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Minnesota AGRICULTURAL ECONOMIST



NO. 557

JULY 1974

The Market For Feed Grains In East Asia -Japan, South Korea, And Taiwan

by Martin E. Abel and Mary E. Ryan*

Introduction

"MINNESOTA'S Agricultural Exports" in the October 1973 *Minnesota Agricultural Economist* pointed out that East Asian countries—principally Japan, Korea¹, and Taiwan—are large and rapidly growing markets for Minnesota farm products. Among the agricultural products Minnesota and the United States export to East Asia, feed grains rank second. (Soybeans and soybean products are first.)

Japan imports more U. S. agricultural products than any other country. Furthermore, between 1964 and 1972, Minnesota's agricultural exports to Japan grew 8 percent per year. The growth rate in 1973 was even greater.

Korea and Taiwan together represent a smaller market than Japan for Minnesota's farm products. However, these two countries are among the world's fastest growing market areas. Between 1964 and 1972, Minnesota exports to Korea and Taiwan increased over 10 percent per year.

This article describes the changes in feed grain imports by Japan, Korea, and Taiwan. It explains the major forces which appear to account for changing import levels. Statistical models have been developed to explain each country's changes in feed grain imports. These models

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¹Republic of Korea, commonly called South Korea.



Feed grains produced by Minnesota farmers (above) are finding a ready market in East Asia. The freighter (below) has brought Japanese cars to New Orleans and is now being loaded with feed grains destined for Japan.

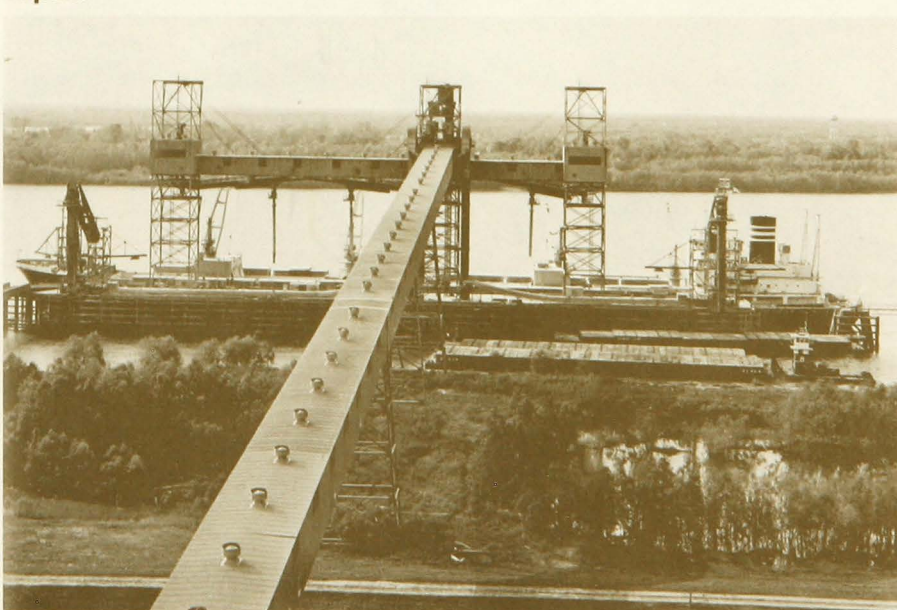


Table 1. Populations, income levels, and growth rates of Japan, Korea, and Taiwan compared to the United States.

| | Population | | Per capita Gross National Product | |
|-------------|---------------------|----------------------------------|--------------------------------------|----------------------------------|
| | 1970 in millions | 1960-70 annual growth rate | 1970 in U.S. dollars | 1960-70 annual growth rate |
| U.S. | 204.8 | 1.2 | 4,760 | 3.2 |
| Japan | 103.4 | 1.0 | 1,920 | 9.6 |
| South Korea | 31.8 | 2.6 | 250 | 6.8 |
| Taiwan | 14.0 | 2.9 | 390 | 7.1 |

consider each country's policy changes which affect its import levels. Only the results are presented here. Descriptions of the models are available from the senior author.

Forces influencing feed grain imports

Japan, Korea, and Taiwan's surging demand for U.S. feed grains reflects their consumers' desires to eat more meat and livestock products. Likewise, it reflects the willingness of these governments to help satisfy such desires. Governments in all three countries are encouraging livestock industries to expand and modernize to provide consumers with more meat, milk, and eggs. But none of these countries can produce enough feed grains to supply its growing livestock industry. Hence, feed grains must be imported.

Principal reasons for the swelling demand for livestock products are growing populations and rising incomes. The table above gives the populations, income levels, and growth rates for Japan, Korea, and Taiwan compared to the United States. Populations are increasing especially fast in Korea and Taiwan. More mouths to feed mean more demand for food *IF* consumers have enough purchasing power. And these East Asians do. Per capita incomes—as indicated by gross national product—are rising. Although income levels are low compared to the U.S., income growth rates are high.

When incomes of low income consumers rise, consumers seek to improve the quality of their diets. One way they do this is by eating more meat and other livestock products. Currently, consumers in these countries eat much less meat than do Americans. In the early 1970's, annual per capita consumption of beef, pork, and poultry was: 227 pounds in the U.S.; 37 pounds in Japan; 65 pounds in Taiwan; and 11 pounds in Korea.

These data suggest that demand for meat in Japan, Taiwan, and Korea is far from saturated. But because those countries' consumers eat considerably more fish per capita than do American consumers, these figures are not a measure of total protein consumption. Fish consumption is especially important in Japan where 17.9 percent of total protein intake in 1965

was from fish. Other animal sources provided 13.8 percent of total protein, and the remainder came from soybeans, grains, and vegetables.

Composition of these countries' livestock populations is a further stimulus to demand for feed grains. As indicated in table 2, pork and chicken production predominate. Production of these meats relies more on corn or other grains than does the production of beef. Cattle can feed on grass and on fodder crops as well as on grain.

In the research reported here, measures were employed to account for: (1) the influence of government policies to provide more meat and; (2) rising incomes.

Japan

Japan's total feed grain imports and chief grain components—corn, sorghum, and barley—are shown in figure 1. There has been especially rapid growth in feed grain imports since 1960—increasing from 1.4 million tons that year to 10.7 million tons in 1972. Thirteen million tons are estimated for 1973. Corn and sorghums account for most of the growth in Japan's feed grain imports.

Expansion of feed grain imports has been encouraged by Japanese government policies, especially since 1961. One of Japan's priority goals is to develop and expand livestock production. This policy recognizes the need to rely heavily upon imports to meet the enlarged demand for feed.

Feed corn was imported under liberal policies throughout the study period, while sorghum was subject

Table 2. Relative importance of beef, pork, and chicken meat production.

| | Japan (1970) | Korea (1970) percent | Taiwan (1969) |
|---------|--------------|-------------------------|---------------|
| Beef | 19 | 24 | neg. |
| Pork | 46 | 48 | 88 |
| Chicken | 35 | 28 | 12 |
| | 100 | 100 | 100 |

to quantitative import quotas before 1964. Now sorghum and corn are treated alike. Barley, wheat, and rice imports are more controlled. Those three commodities are imported solely by the government.

Most of Japan's feed grain imports come from the United States—nearly three-fourths in 1973. This was an unusually large share; in other recent years, the U.S. share ranged from about one-half to two-thirds. Thailand and South Africa are other major suppliers of corn, and Australia and Argentina compete with the U.S. in sorghum exports to Japan.

Estimated and actual corn and total feed grain imports are shown in figure 1. This is done for the years since 1960. Dashed lines indicate estimated total feed grains and corn and solid lines actual total feeds and corn. The two are identical for 1960 and 1961. This is because feed grain imports those years consisted almost entirely of corn. The statistical estimations correspond closely enough to actual imports to indicate that the models can be used to predict import levels a year or so in advance.

Two factors explain most of the growth of Japan's total feed grain imports. These are total real national income and the quantity of rice fed to livestock. Rapid growth in income has resulted in sharp increases in Japan's demand for livestock and livestock products. Because of very high price supports for rice, Japan accumulated large rice surpluses by 1970. To reduce rice stocks, Japan altered its rice policies. Large quantities of rice were diverted to feed uses. Feeding rice to livestock was especially prevalent in 1971 and 1972. This explains most of the 1971 drop in feed grains imports and the modest growth in 1972 imports. By 1973, rice stocks were drawn down, reducing the need to utilize rice as a livestock feed. Feed grain imports then returned to their historical rates of growth—imports of 13 million tons in 1973 compared with 10.7 million tons in 1972. Unless Japan has a reemergence of large rice stocks, rice should not significantly influence futures levels of feed grain imports.

For total feed grains, import levels were insensitive to price

changes.* However, imports of some individual feed grains—primarily corn—were responsive to price.

Because Japan depends almost exclusively on external feed grain sources, domestic production was not considered in the estimates of import demand.

Korea

Korea's feed grain imports are shown in figure 2. As in figure 1, dashed lines represent estimated total feed grain imports and corn. The United States is Korea's main source of feed grains. The U.S. has supplied virtually all the corn South Korea has imported in recent years. Korean barley imports are primarily from the U.S. and Australia; in 1972, each country furnished slightly more than 40 percent of Korea's barley import needs.

The major factors explaining Korea's feed grain imports are total real income, government policies, and barley production. Barley is both a food and feed grain in Korea.

As with Japan, Korea's rapid growth of total real income is a major factor in the growth of Korea's feed grain imports. Rapidly growing incomes in Korea have increased the demand for livestock and livestock products. To meet the corresponding demand for feed grains, imports are required.

Related to the growing demand for feed grains is an important policy change. Government policy played a key role in determining imports of feed grains—especially corn—during the study period. In 1968, the Korean government expanded commercial livestock and poultry industries. These efforts became effective in 1969. The United States extended loans for feed mills and other needed facilities. This new policy resulted in the sharp rise in feed grain imports after 1969 as shown in figure 2.

*There was relatively little variation in feed grain prices during the study period (1960-1972) compared to the large change experienced between 1972 and 1973. Because the statistical results are based on a period with little price change, it is possible imports would be dampened by the recent substantial price increases.

Figure 1. Japan: Imports of corn, sorghum, barley, and total feed grains, 1960—1972.

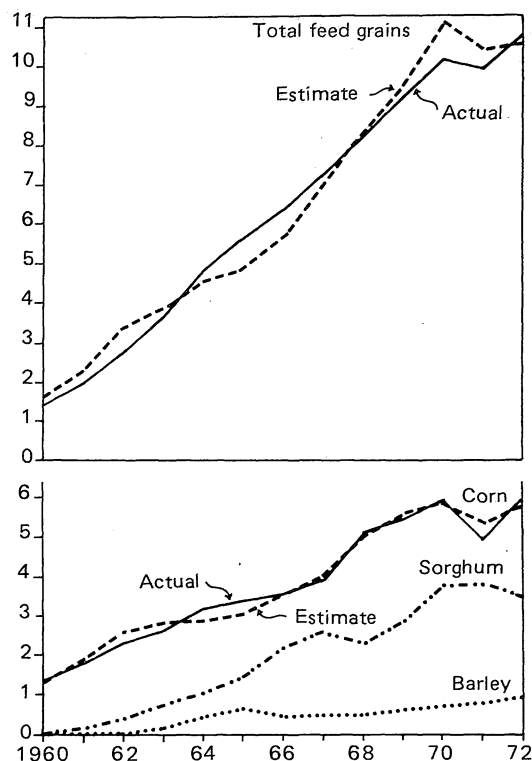
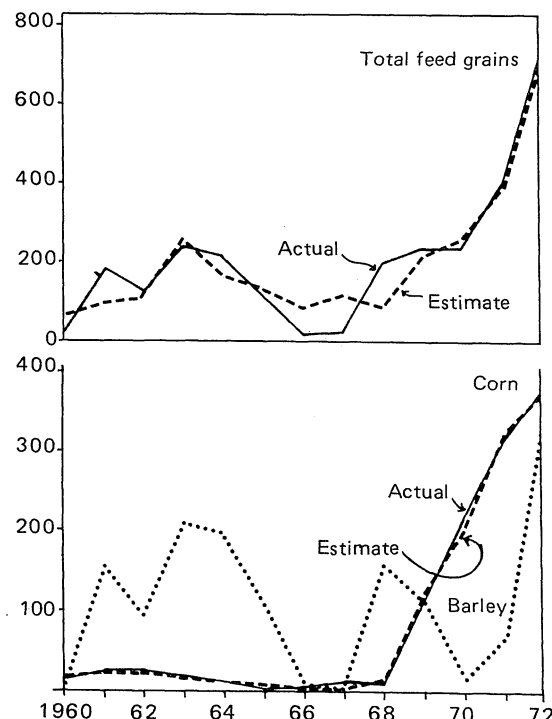


Figure 2. Korea: Imports of corn and barley and total feed grains, 1960—1972.



Finally, while barley is predominantly a food grain in Korea, it is also used for feed. The quantity of barley produced domestically affects total feed grain imports. Corn imports, however, do not appear to compete with domestic barley production.

Imports of both total feed grains and individual grain components were not significantly affected by variations in import prices; income and policy factors seemed to completely dominate Korea's feed grain imports.

Taiwan

The growth pattern in Taiwan's feed grain imports and factors influencing this growth are similar to those for Japan and Korea. Data on imports are presented in figure 3.

Growth in feed grain imports has been especially rapid since 1966. As with Japan and Korea, total real income was the dominant factor and for the same reasons.

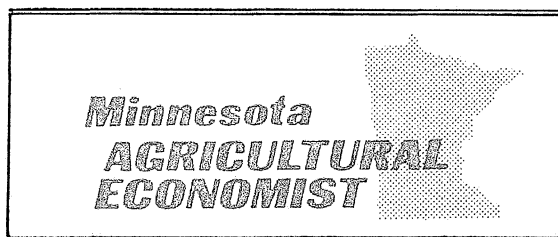
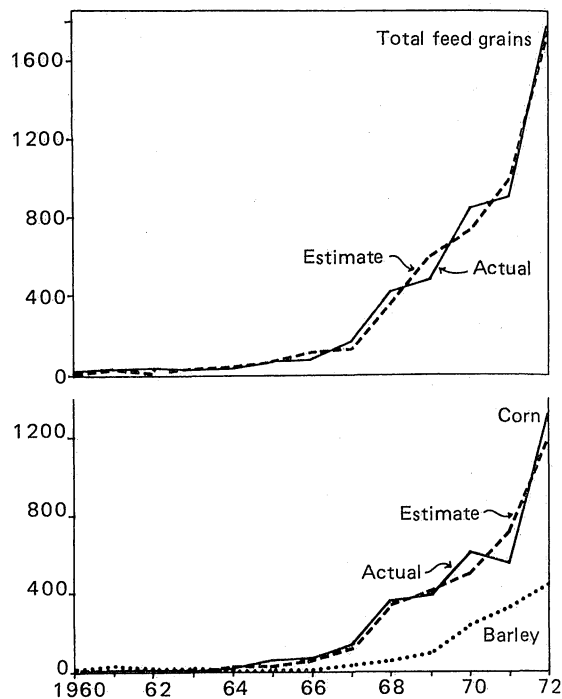
But in addition, imports of total and individual feed grains were modestly influenced by price changes.

Policy was also important. In September 1967, the protective tariff on corn was removed, permitting corn to be imported duty free. Since then, domestic production fell, and imports rose. Removal of this tariff was accounted for in the statistical analysis.

Conclusion

U.S. exports of feed grains to Japan, Korea, and Taiwan are large and rapidly growing. This growth has been based on rapid growth in consumer incomes in these countries together with national policies designed to upgrade the quality of diets through expanded consumption of livestock products. However, forces which would slow the rate of economic growth in these nations—such as the current energy situation—would reduce the growth rates of feed grain imports.

Figure 3. Taiwan: Imports of corn and barley and total feed grains, 1960—1972.



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Cooperative Agricultural Extension Work
Acts of May 8 and June 30, 1914

OFFICIAL BUSINESS

Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Roland H. Abraham, Director of Agricultural Extension Service, University of Minnesota, St. Paul, Minnesota 55101.
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Prepared by the Agricultural Extension Service and the Department of Agricultural and Applied Economics. Views expressed herein are those of the authors, but not necessarily those of the sponsoring institutions. Address comments or suggestions to Associate Professor John J. Waelti, Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, Minnesota 55101.

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