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SOW-VU BRIEF

China's rapidly growing meat demand: a domestic or an international challenge?

Introduction

China's is among the fastest growing economies in the world. Over the period 1990-2003 the economy has been growing at an average growth rate of 8.5 %, and also in coming years China's overall growth rate is expected to be in the 5-10% range. The rate of economic growth is even more impressive when considering the fact that China comprises about one fifth of the global population.

An important characteristic of the increasing levels of incomes and expenditures is a changing food consumption pattern, and in particular, an increasing consumption of meat. While, according to FAO statistics, in 1985 meat consumption in China was approximately 20 kg per person per year, by 2000 it had increased to 50 kg per person per year, and for the next decades further increases in per capita meat consumption are projected.

Currently, China's meat consumption is almost fully met by local production, and meat imports are negligible. Also with respect to feed grains, current levels of imports are low, and practically all maize, barley and other feeds used for raising pigs, chicken and cows is produced within China. Yet, the question needs to be addressed whether also in coming years the production of meat and feed grains in China will be sufficient to keep pace with the increasing demand for meat, or whether China will become a significant importer of meat, feed grains, or both. And when indeed China would increasingly rely on world markets, the question needs to be asked to what extent this would result in major distortions of global food and feed grain markets.

In principle, China's increasing demand for meat can be met in three different ways. In the first place, China's agriculture may increase its level of feed grain production in full synchronization with the increasing demand for feed grains by the livestock sector without any accompanying increase in imports of grains. In the second place, when the livestock sector's feed grain demand would not be met by an increase in production within China, the required feed grains may be imported from the world market. And finally, as a third possibility, an increase in meat demand could, in principle, also be met just through direct imports of meat.

The way in which China will respond to the increasing demand for meat depends on a number of factors that are currently subject of vivid debate. In the first place, in China self-sufficiency in grains is traditionally an issue of major concern, and in particular policy makers may still feel uneasy about the idea of relying partly on world markets for grain supply. In the second place, the question is being asked what China's capacities are to increase its feed grain production and at what cost. In this respect it is important to note that currently about half of China's feed consumption is based on traditional local feeds such as grasses, crop-by-produce and crop-residuals, and household waste. Additional significant increases in the availability of these traditional local feeds are unlikely to be realized, and as a consequence livestock farmers will have to rely more and more on the supply of marketed feed grains and oilseeds. Furthermore, urban growth leads to an increasing pressure on agricultural land, and also on available water, in particular in the North region. At the same time, China is becoming more and more concerned about its ecological balances, and conservation programs have been initiated, such as the so-called grain-for-green measures, which provide incentives to farmers to take land out of production in ecologically vulnerable areas.

These developments put additional constraints on China's capacity to increase its agricultural production.

A third factor relevant to China's food, feed and meat supply is its position towards world trade markets. Relaxation of import constraints, in line with WTO

Figure 1a Rural China, livestock and crops

Figure 1b Urban China, harbor Shanghai

requirements, may affect the competitiveness of China's own agricultural sector, with potentially different impacts on relatively easily accessible coastal regions and more remote and less accessible rural areas. In this respect, it should be noted that differences in levels of well-being between China's coastal provinces and its remote inland regions, are an issue of increasing concern. On the one hand, indeed, a relatively low-income level in rural areas ensures the availability of cheap labor from rural areas for employment in the cities. But on the other hand, there are also reasons to contain the income gap between rural and urban areas. In the first place, large differences in incomes, and associated differences in human well-being, are undesirable by itself. In the second place, a large income gap between rural and urban areas could well lead to massive urban migration, exceeding the urban area's absorption capacity. And in the third place, increasing incomes generate purchasing power, which offers outlets for industry. Thus, an important and relevant question is to what extent relaxation of international trade constraints will have adverse effects on China's agriculture, and in particular on income inequalities between regions.

The Chinagro study

These policy issues have been investigated in the Chinagro-project, a cooperative undertaking by the Centre for Chinese Agricultural Policy, the Institute of Geographical Sciences and Natural Research (both belonging to the China Academy of Sciences), the China Agricultural University, the International Institute for Applied Systems Analysis in Austria, and SOW-VU. For investigating the above-formulated questions, a large economic model study has been designed, with special attention to the enormous distances in China's geography and the large geographical variety of Chinese agriculture. In particular, the model incorporates not only trade flows between China and the rest of the world, but also interregional and intraregional trade between eight economic regions and more than 2400 counties within China.

The study, which relies heavily on original Chinese statistical data, investigates future economic and agricultural developments in China under different scenarios. Under the main scenario, also called the base-scenario, it is assumed that between now and 2030 the Chinese population will grow at an annual rate of 0.5%, that the overall economy of China will continue to expand at a high rate, with a non-agricultural growth rate of 6.5%, and that total cropland in China will decline from 135 million hectares in 2003 to 129 million hectares in 2030. This decline will be mainly on the account of non-irrigated rainfed land. At the same time, it is assumed that steady increases in agricultural productivity will be feasible, partly through significant improvements in water use efficiency, in particular in North China, and that the stable capacity of the intensified livestock sector will double in size. Furthermore, in the base-scenario it is assumed that tariffs on foreign trade will be reduced gradually, and international agricultural prices will remain rather stable.

Outcomes of the model-study

Under such a scenario, China's per capita meat consumption will continue to increase strongly and by 2030 meat consumption will be at around 85 kg per person per year, more than double the 1997 level of

41 kg. Yet, and somewhat unexpectedly, results of the model study indicate that, by and large, between now and 2030 China's agricultural sector will continue to be

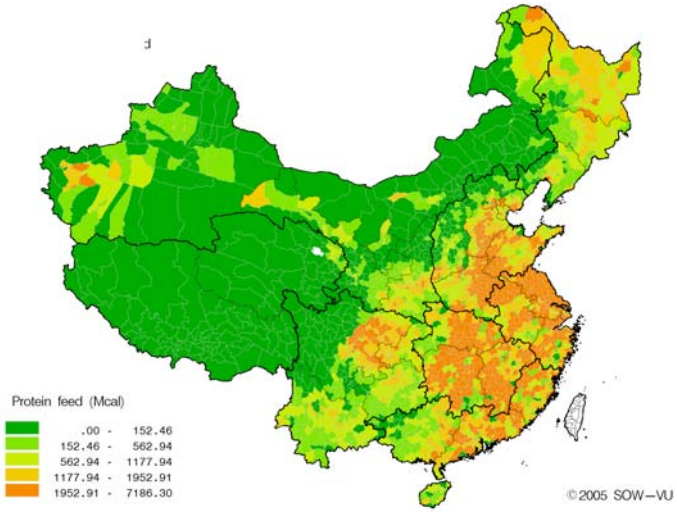

Figure 2 Protein feed output at the level of counties in 2030 (Mcal/ha)

capable to meet the increased demand for meat, without excessive reliance on imported feeds. With a projected level of feed grain imports of 30 million tons in 2030, still approximately three quarters of China's feed grain demand will be supplied by Chinese farmers. Also with respect to protein-rich feeds, such as soybeans, about two third of the country's demand will be locally produced. As an illustration of these model outcomes, and in particular of their geographical detail, figure 2 shows the projected production of protein-rich feeds[1] at the level of counties for the year 2030, expressed in Mcal per hectare of land being cultivated for cropping and livestock purposes. As shown in the figure, outputs vary widely, from below 150 Mcal/ha in western China up to well over 2000 Mcal/ha in eastern China, and to even over 7000 Mcal/ha in some areas.

It is important to note that, due to the change in food consumption pattern and the increased consumption of meat, China's total food grain consumption is not expected to rise over this period (with, in 2003, food consumption being already at a level of 2750 kcal/cap/day), and that food grain requirements will, also in 2030, fully be met by local production. All in all, according to the base scenario, by the year 2030 China will still be largely self-sufficient in both food and feed grains, with only about 8% of all grain demand being imported. This import level, close to ten percent of current international grain trade, is unlikely to cause major distortions on international markets, and it is also far below alarmist projections made some years ago by for example the Worldwatch Institute (Brown, 1995).

As regards inequalities in standards of living, under the base-scenario income differences between rural areas and areas of high non-agricultural growth will increase, as farm incomes will rise at a much slower pace than non-farm incomes. Such developments are expected to cause a steady outflow of agricultural labor, both permanently and seasonally. The large differences in living standards between rural and urban areas can be illustrated by looking at projected levels of meat consumption, ranging from just over 20 kg per person per year in the rural Plateau region up to over 120 kg per person per year in the urban areas of the North, the East and the Southwest region (Figure 3).

Utilizing the same model, also other scenarios have been considered, for example scenarios in which China would have an even higher economic growth rate, a higher productivity in the agricultural sector, or a higher percentage of grain being produced on irrigated land. Also under these alternative scenarios, China is expected to maintain a high level of self-sufficiency in grains.

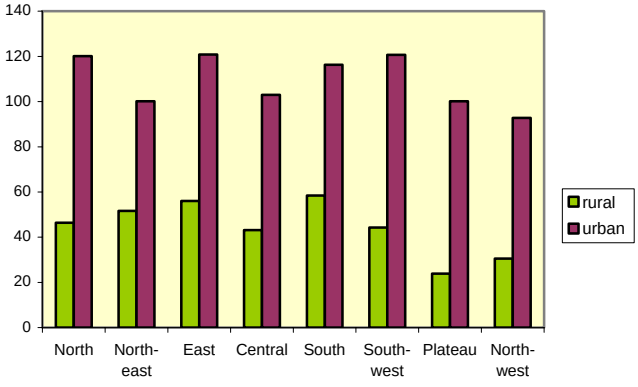

Figure 3 Projected consumption of meat and eggs in 2030 (kg per person per year)

[1] "Protein-rich feeds" is a mixture of several feeds such as bran and oilseed cakes, having on average an energy value of 3 Mcal per kg (1 Mcal=1000 kcal).

Finally, under a liberalization scenario the impact of full removal of Chinese border protection, as promoted by WTO-rules, has been investigated. Here, model outcomes indicate that Chinese per capita incomes would on average increase further, resulting in an even higher level of per capita meat consumption by the year 2030 (88 kg in stead of 85 kg). However, increased competition from abroad is expected to cause a reduction of income gains in the agricultural sector. Interestingly, the opening up of borders will have a stronger dampening effect on farm income growth in coastal provinces than in regions that are at a larger distance from the coast. In other words, inland regions from China appear to be to some extent protected against the negative effects emanating from relaxation of international trade constraints. Large transport costs over rugged and hilly terrain is a major factor in reducing the impact of trade liberalization on inland rural China. But also, just because of these geographic barriers, for coastal China it may well be cheaper to import feeds, or even meat, from the world market than procuring it from remote inland farming areas.

Conclusions

The overall conclusion of the model study is that in 2030 China will still be largely self-sufficient in both its food and its feed production, and projected moderate increases in imports of, in particular, feed are unlikely to cause major distortions in world grain markets. Opening up of borders and relaxation of trade constraints will have a further income increasing effect on Chinese consumers, but a moderate negative effect on Chinese farmers. This dampening effect on farmers' income growth is stronger in coastal regions than in remote rural areas. Yet, prospects for farmers in the hinterland without near-by urban concentrations are not particularly bright, unless they are in a position to enlarge their plots and boost their productivity.

References:

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3. SOW-VU website (http://www.sow.vu.nl), News: Policy Forum on China's Agriculture towards 2030, Program and Presentations.

The Centre for World Food Studies (Dutch acronym SOW-VU for Stichting Onderzoek Wereldvoedselvraagstukken van de Vrije Universiteit) is a research institute related to the Department of Economics and Econometrics of the Vrije Universiteit Amsterdam. It was established in 1977 and engages in quantitative analyses to support national and international policy formulation in the areas of food, agriculture and development cooperation.

SOW-VU's research is directed towards the theoretical and empirical assessment of the mechanisms, which determine food production, food consumption and nutritional status. Its main activities concern the design and application of regional and national models, which put special emphasis on the food and agricultural sector. An analysis of the behavior and options of socio-economic groups, including their response to price and investment policies and to externally induced changes, can contribute to the evaluation of alternative development strategies.

SOW-VU emphasizes the need to collaborate with local researchers and policy makers and to increase their planning capacity.

SOW-VU's research record consists of a series of staff working papers (for mainly internal use), research memoranda (refereed) and research reports (refereed, prepared through team work).

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