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## A View of Food and Agriculture in 1980

By David W. Culver and J. C. Chai<sup>1</sup>

Projected growth in population and the general economy suggest larger domestic food requirements in 1980. The major consumption trends of recent years are projected to continue, with per capita consumption rising for beef and poultry but declining for milk. Food use of most crop products may expand about in line with population, but processed fruits and vegetables will continue to displace fresh use. Production is projected to rise substantially for livestock products and for total crops. Crop yields may rise about as rapidly as demand, with acreage needed for crop production in 1980 likely to be near recent levels.

Key words: Projections, population, economic growth, farm production, crop acreage, food consumption.

The past two decades have seen dramatic changes in U.S. farm production capacity, and in the organization of resources and the production mix. Both technological developments in production and changes in consumer demand have spurred the rate of adjustment.

Farm production has become more closely linked with the nonfarm economy through increased use of nonfarm inputs. Consumption patterns have been upgraded as incomes have risen. In addition, differential rates of technological change have influenced food consumption through their impact on production costs and product prices. Nonfood farm products such as the fibers and the industrial oils have faced strong competition from nonfarm substitutes.

While export markets have increased in total, the importance of foreign markets varies by commodity. Agricultural export levels have fluctuated widely both in total and for individual commodities. Both commercial and Government-assisted export levels have varied considerably.

This article summarizes some of the major results of recent projection analyses. The information presented emphasizes markets provided by domestic food consumption. The prospective total demand picture is then completed by the addition of projections for nonfood use and exports. Projected production, prices, crop

yields, and harvested acres for major crops round out a projected profile for agriculture in 1980. Some important and interesting facets of agriculture, such as farm income and the location and organization of production, are treated summarily in this paper.

An attempt has been made to analyze each commodity or commodity group in an equilibrium framework. Formal models were used for some major commodity groups. Methods of estimation varied from large multi-equation systems to single-equation estimates and less formal techniques. Considerable reliance was placed on the judgment of commodity specialists for all commodity estimates.

Recent trends toward larger and fewer farms and increasing use of nonfarm inputs are assumed to continue. Domestic farm policy goals are expected to continue to emphasize market expansion and the orderly adjustment of production to meet market needs. The major demand shifters, including population and income, are expected to continue to expand markets for farm products.

### Factors Affecting Demand<sup>2</sup>

Population and income are the primary forces influencing domestic demand for farm products. Total U.S. population is assumed to rise to 235 million by

<sup>1</sup>Many ERS staff members participated in various phases of the analysis, including J. D. Ahalt, R. Daly, D. Durost, R. Rizek, R. Hoffman, J. Mathews, A. Rojko, and W. Simmons. Others of the ERS staff who provided basic data and assisted in developing and appraising the projections include W. Askew, M. Clough, J. Donald, S. Gazelle, A. Mathis, D. Seaborg, R. Miller, B. Huang, W. Cathcart, C. Brader, and M. Harron.

<sup>2</sup>A statistical supplement, containing data on which the following charts are based and also commodity supply and distribution detail, is available on request from the Outlook and Projections Branch, Economic and Statistical Analysis Division, Economic Research Service.

1980 as shown in the Series "C" projections of the Bureau of the Census. This would be an annual growth rate of about 1.3 percent compared with a rate of nearly 1.6 percent between 1950 and 1969 (fig. 1).<sup>3</sup>

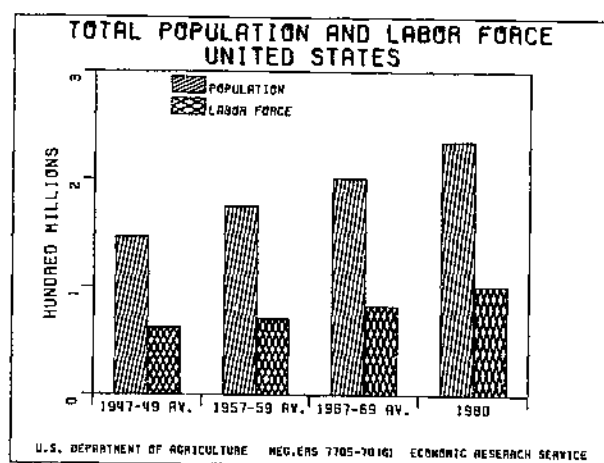


Figure 1

Population growth rates over the next decade are expected to be most rapid among persons 20-44 years old and under 5 years old. This is in contrast with the more rapid growth during the last two decades in the 5-19 and over 65 age groups.

Growth of the labor force in the next 10 years is expected to be at a rate of about 1.7 percent in comparison with 1.4 percent during 1950-69. This higher projected rate is due to a higher rate of growth projected for the age group 20-44 and to expected slightly higher participation rates. The migration of workers from rural to urban areas is expected to continue, although at a slower pace since much of this transfer has already taken place.

Gross national product (GNP) in real terms is projected to rise about 4-4½ percent per year following an expected slower rate in the near term (fig. 2). Real growth during 1950-69 averaged about 3.9 percent per year although the rate from 1962 to 1968 averaged 5 percent. General price increases are assumed to slow gradually in the next few years to around 2 percent per year, then remain at about 2 percent per year for the rest of the decade. The current dollar value (including inflation) of GNP in 1980 is projected to be almost double the 1969 level of \$932 billion. This rate of economic growth can be expected to result in increased

<sup>3</sup>Recent demographic reports suggest a slower rate of growth than is assumed here. Subsequent projection efforts probably will incorporate a slower assumed rate of population increase such as Series "D" of the Bureau of the Census.

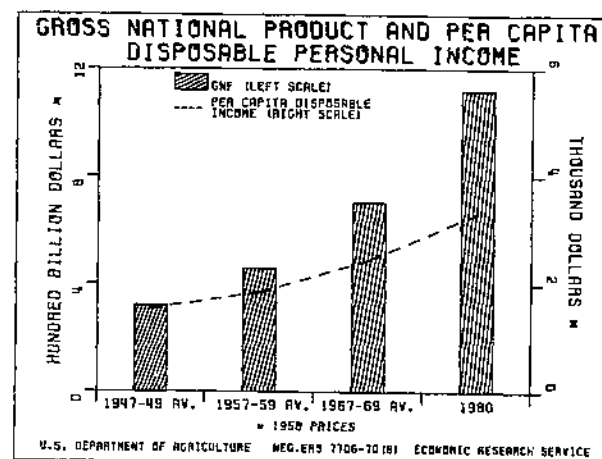


Figure 2

after-tax incomes and a continued expansion of consumer buying power.

The increasing world trade in agricultural commodities is expected to provide important markets for U.S. farm products. The rate of growth in export markets will depend to a considerable extent on factors outside direct U.S. control, such as growth rates of industrialized countries, relative growth of population and food production in less developed countries, and restrictions on trade by individual nations or trading groups. The export projections in this paper assume that the less developed countries will continue to increase production through the use of improved crop varieties and cultural practices. The further assumption is made that the major U.S. agricultural export commodities will continue to be competitive in "free" world trade.

Not all factors favor growth of agricultural markets. Farm product markets face competition from a number of synthetic and other substitute products. Cotton and wool have both suffered from inroads by synthetic fibers in both domestic and foreign markets. Similarly, the natural oils have lost a large part of industrial outlets for products such as paints and detergents; and urea appears to have captured a significant part of the market for high-protein feeds.

### Trends in Consumption

Per capita food consumption on a price-weighted index basis increased slightly over the last two decades even though per capita consumption in terms of total pounds declined over the same period (fig. 3). This reflects changes in the mix of food consumed in response to a variety of forces: Rising incomes, trends in relative prices, changes in living and working conditions, and the increasing importance of convenience foods. The

price-weighted index of per capita food consumption may show some further increase with a continued shift toward more meats, poultry, and convenience foods.

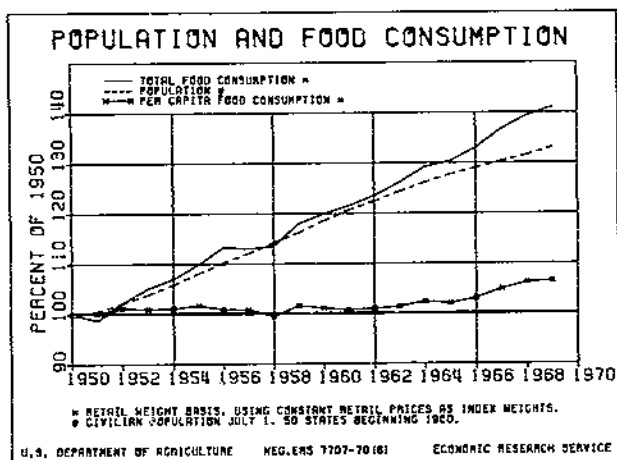


Figure 3

Per capita food consumption trends of the last two decades are highlighted by a rapid rise in consumption of poultry meat. At least part of this increase was in response to lower prices resulting from important technological changes in production and recent developments in marketing methods. Beef consumption also has increased markedly as consumer buying power rose. At the same time, per capita use of all dairy products has declined, mainly because of the sharp decline for butter and other high-fat products. On the other hand, per capita use of cheese has increased somewhat. The downtrend in per capita consumption of wheat products has moderated in recent years, while consumption rates for most other cereals have been steady or rising. There has been relatively little change in per capita use of all fruits and vegetables. However, processed uses of both fruits and vegetables have increased markedly while fresh uses have trended downward.

Rising income levels and the strong consumer preference for beef which encouraged substantial increases in beef consumption over the last two decades seem likely to continue. Accordingly, per capita beef and veal consumption may rise by 15 to 20 pounds above the 1969 level of 113 pounds. Pork consumption per person has not shown a clear trend over the last two decades and may change relatively little by 1980. However, efforts to improve the desirability of pork by reducing the amount of fat could bring some increase in per capita use (fig. 4).

The very rapid increase in per capita consumption of poultry meat over the last two decades resulted in part from the major technological advances in production

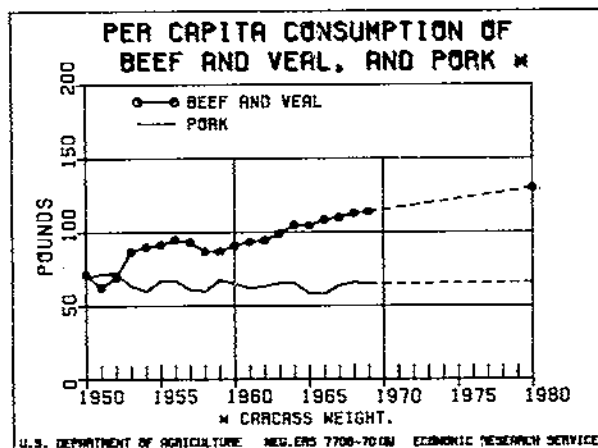


Figure 4

and marketing which brought lower relative prices for poultry. Future technological developments are not likely to be as favorable toward increased production and consumption of poultry as were developments of the last two decades. Nevertheless, poultry prices should continue to encourage expanded consumption of both chicken and turkey. Per capita use of chicken is projected for 1980 at around 50 pounds with per capita use of turkey rising to about 10 pounds (fig. 5).

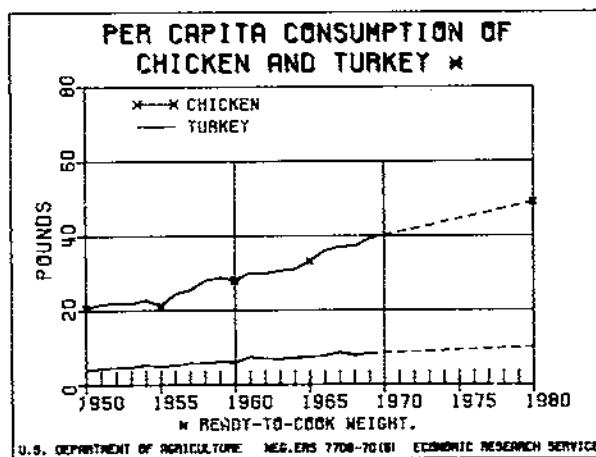


Figure 5

Milk consumption per person has declined sharply over the last two decades as butter and other high-fat dairy products have faced strong price competition from competing products. In addition, these same products have been adversely affected by diet and health questions. Per capita milk consumption (milk equivalent of all uses) may decline by 15-20 percent in 1980 from the 1969 level of 566 pounds. A decline of this magnitude

would more than offset the effect of population growth and would imply some decline in total use from the 1969 level. Per capita consumption of eggs is projected to decline slightly as the continued decline in fresh egg use may not be fully offset by processed uses. However, total use may rise perhaps by around 10 percent in 1980 (fig. 6).

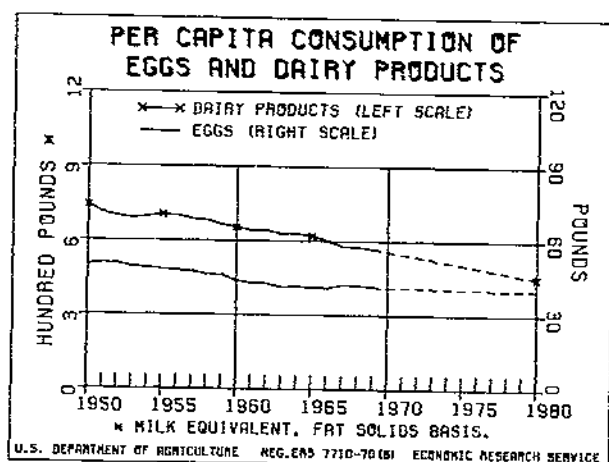


Figure 6

Use of food fats and oils has increased perceptibly in the last few years, perhaps partly because of the increase in quick service retail food outlets. Per capita disappearance is projected to increase slightly in the next decade, possibly by 2 to 5 pounds (fat content) from 52 pounds in 1969. The shift from animal to vegetable oils is expected to continue (fig. 7).

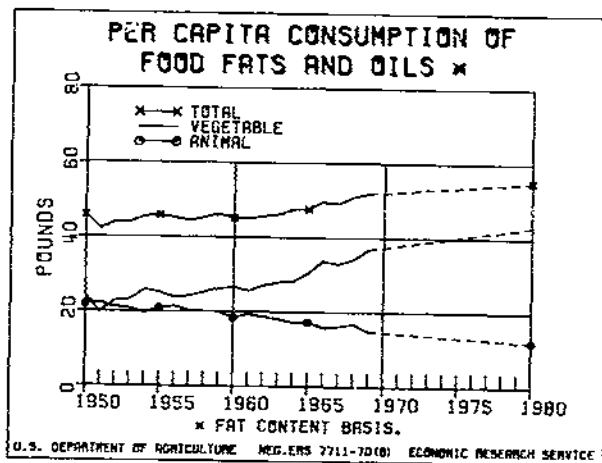


Figure 7

An expected increase in citrus production and consumption suggests that per capita consumption of all fruit may rise in the next few years. Large citrus tree

plantings in recent years in frost-free production areas point to continued growth in citrus production. For this reason, citrus consumption, which was 89 pounds per capita in 1969, is projected to be 20 to 25 percent higher by 1980 (fig. 8).

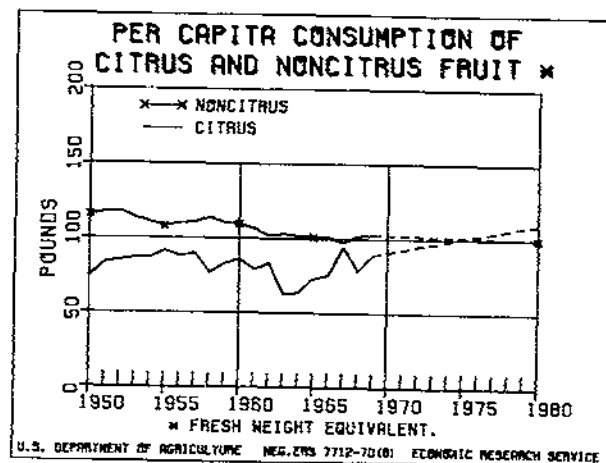


Figure 8

Consumption of all vegetables and melons on a per capita basis has been relatively stable in recent years. However, the form of consumption has shifted considerably from fresh to processed uses, and this trend is expected to continue. Per capita consumption in processed form during the decade may increase by 8 to 10 pounds above recent levels. Fresh consumption, however is expected to decline further, perhaps to around 90 to 95 pounds (fig. 9). Per capita consumption of potatoes

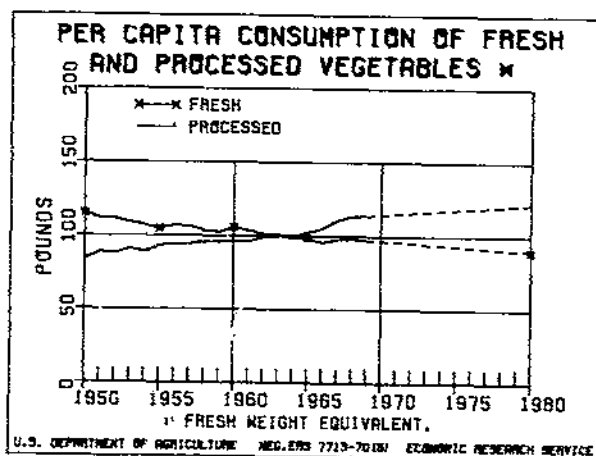


Figure 9

in all forms has been around 110 pounds for several years and may not change very much during the next decade.

The long-term downtrend in wheat consumption has moderated in recent years. Use per person in 1980 is projected to decline by perhaps 5 pounds or a little more from the 155 pounds in 1969. Food use of corn declined up to the midfifties, but has increased during the last 15 years, due largely to the increasing importance of corn sirup and sugar and partly to the introduction of new types of breakfast cereals and other processed products. Per capita consumption in the coming decade is expected to at least maintain the 60 pounds in 1969. Consumption of rice is trending upward while use of oats and other grains is about stable (fig. 10).

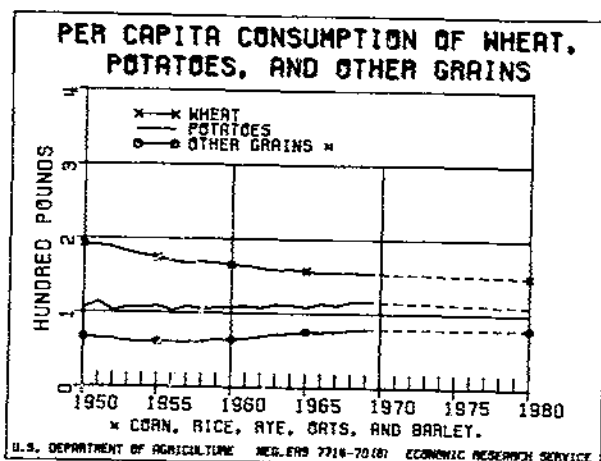


Figure 10

### Feed Use

The quantity of feed concentrates used depends on the production level of livestock and livestock products and the rate of feeding per unit of production. Feeding rates in turn depend on the relative prices of feed and livestock products, the mix of production, and changes in feeding efficiency.

Total livestock production in 1980 is projected to increase by about 30 percent above the 1967-69 average. The feeding rate may rise slightly over the next decade if livestock-feed ratios continue relatively favorable. A larger part of milk and beef production is likely to come from concentrate feeding rather than from roughages even though physical feeding efficiency is expected to increase for most livestock items. Accordingly, the total of concentrates fed is projected to increase possibly around 35 percent by 1980 from the 171-million-ton average for 1967-69 (fig. 11).

Until the early sixties, use of high-protein feeds had been rising more rapidly than use of total feed concentrates. However, in the last few years, this rate of increase has slowed somewhat, apparently in response to

the increasing use of urea for dairy and beef cattle feeding. Projected feed use for 1980 assumes some further increase in the use of urea and other protein feed substitutes such as petro-protein meal.

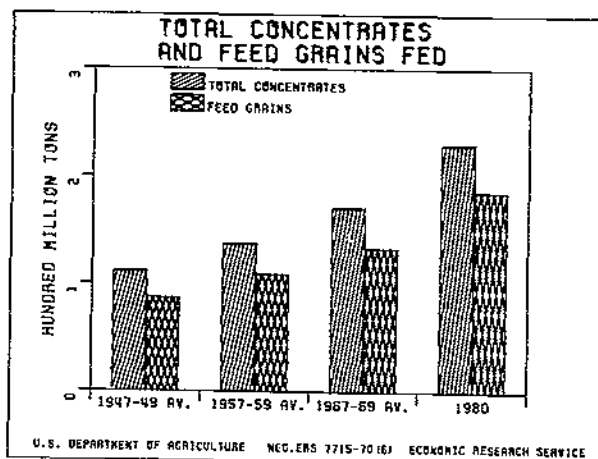


Figure 11

### Export Projections

Export outlets for U.S. agricultural products expanded substantially after World War II but have leveled in recent years. Most of the gain was in commercial sales, even though exports under Government programs have been important, especially for food crops. Export markets, which may fluctuate considerably on a year-to-year basis, are important for many U.S. crops—especially rice, wheat, soybeans, and cotton. Exports of livestock products have increased during the last two decades, but the total remains small relative to crop exports.

Exports are influenced by many factors, including foreign and domestic programs and policies, international trade arrangements, trade relations with communist countries, and the growth of foreign demand. Population and income growth, and technological change as it influences the level of world agricultural production, are major forces affecting export demand.

Livestock exports are expected to continue to be a very small part of total production. Crop exports are projected to rise 35 to 40 percent above the 1967-69 level by 1980 (fig. 12).

Soybean exports are projected to continue to increase, although at a slower rate than over the past decade. Exports of soybeans, not including products, are projected to increase by around two-thirds (fig. 13). Feed grain exports in 1980 may increase by about 50 percent or more from the 1969 level (fig. 14).

Wheat and rice exports may trend upward slightly, with considerable year-to-year variation possible. Cotton

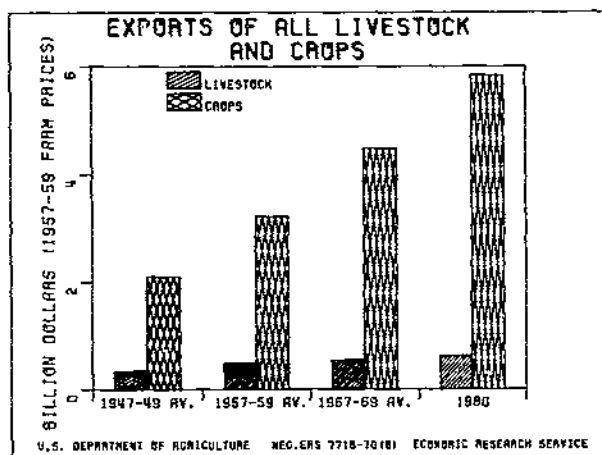


Figure 12

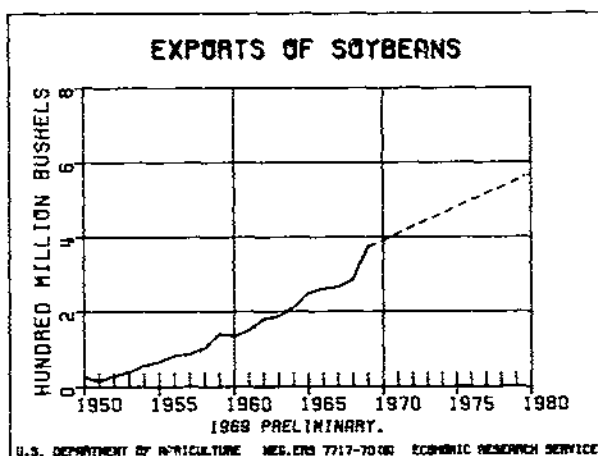


Figure 13

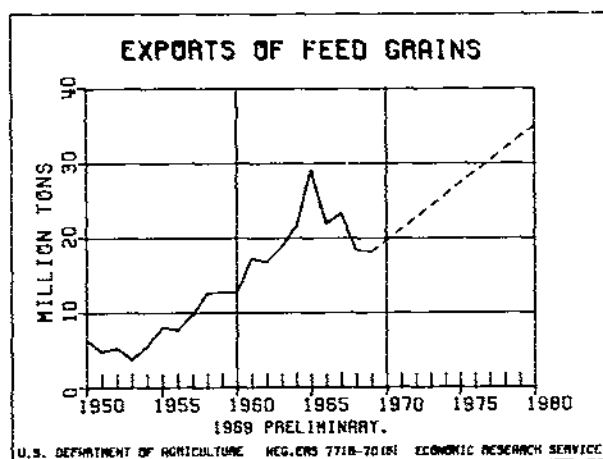


Figure 14

exports are projected to recover somewhat from the depressed level of 1969 and then perhaps to hold near the 1967-69 average. The uncertainties in international cotton trade include competition from synthetic fibers as well as among producing countries (fig. 15). On balance, exports are expected to continue to account for around a fifth or more of total crop output.

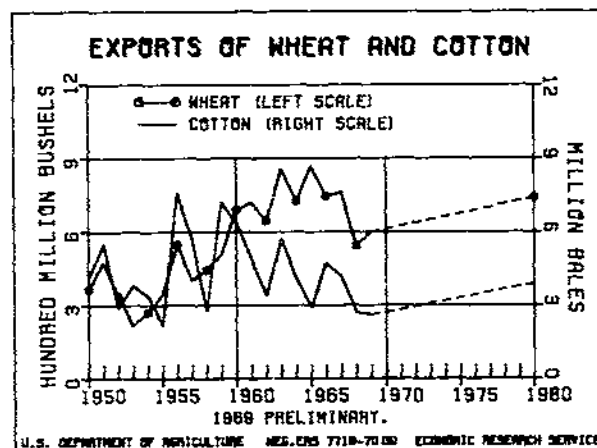


Figure 15

Imports of some commodities, especially those which are labor intensive, are likely to rise in the next decade. The actual rate of increase will depend on both domestic programs and import restrictions as well as on growth in foreign markets.

### Farm Prices, Production and Land Use

Prices of farm products in the coming decade will depend largely on the trend in the general price level and on the success of agriculture in adjusting resource use to market demands. These projections assume prices for major crops around levels of recent years. However, prices may trend upward for the more labor-intensive crops among the fruits, vegetables, and specialty crops. These price levels imply that some cropland will continue to be withheld from production.

Barring some substantial breakthrough in the technology of livestock production, prices for livestock products may rise somewhat over the next decade from the 1967-69 average and will probably continue to rise relative to crop prices. Efficiencies in production of poultry and eggs may limit gains in prices for these commodities even though market demand is expected to remain strong for poultry meat.

Although prices received by farmers for all farm products are not expected to rise in the next few years,

they may show a slight upward trend by 1980. Nevertheless, the increase may be somewhat less than the projected rise in general price levels (fig. 16).

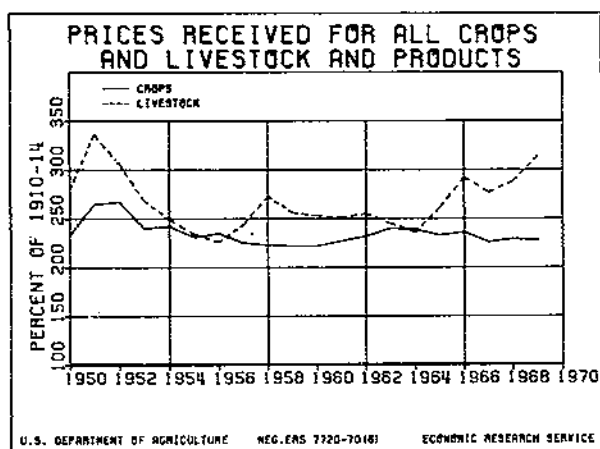


Figure 16

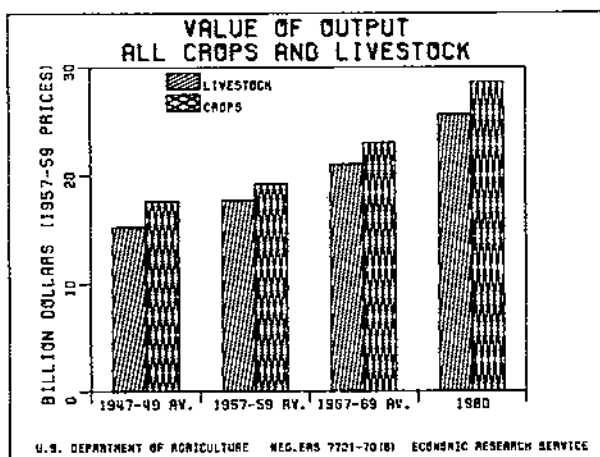


Figure 17

Crop output for 1980 is projected to rise around one-fourth from the 1967-69 average, due in large part to expanding demand for feed crops (fig. 17). Among livestock products, the largest increases over the 1967-69 average in production are projected for poultry (nearly 50 percent) and beef cattle (about one-third). Pork production may increase about in line with the growth in population. A somewhat smaller increase is projected for eggs, while output for milk may decline modestly or remain near recent levels.

Among the major field crops, production levels for feed grains are projected to increase by around 40 percent from 1967-69. Wheat production is expected to increase from the 1970 crop, but may change little from the 1967-69 average if exports expand moderately as expected. Cotton production will probably recover somewhat from reduced levels in recent years. But expansion will continue to depend heavily on domestic

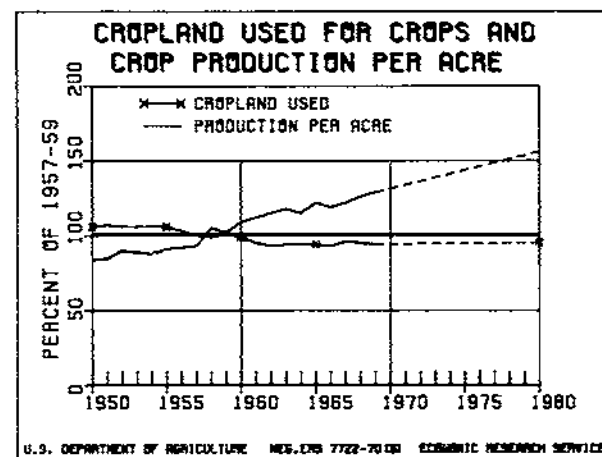


Figure 18

Table 1.—Yields per harvested acre for selected crops, selected averages and projections to 1980

Commodity	Average			Projected 1980
	1947-49	1957-59	1967-69	
Wheat, all . . . . . bu.	16.9	23.6	28.4	35
Rice . . . . . lb.	2,126	3,250	4,416	5,700
Corn for grain . . . . . bu.	36.6	51.4	80.4	159
Grain sorghum . . . . . bu.	19.2	33.4	52.8	76
Oats . . . . . bu.	33.4	40.2	51.9	62
Barley . . . . . bu.	25.4	30.1	42.9	55
Soybeans . . . . . bu.	20.6	23.6	26.2	31
Peanuts . . . . . lb.	721	1,076	1,767	2,470
Tobacco . . . . . lb.	1,208	1,552	1,984	2,200
Cotton . . . . . lb. lint	287	438	466	560
Hay . . . . . tons	1.34	1.68	2.00	2.3



and foreign market prospects. Tobacco production is projected to decline if cigarette consumption drops as expected. Vegetable and fruit crops are projected to increase by around 20 to 25 percent from the 1967-69 average.

Continued advances in technology—including more productive varieties and more efficient cultural practices—as well as increased use of fertilizer and other purchased inputs will further increase yields in the coming decade (table 1). The increase may about match projected growth in demand. This implies little overall change in crop acres harvested, in contrast to the downtrend in crop acres harvested over the last two decades (fig. 18). Changes in the proportions of total harvested acreage used for various crops will continue to

reflect changes in demand and differential rates of expansion in production technology.

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