerably.

1) Feed corn consumption

Feed corn demand ranked in the forefront of Hebei, Shandong, Henan, Sichuan and Hunan. The three northeastern provinces of feed corn demand ranked in the middle position. Feed Corn consumption accounted for the bulk of overall consumer corn, Hebei, Sichuan, Hunan and other place need introduction corn. With even growth of production, improvement and consummation to national transportation system, feed corn to maintain steady growth, corn flow will change; these are responsible for that of feed enterprise.

2) Consumption of corn processing

Industry corn main consumption is processing cornstarch and alcohol. Cornstarch enterprise distribution mainly concentrated in Shandong, Hebei and Jilin provinces, and account for 79% of total cornstarch output. Shaanxi, Shanxi, Henan of cornstarch industry develops rapidly, increase in demand for corn in these area. Development of Heilongjiang, Jilin, Henan, Anhui and Shandong fuel ethanol program has also promoted corn consumption.

Currently, China's cornstarch processing industry is 26 million tons, and alcohol corn processing industry about 14 million tons. Corn processing capacity is further enhanced.

3. Summary

This section mainly introduction status of domestic sub-region supply demand unbalance from Chinese sub-region corn production and consumption, as research of basic point.

Simulation result and analysis

1. Model

China's corn supply and demand of the sub-region is the overall consideration of all provinces, municipalities and autonomous regions of the corn supply and demand and local circumstances, the distribute of domestic corn zoning; Further study of the development potential of corn production, changes in consumption trends, the use of space equilibrium model for a balanced of corn market price and trade volume; The trend of the development of future domestic and international corn trade is forecasted.

On the basic of traditional transportation model, Space equilibrium model introduce price and supply, demand and the price elasticity of demand variables. Impact on commodity supply and demand through model analyzing of multi market (or space), and ultimately implement equilibrium of supply and demand in all markets and price. The spatial equilibrium model is used to maximize net income, solving supply, demand, price. Space equilibrium model is widely used in the agricultural market, the energy market, mineral economic and other fields.

2. Data

The research data comes mainly from the National Statistical Yearbook, the cost-benefit years, the food industry and prices Yearbook Yearbook. Etc. The sub-region corn production data came from 2006 China Agricultural Statistics Yearbook. The Price came from the National Bureau of Statistics of compiled price report. Sub-regional demand on the two-aspect estimate mainly from feed corn demand and industrial demand for both corn.

3. Analysis and Forecasting

China's corn production has average growth 1.92% in recent year and increase6%in domestic demand. Feed Corn industrial growth is relatively stable, and basically maintained at 5%, and the rapid growth of industrial corn as high as 25.01%. Industrial corn data have several versions, we adopted the information calculated the average growth percentage issued by country's grain Bureau. 2006 data has not yet out; we adopted data in 2005 conducted a series of simulations. By an instance, the model is proved, system error within 2%. Simulation is major concerns the domestic market balance.

1) Annual status in 2005

The Simulation result showed the balance quantity in 2005/2006 is 139.9 million tons. Under market equilibrium, national average equilibrium price is RMB 1306 Yuan/ton. The average market equilibrium price of main producing area in the three provinces in Northeast China is RMB 1224 Yuan/ton, and RMB 1341 Yuan/ton in sales area Jiangsu, Jiangxi, Zhejiang and Anhui.

Results (Table 1)			
	Base year (2005/2006)	Simulation (2006/2007)	Simulation (2007/2008)
Equilibrium quantity (mil. ton)	139.90	144.41	147.74
Price (yuan/ton)	1,306	1,589	1652

2) Forecast of 2006/2007 annual statuses

The Simulation result showed that the balance quantity in 2006/2007 is 144.41 million tons. Under market equilibrium, national average equilibrium price is RMB 1589 Yuan/ton. This price was forecasted out basing on 2005/2006. The prices of corn shot up in 2006/2006. The corn futures market used to run up price of over 70%. Domestic corn prices also much raised up.

3) Forecast of 2007/2008 annual statuses

The Simulation result showed the balance quantity in 2007/2008 is 147.74 million tons. Under market equilibrium, national average equilibrium price is RMB 1652 Yuan/ton. This price was forecasted out basing on 2005/2006. The rapid rise in the prices of corn, Strong growth in demand for corn, and 2008/2009 is expected to continue to rise.

4) Forecast feed corn and industry corn increased impact on domestic market

Corn production increased, and domestic total demand increased faster than output, domestic price has rise in not consideration of import large amount, simulation results show that under such circumstances the domestic market average equilibrium price rose 21.67%. Other factors have also affect on corn prices, such as international markets, import and export policies.

Feed corn increase brought along corn prices move up 7%, and industrial corn price increases driven corn prices rose 13%, industrial corn demand rapid increase become the absolute main force of pulling corn price.

4. Summary

This section is the core of the article. We first introduced the model used in research and data sources, finally, simulated basic situation of domestic sub-region between supply and demand, study on the basic of animal husbandry growth to increase of feed corn demand. Processing industry corn increases impact on the corn market balance.

Conclusion

The corn prices increased in 2006 even appeared scare buying in some place. Especially the international futures market of corn jumped in multiple under the background of spinning corn story, and domestic corn futures market also soared up. This is because commercial speculation, as well as corn energy attribute and Fuel Ethanol Program in America. At present our country still take quota restriction on

corn, international market could not make a great impact on internal market. With liberalization development of trade, China corn market will be more and more impacted by international market. And at present corn consumption mainly depends on domestic supplies in China.

Through research of corn sub region balance between supply and demand, we conclude the following:

1. Presently in view of overall situation, the production and demand of corn are still a tendency to increase. However the increase of demand exceeds supply finally would cause rise of price and falling off in corn net export. Improvement of corn processing ability, it is possible to import corn in large quantity.

2. Development of feed processing and deep processing will drive the demand of corn, promote corn price, and corn processing industry will be a stronger power of corn price.

3. The increase of expenses of corn processing in producing area, which will reduce the output in main producing area of corn and enhance the price of corn from producing area.

Because of the corn energy attribute and America Fuel Ethanol Plan, the price of corn will show a tendency to increase for a period time in the future. In 2007, corn is still concerned. Under the stimulation of high prices, the output of corn will be increased .The balance quantity of corn will also reach a higher level in China. The Chinese corn market is going to well connect with international corn market gradually, and play an important role in international corn market.

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