Impacts of the World Crop Glut on Iowa Producers

Impacts of Chinese Swine Feeding Practices on Future Chinese Feed Grain and Livestock Trade

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U.S.-Canada Agricultural Trade Dispute

The United States is the largest importer of Canadian agricultural products, whereas Canada is the second largest destination for the U.S. agricultural exports. Bilateral agricultural trade flows between these two countries have increased further since the implementation of the North American Free Trade Agreement (NAFTA) in 1994. Despite the relative importance of U.S.-Canada agricultural trade, it has not been problem free, particularly in years of low prices.

Traditionally, the United States has imported small quantities of wheat each year from Canada, but its imports increased significantly in 1992/93 and even increased more in 1993/94 (Figure 1). Faced with lower wheat prices in 1993/94, the Northern Plains wheat producers caused an uproar over the increased flow of Canadian wheat into the U.S. market. Farmers alleged that imports of Canadian wheat were lowering U.S. wheat prices, resulting in higher deficiency payments and implying that Canadian wheat was undermining the U.S. price support program. Strong protest from U.S. wheat producers resulted in a formal investigation by United States International Trade Commission (USITC) on the effects of Canadian wheat on U.S. wheat markets, particularly on prices. USITC and other studies (Alston et al., Mohanty et al.) generally concluded that Canadian wheat imports did not have a significant effect on U.S. wheat prices.

After 1993/94, wheat prices started recovering, peaking in 1995/96. Farmers around the world, including in the United States, responded to the higher prices by expanding wheat planting. In addition, changes in agricultural polices around world, for example the elimination of annual acreage reduction programs in the United States and the reduction of the mandatory set aside rate in the European Union (EU), also contributed to an increase in planted area. The combination of favorable weather and increased area resulted in world wheat production rising to a record level in 1996/97. Since then, prices have been continuously sliding, falling below the loan-rate level in recent months. Higher than average yields and the inability of farmers to take land out of production are mainly responsible for falling prices. Static import demand, mainly from Asian countries undergoing financial crisis, has also contributed to falling prices to some extent.

Current low prices have renewed the wheat dispute involving Canadian imports. In addition to wheat, the increasing imports of Canadian cattle are also making news. Before the United States takes any action against Canada in the form of trade restrictions against Canadian

![Figure 1. U.S. Wheat Imports from Canada](image-url)
imports, it is important to verify the role of Canadian imports in depressing U.S. markets.

As shown in Figure 1, Canadian imports account for approximately 3 to 4 percent of U.S. wheat production. This much additional wheat into the U.S. market may lower prices by $0.15 to $0.20 per bushel without factoring in the third-country effect; that is, restricting Canadian wheat into the United States would displace U.S. wheat from international market. By taking into account the third country factor, the net effects on U.S. price will be smaller.

The United States imported 68 million bushels of wheat in the peak year of 1995/96 and increased to 90 million bushels of wheat in 1996/97. Since 1996/97, wheat prices have fallen 37 percent from $4.30 to $2.69 per bushel for the current marketing year. Imports of Canadian wheat, however, have remained more or less constant at 90 million bushels. Although U.S. imports of Canadian wheat for the past two years have been more or less at the same level, prices have declined substantially, suggesting that something other than Canadian wheat is responsible for such a price decline. This price decline may be mostly attributed to larger world supplies from many exporters, including the United States and also, to some extent, due to static import demand from Asian countries.

Similar arguments can be made for livestock markets. The United States imports large numbers of Canadian cattle, but the numbers have been declining in recent years (Figure 2). Relative to U.S. beef production, Canadian imports still account for only 3 to 4 percent. The recent drop in beef prices can be mainly attributed to increased U.S. beef production, although the increase in imports of Canadian cattle has not helped the situation.

Overall, it may be concluded that current low prices are mainly attributable to increased production and, to some extent, weaker import demand from Asian countries. Imports of Canadian crops and livestock have not helped the situation but do not appear to be an important factor in explaining the current weakness in the U.S. market.

### Impacts of the World Crop Glut on Iowa Producers

During the past three years, above average domestic prices and provisions of the 1996 Farm Bill have encouraged producers to plant from fence row to fence row. In 1996 and 1997, Iowa producers experienced high yields and above average prices, which resulted in record or near record levels of net farm income. This led to what has been called by some in the agricultural community “unsustainable optimism.” This summer’s sharp decline in commodity prices was followed by a downturn in expectations.

#### Crop Outlook

Corn production since 1996 has increased, not only in Iowa and the United States but worldwide. In fact, there has been an increase of 37 million acres in corn and soybean plantings. In the United States, there has been a reduction in idled Conservation Reserve Program acres from 36.4 to 30 million acres. And, while wheat area planted in the United States has dropped approximately 3 million acres, corn and soybean acres planted have increased approximately 20 million acres.

The high yields in the United States have been accompanied by high yields in many agricultural producing nations. Argentina, which has experienced excellent growing seasons, has become an aggressive exporter of corn. China, too, has developed into an exporter of corn. The Pacific Asian import market bought corn, especially from China, dampening U.S. exports to that market. This has led to a projected 20 percent drop in Iowa corn prices from 1997 to 1998. Iowa producers are expected to react by planting a projected 300,000 fewer acres to corn in 1999. Corn prices are projected to rebound slightly in 1999/20. Additional price support is likely to come from a projected strengthening of corn exports through 1999.

Like corn, soybean prices are facing downward pressure due to increased supplies in the major producing countries. Soybean production in the United States, Argentina, and Brazil is estimated to increase by 25 million metric tons from 1996/97 to 1997/98. Iowa soybean prices in 1998/99 are projected $1.94 lower than the 1996 price. Even with lower prices this year, Iowa producers will continue to increase the soybean acreage while maintaining their rotational plans.

#### Livestock Outlook

In the livestock sector, world demand has been pressured by disease problems in areas of the EU and in Taiwan during recent years. This has lowered consumer confidence. Even with that, and the underlying shift in consumption from beef and pork to chicken, the United States continues to gain ground in the export markets.

It appeared that the U.S. cattle industry was poised for recovery as inventory numbers continue to drop in the reduction phase of the cattle cycle. However, dampened demand from the Asian market, coupled with the large sell-off of the southern cattle herd due to weather conditions this summer, aggravated the supply problem. U.S. cattle inventories are projected to continue to decline while Iowa cattle producers are projected to cut inventory slightly. This tightening of supplies leads to a projected price recovery of 10 percent during 1999.

Iowa hog numbers are projected to maintain current levels into 1999, with a slight recovery in price. The foot-and-mouth disease (FMD) problem in Taiwan, which had supplied Japan with 90 percent of its fresh and chilled pork, has created export opportunities for other countries. As a large supplier of frozen pork bellies,
Denmark is well situated to gain exports to Japan. In addition, this could open some foreign markets for the United States.

**Farm Income Outlook**

Iowa cash receipts from crops are projected 7 percent lower this year due to the lower prices. Cash Receipts from livestock are projected to be down 13 percent before recovering in 1999. As shown in the Figure 3, Iowa net farm income is projected to drop 36 percent in 1998 compared to 1997, and another 18 percent in 1999. This is a return to more normal levels of income and will cause some belt tightening for those in and close to the agricultural community.

New legislation passed by Congress as an emergency agriculture relief package will provide an additional $6 billion to U.S. farmers, in the form of an additional transition payment and disaster relief. Preliminary indications suggest Iowa will receive roughly $350 to $370 million from this appropriation. This will give net farm income a substantial boost. Depending on timing of this additional payment, net farm income for 1998 or 1999 will then be well above the 5-year average for the first half of the decade. The additional payment will be a welcome relief in the face of current prices producers are experiencing. However, a worldwide production adjustment and demand recovery is necessary to provide a sustained price increase.

**Impacts of Chinese Swine Feeding Practices on Future Chinese Feed Grain and Livestock Trade**

China’s rapid economic growth and gradual transition toward a market economy have brought about significant changes in its food consumption patterns and trade behavior. Chinese consumers, especially those in urban areas, are shifting their food consumption from grains to meats. As rapid economic growth continues in the future, consumption of meat dairy products, alcohol, and fish will increase in China.

The ongoing transition in food consumption patterns has important implications for international trade and U.S. exports. With only 9 percent of the world’s arable land, efficient use of Chinese agricultural resources favors labor-intensive crops such as vegetables and fruits over feed grains because feed-grain production is labor intensive and land extensive. For these reasons, many analysts of international agricultural markets believe China may become a significant importer of either feed grains or livestock products in the near future.

The magnitude of China’s future feed shortfall depends, in part, on feeding practices and feed efficiency in its major livestock sectors. Pork is a staple meat in Chinese diets, accounting for more than 80 percent of total meat consumption. Swine production is the dominant component of China’s total livestock output, and China is the world’s largest pork producing country, accounting for 52.55 percent of world pork production in 1997. Given the great importance of the swine sector in determining China’s future feed grain demand, this article takes a brief look at swine feeding practices in rural Chinese households. In the process, we expose some general trends related to production scale that have important implications for China’s future feed grain demand and, long term, for U.S. exports.

During the past two decades, the configuration of swine production in China has been changing. Households specializing in pork production and commercial enterprises have historically accounted for only a small percentage of total output. Traditional household or “backyard” producers continue to raise the vast majority of hogs in China. In 1965, backyard producers accounted for 83 percent of total Chinese pork production. With the dissolution of many collective farms and the institution of the Household Responsibility System (HRS) in the early 1980s, backyard production increased to 92.9 percent by 1982. China’s rapid transition toward a more market-oriented economy in the 1980s and 1990s reduced backyard pork production to 80.7 percent by 1995, as an increasing number of households began specializing in pork production. This trend toward specialized and commercial production is likely to continue as China’s agricultural economy continues to modernize.

Traditional pork producers in China have typically exhibited low feeding costs and low net income. “Raising cattle for plowing fields and feeding hogs for fertilizer for crop cultivation” has long been the slogan depicting the motivation for Chinese farmers to keep cattle and hogs. There has been little emphasis on quality and efficiency, and this is reflected in the feeding practices of small household producers.

The quantities and types of feed consumed by Chinese livestock, particularly hogs, are quite different from those consumed by animals for meat output in western countries. Hogs in China frequently consume large amounts of green roughage such as water plants, vegetable leaves, tubers, carrots, pumpkins, and various crop stalks. Based on data from a survey conducted by the University of Arkansas (UOA) and the Research Center for Rural Economy (RCRE) in China’s Ministry of Agriculture, green feeds account for 18.5 percent of total feed consumption in backyard hog operations. Grain by-products, such as bran and hulls, are also frequently used to feed swine. Meal products made from soybeans, peanuts, cottonseed, rapeseed, fish, coconuts, and bone are used as supplemental sources of protein or minerals. Based on the survey data, by-products from restaurants and manufactured food processes, such as alcohol, tofu, and bean and tuber noodle production, averaged between 2 and 6 percent of total feed in backyard production. The types of grain used for swine feed varies by location in China. Frequently, the primary grain and

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**Figure 3. Iowa Net Farm Income**

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<td>1999</td>
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</tr>
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**Source:** FAPRI Bulletin

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grain by-products used for feed are derived from the crops grown and processed on the farm. The survey shows that swine rations on backyard farms contain approximately 36.1 percent purchased concentrate feeds, and in some provinces, such as Jilin, Shandong, and Shaanxi, the share of concentrates in total feed is less than 20 percent.

Estimation of a simple unit feed demand equation for farm-mixed grain feed, using the household survey data, reveals that feed prices are significant determinants of the average household’s feed grain demand. However, this demand is not very responsive to changes in the oilseed meal, formula feed, and grain prices. Disaggregating the data by production level shows that producers desiring only to meet their household pork consumption needs behave differently from those more oriented toward market sales.

The use of farm-mixed grain feeds by households with annual pork production of less than 200 kilograms (kg) is not responsive to most feed prices, primarily because virtually all of their feed grain is provided by household production. On average, these farmers feed only 1.53 kg of grain each day per kilogram of pork, and more than 60 percent of the pig’s diet is composed of by-products and green feeds. The use of feed grain by these households changes very little as the price of purchased formula feed fluctuates, because manufactured feeds are substituted more frequently for green feeds and food by-products in hog rations.

Households producing more than 500 kg of pork each year exhibit more market-orientated production responses to changes in feed prices. The response to oilseed meal and formula feed price movements is more than twice that of the average household in the survey sample. A one-percent increase in the average price of feed grain prompts these producers to reduce their farm-mix grain feed use by 1.26 percent for each kilogram of pork they produce. This response is more than twice as large as for households with lower annual pork output.

Moreover, regional differences play a much smaller role in determining feed grain demand in households producing more than 500 kg annually, because a larger proportion of total feed is purchased from input markets. Finally, the length it takes to raise a hog to slaughter weight has a significant negative impact on feed grain demand. Consequently, as these producers continue to adopt more modern management practices that reduce the time for hogs to reach slaughter weight, their feed grain use per kilogram of pork produced increases.

Traditional households are the primary pork producers in China, and the empirical results discussed above imply that the amount of feed grain these farmers use per kilogram of pork is increasing over time. This fact is important for China’s future feed needs because it suggests that feed grain demand in China will rise more rapidly than meat production in the coming years. Given the potential for considerable growth in Chinese meat consumption, it is likely that Chinese feed imports, and potentially meat imports, will become substantial in the near future. With the strength of U.S. agribusiness in both international pork and feed markets, U.S. producers are apt to benefit from the prosperity of Chinese consumers.

The RCRE feed survey was funded in part by the Center for Agricultural and Rural Development at Iowa State University and the Economic Research Service in the U.S. Department of Agriculture.