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# A Grain, Oilseeds, and Livestock Model of Japan

Karen Liu

United States
Department of
Agriculture

Economic
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## ABSTRACT

This report presents a grain, oilseeds, and livestock model of Japan (JPGOL). It describes the background, product coverage, and model structure of JPGOL. A computer-generated listing of the model is provided. The model includes equations for food demand, feed demand, crop and livestock supplies, stocks, trade, and supply and demand prices. The model takes into account cross-commodity effects on both the demand and supply sides of Japan's grain, oilseeds, and livestock complex. The report also discusses the policy analysis capabilities of the model and presents some results of model simulation.

Keywords: Grain, oilseeds, livestock, Japan, JPGOL model, supply, demand, trade, price.

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CONTENTS



## SUMMARY


Japan has relied heavily upon foreign suppliers, primarily the United States, to meet its expanding demand for food and raw materials. This is evidenced by Japan's increasing imports of feed grains and oilseeds, as well as livestock products, during the eighties. Because of Japan's importance in world agricultural trade and in U.S. trade, the trends and policies for Japan's agricultural commodities are a major concern of the world's major agricultural exporters. A grain, oilseeds, and livestock model of Japan (JPGOL) has been developed to evaluate the trends in Japan's grain, oilseeds, and livestock economy and to project alternative futures under different economic and policy assumptions.

The JPGOL model is an annual simulation model with 19 agricultural commodities. These commodities contributed more than 55 percent of Japan's gross farm income in 1981 and accounted for 51 percent of the value of Japan's agricultural imports in 1982. The model simulates production, consumption, stock changes, trade, and prices of Japan's grains, oilseeds, and livestock products. The overall structure of the JPGOL is primarily patterned after a version of a detailed standard GOL (grain, oilseeds, and livestock) country model for the United States with modifications to conform to Japan's agriculture. The model consists of eight major equation groups: (1) supply of crops, (2) supply of livestock products, (3) food and nonfeed demand, (4) derived feed demand for grains and meals, (5) stock demand, (6) trade quantity, (7) marketing margins, and (8) price linkage relations. The functional form for most model equations is nonlinear with constant elasticities over all price ranges.

The model explicitly takes into account the cross-price effects among commodities on both the demand and supply sides. The model is designed as a tool to analyze alternative trade policies such as tariff and nontariff trade restrictions. The model can be simulated as a stand-alone country model, or as a component of the U.S. Department of Agriculture's world grain, oilseeds, and livestock (GOL) agricultural trade model.

# A Grain, Oilseeds, and Livestock Model of Japan

Karen Liu

## INTRODUCTION

Japan is a major agricultural importing nation, with its imports accounting for about 6.9 percent of world agricultural trade in 1982 (table 1). Because of its limited land resources suitable for agriculture, Japan has had to rely on foreign suppliers, primarily the United States, to meet its expanding demand for food and raw materials. Japan's reliance on foreign supplies of agricultural products has increased as per capita income has continued to grow, the role of livestock products in the Japanese diet has increased, and the domestic production of several major agricultural commodities has declined. This is especially applicable to rising imports of feed grains and oilseeds as Japan's livestock industry continues to expand.

The growth of Japan's livestock economy and the resulting increase in feed grain and oilseed demand have important effects on world markets. The trends and policies in Japan's agricultural commodities have become one of the main concerns of the world's major agricultural exporters. In order to evaluate the trends in Japan's grain, oilseeds, and livestock economy and to project its future under alternative policy options, a grain, oilseeds, and livestock model of Japan (JPGOL) was developed.

This report documents the model. A review of the trends in food consumption and supply in Japan is followed by an overview of the Japanese grain, oilseeds, and livestock sectors in terms of production and demand trends, and trade patterns for the various commodities included in the model. The specification of the model is presented, followed by selected simulation results.

## TRENDS IN FOOD CONSUMPTION AND SUPPLY IN JAPAN

A major reduction in rice consumption and an increase in livestock product consumption have been the principal changes in Japan's food consumption during the last two decades. While rice is still the main staple food, accounting for 30 percent of daily per capita caloric intake in 1980, food consumption has been shifting towards fruits, vegetables, and red meat. Fish is widely consumed. Total daily per capita caloric intake for Japan was 2,300 in 1960, 2,471 in 1970, and 2,512 in 1980 (table 2). Rice accounted for 47 percent, 37 percent, and 30 percent of caloric intake for those years, respectively. The proportion of calories coming from livestock products was 8 percent, 19 percent, and 26 percent, respectively. Per capita caloric intake will remain at an estimated level of 2,500 calories per day but the trend toward reduced

Table 1--World and Japan agricultural trade for GOL commodities, 1982

| Commodity | World agricultural trade, imports | Japan agricultural trade, imports | Japan trade as a percentage of total world trade | World agricultural trade by commodity as a percentage of total world agricultural trade | Japan agricultural trade by commodity as a percentage of total Japan agricultural trade |
|---|---|---|---|---|---|
| | Million dollars | | Percent | | |
| Beef & veal | 8319 | 391 | 4.7 | 3.5 | 2.4 |
| Pork | 3384 | 541 | 16.0 | 1.4 | 3.3 |
| Mutton & lamb | 1785 | 154 | 8.6 | .7 | .9 |
| Poultry--meat | 2420 | 163 | 6.7 | 1.0 | 1.0 |
| Poultry--eggs | 916 | 1 | .1 | .4 | -- |
| Wheat | 21191 | 1117 | 5.3 | 9.0 | 6.9 |
| Corn | 10481 | 1830 | 17.5 | 4.5 | 11.3 |
| Other coarse grains | 3783 | 223 | 5.9 | 1.6 | 1.4 |
| Rice | 4418 | 29 | .7 | 1.9 | .2 |
| Soybeans | 7306 | 1147 | 15.7 | 3.1 | 7.1 |
| Other oilseeds | 2566 | 482 | 18.8 | 1.1 | 3.0 |
| Soymeal | 5119 | 22 | .4 | 2.2 | .1 |
| Soyoil | 2057 | 18 | .9 | .9 | .1 |
| Other meals | 1002 | 4.1 | .4 | .4 | -- |
| Other oils | 4775 | 136.2 | 2.9 | 2.0 | .8 |
| Dairy--butter | 3581 | 14 | .4 | 1.5 | .1 |
| Dairy--cheese | 4147 | 148 | 3.6 | 1.8 | .9 |
| Dairy--other | 4619 | 111.4 | 2.4 | 2.0 | .7 |
| Total GOL commodities | 91869 | 6531.7 | 7.1 | 39.0 | 40.2 |
| Other agricultural Commodities | 143530 | 9703.3 | 6.8 | 61.0 | 59.8 |
| Total agricultural trade | 235399 | 16235 | 6.9 | 100.0 | 100.0 |

-- = The value less than .1.

Source: FAO Trade Yearbook (1982 issue).

Table 2--Japanese caloric intake per person per day

| Commodity | 1960 | 1965 | 1970 | 1975 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|
| | | | | Calories | | | |
| Total | 2300.0 | 2424.2 | 2471.2 | 2467.2 | 2512.1 | 2520.4 | 2591.2 |
| Cereals | 1403.1 | 1325.5 | 1237.7 | 1174.5 | 1100.7 | 1083.1 | 1093.3 |
| Rice | 1071.2 | 1023.8 | 914.3 | 844.4 | 759.0 | 748.2 | 745.5 |
| Wheat | 243.4 | 262.0 | 298.5 | 305.3 | 313.6 | 309.1 | 321.0 |
| Barley | 36.3 | 18.1 | 6.7 | 9.0 | 4.8 | 3.4 | 3.6 |
| Sweet corn | 12.2 | 6.4 | 10.4 | 10.0 | 16.4 | 15.5 | 16.4 |
| Potatoes and sweet potatoes | 90.5 | 32.9 | 38.8 | 38.7 | 41.0 | 41.6 | 43.4 |
| Starches | 62.4 | 72.6 | 75.7 | 69.5 | 106.5 | 116.8 | 119.3 |
| Pulses | 108.0 | 99.2 | 103.4 | 99.1 | 90.3 | 89.7 | 99.4 |
| Soybeans | | | | 61.8 | 56.6 | 56.9 | 65.8 |
| Others | | | | 37.3 | 33.7 | 32.8 | 33.6 |
| Vegetables | 69.5 | 113.4 | 93.3 | 86.6 | 92.3 | 91.9 | 78.6 |
| Fruits | 29.9 | 40.4 | 52.3 | 58.0 | 54.0 | 53.4 | 54.0 |
| Meat | 19.3 | 56.3 | 78.0 | 102.9 | 143.6 | 144.0 | 143.0 |
| Beef | 4.3 | 6.1 | 11.6 | 14.2 | 20.1 | 20.8 | 26.5 |
| Pork | 4.6 | 24.0 | 44.4 | 61.3 | 91.4 | 90.5 | 69.4 |
| Chicken | | 6.1 | 12.9 | 17.9 | 26.2 | 26.8 | 39.7 |
| Whale | | | | 3.3 | 1.3 | 1.2 | 1.2 |
| Eggs | 20.2 | 37.8 | 63.1 | 59.8 | 62.5 | 63.0 | 64.7 |
| Cow milk and milk products | 41.4 | 59.2 | 80.9 | 86.0 | 100.5 | 104.8 | 108.5 |
| Marketed for fluid milk | | | | 45.5 | 54.9 | 56.2 | 58.2 |
| Marketed for milk products | | | | 39.4 | 44.9 | 47.9 | 49.6 |
| Fish and shellfish | 76.6 | 82.1 | 92.2 | 99.3 | 102.9 | 103.8 | 127.6 |
| Fresh, chilled, or frozen | | | | 38.4 | 40.6 | 40.8 | 48.1 |
| Salted, dried, or smoked in airtight containers | | | | 58.9 | 58.6 | 59.0 | 74.0 |
| Sugar | 161.5 | 193.5 | 281.6 | 274.3 | 242.9 | 234.8 | 235.3 |
| Fats and oils | 106.4 | 167.6 | 228.7 | 276.6 | 336.4 | 355.6 | 376.7 |
| Vegetable oils and fats | | | 175.4 | 222.5 | 272.7 | 293.6 | 315.1 |
| Animal oils and fats | | | 53.3 | 54.1 | 63.7 | 62.0 | 61.6 |
| "Miso" bean paste | 39.8 | | | 13.6 | 26.1 | 25.8 | 30.5 |
| Soy | | | | 13.6 | 12.4 | 12.1 | 16.8 |

Source: The Statistical Yearbook of the Ministry of Agriculture, Forestry, and Fisheries of Japan; various issues.

rice consumption and increased livestock product consumption will continue. Due to the rising demand for livestock products, Japan's livestock industry has emerged as a very important and growing sector of agriculture. Japan's livestock industry depends heavily on imported feed.

Because agricultural land suitable for growing crops and grazing is severely limited, Japan has had to rely on foreign suppliers, primarily the United States, to meet its expanding demand for food and raw materials. Imports of feed grains, soybeans, meat, and meat products have greatly increased since 1960 (table 3).

Although Japan has relied heavily upon the world market for food and raw materials, it still strives to maintain as much self-sufficiency in food as possible (table 4). 1/ Japan was about 72 percent self-sufficient in all foods in 1979. This included more than 100 percent in rice; more than 90 percent in vegetables and eggs; more than 80 percent in dairy, meat, and fruit; 28 percent in feed; and less than 10 percent in wheat and soybeans (3). 2/ Japan's self-sufficiency in all foods fell from 90 percent in 1960 to 78 percent in 1970 and 72 percent in 1979.

## THE GRAIN, OILSEEDS, AND LIVESTOCK SECTORS OF JAPAN'S AGRICULTURE

Production, consumption, and trade of the various grain, oilseed, and livestock commodities are reviewed briefly here. 3/

### Crop Sector

Rice is the most important crop for Japanese agriculture. In 1979, 57 percent of Japan's farmers gained at least three-fifths of their cash receipts from rice. 4/ In 1981 rice accounted for 32 percent of farm output. Since 1966 rice production has tended to exceed food consumption. As a consequence, the percentage of food use in total domestic rice disappearance has declined (96.8 percent in 1955, 90.5 percent in 1970, 82.4 percent in 1980). The percentage of industrial use of rice has consistently increased, from 3.3 percent in 1955, to 5.9 percent in 1970, and 6.3 percent in 1980. Feed use of rice was negligible until 1969. However, due to a government program to dispose of surplus stocks, feed use increased sharply in 1969-73 and 1980-84. The importance of rice in Japanese agriculture has declined in recent years. The production of rice has fallen in absolute terms and in relation to that of fruits, vegetables, and livestock (table 5).

Wheat consumption in Japan has risen substantially since the end of World War II. Per capita consumption has increased about 22 percent since 1955. Per capita consumption was 44.5 kilograms (kg) in 1960, 50.0 kg in 1975, and 51.8 kg in 1980. This reflects a decline in per capita rice consumption during the same period.

Consumption of wheat increased, but production declined. Although wheat yields rose steadily over the past two decades, the wheat area fell by

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1/ Self-sufficiency is defined by the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) as the ratio of domestic production to total domestic utilization.

2/ Numerals in parentheses refer to items in references.

3/ For additional information about Japan's rice and feed-livestock economy, see (1 and 2).

4/ Calculated from MAFF, Statistical Yearbook, 1979/80, pp. 16-17.

Table 3--Japan's agricultural imports

| Commodity | 1960 | 1965 | 1970 | 1975 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|---|---|
| | | | | 1000 metric tons | | | | |
| Meat | 38.1 | 105.2 | 227.3 | 420 | 523 | 642 | 594 | 630 |
| Beef & veal | 5.8 | 10.8 | 23 | 45 | 122 | 122 | 122 | 137 |
| Pork | 5.9 | .1 | 17 | 125 | 108 | 184 | 141 | 166 |
| Mutton & lamb | 18 | 54 | 111 | 131 | 79 | 88 | 85 | 82 |
| Poultry--meat | .05 | 6 | 11 | 22 | 72 | 101 | 105 | 104 |
| Poultry--eggs | | .2 | .3 | .3 | .4 | .4 | .4 | .4 |
| Total cereals | 4362 | 10262 | 15578 | 18848 | 24473 | 24420 | 24366 | 25296 |
| Wheat | 2754 | 3653 | 4685 | 5654 | 5682 | 5633 | 5713 | 5816 |
| Corn | 1354 | 3434 | 6018 | 7470 | 12830 | 13590 | 13571 | 14701 |
| Other coarse grains | | 695 | 976 | 1792 | 1611 | 1700 | 1444 | 1684 |
| Rice | 175 | 967 | 19 | 36 | 14 | 75 | 66 | 14 |
| Soybeans | 1128 | 1847 | 3243 | 3334 | 4401 | 4197 | 4344 | 4995 |
| Soymeal | .8 | 46 | 72 | 17 | 326 | 214 | 87 | 234 |
| Soyoil | .5 | .5 | 4 | 14 | | 29 | 38 | 7 |
| Dairy--butter | 1 | .7 | 1 | 2 | 1.9 | 1 | 5.4 | 1.7 |
| Dairy--cheese | 1 | 10 | 34 | 49 | 75 | 71 | 74 | 72 |
| Dairy--other | 44 | 70 | 68 | 44 | 111 | 93 | 104 | 103 |

Source: FAO Trade Yearbook (various issues).

Table 4--Japan's self-sufficiency ratios 1/

| Commodity | 1960 | 1965 | 1970 | 1975 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|
| | | | | Percent | | | |
| Cereals | | | 47.8 | 43.4 | 29.1 | 30.5 | 31.2 |
| Rice | 103.7 | | 106.2 | 110.4 | 87.0 | 92.2 | 93.5 |
| Wheat | 38.6 | 27.8 | 9.1 | 4.3 | 9.6 | 9.7 | 12.3 |
| Barley | 103.5 | 64.6 | 28.4 | 8.1 | 13.3 | 13.2 | 14.1 |
| Potatoes and sweet potatoes | | | 100.1 | 99.4 | 95.7 | 96.o | 96.4 |
| Starches | 89.6 | 95.5 | 96.6 | | 94.0 | 90.2 | 97.1 |
| Pulses | | | 12.2 | 9.0 | 6.6 | 7.4 | 8.6 |
| Soybeans | | | | | 4.0 | 4.8 | 5.0 |
| Others | | | | 42.9 | 28.7 | 30.2 | 42.2 |
| Vegetables | 100.1 | 99.9 | 99.5 | 95.8 | 97.2 | 96.6 | 97.6 |
| Fruits | 100.0 | 92.7 | 85.0 | 83.7 | 80.7 | 76.4 | 79.1 |
| Meat | | | 88.8 | 76.1 | 80.3 | 93.3 | 79.7 |
| Beef | 95.9 | 94.5 | 88.9 | 80.3 | 72.2 | 76.0 | 70.9 |
| Pork | 96.2 | 100.0 | 97.6 | 84.2 | 86.9 | 85.8 | 86.6 |
| Chicken | 100.0 | 96.2 | 97.7 | 96.8 | 93.8 | 92.0 | 92.2 |
| Whale | | 107.4 | | 72.4 | 43.2 | 51.3 | 50.0 |
| Eggs | 101.3 | 99.8 | 97.4 | 97.0 | 97.6 | 97.5 | 98.1 |
| Cow milk and milk products | 76.4 | | 89.4 | 81.8 | 86.0 | 83.5 | 84.8 |
| Marketed for milk products | | | | 60.5 | 68.6 | 63.8 | 66.7 |
| Fish and shellfish | 107.8 | 100.4 | 101.9 | 99.2 | 97.1 | 93.0 | 95.2 |
| Fats and oils | 85.2 | 85.5 | 81.9 | 78.6 | 86.9 | 88.6 | 87.6 |
| Vegetable oils and fats | | | | 81.8 | 84.4 | 84.3 | 82.1 |
| Animal oils and fats | | | | 68.8 | 94.0 | 102.3 | 106.2 |

1/ Self-sufficiency ratio is defined as the ratio of domestic production to total domestic utilization.

Source: Calculated from the Statistical Yearbook of the Ministry of Agriculture, Forestry, and Fisheries of Japan; various issues.

Table 5--Agricultural production index

| Commodity | 1960 | 1965 | 1975 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|
| | | | 1970 = 100 | | | |
| Agriculture (total) | 79.5 | 89.0 | 105.6 | 104.2 | 105.9 | 108.0 |
| Crops (total) | 97.3 | 96.3 | 104.4 | 92.6 | 95.3 | 97.0 |
| Rice | 100.9 | 97.7 | 103.5 | 78.1 | 82.7 | 82.3 |
| Wheat & barley | 333.0 | 230.4 | 47.9 | 101.4 | 100.9 | 119.4 |
| Coarse grains | 699.7 | 286.5 | 64.9 | 66.0 | 66.1 | 72.6 |
| Pulses | 176.3 | 121.7 | 82.4 | 87.2 | 87.1 | 95.2 |
| Potatoes | 149.7 | 138.7 | 82.4 | 87.2 | 87.1 | 95.2 |
| Green vegetables | 72.7 | 84.1 | 103.4 | 109.9 | 111.9 | 112.9 |
| Fruits | 56.6 | 69.3 | 122.9 | 121.2 | 114.5 | 123.9 |
| Industrial crops | 90.6 | 113.4 | 103.4 | 102.8 | 100.7 | 102.7 |
| Others | 130.4 | 109.3 | 74.5 | 52.0 | 59.9 | 57.7 |
| Sericulture (total) | 98.9 | 94.2 | 81.7 | 65.6 | 58.3 | 57.0 |
| Livestock (total) | 36.4 | 68.0 | 100.7 | 126.3 | 125.1 | 129.0 |
| Dairy cattle | | | 106.3 | 123.2 | 121.1 | 118.5 |
| Beef cattle | | | 121.4 | 130.5 | 135.7 | 142.6 |
| Swine | | | 120.2 | 168.8 | 157.8 | 162.7 |
| Layers | | | 90.2 | 93.7 | 99.9 | 103.4 |
| Broilers | | | 138.9 | 192.3 | 191.3 | 198.2 |
| Hen eggs | | | 102.1 | 113.9 | 113.8 | 117.0 |
| Cow milk | | | 104.6 | 136.6 | 138.9 | 142.2 |

Source: The Statistical Yearbook of the Ministry of Agriculture, Forestry, and Fisheries of Japan; various issues.

68.3 percent. As the gap between consumption and production widened, the quantity of wheat imported by Japan increased.

Japan is an important wheat customer for major wheat exporters such as the United States, Canada, and Australia. Wheat exports to Japan accounted for 8.1 percent of total U.S. wheat exports, 8.2 percent of Canadian wheat exports, and 10.0 percent of Australian wheat exports in 1980.

Feed grain demand in Japan has been closely associated with the expansion of the Japanese livestock industry. Total feed grain consumption has increased six times from 1960 to 1980, with the largest increases being in corn and grain sorghum. While the demand for feed grains has grown at a rapid rate, the quantity of feed grains produced in Japan has declined.

The United States is the leading exporter of feed grains to Japan. The United States supplied 68 percent of the corn imported by Japan in 1970, 82 percent in 1975, and 97 percent in 1984. The U.S. share of Japanese sorghum imports rose from 60 percent in 1970 to 87 percent in 1981, but dropped to 22 percent in 1983 and 42 percent in 1984.

Japan has also depended on foreign suppliers to meet domestic soybean demand. An insignificant amount of soybeans is produced in Japan. In 1982, only about 4 percent of total demand was met by domestic production, while 83 percent was met by imports. The United States traditionally has been the major supplier of soybeans to Japan. In 1980, 18 percent of all U.S. soybean exports went to Japan.

Demand for soybeans in Japan increased significantly, from 2.0 million metric tons (MMT) in 1965, to 3.3 MMT in 1970, 3.4 MMT in 1975, and 4.4 MMT in 1980. Direct food consumption has been an important use of soybeans in Japan, though food use has fallen in recent years. Human consumption of soybeans accounted for 26 percent of total domestic use in 1965, and 18 percent of total domestic use in 1980. Crushing demand has consistently increased in response to rising demand for protein meal as livestock feed.

Japanese imports of soymeal and soyoil products have been relatively small. Japan has a large and efficient crushing industry. Tariff on soyoil is 20 to 28 yen per kilogram, about $100.00 per ton, or 14 percent of current price. General tariff on meal is 5 percent, but is temporarily fixed at zero. Other meals enter freely. There are no import restrictions on soybeans.

Livestock Sector

Over the past 20 years, Japan has experienced a rapid expansion of operations in all segments of livestock production. The average number of animals per farm in 1960 was 2 head for dairy, 1.2 for beef, 2.4 for hogs, and 12 for chickens. The average number of animals per farm in 1970 was 5.9 head for dairy, 2 for beef, 14.3 for hogs, 70 for hens, and 3,049 for broilers. In 1984, the average livestock inventory per farm specializing in that animal increased to 24.1 head for dairy, 8.2 for beef, 113.9 for hogs, 952 for hens, and 19,500 for broilers. The increase in the average size of operation was particularly remarkable for poultry and hog enterprises, while expansion in the size of beef operations occurred at a more moderate pace.

Japanese pork production has been growing at an annual rate of 10 percent. Hog enterprises are increasing in size, and are becoming more specialized.

Almost all chicken production in Japan takes place in relatively efficient capital-intensive broiler facilities. Poultry meat production has expanded rapidly, increasing from 204,000 metric tons (MT) in 1960 to 1,145,000 MT in 1980.

Because of the heavy reliance on imported feeds, the cost of producing livestock in Japan is high compared with other countries. The production cost of pork in Japan is about 1.4 times that of pork produced in the United States. The production cost of beef in 1980 was three times the production cost of beef in the United States. Because of the high cost of production, the Japanese livestock industry, especially the beef sector, relies upon trade restrictions, subsidies, and high producer prices for its economic survival.

Meat consumption in Japan has been increasing during the last two decades; however, it is still low compared with per capita meat consumption in other developed countries. The growth of per capita disposable income and increased urbanization are among the important factors responsible for the increase in the demand for livestock products.

The demand for beef has quadrupled over the past two decades, from 103,000 MT in 1960 to 418,000 MT in 1980 (carcass weight). During 1960 to 1965, imports of beef were negligible, accounting for only 4-5 percent of the total supply. Imports have increased quite rapidly over the past 10 years or so. In 1970 Japan imported 23,000 MT of beef. In 1975 beef imports amounted to 45,000 MT and in 1980, 122,000 MT. Imports accounted for one third of the total supply of beef for recent years. The increases in Japanese beef imports can be attributed to the fact that domestic production has not been able to keep up with the rapid increase in demand. 5/ About 60-70 percent of Japanese beef production is a byproduct of dairy operations. The rest — Wagyu beef — is very expensive and very high quality. Wagyu beef is considered by Japanese to be far superior to any imported beef.

Australia is the main supplier of beef and veal to Japan (it provided about 70 percent of total imports in 1981). Other suppliers of beef are the United States and New Zealand. Less than half of the Australian beef imported by Japan is middle-quality chilled beef; the remainder is made up of lower quality frozen beef. Beef imported from the United States has traditionally been high quality table beef for the hotel and restaurant trade, while beef imported from New Zealand has been lower quality frozen beef. The United States has been taking an increasing share of Japanese beef imports, accounting for 29 percent of total beef imports in 1984, compared with 10.8 percent in 1976. While Australia's share decreased from 83 percent in 1976 to 63 percent in 1984, the absolute amount of Australia's exports to Japan showed a modest increase.

The major exporters of pork to Japan are Canada, the United States, Taiwan, Denmark, Sweden, and South Korea. Pork imports show a high degree of year-to-year variation. The large percentage variation in pork imports, and their low level on average, are due to the residual nature of imports in a market where domestic supply is close to demand.

Due to the high economic viability of the efficient poultry industry, poultry imports have traditionally been a small portion of total domestic consumption.

5/ Recent bilateral trade agreements with the United States and Australia also affect beef imports.

Most poultry is imported from the United States, with the People's Republic of China and Thailand contributing a small but growing share of total imports.

## Agricultural Trade Policies

Japan's agricultural and trade policies have been characterized as protectionistic (9). Japan controls imports of many commodities by state trading and licensing procedures. All imports into Japan are subject to licensing requirements. Private traders must apply for licenses. Most agricultural commodities, however, are imported by authorized government trading agencies.

Since Japan produces only a small portion of the total feed grain and meal consumed domestically, it has taken a relatively free trade stance towards imports of corn, grain sorghum, and soybeans. On the other hand, the pricing and marketing of food grains such as rice, wheat, and barley are strictly controlled by the Japanese Food Agency which administers internal producer and consumer prices of these commodities. Imports of wheat, barley, and rice are licensed and limited by the Food Agency, and all imports are sold to the government at the port. When rice surpluses develop, as they did in the late sixties and seventies, rice producers are paid to divert paddy land to production of wheat, barley, soybeans, and other crops. Surplus rice is also subsidized for use in mixed feeds, exports, and industrial uses.

The livestock sector has been protected by subsidies and import restrictions. The practical effects of these measures have diminished for Japan's increasingly efficient poultry and pork sectors, but trade restrictions are still quite important to the dairy and beef sectors. Import restrictions on livestock products include both tariffs and quotas. Imports of beef are strictly controlled by a global quota and subject to a 25 percent ad valorem tariff. All beef entering Japan must pass a rigorous customs and quarantine inspection. These sanitary restrictions often make it difficult for exporters to comply, and thus have a tendency to constrain imports. Pork is not subject to import quotas, but is subject to a variable duty or tariff, whichever is larger. This system can be waived in times of high domestic pork prices. Japan is nearly self-sufficient in poultry production, so imports account for only a small portion of total consumption. Tariff on boneless chicken is 18 percent. Tariff on chicken legs will be reduced to 10 percent by 1987.

# A MODEL OF JAPAN'S GRAIN, OILSEEDS, AND LIVESTOCK ECONOMY

A system-of-equations model of 19 agricultural commodities was constructed for Japan. The model simulates consumption, production, stock changes, trade, demand prices, and supply prices for Japan's grains, oilseeds, and livestock products. The 19 commodities included in the model are:

| Grains | Oilseeds and products | Livestock products |
|---|---|---|
| wheat | soybeans | beef and veal |
| corn | soymeal | pork |
| other coarse grains | soyoil | poultry |
| rice | other oilseeds | eggs |
| | other oilmeal | mutton and lamb |
| | other oil | milk |
| | | butter |
| | | cheese |
| | | other dairy products |

These commodities accounted for nearly 60 percent of Japan's gross farm income in 1981 (table 6). In terms of world agricultual trade, Japan is an important importer of grain, oilseeds, and livestock products. Table 1 shows the relative importance of these commodities in world agricultural trade in 1982. They accounted for 40 percent of the value of Japan's agricultural imports, which in turn accounted for 7 percent of the value of world agricultural trade.

## Model Structure

The overall structure of the Japanese GOL model is primarily patterned after a version of a detailed standard GOL country model for the United States (10), modified to conform to Japan's agriculture. The JPGOL model consists of eight major equation groups: (1) supply of crops, (2) supply of livestock products, (3) food and nonfeed demand, (4) derived feed demand for grains and meals, (5) stock demand, (6) trade quantities, (7) marketing margins, and (8) price linkage relations. The linkages among these blocks are illustrated in figure 1. The functional form for most model equations is nonlinear with constant elasticities over all price ranges. A computer-generated listing of the complete Japan GOL model is provided in appendix A.

The crop supply equations are based upon the assumption that producers allocate their resources, such as available cropland and other inputs, to maximize profits. Because of the simultaneous nature of acreage, yield, and production decisions (6), the model specifies a system of behavioral equations for acreage response and yield response, with identity equations defining production as area times yield. In addition to the equations for individual crops, a total cropland supply equation is also specified to increase the consistency between total cropland availability and its allocation to specific crops. The "total GOL crop area" is approximately equal to the sum of the individual GOL crop areas. The total cropland supply is a function of a time trend and the lagged average gross revenue per hectare deflated by an index of the cost of production (equation 1). These equations follow.

Total GOL crop area equation (ARTT):

$$[1] \quad ARTT_t = ARTTI \, (TTRL_{t-1})^{b_1} \, (1 + G)^T$$

where $t$ = time period, $t-1$ = lagged 1 year
$ARTTI$ = intercept of ARTT equation
$TTRL$ = average real return to land
$b_1$ = elasticity of total area with respect to average real return to land
$G$ = an annual growth rate for crop land supply
$T$ = time trend

Definition of average real return to land (TTRL):

$$[2] \quad TTRL = \frac{\sum_i PS_i \, YD_i \, AR_i \quad 100}{ICP \sum_i AR_i}$$

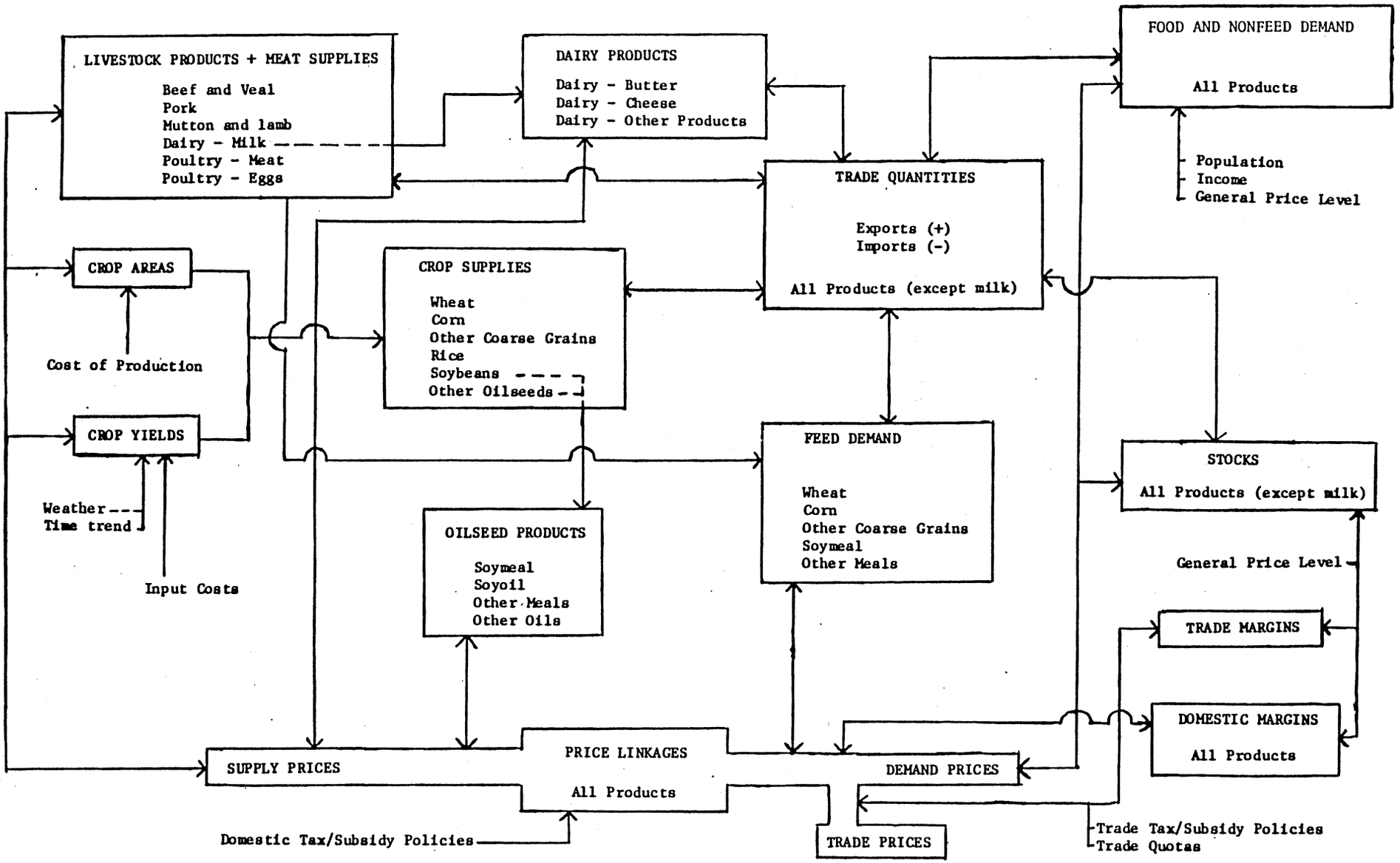
Table 6--Japan's gross agricultural output

| Commodity | 1960 | 1965 | 1970 | 1975 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|
| | Billion yen 1/ | | | | | | |
| Gross agricultural output | 1830.8 | 3043.3 | 4664.3 | 9051.4 | 10262.5 | 10715.4 | 10728.4 |
| Crops | | | | | | | |
| Rice | 888.6 | 1333.9 | 1766.2 | 3465.8 | 3078.1 | 3299.4 | 3312.5 |
| Wheat & barley | 106.0 | 94.1 | 48.3 | 56.6 | 166.1 | 166.3 | 196.4 |
| Miscellaneous cereals & pulses | 54.5 | 55.1 | 57.8 | 77.1 | 99.5 | 118.7 | 138.8 |
| Livestock products | | | | | | | |
| Beef & veal | 51.9 | 101.7 | 147.5 | 246.7 | 370.5 | 382.9 | 395.7 |
| Pork | 54.4 | 140.0 | 253.8 | 733.3 | 833.4 | 837.5 | 895.8 |
| Chickens | 13.5 | 45.0 | 108.0 | 747.1 | 975.2 | 1007.1 | 919.1 |
| Eggs | 90.9 | 193.0 | 306.2 | 477.6 | 574.8 | 589.0 | 505.2 |

1/ The exchange rate between U.S. dollar and yen is as follows. $1.00 = 360, 360, 360, 287, 227, 227, and 249 yen for 1960, 1965, 1970, 1975, 1980, 1981, and 1982, respectively.

Source: The Statistical Yearbook of the Ministry of Agriculture, Forestry, and and Fisheries of Japan; various issues.

Figure 1--GOL Standard Country Model



where $i$ = index for individual crops, that is, wheat, corn, other coarse grains, rice, soybeans, and other oilseeds.

$PS_i$ = supply price for crop $i$

$YD_i$ = yield of crop $i$

$AR_i$ = area of crop $i$

ICP = index of cost of production

A share concept is used to calculate individual crop areas (equation 3). That is, the share of each crop within the six-crop total area is a function of the previous year's deflated gross returns per hectare for all six crops in the model (i.e., wheat, corn, other coarse grains, rice, soybeans, and other oilseeds). Lagged prices serve here as proxies for expected prices because current year prices are not fully known when the planting decision is made. Better price information becomes available as the growing season progresses--for major crops, the government announces its official purchase price before the harvest. This can affect input levels (such as fertilizer and labor), and consequently alter crop yields. Thus, yield per hectare for each crop is a function of the current crop price deflated by an index of input costs, a time trend, and a weather index (equation 4).

Theoretical restrictions such as adding-up and homogeneity conditions are imposed on the individual crop area equations. The adding-up condition keeps the sum of individual crop areas nearly equal to total cropland supply. The homogeneity conditions imply that individual area equations are homogeneous of degree zero in all prices; that is, all of the price elasticities must sum to zero (11).

Individual crop area allocation ($AR_i$):

$$[3]\quad AR_{i,t} = ARI_i \left[\frac{(PS_{i,t-1})\,(YD_{i,t-1})}{ICP_{t-1}}\right]^{b_{ii}} \prod_{j \neq i} \left[\frac{(PS_{j,t-1})\,(YD_{j,t-1})}{ICP_{t-1}}\right]^{b_{ij}}$$

where $ARI_i$ = intercept of individual crop $i$ area equation

$b_{ii}$, $b_{ij}$ = elasticity of area share of crop $i$ with respect to lagged real return to crop $i$ or crop $j$

Individual crop yield ($YD_i$):

$$[4]\quad YD_i = YDI_i\,(PS_i/PIN)^{b_1}\,(AR_i)^{b_2}\,(1+G_i)^T\,(WIN)$$

where $YDI_i$ = intercept of individual crop $i$ yield equation

$G_i$ = annual yield growth rate of crop $i$

WIN = weather index (for "normal" weather, WIN=1)

PIN = price index of crop inputs (such as fertilizer)

Individual crop supply ($QS_i$):

[5] $QS_i = (AR_i)\ (YD_i)$

where $QS_i$ = production quantity of crop i

The oilseed sector is more complex than the grain sector. Soybeans and other oilseeds are principally processed into meal and oil. The oilseed sector includes equations for oilseed crushing demand and oilseed product supplies.

The quantities of soybeans and other oilseeds demanded for crushing are specified as a function of the ratio of oilseed crushing returns to oilseed prices and a time-trend variable which serves as a proxy for growth in crushing capacity (equation 6). The supplies of oilmeal and oil are then calculated as the products of the quantity of oilseed crushed multiplied by the shares going into meal and oil, respectively (equation 8).

Oilseed crushing demand ($QC_i$):

[6] $QC_i = QCI_i\ (PR_i)^{b_i}\ (1 + G_i)^T$

where $QCI_i$ = intercept of oilseed crushing equation for oilseed i

$PR_i$ = ratio of crushing returns to oilseed costs

$G_i$ = growth rate of crushing capacity for oilseed i

i = index for soybeans or other oilseeds

$b_i$ = elasticity of crushing demand with respect to crushing returns/costs ratio

The ratio of crushing returns to costs ($PR_i$):

[7] $$PR_i = \frac{\sum_j (S_{ij} \cdot PS_j)}{PD_i}$$

where $S_{ij}$ = the share of oilseed i weight going to oilseed product j; for example, product extraction rate

j = index for meal or oil

$PS_j$ = supply price of oilseed product j

$PD_i$ = demand price of oilseed i

Quantity supplied of meal or oil ($QS_j$):

[8] $QS_j = S_{ij} \cdot QC_i$

where $QS_j$ = quantity supplied of oilseed product j

For beef cattle, hogs, and mutton and lamb, the supply block consists of the following equations: (1) a livestock inventory identity, (2) a livestock addition-to-inventory equation, (3) a livestock slaughter equation, and (4) a

meat production equation.

The livestock inventory identity specifies the relationship between stocks and flows for each livestock category (equation 9). Equations 11 and 12, which portray additions and subtractions (slaughter) from livestock herds, are very similar. They both depend on the beginning inventory of the particular livestock category and on the current and lagged ratios of the price of the livestock product output relative to the price of feed input. The meat production equations which explain the quantity produced of beef and veal, pork, and mutton and lamb depend on the number of slaughtered animals and on the current and lagged ratios of product prices to feed costs (equation 13). Since most of Japan's beef production comes from dairy breed cattle, the beef cattle inventory includes dairy cattle in the empirical model.

Livestock inventory equation ($LN_i$):

$$[9] \quad LN_{i,t} = LN_{i,t-1} + LA_{i,t-1} - LS_{i,t-1}$$

where LA = livestock number added to herd inventory (net of death loss)
LS = livestock number slaughtered
i = index for livestock category: beef & veal, pork, or mutton & lamb

Definition of weighted feed cost ($FC_i$):

$$[10] \quad FC_i = \sum_j (R_{ij} \cdot PD_j)$$

where i = index for livestock category
j = index for feedstuffs
$R_{ij}$ = share of feedstuff j used to feed livestock i
PD = feed demand price

Livestock additions to livestock number ($LA_i$):

$$[11] \quad LA_{i,t} = LAI_i \left[\frac{PS_{i,t}}{FC_{i,t}}\right]^{b_1} \left[\frac{PS_{i,t-1}}{FC_{i,t-1}}\right]^{b_2} (LN_{i,t})$$

where $LAI_i$ = intercept of livestock slaugther equation
$PS_i$ = supply price of livestock i
$FC_i$ = weighted feed cost for livestock i
$b_1$, $b_2$ = current and lagged elasticity of livestock additions with respect to price/cost ratio

Livestock slaughter equation ($LS_i$):

$$[12] \quad LS_{i,t} = LSI_i \left[\frac{PS_{i,t}}{FC_{i,t}}\right]^{b_1} \left[\frac{PS_{i,t-1}}{FC_{i,t-1}}\right]^{b_2} (LN_{i,t})$$

where $LSI_i$ = intercept of livestock slaughter equation
$b_1$, $b_2$ = current and lagged elasticity of livestock slaughter with respect to price/cost ratio

Meat supply equation ($QS_i$):

$$[13]\quad QS_{i,t} = QSI_i \left[\frac{PS_{i,t}}{FC_{i,t}}\right]^{b_1} \left[\frac{PS_{i,t-1}}{FC_{i,t-1}}\right]^{b_2} (1 + G_i)^T (LS_{i,t})$$

where $QSI_i$ = intercept of meat supply equation

$G_i$ = annual growth rate of slaughter weight per animal

$b_1$, $b_2$ = current and lagged elasticity of meat supply with respect to price/cost ratio

Because of the fast turnover in poultry production, a single poultry meat supply equation is specified. Poultry meat supply is a function of the current and lagged ratios of the poultry supply price to feed costs, and a time trend (equation 14).

Poultry meat supply equation (QSPM):

$$[14]\quad QSPM = QSPMI \left[\frac{PSPM_t}{FCPM_t}\right]^{b_1} \left[\frac{PSPM_{t-1}}{FCPM_{t-1}}\right]^{b_2} (1 + G_i)^T$$

where QSPMI = intercept of poultry meat supply equation

PSPM = poultry meat supply price

FCPM = feed cost for poultry

G = annual growth rate of poultry meat supply

$b_1$, $b_2$ = current and lagged elasticity of poultry meat supply with respect to price/cost ratio

The behavioral relationships for egg supply and milk supply are similar. Layer and dairy cow numbers are a function of the ratios of current and lagged supply prices to feed costs, and lagged layer and dairy cow numbers (equation 15). The production of eggs or milk is a function of animal numbers and the current and lagged ratios of supply prices to feed costs (equation 16).

Livestock numbers equation ($LN_i$):

$$[15]\quad LN_{i,t} = LNI_i \left[\frac{PS_{i,t}}{FC_{i,t}}\right]^{b_1} \left[\frac{PS_{i,t-1}}{FC_{i,t-1}}\right]^{b_2} (LN_{i,t-1})^{b_3}$$

where $LNI_i$ = intercept of livestock numbers equation, i = dairy cattle or hen layers

$PS_i$ = supply price of eggs or milk

$FC_i$ = weighted feed cost for hen layers or milk

$b_1$, $b_2$ = current and lagged elasticity of livestock numbers with respect to supply price/feed cost ratio
$b_3$ = elasticity of livestock numbers with respect to lagged livestock numbers

Supply equation ($QS_i$):

$$[16] \quad QS_{i,t} = QSI_i \left[\frac{PS_{i,t}}{FC_{i,t}}\right]^{b_1} \left[\frac{PS_{i,t-1}}{FC_{i,t-1}}\right]^{b_2} (1 + G_i)^T (LN_{i,t})$$

where $QSI_i$ = intercept of supply equation, i = milk or eggs
$b_1$, $b_2$ = current and lagged elasticity of egg or milk supply with respect to supply price/feed cost ratio

Butter, cheese, and other dairy product supplies are specified as functions of the prices of these products relative to the price of milk (equation 18), and the quantity of milk available for manufacturing which is the total supply of milk minus fluid milk consumption (equation 17).

Manufacturing milk (QMDM):

$$[17] \quad QMDM = QSDM - QDDM$$

where QSDM = quantity of milk supplied (equals $QS_i$ for i = milk in equation 16)
QDDM = quantity of fluid milk demanded

Quantity supplied of dairy product ($QS_i$):

$$[18] \quad QS_i = QSI_i \left[\frac{PS_i}{PSDM}\right]^{b_{ii}} \prod_{j \neq i} \left[\frac{PS_j}{PSDM}\right]^{b_{ij}} (QMDM)$$

where i,j = index for type of dairy product: butter, cheese, or other dairy products
$QSI_i$ = intercept of dairy product i supply equation
$PS_i$ = supply price of dairy product i
$b_{ii}$ = elasticity of dairy product supply with respect to the ratio of its own price to the milk supply price
$b_{ij}$ = elasticity of dairy product supply with respect to the ratio of the cross product price j to the milk supply price

The consumer demand block comprises the demand equations for grains, oilseeds, and livestock products. These equations are based upon the neoclassical theory of utility maximization. Per capita quantity demanded for food and other nonfeed use of each product is a function of own- and cross-prices and per capita disposable income, deflated by the price index for nonagricultural products (equation 19). Theoretical restrictions on parameters of the demandequations, such as homogeneity of degree zero in income and price, are imposed (4).

Fish is an important source of protein in the Japanese diet. Despite the recent rapid growth in meat consumption, the Japanese eat more fish than they

eat all meat combined (1). Therefore, the importance of fish in the Japanese diet should not be overlooked. The price of fish has an important substitution effect on consumer demand for livestock products. In specifying the demand for beef, pork, poultry meat, eggs, and rice, a fish price index was included among the explanatory variables.

Food demand equation ($QD_i$):

$$[19] \quad QD_i = QDI_i \left[\frac{PD_i}{PNG}\right]^{b_{ii}} \prod_{j \neq i} \left[\frac{PD_j}{PNG}\right]^{b_{ij}} \left[\frac{INC/POP}{PNG}\right]^{b_{inc}} (PIF)^{b_f} (POP)$$

where
- $QDI_i$ = intercept of food demand equation i
- i,j = index for GOL commodity
- $PD_i$ = demand price of commodity i
- PNG = index of nonagricultural prices
- INC = national income
- POP = population
- PIF = price index for fish
- $b_{ij}$ = elasticity of demand with respect to jth product demand price deflated by index of non-GOL prices, with i=j for an own-price elasticity, i≠j for a cross-price elasticity
- $b_{inc}$ = income elasticity of demand
- $b_f$ = elasticity of demand with respect to price of fish (for beef, pork, poultry meat, eggs, and rice demand equations)

The derived feed demand component comprises the feed demand equations for corn, other coarse grains, wheat, soymeal, and other oilmeals. The quantity demanded of each feed ingredient depends on the prices of all the feedstuffs relative to the price index of livestock products, and on the number of units of grain consuming animals (equation 20). The general structure of the feed demand equations is consistent with the theoretical framework of derived input demand functions (12). The feed demand relations have been tied to the livestock sectors through the price index of livestock products (equation 22) and an aggregate measure of livestock units (equation 21). The homogeneity condition for prices is imposed on the feed demand equations.

Feed demand equation ($QF_i$):

$$[20] \quad QF_i = QFI_i \left[\frac{PD_i}{LPI}\right]^{b_{ii}} \prod_{j \neq i} \left[\frac{PD_j}{LPI}\right]^{b_{ij}} (GCAU)$$

where
- $QFI_i$ = intercept of feed demand equation i
- i,j = index for corn, other coarse grains, wheat, soymeal, and other oilmeals
- $PD_j$ = demand price for feed j
- LPI = livestock price index
- GCAU = grain consuming feed animal units
- $b_{ij}$ = feed demand elasticity with respect to feed price/livestock price ratio, with i=j for an own price elasticity, i≠j for a cross-price elasticity

Definition of grain consuming animal units (GCAU):

$$[21] \quad GCAU = W_{PM}(QSPM) + \sum_i W_i(LN_i)$$

where $W_i$ = weights for livestock numbers

$LN_i$ = livestock numbers of livestock i

i = index for livestock category

$W_{pm}$ = weights for poultry meat

QSPM = quantity supplied of poultry meat

Definition of livestock price index for feed demand (LPI):

$$[22] \quad LPI = \sum LW_i \ (PS_i)$$

where i = index for livestock category

$LW_i$ = weights for livestock category i

$PS_i$ = livestock supply price

Equations for stock changes provide the link between consumption and domestic production levels. The quantity of ending stocks relative to the quantities demanded and supplied is a function of the product demand price deflated by the non-GOL product price index (equation 23). Only fluid milk is assumed to have no year-to-year carry-over stock.

Stock equation ($SK_i$):

$$[23] \quad SK_i = SKI_i \ (PD_i/PNG)^{b_1} \ (QD_i + QF_i + QC_i + QS_i)$$

where $SKI_i$ = intercept of stock equation i

i = index for each GOL commodity except fluid milk

$SK_i$ = ending stocks of commodity i

$b_1$ = elasticity of stock demand with respect to demand price deflated by index of non-GOL product price

To close the system, the domestic market clearing identity (quantity equilibrium condition) for each commodity is defined. The equilibrium condition is that the net trade quantity (export or import) be equal to the supply quantity minus the sum of demand quantities for human consumption, feed use, and net additions to stocks change. For each of the GOL commodities, trade quantities are calculated as the difference between the domestic supply and demand (equation 24).

Net trade quantities ($QT_i$):

$$[24] \quad QT_{i,t} = QS_{i,t} - QD_{i,t} - QF_{i,t} - QC_{i,t} - [SK_{i,t} - SK_{i,t-1}]$$

Variables called "total supply" and "total demand" are used in the price-estimating part of the model. In equations 25 and 26, total supply is set equal to domestic production, and total demand is set equal to the sum of the demands for food, feed, crushing, and net additions to stocks (as relevant for each commodity).

Total supply and demand ($TS_i$ and $TD_i$):

[25] $TS_i = QS_i$

[26] $TD_{i,t} = QD_{i,t} + QF_{i,t} + QC_{i,t} + (SK_{i,t} - SK_{i,t-1})$

where i = index for each GOL commodity except milk

$TS_i$ = total supply for commodity i

$TD_i$ = total demand for commodity i

The JPGOL model maintains four levels of prices: world trade prices, Japanese trade prices, Japanese demand prices, and Japanese supply prices. These prices are linked by domestic and trade margins, and by applicable taxes, subsidies 6/, and tariffs. For fluid milk, which is assumed not to be traded, only domestic demand and supply prices are calculated.

When JPGOL is run in a stand alone mode — the context for this report — world prices are generally measured as import unit values, so that Japanese trade prices are the same as world trade prices (equation 27). When the JPGOL model is run as a part of the world GOL model, world prices usually are measured f.o.b. at a major export point, and always are denominated in dollars. Under those circumstances, Japanese trade prices are set equal to world trade prices times the yen/dollar exchange rate, plus an allowance for transport costs.

Trade prices ($PT_i$):

[27] $JPPT_i = WDPT_i$

where i = index for each GOL commodity except milk

$JPPT_i$ = Japanese trade price for commodity i, in yen/ton

$WDPT_i$ = world trade price for commodity i, in yen/ton

In the domestic market, demand and supply prices are linked by any applicable taxes and subsidies on production and consumption, and by the domestic margin, which represents the transport and marketing costs associated with selling a Japanese farm product in Japan (equation 28). In a situation in which the amount of trade is not restricted by a quota, the link between trade and demand prices depends on whether the product is imported or exported. For imports (equation 29a), the demand price equals the trade price, plus any applicable import tariff and consumption tax, plus a trade margin which represents the transport and marketing costs associated with traded goods.

6/ A net subsidy is represented as a negative tax in the price linkage relationships.

For exports (equation 29b), the demand price is set so that local producers receive the same revenue (net of taxes and marketing margins) from sales to domestic consumers as they receive from sales to foreign purchasers. Under extreme circumstances, high margins and high taxes may combine to imply negative prices. The absolute value function is used in equations 28 and 29 to keep prices positive in such cases, and to prevent the model from "blowing up" when it calculates equations in which prices are raised to a power.

Supply-demand price linkages:

$$[28] \quad PS_i = ABSV( PD_i - TC_i - MD_i - TP_i )$$

where
- $i$ = index for GOL commodity
- ABSV = absolute value
- PS = supply price
- PD = demand price
- TC = domestic consumption tax/subsidy
- MD = domestic marketing margin
- TP = domestic production tax/subsidy

Demand-trade price linkages:

$$[29] \quad (a) \text{ if } QT_i < 0, \text{ then } PD_i = ABSV( PT_i + MT_i + TM_i + TC_i )$$

$$(b) \text{ if } QT_i > 0, \text{ then } PD_i = ABSV( PT_i - MT_i - TE_i + MD_i + TC_i )$$

where
- $i$ = index for all GOL commodities except milk
- PT = trade price
- TM = import tax/subsidy
- TE = export tax/subsidy
- MT = trade margins

The domestic and trade margins are set either to a constant value (measured in constant yen per kilogram) or set to a constant share measured as a fraction of the demand price. The domestic margin for seven livestock products is modeled as a constant share; for all other commodities, the domestic margin is modeled as a constant value. For five commodities--corn, rice, other oilseeds, other oils, and mutton--the trade margin is modeled as a constant. For the other 13 commodities, the trade margin is modeled as a constant share. For consistency with other GOL models, the margin equations shown in appendix A are specified as a function of the current and lagged ratios of the non-GOL product price index to the demand price (equations 30 and 31). But the current and lagged margin elasticities are always set to zero in this model, so these equations specify constant shares in practice.

Domestic marketing margins ($MD_i$):

$$[30] \quad MD_{i,t} = MDI_i \left[ \frac{PNG_t}{PD_{i,t}} \right]^{b_1} \left[ \frac{PNG_{t-1}}{PD_{i,t-1}} \right]^{b_2} (PD_{i,t})$$

where
- $i$ = index for beef and veal, pork, poultry meat, eggs, milk, butter, and other dairy products
- $MDI_i$ = intercept of domestic margin equation for commodity i
- $b_1$, $b_2$ = the current and lagged domestic margin share of demand price elasticities (in this model, always set equal to zero)

Trade margins ($MT_i$):

$$[31] \quad MT_{i,t} = MTI_i \left( \frac{PNG_t}{PD_{i,t}} \right)^{b_1} \left( \frac{PNG_{t-1}}{PD_{i,t-1}} \right)^{b_2} (PD_{i,t})$$

where
- $i$ = index for beef and veal, pork, poultry meat, eggs, wheat, other coarse grains, soybeans, soymeal, soyoil, other meal, butter, cheese, and other dairy products
- $MTI_i$ = intercept of domestic margin equation for commodity i
- $b_1$, $b_2$ = the current and lagged trade margin share of product price elasticities (in this model, always set equal to zero)

The price linkage equations introduce specific places for price oriented policy variables to enter the model in a general way. Generally, production and export taxes are exogenous variables in the model, assumed as "given." The exceptions are for grains. Subsidies (negative taxes) to wheat, coarse grain, and rice production and subsidies to rice exports are a function of their own lagged values, lagged rice stocks, and an exponential time trend (equations 32 to 36).

Production subsidy equations ($SP_i$):

$$[32] \quad SP_{i,t} = SPI_i \, (SKRI_{t-1})^{b_1} \, (SPRI_{t-1})^{b_2} \, (SP_{i,t-1})^{b_3} \, (T)^{b_4}$$

$$[33] \quad TP_i = - SP_i$$

where
- $i$ = index for wheat or other coarse grains
- $SPI$ = intercept of production subsidy equation
- $SP$ = production subsidy
- $SKRI_{t-1}$ = beginning stock of rice
- $SPRI_{t-1}$ = production subsidy of rice, lagged 1 year
- b's = elasticity coefficients

$$[34] \quad SPRI_t = SPRII \, (SKRI_{t-1})^{b_1} \, (SPRI_{t-1})^{b_2} \, (T)^{b_3}$$

where
- $SPRI$ = production subsidy of rice
- $SPRII$ = intercept of rice production subsidy equation
- b's = elasticity coefficients

Rice export subsidy equation ($SERI$):

$$[35] \quad SERI_t = SERII \, (SKRI_{t-1})^{b_1} \, (SERI_{t-1})^{b_2} \, (T)^{b_3}$$

$$[36] \quad TERI = - SERI$$

where
- $SERI$ = export subsidy of rice
- $SERII$ = intercept of export subsidy equation for rice
- b's = elasticity coefficients

The demand price for fluid milk is modeled as a constant fraction of the gross revenue received from all manufactured dairy products, per ton of milk used in their production (equation 37). Then the supply price is calculated as the demand price minus the domestic margin and taxes on production and consumption (equation 38).

Milk price equations (PDDM and PSDM):

$$[37] \quad PDDM = (PDDMI) \left[ \frac{\sum_j (QS_j \cdot PS_j)}{QMDM} \right]$$

$$[38] \quad PSDM = PDDM - TPDM - MDDM - TCDM$$

where PDDM = demand price for fluid milk
PDDMI = intercept of milk demand price equation
PSDM = supply price for fluid milk

The model allows trade to depend on a direct link between domestic prices and world market prices. However, the model also allows trade to be bound by an export quota and/or an import quota. In cases where there is no trade or where trade is restricted by quotas, the linkage between the domestic price and the world market price is severed.

Quota restrictions are introduced by means of "if-then" statements, and an iterative solution technique (Gauss-Seidel) is used to solve the model. These "if-then" switching statements in effect disconnect domestic prices from trade prices when a quota is binding. Additional equations to estimate the domestic market clearing prices are specified so that the model iterates to a set of prices that clear the domestic markets even when the quantity of trade is fixed.

To understand how the model handles situations in which there are quantitative limits on trade, one must be aware of its general structure. When the model simulates results for a particular year, all the endogenous variables are initialized to their levels in the previous year. Then the model iterates between two phases: In equations 1 to 26, the values of quantity variables are recalculated, based on the current iteration's estimates for prices. Then in equations 27 to 42, the values of price variables are recalculated, based on the newly re-estimated values for the quantity variables. Next the newly recalculated prices are fed back into equations 1 to 26, and so on. The iterations stop when each variable has a value no more than 1 percent different from its level in the previous iteration.

There are three situations in which trade is restricted by quantitative limits:

(1) The estimated demand price implies a level of exports which exceeds an export quota. Here trade is restricted by the export quota.

(2) The estimated demand price implies a level of imports which exceeds an import quota. Here trade is restricted by the import quota.

(3) The domestic demand price is low enough, and import tariffs and trade margins are high enough, so that it is cheaper for Japanese consumers to buy a locally produced good than to import it. At the same time,

domestic supply prices, taxes, export taxes, and trade margins are high enough in combination so that the Japanese product is not profitable to sell abroad. This can be called a "zero trade situation." Such situations normally apply only to products that are very expensive to transport, relative to their cost of production. Fresh milk is an example.

The quantities of trade implied by the levels of prices in the current iteration of the model are calculated in equation 24 above. Since trade is measured as net exports, imports are recorded as negative amounts of trade.

In equation 39, if the level of trade implied by prices in the current iteration exceeds the export quota, then a "price adjustment factor" is calculated in proportion to the excess of trade over the quota, divided by the sum of domestic supply and demand. If the implied level of trade is so negative that it would violate an import quota, the price adjustment factor is calculated in proportion to the excess of imports over the quota, divided by the sum of domestic supply and demand. Otherwise, for use in a potential zero trade situation, the price adjustment factor is calculated in proportion to the implied quantity of trade, divided by the sum of domestic supply and demand. In equation 40, a new "estimated price" usually is calculated as the demand price in the current iteration, multiplied by one minus the price adjustment factor. However, to avoid the possibility of wild price gyrations during the iterative calculations, a "convergence limit" replaces the price adjustment factor whenever this convergence limit has the smaller absolute value. In equation 41, a "price constraint" variable is set equal to one if (1) an export quota is binding, or (2) an import quota is binding, or (3) a zero-trade situation exists; otherwise (4) the price constraint variable equals zero. In equation 42a, if the price constraint variable equals one, then the demand price to be used in the next iteration is set equal to the estimated price obtained from equation 40. If the price constraint variable equals zero, then the demand price to be used in the next iteration is calculated in equations 42b and 42c, which are exactly the same as the unrestricted trade equations 29a and 29b described previously. Finally, equations 39 through 42 apply to every GOL commodity except milk.

Price adjustment factor (PRAJ):

[39] (a) if $QT \geq EQ$, then $PRAJ = CP \left[ \frac{QT - EQ}{TS + TD} \right]$

(b) if $QT \leq -MQ$, then $PRAJ = CP \left[ \frac{QT + MQ}{TS + TD} \right]$

(c) otherwise, $PRAJ = CP \left[ \frac{QT}{TS + TD} \right]$

where
- EQ = export quota
- MQ = import quota
- QT = net trade quantity, positive values indicate net exports and negative values indicate net imports
- PRAJ = price adjustment factor
- CP = convergence parameter
- TS = total supply, is the same as quantity supplied
- TD = total demand, is defined as the sum of food demand, feed demand, changes in stock and crushing demand

The value of the convergence parameter (CP) is set equal to 0.5 for all commodities. Thus, the value of the price adjustment factor (PRAJ) is positive for exported goods and negative for imported goods.

Price estimate (PE):

[40] (a) if $PRAJ > CL$, then $PE = PD(1 - CL)$

(b) if $PRAJ < -CL$, then $PE = PD(1 + CL)$

(c) otherwise, $PE = PD(1 - PRAJ)$

where CL = a convergence limit parameter in the model
PD = price in the last interation

The value of the convergence limit (CL) is set equal to 0.1 for all commodities. The value PE is less than PD for exported goods and greater than PD for imported goods.

Price constraint parameter (PC):

[41] (a) if $QT \geq EQ$, then $PC = 1$

(b) if $QT \leq -MQ$, then $PC = 1$

(c) if both $PE < (PT + MT + TM + TC)$ and $PE > (PT - MT + MD - TE + TC)$, then $PC = 1$

(d) otherwise, $PC = 0$

where PC = price constraint parameter

Domestic demand price (PD):

[42] (a) if $PC = 1$, then $PD = ABSV(PE)$, where ABSV = absolute value

(b) if $PC = 0$, and if $QT < 0$, then $PD = ABSV(PT + MT + TM + TC)$

(c) otherwise, $PD = ABSV(PT - MT - TE + MD + TC)$

Model Coefficients and Parameters

The world agricultural commodity database compiled by the U.S. Department of Agriculture's Foreign Agricultural Service (FAS) was the primary source of data on supply, utilization, crop areas, crop yields, and livestock numbers in the JPGOL model. Data on income, population, domestic production subsidies, prices (such as producer and consumer prices, whether at the retail or wholesale level), and so on were obtained from statistical yearbooks and bulletins published by Japan's Ministry of Agriculture, Forestry, and Fisheries. Time series data from 1960 to 1980 were collected to estimate the model coefficients. Because insufficient data were available to estimate a complete demand elasticity matrix, demand coefficients were obtained mainly from existing studies and analysis.

Table 7 shows the estimated crop area elasticities for wheat, corn, other coarse grains, rice, soybeans, and other oilseeds. The estimated elasticity of total GOL crop area with respect to the real return to land is 0.43, while the annual growth rate for total GOL crop area is estimated as 0.015. Yield elasticity estimates for these crops are reported in table 8.

Table 7--Crop area elasticities, Japan 1/

| | INTERCEPTS FOR CROP AREA EQUATIONS (I) | WHEAT (WH) | CORN (CN) | OTHER COARSE GRAINS (CG) |
|---|---|---|---|---|
| TOTAL GOL CROP AREA (TT) - | 1551.21 | NA | NA | NA |
| 7 WHEAT (WH) ---------- | 0.069 | 0.15 | 0. | -0.05 |
| 8 CORN (CN) ---------- | 0.000822 | 0. | 0.32 | -0.08 |
| 9 OTHER COARSE GRAINS (CG) | 0.0443 | -0.08 | 0. | 0.14 |
| 10 RICE (RI) ---------- | 0.7242 | 0. | 0. | 0. |
| 11 SOYBEANS (SB) ---------- | 0.05 | 0. | 0. | -0.07 |
| 12 OTHER OILSEEDS (OS) --- | 0.00713 | 0. | -0.01 | -0.07 |

| | RICE (RI) | SOYBEANS (SB) | OTHER OILSEEDS (OS) | COST OF PRODUCTION 2/ |
|---|---|---|---|---|
| TOTAL GOL CROP AREA (TT) - | NA | NA | NA | NA |
| 7 WHEAT (WH) ---------- | -0.03 | 0. | 0. | -0.07 |
| 8 CORN (CN) ---------- | -0.02 | -0.07 | -0.09 | -0.06 |
| 9 OTHER COARSE GRAINS (CG) | -0.01 | -0.07 | -0.01 | 0.03 |
| 10 RICE (RI) ---------- | 0.06 | 0. | 0. | -0.06 |
| 11 SOYBEANS (SB) ---------- | 0. | 0.07 | -0.01 | 0.01 |
| 12 OTHER OILSEEDS (OS) --- | 0. | -0.08 | 0.08 | 0.08 |

| | REAL RETURN TO LAND (RL) | GROWTH RATE |
|---|---|---|
| TOTAL GOL CROP AREA (TT) - | 0.0434 | 0.015 |
| 7 WHEAT (WH) ---------- | NA | NA |
| 8 CORN (CN) ---------- | NA | NA |
| 9 OTHER COARSE GRAINS (CG) | NA | NA |
| 10 RICE (RI) ---------- | NA | NA |
| 11 SOYBEANS (SB) ---------- | NA | NA |
| 12 OTHER OILSEEDS (OS) --- | NA | NA |

1/ ELASTICITIES ARE FOR AREA WITH RESPECT TO TOTAL REAL RETURN PER HECTARE.
2/ ELASTICITY WITH RESPECT TO COST OF PRODUCTION IS IMPLIED BY THE ELASTICITIES AND FUNCTIONAL FORM OF THE CROP AREA EQUATION.
NA = Not applicable.

Table 8--Crop yield elasticities, Japan

| | INTERCEPTS FOR CROP YIELD EQUATIONS (I) | OWN PRICE | TOTAL AREA (AR) | GROWTH RATE |
|---|---|---|---|---|
| 7 WHEAT (WH) ---------- | 2.25228 | 0.44731 | 0. | 0.009 |
| 8 CORN (CN) ---------- | 3.11626 | 0.17911 | -0.04 | 0.005 |
| 9 OTHER COARSE GRAINS (CG) | 2.69413 | 0.3241 | 0. | 0.005 |
| 10 RICE (RI) ---------- | 3.50041 | 0.022 | 0. | 0.006 |
| 11 SOYBEANS (SB) ---------- | 1.1343 | 0.2 | -0.01 | 0.008 |
| 12 OTHER OILSEEDS (OS) --- | 3.82318 | 0.6 | 0. | 0.007 |

Table 9 presents the supply elasticities for livestock and livestock products. The dairy product supply elasticity matrix is shown in table 10. These dairy products are butter, cheese, and other dairy products. The supply of these dairy products is dependent upon the quantity of manufacturing milk. Also, butter and other dairy products (mainly powdered milk) are joint products. The sign conditions of price elasticities reflect such a relationship.

Table 11 presents the demand elasticity matrix used for the model. Generally, the own-price elasticities of demand for meat are more elastic than those for cereals. Similarly, income elasticities for meat are higher than for cereals.

The feed demand elasticity matrix is shown in table 12. These elasticities were empirically estimated. A weighted livestock price index was used in feed demand equations. The weights used for calculating an aggregate livestock price index were derived from farm income cash receipts from marketings of crop and livestock products (see appendix B, table 1). Also, for grain consuming animal units, an aggregate measure of livestock numbers is used in feed demand relations (appendix B, table 2). These weights are primarily obtained from total feed use by different livestock categories. In livestock supply relations, a weighted feed cost for each livestock category was used as an explanatory variable. Feed cost weights for each livestock category are basically the weights of feed rations for different kinds of livestock. The model specification used assumes a fixed feed ration for each class of livestock.

Table 13 presents oilseed crushing demand elasticities for soybeans and other oilseeds, as well as the time-trend variable used as a proxy for growth in crushing capacity. Table 14 presents price elasticities of demand for stocks. Table 15 shows values of constant share of the domestic and trade margins to demand prices. Table 16 presents production and/or export subsidy elasticities for wheat, other coarse grains, and rice.

## Policy Analysis Capabilities

The previous sections discuss the overall structure of the Japanese grains, oilseeds, and livestock model. The model simulates equilibrium prices, supply, utilization, and trade quantities for each of 19 commodities under alternative assumptions.

The model explicitly takes into account cross-price effects among commodities on both the demand and supply sides. More importantly, the model is designed as a tool to analyze alternative trade policies such as tariff and nontariff trade restrictions. Exogenous variables which drive the model consist of one set of nonpolicy-related variables and two sets of policy-related variables. The nonpolicy exogenous variables are the world prices for 18 traded commodities (denominated in yen) and macroeconomic variables: population and income, four Japanese price indices, a weather index, and a time trend. The first set of policy-related exogenous variables are taxes and subsidies on domestic consumption and production, import tariffs, and export taxes or subsidies. All of these taxes and subsidies directly affect the linkage between domestic prices and the world price of each commodity considered. The second set of policy-related variables consists of import and export quotas.

Table 9--Livestock and livestock product elasticities, Japan

| | INTERCEPTS FOR LIVESTOCK EQUATIONS (I) | CURRENT PRICE ELASTICITY (PC) | LAGGED PRICE ELASTICITY (PL) | GROWTH RATE |
|---|---|---|---|---|
| BEEF+VEAL ADDITIONS (LABF) - | 0.281024 | 0.01 | 0.04 | NA |
| BEEF+VEAL SLAUGHTER (LSBF) - | 0.225906 | 0.01 | 0.07 | NA |
| BEEF+VEAL SUPPLY (QSBF) ---- | 0.137444 | 0.17 | 0.01 | 0.001 |
| PORK ADDITIONS (LAPK) ------ | 1.74673 | 0.0224 | 0.02 | NA |
| PORK SLAUGHTER (LSPK) ------ | 2.01497 | -0.114 | 0.1 | NA |
| PORK SUPPLY (QSPK) --------- | 0.050268 | 0.089 | 0.037 | 0.001 |
| MUTTON+LAMB ADDITIONS (LAML) | 0.095123 | 0.115 | -0.311 | NA |
| MUTTON+LAMB SLAUGHTER (LSML) | 1.90298 | 0.078 | -1.089 | NA |
| MUTTON+LAMB SUPPLY (QSML) -- | 7.731721E-05 | 0.091 | 0.812 | 0.0084 |
| DAIRY-MILK NUMBERS (LNDM) -- | 9.5964 | 0.14 | 0.12 | NA |
| DAIRY-MILK SUPPLY (QSDM) --- | 3.35189 | 0.0468 | 0.05 | 0.025 |
| POULTRY-MEAT SUPPLY (QSPM) - | 495.409 | 0.012 | -0.08 | 0.04 |
| POULTRY-EGGS NUMBERS (LNPE) | 143110. | 0.01 | 0.01 | NA |
| POULTRY-EGGS SUPPLY (QSPE) - | 0.008149 | 0.017 | 0.02 | 0.02 |

| | LAGGED DEPENDENT VARIABLE (LG) |
|---|---|
| BEEF+VEAL ADDITIONS (LABF) - | NA |
| BEEF+VEAL SLAUGHTER (LSBF) - | NA |
| BEEF+VEAL SUPPLY (QSBF) ---- | NA |
| PORK ADDITIONS (LAPK) ------ | NA |
| PORK SLAUGHTER (LSPK) ------ | NA |
| PORK SUPPLY (QSPK) --------- | NA |
| MUTTON+LAMB ADDITIONS (LAML) | NA |
| MUTTON+LAMB SLAUGHTER (LSML) | NA |
| MUTTON+LAMB SUPPLY (QSML) -- | NA |
| DAIRY-MILK NUMBERS (LNDM) -- | 0.6293 |
| DAIRY-MILK SUPPLY (QSDM) --- | NA |
| POULTRY-MEAT SUPPLY (QSPM) - | NA |
| POULTRY-EGGS NUMBERS (LNPE) | 0. |
| POULTRY-EGGS SUPPLY (QSPE) - | NA |

NA = Not applicable.

Table 10--Dairy product supply elasticities, Japan

| | INTERCEPTS FOR DAIRY PRODUCT EQUATIONS (I) | DAIRY-BUTTER (DB) | DAIRY-CHEESE (DC) |
|---|---|---|---|
| 17 DAIRY-BUTTER (DB) ------- | 0.025533 | 0.03 | -0.01 |
| 18 DAIRY-CHEESE (DC) ------- | 0.002364 | -0.01 | 0.35 |
| 19 DAIRY-OTHER PRODUCTS (DO) | 0.052862 | 0.01 | -0.01 |

| | DAIRY-OTHER PRODUCTS (DO) | DAIRY-MILK (DM) 1/ |
|---|---|---|
| 17 DAIRY-BUTTER (DB) ------- | 0.01 | -0.03 |
| 18 DAIRY-CHEESE (DC) ------- | -0.23 | -0.11 |
| 19 DAIRY-OTHER PRODUCTS (DO) | 0.02 | -0.02 |

1/ ELASTICITY WITH RESPECT TO THE MILK PRICE IS IMPLIED BY THE ELASTICITIES AND FUNCTIONAL FORM OF THE DAIRY PRODUCT SUPPLY EQUATION.

Table 11--Demand elasticities, Japan

| | INTERCEPTS FOR DEMAND EQUATIONS (I) | BEEF+VEAL (BF) | PORK (PK) | MUTTON+LAMB (ML) |
|---|---|---|---|---|
| 1 BEEF+VEAL (BF) | 5.64378 | -0.77 | 0.15 | 0. |
| 2 PORK (PK) | 0.375985 | 0.3 | -0.45 | 0. |
| 3 MUTTON+LAMB (ML) | 0.135453 | 0.02 | 0. | -0.59 |
| 4 DAIRY-MILK (DM) | 0.437682 | -0.03 | -0.03 | 0. |
| 5 POULTRY-MEAT (PM) | 0.062955 | 0.07 | 0.22 | 0. |
| 6 POULTRY-EGGS (PE) | 0.012237 | 0.008 | 0.02 | 0. |
| 7 WHEAT (WH) | 0.140201 | 0.04 | 0.02 | 0. |
| 8 CORN (CN) | 0.012921 | 0.05 | 0.03 | 0. |
| 9 OTHER COARSE GRAINS (CG) | 0.004558 | 0.05 | 0.03 | 0. |
| 10 RICE (RI) | 0.081549 | 0.0001 | 0.0001 | 0. |
| 11 SOYBEANS (SB) | 0.008234 | 0.05 | 0.03 | 0. |
| 12 OTHER OILSEEDS (OS) | 0.001499 | 0.05 | 0.03 | 0. |
| 13 SOYMEAL (SM) | 0.024389 | 0.02 | 0.01 | 0. |
| 14 SOYOIL (SO) | 0.15734 | 0.01 | -0.01 | 0. |
| 15 OTHER MEALS (OM) | 0.002158 | 0.05 | 0.03 | 0. |
| 16 OTHER OILS (OO) | 0.085041 | 0.01 | -0.01 | 0. |
| 17 DAIRY-BUTTER (DB) | 0.032263 | 0.02 | 0.09 | 0. |
| 18 DAIRY-CHEESE (DC) | 0.379671 | 0.21 | -0.01 | 0. |
| 19 DAIRY-OTHER PRODUCTS (DO) | 0.011779 | 0.04 | 0.02 | 0. |

| | DAIRY-MILK (DM) | POULTRY-MEAT (PM) | POULTRY-EGGS (PE) | WHEAT (WH) |
|---|---|---|---|---|
| 1 BEEF+VEAL (BF) | 0. | 0.3 | 0. | 0. |
| 2 PORK (PK) | 0. | 0.12 | 0. | 0. |
| 3 MUTTON+LAMB (ML) | 0. | 0. | 0. | 0. |
| 4 DAIRY-MILK (DM) | -0.07 | 0. | 0. | 0. |
| 5 POULTRY-MEAT (PM) | 0.02 | -0.45 | 0. | 0. |
| 6 POULTRY-EGGS (PE) | 0.02 | 0.01 | -0.03 | 0.03 |
| 7 WHEAT (WH) | 0.02 | 0.01 | 0.06 | -0.1 |
| 8 CORN (CN) | 0.03 | 0.01 | 0.01 | 0. |
| 9 OTHER COARSE GRAINS (CG) | 0.03 | 0.01 | 0.03 | 0.01 |
| 10 RICE (RI) | 0.03 | 0.0001 | 0.0001 | 0.001 |
| 11 SOYBEANS (SB) | 0.03 | 0.01 | 0. | 0. |
| 12 OTHER OILSEEDS (OS) | 0.03 | 0.01 | 0. | 0. |
| 13 SOYMEAL (SM) | 0.01 | -0.01 | -0.01 | -0.01 |
| 14 SOYOIL (SO) | 0.01 | -0.01 | -0.01 | -0.01 |
| 15 OTHER MEALS (OM) | 0.03 | 0.01 | -0.02 | -0.01 |
| 16 OTHER OILS (OO) | 0.01 | -0.01 | -0.01 | -0.01 |
| 17 DAIRY-BUTTER (DB) | 0.01 | 0.06 | -0.01 | 0.01 |
| 18 DAIRY-CHEESE (DC) | 0.01 | -0.01 | -0.01 | -0.01 |
| 19 DAIRY-OTHER PRODUCTS (DO) | 0.02 | -0.01 | -0.02 | -0.01 |

Continued —

Table 11 (Cont.)--Demand elasticities, Japan

| | CORN (CN) | OTHER COARSE GRAINS (CG) | RICE (RI) | SOYBEANS (SB) |
|---|---|---|---|---|
| 1 BEEF+VEAL (BF) | 0. | 0. | -0.1 | 0. |
| 2 PORK (PK) | 0. | 0. | 0.08 | 0. |
| 3 MUTTON+LAMB (ML) | 0. | 0. | 0. | 0. |
| 4 DAIRY-MILK (DM) | 0. | 0. | 0. | 0. |
| 5 POULTRY-MEAT (PM) | 0. | 0. | 0.02 | 0. |
| 6 POULTRY-EGGS (PE) | 0. | 0. | -0.07 | 0. |
| 7 WHEAT (WH) | 0. | 0. | 0.08 | 0. |
| 8 CORN (CN) | -0.07 | 0.05 | 0.06 | 0. |
| 9 OTHER COARSE GRAINS (CG) | 0.2 | -0.07 | 0.1 | 0. |
| 10 RICE (RI) | 0. | 0.001 | -0.005 | 0. |
| 11 SOYBEANS (SB) | 0. | 0. | -0.01 | -0.09 |
| 12 OTHER OILSEEDS (OS) | 0. | 0. | -0.01 | 0. |
| 13 SOYMEAL (SM) | 0. | 0. | -0.05 | -0.01 |
| 14 SOYOIL (SO) | 0. | 0. | -0.06 | 0. |
| 15 OTHER MEALS (OM) | 0. | 0. | -0.01 | -0.01 |
| 16 OTHER OILS (OO) | 0. | 0. | -0.06 | 0. |
| 17 DAIRY-BUTTER (DB) | 0. | 0. | -0.05 | 0.01 |
| 18 DAIRY-CHEESE (DC) | 0. | 0. | -0.05 | 0. |
| 19 DAIRY-OTHER PRODUCTS (DO) | 0. | 0. | -0.02 | -0.01 |

| | OTHER OILSEEDS (OS) | SOYMEAL (SM) | SOYOIL (SO) | OTHER MEALS (OM) |
|---|---|---|---|---|
| 1 BEEF+VEAL (BF) | 0. | 0. | 0. | 0. |
| 2 PORK (PK) | 0. | 0. | 0. | 0. |
| 3 MUTTON+LAMB (ML) | 0. | 0. | 0. | 0. |
| 4 DAIRY-MILK (DM) | 0. | 0. | 0. | 0. |
| 5 POULTRY-MEAT (PM) | 0. | 0. | 0. | 0. |
| 6 POULTRY-EGGS (PE) | 0. | 0. | 0. | 0. |
| 7 WHEAT (WH) | 0. | 0. | 0. | 0. |
| 8 CORN (CN) | 0. | 0. | 0. | 0. |
| 9 OTHER COARSE GRAINS (CG) | 0. | 0. | 0. | 0. |
| 10 RICE (RI) | 0. | 0. | 0. | 0. |
| 11 SOYBEANS (SB) | 0. | 0. | 0. | 0. |
| 12 OTHER OILSEEDS (OS) | -0.01 | 0. | 0. | 0. |
| 13 SOYMEAL (SM) | 0. | -0.07 | 0. | 0. |
| 14 SOYOIL (SO) | 0. | 0. | -0.1 | 0. |
| 15 OTHER MEALS (OM) | 0. | 0. | 0.01 | -0.08 |
| 16 OTHER OILS (OO) | 0. | 0. | 0.3 | 0. |
| 17 DAIRY-BUTTER (DB) | 0. | 0.01 | 0.01 | 0. |
| 18 DAIRY-CHEESE (DC) | 0. | 0. | 0. | 0. |
| 19 DAIRY-OTHER PRODUCTS (DO) | 0. | 0. | 0. | 0. |

Continued —

Table 11 (Cont.)—Demand elasticities, Japan

| | OTHER OILS (OO) | DAIRY-BUTTER (DB) | DAIRY-CHEESE (DC) | DAIRY-OTHER PRODUCTS (DO) |
|---|---|---|---|---|
| 1 BEEF+VEAL (BF) | 0. | 0. | 0.01 | 0. |
| 2 PORK (PK) | 0. | 0. | 0. | 0. |
| 3 MUTTON+LAMB (ML) | 0. | 0. | 0. | 0. |
| 4 DAIRY-MILK (DM) | 0. | 0. | 0. | 0. |
| 5 POULTRY-MEAT (PM) | 0. | 0. | 0. | 0. |
| 6 POULTRY-EGGS (PE) | 0. | 0. | 0. | 0. |
| 7 WHEAT (WH) | 0. | 0. | 0. | 0. |
| 8 CORN (CN) | 0. | 0. | 0. | 0. |
| 9 OTHER COARSE GRAINS (CG) | 0. | 0. | 0. | 0. |
| 10 RICE (RI) | 0. | 0. | 0. | 0. |
| 11 SOYBEANS (SB) | 0. | 0. | 0. | 0. |
| 12 OTHER OILSEEDS (OS) | 0. | 0. | 0. | 0. |
| 13 SOYMEAL (SM) | 0. | 0. | 0. | 0. |
| 14 SOYOIL (SO) | 0.11 | 0. | 0. | 0. |
| 15 OTHER MEALS (OM) | 0. | 0. | 0. | 0. |
| 16 OTHER OILS (OO) | -0.35 | 0. | 0. | 0. |
| 17 DAIRY-BUTTER (DB) | 0. | -0.35 | 0. | 0. |
| 18 DAIRY-CHEESE (DC) | 0. | 0. | -1.11 | 0. |
| 19 DAIRY-OTHER PRODUCTS (DO) | 0. | 0. | 0. | -0.1 |

| | NON-GOL ITEMS 1/ | INCOME (IN) |
|---|---|---|
| 1 BEEF+VEAL (BF) | -1.04 | 1.45 |
| 2 PORK (PK) | -0.85 | 0.8 |
| 3 MUTTON+LAMB (ML) | -0.14 | 0.71 |
| 4 DAIRY-MILK (DM) | -0.37 | 0.5 |
| 5 POULTRY-MEAT (PM) | -0.33 | 0.45 |
| 6 POULTRY-EGGS (PE) | -0.128 | 0.14 |
| 7 WHEAT (WH) | -0.43 | 0.3 |
| 8 CORN (CN) | -0.21 | 0.04 |
| 9 OTHER COARSE GRAINS (CG) | -0.4 | 0.01 |
| 10 RICE (RI) | -0.0074 | -0.02 |
| 11 SOYBEANS (SB) | -0.09 | 0.07 |
| 12 OTHER OILSEEDS (OS) | -0.11 | 0.01 |
| 13 SOYMEAL (SM) | 0.04 | 0.08 |
| 14 SOYOIL (SO) | -0.63 | 0.7 |
| 15 OTHER MEALS (OM) | -0.07 | 0.07 |
| 16 OTHER OILS (OO) | -0.57 | 0.7 |
| 17 DAIRY-BUTTER (DB) | -0.58 | 0.77 |
| 18 DAIRY-CHEESE (DC) | 0.05 | 0.93 |
| 19 DAIRY-OTHER PRODUCTS (DO) | -0.31 | 0.4 |

1/ ELASTICITY WITH RESPECT TO NON-GOL ITEMS IS IMPLIED BY THE ELASTICITIES AND FUNCTIONAL FORM OF THE DEMAND EQUATION.

Table 12--Feed demand elasticities, Japan

| | INTERCEPTS FOR FEED DEMAND EQUATIONS (I) | WHEAT (WH) | CORN (CN) |
|---|---|---|---|
| 7 WHEAT (WH) | 0.00352 | -0.7 | 0.3 |
| 8 CORN (CN) | 0.162653 | 0.05 | -.25 |
| 9 OTHER COARSE GRAINS (CG) | 0.078 | 0. | 0.1 |
| 13 SOYMEAL (SM) | 0.016541 | 0.01 | 0.08 |
| 15 OTHER MEALS (OM) | 0.028793 | 0.01 | 0.15 |

| | OTHER COARSE GRAINS (CG) | SOYMEAL (SM) | OTHER MEALS (OM) |
|---|---|---|---|
| 7 WHEAT (WH) | 0.16 | 0.21 | 0.03 |
| 8 CORN (CN) | 0.05 | 0.02 | 0.01 |
| 9 OTHER COARSE GRAINS (CG) | -0.34 | 0.08 | 0.04 |
| 13 SOYMEAL (SM) | 0.15 | -0.3 | 0.15 |
| 14 OTHER MEALS (OM) | 0.27 | 0.5 | -0.5 |

| | LIVESTOCK PRICES 1/ |
|---|---|
| 7 WHEAT (WH) | -2.980232E-08 |
| 8 CORN (CN) | 0.12 |
| 9 OTHER COARSE GRAINS (CG) | 0.12 |
| 13 SOYMEAL (SM) | -0.09 |
| 15 OTHER MEALS (OM) | -0.43 |

1/ ELASTICITIES WITH RESPECT TO LIVESTOCK PRICES IS IMPLIED BY THE ELASTICITIES AND FUNCTIONAL FORM OF THE FEED DEMAND EQUATION.

Table 13--Oilseed crushing elasticities, Japan

| | SHARE OF OILSEED WEIGHT GOING TO MEAL (QS***M) | SHARE OF OILSEED WEIGHT GOING TO OIL (QS***O) | INTERCEPTS FOR OILSEED CRUSHING EQUATIONS (I) |
|---|---|---|---|
| 11 SOYBEANS (SB) ----- | 0.77 | 0.18 | 1767.44 |
| 12 OTHER OILSEEDS (OS) | 0.55 | 0.40 | 416.64 |

| | OILSEED CRUSHING ELASTICITY (PM) 1/ | GROWTH RATE (TR) |
|---|---|---|
| 11 SOYBEANS (SB) ----- | 0.01 | 0.03 |
| 12 OTHER OILSEEDS (OS) | 0.01 | 0.05 |

1/ OILSEED CRUSH WITH RESPECT TO CRUSHING MARGIN RATIO.

Table 14--Stock elasticities, Japan

| | INTERCEPTS FOR STOCK EQUATIONS (I) | STOCK ELASTICITIES 1/ |
|---|---|---|
| 1 BEEF+VEAL (BF) ---------- | 0.049341 | 0. |
| 2 PORK (PK) ---------- | 0.025035 | -0.15 |
| 3 MUTTON+LAMB (ML) ---------- | 0.233058 | 0. |
| 5 POULTRY-MEAT (PM) ---------- | 0.007535 | 0. |
| 6 POULTRY-EGGS (PE) ---------- | 0.000289 | 0. |
| 7 WHEAT (WH) ---------- | 0.085 | -0.91 |
| 8 CORN (CN) ---------- | 0.016349 | -1.45 |
| 9 OTHER COARSE GRAINS (CG) - | 0.04392 | -1.35 |
| 10 RICE (RI) ---------- | 0.15 | -0.24 |
| 11 SOYBEANS (SB) ---------- | 0.146541 | 0. |
| 12 OTHER OILSEEDS (OS) ----- | 0.077681 | 0. |
| 13 SOYMEAL (SM) ---------- | 0.0162 | 0. |
| 14 SOYOIL (SO) ---------- | 0.015067 | 0. |
| 15 OTHER MEALS (OM) ---------- | 0.017472 | 0. |
| 16 OTHER OILS (OO) ---------- | 0.027994 | 0. |
| 17 DAIRY-BUTTER (DB) ---------- | 0.313866 | 0. |
| 18 DAIRY-CHEESE (DC) ---------- | 0.08119 | 0. |
| 19 DAIRY-OTHER PRODUCTS (DO) | 0.199389 | 0. |

1/ STOCK SHARE ELASTICITIES WITH RESPECT TO (OWN/NON-GOL PRICES).

Table 15--Domestic and trade margin shares, Japan

| | SHARE OF DOMESTIC MARGIN TO DEMAND PRICE | SHARE OF TRADE MARGIN TO DEMAND PRICE |
|---|---|---|
| 1 BEEF+VEAL (BF) | 0.3550 | 0.7026 |
| 2 PORK (PK) | 0.5254 | 0.3954 |
| 4 DAIRY-MILK (DM) | 0.6287 | NA |
| 5 POULTRY-MEAT (PM) | 0.6598 | 0.5656 |
| 6 POULTRY-EGGS (PE) | 0.2151 | 0.1578 |
| 7 WHEAT (WH) | 0. | 0.1797 |
| 9 OTHER COARSE GRAINS (CG) | 0. | 0.1492 |
| 11 SOYBEANS (SB) | 0. | 0.5190 |
| 13 SOYMEAL (SM) | 0. | 0.2969 |
| 14 SOYOIL (SO) | 0. | 0.6288 |
| 15 OTHER MEALS (OM) | 0. | 0.3293 |
| 17 DAIRY-BUTTER (DB) | 0.1767 | 0.5729 |
| 18 DAIRY-CHEESE (DC) | 0. | 0.5849 |
| 19 DAIRY-OTHER PRODUCTS (DO) | 0.5388 | 0.8527 |

Table 16--Subsidy elasticities, Japan

| | INTERCEPTS FOR SUBSIDY EQUATIONS (I) | LAGGED RICE STOCKS |
|---|---|---|
| WHEAT PRODUCTION (SPWH) | 0.78 | 0.44 |
| OTHER COARSE GRAIN PRODUCTION (SPCG) | 0.69 | 0.44 |
| RICE PRODUCTION (SPRI) | 5298.16 | -0.965 |
| RICE EXPORTS (SERI) | 1.399 | 0.00097 |

| | LAGGED OWN SUBSIDY | TIME |
|---|---|---|
| WHEAT PRODUCTION (SPWH) | 0. | 0.4 |
| OTHER COARSE GRAIN PRODUCTION (SPCG) | 0. | 0.4 |
| RICE PRODUCTION (SPRI) | 0.428 | 0.4 |
| RICE EXPORTS (SERI) | 0.715 | 0.4 |

Tariff barriers still permit world (trade) price fluctuations to be transmitted to the domestic market, although in a distorted manner. However, the more common form of agricultural protection in Japan is through nontariff measures, which in effect cut the linkage between domestic and world market prices.

In this model, quantitative restrictions are introduced by means of "if-then" statements, and an iterative solution technique (Gauss-Seidel) is used to solve the set of nonlinear equations. These "if-then" switching statements in effect disconnect domestic prices from trade prices when trade is restricted by quotas or is nonexistent. Under these circumstances, additional equations estimate the domestic market clearing prices so that the model iterates to a set of prices that clear the domestic markets, given fixed trade quantities.

## VALIDATION AND SIMULATION OF THE MODEL

The JPGOL model is an annual simulation model of Japan's grain, oilseeds, and livestock economy. It can be run as a stand-alone country model, or as a component of the world grain, oilseeds, and livestock (GOL) agricultural trade model. Discussions here focus on stand-alone model simulation. Simulating the model requires data or projections for the exogenous variables and beginning values for the endogenous variables. The base year for the model is 1976. Since the JPGOL model is designed to provide projections of Japan's grain, oilseeds, and livestock sectors until the year 2000 under alternative scenarios, the values of exogenous variables must also be projected through the year 2000.

To examine the performance of the model, we have tested its stability using actual exogenous data over the historical period from 1976 to 1980. The percentage differences between historical and simulated values of the endogenous variables were computed to determine how well the model replicated historical data. Other statistics such as the root mean square percent error and the standard deviation between simulated and actual values were evaluated. In general the root mean square percent errors are reasonably low. The largest percent errors usually occur for variables with the smallest magnitudes. Trade quantities and carry-over stocks have larger relative errors than supply and demand. High errors on trade are to be expected, since trade absorbs much of the random variation in domestic demand and supply. Some values of parameters and elasticities were revised during the process of testing the model. The current set of coefficients does provide a stable solution.

Table 17 presents the root mean square percent errors for selected endogenous variables. Errors on crop areas range from 7 percent on total area to 91 percent on wheat area. Since a small portion of total cropland is devoted to wheat, soybeans, and corn, tracking these crop areas is particularly difficult. Errors on crop yields are relatively low, with the highest (15 percent) on wheat yield. Errors on livestock product supply are fairly low, except for some dairy products, poultry meat, and mutton and lamb. Errors on food demand for various commodities are relatively low on livestock products. Errors are relatively high on coarse grains and other meal demands. These commodities are primarily for feed and industrial uses; it is difficult to track the historical series of these variables.

After the model was tested and adjusted for the period 1976-80, it was simulated through the year 2000. Income, population, supply growth trends,

Table 17--Root mean square percent error, selected endogenous variables, JPGOL model, 1976-80

| Variable 1/ | RMS percent error | Variable 1/ | RMS percent error | Variable 1/ | RMS percent error | Variable 1/ | RMS percent error |
|---|---|---|---|---|---|---|---|
| JPARCG | 21.2 | JPPDBF | 7.9 | JPQDDM | 5.9 | JPQSBF | 4.5 |
| JPARCN | 44.7 | JPPDCG | 21.3 | JPQDDO | 20.4 | JPQSDB | 25.6 |
| JPAROS | 12.2 | JPPDDB | 29.6 | JPQDML | 33.7 | JPQSDC | 9.8 |
| JPARRI | 11.3 | JPPDDC | 8.2 | JPQDOO | 8.6 | JPQSDM | 7.8 |
| JPARSB | 46.7 | JPPDDM | 5.1 | JPQDOS | 18.6 | JPQSDO | 29.6 |
| JPARTT | 7.0 | JPPDDO | 42.6 | JPQDPE | 10.3 | JPQSML | 18.9 |
| JPARWH | 91.0 | JPPDOM | 22.0 | JPQDPK | 4.4 | JPQSPE | 4.6 |
| JPLABF | 5.6 | JPPDPE | 10.0 | JPQDPM | 14.7 | JPQSPK | 6.9 |
| JPLAPK | 4.8 | JPPDPK | 5.2 | JPQDRI | 6.0 | JPQSPM | 19.9 |
| JPLNBF | 1.0 | JPPDPM | 28.4 | JPQDSB | 9.8 | JPYDCG | 13.8 |
| JPLNDM | 13.0 | JPPDRI | 8.4 | JPQDSM | 14.1 | JPYDCN | 6.3 |
| JPLNML | 9.1 | JPPDSB | 30.7 | JPQDSO | 8.3 | JPYDOS | 13.2 |
| JPLNPE | 15.9 | JPPDSM | 9.3 | JPQDWH | 7.1 | JPYDRI | 9.3 |
| JPLNPK | 3.9 | JPPDSO | 45.0 | JPQFCG | 20.8 | JPYDSB | 7.8 |
| JPLSBF | 8.5 | JPPDWH | 23.9 | JPQFCN | 33.0 | JPYDWH | 15.1 |
| JPLSPK | 6.2 | JPQDBF | 6.9 | JPQFOM | 116.8 | | |
| JPQCOS | 10.4 | JPQDDB | 10.9 | JPQFSM | 23.6 | | |
| JPQCSB | 6.0 | JPQDDC | 10.3 | JPQFWH | 43.1 | | |

1/ Variable definition is found in appendix A, a computer-generated listing of JPGOL model.

and policy assumptions are the major driving forces of projections. Population was assumed to grow at a rate of 0.5 percent per year over the period 1981 to 2000, and real income was assumed to grow at an annual rate of 5.0 percent overall, or 4.5 percent per capita. Assumptions on other exogenous price indices were an annual growth rate of 7.5 percent for the general consumer price index (used as a proxy for the non-GOL price index), 6 percent for the fish price index, and 5.6 percent for both the index of the cost of production and the index of crop input prices. Trade prices of GOL commodities were assumed to grow at the same rate as the general price index. Continuation of current trade policies was assumed. For example, the current beef import tariff was assumed to remain in place, while the beef import quota was assumed to continue increasing by about 5 percent per year, reaching 313,000 MT in the year 2000. The base projections of major feed grains and livestock products generated by the JPGOL model are roughly in line with other ERS projections and official Japanese projections for 1990 (table 18).

In addition to providing baseline projections, the JPGOL model can also be used for evaluating the effects of changes in trade policies. As an example, a comparative static analysis of the anticipated effects of changes in Japan's beef import quotas is presented here.

The JPGOL base run (shown in table 18) assumed that the current 25 percent ad valorem import tariff would be maintained through the year 2000, while beef import quotas would be raised by about 5 percent per year. Then the model was simulated under the assumption of completely removing beef tariff and quota restrictions in 1981 and thereafter. Comparison of these alternative simulations shows that if all beef import restrictions were to be removed, then beef demand would increase by about 55 percent in the year 2000 (table 19). Japan's beef imports would more than double in 1990, and more than triple in 2000. Domestic beef prices would drop by 29 percent in 1990 and 45 percent in 2000. However, Japanese beef production would be reduced by only 6 to 9 percent. The impacts on other commodity sectors would vary. Generally, livestock product demand would be most affected. For example, under the scenario of removing beef import restrictions, lower beef prices would reduce the demand for pork, poultry, eggs, and dairy products. The substitution of imported beef for locally produced livestock products also would reduce Japanese feed demand for coarse grains and meals.

## CONCLUDING REMARKS

This report presents a 19-commodity grain, oilseeds, and livestock model of Japan. It accounts for cross-commodity substitution effects which often have been ignored in single-commodity models. The model can be used to project Japan's grain, oilseeds, and livestock economy in terms of demand, production, trade, and prices. The model also can analyze the effects of trade restrictions on domestic commodity markets.

In addition to simulating the model in a stand-alone mode as a single country agricultural sectoral model, researchers can link the JPGOL model to other GOL country and regional models in a world model system. Linkage to other GOL component models and the world market clearing mechanism via TROLL's LINKMOD feature (5) can provide a useful tool to analyze major policy effects in a global context for major trading countries. The linkage mechanism is explained in the documentation of the world GOL model by Liu and Roningen (7).

Table 18—Alternative projections of livestock products and feed grains 1990 and 2000

| Commodity | Actual 1980 | MAFF 1/ 1990 | ERS I 1/ 1990 | ERS II 1/ 1990 | JPGOL 1990 | JPGOL 2000 |
|---|---|---|---|---|---|---|
| | | | 1000 metric tons | | | |
| Meat: | | | | | | |
| Consumption-- | | | | | | |
| Total meats | 4930 | 6245 | 7049 | | | |
| Beef and veal | 590 | 890 | 1130 | 1278 | 810 | 1173 |
| Pork | 1677 | 2030 | 2630 | 2928 | 2150 | 3329 |
| Poultry--meat | 1222 | 1570 | 1932 | 2184 | 1713 | 2774 |
| Poultry--eggs | 2124 | 2250 | 2430 | 2730 | 2803 | 3629 |
| Production-- | | | | | | |
| Beef & Veal | 418 | 630 | 529 | 569 | 598 | 864 |
| Pork | 1396 | 1940 | 2498 | 2799 | 2069 | 3323 |
| Poultry--meat | 1145 | 1460 | 1868 | 2112 | 1477 | 2258 |
| Poultry--eggs | 1973 | 2220 | 2390 | 2695 | 2409 | 2910 |
| Feed grains: | | | | | | |
| Total consumption | 19197 | | 29659 | 32762 | 25453 | 28055 |
| Production | 400 | | 577 | 577 | 428 | 498 |
| Imports | 18863 | | 29082 | 32185 | 25030 | 27593 |

1/ Projections published in (1). The MAFF projections were previously published in The Long-Term Prospects for the Demand and Supply of Agricultural Products, released by MAFF, Government of Japan, November 1980. ERS I and ERS II projections are based on Coyle's assumptions (1), including higher income elasticities of demand for livestock products than those implied by MAFF. ERS II projections assume lower fish consumption then ERS I.

Table 19--Selected simulation results from changes in Japanese beef import restrictions

| Commodity | Base run with beef import quota | | In absence of beef quota | | Difference from base run | |
|---|---|---|---|---|---|---|
| | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 |
| | 1000 metric tons | | | | Percent | |
| Beef: | | | | | | |
| Demand quantity | 810 | 1173 | 1031 | 1823 | 27 | 55 |
| Production | 598 | 864 | 561 | 784 | -6 | -9 |
| Import | 214 | 313 | 473 | 1046 | 121 | 234 |
| Demand price 1/ | 9909 | 28982 | 7064 | 15960 | 29 | -45 |
| Other commodities: | | | | | | |
| Demand quantity-- | | | | | | |
| Pork | 2150 | 3329 | 2040 | 2932 | -5 | -12 |
| Poultry--meat | 1713 | 2774 | 1634 | 2594 | -5 | -7 |
| Eggs | 2803 | 3629 | 2790 | 3603 | -0.5 | -0.7 |
| Rice | 11294 | 11649 | 11294 | 11648 | 0 | 0 |
| Wheat | 6727 | 7466 | 6624 | 7273 | -2 | -3 |
| Coarse grains: | | | | | | |
| Feed demand | 22943 | 25518 | 22274 | 23924 | -3 | -6 |

1/ Price is in yen per kilogram.

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APPENDIX A

MODEL : JPGOL

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[
[-------------------------------------------------------------------------------[
[ NOTATION FOR ERS GRAIN, OILSEED, AND LIVESTOCK (GOL) MODEL : SYMBOL AND      [
[ VARIABLE NAMES CONTAIN UP TO 8 CHARACTERS AND ARE FOLLOWED BY A SUFFIX       [
[ WHICH SHOWS THE DECLARATION (E.G. CONSTANT, ENDOGENOUS VARIABLE, ETC.).      [
[ THE FIRST 2 CHARACTERS ARE THE COUNTRY CODE AND THE NEXT 2, AN EQUATION      [
[ 'TYPE' CODE. THE NEXT 2 CHARACTERS ARE USUALLY A 2 DIGIT COMMODITY CODE.     [
[ AN ELASTICITY WILL HAVE 2 MORE CHARACTERS INDICATING THE CODE TO WHCIH       [
[ THE ELASTICITY RELATES.  GENERALLY, THE NUMBER OF CHARACTERS IN A SYMBOL     [
[ HAS A MEANING:  5 CHAR. = COUNTRY SPECIFIC VARIABLE, 6 CHAR. =  COUNTRY     [
[ AND COMMODITY SPECIFIC VARIABLE, 7 CHAR.(ENDING WITH 'I') = EQUATION        [
[ INTERCEPT, 8 CHAR. = COEFFICIENT/ELASTICITY.                                [
[ COMMODITY CODES ARE:                                                        [
[   BF = BEEF+VEAL      PK = PORK              ML = MUTTON+LAMB(+GOAT)        [
[   DM = DAIRY-MILK     PM = POULTRY-MEAT      PE = POULTRY-EGGS              [
[   WH = WHEAT          CN = CORN              CG = OTHER COARSE GRAINS       [
[   RI = RICE           SB = SOYBEANS          OS = OTHER OILSEEDS            [
[   SM = SOYMEAL        SO = SOYOIL            OM = OTHER MEALS               [
[   OO = OTHER OILS     DB = DAIRY-BUTTER      DC = DAIRY-CHEESE              [
[   DO = DAIRY-OTHER PRODUCTS                                                 [
[ EQUATION 'TYPE' CODES ARE:                                                  [
[   MD = MARGIN-DOMESTIC                    MT = MARGIN-TRADE                 [
[   PS = PRICE-SUPPLY                       AR = AREA                         [
[   YD = YIELD                              QS = QUANTITY-SUPPLIED            [
[   QC = QUANTITY-CRUSHED                   FC = FEED COST                    [
[   LN = LIVESTOCK-NUMBERS                  LA = LIVESTOCK-ADDITIONS          [
[   LS = LIVESTOCK-SLAUGHTER                QF = QUANTITY-FEED                [
[   QD = QUANTITY-FOOD AND OTHER DEMAND     SK = ENDING STOCKS                [
[   QT = QUANTITY-TRADED                    PD = PRICE-DEMAND                 [
[   PE = PRICE ESTIMATE (DEMAND) WITH TRADE RESTRICTIONS                      [
[ POLICY VARIABLE CODES ARE :                                                 [
[   EQ = EXPORT QUOTA      MQ = IMPORT QUOTA      TE = TAX-EXPORTS            [
[   TM = TAX-IMPORTS       TP = TAX-PRODUCTION    TC = TAX-CONSUMPTION        [
[                                                                             [
[-------------------------------------------------------------------------------
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SYMBOL DECLARATIONS

ENDOGENOUS:

```
   JPARCG   - CROP AREA * OTHER COARSE GRAINS (1000 HECTARES)
   JPARCN   - CROP AREA * CORN (1000 HECTARES)
   JPAROS   - CROP AREA * OTHER OILSEEDS (1000 HECTARES)
   JPARRI   - CROP AREA * RICE (1000 HECTARES)
   JPARSB   - CROP AREA * SOYBEANS (1000 HECTARES)
   JPARTT   - TOTAL CROP AREA (1000 HECTARES)
   JPARWH   - CROP AREA * WHEAT (1000 HECTARES)
   JPLABF   - LIVESTOCK ADDITIONS * BEEF+VEAL (1000)
   JPLAML   - LIVESTOCK ADDITIONS * MUTTON+LAMB (1000)
   JPLAPK   - LIVESTOCK ADDITIONS * PORK (1000)
   JPLNBF   - LIVESTOCK NUMBERS * BEEF+VEAL (1000)
   JPLNDM   - LIVESTOCK NUMBERS * DAIRY-MILK (1000)
   JPLNML   - LIVESTOCK NUMBERS * MUTTON+LAMB (1000)
   JPLNPE   - LIVESTOCK NUMBERS * POULTRY-EGGS (1000)
   JPLNPK   - LIVESTOCK NUMBERS * PORK (1000)
```

JPLSBF - LIVESTOCK SLAUGHTER * BEEF+VEAL (1000)
JPLSML - LIVESTOCK SLAUGHTER * MUTTON+LAMB (1000)
JPLSPK - LIVESTOCK SLAUGHTER * PORK (1000)
JPMDBF - MARGIN (DOMESTIC) * BEEF+VEAL (JPYEN/MT)
JPMDDB - MARGIN (DOMESTIC) * DAIRY-BUTTER (JPYEN/MT)
JPMDDM - MARGIN (DOMESTIC) * DAIRY-MILK (JPYEN/MT)
JPMDDO - MARGIN (DOMESTIC) * DAIRY-OTHER PRODUCTS (JPYEN/MT)
JPMDPE - MARGIN (DOMESTIC) * POULTRY-EGGS (JPYEN/MT)
JPMDPK - MARGIN (DOMESTIC) * PORK (JPYEN/MT)
JPMDPM - MARGIN (DOMESTIC) * POULTRY-MEAT (JPYEN/MT)
JPMTBF - MARGIN (TRADE) * BEEF+VEAL (JPYEN/MT)
JPMTCG - MARGIN (TRADE) * OTHER COARSE GRAINS (JPYEN/MT)
JPMTDB - MARGIN (TRADE) * DAIRY-BUTTER (JPYEN/MT)
JPMTDC - MARGIN (TRADE) * DAIRY-CHEESE (JPYEN/MT)
JPMTDO - MARGIN (TRADE) * DAIRY-OTHER PRODUCTS (JPYEN/MT)
JPMTOM - MARGIN (TRADE) * OTHER MEALS (JPYEN/MT)
JPMTPE - MARGIN (TRADE) * POULTRY-EGGS (JPYEN/MT)
JPMTPK - MARGIN (TRADE) * PORK (JPYEN/MT)
JPMTPM - MARGIN (TRADE) * POULTRY-MEAT (JPYEN/MT)
JPMTSB - MARGIN (TRADE) * SOYBEANS (JPYEN/MT)
JPMTSM - MARGIN (TRADE) * SOYMEAL (JPYEN/MT)
JPMTSO - MARGIN (TRADE) * SOYOIL (JPYEN/MT)
JPMTWH - MARGIN (TRADE) * WHEAT (JPYEN/MT)
JPPDBF - PRICE (DEMAND) * BEEF+VEAL (JP YEN/MT)
JPPDCG - PRICE (DEMAND) * OTHER COARSE GRAINS (JP YEN/MT)
JPPDCN - PRICE (DEMAND) * CORN (JP YEN/MT)
JPPDDB - PRICE (DEMAND) * DAIRY-BUTTER (JP YEN/MT)
JPPDDC - PRICE (DEMAND) * DAIRY-CHEESE (JP YEN/MT)
JPPDDM - PRICE (DEMAND) * DAIRY-MILK (JP YEN/MT)
JPPDDO - PRICE (DEMAND) * DAIRY-OTHER PRODUCTS (JP YEN/MT)
JPPDML - PRICE (DEMAND) * MUTTON+LAMB (JP YEN/MT)
JPPDOM - PRICE (DEMAND) * OTHER MEALS (JP YEN/MT)
JPPDOO - PRICE (DEMAND) * OTHER OILS (JP YEN/MT)
JPPDOS - PRICE (DEMAND) * OTHER OILSEEDS (JP YEN/MT)
JPPDPE - PRICE (DEMAND) * POULTRY-EGGS (JP YEN/MT)
JPPDPK - PRICE (DEMAND) * PORK (JP YEN/MT)
JPPDPM - PRICE (DEMAND) * POULTRY-MEAT (JP YEN/MT)
JPPDRI - PRICE (DEMAND) * RICE (JP YEN/MT)
JPPDSB - PRICE (DEMAND) * SOYBEANS (JP YEN/MT)
JPPDSM - PRICE (DEMAND) * SOYMEAL (JP YEN/MT)
JPPDSO - PRICE (DEMAND) * SOYOIL (JP YEN/MT)
JPPDWH - PRICE (DEMAND) * WHEAT (JP YEN/MT)
JPPTBF - PRICE (TRADE) * BEEF+VEAL (JP YEN/MT)
JPPTCG - PRICE (TRADE) * OTHER COARSE GRAINS (JP YEN/MT)
JPPTCN - PRICE (TRADE) * CORN (JP YEN/MT)
JPPTDB - PRICE (TRADE) * DAIRY-BUTTER (JP YEN/MT)
JPPTDC - PRICE (TRADE) * DAIRY-CHEESE (JP YEN/MT)
JPPTDO - PRICE (TRADE) * DAIRY-OTHER PRODUCTS (JP YEN/MT)
JPPTML - PRICE (TRADE) * MUTTON+LAMB (JP YEN/MT)
JPPTOM - PRICE (TRADE) * OTHER MEALS (JP YEN/MT)
JPPTOO - PRICE (TRADE) * OTHER OILS (JP YEN/MT)
JPPTOS - PRICE (TRADE) * OTHER OILSEEDS (JP YEN/MT)
JPPTPE - PRICE (TRADE) * POULTRY-EGGS (JP YEN/MT)
JPPTPK - PRICE (TRADE) * PORK (JP YEN/MT)
JPPTPM - PRICE (TRADE) * POULTRY-MEAT (JP YEN/MT)
JPPTRI - PRICE (TRADE) * RICE (JP YEN/MT)

JPPTSB - PRICE (TRADE) * SOYBEANS (JP YEN/MT)
JPPTSM - PRICE (TRADE) * SOYMEAL (JP YEN/MT)
JPPTSO - PRICE (TRADE) * SOYOIL (JP YEN/MT)
JPPTWH - PRICE (TRADE) * WHEAT (JP YEN/MT)
JPQCOS - QUANTITY CRUSHED * OTHER OILSEEDS (1000 MT)
JPQCSB - QUANTITY CRUSHED * SOYBEANS (1000 MT)
JPQDBF - QUANTITY DEMANDED * BEEF+VEAL (1000 MT)
JPQDCG - QUANTITY DEMANDED * OTHER COARSE GRAINS (1000 MT)
JPQDCN - QUANTITY DEMANDED * CORN (1000 MT)
JPQDDB - QUANTITY DEMANDED * DAIRY-BUTTER (1000 MT)
JPQDDC - QUANTITY DEMANDED * DAIRY-CHEESE (1000 MT)
JPQDDM - QUANTITY DEMANDED * DAIRY-MILK (1000 MT)
JPQDDO - QUANTITY DEMANDED * DAIRY-OTHER PRODUCTS (1000 MT)
JPQDML - QUANTITY DEMANDED * MUTTON+LAMB (1000 MT)
JPQDOM - QUANTITY DEMANDED * OTHER MEALS (1000 MT)
JPQDOO - QUANTITY DEMANDED * OTHER OILS (1000 MT)
JPQDOS - QUANTITY DEMANDED * OTHER OILSEEDS (1000 MT)
JPQDPE - QUANTITY DEMANDED * POULTRY-EGGS (1000 MT)
JPQDPK - QUANTITY DEMANDED * PORK (1000 MT)
JPQDPM - QUANTITY DEMANDED * POULTRY-MEAT (1000 MT)
JPQDRI - QUANTITY DEMANDED * RICE (1000 MT)
JPQDSB - QUANTITY DEMANDED * SOYBEANS (1000 MT)
JPQDSM - QUANTITY DEMANDED * SOYMEAL (1000 MT)
JPQDSO - QUANTITY DEMANDED * SOYOIL (1000 MT)
JPQDWH - QUANTITY DEMANDED * WHEAT (1000 MT)
JPQFCG - QUANT. DEMANDED FOR FEED * OTHER COARSE GRAINS (1000 MT)
JPQFCN - QUANT. DEMANDED FOR FEED * CORN (1000 MT)
JPQFOM - QUANT. DEMANDED FOR FEED * OTHER MEALS (1000 MT)
JPQFSM - QUANT. DEMANDED FOR FEED * SOYMEAL (1000 MT)
JPQFWH - QUANT. DEMANDED FOR FEED * WHEAT (1000 MT)
JPQSBF - QUANTITY SUPPLIED * BEEF+VEAL (1000 MT)
JPQSDB - QUANTITY SUPPLIED * DAIRY-BUTTER (1000 MT)
JPQSDC - QUANTITY SUPPLIED * DAIRY-CHEESE (1000 MT)
JPQSDM - QUANTITY SUPPLIED * DAIRY-MILK (1000 MT)
JPQSDO - QUANTITY SUPPLIED * DAIRY-OTHER PRODUCTS (1000 MT)
JPQSML - QUANTITY SUPPLIED * MUTTON+LAMB (1000 MT)
JPQSPE - QUANTITY SUPPLIED * POULTRY-EGGS (1000 MT)
JPQSPK - QUANTITY SUPPLIED * PORK (1000 MT)
JPQSPM - QUANTITY SUPPLIED * POULTRY-MEAT (1000 MT)
JPQTBF - QUANTITY TRADED * BEEF+VEAL (1000 MT)
JPQTCG - QUANTITY TRADED * OTHER COARSE GRAINS (1000 MT)
JPQTCN - QUANTITY TRADED * CORN (1000 MT)
JPQTDB - QUANTITY TRADED * DAIRY-BUTTER (1000 MT)
JPQTDC - QUANTITY TRADED * DAIRY-CHEESE (1000 MT)
JPQTDO - QUANTITY TRADED * DAIRY-OTHER PRODUCTS (1000 MT)
JPQTML - QUANTITY TRADED * MUTTON+LAMB (1000 MT)
JPQTOM - QUANTITY TRADED * OTHER MEALS (1000 MT)
JPQTOO - QUANTITY TRADED * OTHER OILS (1000 MT)
JPQTOS - QUANTITY TRADED * OTHER OILSEEDS (1000 MT)
JPQTPE - QUANTITY TRADED * POULTRY-EGGS (1000 MT)
JPQTPK - QUANTITY TRADED * PORK (1000 MT)
JPQTPM - QUANTITY TRADED * POULTRY-MEAT (1000 MT)
JPQTRI - QUANTITY TRADED * RICE (1000 MT)
JPQTSB - QUANTITY TRADED * SOYBEANS (1000 MT)
JPQTSM - QUANTITY TRADED * SOYMEAL (1000 MT)
JPQTSO - QUANTITY TRADED * SOYOIL (1000 MT)

JPQTWH - QUANTITY TRADED *WHEAT (1000 MT)
JPSERI - SUBSIDY (EXPORT) * RICE (JP YEN/MT)
JPSKBF - ENDING STOCKS * BEEF+VEAL (1000 MT)
JPSKCG - ENDING STOCKS * OTHER COARSE GRAIN (1000 MT)
JPSKCN - ENDING STOCKS * CORN (1000 MT)
JPSKDB - ENDING STOCKS * DAIRY-BUTTER (1000 MT)
JPSKDC - ENDING STOCKS * DAIRY-CHEESE (1000 MT)
JPSKDO - ENDING STOCKS * DAIRY-OTHER PRODUCTS (1000 MT)
JPSKML - ENDING STOCKS * MUTTON+LAMB (1000 MT)
JPSKOM - ENDING STOCKS * OTHER MEALS (1000 MT)
JPSKOO - ENDING STOCKS * OTHER OILS (1000 MT)
JPSKOS - ENDING STOCKS * OTHER OILSEEDS (1000 MT)
JPSKPE - ENDING STOCKS * POULTRY-EGGS (1000 MT)
JPSKPK - ENDING STOCKS * PORK (1000 MT)
JPSKPM - ENDING STOCKS * POULTRY-MEAT (1000 MT)
JPSKRI - ENDING STOCKS * RICE (1000 MT)
JPSKSB - ENDING STOCKS * SOYBEANS (1000 MT)
JPSKSM - ENDING STOCKS * SOYMEAL (1000 MT)
JPSKSO - ENDING STOCKS * SOYOIL (1000 MT)
JPSKWH - ENDING STOCKS * WHEAT (1000 MT)
JPSPCG - SUBSIDY (PRODUCTION) * OTHER COARSE GRAINS (JP YEN/MT)
JPSPRI - SUBSIDY (PRODUCTION) * RICE (JP YEN/MT)
JPSPWH - SUBSIDY (PRODUTION) * WHEAT (JP YEN/MT)
JPTERI - TAX(+)/SUBSIDY(-) (EXPORT) * RICE (JP YEN/MT)
JPTPCG - TAX(+)/SUBSIDY(-) (PRODUCTION) * OTHER COARSE GRAINS (JPYEN/MT)
JPTPRI - TAX(+)/SUBSIDY(-) (PRODUCTION) * RICE (JP YEN/MT)
JPTPWH - TAX(+)/SUBSIDY(-) (PRODUCTION) * WHEAT (JPYEN/MT)
JPYDCG - CROP YIELD * OTHER COARSE GRAINS (MT/HECTARE)
JPYDCN - CROP YIELD * CORN (MT/HECTARE)
JPYDOS - CROP YIELD * OTHER OILSEEDS (MT/HECTARE)
JPYDRI - CROP YIELD * RICE (MT/HECTARE)
JPYDSB - CROP YIELD * SOYBEANS (MT/HECTARE)
JPYDWH - CROP YIELD * WHEAT (MT/HECTARE)

DEFINITION:
JPFCBF - FEED COST * BEEF+VEAL (JPYEN/MT)
JPFCDM - FEED COST * DAIRY-MILK (JPYEN/MT)
JPFCML - FEED COST * MUTTON+LAMB (JPYEN/MT)
JPFCPE - FEED COST * POULTRY-EGGS (JPYEN/MT)
JPFCPK - FEED COST * PORK (JPYEN/MT)
JPFCPM - FEED COST * POULTRY-MEAT (JPYEN/MT)
JPGCAU - GRAIN CONSUMING ANIMAL UNIT (FOR FEED DEMAND)
JPLPI - LIVESTOCK PRICE INDEX (WEIGHTED) FOR FEED DEMAND
JPOSPM - RATIO OF OTHER OILSEEDS CRUSHING RETURNS TO COSTS
JPPCBF - PRICE CONSTRAINT (DEFINITION) * BEEF+VEAL
JPPCCG - PRICE CONSTRAINT (DEFINITION) * OTHER COARSE GRAINS
JPPCCN - PRICE CONSTRAINT (DEFINITION) * CORN
JPPCDB - PRICE CONSTRAINT (DEFINITION) * DAIRY-BUTTER
JPPCDC - PRICE CONSTRAINT (DEFINITION) * DAIRY-CHEESE
JPPCDO - PRICE CONSTRAINT (DEFINITION) * DAIRY-OTHER PRODUCTS
JPPCML - PRICE CONSTRAINT (DEFINITION) * MUTTON+LAMB
JPPCOM - PRICE CONSTRAINT (DEFINITION) * OTHER MEALS
JPPCOO - PRICE CONSTRAINT (DEFINITION) * OTHER OILS
JPPCOS - PRICE CONSTRAINT (DEFINITION) * OTHER OILSEEDS
JPPCPE - PRICE CONSTRAINT (DEFINITION) * POULTRY-EGGS
JPPCPK - PRICE CONSTRAINT (DEFINITION) * PORK

JPPCPM - PRICE CONSTRAINT (DEFINITION) * POULTRY-MEAT
JPPCRI - PRICE CONSTRAINT (DEFINITION) * RICE
JPPCSB - PRICE CONSTRAINT (DEFINITION) * SOYBEANS
JPPCSM - PRICE CONSTRAINT (DEFINITION) * SOYMEAL
JPPCSO - PRICE CONSTRAINT (DEFINITION) * SOYOIL
JPPCWH - PRICE CONSTRAINT (DEFINITION) * WHEAT
JPPEBF - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * BEEF+VEAL
JPPECG - PRICE ESTIMATE FOR RESTRICTED TRADE * OTHER C. GRAINS
JPPECN - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * CORN
JPPEDB - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * DAIRY-BUTTER
JPPEDC - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * DAIRY-CHEESE
JPPEDO - PRICE ESTIMATE FOR RESTRICTED TRADE * DAIRY-OTHER PROD
JPPEML - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * MUTTON+LAMB
JPPEOM - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * OTHER MEALS
JPPEOO - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * OTHER OILS
JPPEOS - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * OTHER OILSEEDS
JPPEPE - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * POULTRY-EGGS
JPPEPK - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * PORK
JPPEPM - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * POULTRY-MEAT
JPPERI - PRICE ESTIMATE FOR RESTRICTED TRADE * RICE
JPPESB - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * SOYBEANS
JPPESM - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * SOYMEAL
JPPESO - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * SOYOIL
JPPEWH - PRICE ESTIMATE FOR RESTRICTED TRADE (DEM. DEF) * WHEAT
JPPRBF - PRICE (ADJUSTMENT) RATIO * BEEF+VEAL
JPPRCG - PRICE (ADJUSTMENT) RATIO * OTHER COARSE GRAINS
JPPRCN - PRICE (ADJUSTMENT) RATIO * CORN
JPPRDB - PRICE (ADJUSTMENT) RATIO * DAIRY-BUTTER
JPPRDC - PRICE (ADJUSTMENT) RATIO * DAIRY-CHEESE
JPPRDO - PRICE (ADJUSTMENT) RATIO * DAIRY-OTHER PRODUCTS
JPPRML - PRICE (ADJUSTMENT) RATIO * MUTTON+LAMB
JPPROM - PRICE (ADJUSTMENT) RATIO * OTHER MEALS
JPPROO - PRICE (ADJUSTMENT) RATIO * OTHER OILS
JPPROS - PRICE (ADJUSTMENT) RATIO * OTHER OILSEEDS
JPPRPE - PRICE (ADJUSTMENT) RATIO * POULTRY-EGGS
JPPRPK - PRICE (ADJUSTMENT) RATIO * PORK
JPPRPM - PRICE (ADJUSTMENT) RATIO * POULTRY-MEAT
JPPRRI - PRICE (ADJUSTMENT) RATIO * RICE
JPPRSB - PRICE (ADJUSTMENT) RATIO * SOYBEANS
JPPRSM - PRICE (ADJUSTMENT) RATIO * SOYMEAL
JPPRSO - PRICE (ADJUSTMENT) RATIO * SOYOIL
JPPRWH - PRICE (ADJUSTMENT) RATIO * WHEAT
JPPSBF - PRICE (SUPPLY) DEFINITION * BEEF+VEAL (JPYEN/MT)
JPPSCG - PRICE (SUPPLY) DEFINITION * OTHER COARSE GRAINS (JPYEN/MT)
JPPSCN - PRICE (SUPPLY) DEFINITION * CORN (JPYEN/MT)
JPPSDB - PRICE (SUPPLY) DEFINITION * DAIRY-BUTTER (JPYEN/MT)
JPPSDC - PRICE (SUPPLY) DEFINITION * DAIRY-CHEESE (JPYEN/MT)
JPPSDM - PRICE (SUPPLY) DEFINITION * DAIRY-MILK (JP YEN/MT)
JPPSDO - PRICE (SUPPLY) DEFINITION * DAIRY-OTHER PRODUCTS (JPYEN/MT)
JPPSML - PRICE (SUPPLY) DEFINITION * MUTTON+LAMB (JPYEN/MT)
JPPSOM - PRICE (SUPPLY) DEFINITION * OTHER MEALS (JPYEN/MT)
JPPSOO - PRICE (SUPPLY) DEFINITION * OTHER OILS (JPYEN/MT)
JPPSOS - PRICE (SUPPLY) DEFINITION * OTHER OILSEEDS (JPYEN/MT)
JPPSPE - PRICE (SUPPLY) DEFINITION * POULTRY-EGGS (JPYEN/MT)
JPPSPK - PRICE (SUPPLY) DEFINITION * PORK (JPYEN/MT)
JPPSPM - PRICE (SUPPLY) DEFINITION * POULTRY-MEAT (JPYEN/MT)

JPPSRI - PRICE (SUPPLY) DEFINITION * RICE (JP YEN/MT)
JPPSSB - PRICE (SUPPLY) DEFINITION * SOYBEANS (JPYEN/MT)
JPPSSM - PRICE (SUPPLY) DEFINITION * SOYMEAL (JPYEN/MT)
JPPSSO - PRICE (SUPPLY) DEFINITION * SOYOIL (JPYEN/MT)
JPPSWH - PRICE (SUPPLY) DEFINITION * WHEAT (JPYEN/MT)
JPQMDM - QUANTITY OF MILK AVAILABLE FOR MANUFACTURING (1000 MT)
JPQSCG - QUANTITY SUPPLIED * OTHER COARSE GRAINS (1000 MT)
JPQSCN - QUANTITY SUPPLIED * CORN (1000 MT)
JPQSOM - QUANTITY SUPPLIED * OTHER MEALS (1000 MT)
JPQSOO - QUANTITY SUPPLIED * OTHER OILS (1000 MT)
JPQSOS - QUANTITY SUPPLIED * OTHER OILSEEDS (1000 MT)
JPQSRI - QUANTITY SUPPLIED * RICE (1000 MT)
JPQSSB - QUANTITY SUPPLIED * SOYBEANS (1000 MT)
JPQSSM - QUANTITY SUPPLIED * SOYMEAL (1000 MT)
JPQSSO - QUANTITY SUPPLIED * SOYOIL (1000 MT)
JPQSWH - QUANTITY SUPPLIED * WHEAT (1000 MT)
JPSBPM - RATIO OF SOYBEAN CRUSHING RETURNS TO COSTS
JPTDBF - TOTAL DEMAND (1000 MT) * BEEF+VEAL
JPTDCG - TOTAL DEMAND (1000 MT) * OTHER COARSE GRAINS
JPTDCN - TOTAL DEMAND (1000 MT) * CORN
JPTDDB - TOTAL DEMAND (1000 MT) * DAIRY-BUTTER
JPTDDC - TOTAL DEMAND (1000 MT) * DAIRY-CHEESE
JPTDDO - TOTAL DEMAND (1000 MT) * DAIRY-OTHER PRODUCTS
JPTDML - TOTAL DEMAND (1000 MT) * MUTTON+LAMB
JPTDOM - TOTAL DEMAND (1000 MT) * OTHER MEALS
JPTDOO - TOTAL DEMAND (1000 MT) * OTHER OILS
JPTDOS - TOTAL DEMAND (1000 MT) * OTHER OILSEEDS
JPTDPE - TOTAL DEMAND (1000 MT) * POULTRY-EGGS
JPTDPK - TOTAL DEMAND (1000 MT) * PORK
JPTDPM - TOTAL DEMAND (1000 MT) * POULTRY-MEAT
JPTDRI - TOTAL DEMAND (1000 MT) * RICE
JPTDSB - TOTAL DEMAND (1000 MT) * SOYBEANS
JPTDSM - TOTAL DEMAND (1000 MT) * SOYMEAL
JPTDSO - TOTAL DEMAND (1000 MT) * SOYOIL
JPTDWH - TOTAL DEMAND (1000 MT) * WHEAT
JPTSBF - TOTAL SUPPLY (1000 MT) * BEEF+VEAL
JPTSCG - TOTAL SUPPLY (1000 MT) * OTHER COARSE GRAINS
JPTSCN - TOTAL SUPPLY (1000 MT) * CORN
JPTSDB - TOTAL SUPPLY (1000 MT) * DAIRY-BUTTER
JPTSDC - TOTAL SUPPLY (1000 MT) * DAIRY-CHEESE
JPTSDO - TOTAL SUPPLY (1000 MT) * DAIRY-OTHER PRODUCTS
JPTSML - TOTAL SUPPLY (1000 MT) * MUTTON+LAMB
JPTSOM - TOTAL SUPPLY (1000 MT) * OTHER MEALS
JPTSOO - TOTAL SUPPLY (1000 MT) * OTHER OILS
JPTSOS - TOTAL SUPPLY (1000 MT) * OTHER OILSEEDS
JPTSPE - TOTAL SUPPLY (1000 MT) * POULTRY-EGGS
JPTSPK - TOTAL SUPPLY (1000 MT) * PORK
JPTSPM - TOTAL SUPPLY (1000 MT) * POULTRY-MEAT
JPTSRI - TOTAL SUPPLY (1000 MT) * RICE
JPTSSB - TOTAL SUPPLY (1000 MT) * SOYBEANS
JPTSSM - TOTAL SUPPLY (1000 MT) * SOYMEAL
JPTSSO - TOTAL SUPPLY (1000 MT) * SOYOIL
JPTSWH - TOTAL SUPPLY (1000 MT) * WHEAT
JPTTRL - AVERAGE RETURN TO LAND (1976 JPYEN)

EXOGENOUS:

| | |
|---|---|
| JPICP | - INDEX OF COST OF PRODUCTION (1976=100) |
| JPINC | - INCOME (MILLION JP YEN) |
| JPMDCG | - MARGIN (DOMESTIC) * OTHER COARSE GRAINS (JPYEN/MT) |
| JPMDCN | - MARGIN (DOMESTIC) * CORN (JPYEN/MT) |
| JPMDDC | - MARGIN (DOMESTIC) * DAIRY-CHEESE (JPYEN/MT) |
| JPMDML | - MARGIN (DOMESTIC) * MUTTON+LAMB (JPYEN/MT) |
| JPMDOM | - MARGIN (DOMESTIC) * OTHER MEALS (JPYEN/MT) |
| JPMDOO | - MARGIN (DOMESTIC) * OTHER OILS (JPYEN/MT) |
| JPMDOS | - MARGIN (DOMESTIC) * OTHER OILSEEDS (JPYEN/MT) |
| JPMDRI | - MARGIN (DOMESTIC) * RICE (JP YEN/MT) |
| JPMDSB | - MARGIN (DOMESTIC) * SOYBEANS (JPYEN/MT) |
| JPMDSM | - MARGIN (DOMESTIC) * SOYMEAL (JPYEN/MT) |
| JPMDSO | - MARGIN (DOMESTIC) * SOYOIL (JPYEN/MT) |
| JPMDWH | - MARGIN (DOMESTIC) * WHEAT (JPYEN/MT) |
| JPMTCN | - MARGIN (TRADE) * CORN (JPYEN/MT) |
| JPMTML | - MARGIN (TRADE) * MUTTON+LAMB (JPYEN/MT) |
| JPMTOO | - MARGIN (TRADE) * OTHER OILS (JPYEN/MT) |
| JPMTOS | - MARGIN (TRADE) * OTHER OILSEEDS (JPYEN/MT) |
| JPMTRI | - MARGIN (TRADE) * RICE (JPYEN/MT) |
| JPPDFI | - DEMAND PRICE INDEX * FISH |
| JPPIN | - PRICE INDEX OF CROP INPUTS (FERTILIZER, ETC., 1976=100) |
| JPPNG | - PRICE INDEX OF NON-GOL ITEMS (1976=100) |
| JPPOP | - POPULATION (MILLION) |
| JPWIN | - WEATHER INDEX |
| TIME | - TIME |
| WDPTBF | - WORLD PRICE (TRADE) * BEEF+VEAL (JP YEN/MT) |
| WDPTCG | - WORLD PRICE (TRADE) * OTHER COARSE GRAINS (JP YEN/MT) |
| WDPTCN | - WORLD PRICE (TRADE) * CORN (JP YEN/MT) |
| WDPTDB | - WORLD PRICE (TRADE) * DAIRY-BUTTER (JP YEN/MT) |
| WDPTDC | - WORLD PRICE (TRADE) * DAIRY-CHEESE (JP YEN/MT) |
| WDPTDO | - WORLD PRICE (TRADE) * DAIRY-OTHER PRODUCTS (JP YEN/MT) |
| WDPTML | - WORLD PRICE (TRADE) * MUTTON+LAMB (JP YEN/MT) |
| WDPTOM | - WORLD PRICE (TRADE) * OTHER MEALS (JP YEN/MT) |
| WDPTOO | - WORLD PRICE (TRADE) * OTHER OILS (JP YEN/MT) |
| WDPTOS | - WORLD PRICE (TRADE) * OTHER OILSEEDS (JP YEN/MT) |
| WDPTPE | - WORLD PRICE (TRADE) * POULTRY-EGGS (JP YEN/MT) |
| WDPTPK | - WORLD PRICE (TRADE) * PORK (JP YEN/MT) |
| WDPTPM | - WORLD PRICE (TRADE) * POULTRY-MEAT (JP YEN/MT) |
| WDPTRI | - WORLD PRICE (TRADE) * RICE (JP YEN/MT) |
| WDPTSB | - WORLD PRICE (TRADE) * SOYBEANS (JP YEN/MT) |
| WDPTSM | - WORLD PRICE (TRADE) * SOYMEAL (JP YEN/MT) |
| WDPTSO | - WORLD PRICE (TRADE) * SOYOIL (JP YEN/MT) |
| WDPTWH | - WORLD PRICE (TRADE) * WHEAT (JP YEN/MT) |

POLICY:

| | |
|---|---|
| JPEQBF | - EXPORT QUOTA * BEEF+VEAL (1000 MT) |
| JPEQCG | - EXPORT QUOTA * OTHER COARSE GRAINS (1000 MT) |
| JPEQCN | - EXPORT QUOTA * CORN (1000 MT) |
| JPEQDB | - EXPORT QUOTA * DAIRY-BUTTER (1000 MT) |
| JPEQDC | - EXPORT QUOTA * DAIRY-CHEESE (1000 MT) |
| JPEQDO | - EXPORT QUOTA * DAIRY-OTHER PRODUCTS (1000 MT) |
| JPEQML | - EXPORT QUOTA * MUTTON+LAMB (1000 MT) |
| JPEQOM | - EXPORT QUOTA * OTHER MEALS (1000 MT) |
| JPEQOO | - EXPORT QUOTA * OTHER OILS (1000 MT) |
| JPEQOS | - EXPORT QUOTA * OTHER OILSEEDS (1000 MT) |

JPEQPE - EXPORT QUOTA * POULTRY-EGGS (1000 MT)
JPEQPK - EXPORT QUOTA * PORK (1000 MT)
JPEQPM - EXPORT QUOTA * POULTRY-MEAT (1000 MT)
JPEQRI - EXPORT QUOTA * RICE (1000 MT)
JPEQSB - EXPORT QUOTA * SOYBEANS (1000 MT)
JPEQSM - EXPORT QUOTA * SOYMEAL (1000 MT)
JPEQSO - EXPORT QUOTA * SOYOIL (1000 MT)
JPEQWH - EXPORT QUOTA * WHEAT (1000 MT)
JPMQBF - IMPORT QUOTA * BEEF+VEAL (1000 MT)
JPMQCG - IMPORT QUOTA * OTHER COARSE GRAINS (1000 MT)
JPMQCN - IMPORT QUOTA * CORN (1000 MT)
JPMQDB - IMPORT QUOTA * DAIRY-BUTTER (1000 MT)
JPMQDC - IMPORT QUOTA * DAIRY-CHEESE (1000 MT)
JPMQDO - IMPORT QUOTA * DAIRY-OTHER PRODUCTS (1000 MT)
JPMQML - IMPORT QUOTA * MUTTON+LAMB (1000 MT)
JPMQOM - IMPORT QUOTA * OTHER MEALS (1000 MT)
JPMQOO - IMPORT QUOTA * OTHER OILS (1000 MT)
JPMQOS - IMPORT QUOTA * OTHER OILSEEDS (1000 MT)
JPMQPE - IMPORT QUOTA * POULTRY-EGGS (1000 MT)
JPMQPK - IMPORT QUOTA * PORK (1000 MT)
JPMQPM - IMPORT QUOTA * POULTRY-MEAT (1000 MT)
JPMQRI - IMPORT QUOTA * RICE (1000 MT)
JPMQSB - IMPORT QUOTA * SOYBEANS (1000 MT)
JPMQSM - IMPORT QUOTA * SOYMEAL (1000 MT)
JPMQSO - IMPORT QUOTA * SOYOIL (1000 MT)
JPMQWH - IMPORT QUOTA * WHEAT (1000 MT)
JPTCBF - TAX(+)/SUBSIDY(-) (CONSUMPTION) * BEEF+VEAL (JPYEN/MT)
JPTCCG - TAX(+)/SUBSIDY(-) (CONSUMPTION) * OTHER COARSE GRAINS (JPYEN/MT)
JPTCCN - TAX(+)/SUBSIDY(-) (CONSUMPTION) * CORN (JPYEN/MT)
JPTCDB - TAX(+)/SUBSIDY(-) (CONSUMPTION) * DAIRY-BUTTER (JPYEN/MT)
JPTCDC - TAX(+)/SUBSIDY(-) (CONSUMPTION) * DAIRY-CHEESE (JPYEN/MT)
JPTCDM - TAX(+)/SUBSIDY(-) (CONSUMPTION) * DAIRY-MILK (JP YEN/MT)
JPTCDO - TAX(+)/SUBSIDY(-) (CONSUMPTION) * DAIRY-OTHER PRODUCTS (JPYEN/MT)
JPTCML - TAX(+)/SUBSIDY(-) (CONSUMPTION) * MUTTON+LAMB (JPYEN/MT)
JPTCOM - TAX(+)/SUBSIDY(-) (CONSUMPTION) * OTHER MEALS (JPYEN/MT)
JPTCOO - TAX(+)/SUBSIDY(-) (CONSUMPTION) * OTHER OILS (JPYEN/MT)
JPTCOS - TAX(+)/SUBSIDY(-) (CONSUMPTION) * OTHER OILSEEDS (JPYEN/MT)
JPTCPE - TAX(+)/SUBSIDY(-) (CONSUMPTION) * POULTRY-EGGS (JPYEN/MT)
JPTCPK - TAX(+)/SUBSIDY(-) (CONSUMPTION) * PORK (JPYEN/MT)
JPTCPM - TAX(+)/SUBSIDY(-) (CONSUMPTION) * POULTRY-MEAT (JPYEN/MT)
JPTCRI - TAX(+)/SUBSIDY(-) (CONSUMPTION) * RICE (JPYEN/MT)
JPTCSB - TAX(+)/SUBSIDY(-) (CONSUMPTION) * SOYBEANS (JPYEN/MT)
JPTCSM - TAX(+)/SUBSIDY(-) (CONSUMPTION) * SOYMEAL (JPYEN/MT)
JPTCSO - TAX(+)/SUBSIDY(-) (CONSUMPTION) * SOYOIL (JPYEN/MT)
JPTCWH - TAX(+)/SUBSIDY(-) (CONSUMPTION) * WHEAT (JPYEN/MT)
JPTEBF - TAX(+)/SUBSIDY(-) (EXPORT) * BEEF+VEAL (JP YEN/MT)
JPTECG - TAX(+)/SUBSIDY(-) (EXPORT) * OTHER COARSE GRAINS (JP YEN/MT)
JPTECN - TAX(+)/SUBSIDY(-) (EXPORT) * CORN (JP YEN/MT)
JPTEDB - TAX(+)/SUBSIDY(-) (EXPORT) * DAIRY-BUTTER (JP YEN/MT)
JPTEDC - TAX(+)/SUBSIDY(-) (EXPORT) * DAIRY-CHEESE (JP YEN/MT)
JPTEDO - TAX(+)/SUBSIDY(-) (EXPORT) * DAIRY-OTHER PRODUCTS (JP YEN/MT)
JPTEML - TAX(+)/SUBSIDY(-) (EXPORT) * MUTTON+LAMB (JP YEN/MT)
JPTEOM - TAX(+)/SUBSIDY(-) (EXPORT) * OTHER MEALS (JP YEN/MT)
JPTEOO - TAX(+)/SUBSIDY(-) (EXPORT) * OTHER OILS (JP YEN/MT)
JPTEOS - TAX(+)/SUBSIDY(-) (EXPORT) * OTHER OILSEEDS (JP YEN/MT)
JPTEPE - TAX(+)/SUBSIDY(-) (EXPORT) * POULTRY-EGGS (JP YEN/MT)

JPTEPK - TAX(+)/SUBSIDY(-) (EXPORT) * PORK (JP YEN/MT)
JPTEPM - TAX(+)/SUBSIDY(-) (EXPORT) * POULTRY-MEAT (JP YEN/MT)
JPTESB - TAX(+)/SUBSIDY(-) (EXPORT) * SOYBEANS (JP YEN/MT)
JPTESM - TAX(+)/SUBSIDY(-) (EXPORT) * SOYMEAL (JP YEN/MT)
JPTESO - TAX(+)/SUBSIDY(-) (EXPORT) * SOYOIL (JP YEN/MT)
JPTEWH - TAX(+)/SUBSIDY(-) (EXPORT) * WHEAT (JP YEN/MT)
JPTMBF - TARIFF(+)/SUBSIDY(-) (IMPORT) * BEEF+VEAL (JP YEN/MT)
JPTMCG - TARIFF(+)/SUBSIDY(-) (IMPORT) * OTHER COARSE GRAINS (JP YEN/MT)
JPTMCN - TARIFF(+)/SUBSIDY(-) (IMPORT) * CORN (JP YEN/MT)
JPTMDB - TARIFF(+)/SUBSIDY(-) (IMPORT) * DAIRY-BUTTER (JP YEN/MT)
JPTMDC - TARIFF(+)/SUBSIDY(-) (IMPORT) * DAIRY-CHEESE (JP YEN/MT)
JPTMDO - TARIFF(+)/SUBSIDY(-) (IMPORT) * DAIRY-OTHER PRODUCTS (JP YEN/MT)
JPTMML - TARIFF(+)/SUBSIDY(-) (IMPORT) * MUTTON+LAMB (JP YEN/MT)
JPTMOM - TARIFF(+)/SUBSIDY(-) (IMPORT) * OTHER MEALS (JP YEN/MT)
JPTMOO - TARIFF(+)/SUBSIDY(-) (IMPORT) * OTHER OILS (JP YEN/MT)
JPTMOS - TARIFF(+)/SUBSIDY(-) (IMPORT) * OTHER OILSEEDS (JP YEN/MT)
JPTMPE - TARIFF(+)/SUBSIDY(-) (IMPORT) * POULTRY-EGGS (JP YEN/MT)
JPTMPK - TARIFF(+)/SUBSIDY(-) (IMPORT) * PORK (JP YEN/MT)
JPTMPM - TARIFF(+)/SUBSIDY(-) (IMPORT) * POULTRY-MEAT (JP YEN/MT)
JPTMRI - TARIFF(+)/SUBSIDY(-) (IMPORT) * RICE (JP YEN/MT)
JPTMSB - TARIFF(+)/SUBSIDY(-) (IMPORT) * SOYBEANS (JP YEN/MT)
JPTMSM - TARIFF(+)/SUBSIDY(-) (IMPORT) * SOYMEAL (JP YEN/MT)
JPTMSO - TARIFF(+)/SUBSIDY(-) (IMPORT) * SOYOIL (JP YEN/MT)
JPTMWH - TARIFF(+)/SUBSIDY(-) (IMPORT) * WHEAT (JP YEN/MT)
JPTPBF - TAX(+)/SUBSIDY(-) (PRODUCTION) * BEEF+VEAL (JPYEN/MT)
JPTPCN - TAX(+)/SUBSIDY(-) (PRODUCTION) * CORN (JPYEN/MT)
JPTPDB - TAX(+)/SUBSIDY(-) (PRODUCTION) * DAIRY-BUTTER (JPYEN/MT)
JPTPDC - TAX(+)/SUBSIDY(-) (PRODUCTION) * DAIRY-CHEESE (JPYEN/MT)
JPTPDM - TAX(+)/SUBSIDY(-) (PRODUCTION) * DAIRY-MILK (JPYEN/MT)
JPTPDO - TAX(+)/SUBSIDY(-) (PRODUCTION) * DAIRY-OTHER PRODUCTS (JPYEN/MT)
JPTPML - TAX(+)/SUBSIDY(-) (PRODUCTION) * MUTTON+LAMB (JPYEN/MT)
JPTPOM - TAX(+)/SUBSIDY(-) (PRODUCTION) * OTHER MEALS (JPYEN/MT)
JPTPOO - TAX(+)/SUBSIDY(-) (PRODUCTION) * OTHER OILS (JPYEN/MT)
JPTPOS - TAX(+)/SUBSIDY(-) (PRODUCTION) * OTHER OILSEEDS (JPYEN/MT)
JPTPPE - TAX(+)/SUBSIDY(-) (PRODUCTION) * POULTRY-EGGS (JPYEN/MT)
JPTPPK - TAX(+)/SUBSIDY(-) (PRODUCTION) * PORK (JPYEN/MT)
JPTPPM - TAX(+)/SUBSIDY(-) (PRODUCTION) * POULTRY-MEAT (JPYEN/MT)
JPTPSB - TAX(+)/SUBSIDY(-) (PRODUCTION) * SOYBEANS (JPYEN/MT)
JPTPSM - TAX(+)/SUBSIDY(-) (PRODUCTION) * SOYMEAL (JPYEN/MT)
JPTPSO - TAX(+)/SUBSIDY(-) (PRODUCTION) * SOYOIL (JPYEN/MT)

FUNCTION:
ABSV

COEFFICIENT:
JPARCGCG - AREA ELAS. * OTHER COARSE GRAINS WRT OTHER COARSE GRAINS
JPARCGCN - AREA ELAS. * OTHER COARSE GRAINS WRT CORN
JPARCGI - INTERCEPT OF CROP AREA EQUATION * OTHER COARSE GRAINS
JPARCGOS - AREA ELAS. * OTHER COARSE GRAINS WRT OTHER OILSEEDS
JPARCGRI - AREA ELAS. * OTHER COARSE GRAINS WRT RICE
JPARCGSB - AREA ELAS. * OTHER COARSE GRAINS WRT SOYBEANS
JPARCGWH - AREA ELAS. * OTHER COARSE GRAINS WRT WHEAT
JPARCNCG - AREA ELAS. * CORN WRT OTHER COARSE GRAINS
JPARCNCN - AREA ELAS. * CORN WRT CORN
JPARCNI - INTERCEPT OF CROP AREA EQUATION * CORN
JPARCNOS - AREA ELAS. * CORN WRT OTHER OILSEEDS

JPARCNRI - AREA ELAS. * CORN WRT RICE
JPARCNSB - AREA ELAS. * CORN WRT SOYBEANS
JPARCNWH - AREA ELAS. * CORN WRT WHEAT
JPAROSCG - AREA ELAS. * OTHER OILSEEDS WRT OTHER COARSE GRAINS
JPAROSCN - AREA ELAS. * OTHER OILSEEDS WRT CORN
JPAROSI - INTERCEPT OF CROP AREA EQUATION * OTHER OILSEEDS
JPAROSOS - AREA ELAS. * OTHER OILSEEDS WRT OTHER OILSEEDS
JPAROSRI - AREA ELAS. * OTHER OILSEEDS WRT RICE
JPAROSSB - AREA ELAS. * OTHER OILSEEDS WRT SOYBEANS
JPAROSWH - AREA ELAS. * OTHER OILSEEDS WRT WHEAT
JPARRICG - AREA ELAS. * RICE WRT OTHER COARSE GRAINS
JPARRICN - AREA ELAS. * RICE WRT CORN
JPARRII - INTERCEPT OF CROP AREA EQUATION * RICE
JPARRIOS - AREA ELAS. * RICE WRT OTHER OILSEEDS
JPARRIRI - AREA ELAS. * RICE WRT RICE
JPARRISB - AREA ELAS. * RICE WRT SOYBEANS
JPARRIWH - AREA ELAS. * RICE WRT WHEAT
JPARSBCG - AREA ELAS. * SOYBEANS WRT OTHER COARSE GRAINS
JPARSBCN - AREA ELAS. * SOYBEANS WRT CORN
JPARSBI - INTERCEPT OF CROP AREA EQUATION * SOYBEANS
JPARSBOS - AREA ELAS. * SOYBEANS WRT OTHER OILSEEDS
JPARSBRI - AREA ELAS. * SOYBEANS WRT RICE
JPARSBSB - AREA ELAS. * SOYBEANS WRT SOYBEANS
JPARSBWH - AREA ELAS. * SOYBEANS WRT WHEAT
JPARTTI - INTERCEPT OF TOTAL CROP AREA EQUATION
JPARTTRL - TOTAL FARMLAND AREA ELASTICITY (WRT REAL RETURN ON LAND)
JPARTTTR - ANNUAL GROWTH RATE OF FARMLAND
JPARWHCG - AREA ELAS. * WHEAT WRT OTHER COARSE GRAINS
JPARWHCN - AREA ELAS. * WHEAT WRT CORN
JPARWHI - INTERCEPT OF CROP AREA EQUATION * WHEAT
JPARWHOS - AREA ELAS. * WHEAT WRT OTHER OILSEEDS
JPARWHRI - AREA ELAS. * WHEAT WRT RICE
JPARWHSB - AREA ELAS. * WHEAT WRT SOYBEANS
JPARWHWH - AREA ELAS. * WHEAT WRT WHEAT
JPLABFI - INTERCEPT OF LIVESTOCK ADDITION EQ. * BEEF+VEAL
JPLABFPC - CUR. PRICE ELAST. LIVESTOCK ADDITIONS * BEEF+VEAL
JPLABFPL - LAG. PRICE ELAST. LIVESTOCK ADDITIONS * BEEF+VEAL
JPLAMLI - INTERCEPT OF LIVESTOCK ADDITION EQ. * MUTTON+LAMB
JPLAMLPC - CUR. PRICE ELAST. LIVESTOCK ADDITIONS * MUTTON+LAMB
JPLAMLPL - LAG. PRICE ELAST. LIVESTOCK ADDITIONS * MUTTON+LAMB
JPLAPKI - INTERCEPT OF LIVESTOCK ADDITION EQ. * PORK
JPLAPKPC - CUR. PRICE ELAST. LIVESTOCK ADDITIONS * PORK
JPLAPKPL - LAG. PRICE ELAST. LIVESTOCK ADDITIONS * PORK
JPLNDMI - INTERCEPT OF LIVESTOCK NUMBERS EQUATION * DAIRY-MILK
JPLNDMLG - NUMBERS ELASTICITY WRT LAGGED NUMBERS * DAIRY-MILK
JPLNDMPC - CUR. PRICE ELAST. LIVESTOCK NUMBERS * DAIRY-MILK
JPLNDMPL - LAG. PRICE ELAST. LIVESTOCK NUMBERS * DAIRY-MILK
JPLNPEI - INTERCEPT OF LIVESTOCK NUMBERS EQ. * POULTRY-EGGS
JPLNPELG - NUMBERS ELASTICITY WRT LAGGED NUMBERS * POULTRY-EGGS
JPLNPEPC - CUR. PRICE ELAST. LIVESTOCK NUMBERS * POULTRY-EGGS
JPLNPEPL - LAG. PRICE ELAST. LIVESTOCK NUMBERS * POULTRY-EGGS
JPLSBFI - INTERCEPT OF LIVESTOCK SLAUGHTER EQ. * BEEF+VEAL
JPLSBFPC - CUR. PRICE ELAST. LIVESTOCK SLAUGHTER * BEEF+VEAL
JPLSBFPL - LAG. PRICE ELAST. LIVESTOCK SLAUGHTER * BEEF+VEAL
JPLSMLI - INTERCEPT OF LIVESTOCK SLAUGHTER EQ. * MUTTON+LAMB
JPLSMLPC - CUR. PRICE ELAST. LIVESTOCK SLAUGHTER * MUTTON+LAMB

JPLSMLPL - LAG. PRICE ELAST. LIVESTOCK SLAUGHTER * MUTTON+LAMB
JPLSPKI - INTERCEPT OF LIVESTOCK SLAUGHTER EQ. * PORK
JPLSPKPC - CUR. PRICE ELAST. LIVESTOCK SLAUGHTER * PORK
JPLSPKPL - LAG. PRICE ELAST. LIVESTOCK SLAUGHTER * PORK
JPMDBFI - INTERCEPT OF DOMESTIC MARGIN EQUATION * BEEF+VEAL
JPMDBFPC - DOMESTIC MARGIN ELAST. WRT CUR. NON-GOL PRICE * BEEF+VEAL
JPMDBFPL - DOMESTIC MARGIN ELAST. WRT LAG. NON-GOL PRICE * BEEF+VEAL
JPMDDBI - INTERCEPT OF DOMESTIC MARGIN EQUATION * DAIRY-BUTTER
JPMDDBPC - DOMESTIC MARGIN ELAST. WRT CUR. NON-GOL PRICE * DAIRY-BUTTER
JPMDDBPL - DOMESTIC MARGIN ELAST. WRT LAG. NON-GOL PRICE * DAIRY-BUTTER
JPMDDMI - INTERCEPT OF DOMESTIC MARGIN EQUATION * DAIRY-MILK
JPMDDMPC - DOMESTIC MARGIN ELAST. WRT CUR. NON-GOL PRICE * DAIRY-MILK
JPMDDMPL - DOMESTIC MARGIN ELAST. WRT LAG. NON-GOL PRICE * DAIRY-MILK
JPMDDOI - INTERCEPT OF DOMESTIC MARGIN EQUATION * DAIRY-OTHER PRODUCTS
JPMDDOPC - DOM. MARG. ELAST. WRT CUR. NON-GOL PRICE * DAIRY OTHER PRODUCTS
JPMDDOPL - DOM. MARG. ELAST. WRT LAG. NON-GOL PRICE * DAIRY OTHER PRODUCTS
JPMDPEI - INTERCEPT OF DOMESTIC MARGIN EQUATION * POULTRY-EGGS
JPMDPEPC - DOMESTIC MARGIN ELAST. WRT CUR. NON-GOL PRICE * POULTRY-EGGS
JPMDPEPL - DOMESTIC MARGIN ELAST. WRT LAG. NON-GOL PRICE * POULTRY-EGGS
JPMDPKI - INTERCEPT OF DOMESTIC MARGIN EQUATION * PORK
JPMDPKPC - DOMESTIC MARGIN ELAST. WRT CUR. NON-GOL PRICE * PORK
JPMDPKPL - DOMESTIC MARGIN ELAST. WRT LAG. NON-GOL PRICE * PORK
JPMDPMI - INTERCEPT OF DOMESTIC MARGIN EQUATION * POULTRY-MEAT
JPMDPMPC - DOMESTIC MARGIN ELAST. WRT CUR. NON-GOL PRICE * POULTRY-MEAT
JPMDPMPL - DOMESTIC MARGIN ELAST. WRT LAG. NON-GOL PRICE * POULTRY-MEAT
JPMTBFI - INTERCEPT OF TRADE MARGIN EQUATION * BEEF+VEAL
JPMTBFPC - TRADE MARGIN ELAST. WRT CUR. NON-GOL PRICE * BEEF+VEAL
JPMTBFPL - TRADE MARGIN ELAST. WRT LAG. NON-GOL PRICE * BEEF+VEAL
JPMTCGI - INTERCEPT OF TRADE MARGIN EQUATION * OTHER COARSE GRAINS
JPMTCGPC - TRADE MARG. ELAST. WRT CUR. NON-GOL PRICE * OTHER COARSE GRAINS
JPMTCGPL - TRADE MARG. ELAST. WRT LAG. NON-GOL PRICE * OTHER COARSE GRAINS
JPMTDBI - INTERCEPT OF TRADE MARGIN EQUATION * DAIRY-BUTTER
JPMTDBPC - TRADE MARGIN ELAST. WRT CUR. NON-GOL PRICE * DAIRY-BUTTER
JPMTDBPL - TRADE MARGIN ELAST. WRT LAG. NON-GOL PRICE * DAIRY-BUTTER
JPMTDCI - INTERCEPT OF TRADE MARGIN EQUATION * DAIRY-CHEESE
JPMTDCPC - TRADE MARGIN ELAST. WRT CUR. NON-GOL PRICE * DAIRY-CHEESE
JPMTDCPL - TRADE MARGIN ELAST. WRT LAG. NON-GOL PRICE * DAIRY-CHEESE
JPMTDOI - INTERCEPT OF TRADE MARGIN EQUATION * DAIRY-OTHER PRODUCTS
JPMTDOPC - TRADE MARG. ELAS. WRT CUR. NON-GOL PRICE * DAIRY-OTHER PRODUCTS
JPMTDOPL - TRADE MARG. ELAS. WRT LAG. NON-GOL PRICE * DAIRY-OTHER PRODUCTS
JPMTOMI - INTERCEPT OF TRADE MARGIN EQUATION * OTHER MEALS
JPMTOMPC - TRADE MARGIN ELAST. WRT CUR. NON-GOL PRICE * OTHER MEALS
JPMTOMPL - TRADE MARGIN ELAST. WRT LAG. NON-GOL PRICE * OTHER MEALS
JPMTPEI - INTERCEPT OF TRADE MARGIN EQUATION * POULTRY-EGGS
JPMTPEPC - TRADE MARGIN ELAST. WRT CUR. NON-GOL PRICE * POULTRY-EGGS
JPMTPEPL - TRADE MARGIN ELAST. WRT LAG. NON-GOL PRICE * POULTRY-EGGS
JPMTPKI - INTERCEPT OF TRADE MARGIN EQUATION * PORK
JPMTPKPC - TRADE MARGIN ELAST. WRT CUR. NON-GOL PRICE * PORK
JPMTPKPL - TRADE MARGIN ELAST. WRT LAG. NON-GOL PRICE * PORK
JPMTPMI - INTERCEPT OF TRADE MARGIN EQUATION * POULTRY-MEAT
JPMTPMPC - TRADE MARGIN ELAST. WRT CUR. NON-GOL PRICE * POULTRY-MEAT
JPMTPMPL - TRADE MARGIN ELAST. WRT LAG. NON-GOL PRICE * POULTRY-MEAT
JPMTSBI - INTERCEPT OF TRADE MARGIN EQUATION * SOYBEANS
JPMTSBPC - TRADE MARGIN ELAST. WRT CUR. NON-GOL PRICE * SOYBEANS
JPMTSBPL - TRADE MARGIN ELAST. WRT LAG. NON-GOL PRICE * SOYBEANS
JPMTSMI - INTERCEPT OF TRADE MARGIN EQUATION * SOYMEAL

JPMTSMPC - TRADE MARGIN ELAST. WRT CUR. NON-GOL PRICE * SOYMEAL
JPMTSMPL - TRADE MARGIN ELAST. WRT LAG. NON-GOL PRICE * SOYMEAL
JPMTSOI - INTERCEPT OF TRADE MARGIN EQUATION * SOYOIL
JPMTSOPC - TRADE MARGIN ELAST. WRT CUR. NON-GOL PRICE * SOYOIL
JPMTSOPL - TRADE MARGIN ELAST. WRT LAG. NON-GOL PRICE * SOYOIL
JPMTWHI - INTERCEPT OF TRADE MARGIN EQUATION * WHEAT
JPMTWHPC - TRADE MARGIN ELAST. WRT CUR. NON-GOL PRICE * WHEAT
JPMTWHPL - TRADE MARGIN ELAST. WRT LAG. NON-GOL PRICE * WHEAT
JPPDDMI - INTERCEPT OF DEMAND PRICE EQUATION * DAIRY-MILK
JPQCOSI - INTERCEPT OF CRUSHING DEMAND EQUATION * OTHER OILSEEDS
JPQCOSPM - CRUSHING DEMAND ELAST. * OTHER OILSEEDS WRT CRUSH. MARG.
JPQCOSTR - ANNUAL GROWTH RATE OF OTHER OILSEEDS CRUSHING DEMAND
JPQCSBI - INTERCEPT OF CRUSHING DEMAND EQUATION * SOYBEANS
JPQCSBPM - CRUSHING DEMAND ELAST. * SOYBEANS WRT CRUSH. MARG.
JPQCSBTR - ANNUAL GROWTH RATE OF SOYBEAN CRUSHING DEMAND
JPQDBFBF - DEMAND ELAST. * BEEF+VEAL WRT BEEF+VEAL
JPQDBFCG - DEMAND ELAST. * BEEF+VEAL WRT OTHER COARSE GRAINS
JPQDBFCN - DEMAND ELAST. * BEEF+VEAL WRT CORN
JPQDBFDB - DEMAND ELAST. * BEEF+VEAL WRT DAIRY-BUTTER
JPQDBFDC - DEMAND ELAST. * BEEF+VEAL WRT DAIRY-CHEESE
JPQDBFDM - DEMAND ELAST. * BEEF+VEAL WRT DAIRY-MILK
JPQDBFDO - DEMAND ELAST. * BEEF+VEAL WRT DAIRY-OTHER PRODUCTS
JPQDBFFI - DEMAND ELAST. * BEEF WRT FISH
JPQDBFI - INTERCEPT OF DEMAND EQUATION * BEEF+VEAL
JPQDBFIN - DEMAND ELAST. * BEEF+VEAL WRT INCOME
JPQDBFML - DEMAND ELAST. * BEEF+VEAL WRT MUTTON+LAMB
JPQDBFOM - DEMAND ELAST. * BEEF+VEAL WRT OTHER MEALS
JPQDBFOO - DEMAND ELAST. * BEEF+VEAL WRT OTHER OILS
JPQDBFOS - DEMAND ELAST. * BEEF+VEAL WRT OTHER OILSEEDS
JPQDBFPE - DEMAND ELAST. * BEEF+VEAL WRT POULTRY-EGGS
JPQDBFPK - DEMAND ELAST. * BEEF+VEAL WRT PORK
JPQDBFPM - DEMAND ELAST. * BEEF+VEAL WRT POULTRY-MEAT
JPQDBFRI - DEMAND ELAST. * BEEF+VEAL WRT RICE
JPQDBFSB - DEMAND ELAST. * BEEF+VEAL WRT SOYBEANS
JPQDBFSM - DEMAND ELAST. * BEEF+VEAL WRT SOYMEAL
JPQDBFSO - DEMAND ELAST. * BEEF+VEAL WRT SOYOIL
JPQDBFWH - DEMAND ELAST. * BEEF+VEAL WRT WHEAT
JPQDCGBF - DEMAND ELAST. * OTHER COARSE GRAINS WRT BEEF+VEAL
JPQDCGCG - DEMAND ELAST. * OTHER COARSE GRAINS WRT OTHER COARSE GRAINS
JPQDCGCN - DEMAND ELAST. * OTHER COARSE GRAINS WRT CORN
JPQDCGDB - DEMAND ELAST. * OTHER COARSE GRAINS WRT DAIRY-BUTTER
JPQDCGDC - DEMAND ELAST. * OTHER COARSE GRAINS WRT DAIRY-CHEESE
JPQDCGDM - DEMAND ELAST. * OTHER COARSE GRAINS WRT DAIRY-MILK
JPQDCGDO - DEMAND ELAST. * OTHER COARSE GRAINS WRT DAIRY-OTHER PRODUCTS
JPQDCGI - INTERCEPT OF DEMAND EQUATION * OTHER COARSE GRAINS
JPQDCGIN - DEMAND ELAST. * OTHER COARSE GRAINS WRT INCOME
JPQDCGML - DEMAND ELAST. * OTHER COARSE GRAINS WRT MUTTON+LAMB
JPQDCGOM - DEMAND ELAST. * OTHER COARSE GRAINS WRT OTHER MEALS
JPQDCGOO - DEMAND ELAST. * OTHER COARSE GRAINS WRT OTHER OILS
JPQDCGOS - DEMAND ELAST. * OTHER COARSE GRAINS WRT OTHER OILSEEDS
JPQDCGPE - DEMAND ELAST. * OTHER COARSE GRAINS WRT POULTRY-EGGS
JPQDCGPK - DEMAND ELAST. * OTHER COARSE GRAINS WRT PORK
JPQDCGPM - DEMAND ELAST. * OTHER COARSE GRAINS WRT POULTRY-MEAT
JPQDCGRI - DEMAND ELAST. * OTHER COARSE GRAINS WRT RICE
JPQDCGSB - DEMAND ELAST. * OTHER COARSE GRAINS WRT SOYBEANS
JPQDCGSM - DEMAND ELAST. * OTHER COARSE GRAINS WRT SOYMEAL

JPQDCGSO - DEMAND ELAST. * OTHER COARSE GRAINS WRT SOYOIL
JPQDCGWH - DEMAND ELAST. * OTHER COARSE GRAINS WRT WHEAT
JPQDCNBF - DEMAND ELAST. * CORN WRT BEEF+VEAL
JPQDCNCG - DEMAND ELAST. * CORN WRT OTHER COARSE GRAINS
JPQDCNCN - DEMAND ELAST. * CORN WRT CORN
JPQDCNDB - DEMAND ELAST. * CORN WRT DAIRY-BUTTER
JPQDCNDC - DEMAND ELAST. * CORN WRT DAIRY-CHEESE
JPQDCNDM - DEMAND ELAST. * CORN WRT DAIRY-MILK
JPQDCNDO - DEMAND ELAST. * CORN WRT DAIRY-OTHER PRODUCTS
JPQDCNI - INTERCEPT OF DEMAND EQUATION * CORN
JPQDCNIN - DEMAND ELAST. * CORN WRT INCOME
JPQDCNML - DEMAND ELAST. * CORN WRT MUTTON+LAMB
JPQDCNOM - DEMAND ELAST. * CORN WRT OTHER MEALS
JPQDCNOO - DEMAND ELAST. * CORN WRT OTHER OILS
JPQDCNOS - DEMAND ELAST. * CORN WRT OTHER OILSEEDS
JPQDCNPE - DEMAND ELAST. * CORN WRT POULTRY-EGGS
JPQDCNPK - DEMAND ELAST. * CORN WRT PORK
JPQDCNPM - DEMAND ELAST. * CORN WRT POULTRY-MEAT
JPQDCNRI - DEMAND ELAST. * CORN WRT RICE
JPQDCNSB - DEMAND ELAST. * CORN WRT SOYBEANS
JPQDCNSM - DEMAND ELAST. * CORN WRT SOYMEAL
JPQDCNSO - DEMAND ELAST. * CORN WRT SOYOIL
JPQDCNWH - DEMAND ELAST. * CORN WRT WHEAT
JPQDDBBF - DEMAND ELAST. * DAIRY-BUTTER WRT BEEF+VEAL
JPQDDBCG - DEMAND ELAST. * DAIRY-BUTTER WRT OTHER COARSE GRAINS
JPQDDBCN - DEMAND ELAST. * DAIRY-BUTTER WRT CORN
JPQDDBDB - DEMAND ELAST. * DAIRY-BUTTER WRT DAIRY-BUTTER
JPQDDBDC - DEMAND ELAST. * DAIRY-BUTTER WRT DAIRY-CHEESE
JPQDDBDM - DEMAND ELAST. * DAIRY-BUTTER WRT DAIRY-MILK
JPQDDBDO - DEMAND ELAST. * DAIRY-BUTTER WRT DAIRY-OTHER PRODUCTS
JPQDDBI - INTERCEPT OF DEMAND EQUATION * DAIRY-BUTTER
JPQDDBIN - DEMAND ELAST. * DAIRY-BUTTER WRT INCOME
JPQDDBML - DEMAND ELAST. * DAIRY-BUTTER WRT MUTTON+LAMB
JPQDDBOM - DEMAND ELAST. * DAIRY-BUTTER WRT OTHER MEALS
JPQDDBOO - DEMAND ELAST. * DAIRY-BUTTER WRT OTHER OILS
JPQDDBOS - DEMAND ELAST. * DAIRY-BUTTER WRT OTHER OILSEEDS
JPQDDBPE - DEMAND ELAST. * DAIRY-BUTTER WRT POULTRY-EGGS
JPQDDBPK - DEMAND ELAST. * DAIRY-BUTTER WRT PORK
JPQDDBPM - DEMAND ELAST. * DAIRY-BUTTER WRT POULTRY-MEAT
JPQDDBRI - DEMAND ELAST. * DAIRY-BUTTER WRT RICE
JPQDDBSB - DEMAND ELAST. * DAIRY-BUTTER WRT SOYBEANS
JPQDDBSM - DEMAND ELAST. * DAIRY-BUTTER WRT SOYMEAL
JPQDDBSO - DEMAND ELAST. * DAIRY-BUTTER WRT SOYOIL
JPQDDBWH - DEMAND ELAST. * DAIRY-BUTTER WRT WHEAT
JPQDDCBF - DEMAND ELAST. * DAIRY-CHEESE WRT BEEF+VEAL
JPQDDCCG - DEMAND ELAST. * DAIRY-CHEESE WRT OTHER COARSE GRAINS
JPQDDCCN - DEMAND ELAST. * DAIRY-CHEESE WRT CORN
JPQDDCDB - DEMAND ELAST. * DAIRY-CHEESE WRT DAIRY-BUTTER
JPQDDCDC - DEMAND ELAST. * DAIRY-CHEESE WRT DAIRY-CHEESE
JPQDDCDM - DEMAND ELAST. * DAIRY-CHEESE WRT DAIRY-MILK
JPQDDCDO - DEMAND ELAST. * DAIRY-CHEESE WRT DAIRY-OTHER PRODUCTS
JPQDDCI - INTERCEPT OF DEMAND EQUATION * DAIRY-CHEESE
JPQDDCIN - DEMAND ELAST. * DAIRY-CHEESE WRT INCOME
JPQDDCML - DEMAND ELAST. * DAIRY-CHEESE WRT MUTTON+LAMB
JPQDDCOM - DEMAND ELAST. * DAIRY-CHEESE WRT OTHER MEALS
JPQDDCOO - DEMAND ELAST. * DAIRY-CHEESE WRT OTHER OILS

JPQDDCOS - DEMAND ELAST. * DAIRY-CHEESE WRT OTHER OILSEEDS
JPQDDCPE - DEMAND ELAST. * DAIRY-CHEESE WRT POULTRY-EGGS
JPQDDCPK - DEMAND ELAST. * DAIRY-CHEESE WRT PORK
JPQDDCPM - DEMAND ELAST. * DAIRY-CHEESE WRT POULTRY-MEAT
JPQDDCRI - DEMAND ELAST. * DAIRY-CHEESE WRT RICE
JPQDDCSB - DEMAND ELAST. * DAIRY-CHEESE WRT SOYBEANS
JPQDDCSM - DEMAND ELAST. * DAIRY-CHEESE WRT SOYMEAL
JPQDDCSO - DEMAND ELAST. * DAIRY-CHEESE WRT SOYOIL
JPQDDCWH - DEMAND ELAST. * DAIRY-CHEESE WRT WHEAT
JPQDDMBF - DEMAND ELAST. * DAIRY-MILK WRT BEEF+VEAL
JPQDDMCG - DEMAND ELAST. * DAIRY-MILK WRT OTHER COARSE GRAINS
JPQDDMCN - DEMAND ELAST. * DAIRY-MILK WRT CORN
JPQDDMDB - DEMAND ELAST. * DAIRY-MILK WRT DAIRY-BUTTER
JPQDDMDC - DEMAND ELAST. * DAIRY-MILK WRT DAIRY-CHEESE
JPQDDMDM - DEMAND ELAST. * DAIRY-MILK WRT DAIRY-MILK
JPQDDMDO - DEMAND ELAST. * DAIRY-MILK WRT DAIRY-OTHER PRODUCTS
JPQDDMI - INTERCEPT OF DEMAND EQUATION * DAIRY-MILK
JPQDDMIN - DEMAND ELAST. * DAIRY-MILK WRT INCOME
JPQDDMML - DEMAND ELAST. * DAIRY-MILK WRT MUTTON+LAMB
JPQDDMOM - DEMAND ELAST. * DAIRY-MILK WRT OTHER MEALS
JPQDDMOO - DEMAND ELAST. * DAIRY-MILK WRT OTHER OILS
JPQDDMOS - DEMAND ELAST. * DAIRY-MILK WRT OTHER OILSEEDS
JPQDDMPE - DEMAND ELAST. * DAIRY-MILK WRT POULTRY-EGGS
JPQDDMPK - DEMAND ELAST. * DAIRY-MILK WRT PORK
JPQDDMPM - DEMAND ELAST. * DAIRY-MILK WRT POULTRY-MEAT
JPQDDMRI - DEMAND ELAST. * DAIRY-MILK WRT RICE
JPQDDMSB - DEMAND ELAST. * DAIRY-MILK WRT SOYBEANS
JPQDDMSM - DEMAND ELAST. * DAIRY-MILK WRT SOYMEAL
JPQDDMSO - DEMAND ELAST. * DAIRY-MILK WRT SOYOIL
JPQDDMWH - DEMAND ELAST. * DAIRY-MILK WRT WHEAT
JPQDDOBF - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT BEEF+VEAL
JPQDDOCG - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT OTHER COARSE GRAINS
JPQDDOCN - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT CORN
JPQDDODB - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT DAIRY-BUTTER
JPQDDODC - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT DAIRY-CHEESE
JPQDDODM - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT DAIRY-MILK
JPQDDODO - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT DAIRY-OTHER PRODUCTS
JPQDDOI - INTERCEPT OF DEMAND EQUATION * DAIRY-OTHER PRODUCTS
JPQDDOIN - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT INCOME
JPQDDOML - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT MUTTON+LAMB
JPQDDOOM - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT OTHER MEALS
JPQDDOOO - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT OTHER OILS
JPQDDOOS - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT OTHER OILSEEDS
JPQDDOPE - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT POULTRY-EGGS
JPQDDOPK - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT PORK
JPQDDOPM - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT POULTRY-MEAT
JPQDDORI - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT RICE
JPQDDOSB - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT SOYBEANS
JPQDDOSM - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT SOYMEAL
JPQDDOSO - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT SOYOIL
JPQDDOWH - DEMAND ELAST. * DAIRY-OTHER PRODUCTS WRT WHEAT
JPQDMLBF - DEMAND ELAST. * MUTTON+LAMB WRT BEEF+VEAL
JPQDMLCG - DEMAND ELAST. * MUTTON+LAMB WRT OTHER COARSE GRAINS
JPQDMLCN - DEMAND ELAST. * MUTTON+LAMB WRT CORN
JPQDMLDB - DEMAND ELAST. * MUTTON+LAMB WRT DAIRY-BUTTER
JPQDMLDC - DEMAND ELAST. * MUTTON+LAMB WRT DAIRY-CHEESE

JPQDMLDM - DEMAND ELAST. * MUTTON+LAMB WRT DAIRY-MILK
JPQDMLDO - DEMAND ELAST. * MUTTON+LAMB WRT DAIRY-OTHER PRODUCTS
JPQDMLI - INTERCEPT OF DEMAND EQUATION * MUTTON+LAMB
JPQDMLIN - DEMAND ELAST. * MUTTON+LAMB WRT INCOME
JPQDMLML - DEMAND ELAST. * MUTTON+LAMB WRT MUTTON+LAMB
JPQDMLOM - DEMAND ELAST. * MUTTON+LAMB WRT OTHER MEALS
JPQDMLOO - DEMAND ELAST. * MUTTON+LAMB WRT OTHER OILS
JPQDMLOS - DEMAND ELAST. * MUTTON+LAMB WRT OTHER OILSEEDS
JPQDMLPE - DEMAND ELAST. * MUTTON+LAMB WRT POULTRY-EGGS
JPQDMLPK - DEMAND ELAST. * MUTTON+LAMB WRT PORK
JPQDMLPM - DEMAND ELAST. * MUTTON+LAMB WRT POULTRY-MEAT
JPQDMLRI - DEMAND ELAST. * MUTTON+LAMB WRT RICE
JPQDMLSB - DEMAND ELAST. * MUTTON+LAMB WRT SOYBEANS
JPQDMLSM - DEMAND ELAST. * MUTTON+LAMB WRT SOYMEAL
JPQDMLSO - DEMAND ELAST. * MUTTON+LAMB WRT SOYOIL
JPQDMLWH - DEMAND ELAST. * MUTTON+LAMB WRT WHEAT
JPQDOMBF - DEMAND ELAST. * OTHER MEALS WRT BEEF+VEAL
JPQDOMCG - DEMAND ELAST. * OTHER MEALS WRT OTHER COARSE GRAINS
JPQDOMCN - DEMAND ELAST. * OTHER MEALS WRT CORN
JPQDOMDB - DEMAND ELAST. * OTHER MEALS WRT DAIRY-BUTTER
JPQDOMDC - DEMAND ELAST. * OTHER MEALS WRT DAIRY-CHEESE
JPQDOMDM - DEMAND ELAST. * OTHER MEALS WRT DAIRY-MILK
JPQDOMDO - DEMAND ELAST. * OTHER MEALS WRT DAIRY-OTHER PRODUCTS
JPQDOMI - INTERCEPT OF DEMAND EQUATION * OTHER MEALS
JPQDOMIN - DEMAND ELAST. * OTHER MEALS WRT INCOME
JPQDOMML - DEMAND ELAST. * OTHER MEALS WRT MUTTON+LAMB
JPQDOMOM - DEMAND ELAST. * OTHER MEALS WRT OTHER MEALS
JPQDOMOO - DEMAND ELAST. * OTHER MEALS WRT OTHER OILS
JPQDOMOS - DEMAND ELAST. * OTHER MEALS WRT OTHER OILSEEDS
JPQDOMPE - DEMAND ELAST. * OTHER MEALS WRT POULTRY-EGGS
JPQDOMPK - DEMAND ELAST. * OTHER MEALS WRT PORK
JPQDOMPM - DEMAND ELAST. * OTHER MEALS WRT POULTRY-MEAT
JPQDOMRI - DEMAND ELAST. * OTHER MEALS WRT RICE
JPQDOMSB - DEMAND ELAST. * OTHER MEALS WRT SOYBEANS
JPQDOMSM - DEMAND ELAST. * OTHER MEALS WRT SOYMEAL
JPQDOMSO - DEMAND ELAST. * OTHER MEALS WRT SOYOIL
JPQDOMWH - DEMAND ELAST. * OTHER MEALS WRT WHEAT
JPQDOOBF - DEMAND ELAST. * OTHER OILS WRT BEEF+VEAL
JPQDOOCG - DEMAND ELAST. * OTHER OILS WRT OTHER COARSE GRAINS
JPQDOOCN - DEMAND ELAST. * OTHER OILS WRT CORN
JPQDOODB - DEMAND ELAST. * OTHER OILS WRT DAIRY-BUTTER
JPQDOODC - DEMAND ELAST. * OTHER OILS WRT DAIRY-CHEESE
JPQDOODM - DEMAND ELAST. * OTHER OILS WRT DAIRY-MILK
JPQDOODO - DEMAND ELAST. * OTHER OILS WRT DAIRY-OTHER PRODUCTS
JPQDOOI - INTERCEPT OF DEMAND EQUATION * OTHER OILS
JPQDOOIN - DEMAND ELAST. * OTHER OILS WRT INCOME
JPQDOOML - DEMAND ELAST. * OTHER OILS WRT MUTTON+LAMB
JPQDOOOM - DEMAND ELAST. * OTHER OILS WRT OTHER MEALS
JPQDOOOO - DEMAND ELAST. * OTHER OILS WRT OTHER OILS
JPQDOOOS - DEMAND ELAST. * OTHER OILS WRT OTHER OILSEEDS
JPQDOOPE - DEMAND ELAST. * OTHER OILS WRT POULTRY-EGGS
JPQDOOPK - DEMAND ELAST. * OTHER OILS WRT PORK
JPQDOOPM - DEMAND ELAST. * OTHER OILS WRT POULTRY-MEAT
JPQDOORI - DEMAND ELAST. * OTHER OILS WRT RICE
JPQDOOSB - DEMAND ELAST. * OTHER OILS WRT SOYBEANS
JPQDOOSM - DEMAND ELAST. * OTHER OILS WRT SOYMEAL

JPQDOOSO - DEMAND ELAST. * OTHER OILS WRT SOYOIL
JPQDOOWH - DEMAND ELAST. * OTHER OILS WRT WHEAT
JPQDOSBF - DEMAND ELAST. * OTHER OILSEEDS WRT BEEF+VEAL
JPQDOSCG - DEMAND ELAST. * OTHER OILSEEDS WRT OTHER COARSE GRAINS
JPQDOSCN - DEMAND ELAST. * OTHER OILSEEDS WRT CORN
JPQDOSDB - DEMAND ELAST. * OTHER OILSEEDS WRT DAIRY-BUTTER
JPQDOSDC - DEMAND ELAST. * OTHER OILSEEDS WRT DAIRY-CHEESE
JPQDOSDM - DEMAND ELAST. * OTHER OILSEEDS WRT DAIRY-MILK
JPQDOSDO - DEMAND ELAST. * OTHER OILSEEDS WRT DAIRY-OTHER PRODUCTS
JPQDOSI - INTERCEPT OF DEMAND EQUATION * OTHER OILSEEDS
JPQDOSIN - DEMAND ELAST. * OTHER OILSEEDS WRT INCOME
JPQDOSML - DEMAND ELAST. * OTHER OILSEEDS WRT MUTTON+LAMB
JPQDOSOM - DEMAND ELAST. * OTHER OILSEEDS WRT OTHER MEALS
JPQDOSOO - DEMAND ELAST. * OTHER OILSEEDS WRT OTHER OILS
JPQDOSOS - DEMAND ELAST. * OTHER OILSEEDS WRT OTHER OILSEEDS
JPQDOSPE - DEMAND ELAST. * OTHER OILSEEDS WRT POULTRY-EGGS
JPQDOSPK - DEMAND ELAST. * OTHER OILSEEDS WRT PORK
JPQDOSPM - DEMAND ELAST. * OTHER OILSEEDS WRT POULTRY-MEAT
JPQDOSRI - DEMAND ELAST. * OTHER OILSEEDS WRT RICE
JPQDOSSB - DEMAND ELAST. * OTHER OILSEEDS WRT SOYBEANS
JPQDOSSM - DEMAND ELAST. * OTHER OILSEEDS WRT SOYMEAL
JPQDOSSO - DEMAND ELAST. * OTHER OILSEEDS WRT SOYOIL
JPQDOSWH - DEMAND ELAST. * OTHER OILSEEDS WRT WHEAT
JPQDPEBF - DEMAND ELAST. * POULTRY-EGGS WRT BEEF+VEAL
JPQDPECG - DEMAND ELAST. * POULTRY-EGGS WRT OTHER COARSE GRAINS
JPQDPECN - DEMAND ELAST. * POULTRY-EGGS WRT CORN
JPQDPEDB - DEMAND ELAST. * POULTRY-EGGS WRT DAIRY-BUTTER
JPQDPEDC - DEMAND ELAST. * POULTRY-EGGS WRT DAIRY-CHEESE
JPQDPEDM - DEMAND ELAST. * POULTRY-EGGS WRT DAIRY-MILK
JPQDPEDO - DEMAND ELAST. * POULTRY-EGGS WRT DAIRY-OTHER PRODUCTS
JPQDPEFI - DEMAND ELAST. * POULTRY-EGGS WRT FISH
JPQDPEI - INTERCEPT OF DEMAND EQUATION * POULTRY-EGGS
JPQDPEIN - DEMAND ELAST. * POULTRY-EGGS WRT INCOME
JPQDPEML - DEMAND ELAST. * POULTRY-EGGS WRT MUTTON+LAMB
JPQDPEOM - DEMAND ELAST. * POULTRY-EGGS WRT OTHER MEALS
JPQDPEOO - DEMAND ELAST. * POULTRY-EGGS WRT OTHER OILS
JPQDPEOS - DEMAND ELAST. * POULTRY-EGGS WRT OTHER OILSEEDS
JPQDPEPE - DEMAND ELAST. * POULTRY-EGGS WRT POULTRY-EGGS
JPQDPEPK - DEMAND ELAST. * POULTRY-EGGS WRT PORK
JPQDPEPM - DEMAND ELAST. * POULTRY-EGGS WRT POULTRY-MEAT
JPQDPERI - DEMAND ELAST. * POULTRY-EGGS WRT RICE
JPQDPESB - DEMAND ELAST. * POULTRY-EGGS WRT SOYBEANS
JPQDPESM - DEMAND ELAST. * POULTRY-EGGS WRT SOYMEAL
JPQDPESO - DEMAND ELAST. * POULTRY-EGGS WRT SOYOIL
JPQDPEWH - DEMAND ELAST. * POULTRY-EGGS WRT WHEAT
JPQDPKBF - DEMAND ELAST. * PORK WRT BEEF+VEAL
JPQDPKCG - DEMAND ELAST. * PORK WRT OTHER COARSE GRAINS
JPQDPKCN - DEMAND ELAST. * PORK WRT CORN
JPQDPKDB - DEMAND ELAST. * PORK WRT DAIRY-BUTTER
JPQDPKDC - DEMAND ELAST. * PORK WRT DAIRY-CHEESE
JPQDPKDM - DEMAND ELAST. * PORK WRT DAIRY-MILK
JPQDPKDO - DEMAND ELAST. * PORK WRT DAIRY-OTHER PRODUCTS
JPQDPKFI - DEMAND ELAST. * PORK WRT FISH
JPQDPKI - INTERCEPT OF DEMAND EQUATION * PORK
JPQDPKIN - DEMAND ELAST. * PORK WRT INCOME
JPQDPKML - DEMAND ELAST. * PORK WRT MUTTON+LAMB

JPQDPKOM - DEMAND ELAST. * PORK WRT OTHER MEALS
JPQDPKOO - DEMAND ELAST. * PORK WRT OTHER OILS
JPQDPKOS - DEMAND ELAST. * PORK WRT OTHER OILSEEDS
JPQDPKPE - DEMAND ELAST. * PORK WRT POULTRY-EGGS
JPQDPKPK - DEMAND ELAST. * PORK WRT PORK
JPQDPKPM - DEMAND ELAST. * PORK WRT POULTRY-MEAT
JPQDPKRI - DEMAND ELAST. * PORK WRT RICE
JPQDPKSB - DEMAND ELAST. * PORK WRT SOYBEANS
JPQDPKSM - DEMAND ELAST. * PORK WRT SOYMEAL
JPQDPKSO - DEMAND ELAST. * PORK WRT SOYOIL
JPQDPKWH - DEMAND ELAST. * PORK WRT WHEAT
JPQDPMBF - DEMAND ELAST. * POULTRY-MEAT WRT BEEF+VEAL
JPQDPMCG - DEMAND ELAST. * POULTRY-MEAT WRT OTHER COARSE GRAINS
JPQDPMCN - DEMAND ELAST. * POULTRY-MEAT WRT CORN
JPQDPMDB - DEMAND ELAST. * POULTRY-MEAT WRT DAIRY-BUTTER
JPQDPMDC - DEMAND ELAST. * POULTRY-MEAT WRT DAIRY-CHEESE
JPQDPMDM - DEMAND ELAST. * POULTRY-MEAT WRT DAIRY-MILK
JPQDPMDO - DEMAND ELAST. * POULTRY-MEAT WRT DAIRY-OTHER PRODUCTS
JPQDPMFI - DEMAND ELAST. * POULTRY-MEAT WRT FISH
JPQDPMI - INTERCEPT OF DEMAND EQUATION * POULTRY-MEAT
JPQDPMIN - DEMAND ELAST. * POULTRY-MEAT WRT INCOME
JPQDPMML - DEMAND ELAST. * POULTRY-MEAT WRT MUTTON+LAMB
JPQDPMOM - DEMAND ELAST. * POULTRY-MEAT WRT OTHER MEALS
JPQDPMOO - DEMAND ELAST. * POULTRY-MEAT WRT OTHER OILS
JPQDPMOS - DEMAND ELAST. * POULTRY-MEAT WRT OTHER OILSEEDS
JPQDPMPE - DEMAND ELAST. * POULTRY-MEAT WRT POULTRY-EGGS
JPQDPMPK - DEMAND ELAST. * POULTRY-MEAT WRT PORK
JPQDPMPM - DEMAND ELAST. * POULTRY-MEAT WRT POULTRY-MEAT
JPQDPMRI - DEMAND ELAST. * POULTRY-MEAT WRT RICE
JPQDPMSB - DEMAND ELAST. * POULTRY-MEAT WRT SOYBEANS
JPQDPMSM - DEMAND ELAST. * POULTRY-MEAT WRT SOYMEAL
JPQDPMSO - DEMAND ELAST. * POULTRY-MEAT WRT SOYOIL
JPQDPMWH - DEMAND ELAST. * POULTRY-MEAT WRT WHEAT
JPQDRIBF - DEMAND ELAST. * RICE WRT BEEF+VEAL
JPQDRICG - DEMAND ELAST. * RICE WRT OTHER COARSE GRAINS
JPQDRICN - DEMAND ELAST. * RICE WRT CORN
JPQDRIDB - DEMAND ELAST. * RICE WRT DAIRY-BUTTER
JPQDRIDC - DEMAND ELAST. * RICE WRT DAIRY-CHEESE
JPQDRIDM - DEMAND ELAST. * RICE WRT DAIRY-MILK
JPQDRIDO - DEMAND ELAST. * RICE WRT DAIRY-OTHER PRODUCTS
JPQDRIFI - DEMAND ELAST. * RICE WRT FISH
JPQDRII - INTERCEPT OF DEMAND EQUATION * RICE
JPQDRIIN - DEMAND ELAST. * RICE WRT INCOME
JPQDRIML - DEMAND ELAST. * RICE WRT MUTTON+LAMB
JPQDRIOM - DEMAND ELAST. * RICE WRT OTHER MEALS
JPQDRIOO - DEMAND ELAST. * RICE WRT OTHER OILS
JPQDRIOS - DEMAND ELAST. * RICE WRT OTHER OILSEEDS
JPQDRIPE - DEMAND ELAST. * RICE WRT POULTRY-EGGS
JPQDRIPK - DEMAND ELAST. * RICE WRT PORK
JPQDRIPM - DEMAND ELAST. * RICE WRT POULTRY-MEAT
JPQDRIRI - DEMAND ELAST. * RICE WRT RICE
JPQDRISB - DEMAND ELAST. * RICE WRT SOYBEANS
JPQDRISM - DEMAND ELAST. * RICE WRT SOYMEAL
JPQDRISO - DEMAND ELAST. * RICE WRT SOYOIL
JPQDRIWH - DEMAND ELAST. * RICE WRT WHEAT
JPQDSBBF - DEMAND ELAST. * SOYBEANS WRT BEEF+VEAL

JPQDSBCG - DEMAND ELAST. * SOYBEANS WRT OTHER COARSE GRAINS
JPQDSBCN - DEMAND ELAST. * SOYBEANS WRT CORN
JPQDSBDB - DEMAND ELAST. * SOYBEANS WRT DAIRY-BUTTER
JPQDSBDC - DEMAND ELAST. * SOYBEANS WRT DAIRY-CHEESE
JPQDSBDM - DEMAND ELAST. * SOYBEANS WRT DAIRY-MILK
JPQDSBDO - DEMAND ELAST. * SOYBEANS WRT DAIRY-OTHER PRODUCTS
JPQDSBI - INTERCEPT OF DEMAND EQUATION * SOYBEANS
JPQDSBIN - DEMAND ELAST. * SOYBEANS WRT INCOME
JPQDSBML - DEMAND ELAST. * SOYBEANS WRT MUTTON+LAMB
JPQDSBOM - DEMAND ELAST. * SOYBEANS WRT OTHER MEALS
JPQDSBOO - DEMAND ELAST. * SOYBEANS WRT OTHER OILS
JPQDSBOS - DEMAND ELAST. * SOYBEANS WRT OTHER OILSEEDS
JPQDSBPE - DEMAND ELAST. * SOYBEANS WRT POULTRY-EGGS
JPQDSBPK - DEMAND ELAST. * SOYBEANS WRT PORK
JPQDSBPM - DEMAND ELAST. * SOYBEANS WRT POULTRY-MEAT
JPQDSBRI - DEMAND ELAST. * SOYBEANS WRT RICE
JPQDSBSB - DEMAND ELAST. * SOYBEANS WRT SOYBEANS
JPQDSBSM - DEMAND ELAST. * SOYBEANS WRT SOYMEAL
JPQDSBSO - DEMAND ELAST. * SOYBEANS WRT SOYOIL
JPQDSBWH - DEMAND ELAST. * SOYBEANS WRT WHEAT
JPQDSMBF - DEMAND ELAST. * SOYMEAL WRT BEEF+VEAL
JPQDSMCG - DEMAND ELAST. * SOYMEAL WRT OTHER COARSE GRAINS
JPQDSMCN - DEMAND ELAST. * SOYMEAL WRT CORN
JPQDSMDB - DEMAND ELAST. * SOYMEAL WRT DAIRY-BUTTER
JPQDSMDC - DEMAND ELAST. * SOYMEAL WRT DAIRY-CHEESE
JPQDSMDM - DEMAND ELAST. * SOYMEAL WRT DAIRY-MILK
JPQDSMDO - DEMAND ELAST. * SOYMEAL WRT DAIRY-OTHER PRODUCTS
JPQDSMI - INTERCEPT OF DEMAND EQUATION * SOYMEAL
JPQDSMIN - DEMAND ELAST. * SOYMEAL WRT INCOME
JPQDSMML - DEMAND ELAST. * SOYMEAL WRT MUTTON+LAMB
JPQDSMOM - DEMAND ELAST. * SOYMEAL WRT OTHER MEALS
JPQDSMOO - DEMAND ELAST. * SOYMEAL WRT OTHER OILS
JPQDSMOS - DEMAND ELAST. * SOYMEAL WRT OTHER OILSEEDS
JPQDSMPE - DEMAND ELAST. * SOYMEAL WRT POULTRY-EGGS
JPQDSMPK - DEMAND ELAST. * SOYMEAL WRT PORK
JPQDSMPM - DEMAND ELAST. * SOYMEAL WRT POULTRY-MEAT
JPQDSMRI - DEMAND ELAST. * SOYMEAL WRT RICE
JPQDSMSB - DEMAND ELAST. * SOYMEAL WRT SOYBEANS
JPQDSMSM - DEMAND ELAST. * SOYMEAL WRT SOYMEAL
JPQDSMSO - DEMAND ELAST. * SOYMEAL WRT SOYOIL
JPQDSMWH - DEMAND ELAST. * SOYMEAL WRT WHEAT
JPQDSOBF - DEMAND ELAST. * SOYOIL WRT BEEF+VEAL
JPQDSOCG - DEMAND ELAST. * SOYOIL WRT OTHER COARSE GRAINS
JPQDSOCN - DEMAND ELAST. * SOYOIL WRT CORN
JPQDSODB - DEMAND ELAST. * SOYOIL WRT DAIRY-BUTTER
JPQDSODC - DEMAND ELAST. * SOYOIL WRT DAIRY-CHEESE
JPQDSODM - DEMAND ELAST. * SOYOIL WRT DAIRY-MILK
JPQDSODO - DEMAND ELAST. * SOYOIL WRT DAIRY-OTHER PRODUCTS
JPQDSOI - INTERCEPT OF DEMAND EQUATION * SOYOIL
JPQDSOIN - DEMAND ELAST. * SOYOIL WRT INCOME
JPQDSOML - DEMAND ELAST. * SOYOIL WRT MUTTON+LAMB
JPQDSOOM - DEMAND ELAST. * SOYOIL WRT OTHER MEALS
JPQDSOOO - DEMAND ELAST. * SOYOIL WRT OTHER OILS
JPQDSOOS - DEMAND ELAST. * SOYOIL WRT OTHER OILSEEDS
JPQDSOPE - DEMAND ELAST. * SOYOIL WRT POULTRY-EGGS
JPQDSOPK - DEMAND ELAST. * SOYOIL WRT PORK

JPQDSOPM - DEMAND ELAST. * SOYOIL WRT POULTRY-MEAT
JPQDSORI - DEMAND ELAST. * SOYOIL WRT RICE
JPQDSOSB - DEMAND ELAST. * SOYOIL WRT SOYBEANS
JPQDSOSM - DEMAND ELAST. * SOYOIL WRT SOYMEAL
JPQDSOSO - DEMAND ELAST. * SOYOIL WRT SOYOIL
JPQDSOWH - DEMAND ELAST. * SOYOIL WRT WHEAT
JPQDWHBF - DEMAND ELAST. * WHEAT WRT BEEF+VEAL
JPQDWHCG - DEMAND ELAST. * WHEAT WRT OTHER COARSE GRAINS
JPQDWHCN - DEMAND ELAST. * WHEAT WRT CORN
JPQDWHDB - DEMAND ELAST. * WHEAT WRT DAIRY-BUTTER
JPQDWHDC - DEMAND ELAST. * WHEAT WRT DAIRY-CHEESE
JPQDWHDM - DEMAND ELAST. * WHEAT WRT DAIRY-MILK
JPQDWHDO - DEMAND ELAST. * WHEAT WRT DAIRY-OTHER PRODUCTS
JPQDWHI - INTERCEPT OF DEMAND EQUATION * WHEAT
JPQDWHIN - DEMAND ELAST. * WHEAT WRT INCOME
JPQDWHML - DEMAND ELAST. * WHEAT WRT MUTTON+LAMB
JPQDWHOM - DEMAND ELAST. * WHEAT WRT OTHER MEALS
JPQDWHOO - DEMAND ELAST. * WHEAT WRT OTHER OILS
JPQDWHOS - DEMAND ELAST. * WHEAT WRT OTHER OILSEEDS
JPQDWHPE - DEMAND ELAST. * WHEAT WRT POULTRY-EGGS
JPQDWHPK - DEMAND ELAST. * WHEAT WRT PORK
JPQDWHPM - DEMAND ELAST. * WHEAT WRT POULTRY-MEAT
JPQDWHRI - DEMAND ELAST. * WHEAT WRT RICE
JPQDWHSB - DEMAND ELAST. * WHEAT WRT SOYBEANS
JPQDWHSM - DEMAND ELAST. * WHEAT WRT SOYMEAL
JPQDWHSO - DEMAND ELAST. * WHEAT WRT SOYOIL
JPQDWHWH - DEMAND ELAST. * WHEAT WRT WHEAT
JPQFCGCG - FEED D.P. ELAS. * OTHER COARSE GRAINS WRT OTHER COARSE GRAINS
JPQFCGCN - FEED D.P. ELAS. * OTHER COARSE GRAINS WRT CORN
JPQFCGI - INTERCEPT OF FEED DEMAND EQUATION * OTHER COARSE GRAINS
JPQFCGOM - FEED D.P. ELAS. * OTHER COARSE GRAINS WRT OTHER MEALS
JPQFCGSM - FEED D.P. ELAS. * OTHER COARSE GRAINS WRT SOYMEAL
JPQFCGWH - FEED D.P. ELAS. * OTHER COARSE GRAINS WRT WHEAT
JPQFCNCG - FEED D.P. ELAS. * CORN WRT OTHER COARSE GRAINS
JPQFCNCN - FEED D.P. ELAS. * CORN WRT CORN
JPQFCNI - INTERCEPT OF FEED DEMAND EQUATION * CORN
JPQFCNOM - FEED D.P. ELAS. * CORN WRT OTHER MEALS
JPQFCNSM - FEED D.P. ELAS. * CORN WRT SOYMEAL
JPQFCNWH - FEED D.P. ELAS. * CORN WRT WHEAT
JPQFOMCG - FEED D.P. ELAS. * OTHER MEALS WRT OTHER COARSE GRAINS
JPQFOMCN - FEED D.P. ELAS. * OTHER MEALS WRT CORN
JPQFOMI - INTERCEPT OF FEED DEMAND EQUATION * OTHER MEALS
JPQFOMOM - FEED D.P. ELAS. * OTHER MEALS WRT OTHER MEALS
JPQFOMSM - FEED D.P. ELAS. * OTHER MEALS WRT SOYMEAL
JPQFOMWH - FEED D.P. ELAS. * OTHER MEALS WRT WHEAT
JPQFSMCG - FEED D.P. ELAS. * SOYMEAL WRT OTHER COARSE GRAINS
JPQFSMCN - FEED D.P. ELAS. * SOYMEAL WRT CORN
JPQFSMI - INTERCEPT OF FEED DEMAND EQUATION * SOYMEAL
JPQFSMOM - FEED D.P. ELAS. * SOYMEAL WRT OTHER MEALS
JPQFSMSM - FEED D.P. ELAS. * SOYMEAL WRT SOYMEAL
JPQFSMWH - FEED D.P. ELAS. * SOYMEAL WRT WHEAT
JPQFWHCG - FEED D.P. ELAS. * WHEAT WRT OTHER COARSE GRAINS
JPQFWHCN - FEED D.P. ELAS. * WHEAT WRT CORN
JPQFWHI - INTERCEPT OF FEED DEMAND EQUATION * WHEAT
JPQFWHOM - FEED D.P. ELAS. * WHEAT WRT OTHER MEALS
JPQFWHSM - FEED D.P. ELAS. * WHEAT WRT SOYMEAL

JPQFWHWH - FEED D.P. ELAS. * WHEAT WRT WHEAT
JPQSBFI - INTERCEPT OF SUPPLY EQUATION * BEEF+VEAL
JPQSBFPC - CUR. PRICE ELAST. SUPPLY * BEEF+VEAL
JPQSBFPL - LAG. PRICE ELAST. SUPPLY * BEEF+VEAL
JPQSBFTR - ANNUAL GROWTH RATE OF SUPPLY * BEEF+VEAL
JPQSDBDB - PRICE ELAST. SUPPLY * DAIRY-BUTTER WRT DAIRY-BUTTER
JPQSDBDC - PRICE ELAST. SUPPLY * DAIRY-BUTTER WRT DAIRY-CHEESE
JPQSDBDO - PRICE ELAST. SUPPLY * DAIRY-BUTTER WRT DAIRY-OTHER PRODUCTS
JPQSDBI - INTERCEPT OF SUPPLY EQUATION * DAIRY-BUTTER
JPQSDCDB - PRICE ELAST. SUPPLY * DAIRY-CHEESE WRT DAIRY-BUTTER
JPQSDCDC - PRICE ELAST. SUPPLY * DAIRY-CHEESE WRT DAIRY-CHEESE
JPQSDCDO - PRICE ELAST. SUPPLY * DAIRY-CHEESE WRT DAIRY-OTHER PRODUCTS
JPQSDCI - INTERCEPT OF SUPPLY EQUATION * DAIRY-CHEESE
JPQSDMI - INTERCEPT OF SUPPLY EQUATION * DAIRY-MILK
JPQSDMPC - CUR. PRICE ELAST. SUPPLY * DAIRY-MILK
JPQSDMPL - LAG. PRICE ELAST. SUPPLY * DAIRY-MILK
JPQSDMTR - ANNUAL GROWTH RATE OF SUPPLY * DAIRY-MILK
JPQSDODB - PRICE ELAST. SUPPLY * DAIRY-OTHER PRODUCTS WRT DAIRY-BUTTER
JPQSDODC - PRICE ELAST. SUPPLY * DAIRY-OTHER PRODUCTS WRT DAIRY-CHEESE
JPQSDODO - PRICE ELAST. SUPPLY * DAIRY-OTHER PRODUCTS WRT DAIRY-OTHER PROD
JPQSDOI - INTERCEPT OF SUPPLY EQUATION * DAIRY-OTHER PRODUCTS
JPQSMLI - INTERCEPT OF SUPPLY EQUATION * MUTTON+LAMB
JPQSMLPC - CUR. PRICE ELAST. SUPPLY * MUTTON+LAMB
JPQSMLPL - LAG. PRICE ELAST. SUPPLY * MUTTON+LAMB
JPQSMLTR - ANNUAL GROWTH RATE OF SUPPLY * MUTTON+LAMB
JPQSPEI - INTERCEPT OF SUPPLY EQUATION * POULTRY-EGGS
JPQSPEPC - CUR. PRICE ELAST. SUPPLY * POULTRY-EGGS
JPQSPEPL - LAG. PRICE ELAST. SUPPLY * POULTRY-EGGS
JPQSPETR - ANNUAL GROWTH RATE OF SUPPLY * POULTRY-EGGS
JPQSPKI - INTERCEPT OF SUPPLY EQUATION * PORK
JPQSPKPC - CUR. PRICE ELAST. SUPPLY * PORK
JPQSPKPL - LAG. PRICE ELAST. SUPPLY * PORK
JPQSPKTR - ANNUAL GROWTH RATE OF SUPPLY * PORK
JPQSPMI - INTERCEPT OF SUPPLY EQUATION * POULTRY-MEAT
JPQSPMPC - CUR. PRICE ELAST. SUPPLY * POULTRY-MEAT
JPQSPMPL - LAG. PRICE ELAST. SUPPLY * POULTRY-MEAT
JPQSPMTR - ANNUAL GROWTH RATE OF SUPPLY * POULTRY-MEAT
JPSERII - INTERCEPT OF EXPORT SUBSIDY EQUATION * RICE
JPSERIRI - SUBSIDY (EXPORT) ELAST. * RICE WRT RICE
JPSERISK - SUBSIDY (EXPORT) ELAST. * RICE WRT STOCK
JPSERITR - SUBSIDY (EXPORT) ELAST. * RICE WRT TIME TREND
JPSKBFBF - STOCK ELASTICITY * BEEF+VEAL WRT BEEF+VEAL
JPSKBFI - INTERCEPT OF STOCK EQUATION * BEEF+VEAL
JPSKCGCG - STOCK ELASTICITY * OTHER COARSE GRAIN WRT OTHER COARSE GRAIN
JPSKCGI - INTERCEPT OF STOCK EQUATION * OTHER COARSE GRAIN
JPSKCNCN - STOCK ELASTICITY * CORN WRT CORN
JPSKCNI - INTERCEPT OF STOCK EQUATION * CORN
JPSKDBDB - STOCK ELASTICITY * DAIRY-BUTTER WRT DAIRY-BUTTER
JPSKDBI - INTERCEPT OF STOCK EQUATION * DAIRY-BUTTER
JPSKDCDC - STOCK ELASTICITY * DAIRY-CHEESE WRT DAIRY-CHEESE
JPSKDCI - INTERCEPT OF STOCK EQUATION * DAIRY-CHEESE
JPSKDODO - STOCK ELASTICITY * DAIRY-OTHER PRODUCTS WRT DAIRY-OTHER PRODUCT
JPSKDOI - INTERCEPT OF STOCK EQUATION * DAIRY-OTHER PRODUCTS
JPSKMLI - INTERCEPT OF STOCK EQUATION * MUTTON+LAMB
JPSKMLML - STOCK ELASTICITY * MUTTON+LAMB WRT MUTTON+LAMB
JPSKOMI - INTERCEPT OF STOCK EQUATION * OTHER MEALS
JPSKOMOM - STOCK ELASTICITY * OTHER MEALS WRT OTHER MEALS

JPSKOOI - INTERCEPT OF STOCK EQUATION * OTHER OILS
JPSKOOOO - STOCK ELASTICITY * OTHER OILS WRT OTHER OILS
JPSKOSI - INTERCEPT OF STOCK EQUATION * OTHER OILSEEDS
JPSKOSOS - STOCK ELASTICITY * OTHER OILSEEDS WRT OTHER OILSEEDS
JPSKPEI - INTERCEPT OF STOCK EQUATION * POULTRY-EGGS
JPSKPEPE - STOCK ELASTICITY * POULTRY-EGGS WRT POULTRY-EGGS
JPSKPKI - INTERCEPT OF STOCK EQUATION * PORK
JPSKPKPK - STOCK ELASTICITY * PORK WRT PORK
JPSKPMI - INTERCEPT OF STOCK EQUATION * POULTRY-MEAT
JPSKPMPM - STOCK ELASTICITY * POULTRY-MEAT WRT POULTRY-MEAT
JPSKRII - INTERCEPT OF STOCK EQUATION * RICE
JPSKRIRI - STOCK ELASTICITY * RICE WRT RICE
JPSKSBI - INTERCEPT OF STOCK EQUATION * SOYBEANS
JPSKSBSB - STOCK ELASTICITY * SOYBEANS WRT SOYBEANS
JPSKSMI - INTERCEPT OF STOCK EQUATION * SOYMEAL
JPSKSMSM - STOCK ELASTICITY * SOYMEAL WRT SOYMEAL
JPSKSOI - INTERCEPT OF STOCK EQUATION * SOYOIL
JPSKSOSO - STOCK ELASTICITY * SOYOIL WRT SOYOIL
JPSKWHI - INTERCEPT OF STOCK EQUATION * WHEAT
JPSKWHWH - STOCK ELASTICITY * WHEAT WRT WHEAT
JPSPCGCG - SUBSIDY (PROD.) ELAST. * OTHER C. GRAINS WRT OTHER C. GRAINS
JPSPCGI - INTERCEPT OF PROD. SUBSIDY EQUATION * OTHER C. GRAINS
JPSPCGRI - SUBSIDY (PROD.) ELAST. * OTHER C. GRAINS WRT RICE
JPSPCGSK - SUBSIDY (PROD.) ELAST. * OTHER C. GRAINS WRT STOCK
JPSPCGTR - SUBSIDY (PROD.) ELAST. * OTHER C. GRAINS WRT TIME TREND
JPSPRII - INTERCEPT OF PROD. SUBSIDY EQUATION * RICE
JPSPRIRI - SUBSIDY (PROD.) ELAST. * RICE WRT RICE
JPSPRISK - SUBSIDY (PROD.) ELAST. * RICE WRT STOCK
JPSPRITR - SUBSIDY (PROD.) ELAST. * RICE WRT TIME TREND
JPSPWHI - INTERCEPT OF PROD. SUBSIDY EQUATION * WHEAT
JPSPWHRI - SUBSIDY (PROD.) ELAST. * WHEAT WRT RICE
JPSPWHSK - SUBSIDY (PROD.) ELAST. * WHEAT WRT STOCK
JPSPWHWH - SUBSIDY (PROD.) ELAST. * WHEAT WRT WHEAT
JPSPWHTR - SUBSIDY (PROD.) ELAST. * WHEAT WRT TIME TREND
JPYDCGAR - YIELD AREA ELAST. * OTHER COARSE GRAINS
JPYDCGCG - YIELD PRICE ELAST. * OTHER COARSE GRAINS
JPYDCGI - INTERCEPT OF CROP YIELD EQUATION * OTHER COARSE GRAINS
JPYDCGTR - YIELD ANNUAL GROWTH RATE * OTHER COARSE GRAINS
JPYDCNAR - YIELD AREA ELAST. * CORN
JPYDCNCN - YIELD PRICE ELAST. * CORN
JPYDCNI - INTERCEPT OF CROP YIELD EQUATION * CORN
JPYDCNTR - YIELD ANNUAL GROWTH RATE * CORN
JPYDOSAR - YIELD AREA ELAST. * OTHER OILSEEDS
JPYDOSI - INTERCEPT OF CROP YIELD EQUATION * OTHER OILSEEDS
JPYDOSOS - YIELD PRICE ELAST. * OTHER OILSEEDS
JPYDOSTR - YIELD ANNUAL GROWTH RATE * OTHER OILSEEDS
JPYDRIAR - YIELD AREA ELAST. * RICE
JPYDRII - INTERCEPT OF CROP YIELD EQUATION * RICE
JPYDRIRI - YIELD PRICE ELAST. * RICE
JPYDRITR - YIELD ANNUAL GROWTH RATE * RICE
JPYDSBAR - YIELD AREA ELAST. * SOYBEANS
JPYDSBI - INTERCEPT OF CROP YIELD EQUATION * SOYBEANS
JPYDSBSB - YIELD PRICE ELAST. * SOYBEANS
JPYDSBTR - YIELD ANNUAL GROWTH RATE * SOYBEANS
JPYDWHAR - YIELD AREA ELAST. * WHEAT
JPYDWHI - INTERCEPT OF CROP YIELD EQUATION * WHEAT
JPYDWHTR - YIELD ANNUAL GROWTH RATE * WHEAT
JPYDWHWH - YIELD PRICE ELAST. * WHEAT

PARAMETER:

JPCLBF - CONVERGENCE LIMIT * BEEF+VEAL
JPCLCG - CONVERGENCE LIMIT * OTHER COARSE GRAINS
JPCLCN - CONVERGENCE LIMIT * CORN
JPCLDB - CONVERGENCE LIMIT * DAIRY-BUTTER
JPCLDC - CONVERGENCE LIMIT * DAIRY-CHEESE
JPCLDO - CONVERGENCE LIMIT * DAIRY-OTHER PRODUCTS
JPCLML - CONVERGENCE LIMIT * MUTTON+LAMB
JPCLOM - CONVERGENCE LIMIT * OTHER MEALS
JPCLOO - CONVERGENCE LIMIT * OTHER OILS
JPCLOS - CONVERGENCE LIMIT * OTHER OILSEEDS
JPCLPE - CONVERGENCE LIMIT * POULTRY-EGGS
JPCLPK - CONVERGENCE LIMIT * PORK
JPCLPM - CONVERGENCE LIMIT * POULTRY-MEAT
JPCLRI - CONVERGENCE LIMIT * RICE
JPCLSB - CONVERGENCE LIMIT * SOYBEANS
JPCLSM - CONVERGENCE LIMIT * SOYMEAL
JPCLSO - CONVERGENCE LIMIT * SOYOIL
JPCLWH - CONVERGENCE LIMIT * WHEAT
JPCPBF - CONVERGENCE PARAMETER * BEEF+VEAL
JPCPCG - CONVERGENCE PARAMETER * OTHER COARSE GRAINS
JPCPCN - CONVERGENCE PARAMETER * CORN
JPCPDB - CONVERGENCE PARAMETER * DAIRY-BUTTER
JPCPDC - CONVERGENCE PARAMETER * DAIRY-CHEESE
JPCPDO - CONVERGENCE PARAMETER * DAIRY-OTHER PRODUCTS
JPCPML - CONVERGENCE PARAMETER * MUTTON+LAMB
JPCPOM - CONVERGENCE PARAMETER * OTHER MEALS
JPCPOO - CONVERGENCE PARAMETER * OTHER OILS
JPCPOS - CONVERGENCE PARAMETER * OTHER OILSEEDS
JPCPPE - CONVERGENCE PARAMETER * POULTRY-EGGS
JPCPPK - CONVERGENCE PARAMETER * PORK
JPCPPM - CONVERGENCE PARAMETER * POULTRY-MEAT
JPCPRI - CONVERGENCE PARAMETER * RICE
JPCPSB - CONVERGENCE PARAMETER * SOYBEANS
JPCPSM - CONVERGENCE PARAMETER * SOYMEAL
JPCPSO - CONVERGENCE PARAMETER * SOYOIL
JPCPWH - CONVERGENCE PARAMETER * WHEAT
JPFCBFCG - FEED COST WEIGHT * OTHER COARSE GRAINS FOR BEEF+VEAL
JPFCBFCN - FEED COST WEIGHT * CORN FOR BEEF+VEAL
JPFCBFOM - FEED COST WEIGHT * OTHER MEALS FOR BEEF+VEAL
JPFCBFSM - FEED COST WEIGHT * SOYMEAL FOR BEEF+VEAL.
JPFCBFWH - FEED COST WEIGHT * WHEAT FOR BEEF+VEAL
JPFCDMCG - FEED COST WEIGHT * OTHER COARSE GRAINS FOR DAIRY-MILK
JPFCDMCN - FEED COST WEIGHT * CORN FOR DAIRY-MILK
JPFCDMOM - FEED COST WEIGHT * OTHER MEALS FOR DAIRY-MILK
JPFCDMSM - FEED COST WEIGHT * SOYMEAL FOR DAIRY-MILK
JPFCDMWH - FEED COST WEIGHT * WHEAT FOR DAIRY-MILK
JPFCMLCG - FEED COST WEIGHT * OTHER COARSE GRAINS FOR MUTTON+LAMB
JPFCMLCN - FEED COST WEIGHT * CORN FOR MUTTON+LAMB
JPFCMLOM - FEED COST WEIGHT * OTHER MEALS FOR MUTTON+LAMB
JPFCMLSM - FEED COST WEIGHT * SOYMEAL FOR MUTTON+LAMB
JPFCMLWH - FEED COST WEIGHT * WHEAT FOR MUTTON+LAMB
JPFCPECG - FEED COST WEIGHT * OTHER COARSE GRAINS FOR POULTRY-EGGS
JPFCPECN - FEED COST WEIGHT * CORN FOR POULTRY-EGGS
JPFCPEOM - FEED COST WEIGHT * OTHER MEALS FOR POULTRY-EGGS
JPFCPESM - FEED COST WEIGHT * SOYMEAL FOR POULTRY-EGGS
JPFCPEWH - FEED COST WEIGHT * WHEAT FOR POULTRY-EGGS

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JPFCPKCG - FEED COST WEIGHT * OTHER COARSE GRAINS FOR PORK
JPFCPKCN - FEED COST WEIGHT * CORN FOR PORK
JPFCPKOM - FEED COST WEIGHT * OTHER MEALS FOR PORK
JPFCPKSM - FEED COST WEIGHT * SOYMEAL FOR PORK
JPFCPKWH - FEED COST WEIGHT * WHEAT FOR PORK
JPFCPMCG - FEED COST WEIGHT * OTHER COARSE GRAINS FOR POULTRY-MEAT
JPFCPMCN - FEED COST WEIGHT * CORN FOR POULTRY-MEAT
JPFCPMOM - FEED COST WEIGHT * OTHER MEALS FOR POULTRY-MEAT
JPFCPMSM - FEED COST WEIGHT * SOYMEAL FOR POULTRY-MEAT
JPFCPMWH - FEED COST WEIGHT * WHEAT FOR POULTRY-MEAT
JPGCAUBF - WEIGHT FOR GRAIN CONSUMING ANIMAL UNIT * BEEF+VEAL
JPGCAUDM - WEIGHT FOR GRAIN CONSUMING ANIMAL UNIT * DAIRY-MILK
JPGCAUML - WEIGHT FOR GRAIN CONSUMING ANIMAL UNIT * MUTTON+LAMB
JPGCAUPE - WEIGHT FOR GRAIN CONSUMING ANIMAL UNIT * POULTRY-EGGS
JPGCAUPK - WEIGHT FOR GRAIN CONSUMING ANIMAL UNIT * PORK
JPGCMUPM - WEIGHT FOR GRAIN CONSUMING ANIMAL MEAT UNIT * POULTRY-MEAT
JPLPWTBF - LIVESTOCK PRICE INDEX WEIGHT * BEEF+VEAL
JPLPWTDM - LIVESTOCK PRICE INDEX WEIGHT * DAIRY-MILK
JPLPWTML - LIVESTOCK PRICE INDEX WEIGHT * MUTTON+LAMB
JPLPWTPE - LIVESTOCK PRICE INDEX WEIGHT * POULTRY-EGGS
JPLPWTPK - LIVESTOCK PRICE INDEX WEIGHT * PORK
JPLPWTPM - LIVESTOCK PRICE INDEX WEIGHT * POULTRY-MEAT
JPQSOSOM - SHARE OF OTHER OILSEED WEIGHT GOING TO MEAL
JPQSOSOO - SHARE OF OTHER OILSEED WEIGHT GOING TO OIL
JPQSSBSM - SHARE OF SOYBEAN WEIGHT GOING TO MEAL
JPQSSBSO - SHARE OF SOYBEAN WEIGHT GOING TO OIL

EQUATIONS

     ***************************************************************************
     *      GRAIN, OILSEEDS, LIVESTOCK COUNTRY MODEL - JAPAN (JP)              *
     *                                                                         *
     ***************************************************************************


     ***************************************************************************
     *      DOMESTIC MARGIN EQUATIONS                                          *
     *                                                                         *
     ***************************************************************************

      MARGIN (DOMESTIC) - BEEF+VEAL:
    1:JPMDBF JPMDBF'N = JPMDBFI'C*(JPPNG'X/JPPDBF'N)**JPMDBFPC'C*(JPPNG'X(-1)/
             JPPDBF'N(-1))**JPMDBFPL'C*JPPDBF'N

      MARGIN (DOMESTIC) - PORK:
    2:JPMDPK JPMDPK'N = JPMDPKI'C*(JPPNG'X/JPPDPK'N)**JPMDPKPC'C*(JPPNG'X(-1)/
             JPPDPK'N(-1))**JPMDPKPL'C*JPPDPK'N

      MARGIN (DOMESTIC) - DAIRY-MILK:
    3:JPMDDM JPMDDM'N = JPMDDMI'C*(JPPNG'X/JPPDDM'N)**JPMDDMPC'C*(JPPNG'X(-1)/
             JPPDDM'N(-1))**JPMDDMPL'C*JPPDDM'N

      MARGIN (DOMESTIC) - POULTRY-MEAT:
    4:JPMDPM JPMDPM'N = JPMDPMI'C*(JPPNG'X/JPPDPM'N)**JPMDPMPC'C*(JPPNG'X(-1)/
             JPPDPM'N(-1))**JPMDPMPL'C*JPPDPM'N
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  MARGIN (DOMESTIC) - POULTRY-EGGS:
 5:JPMDPE JPMDPE'N = JPMDPEI'C*(JPPNG'X/JPPDPE'N)**JPMDPEPC'C*(JPPNG'X(-1)/
          JPPDPE'N(-1))**JPMDPEPL'C*JPPDPE'N

  MARGIN (DOMESTIC) - DAIRY-BUTTER:
 6:JPMDDB JPMDDB'N = JPMDDBI'C*(JPPNG'X/JPPDDB'N)**JPMDDBPC'C*(JPPNG'X(-1)/
         JPPDDB'N(-1))**JPMDDBPL'C*JPPDDB'N

  MARGIN (DOMESTIC) - DAIRY-OTHER PRODUCTS:
 7:JPMDDO JPMDDO'N = JPMDDOI'C*(JPPNG'X/JPPDDO'N)**JPMDDOPC'C*(JPPNG'X(-1)/
          JPPDDO'N(-1))**JPMDDOPL'C*JPPDDO'N


 ************************************************************************
 *      TRADE MARGIN EQUATIONS                                          *
 *                                                                      *
 ************************************************************************

  MARGIN (TRADE) - BEEF+VEAL:
 8:JPMTBF JPMTBF'N = JPMTBFI'C*(JPPNG'X/JPPDBF'N)**JPMTBFPC'C*(JPPNG'X(-1)/
          JPPDBF'N(-1))**JPMTBFPL'C*JPPDBF'N

  MARGIN (TRADE) - PORK:
 9:JPMTPK JPMTPK'N = JPMTPKI'C*(JPPNG'X/JPPDPK'N)**JPMTPKPC'C*(JPPNG'X(-1)/
          JPPDPK'N(-1))**JPMTPKPL'C*JPPDPK'N

  MARGIN (TRADE) - POULTRY-MEAT:
10:JPMTPM JPMTPM'N = JPMTPMI'C*(JPPNG'X/JPPDPM'N)**JPMTPMPC'C*(JPPNG'X(-1)/
          JPPDPM'N(-1))**JPMTPMPL'C*JPPDPM'N

  MARGIN (TRADE) - POULTRY-EGGS:
11:JPMTPE JPMTPE'N = JPMTPEI'C*(JPPNG'X/JPPDPE'N)**JPMTPEPC'C*(JPPNG'X(-1)/
          JPPDPE'N(-1))**JPMTPEPL'C*JPPDPE'N
  MARGIN (TRADE) - WHEAT:
12:JPMTWH JPMTWH'N = JPMTWHI'C*(JPPNG'X/JPPDWH'N)**JPMTWHPC'C*(JPPNG'X(-1)/
          JPPDWH'N(-1))**JPMTWHPL'C*JPPDWH'N

  MARGIN (TRADE) - OTHER COARSE GRAINS:
13:JPMTCG JPMTCG'N = JPMTCGI'C*(JPPNG'X/JPPDCG'N)**JPMTCGPC'C*(JPPNG'X(-1)/
          JPPDCG'N(-1))**JPMTCGPL'C*JPPDCG'N

  MARGIN (TRADE) - SOYBEANS:
14:JPMTSB JPMTSB'N = JPMTSBI'C*(JPPNG'X/JPPDSB'N)**JPMTSBPC'C*(JPPNG'X(-1)/
          JPPDSB'N(-1))**JPMTSBPL'C*JPPDSB'N

  MARGIN (TRADE) - SOYMEAL:
15:JPMTSM JPMTSM'N = JPMTSMI'C*(JPPNG'X/JPPDSM'N)**JPMTSMPC'C*(JPPNG'X(-1)/
          JPPDSM'N(-1))**JPMTSMPL'C*JPPDSM'N

  MARGIN (TRADE) - SOYOIL:
16:JPMTSO JPMTSO'N = JPMTSOI'C*(JPPNG'X/JPPDSO'N)**JPMTSOPC'C*(JPPNG'X(-1)/
          JPPDSO'N(-1))**JPMTSOPL'C*JPPDSO'N

  MARGIN (TRADE) - OTHER MEALS:
17:JPMTOM JPMTOM'N = JPMTOMI'C*(JPPNG'X/JPPDOM'N)**JPMTOMPC'C*(JPPNG'X(-1)/
          JPPDOM'N(-1))**JPMTOMPL'C*JPPDOM'N
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   MARGIN (TRADE) - DAIRY-BUTTER:
18:JPMTDB JPMTDB'N = JPMTDBI'C*(JPPNG'X/JPPDDB'N)**JPMTDBPC'C*(JPPNG'X(-1)/
          JPPDDB'N(-1))**JPMTDBPL'C*JPPDDB'N

   MARGIN (TRADE) - DAIRY-CHEESE:
19:JPMTDC JPMTDC'N = JPMTDCI'C*(JPPNG'X/JPPDDC'N)**JPMTDCPC'C*(JPPNG'X(-1)/
          JPPDDC'N(-1))**JPMTDCPL'C*JPPDDC'N

   MARGIN (TRADE) - DAIRY-OTHER PRODUCTS:
20:JPMTDO JPMTDO'N = JPMTDOI'C*(JPPNG'X/JPPDDO'N)**JPMTDOPC'C*(JPPNG'X(-1)/
          JPPDDO'N(-1))**JPMTDOPL'C*JPPDDO'N

   SUBSIDY (PRODUCTION) - WHEAT:
21:JPSPWH JPSPWH = JPSPWHI'C*JPSKRI'N(-1)**JPSPWHSK'C*JPSPRI(-1)**JPSPWHRI'C
          *JPSPWH(-1)**JPSPWHWH'C*TIME'X**JPSPWHTR'C

   SUBSIDY (PRODUCTION) - OTHER COARSE GRAINS:
22:JPSPCG JPSPCG = JPSPCGI'C*JPSKRI'N(-1)**JPSPCGSK'C*JPSPRI(-1)**JPSPCGRI'C
          *JPSPCG(-1)**JPSPCGCG'C*TIME'X**JPSPCGTR'C

   SUBSIDY (PRODUCTION) - RICE:
23:JPSPRI JPSPRI = JPSPRII'C*JPSKRI'N(-1)**JPSPRISK'C*JPSPRI(-1)**JPSPRIRI'C
          *TIME'X**JPSPRITR'C

    SUBSIDY (EXPORT) - RICE:
24:JPSERI JPSERI = JPSERII'C*JPSKRI'N(-1)**JPSERISK'C*JPSERI(-1)**JPSERIRI'C
         *TIME'X**JPSERITR'C

   TAX/SUBSIDY (PRODUCTION) - WHEAT:
25:JPTPWH JPTPWH = -JPSPWH

   TAX/SUBSIDY (PRODUCTION) - OTHER COARSE GRAINS:
26:JPTPCG JPTPCG = -JPSPCG
   TAX/SUBSIDY (PRODUCTION) - RICE:
27:JPTPRI JPTPRI = -JPSPRI

   TAX/SUBSIDY (EXPORT) - RICE:
28:JPTERI JPTERI = -JPSERI

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  *      SUPPLY - DEMAND PRICE LINKAGE EQUATIONS                         *
  *                                                                      *
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   PRICE (SUPPLY) DEFINITION - BEEF+VEAL:
29:JPPSBF JPPSBF'DEF == ABSV'F(JPPDBF'N-JPTCBF'POLN-JPMDBF'N-JPTPBF'POLN)

   PRICE (SUPPLY) DEFINITION - PORK:
30:JPPSPK JPPSPK'DEF == ABSV'F(JPPDPK'N-JPTCPK'POLN-JPMDPK'N-JPTPPK'POLN)

   PRICE (SUPPLY) DEFINITION - MUTTON+LAMB:
31:JPPSML JPPSML'DEF == ABSV'F(JPPDML'N-JPTCML'POLN-JPMDML-JPTPML'POLN)
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   PRICE (SUPPLY) DEFINITION - DAIRY-MILK:
32:JPPSDM JPPSDM'DEF == ABSV'F(JPPDDM'N-JPTCDM'POLN-JPMDDM'N-JPTPDM'POLN)

   PRICE (SUPPLY) DEFINITION - POULTRY-MEAT:
33:JPPSPM JPPSPM'DEF == ABSV'F(JPPDPM'N-JPTCPM'POLN-JPMDPM'N-JPTPPM'POLN)

   PRICE (SUPPLY) DEFINITION - POULTRY-EGGS:
34:JPPSPE JPPSPE'DEF == ABSV'F(JPPDPE'N-JPTCPE'POLN-JPMDPE'N-JPTPPE'POLN)

   PRICE (SUPPLY) DEFINITION - WHEAT:
35:JPPSWH JPPSWH'DEF == ABSV'F(JPPDWH'N-JPTCWH'POLN-JPMDWH-JPTPWH)

   PRICE (SUPPLY) DEFINITION - CORN:
36:JPPSCN JPPSCN'DEF == ABSV'F(JPPDCN'N-JPTCCN'POLN-JPMDCN-JPTPCN'POLN)

   PRICE (SUPPLY) DEFINITION - OTHER COARSE GRAINS:
37:JPPSCG JPPSCG'DEF == ABSV'F(JPPDCG'N-JPTCCG'POLN-JPMDCG-JPTPCG)

   PRICE (SUPPLY) DEFINITION - RICE:
38:JPPSRI JPPSRI'DEF == ABSV'F(JPPDRI'N-JPTCRI'POLN-JPMDRI-JPTPRI)

   PRICE (SUPPLY) DEFINITION - SOYBEANS:
39:JPPSSB JPPSSB'DEF == ABSV'F(JPPDSB'N-JPTCSB'POLN-JPMDSB-JPTPSB'POLN)

   PRICE (SUPPLY) DEFINITION - OTHER OILSEEDS:
40:JPPSOS JPPSOS'DEF == ABSV'F(JPPDOS'N-JPTCOS'POLN-JPMDOS-JPTPOS'POLN)

   PRICE (SUPPLY) DEFINITION - SOYMEAL:
41:JPPSSM JPPSSM'DEF == ABSV'F(JPPDSM'N-JPTCSM'POLN-JPMDSM-JPTPSM'POLN)

   PRICE (SUPPLY) DEFINITION - SOYOIL:
42:JPPSSO JPPSSO'DEF == ABSV'F(JPPDSO'N-JPTCSO'POLN-JPMDSO-JPTPSO'POLN)

   PRICE (SUPPLY) DEFINITION - OTHER MEALS:
43:JPPSOM JPPSOM'DEF == ABSV'F(JPPDOM'N-JPTCOM'POLN-JPMDOM-JPTPOM'POLN)

   PRICE (SUPPLY) DEFINITION - OTHER OILS:
44:JPPSOO JPPSOO'DEF == ABSV'F(JPPDOO'N-JPTCOO'POLN-JPMDOO-JPTPOO'POLN)

   PRICE (SUPPLY) DEFINITION - DAIRY-BUTTER:
45:JPPSDB JPPSDB'DEF == ABSV'F(JPPDDB'N-JPTCDB'POLN-JPMDDB'N-JPTPDB'POLN)

   PRICE (SUPPLY) DEFINITION - DAIRY-CHEESE:
46:JPPSDC JPPSDC'DEF == ABSV'F(JPPDDC'N-JPTCDC'POLN-JPMDDC-JPTPDC'POLN)

   PRICE (SUPPLY) DEFINITION - DAIRY-OTHER PRODUCTS:
47:JPPSDO JPPSDO'DEF == ABSV'F(JPPDDO'N-JPTCDO'POLN-JPMDDO'N-JPTPDO'POLN)

  ************************************************************************
  *      CROP AREA EQUATIONS                                             *
  *                                                                      *
  ************************************************************************

   AVERAGE REAL RETURN TO LAND (1976 PRICES):
48:JPTTRL JPTTRL'DEF == (JPPSWH'DEF*JPYDWH'N*JPARWH'N+JPPSCN'DEF*JPYDCN'N*
          JPARCN'N+JPPSCG'DEF*JPYDCG'N*JPARCG'N+JPPSRI'DEF*JPYDRI'N*JPARRI'N
          +JPPSSB'DEF*JPYDSB'N*JPARSB'N+JPPSOS'DEF*JPYDOS'N*JPAROS'N)*100/(
          JPICP'X*(JPARWH'N+JPARCN'N+JPARCG'N+JPARRI'N+JPARSB'N+JPAROS'N))
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   TOTAL LAND SUPPLY:
49:JPARTT JPARTT'N = JPARTTI'C*JPTTRL'DEF(-1)**JPARTTRL'C*(1+JPARTTTR'C)**
          TIME'X

   CROP AREA SUPPLY - WHEAT:
50:JPARWH JPARWH'N = JPARWHI'C*(JPPSWH'DEF(-1)*JPYDWH'N(-1)/JPICP'X(-1))**
          JPARWHWH'C*(JPPSCN'DEF(-1)*JPYDCN'N(-1)/JPICP'X(-1))**JPARWHCN'C*(
          JPPSCG'DEF(-1)*JPYDCG'N(-1)/JPICP'X(-1))**JPARWHCG'C*(JPPSRI'DEF(
          -1)*JPYDRI'N(-1)/JPICP'X(-1))**JPARWHRI'C*(JPPSSB'DEF(-1)*JPYDSB'N
          (-1)/JPICP'X(-1))**JPARWHSB'C*(JPPSOS'DEF(-1)*JPYDOS'N(-1)/JPICP'X
          (-1))**JPARWHOS'C*JPARTT'N

   CROP AREA SUPPLY - CORN:
51:JPARCN JPARCN'N = JPARCNI'C*(JPPSWH'DEF(-1)*JPYDWH'N(-1)/JPICP'X(-1))**
          JPARCNWH'C*(JPPSCN'DEF(-1)*JPYDCN'N(-1)/JPICP'X(-1))**JPARCNCN'C*(
          JPPSCG'DEF(-1)*JPYDCG'N(-1)/JPICP'X(-1))**JPARCNCG'C*(JPPSRI'DEF(
          -1)*JPYDRI'N(-1)/JPICP'X(-1))**JPARCNRI'C*(JPPSSB'DEF(-1)*JPYDSB'N
          (-1)/JPICP'X(-1))**JPARCNSB'C*(JPPSOS'DEF(-1)*JPYDOS'N(-1)/JPICP'X
          (-1))**JPARCNOS'C*JPARTT'N

   CROP AREA SUPPLY - OTHER COARSE GRAINS:
52:JPARCG JPARCG'N = JPARCGI'C*(JPPSWH'DEF(-1)*JPYDWH'N(-1)/JPICP'X(-1))**
          JPARCGWH'C*(JPPSCN'DEF(-1)*JPYDCN'N(-1)/JPICP'X(-1))**JPARCGCN'C*(
          JPPSCG'DEF(-1)*JPYDCG'N(-1)/JPICP'X(-1))**JPARCGCG'C*(JPPSRI'DEF(
          -1)*JPYDRI'N(-1)/JPICP'X(-1))**JPARCGRI'C*(JPPSSB'DEF(-1)*JPYDSB'N
          (-1)/JPICP'X(-1))**JPARCGSB'C*(JPPSOS'DEF(-1)*JPYDOS'N(-1)/JPICP'X
          (-1))**JPARCGOS'C*JPARTT'N

   CROP AREA SUPPLY - RICE:
53:JPARRI JPARRI'N = JPARRII'C*(JPPSWH'DEF(-1)*JPYDWH'N(-1)/JPICP'X(-1))**
          JPARRIWH'C*(JPPSCN'DEF(-1)*JPYDCN'N(-1)/JPICP'X(-1))**JPARRICN'C*(
          JPPSCG'DEF(-1)*JPYDCG'N(-1)/JPICP'X(-1))**JPARRICG'C*(JPPSRI'DEF(
          -1)*JPYDRI'N(-1)/JPICP'X(-1))**JPARRIRI'C*(JPPSSB'DEF(-1)*JPYDSB'N
          (-1)/JPICP'X(-1))**JPARRISB'C*(JPPSOS'DEF(-1)*JPYDOS'N(-1)/JPICP'X
          (-1))**JPARRIOS'C*JPARTT'N

   CROP AREA SUPPLY - SOYBEANS:
54:JPARSB JPARSB'N = JPARSBI'C*(JPPSWH'DEF(-1)*JPYDWH'N(-1)/JPICP'X(-1))**
          JPARSBWH'C*(JPPSCN'DEF(-1)*JPYDCN'N(-1)/JPICP'X(-1))**JPARSBCN'C*(
          JPPSCG'DEF(-1)*JPYDCG'N(-1)/JPICP'X(-1))**JPARSBCG'C*(JPPSRI'DEF(
          -1)*JPYDRI'N(-1)/JPICP'X(-1))**JPARSBRI'C*(JPPSSB'DEF(-1)*JPYDSB'N
          (-1)/JPICP'X(-1))**JPARSBSB'C*(JPPSOS'DEF(-1)*JPYDOS'N(-1)/JPICP'X
          (-1))**JPARSBOS'C*JPARTT'N

   CROP AREA SUPPLY - OTHER OILSEEDS:
55:JPAROS JPAROS'N = JPAROSI'C*(JPPSWH'DEF(-1)*JPYDWH'N(-1)/JPICP'X(-1))**
          JPAROSWH'C*(JPPSCN'DEF(-1)*JPYDCN'N(-1)/JPICP'X(-1))**JPAROSCN'C*(
          JPPSCG'DEF(-1)*JPYDCG'N(-1)/JPICP'X(-1))**JPAROSCG'C*(JPPSRI'DEF(
          -1)*JPYDRI'N(-1)/JPICP'X(-1))**JPAROSRI'C*(JPPSSB'DEF(-1)*JPYDSB'N
          (-1)/JPICP'X(-1))**JPAROSSB'C*(JPPSOS'DEF(-1)*JPYDOS'N(-1)/JPICP'X
          (-1))**JPAROSOS'C*JPARTT'N
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*************************************************************************
*      CROP YIELD EQUATIONS                                             *
*                                                                       *
*************************************************************************

   YIELD - WHEAT:
56:JPYDWH JPYDWH'N = JPYDWHI'C*(JPPSWH'DEF/JPPIN'X)**JPYDWHWH'C*JPARWH'N**
         JPYDWHAR'C*(1+JPYDWHTR'C)**TIME'X*JPWIN'X

   YIELD - CORN:
57:JPYDCN JPYDCN'N = JPYDCNI'C*(JPPSCN'DEF/JPPIN'X)**JPYDCNCN'C*JPARCN'N**
         JPYDCNAR'C*(1+JPYDCNTR'C)**TIME'X*JPWIN'X

   YIELD - OTHER COARSE GRAINS:
58:JPYDCG JPYDCG'N = JPYDCGI'C*(JPPSCG'DEF/JPPIN'X)**JPYDCGCG'C*JPARCG'N**
         JPYDCGAR'C*(1+JPYDCGTR'C)**TIME'X*JPWIN'X

   YIELD - RICE:
59:JPYDRI JPYDRI'N = JPYDRII'C*(JPPSRI'DEF/JPPIN'X)**JPYDRIRI'C*JPARRI'N**
         JPYDRIAR'C*(1+JPYDRITR'C)**TIME'X*JPWIN'X
   YIELD - SOYBEANS:
60:JPYDSB JPYDSB'N = JPYDSBI'C*(JPPSSB'DEF/JPPIN'X)**JPYDSBSB'C*JPARSB'N**
         JPYDSBAR'C*(1+JPYDSBTR'C)**TIME'X*JPWIN'X

   YIELD - OTHER OILSEEDS:
61:JPYDOS JPYDOS'N = JPYDOSI'C*(JPPSOS'DEF/JPPIN'X)**JPYDOSOS'C*JPAROS'N**
         JPYDOSAR'C*(1+JPYDOSTR'C)**TIME'X*JPWIN'X

*************************************************************************
*    CROP SUPPLY EQUATIONS                                              *
*                                                                       *
*************************************************************************

   QUANTITY SUPPLIED - WHEAT:
62:JPQSWH JPQSWH'DEF == JPARWH'N*JPYDWH'N

   QUANTITY SUPPLIED - CORN :
63:JPQSCN JPQSCN'DEF == JPARCN'N*JPYDCN'N

   QUANTITY SUPPLIED - OTHER COARSE GRAINS :
64:JPQSCG JPQSCG'DEF == JPARCG'N*JPYDCG'N

   QUANTITY SUPPLIED - RICE :
65:JPQSRI JPQSRI'DEF == JPARRI'N*JPYDRI'N

   QUANTITY SUPPLIED - SOYBEANS :
66:JPQSSB JPQSSB'DEF == JPARSB'N*JPYDSB'N

   QUANTITY SUPPLIED - OTHER OILSEEDS :
67:JPQSOS JPQSOS'DEF == JPAROS'N*JPYDOS'N
```

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*************************************************************************
*      OILSEED PRODUCT EQUATIONS                                        *
*                                                                       *
*************************************************************************

   RATIO OF ((SOYBEAN CRUSHING RETURNS)/SOYBEAN PRICES):
68:JPSBPM JPSBPM'DEF == (JPQSSBSO'P*JPPSSO'DEF+JPQSSBSM'P*JPPSSM'DEF)/
          JPPDSB'N

   RATIO OF ((OTHER OILSEED CRUSHING RETURNS)/OTHER OILSEEDS PRICE):
69:JPOSPM JPOSPM'DEF == (JPQSOSOO'P*JPPSOO'DEF+JPQSOSOM'P*JPPSOM'DEF)/
          JPPDOS'N

   QUANTITY CRUSHED - SOYBEANS:
70:JPQCSB JPQCSB'N = JPQCSBI'C*JPSBPM'DEF**JPQCSBPM'C*(1+JPQCSBTR'C)**TIME'X

   QUANTITY CRUSHED - OTHER OILSEEDS:
71:JPQCOS JPQCOS'N = JPQCOSI'C*JPOSPM'DEF**JPQCOSPM'C*(1+JPQCOSTR'C)**TIME'X

   QUANTITY SUPPLIED - SOYMEAL:
72:JPQSSM JPQSSM'DEF == JPQSSBSM'P*JPQCSB'N

   QUANTITY SUPPLIED - OTHER MEALS:
73:JPQSOM JPQSOM'DEF == JPQSOSOM'P*JPQCOS'N

   QUANTITY SUPPLIED - SOYOIL:
74:JPQSSO JPQSSO'DEF == JPQSSBSO'P*JPQCSB'N

   QUANTITY SUPPLIED - OTHER OILS:
75:JPQSOO JPQSOO'DEF == JPQSOSOO'P*JPQCOS'N

*************************************************************************
*    FEED COST EQUATIONS                                                *
*                                                                       *
*************************************************************************

   FEED COST (WEIGHTED) - BEEF+VEAL:
76:JPFCBF JPFCBF'DEF == JPFCBFOM'P*JPPDOM'N+JPFCBFSM'P*JPPDSM'N+JPFCBFCG'P*
          JPPDCG'N+JPFCBFCN'P*JPPDCN'N+JPFCBFWH'P*JPPDWH'N

   FEED COST (WEIGHTED) - PORK:
77:JPFCPK JPFCPK'DEF == JPFCPKOM'P*JPPDOM'N+JPFCPKSM'P*JPPDSM'N+JPFCPKCG'P*
          JPPDCG'N+JPFCPKCN'P*JPPDCN'N+JPFCPKWH'P*JPPDWH'N

   FEED COST (WEIGHTED) - MUTTON+LAMB:
78:JPFCML JPFCML'DEF == JPFCMLOM'P*JPPDOM'N+JPFCMLSM'P*JPPDSM'N+JPFCMLCG'P*
          JPPDCG'N+JPFCMLCN'P*JPPDCN'N+JPFCMLWH'P*JPPDWH'N

   FEED COST (WEIGHTED) - DAIRY-MILK:
79:JPFCDM JPFCDM'DEF == JPFCDMOM'P*JPPDOM'N+JPFCDMSM'P*JPPDSM'N+JPFCDMCG'P*
          JPPDCG'N+JPFCDMCN'P*JPPDCN'N+JPFCDMWH'P*JPPDWH'N

   FEED COST (WEIGHTED) - POULTRY-MEAT:
80:JPFCPM JPFCPM'DEF == JPFCPMOM'P*JPPDOM'N+JPFCPMSM'P*JPPDSM'N+JPFCPMCG'P*
          JPPDCG'N+JPFCPMCN'P*JPPDCN'N+JPFCPMWH'P*JPPDWH'N
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   FEED COST (WEIGHTED) - POULTRY-EGGS:
81:JPFCPE JPFCPE'DEF == JPFCPEOM'P*JPPDOM'N+JPFCPESM'P*JPPDSM'N+JPFCPECG'P*
         JPPDCG'N+JPFCPECN'P*JPPDCN'N+JPFCPEWH'P*JPPDWH'N

  ************************************************************************
  *      LIVESTOCK NUMBER AND PRODUCT EQUATIONS                          *
  *                                                                      *
  ************************************************************************

   LIVESTOCK NUMBERS - BEEF+VEAL:
82:JPLNBF JPLNBF'N = JPLNBF'N(-1)+JPLABF'N(-1)-JPLSBF'N(-1)

   LIVESTOCK ADDITIONS - BEEF+VEAL:
83:JPLABF JPLABF'N = JPLABFI'C*(JPPSBF'DEF/JPFCBF'DEF)**JPLABFPC'C*(
         JPPSBF'DEF(-1)/JPFCBF'DEF(-1))**JPLABFPL'C*JPLNBF'N

   LIVESTOCK SLAUGHTER - BEEF+VEAL:
84:JPLSBF JPLSBF'N = JPLSBFI'C*(JPPSBF'DEF/JPFCBF'DEF)**JPLSBFPC'C*(
         JPPSBF'DEF(-1)/JPFCBF'DEF(-1))**JPLSBFPL'C*JPLNBF'N

   QUANTITY SUPPLIED - BEEF+VEAL:
85:JPQSBF JPQSBF'N = JPQSBFI'C*(JPPSBF'DEF/JPFCBF'DEF)**JPQSBFPC'C*(
         JPPSBF'DEF(-1)/JPFCBF'DEF(-1))**JPQSBFPL'C*JPLSBF'N*(1+JPQSBFTR'C)
         **TIME'X

   LIVESTOCK NUMBERS - PORK:
86:JPLNPK JPLNPK'N = JPLNPK'N(-1)+JPLAPK'N(-1)-JPLSPK'N(-1)

   LIVESTOCK ADDITIONS - PORK:
87:JPLAPK JPLAPK'N = JPLAPKI'C*(JPPSPK'DEF/JPFCPK'DEF)**JPLAPKPC'C*(
         JPPSPK'DEF(-1)/JPFCPK'DEF(-1))**JPLAPKPL'C*JPLNPK'N

   LIVESTOCK SLAUGHTER - PORK:
88:JPLSPK JPLSPK'N = JPLSPKI'C*(JPPSPK'DEF/JPFCPK'DEF)**JPLSPKPC'C*(
         JPPSPK'DEF(-1)/JPFCPK'DEF(-1))**JPLSPKPL'C*JPLNPK'N

   QUANTITY SUPPLIED - PORK:
89:JPQSPK JPQSPK'N = JPQSPKI'C*(JPPSPK'DEF/JPFCPK'DEF)**JPQSPKPC'C*(
         JPPSPK'DEF(-1)/JPFCPK'DEF(-1))**JPQSPKPL'C*JPLSPK'N*(1+JPQSPKTR'C)
         **TIME'X

   LIVESTOCK NUMBERS - MUTTON+LAMB:
90:JPLNML JPLNML'N = JPLNML'N(-1)+JPLAML'N(-1)-JPLSML'N(-1)

   LIVESTOCK ADDITIONS - MUTTON+LAMB:
91:JPLAML JPLAML'N = JPLAMLI'C*(JPPSML'DEF/JPFCML'DEF)**JPLAMLPC'C*(
         JPPSML'DEF(-1)/JPFCML'DEF(-1))**JPLAMLPL'C*JPLNML'N

   LIVESTOCK SLAUGHTER - MUTTON+LAMB:
92:JPLSML JPLSML'N = JPLSMLI'C*(JPPSML'DEF/JPFCML'DEF)**JPLSMLPC'C*(
         JPPSML'DEF(-1)/JPFCML'DEF(-1))**JPLSMLPL'C*JPLNML'N

   QUANTITY SUPPLIED - MUTTON+LAMB:
93:JPQSML JPQSML'N = JPQSMLI'C*(JPPSML'DEF/JPFCML'DEF)**JPQSMLPC'C*(
         JPPSML'DEF(-1)/JPFCML'DEF(-1))**JPQSMLPL'C*JPLSML'N*(1+JPQSMLTR'C)
         **TIME'X
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          JPPNG'X)**JPQDPKSO'C*(JPPDOM'N/JPPNG'X)**JPQDPKOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDPKOO'C*(JPPDDB'N/JPPNG'X)**JPQDPKDB'C*(JPPDDC'N/
          JPPNG'X)**JPQDPKDC'C*(JPPDDO'N/JPPNG'X)**JPQDPKDO'C*JPPDFI'X**
          JPQDPKFI'C*(JPINC'X/(JPPNG'X*JPPOP'X))**JPQDPKIN'C*JPPOP'X

    QUANTITY DEMANDED - POULTRY-MEAT:
112:JPQDPM JPQDPM'N = JPQDPMI'C*(JPPDBF'N/JPPNG'X)**JPQDPMBF'C*(JPPDPK'N/
          JPPNG'X)**JPQDPMPK'C*(JPPDML'N/JPPNG'X)**JPQDPMML'C*(JPPDDM'N/
          JPPNG'X)**JPQDPMDM'C*(JPPDPM'N/JPPNG'X)**JPQDPMPM'C*(JPPDPE'N/
          JPPNG'X)**JPQDPMPE'C*(JPPDWH'N/JPPNG'X)**JPQDPMWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDPMCN'C*(JPPDCG'N/JPPNG'X)**JPQDPMCG'C*(JPPDRI'N/
          JPPNG'X)**JPQDPMRI'C*(JPPDSB'N/JPPNG'X)**JPQDPMSB'C*(JPPDOS'N/
          JPPNG'X)**JPQDPMOS'C*(JPPDSM'N/JPPNG'X)**JPQDPMSM'C*(JPPDSO'N/
          JPPNG'X)**JPQDPMSO'C*(JPPDOM'N/JPPNG'X)**JPQDPMOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDPMOO'C*(JPPDDB'N/JPPNG'X)**JPQDPMDB'C*(JPPDDC'N/
          JPPNG'X)**JPQDPMDC'C*(JPPDDO'N/JPPNG'X)**JPQDPMDO'C*JPPDFI'X**
          JPQDPMFI'C*(JPINC'X/(JPPNG'X*JPPOP'X))**JPQDPMIN'C*JPPOP'X

    QUANTITY DEMANDED - POULTRY-EGGS:
113:JPQDPE JPQDPE'N = JPQDPEI'C*(JPPDBF'N/JPPNG'X)**JPQDPEBF'C*(JPPDPK'N/
          JPPNG'X)**JPQDPEPK'C*(JPPDML'N/JPPNG'X)**JPQDPEML'C*(JPPDDM'N/
          JPPNG'X)**JPQDPEDM'C*(JPPDPM'N/JPPNG'X)**JPQDPEPM'C*(JPPDPE'N/
          JPPNG'X)**JPQDPEPE'C*(JPPDWH'N/JPPNG'X)**JPQDPEWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDPECN'C*(JPPDCG'N/JPPNG'X)**JPQDPECG'C*(JPPDRI'N/
          JPPNG'X)**JPQDPERI'C*(JPPDSB'N/JPPNG'X)**JPQDPESB'C*(JPPDOS'N/
          JPPNG'X)**JPQDPEOS'C*(JPPDSM'N/JPPNG'X)**JPQDPESM'C*(JPPDSO'N/
          JPPNG'X)**JPQDPESO'C*(JPPDOM'N/JPPNG'X)**JPQDPEOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDPEOO'C*(JPPDDB'N/JPPNG'X)**JPQDPEDB'C*(JPPDDC'N/
          JPPNG'X)**JPQDPEDC'C*(JPPDDO'N/JPPNG'X)**JPQDPEDO'C*JPPDFI'X**
          JPQDPEFI'C*(JPINC'X/(JPPNG'X*JPPOP'X))**JPQDPEIN'C*JPPOP'X

    QUANTITY DEMANDED - RICE:
114:JPQDRI JPQDRI'N = JPQDRII'C*(JPPDBF'N/JPPNG'X)**JPQDRIBF'C*(JPPDPK'N/
          JPPNG'X)**JPQDRIPK'C*(JPPDML'N/JPPNG'X)**JPQDRIML'C*(JPPDDM'N/
          JPPNG'X)**JPQDRIDM'C*(JPPDPM'N/JPPNG'X)**JPQDRIPM'C*(JPPDPE'N/
          JPPNG'X)**JPQDRIPE'C*(JPPDWH'N/JPPNG'X)**JPQDRIWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDRICN'C*(JPPDCG'N/JPPNG'X)**JPQDRICG'C*(JPPDRI'N/
          JPPNG'X)**JPQDRIRI'C*(JPPDSB'N/JPPNG'X)**JPQDRISB'C*(JPPDOS'N/
          JPPNG'X)**JPQDRIOS'C*(JPPDSM'N/JPPNG'X)**JPQDRISM'C*(JPPDSO'N/
          JPPNG'X)**JPQDRISO'C*(JPPDOM'N/JPPNG'X)**JPQDRIOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDRIOO'C*(JPPDDB'N/JPPNG'X)**JPQDRIDB'C*(JPPDDC'N/
          JPPNG'X)**JPQDRIDC'C*(JPPDDO'N/JPPNG'X)**JPQDRIDO'C*JPPDFI'X**
          JPQDRIFI'C*(JPINC'X/(JPPNG'X*JPPOP'X))**JPQDRIIN'C*JPPOP'X

    QUANTITY DEMANDED - MUTTON+LAMB:
115:JPQDML JPQDML'N = JPQDMLI'C*((JPPDBF'N/JPPNG'X)**JPQDMLBF'C*(JPPDPK'N/
          JPPNG'X)**JPQDMLPK'C*(JPPDML'N/JPPNG'X)**JPQDMLML'C*(JPPDDM'N/
          JPPNG'X)**JPQDMLDM'C*(JPPDPM'N/JPPNG'X)**JPQDMLPM'C*(JPPDPE'N/
          JPPNG'X)**JPQDMLPE'C*(JPPDWH'N/JPPNG'X)**JPQDMLWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDMLCN'C*(JPPDCG'N/JPPNG'X)**JPQDMLCG'C*(JPPDRI'N/
          JPPNG'X)**JPQDMLRI'C*(JPPDSB'N/JPPNG'X)**JPQDMLSB'C*(JPPDOS'N/
          JPPNG'X)**JPQDMLOS'C*(JPPDSM'N/JPPNG'X)**JPQDMLSM'C*(JPPDSO'N/
          JPPNG'X)**JPQDMLSO'C*(JPPDOM'N/JPPNG'X)**JPQDMLOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDMLOO'C*(JPPDDB'N/JPPNG'X)**JPQDMLDB'C*(JPPDDC'N/
          JPPNG'X)**JPQDMLDC'C*(JPPDDO'N/JPPNG'X)**JPQDMLDO'C*(JPINC'X/(
          JPPNG'X*JPPOP'X))**JPQDMLIN'C*JPPOP'X)
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    QUANTITY DEMANDED - DAIRY-MILK:
116:JPQDDM JPQDDM'N = JPQDDMI'C*(JPPDBF'N/JPPNG'X)**JPQDDMBF'C*(JPPDPK'N/
           JPPNG'X)**JPQDDMPK'C*(JPPDML'N/JPPNG'X)**JPQDDMML'C*(JPPDDM'N/
           JPPNG'X)**JPQDDMDM'C*(JPPDPM'N/JPPNG'X)**JPQDDMPM'C*(JPPDPE'N/
           JPPNG'X)**JPQDDMPE'C*(JPPDWH'N/JPPNG'X)**JPQDDMWH'C*(JPPDCN'N/
           JPPNG'X)**JPQDDMCN'C*(JPPDCG'N/JPPNG'X)**JPQDDMCG'C*(JPPDRI'N/
           JPPNG'X)**JPQDDMRI'C*(JPPDSB'N/JPPNG'X)**JPQDDMSB'C*(JPPDOS'N/
           JPPNG'X)**JPQDDMOS'C*(JPPDSM'N/JPPNG'X)**JPQDDMSM'C*(JPPDSO'N/
           JPPNG'X)**JPQDDMSO'C*(JPPDOM'N/JPPNG'X)**JPQDDMOM'C*(JPPDOO'N/
           JPPNG'X)**JPQDDMOO'C*(JPPDDB'N/JPPNG'X)**JPQDDMDB'C*(JPPDDC'N/
           JPPNG'X)**JPQDDMDC'C*(JPPDDO'N/JPPNG'X)**JPQDDMDO'C*(JPINC'X/(
           JPPNG'X*JPPOP'X))**JPQDDMIN'C*JPPOP'X

    QUANTITY DEMANDED - WHEAT:
117:JPQDWH JPQDWH'N = JPQDWHI'C*((JPPDBF'N/JPPNG'X)**JPQDWHBF'C*(JPPDPK'N/
           JPPNG'X)**JPQDWHPK'C*(JPPDML'N/JPPNG'X)**JPQDWHML'C*(JPPDDM'N/
           JPPNG'X)**JPQDWHDM'C*(JPPDPM'N/JPPNG'X)**JPQDWHPM'C*(JPPDPE'N/
           JPPNG'X)**JPQDWHPE'C*(JPPDWH'N/JPPNG'X)**JPQDWHWH'C*(JPPDCN'N/
           JPPNG'X)**JPQDWHCN'C*(JPPDCG'N/JPPNG'X)**JPQDWHCG'C*(JPPDRI'N/
           JPPNG'X)**JPQDWHRI'C*(JPPDSB'N/JPPNG'X)**JPQDWHSB'C*(JPPDOS'N/
           JPPNG'X)**JPQDWHOS'C*(JPPDSM'N/JPPNG'X)**JPQDWHSM'C*(JPPDSO'N/
           JPPNG'X)**JPQDWHSO'C*(JPPDOM'N/JPPNG'X)**JPQDWHOM'C*(JPPDOO'N/
           JPPNG'X)**JPQDWHOO'C*(JPPDDB'N/JPPNG'X)**JPQDWHDB'C*(JPPDDC'N/
           JPPNG'X)**JPQDWHDC'C*(JPPDDO'N/JPPNG'X)**JPQDWHDO'C*(JPINC'X/(
           JPPNG'X*JPPOP'X))**JPQDWHIN'C*JPPOP'X)

    QUANTITY DEMANDED - CORN:
118:JPQDCN JPQDCN'N = JPQDCNI'C*((JPPDBF'N/JPPNG'X)**JPQDCNBF'C*(JPPDPK'N/
           JPPNG'X)**JPQDCNPK'C*(JPPDML'N/JPPNG'X)**JPQDCNML'C*(JPPDDM'N/
           JPPNG'X)**JPQDCNDM'C*(JPPDPM'N/JPPNG'X)**JPQDCNPM'C*(JPPDPE'N/
           JPPNG'X)**JPQDCNPE'C*(JPPDWH'N/JPPNG'X)**JPQDCNWH'C*(JPPDCN'N/
           JPPNG'X)**JPQDCNCN'C*(JPPDCG'N/JPPNG'X)**JPQDCNCG'C*(JPPDRI'N/
           JPPNG'X)**JPQDCNRI'C*(JPPDSB'N/JPPNG'X)**JPQDCNSB'C*(JPPDOS'N/
           JPPNG'X)**JPQDCNOS'C*(JPPDSM'N/JPPNG'X)**JPQDCNSM'C*(JPPDSO'N/
           JPPNG'X)**JPQDCNSO'C*(JPPDOM'N/JPPNG'X)**JPQDCNOM'C*(JPPDOO'N/
           JPPNG'X)**JPQDCNOO'C*(JPPDDB'N/JPPNG'X)**JPQDCNDB'C*(JPPDDC'N/
           JPPNG'X)**JPQDCNDC'C*(JPPDDO'N/JPPNG'X)**JPQDCNDO'C*(JPINC'X/(
           JPPNG'X*JPPOP'X))**JPQDCNIN'C*JPPOP'X)

    QUANTITY DEMANDED - OTHER COARSE GRAINS:
119:JPQDCG JPQDCG'N = JPQDCGI'C*((JPPDBF'N/JPPNG'X)**JPQDCGBF'C*(JPPDPK'N/
           JPPNG'X)**JPQDCGPK'C*(JPPDML'N/JPPNG'X)**JPQDCGML'C*(JPPDDM'N/
           JPPNG'X)**JPQDCGDM'C*(JPPDPM'N/JPPNG'X)**JPQDCGPM'C*(JPPDPE'N/
           JPPNG'X)**JPQDCGPE'C*(JPPDWH'N/JPPNG'X)**JPQDCGWH'C*(JPPDCN'N/
           JPPNG'X)**JPQDCGCN'C*(JPPDCG'N/JPPNG'X)**JPQDCGCG'C*(JPPDRI'N/
           JPPNG'X)**JPQDCGRI'C*(JPPDSB'N/JPPNG'X)**JPQDCGSB'C*(JPPDOS'N/
           JPPNG'X)**JPQDCGOS'C*(JPPDSM'N/JPPNG'X)**JPQDCGSM'C*(JPPDSO'N/
           JPPNG'X)**JPQDCGSO'C*(JPPDOM'N/JPPNG'X)**JPQDCGOM'C*(JPPDOO'N/
           JPPNG'X)**JPQDCGOO'C*(JPPDDB'N/JPPNG'X)**JPQDCGDB'C*(JPPDDC'N/
           JPPNG'X)**JPQDCGDC'C*(JPPDDO'N/JPPNG'X)**JPQDCGDO'C*(JPINC'X/(
           JPPNG'X*JPPOP'X))**JPQDCGIN'C*JPPOP'X)

    QUANTITY DEMANDED - SOYBEANS:
120:JPQDSB JPQDSB'N = JPQDSBI'C*((JPPDBF'N/JPPNG'X)**JPQDSBBF'C*(JPPDPK'N/
           JPPNG'X)**JPQDSBPK'C*(JPPDML'N/JPPNG'X)**JPQDSBML'C*(JPPDDM'N/
           JPPNG'X)**JPQDSBDM'C*(JPPDPM'N/JPPNG'X)**JPQDSBPM'C*(JPPDPE'N/
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          JPPNG'X)**JPQDSBPE'C*(JPPDWH'N/JPPNG'X)**JPQDSBWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDSBCN'C*(JPPDCG'N/JPPNG'X)**JPQDSBCG'C*(JPPDRI'N/
          JPPNG'X)**JPQDSBRI'C*(JPPDSB'N/JPPNG'X)**JPQDSBSB'C*(JPPDOS'N/
          JPPNG'X)**JPQDSBOS'C*(JPPDSM'N/JPPNG'X)**JPQDSBSM'C*(JPPDSO'N/
          JPPNG'X)**JPQDSBSO'C*(JPPDOM'N/JPPNG'X)**JPQDSBOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDSBOO'C*(JPPDDB'N/JPPNG'X)**JPQDSBDB'C*(JPPDDC'N/
          JPPNG'X)**JPQDSBDC'C*(JPPDDO'N/JPPNG'X)**JPQDSBDO'C*(JPINC'X/(
          JPPNG'X*JPPOP'X))**JPQDSBIN'C*JPPOP'X)

    QUANTITY DEMANDED - OTHER OILSEEDS:
121:JPQDOS JPQDOS'N = JPQDOSI'C*((JPPDBF'N/JPPNG'X)**JPQDOSBF'C*(JPPDPK'N/
          JPPNG'X)**JPQDOSPK'C*(JPPDML'N/JPPNG'X)**JPQDOSML'C*(JPPDDM'N/
          JPPNG'X)**JPQDOSDM'C*(JPPDPM'N/JPPNG'X)**JPQDOSPM'C*(JPPDPE'N/
          JPPNG'X)**JPQDOSPE'C*(JPPDWH'N/JPPNG'X)**JPQDOSWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDOSCN'C*(JPPDCG'N/JPPNG'X)**JPQDOSCG'C*(JPPDRI'N/
          JPPNG'X)**JPQDOSRI'C*(JPPDSB'N/JPPNG'X)**JPQDOSSB'C*(JPPDOS'N/
          JPPNG'X)**JPQDOSOS'C*(JPPDSM'N/JPPNG'X)**JPQDOSSM'C*(JPPDSO'N/
          JPPNG'X)**JPQDOSSO'C*(JPPDOM'N/JPPNG'X)**JPQDOSOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDOSOO'C*(JPPDDB'N/JPPNG'X)**JPQDOSDB'C*(JPPDDC'N/
          JPPNG'X)**JPQDOSDC'C*(JPPDDO'N/JPPNG'X)**JPQDOSDO'C*(JPINC'X/(
          JPPNG'X*JPPOP'X))**JPQDOSIN'C*JPPOP'X)

    QUANTITY DEMANDED - SOYMEAL:
122:JPQDSM JPQDSM'N = JPQDSMI'C*((JPPDBF'N/JPPNG'X)**JPQDSMBF'C*(JPPDPK'N/
          JPPNG'X)**JPQDSMPK'C*(JPPDML'N/JPPNG'X)**JPQDSMML'C*(JPPDDM'N/
          JPPNG'X)**JPQDSMDM'C*(JPPDPM'N/JPPNG'X)**JPQDSMPM'C*(JPPDPE'N/
          JPPNG'X)**JPQDSMPE'C*(JPPDWH'N/JPPNG'X)**JPQDSMWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDSMCN'C*(JPPDCG'N/JPPNG'X)**JPQDSMCG'C*(JPPDRI'N/
          JPPNG'X)**JPQDSMRI'C*(JPPDSB'N/JPPNG'X)**JPQDSMSB'C*(JPPDOS'N/
          JPPNG'X)**JPQDSMOS'C*(JPPDSM'N/JPPNG'X)**JPQDSMSM'C*(JPPDSO'N/
          JPPNG'X)**JPQDSMSO'C*(JPPDOM'N/JPPNG'X)**JPQDSMOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDSMOO'C*(JPPDDB'N/JPPNG'X)**JPQDSMDB'C*(JPPDDC'N/
          JPPNG'X)**JPQDSMDC'C*(JPPDDO'N/JPPNG'X)**JPQDSMDO'C*(JPINC'X/(
          JPPNG'X*JPPOP'X))**JPQDSMIN'C*JPPOP'X)

    QUANTITY DEMANDED - SOYOIL:
123:JPQDSO JPQDSO'N = JPQDSOI'C*((JPPDBF'N/JPPNG'X)**JPQDSOBF'C*(JPPDPK'N/
          JPPNG'X)**JPQDSOPK'C*(JPPDML'N/JPPNG'X)**JPQDSOML'C*(JPPDDM'N/
          JPPNG'X)**JPQDSODM'C*(JPPDPM'N/JPPNG'X)**JPQDSOPM'C*(JPPDPE'N/
          JPPNG'X)**JPQDSOPE'C*(JPPDWH'N/JPPNG'X)**JPQDSOWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDSOCN'C*(JPPDCG'N/JPPNG'X)**JPQDSOCG'C*(JPPDRI'N/
          JPPNG'X)**JPQDSORI'C*(JPPDSB'N/JPPNG'X)**JPQDSOSB'C*(JPPDOS'N/
          JPPNG'X)**JPQDSOOS'C*(JPPDSM'N/JPPNG'X)**JPQDSOSM'C*(JPPDSO'N/
          JPPNG'X)**JPQDSOSO'C*(JPPDOM'N/JPPNG'X)**JPQDSOOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDSOOO'C*(JPPDDB'N/JPPNG'X)**JPQDSODB'C*(JPPDDC'N/
          JPPNG'X)**JPQDSODC'C*(JPPDDO'N/JPPNG'X)**JPQDSODO'C*(JPINC'X/(
          JPPNG'X*JPPOP'X))**JPQDSOIN'C*JPPOP'X)

    QUANTITY DEMANDED - OTHER MEALS:
124:JPQDOM JPQDOM'N = JPQDOMI'C*((JPPDBF'N/JPPNG'X)**JPQDOMBF'C*(JPPDPK'N/
          JPPNG'X)**JPQDOMPK'C*(JPPDML'N/JPPNG'X)**JPQDOMML'C*(JPPDDM'N/
          JPPNG'X)**JPQDOMDM'C*(JPPDPM'N/JPPNG'X)**JPQDOMPM'C*(JPPDPE'N/
          JPPNG'X)**JPQDOMPE'C*(JPPDWH'N/JPPNG'X)**JPQDOMWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDOMCN'C*(JPPDCG'N/JPPNG'X)**JPQDOMCG'C*(JPPDRI'N/
          JPPNG'X)**JPQDOMRI'C*(JPPDSB'N/JPPNG'X)**JPQDOMSB'C*(JPPDOS'N/
          JPPNG'X)**JPQDOMOS'C*(JPPDSM'N/JPPNG'X)**JPQDOMSM'C*(JPPDSO'N/
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          JPPNG'X)**JPQDOMSO'C*(JPPDOM'N/JPPNG'X)**JPQDOMOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDOMOO'C*(JPPDDB'N/JPPNG'X)**JPQDOMDB'C*(JPPDDC'N/
          JPPNG'X)**JPQDOMDC'C*(JPPDDO'N/JPPNG'X)**JPQDOMDO'C*(JPINC'X/(
          JPPNG'X*JPPOP'X))**JPQDOMIN'C*JPPOP'X)

    QUANTITY DEMANDED - OTHER OILS:
125:JPQDOO JPQDOO'N = JPQDOOI'C*((JPPDBF'N/JPPNG'X)**JPQDOOBF'C*(JPPDPK'N/
          JPPNG'X)**JPQDOOPK'C*(JPPDML'N/JPPNG'X)**JPQDOOML'C*(JPPDDM'N/
          JPPNG'X)**JPQDOODM'C*(JPPDPM'N/JPPNG'X)**JPQDOOPM'C*(JPPDPE'N/
          JPPNG'X)**JPQDOOPE'C*(JPPDWH'N/JPPNG'X)**JPQDOOWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDOOCN'C*(JPPDCG'N/JPPNG'X)**JPQDOOCG'C*(JPPDRI'N/
          JPPNG'X)**JPQDOORI'C*(JPPDSB'N/JPPNG'X)**JPQDOOSB'C*(JPPDOS'N/
          JPPNG'X)**JPQDOOOS'C*(JPPDSM'N/JPPNG'X)**JPQDOOSM'C*(JPPDSO'N/
          JPPNG'X)**JPQDOOSO'C*(JPPDOM'N/JPPNG'X)**JPQDOOOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDOOOO'C*(JPPDDB'N/JPPNG'X)**JPQDOODB'C*(JPPDDC'N/
          JPPNG'X)**JPQDOODC'C*(JPPDDO'N/JPPNG'X)**JPQDOODO'C*(JPINC'X/(
          JPPNG'X*JPPOP'X))**JPQDOOIN'C*JPPOP'X)

    QUANTITY DEMANDED - DAIRY-BUTTER:
126:JPQDDB JPQDDB'N = JPQDDBI'C*((JPPDBF'N/JPPNG'X)**JPQDDBBF'C*(JPPDPK'N/
          JPPNG'X)**JPQDDBPK'C*(JPPDML'N/JPPNG'X)**JPQDDBML'C*(JPPDDM'N/
          JPPNG'X)**JPQDDBDM'C*(JPPDPM'N/JPPNG'X)**JPQDDBPM'C*(JPPDPE'N/
          JPPNG'X)**JPQDDBPE'C*(JPPDWH'N/JPPNG'X)**JPQDDBWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDDBCN'C*(JPPDCG'N/JPPNG'X)**JPQDDBCG'C*(JPPDRI'N/
          JPPNG'X)**JPQDDBRI'C*(JPPDSB'N/JPPNG'X)**JPQDDBSB'C*(JPPDOS'N/
          JPPNG'X)**JPQDDBOS'C*(JPPDSM'N/JPPNG'X)**JPQDDBSM'C*(JPPDSO'N/
          JPPNG'X)**JPQDDBSO'C*(JPPDOM'N/JPPNG'X)**JPQDDBOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDDBOO'C*(JPPDDB'N/JPPNG'X)**JPQDDBDB'C*(JPPDDC'N/
          JPPNG'X)**JPQDDBDC'C*(JPPDDO'N/JPPNG'X)**JPQDDBDO'C*(JPINC'X/(
          JPPNG'X*JPPOP'X))**JPQDDBIN'C*JPPOP'X)

    QUANTITY DEMANDED - DAIRY-CHEESE:
127:JPQDDC JPQDDC'N = JPQDDCI'C*((JPPDBF'N/JPPNG'X)**JPQDDCBF'C*(JPPDPK'N/
          JPPNG'X)**JPQDDCPK'C*(JPPDML'N/JPPNG'X)**JPQDDCML'C*(JPPDDM'N/
          JPPNG'X)**JPQDDCDM'C*(JPPDPM'N/JPPNG'X)**JPQDDCPM'C*(JPPDPE'N/
          JPPNG'X)**JPQDDCPE'C*(JPPDWH'N/JPPNG'X)**JPQDDCWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDDCCN'C*(JPPDCG'N/JPPNG'X)**JPQDDCCG'C*(JPPDRI'N/
          JPPNG'X)**JPQDDCRI'C*(JPPDSB'N/JPPNG'X)**JPQDDCSB'C*(JPPDOS'N/
          JPPNG'X)**JPQDDCOS'C*(JPPDSM'N/JPPNG'X)**JPQDDCSM'C*(JPPDSO'N/
          JPPNG'X)**JPQDDCSO'C*(JPPDOM'N/JPPNG'X)**JPQDDCOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDDCOO'C*(JPPDDB'N/JPPNG'X)**JPQDDCDB'C*(JPPDDC'N/
          JPPNG'X)**JPQDDCDC'C*(JPPDDO'N/JPPNG'X)**JPQDDCDO'C*(JPINC'X/(
          JPPNG'X*JPPOP'X))**JPQDDCIN'C*JPPOP'X)

    QUANTITY DEMANDED - DAIRY-OTHER PRODUCTS:
128:JPQDDO JPQDDO'N = JPQDDOI'C*((JPPDBF'N/JPPNG'X)**JPQDDOBF'C*(JPPDPK'N/
          JPPNG'X)**JPQDDOPK'C*(JPPDML'N/JPPNG'X)**JPQDDOML'C*(JPPDDM'N/
          JPPNG'X)**JPQDDODM'C*(JPPDPM'N/JPPNG'X)**JPQDDOPM'C*(JPPDPE'N/
          JPPNG'X)**JPQDDOPE'C*(JPPDWH'N/JPPNG'X)**JPQDDOWH'C*(JPPDCN'N/
          JPPNG'X)**JPQDDOCN'C*(JPPDCG'N/JPPNG'X)**JPQDDOCG'C*(JPPDRI'N/
          JPPNG'X)**JPQDDORI'C*(JPPDSB'N/JPPNG'X)**JPQDDOSB'C*(JPPDOS'N/
          JPPNG'X)**JPQDDOOS'C*(JPPDSM'N/JPPNG'X)**JPQDDOSM'C*(JPPDSO'N/
          JPPNG'X)**JPQDDOSO'C*(JPPDOM'N/JPPNG'X)**JPQDDOOM'C*(JPPDOO'N/
          JPPNG'X)**JPQDDOOO'C*(JPPDDB'N/JPPNG'X)**JPQDDODB'C*(JPPDDC'N/
          JPPNG'X)**JPQDDODC'C*(JPPDDO'N/JPPNG'X)**JPQDDODO'C*(JPINC'X/(
          JPPNG'X*JPPOP'X))**JPQDDOIN'C*JPPOP'X)
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*************************************************************************
*       STOCK EQUATIONS                                                 *
*                                                                       *
*************************************************************************

    ENDING STOCKS - BEEF+VEAL:
129:JPSKBF JPSKBF'N = JPSKBFI'C*(JPPDBF'N/JPPNG'X)**JPSKBFBF'C*(JPQDBF'N+
           JPQSBF'N)

    ENDING STOCKS - PORK:
130:JPSKPK JPSKPK'N = JPSKPKI'C*(JPPDPK'N/JPPNG'X)**JPSKPKPK'C*(JPQDPK'N+
           JPQSPK'N)

    ENDING STOCKS - MUTTOM+LAMB:
131:JPSKML JPSKML'N = JPSKMLI'C*(JPPDML'N/JPPNG'X)**JPSKMLML'C*(JPQDML'N+
           JPQSML'N)

    ENDING STOCKS - POULTRY-MEAT:
132:JPSKPM JPSKPM'N = JPSKPMI'C*(JPPDPM'N/JPPNG'X)**JPSKPMPM'C*(JPQDPM'N+
           JPQSPM'N)

    ENDING STOCKS - POULTRY-EGGS:
133:JPSKPE JPSKPE'N = JPSKPEI'C*(JPPDPE'N/JPPNG'X)**JPSKPEPE'C*(JPQDPE'N+
           JPQSPE'N)

    ENDING STOCKS - WHEAT:
134:JPSKWH JPSKWH'N = JPSKWHI'C*(JPPDWH'N/JPPNG'X)**JPSKWHWH'C*(JPQSWH'DEF+
           JPQDWH'N+JPQFWH'N)

    ENDING STOCKS - CORN:
135:JPSKCN JPSKCN'N = JPSKCNI'C*(JPPDCN'N/JPPNG'X)**JPSKCNCN'C*(JPQSCN'DEF+
           JPQDCN'N+JPQFCN'N)

    ENDING STOCKS - OTHER COARSE GRAINS:
136:JPSKCG JPSKCG'N = JPSKCGI'C*(JPPDCG'N/JPPNG'X)**JPSKCGCG'C*(JPQSCG'DEF+
           JPQDCG'N+JPQFCG'N)

    ENDING STOCKS - RICE:
137:JPSKRI JPSKRI'N = JPSKRII'C*(JPPDRI'N/JPPNG'X)**JPSKRIRI'C*(JPQSRI'DEF+
           JPQDRI'N)

    ENDING STOCKS - SOYBEANS:
138:JPSKSB JPSKSB'N = JPSKSBI'C*(JPPDSB'N/JPPNG'X)**JPSKSBSB'C*(JPQSSB'DEF+
           JPQDSB'N+JPQCSB'N)

    ENDING STOCKS - OTHER OILSEEDS:
139:JPSKOS JPSKOS'N = JPSKOSI'C*(JPPDOS'N/JPPNG'X)**JPSKOSOS'C*(JPQSOS'DEF+
           JPQDOS'N+JPQCOS'N)

    ENDING STOCKS - SOYMEAL:
140:JPSKSM JPSKSM'N = JPSKSMI'C*(JPPDSM'N/JPPNG'X)**JPSKSMSM'C*(JPQSSM'DEF+
           JPQDSM'N+JPQFSM'N)

    ENDING STOCKS - SOYOIL:
141:JPSKSO JPSKSO'N = JPSKSOI'C*(JPPDSO'N/JPPNG'X)**JPSKSOSO'C*(JPQDSO'N+
           JPQSSO'DEF)
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    ENDING STOCKS - OTHER MEALS:
142:JPSKOM JPSKOM'N = JPSKOMI'C*(JPPDOM'N/JPPNG'X)**JPSKOMOM'C*(JPQSOM'DEF+
           JPQDOM'N+JPQFOM'N)

    ENDING STOCKS - OTHER OILS:
143:JPSKOO JPSKOO'N = JPSKOOI'C*(JPPDOO'N/JPPNG'X)**JPSKOOOO'C*(JPQDOO'N+
           JPQSOO'DEF)

    ENDING STOCKS - DAIRY-BUTTER:
144:JPSKDB JPSKDB'N = JPSKDBI'C*(JPPDDB'N/JPPNG'X)**JPSKDBDB'C*(JPQDDB'N+
           JPQSDB'N)

    ENDING STOCKS - DAIRY-CHEESE:
145:JPSKDC JPSKDC'N = JPSKDCI'C*(JPPDDC'N/JPPNG'X)**JPSKDCDC'C*(JPQDDC'N+
           JPQSDC'N)

    ENDING STOCKS - DAIRY-OTHER PRODUCTS:
146:JPSKDO JPSKDO'N = JPSKDOI'C*(JPPDDO'N/JPPNG'X)**JPSKDODO'C*(JPQDDO'N+
           JPQSDO'N)

   ************************************************************************
   *      TRADE QUANTITY EQUATIONS                                        *
   *                                                                      *
   ************************************************************************

    QUANTITY TRADED DEFINITION - BEEF+VEAL:
147:JPQTBF JPQTBF'N = JPQSBF'N-JPQDBF'N-(JPSKBF'N-JPSKBF'N(-1))

    QUANTITY TRADED DEFINITION - PORK:
148:JPQTPK JPQTPK'N = JPQSPK'N-JPQDPK'N-(JPSKPK'N-JPSKPK'N(-1))

    QUANTITY TRADED DEFINITION - MUTTON+LAMB:
149:JPQTML JPQTML'N = JPQSML'N-JPQDML'N-(JPSKML'N-JPSKML'N(-1))

    QUANTITY TRADED DEFINITION - POULTRY-MEAT:
150:JPQTPM JPQTPM'N = JPQSPM'N-JPQDPM'N-(JPSKPM'N-JPSKPM'N(-1))

    QUANTITY TRADED DEFINITION - POULTRY-EGGS:
151:JPQTPE JPQTPE'N = JPQSPE'N-JPQDPE'N-(JPSKPE'N-JPSKPE'N(-1))

    QUANTITY TRADED DEFINITION - WHEAT:
152:JPQTWH JPQTWH'N = JPQSWH'DEF-JPQDWH'N-JPQFWH'N-(JPSKWH'N-JPSKWH'N(-1))

    QUANTITY TRADED DEFINITION - CORN:
153:JPQTCN JPQTCN'N = JPQSCN'DEF-JPQFCN'N-JPQDCN'N-(JPSKCN'N-JPSKCN'N(-1))

    QUANTITY TRADED DEFINITION - OTHER COARSE GRAINS:
154:JPQTCG JPQTCG'N = JPQSCG'DEF-JPQDCG'N-JPQFCG'N-(JPSKCG'N-JPSKCG'N(-1))

    QUANTITY TRADED DEFINITION - RICE:
155:JPQTRI JPQTRI'N = JPQSRI'DEF-JPQDRI'N-(JPSKRI'N-JPSKRI'N(-1))

    QUANTITY TRADED DEFINITION - SOYBEANS:
156:JPQTSB JPQTSB'N = JPQSSB'DEF-JPQDSB'N-JPQCSB'N-(JPSKSB'N-JPSKSB'N(-1))

    QUANTITY TRADED DEFINITION - OTHER OILSEEDS:
157:JPQTOS JPQTOS'N = JPQSOS'DEF-JPQDOS'N-JPQCOS'N-(JPSKOS'N-JPSKOS'N(-1))
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    QUANTITY TRADED DEFINITION - SOYMEAL:
158:JPQTSM JPQTSM'N = JPQSSM'DEF-JPQDSM'N-JPQFSM'N-(JPSKSM'N-JPSKSM'N(-1))

    QUANTITY TRADED DEFINITION - SOYOIL:
159:JPQTSO JPQTSO'N = JPQSSO'DEF-JPQDSO'N-(JPSKSO'N-JPSKSO'N(-1))

    QUANTITY TRADED DEFINITION - OTHER MEALS:
160:JPQTOM JPQTOM'N = JPQSOM'DEF-JPQDOM'N-JPQFOM'N-(JPSKOM'N-JPSKOM'N(-1))

    QUANTITY TRADED DEFINITION - OTHER OILS:
161:JPQTOO JPQTOO'N = JPQSOO'DEF-JPQDOO'N-(JPSKOO'N-JPSKOO'N(-1))

    QUANTITY TRADED DEFINITION - DAIRY-BUTTER:
162:JPQTDB JPQTDB'N = JPQSDB'N-JPQDDB'N-(JPSKDB'N-JPSKDB'N(-1))

    QUANTITY TRADED DEFINITION - DAIRY-CHEESE:
163:JPQTDC JPQTDC'N = JPQSDC'N-JPQDDC'N-(JPSKDC'N-JPSKDC'N(-1))

    QUANTITY TRADED DEFINITION - DAIRY-OTHER PRODUCTS:
164:JPQTDO JPQTDO'N = JPQSDO'N-JPQDDO'N-(JPSKDO'N-JPSKDO'N(-1))

    TOTAL SUPPLY - BEEF+VEAL:
165:JPTSBF JPTSBF'DEF == JPQSBF'N

    TOTAL SUPPLY - PORK:
166:JPTSPK JPTSPK'DEF == JPQSPK'N

    TOTAL SUPPLY - MUTTON+LAMB:
167:JPTSML JPTSML'DEF == JPQSML'N

    TOTAL SUPPLY - POULTRY-MEAT:
168:JPTSPM JPTSPM'DEF == JPQSPM'N

    TOTAL SUPPLY - POULTRY-EGGS:
169:JPTSPE JPTSPE'DEF == JPQSPE'N

    TOTAL SUPPLY - WHEAT:
170:JPTSWH JPTSWH'DEF == JPQSWH'DEF

    TOTAL SUPPLY - CORN:
171:JPTSCN JPTSCN'DEF == JPQSCN'DEF

    TOTAL SUPPLY - OTHER COARSE GRAINS:
172:JPTSCG JPTSCG'DEF == JPQSCG'DEF

    TOTAL SUPPLY - RICE:
173:JPTSRI JPTSRI'DEF == JPQSRI'DEF

    TOTAL SUPPLY - SOYBEANS:
174:JPTSSB JPTSSB'DEF == JPQSSB'DEF

    TOTAL SUPPLY - OTHER OILSEEDS:
175:JPTSOS JPTSOS'DEF == JPQSOS'DEF

    TOTAL SUPPLY - SOYMEAL:
176:JPTSSM JPTSSM'DEF == JPQSSM'DEF
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    TOTAL SUPPLY - SOYOIL:
177:JPTSSO JPTSSO'DEF == JPQSSO'DEF

    TOTAL SUPPLY - OTHER MEALS:
178:JPTSOM JPTSOM'DEF == JPQSOM'DEF

    TOTAL SUPPLY - OTHER OILS:
179:JPTSOO JPTSOO'DEF == JPQSOO'DEF

    TOTAL SUPPLY - DAIRY-BUTTER:
180:JPTSDB JPTSDB'DEF == JPQSDB'N

    TOTAL SUPPLY - DAIRY-CHEESE:
181:JPTSDC JPTSDC'DEF == JPQSDC'N

    TOTAL SUPPLY - DAIRY-OTHER PRODUCTS:
182:JPTSDO JPTSDO'DEF == JPQSDO'N

    TOTAL DEMAND - BEEF+VEAL:
183:JPTDBF JPTDBF'DEF == JPQDBF'N+(JPSKBF'N-JPSKBF'N(-1))

    TOTAL DEMAND - PORK:
184:JPTDPK JPTDPK'DEF == JPQDPK'N+(JPSKPK'N-JPSKPK'N(-1))

    TOTAL DEMAND - MUTTON+LAMB:
185:JPTDML JPTDML'DEF == JPQDML'N+(JPSKML'N-JPSKML'N(-1))

    TOTAL DEMAND - POULTRY-MEAT:
186:JPTDPM JPTDPM'DEF == JPQDPM'N+(JPSKPM'N-JPSKPM'N(-1))

    TOTAL DEMAND - POULTRY-EGGS:
187:JPTDPE JPTDPE'DEF == JPQDPE'N+(JPSKPE'N-JPSKPE'N(-1))

    TOTAL DEMAND - WHEAT:
188:JPTDWH JPTDWH'DEF == JPQDWH'N+JPQFWH'N+(JPSKWH'N-JPSKWH'N(-1))

    TOTAL DEMAND - CORN:
189:JPTDCN JPTDCN'DEF == JPQDCN'N+JPQFCN'N+(JPSKCN'N-JPSKCN'N(-1))

    TOTAL DEMAND - OTHER COARSE GRAINS:
190:JPTDCG JPTDCG'DEF == JPQDCG'N+JPQFCG'N+(JPSKCG'N-JPSKCG'N(-1))

    TOTAL DEMAND - RICE:
191:JPTDRI JPTDRI'DEF == JPQDRI'N+(JPSKRI'N-JPSKRI'N(-1))

    TOTAL DEMAND - SOYBEANS:
192:JPTDSB JPTDSB'DEF == JPQDSB'N+JPQCSB'N+(JPSKSB'N-JPSKSB'N(-1))

    TOTAL DEMAND - OTHER OILSEEDS:
193:JPTDOS JPTDOS'DEF == JPQDOS'N+JPQCOS'N+(JPSKOS'N-JPSKOS'N(-1))

    TOTAL DEMAND - SOYMEAL:
194:JPTDSM JPTDSM'DEF == JPQDSM'N+JPQFSM'N+(JPSKSM'N-JPSKSM'N(-1))

    TOTAL DEMAND - SOYOIL:
195:JPTDSO JPTDSO'DEF == JPQDSO'N+(JPSKSO'N-JPSKSO'N(-1))
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    TOTAL DEMAND - OTHER MEALS:
196:JPTDOM JPTDOM'DEF == JPQDOM'N+JPQFOM'N+(JPSKOM'N-JPSKOM'N(-1))

    TOTAL DEMAND - OTHER OILS:
197:JPTDOO JPTDOO'DEF == JPQDOO'N+(JPSKOO'N-JPSKOO'N(-1))

    TOTAL DEMAND - DAIRY-BUTTER:
198:JPTDDB JPTDDB'DEF == JPQDDB'N+(JPSKDB'N-JPSKDB'N(-1))

    TOTAL DEMAND - DAIRY-CHEESE:
199:JPTDDC JPTDDC'DEF == JPQDDC'N+(JPSKDC'N-JPSKDC'N(-1))

    TOTAL DEMAND - DAIRY-OTHER PRODUCTS:
200:JPTDDO JPTDDO'DEF == JPQDDO'N+(JPSKDO'N-JPSKDO'N(-1))

    PRICE (ADJUSTMENT) RATIO - BEEF+VEAL:
201:JPPRBF JPPRBF'DEF == JPCPBF'P*(JPQTBF'N-(IF JPQTBF'N GE JPEQBF'POLN THEN
          JPEQBF'POLN ELSE (IF JPQTBF'N LE -JPMQBF'POLN THEN -JPMQBF'POLN
           ELSE 0)))/(JPTSBF'DEF+JPTDBF'DEF)

    PRICE (ADJUSTMENT) RATIO - PORK:
202:JPPRPK JPPRPK'DEF == JPCPPK'P*(JPQTPK'N-(IF JPQTPK'N GE JPEQPK'POLN THEN
          JPEQPK'POLN ELSE (IF JPQTPK'N LE -JPMQPK'POLN THEN -JPMQPK'POLN
           ELSE 0)))/(JPTSPK'DEF+JPTDPK'DEF)

    PRICE (ADJUSTMENT) RATIO - MUTTON+LAMB:
203:JPPRML JPPRML'DEF == JPCPML'P*(JPQTML'N-(IF JPQTML'N GE JPEQML'POLN THEN
          JPEQML'POLN ELSE (IF JPQTML'N LE -JPMQML'POLN THEN -JPMQML'POLN
           ELSE 0)))/(JPTSML'DEF+JPTDML'DEF)

    PRICE (ADJUSTMENT) RATIO - POULTRY-MEAT:
204:JPPRPM JPPRPM'DEF == JPCPPM'P*(JPQTPM'N-(IF JPQTPM'N GE JPEQPM'POLN THEN
          JPEQPM'POLN ELSE (IF JPQTPM'N LE -JPMQPM'POLN THEN -JPMQPM'POLN
           ELSE 0)))/(JPTSPM'DEF+JPTDPM'DEF)

    PRICE (ADJUSTMENT) RATIO - POULTRY-EGGS:
205:JPPRPE JPPRPE'DEF == JPCPPE'P*(JPQTPE'N-(IF JPQTPE'N GE JPEQPE'POLN THEN
          JPEQPE'POLN ELSE (IF JPQTPE'N LE -JPMQPE'POLN THEN -JPMQPE'POLN
           ELSE 0)))/(JPTSPE'DEF+JPTDPE'DEF)

    PRICE (ADJUSTMENT) RATIO - WHEAT:
206:JPPRWH JPPRWH'DEF == JPCPWH'P*(JPQTWH'N-(IF JPQTWH'N GE JPEQWH'POLN THEN
          JPEQWH'POLN ELSE (IF JPQTWH'N LE -JPMQWH'POLN THEN -JPMQWH'POLN
           ELSE 0)))/(JPTSWH'DEF+JPTDWH'DEF)

    PRICE (ADJUSTMENT) RATIO - CORN:
207:JPPRCN JPPRCN'DEF == JPCPCN'P*(JPQTCN'N-(IF JPQTCN'N GE JPEQCN'POLN THEN
          JPEQCN'POLN ELSE (IF JPQTCN'N LE -JPMQCN'POLN THEN -JPMQCN'POLN
           ELSE 0)))/(JPTSCN'DEF+JPTDCN'DEF)

    PRICE (ADJUSTMENT) RATIO - OTHER COARSE GRAINS:
208:JPPRCG JPPRCG'DEF == JPCPCG'P*(JPQTCG'N-(IF JPQTCG'N GE JPEQCG'POLN THEN
          JPEQCG'POLN ELSE (IF JPQTCG'N LE -JPMQCG'POLN THEN -JPMQCG'POLN
           ELSE 0)))/(JPTSCG'DEF+JPTDCG'DEF)
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    PRICE (ADJUSTMENT) RATIO - RICE:
209:JPPRRI JPPRRI'DEF == JPCPRI'P*(JPQTRI'N-(IF JPQTRI'N GE JPEQRI'POLN THEN
           JPEQRI'POLN ELSE (IF JPQTRI'N LE -JPMQRI'POLN THEN -JPMQRI'POLN
            ELSE 0)))/(JPTSRI'DEF+JPTDRI'DEF)

    PRICE (ADJUSTMENT) RATIO - SOYBEANS:
210:JPPRSB JPPRSB'DEF == JPCPSB'P*(JPQTSB'N-(IF JPQTSB'N GE JPEQSB'POLN THEN
           JPEQSB'POLN ELSE (IF JPQTSB'N LE -JPMQSB'POLN THEN -JPMQSB'POLN
            ELSE 0)))/(JPTSSB'DEF+JPTDSB'DEF)

    PRICE (ADJUSTMENT) RATIO - OTHER OILSEEDS:
211:JPPROS JPPROS'DEF == JPCPOS'P*(JPQTOS'N-(IF JPQTOS'N GE JPEQOS'POLN THEN
           JPEQOS'POLN ELSE (IF JPQTOS'N LE -JPMQOS'POLN THEN -JPMQOS'POLN
            ELSE 0)))/(JPTSOS'DEF+JPTDOS'DEF)

    PRICE (ADJUSTMENT) RATIO - SOYMEAL:
212:JPPRSM JPPRSM'DEF == JPCPSM'P*(JPQTSM'N-(IF JPQTSM'N GE JPEQSM'POLN THEN
           JPEQSM'POLN ELSE (IF JPQTSM'N LE -JPMQSM'POLN THEN -JPMQSM'POLN
            ELSE 0)))/(JPTSSM'DEF+JPTDSM'DEF)

    PRICE (ADJUSTMENT) RATIO - SOYOIL:
213:JPPRSO JPPRSO'DEF == JPCPSO'P*(JPQTSO'N-(IF JPQTSO'N GE JPEQSO'POLN THEN
           JPEQSO'POLN ELSE (IF JPQTSO'N LE -JPMQSO'POLN THEN -JPMQSO'POLN
            ELSE 0)))/(JPTSSO'DEF+JPTDSO'DEF)

    PRICE (ADJUSTMENT) RATIO - OTHER MEALS:
214:JPPROM JPPROM'DEF == JPCPOM'P*(JPQTOM'N-(IF JPQTOM'N GE JPEQOM'POLN THEN
           JPEQOM'POLN ELSE (IF JPQTOM'N LE -JPMQOM'POLN THEN -JPMQOM'POLN
            ELSE 0)))/(JPTSOM'DEF+JPTDOM'DEF)

    PRICE (ADJUSTMENT) RATIO - OTHER OILS:
215:JPPROO JPPROO'DEF == JPCPOO'P*(JPQTOO'N-(IF JPQTOO'N GE JPEQOO'POLN THEN
           JPEQOO'POLN ELSE (IF JPQTOO'N LE -JPMQOO'POLN THEN -JPMQOO'POLN
            ELSE 0)))/(JPTSOO'DEF+JPTDOO'DEF)

    PRICE (ADJUSTMENT) RATIO - DAIRY-BUTTER:
216:JPPRDB JPPRDB'DEF == JPCPDB'P*(JPQTDB'N-(IF JPQTDB'N GE JPEQDB'POLN THEN
           JPEQDB'POLN ELSE (IF JPQTDB'N LE -JPMQDB'POLN THEN -JPMQDB'POLN
            ELSE 0)))/(JPTSDB'DEF+JPTDDB'DEF)

    PRICE (ADJUSTMENT) RATIO - DAIRY-CHEESE:
217:JPPRDC JPPRDC'DEF == JPCPDC'P*(JPQTDC'N-(IF JPQTDC'N GE JPEQDC'POLN THEN
           JPEQDC'POLN ELSE (IF JPQTDC'N LE -JPMQDC'POLN THEN -JPMQDC'POLN
            ELSE 0)))/(JPTSDC'DEF+JPTDDC'DEF)

    PRICE (ADJUSTMENT) RATIO - DAIRY-OTHER PRODUCTS:
218:JPPRDO JPPRDO'DEF == JPCPDO'P*(JPQTDO'N-(IF JPQTDO'N GE JPEQDO'POLN THEN
           JPEQDO'POLN ELSE (IF JPQTDO'N LE -JPMQDO'POLN THEN -JPMQDO'POLN
            ELSE 0)))/(JPTSDO'DEF+JPTDDO'DEF)
```

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*************************************************************************
*      EQUATIONS FOR DEMAND PRICE ESTIMATES IF TRADE IS RESTRICTED OR   *
*      NON-EXISTENT                                                     *
*************************************************************************

   PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - BEEF+VEAL:
219:JPPEBF JPPEBF'DEF == JPPDBF'N*(1-(IF JPPRBF'DEF GT JPCLBF'P THEN JPCLBF'P
           ELSE (IF JPPRBF'DEF LT -JPCLBF'P THEN -JPCLBF'P ELSE JPPRBF'DEF))
          )

   PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - PORK:
220:JPPEPK JPPEPK'DEF == JPPDPK'N*(1-(IF JPPRPK'DEF GT JPCLPK'P THEN JPCLPK'P
           ELSE (IF JPPRPK'DEF LT -JPCLPK'P THEN -JPCLPK'P ELSE JPPRPK'DEF))
          )

   PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - MUTTON+LAMB:
221:JPPEML JPPEML'DEF == JPPDML'N*(1-(IF JPPRML'DEF GT JPCLML'P THEN JPCLML'P
           ELSE (IF JPPRML'DEF LT -JPCLML'P THEN -JPCLML'P ELSE JPPRML'DEF))
          )

   PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - POULTRY-MEAT:
222:JPPEPM JPPEPM'DEF == JPPDPM'N*(1-(IF JPPRPM'DEF GT JPCLPM'P THEN JPCLPM'P
           ELSE (IF JPPRPM'DEF LT -JPCLPM'P THEN -JPCLPM'P ELSE JPPRPM'DEF))
          )

   PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - POULTRY-EGGS:
223:JPPEPE JPPEPE'DEF == JPPDPE'N*(1-(IF JPPRPE'DEF GT JPCLPE'P THEN JPCLPE'P
           ELSE (IF JPPRPE'DEF LT -JPCLPE'P THEN -JPCLPE'P ELSE JPPRPE'DEF))
          )

   PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - WHEAT:
224:JPPEWH JPPEWH'DEF == JPPDWH'N*(1-(IF JPPRWH'DEF GT JPCLWH'P THEN JPCLWH'P
           ELSE (IF JPPRWH'DEF LT -JPCLWH'P THEN -JPCLWH'P ELSE JPPRWH'DEF))
          )

   PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - CORN:
225:JPPECN JPPECN'DEF == JPPDCN'N*(1-(IF JPPRCN'DEF GT JPCLCN'P THEN JPCLCN'P
           ELSE (IF JPPRCN'DEF LT -JPCLCN'P THEN -JPCLCN'P ELSE JPPRCN'DEF))
          )

   PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - OTHER COARSE GRAIN:
226:JPPECG JPPECG'DEF == JPPDCG'N*(1-(IF JPPRCG'DEF GT JPCLCG'P THEN JPCLCG'P
           ELSE (IF JPPRCG'DEF LT -JPCLCG'P THEN -JPCLCG'P ELSE JPPRCG'DEF))
          )

   PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - RICE:
227:JPPERI JPPERI'DEF == JPPDRI'N*(1-(IF JPPRRI'DEF GT JPCLRI'P THEN JPCLRI'P
           ELSE (IF JPPRRI'DEF LT -JPCLRI'P THEN -JPCLRI'P ELSE JPPRRI'DEF))
          )

   PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - SOYBEANS:
228:JPPESB JPPESB'DEF == JPPDSB'N*(1-(IF JPPRSB'DEF GT JPCLSB'P THEN JPCLSB'P
           ELSE (IF JPPRSB'DEF LT -JPCLSB'P THEN -JPCLSB'P ELSE JPPRSB'DEF))
          )
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    PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - OTHER OILSEEDS:
229:JPPEOS JPPEOS'DEF == JPPDOS'N*(1-(IF JPPROS'DEF GT JPCLOS'P THEN JPCLOS'P
           ELSE (IF JPPROS'DEF LT -JPCLOS'P THEN -JPCLOS'P ELSE JPPROS'DEF))
          )

    PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - SOYMEAL:
230:JPPESM JPPESM'DEF == JPPDSM'N*(1-(IF JPPRSM'DEF GT JPCLSM'P THEN JPCLSM'P
           ELSE (IF JPPRSM'DEF LT -JPCLSM'P THEN -JPCLSM'P ELSE JPPRSM'DEF))
          )

    PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - SOYOIL:
231:JPPESO JPPESO'DEF == JPPDSO'N*(1-(IF JPPRSO'DEF GT JPCLSO'P THEN JPCLSO'P
           ELSE (IF JPPRSO'DEF LT -JPCLSO'P THEN -JPCLSO'P ELSE JPPRSO'DEF))
          )

    PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - OTHER MEALS:
232:JPPEOM JPPEOM'DEF == JPPDOM'N*(1-(IF JPPROM'DEF GT JPCLOM'P THEN JPCLOM'P
           ELSE (IF JPPROM'DEF LT -JPCLOM'P THEN -JPCLOM'P ELSE JPPROM'DEF))
          )

    PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - OTHER OILS:
233:JPPEOO JPPEOO'DEF == JPPDOO'N*(1-(IF JPPROO'DEF GT JPCLOO'P THEN JPCLOO'P
           ELSE (IF JPPROO'DEF LT -JPCLOO'P THEN -JPCLOO'P ELSE JPPROO'DEF))
          )

    PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - DAIRY-BUTTER:
234:JPPEDB JPPEDB'DEF == JPPDDB'N*(1-(IF JPPRDB'DEF GT JPCLDB'P THEN JPCLDB'P
           ELSE (IF JPPRDB'DEF LT -JPCLDB'P THEN -JPCLDB'P ELSE JPPRDB'DEF))
          )

    PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - DAIRY-CHEESE:
235:JPPEDC JPPEDC'DEF == JPPDDC'N*(1-(IF JPPRDC'DEF GT JPCLDC'P THEN JPCLDC'P
           ELSE (IF JPPRDC'DEF LT -JPCLDC'P THEN -JPCLDC'P ELSE JPPRDC'DEF))
          )

    PRICE ESTIMATE (DEMAND) WITH RESTRICTED TRADE - DAIRY-OTHER PROD.:
236:JPPEDO JPPEDO'DEF == JPPDDO'N*(1-(IF JPPRDO'DEF GT JPCLDO'P THEN JPCLDO'P
           ELSE (IF JPPRDO'DEF LT -JPCLDO'P THEN -JPCLDO'P ELSE JPPRDO'DEF))
          )

    PRICE CONSTRAINT (DEFINITION) - BEEF+VEAL:
237:JPPCBF JPPCBF'DEF == IF JPPEBF'DEF LT JPPTBF+JPMTBF'N+JPTMBF'POLN+
          JPTCBF'POLN AND JPPEBF'DEF GT JPPTBF-JPMTBF'N+JPMDBF'N-JPTEBF'POLN
          +JPTCBF'POLN OR JPQTBF'N GE JPEQBF'POLN OR JPQTBF'N LE -
          JPMQBF'POLN THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - PORK:
238:JPPCPK JPPCPK'DEF == IF JPPEPK'DEF LT JPPTPK+JPMTPK'N+JPTMPK'POLN+
          JPTCPK'POLN AND JPPEPK'DEF GT JPPTPK-JPMTPK'N+JPMDPK'N-JPTEPK'POLN
          +JPTCPK'POLN OR JPQTPK'N GE JPEQPK'POLN OR JPQTPK'N LE -
          JPMQPK'POLN THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - MUTTON+LAMB:
239:JPPCML JPPCML'DEF == IF JPPEML'DEF LT JPPTML+JPMTML+JPTMML'POLN+
          JPTCML'POLN AND JPPEML'DEF GT JPPTML-JPMTML+JPMDML-JPTEML'POLN+
          JPTCML'POLN OR JPQTML'N GE JPEQML'POLN OR JPQTML'N LE -JPMQML'POLN
           THEN 1 ELSE 0
```

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    PRICE CONSTRAINT (DEFINITION) - POULTRY-MEAT:
240:JPPCPM JPPCPM'DEF == IF JPPEPM'DEF LT JPPTPM+JPMTPM'N+JPTMPM'POLN+
          JPTCPM'POLN AND JPPEPM'DEF GT JPPTPM-JPMTPM'N+JPMDPM'N-JPTEPM'POLN
          +JPTCPM'POLN OR JPQTPM'N GE JPEQPM'POLN OR JPQTPM'N LE -
          JPMQPM'POLN THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - POULTRY-EGGS:
241:JPPCPE JPPCPE'DEF == IF JPPEPE'DEF LT JPPTPE+JPMTPE'N+JPTMPE'POLN+
          JPTCPE'POLN AND JPPEPE'DEF GT JPPTPE-JPMTPE'N+JPMDPE'N-JPTEPE'POLN
          +JPTCPE'POLN OR JPQTPE'N GE JPEQPE'POLN OR JPQTPE'N LE -
          JPMQPE'POLN THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - WHEAT:
242:JPPCWH JPPCWH'DEF == IF JPPEWH'DEF LT JPPTWH+JPMTWH'N+JPTMWH'POLN+
          JPTCWH'POLN AND JPPEWH'DEF GT JPPTWH-JPMTWH'N+JPMDWH-JPTEWH'POLN+
          JPTCWH'POLN OR JPQTWH'N GE JPEQWH'POLN OR JPQTWH'N LE -JPMQWH'POLN
           THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - CORN:
243:JPPCCN JPPCCN'DEF == IF JPPECN'DEF LT JPPTCN+JPMTCN+JPTMCN'POLN+
          JPTCCN'POLN AND JPPECN'DEF GT JPPTCN-JPMTCN+JPMDCN-JPTECN'POLN+
          JPTCCN'POLN OR JPQTCN'N GE JPEQCN'POLN OR JPQTCN'N LE -JPMQCN'POLN
           THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - OTHER COARSE GRAINS:
244:JPPCCG JPPCCG'DEF == IF JPPECG'DEF LT JPPTCG+JPMTCG'N+JPTMCG'POLN+
          JPTCCG'POLN AND JPPECG'DEF GT JPPTCG-JPMTCG'N+JPMDCG-JPTECG'POLN+
          JPTCCG'POLN OR JPQTCG'N GE JPEQCG'POLN OR JPQTCG'N LE -JPMQCG'POLN
           THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - RICE:
245:JPPCRI JPPCRI'DEF == IF JPPERI'DEF LT JPPTRI+JPMTRI+JPTMRI'POLN+
          JPTCRI'POLN AND JPPERI'DEF GT JPPTRI-JPMTRI+JPMDRI-JPTERI+
          JPTCRI'POLN OR JPQTRI'N GE JPEQRI'POLN OR JPQTRI'N LE -JPMQRI'POLN
           THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - SOYBEANS:
246:JPPCSB JPPCSB'DEF == IF JPPESB'DEF LT JPPTSB+JPMTSB'N+JPTMSB'POLN+
          JPTCSB'POLN AND JPPESB'DEF GT JPPTSB-JPMTSB'N+JPMDSB-JPTESB'POLN+
          JPTCSB'POLN OR JPQTSB'N GE JPEQSB'POLN OR JPQTSB'N LE -JPMQSB'POLN
           THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - OTHER OILSEEDS:
247:JPPCOS JPPCOS'DEF == IF JPPEOS'DEF LT JPPTOS+JPMTOS+JPTMOS'POLN+
          JPTCOS'POLN AND JPPEOS'DEF GT JPPTOS-JPMTOS+JPMDOS-JPTEOS'POLN+
          JPTCOS'POLN OR JPQTOS'N GE JPEQOS'POLN OR JPQTOS'N LE -JPMQOS'POLN
           THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - SOYMEAL:
248:JPPCSM JPPCSM'DEF == IF JPPESM'DEF LT JPPTSM+JPMTSM'N+JPTMSM'POLN+
          JPTCSM'POLN AND JPPESM'DEF GT JPPTSM-JPMTSM'N+JPMDSM-JPTESM'POLN+
          JPTCSM'POLN OR JPQTSM'N GE JPEQSM'POLN OR JPQTSM'N LE -JPMQSM'POLN
           THEN 1 ELSE 0
```

```
    PRICE CONSTRAINT (DEFINITION) - SOYOIL:
249:JPPCSO JPPCSO'DEF == IF JPPESO'DEF LT JPPTSO+JPMTSO'N+JPTMSO'POLN+
          JPTCSO'POLN AND JPPESO'DEF GT JPPTSO-JPMTSO'N+JPMDSO-JPTESO'POLN+
          JPTCSO'POLN OR JPQTSO'N GE JPEQSO'POLN OR JPQTSO'N LE -JPMQSO'POLN
           THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - OTHER MEALS:
250:JPPCOM JPPCOM'DEF == IF JPPEOM'DEF LT JPPTOM+JPMTOM'N+JPTMOM'POLN+
          JPTCOM'POLN AND JPPEOM'DEF GT JPPTOM-JPMTOM'N+JPMDOM-JPTEOM'POLN+
          JPTCOM'POLN OR JPQTOM'N GE JPEQOM'POLN OR JPQTOM'N LE -JPMQOM'POLN
           THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - OTHER OILS:
251:JPPCOO JPPCOO'DEF == IF JPPEOO'DEF LT JPPTOO+JPMTOO+JPTMOO'POLN+
          JPTCOO'POLN AND JPPEOO'DEF GT JPPTOO-JPMTOO+JPMDOO-JPTEOO'POLN+
          JPTCOO'POLN OR JPQTOO'N GE JPEQOO'POLN OR JPQTOO'N LE -JPMQOO'POLN
           THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - DAIRY-BUTTER:
252:JPPCDB JPPCDB'DEF == IF JPPEDB'DEF LT JPPTDB+JPMTDB'N+JPTMDB'POLN+
          JPTCDB'POLN AND JPPEDB'DEF GT JPPTDB-JPMTDB'N+JPMDDB'N-JPTEDB'POLN
          +JPTCDB'POLN OR JPQTDB'N GE JPEQDB'POLN OR JPQTDB'N LE -
          JPMQDB'POLN THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - DAIRY-CHEESE:
253:JPPCDC JPPCDC'DEF == IF JPPEDC'DEF LT JPPTDC+JPMTDC'N+JPTMDC'POLN+
          JPTCDC'POLN AND JPPEDC'DEF GT JPPTDC-JPMTDC'N+JPMDDC-JPTEDC'POLN+
          JPTCDC'POLN OR JPQTDC'N GE JPEQDC'POLN OR JPQTDC'N LE -JPMQDC'POLN
           THEN 1 ELSE 0

    PRICE CONSTRAINT (DEFINITION) - DAIRY-OTHER PRODUCTS:
254:JPPCDO JPPCDO'DEF == IF JPPEDO'DEF LT JPPTDO+JPMTDO'N+JPTMDO'POLN+
          JPTCDO'POLN AND JPPEDO'DEF GT JPPTDO-JPMTDO'N+JPMDDO'N-JPTEDO'POLN
          +JPTCDO'POLN OR JPQTDO'N GE JPEQDO'POLN OR JPQTDO'N LE -
          JPMQDO'POLN THEN 1 ELSE 0

  ************************************************************************
  *    DEMAND PRICE EQUATIONS - TRADE LINKED OR DOMESTIC MARKET CLEARING  *
  *    ESTIMATES                                                          *
  *                                                                       *
  ************************************************************************

    PRICE (DEMAND) - BEEF+VEAL:
255:JPPDBF JPPDBF'N = IF JPPCBF'DEF EQ 1 THEN ABSV'F(JPPEBF'DEF) ELSE (IF
          JPQTBF'N LT 0 THEN ABSV'F(JPPTBF+JPMTBF'N+JPTMBF'POLN+JPTCBF'POLN)
           ELSE ABSV'F(JPPTBF-JPMTBF'N+JPMDBF'N-JPTEBF'POLN+JPTCBF'POLN))

    PRICE (DEMAND) - PORK:
256:JPPDPK JPPDPK'N = IF JPPCPK'DEF EQ 1 THEN ABSV'F(JPPEPK'DEF) ELSE (IF
          JPQTPK'N LT 0 THEN ABSV'F(JPPTPK+JPMTPK'N+JPTMPK'POLN+JPTCPK'POLN)
           ELSE ABSV'F(JPPTPK-JPMTPK'N+JPMDPK'N-JPTEPK'POLN+JPTCPK'POLN))

    PRICE (DEMAND) - MUTTON+LAMB:
257:JPPDML JPPDML'N = IF JPPCML'DEF EQ 1 THEN ABSV'F(JPPEML'DEF) ELSE (IF
          JPQTML'N LT 0 THEN ABSV'F(JPPTML+JPMTML+JPTMML'POLN+JPTCML'POLN)
           ELSE ABSV'F(JPPTML-JPMTML+JPMDML-JPTEML'POLN+JPTCML'POLN))
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    PRICE (DEMAND) - DAIRY-MILK:
258:JPPDDM JPPDDM'N = ABSV'F(JPPDDMI'C*((JPQSDB'N*JPPSDB'DEF+JPQSDC'N*
           JPPSDC'DEF+JPQSDO'N*JPPSDO'DEF)/JPQMDM'DEF)+JPTCDM'POLN+JPMDDM'N+
           JPTPDM'POLN)

    PRICE (DEMAND) - POULTRY-MEAT:
259:JPPDPM JPPDPM'N = IF JPPCPM'DEF EQ 1 THEN ABSV'F(JPPEPM'DEF) ELSE (IF
           JPQTPM'N LT 0 THEN ABSV'F(JPPTPM+JPMTPM'N+JPTMPM'POLN+JPTCPM'POLN)
            ELSE ABSV'F(JPPTPM-JPMTPM'N+JPMDPM'N-JPTEPM'POLN+JPTCPM'POLN))

    PRICE (DEMAND) - POULTRY-EGGS:
260:JPPDPE JPPDPE'N = IF JPPCPE'DEF EQ 1 THEN ABSV'F(JPPEPE'DEF) ELSE (IF
           JPQTPE'N LT 0 THEN ABSV'F(JPPTPE+JPMTPE'N+JPTMPE'POLN+JPTCPE'POLN)
            ELSE ABSV'F(JPPTPE-JPMTPE'N+JPMDPE'N-JPTEPE'POLN+JPTCPE'POLN))

    PRICE (DEMAND) - WHEAT:
261:JPPDWH JPPDWH'N = IF JPPCWH'DEF EQ 1 THEN ABSV'F(JPPEWH'DEF) ELSE (IF
           JPQTWH'N LT 0 THEN ABSV'F(JPPTWH+JPMTWH'N+JPTMWH'POLN+JPTCWH'POLN)
            ELSE ABSV'F(JPPTWH-JPMTWH'N+JPMDWH-JPTEWH'POLN+JPTCWH'POLN))

    PRICE (DEMAND) - CORN:
262:JPPDCN JPPDCN'N = IF JPPCCN'DEF EQ 1 THEN ABSV'F(JPPECN'DEF) ELSE (IF
           JPQTCN'N LT 0 THEN ABSV'F(JPPTCN+JPMTCN+JPTMCN'POLN+JPTCCN'POLN)
            ELSE ABSV'F(JPPTCN-JPMTCN+JPMDCN-JPTECN'POLN+JPTCCN'POLN))

    PRICE (DEMAND) - OTHER COARSE GRAINS:
263:JPPDCG JPPDCG'N = IF JPPCCG'DEF EQ 1 THEN ABSV'F(JPPECG'DEF) ELSE (IF
           JPQTCG'N LT 0 THEN ABSV'F(JPPTCG+JPMTCG'N+JPTMCG'POLN+JPTCCG'POLN)
            ELSE ABSV'F(JPPTCG-JPMTCG'N+JPMDCG-JPTECG'POLN+JPTCCG'POLN))

    PRICE (DEMAND) - RICE:
264:JPPDRI JPPDRI'N = IF JPPCRI'DEF EQ 1 THEN ABSV'F(JPPERI'DEF) ELSE (IF
           JPQTRI'N LT 0 THEN ABSV'F(JPPTRI+JPMTRI+JPTMRI'POLN+JPTCRI'POLN)
            ELSE ABSV'F(JPPTRI-JPMTRI+JPMDRI-JPTERI+JPTCRI'POLN))

    PRICE (DEMAND) - SOYBEANS:
265:JPPDSB JPPDSB'N = IF JPPCSB'DEF EQ 1 THEN ABSV'F(JPPESB'DEF) ELSE (IF
           JPQTSB'N LT 0 THEN ABSV'F(JPPTSB+JPMTSB'N+JPTMSB'POLN+JPTCSB'POLN)
            ELSE ABSV'F(JPPTSB-JPMTSB'N+JPMDSB-JPTESB'POLN+JPTCSB'POLN))

    PRICE (DEMAND) - OTHER OILSEEDS:
266:JPPDOS JPPDOS'N = IF JPPCOS'DEF EQ 1 THEN ABSV'F(JPPEOS'DEF) ELSE (IF
           JPQTOS'N LT 0 THEN ABSV'F(JPPTOS+JPMTOS+JPTMOS'POLN+JPTCOS'POLN)
            ELSE ABSV'F(JPPTOS-JPMTOS+JPMDOS-JPTEOS'POLN+JPTCOS'POLN))

    PRICE (DEMAND) - SOYMEAL:
267:JPPDSM JPPDSM'N = IF JPPCSM'DEF EQ 1 THEN ABSV'F(JPPESM'DEF) ELSE (IF
           JPQTSM'N LT 0 THEN ABSV'F(JPPTSM+JPMTSM'N+JPTMSM'POLN+JPTCSM'POLN)
            ELSE ABSV'F(JPPTSM-JPMTSM'N+JPMDSM-JPTESM'POLN+JPTCSM'POLN))

    PRICE (DEMAND) - SOYOIL:
268:JPPDSO JPPDSO'N = IF JPPCSO'DEF EQ 1 THEN ABSV'F(JPPESO'DEF) ELSE (IF
           JPQTSO'N LT 0 THEN ABSV'F(JPPTSO+JPMTSO'N+JPTMSO'POLN+JPTCSO'POLN)
            ELSE ABSV'F(JPPTSO-JPMTSO'N+JPMDSO-JPTESO'POLN+JPTCSO'POLN))
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    PRICE (DEMAND) - OTHER MEALS:
269:JPPDOM JPPDOM'N = IF JPPCOM'DEF EQ 1 THEN ABSV'F(JPPEOM'DEF) ELSE (IF
           JPQTOM'N LT 0 THEN ABSV'F(JPPTOM+JPMTOM'N+JPTMOM'POLN+JPTCOM'POLN)
            ELSE ABSV'F(JPPTOM-JPMTOM'N+JPMDOM-JPTEOM'POLN+JPTCOM'POLN))

    PRICE (DEMAND) - OTHER OILS:
270:JPPDOO JPPDOO'N = IF JPPCOO'DEF EQ 1 THEN ABSV'F(JPPEOO'DEF) ELSE (IF
           JPQTOO'N LT 0 THEN ABSV'F(JPPTOO+JPMTOO+JPTMOO'POLN+JPTCOO'POLN)
            ELSE ABSV'F(JPPTOO-JPMTOO+JPMDOO-JPTEOO'POLN+JPTCOO'POLN))

    PRICE (DEMAND) - DAIRY-BUTTER:
271:JPPDDB JPPDDB'N = IF JPPCDB'DEF EQ 1 THEN ABSV'F(JPPEDB'DEF) ELSE (IF
           JPQTDB'N LT 0 THEN ABSV'F(JPPTDB+JPMTDB'N+JPTMDB'POLN+JPTCDB'POLN)
            ELSE ABSV'F(JPPTDB-JPMTDB'N+JPMDDB'N-JPTEDB'POLN+JPTCDB'POLN))

    PRICE (DEMAND) - DAIRY-CHEESE:
272:JPPDDC JPPDDC'N = IF JPPCDC'DEF EQ 1 THEN ABSV'F(JPPEDC'DEF) ELSE (IF
           JPQTDC'N LT 0 THEN ABSV'F(JPPTDC+JPMTDC'N+JPTMDC'POLN+JPTCDC'POLN)
            ELSE ABSV'F(JPPTDC-JPMTDC'N+JPMDDC-JPTEDC'POLN+JPTCDC'POLN))

    PRICE (DEMAND) - DAIRY-OTHER PRODUCTS:
273:JPPDDO JPPDDO'N = IF JPPCDO'DEF EQ 1 THEN ABSV'F(JPPEDO'DEF) ELSE (IF
           JPQTDO'N LT 0 THEN ABSV'F(JPPTDO+JPMTDO'N+JPTMDO'POLN+JPTCDO'POLN)
            ELSE ABSV'F(JPPTDO-JPMTDO'N+JPMDDO'N-JPTEDO'POLN+JPTCDO'POLN))

    TRADE PRICE LINKAGE - BEEF+VEAL:
274:JPPTBF JPPTBF = WDPTBF

    TRADE PRICE LINKAGE - PORK:
275:JPPTPK JPPTPK = WDPTPK

    TRADE PRICE LINKAGE - MUTTON+LAMB:
276:JPPTML JPPTML = WDPTML

    TRADE PRICE LINKAGE - POULTRY-MEAT:
277:JPPTPM JPPTPM = WDPTPM

    TRADE PRICE LINKAGE - POULTRY-EGGS:
278:JPPTPE JPPTPE = WDPTPE

    TRADE PRICE LINKAGE - WHEAT:
279:JPPTWH JPPTWH = WDPTWH

    TRADE PRICE LINKAGE - CORN:
280:JPPTCN JPPTCN = WDPTCN

    TRADE PRICE LINKAGE - OTHER COARSE GRAINS:
281:JPPTCG JPPTCG = WDPTCG

    TRADE PRICE LINKAGE - RICE:
282:JPPTRI JPPTRI = WDPTRI

    TRADE PRICE LINKAGE - SOYBEANS:
283:JPPTSB JPPTSB = WDPTSB
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    TRADE PRICE LINKAGE - OTHER OILSEEDS:
284:JPPTOS JPPTOS = WDPTOS

    TRADE PRICE LINKAGE - SOYMEAL:
285:JPPTSM JPPTSM = WDPTSM

    TRADE PRICE LINKAGE - SOYOIL:
286:JPPTSO JPPTSO = WDPTSO

    TRADE PRICE LINKAGE - OTHER MEALS:
287:JPPTOM JPPTOM = WDPTOM

    TRADE PRICE LINKAGE - OTHER OILS:
288:JPPTOO JPPTOO = WDPTOO

    TRADE PRICE LINKAGE - DAIRY-BUTTER:
289:JPPTDB JPPTDB = WDPTDB

    TRADE PRICE LINKAGE - DAIRY-CHEESE:
290:JPPTDC JPPTDC = WDPTDC

    TRADE PRICE LINKAGE - DAIRY-OTHER PRODUCTS:
291:JPPTDO JPPTDO = WDPTDO.


SUFFIXES

ENDOGENOUS:     'N  'NX  'NXS  'NPOL

DEFINITION:     'DEF

EXOGENOUS:      'X  'XN  'XNS  'XP

POLICY:         'POL  'POLN  'POLP

FUNCTION:       'F

COEFFICIENT:    'C

PARAMETER:      'P  'PX  'PPOL
```

APPENDIX B

Table 1--Livestock feed cost parameters, Japan

| | FEED COST WEIGHT FOR WHEAT (FC**WH) | FEED COST WEIGHT FOR CORN (FC**CN) | FEED COST WEIGHT FOR OTHER COARSE GRAINS (FC**CG) |
|---|---|---|---|
| 1 BEEF+VEAL (BF) -- | 0.06088 | 0.1949 | 0.3321 |
| 2 PORK (PK) ------- | 0.03372 | 0.34145 | 0.34408 |
| 3 MUTTON+LAMB (ML) | 0.06088 | 0.1949 | 0.3321 |
| 4 DAIRY-MILK (DM) - | 0.00242 | 0.11559 | 0.25128 |
| 5 POULTRY-MEAT (PM) | 0.00715 | 0.47981 | 0.1931 |
| 6 POULTRY-EGGS (PE) | 0.00715 | 0.47981 | 0.1931 |

| | FEED COST WEIGHT FOR SOYMEAL (FC**SM) | FEED COST WEIGHT FOR OTHER MEALS (FC**OM) |
|---|---|---|
| 1 BEEF+VEAL (BF) -- | 0.05037 | 0.02865 |
| 2 PORK (PK) ------- | 0.12252 | 0.00932 |
| 3 MUTTON+LAMB (ML) | 0.05037 | 0.02865 |
| 4 DAIRY-MILK (DM) - | 0.11329 | 0.08097 |
| 5 POULTRY-MEAT (PM) | 0.11081 | 0.01479 |
| 6 POULTRY-EGGS (PE) | 0.11081 | 0.01479 |

Table 2--Feed demand parameters, Japan

| | LIVESTOCK PRICE INDEX WEIGHTS FOR FEED DEMAND (LPWT**) | WEIGHTS FOR CALCULATING GRAIN CONSUMING ANIMAL UNIT (GCAU) |
|---|---|---|
| 1 BEEF+VEAL (BF) -- | 0.15574 | 0.10237 |
| 2 PORK (PK) ------- | 0.3011 | 0.30933 |
| 3 MUTTON+LAMB (ML) | 0. | 0. |
| 4 DAIRY-MILK (DM) - | 0.22726 | 0.07806 |
| 5 POULTRY-MEAT (PM) | 0.12229 | 0.20424 |
| 6 POULTRY-EGGS (PE) | 0.1936 | 0.306 |

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