

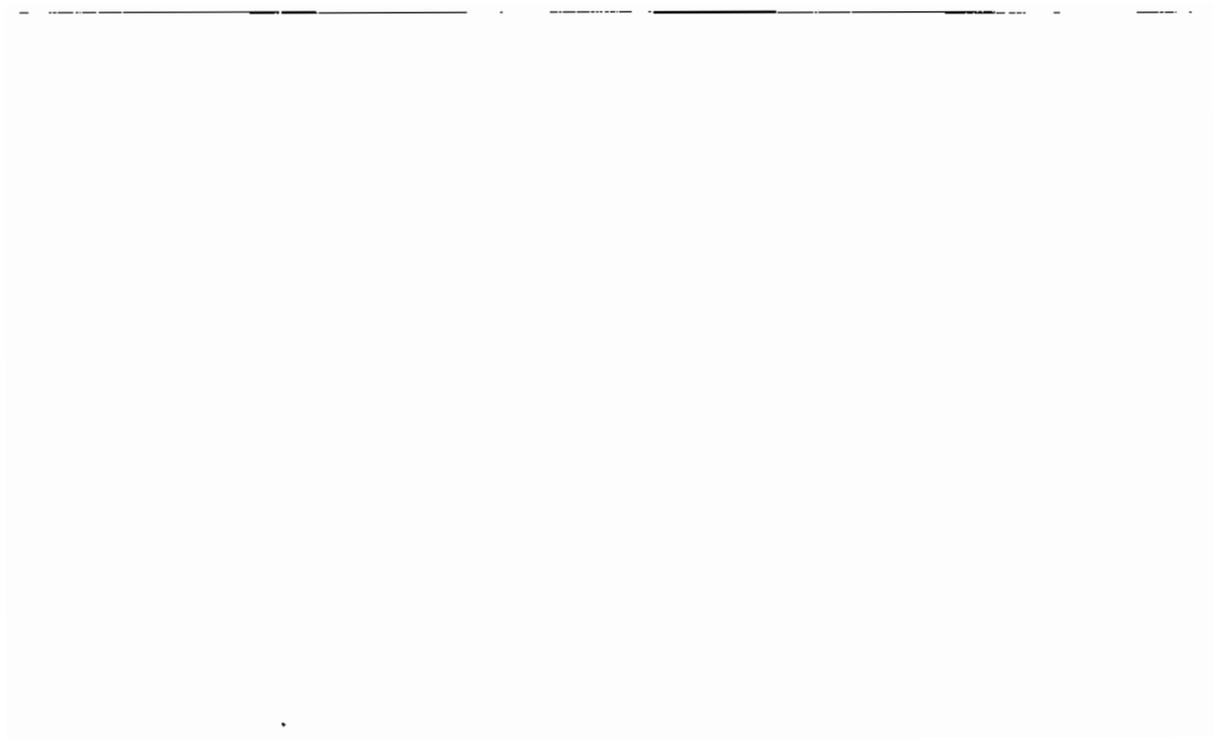
# U.S. FOOD AND AGRICULTURAL POLICY IN THE WORLD ECONOMY

April 26, 1976



CONGRESS OF THE UNITED STATES  
Congressional Budget Office  
Washington, D.C.

Revised Second Printing



## PREFACE

As part of its first annual **report** to the House and Senate Budget Committees, **Budget Options for Fiscal Year 1977, the Congressional Budget Office** presented **several** options in the area of **national** agricultural **policy**. Because of space **limitations**, the **complex** relationships between United States agriculture and world needs and markets for food and fiber could not be **laid out fully** in that **report**. This paper discusses these options in greater depth, places them in context, and reflects the research and analysis leading to them.

This paper is a joint project of the Natural Resources and Commerce Division and the Fiscal **Analysis** Division of CBO. The principal authors are Lynn Daft, George **Iden**, and Jim Vertrees. They were assisted by Stephen Brooks, Robert Gordon, Mike Owen, and Paul Warren. Cheryl **Miller**, Connie Leonard, and Barbara **Saragovitz** typed the manuscript. **Melinda** Upp provided **editorial** assistance. The project was **carried** out under the general direction of Douglas M. **Costle**, Kenneth L. Deavers, and Frank de Leeuw.

This report has received extensive external review and the authors wish particularly to acknowledge the helpful comments of James **Driscoll**, **Bill** Gahr, Bruce Gardner, **Allen** Grommet, Steve Guebert, Barbara **Huddelston**, Dick Kennedy, **Elmer** Klumpp, Francis **Kutish**, Gene Lee, Ben **Massell**, Leo Mayer, Glenn Nelson, Pat **O'Brien**, **Allen** Paul, J. B. Penn, Tom Saylor, Ed **Schuh**, Henry Shue, Walter **Wilcox**, and Larry Witt.

The authors also note their **special** gratitude to Congressman **Neal** Smith for his review of an earlier draft and suggestions on how this report **could** be made most useful to Members of the Congress.

In keeping with the Congressional Budget **Office's** mandate to provide **nonpartisan** analysis of policy options, the report contains no **recommendations**.



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## Summary

The **agricultural** situation of the United States has changed significantly since the **beginning** of this decade. Abundance and its attendant problems of low farm prices and **large**, costly government stockpiles have given way to a tight market and higher prices. **Already** an important force in the world market, U.S. agriculture has assumed **still** greater importance. **Along** with the new **circumstances** have come new problems: higher prices for food, increased price instability resulting in sizable income transfers affecting both farmers and consumers, higher farm production costs, increases in the cost of providing foreign food aid, and **general** uncertainty about the future of **agriculture** and how governments **will** respond to it.

A review of major trends in world agriculture over the past two decades is **useful** for putting the current situation in clearer perspective. Aggregate world food production has increased over this period, falling only in 1972 and remaining constant in 1974. Though production in the **less** developed countries (LDC's) had risen at about the same pace as in **developed** countries, a higher rate of population growth in the **LDC's** resulted in their per capita food production increasing **comparatively little**. Thus, **malnourishment** remains a serious problem in many of the poorer nations.

During the 1950s and 1960s, the major grain exporting nations accumulated large government-held stocks, despite continuing efforts to keep supply in line with demand. Though this build-up of grain stocks was largely unplanned and unwanted, the release of stocks during periods of short **supply** dampened or prevented price rises. The combination of **large** stocks and high farm price supports helped keep world commodity prices **relatively** stable throughout the period. However, in the late 1960s and **early** 1970s, the major grain exporting nations succeeded in reducing government **stockholdings**.

This reduction in stocks and the related diversion of over 60 **million** acres of cropland under government programs in the United States coincided, in 1972, with a number of other important events on

the **world agricultural** scene: poor harvests in many growing regions, a **decision** by the Soviet Union to make up domestic **shortfalls** through purchases from abroad, continuing increases in the per capita demand for food (particularly livestock products) due to worldwide economic prosperity and rapidly rising incomes, and the stimulative effects on U.S. exports of a **dollar devaluation**.

The combination of these events predictably caused world **agricultural** prices to skyrocket. Within the span of two years, many commodity prices **doubled** and some **tripled**. Although no longer at these peaks, commodity prices remain high by earlier standards. As a major supplier of world food imports, the United States experienced a surge in exports that has continued at a level about half again the **volume** of the late **1960s**. This further increased the dominance of North American agriculture (including Canada) as the major source of world grain exports.

Adjustment to price changes of this magnitude was impeded by the agricultural and trade policies of a number of countries and trading **blocks** that **isolate** their agricultural sectors from the world market. This essentially forced those nations that maintain more open markets, such as the U.S., to bear a disproportionately larger share of the adjustment burden.

But how long will conditions of the past three years continue? Over the longer run, looking to about **1985**, it appears that: aggregate **world** food production will continue its long-run rate of increase; less developed countries will continue to depend on food imports from developed countries; collectively developed countries will continue to have the capacity to produce more food than they can consume **internally** at **acceptable price levels**; and the demand for **feedgrains** will continue to grow as **livestock** products assume greater importance in the diets of the more affluent people around the world. The **near-term** situation, however, continues to be highly unpredictable. The one thing that is most certain is that year-to-year variation from the long-term trend will be **substantial**.

A central consideration in fashioning U.S. **agricultural** trade **policy** will be the effects of **larger agricultural** exports on the U.S. economy. This study uses an econometric **model** to estimate the effects of exporting 10 **million** metric tons of grain more than the **level** expected for **fiscal** year 1976 "(the **equivalent** of a 13 percent increase). This simulation indicates that an increase in exports of this magnitude by a year later would: increase retail food prices about 1.0 percent and the overall cost of living by 0.2 to 0.3 percent; increase overall net farm income by about \$2.4 **billion**, though this would **include** a **decline** in the net income of livestock producers as higher **feedgrain** prices **lead** to increased livestock slaughter; increase federal tax

revenues by about \$0.8 billion, which would more than offset increased spending (\$0.4 billion), resulting in a net reduction in the federal budget deficit of \$0.4 billion; and increase the balance of payments by at least \$1.4 billion. The simulation also indicates that after a year the real gross national product<sup>1</sup> and the rate of unemployment would be essentially unchanged. After two years, however, real output would decline by \$1.1 billion to \$1.5 billion (in 1975 prices), unless compensating changes in fiscal and/or monetary policies were made. Though farm prices and farm income would both recede as grain production increased the second year, food prices would continue to rise as the effects of reduced livestock production continued to be reflected at the retail level. In addition, the high consumer prices of the first year would begin to result in higher wage rates and increased inflation.

These effects would, of course, be felt differently by different groups of people. Consumers would have to pay higher food prices, yet they would also benefit from improved accessibility to foreign products. Farmers who raise crops would benefit from higher incomes, while the incomes of those raising livestock eventually would fall. The employees and owners of the large grain exporting firms, as well as those employed in the maritime industry, would benefit from the increased volume of shipments.

The principal fiscal policy issue would be developing a response to the occasionally sharp increases in farm prices that are associated with crop failures, either in this country or abroad. As a major exporter of farm products, income and purchasing power in the U.S. respond to higher farm prices, particularly if the increase in farm prices is caused by crop failure abroad rather than in this country. Nevertheless, increased inflationary pressures can intensify dilemmas of fiscal policy. If a more restrictive fiscal policy were pursued, the inflationary effect would be reduced, but at the expense of some output. If fiscal policy were adjusted to accommodate shocks to the price system from food or oil, the decreased output could be mitigated or eliminated; but in that case, the impact on inflation could be reinforced.

From the standpoint of future U.S. food and agricultural policy, the principal issue is how to avoid the increased price instability

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1. Real Gross National Product is GNP that has been adjusted for inflation.

that would accompany expanding grain exports, particularly if this occurred when world grain stocks were low, as at present. Additionally, there are issues of how to achieve a more equitable distribution of both the benefits and costs associated with these exports. The principal policy options are: (1) continuation of present policy; (2) establishment of a domestic grain reserve; (3) creation of an international grain reserve; (4) imposition of trade restrictions; (5) further trade liberalization; and (6) negotiation of bilateral trade agreements.

(1) Continuation of the existing price and income support programs would probably result in: continued price and income instability; as long as market prices remained above intervention prices, relatively low budget costs for farm programs; high foreign exchange earnings in some years; and doubt and uncertainty over U.S. reliability as a major supplier of food, both commercially and as food aid.

(2) Adoption of a domestic grain reserve would: reduce price and income instability; increase budget costs somewhat over current levels; and for foreign customers and aid recipients, reduce uncertainty over conditions of their access to U.S. supplies. On the other hand, in periods of price extremes, some intervention in trade would probably still be necessary. Another drawback to a domestic reserve is the difficulty in adapting it to agricultural income support objectives and the possibility of a return to large and costly programs like those in effect during the 1950s and 1960s. The effect of a domestic grain reserve on farm income is uncertain. It seems likely that consumers would benefit more from increased agricultural price stability than would farmers, though evidence in support of this conclusion is meager.

(3) An international reserve would entail most of the same advantages and disadvantages as a domestic grain reserve except that it would face the additional handicap of requiring a high degree of international cooperation and agreement. On the basis of past international experience, this must be considered a severe handicap.

(4) Further regulation of trade by the United States, though temptingly simple to employ and absent a direct budget cost, also would have drawbacks. By restricting exports, the United States would encourage its foreign customers to develop alternative sources of supply, perhaps including their own domestic agricultural sectors. This would depress U.S. farm prices and farm income which, in turn, could lead to higher government farm program costs and reduced long-term investments in U.S. agricultural production capacity. Also, though relatively easy to implement, trade restrictions often outlive their usefulness.

(5) Trade **liberalization** has much to offer in terms of reduced **instability** of **world** prices, increased economic efficiency of resource allocation, and low budget costs, but it is also dependent on a high degree of international cooperation. To the extent U.S. policy changes improve this **country's dependability** as a source of supply and demonstrate a **willingness** to remove **U.S.-imposed** trade barriers, the chances for trade **liberalization** would be improved. However, chances for **significant liberalization** over the near term appear slight.

(6) Bilateral agreements between the United States and major importers offer a **simpler**, more **attainable** route to dealing with other nations. They are much **easier** to negotiate and **implement** than **multi-lateral** agreements. And, they offer a means of reducing market uncertainty. Yet, these agreements require a high degree of central **control**; they often **outlive** their **usefulness**; and if used **excessively**, they become constraints to a freely functioning market.



CHAPTER I  
INTRODUCTION

As recently as the beginning of this decade, the "agricultural problem" of the United States was viewed chiefly as one of excess production. Ever-increasing productivity contributed to chronic over-supply. In attempting to support commodity prices and farm income, the federal government accumulated large stockpiles of grain. To avoid further stock buildups, the government paid farmers to withhold nearly 60 million acres from production. In fiscal year 1970, farm income support programs cost over \$3.6 billion. In an effort to increase demand, particularly from foreign markets, the U.S. government from the late 1950s subsidized commercial sales of some commodities, developed new markets and promoted products, and, for humanitarian and diplomatic purposes as well as to dispose of surpluses, sold on concessional terms or gave large quantities of grain to poorer nations.

The outlook for food production by the less developed countries (LDCs) looked promising at the beginning of the decade. A "green revolution" sparked by the development of new varieties of rice and wheat and aided by low fertilizer prices promised significantly improved diets. It also appeared that newly developed techniques of birth control might be more widely adopted, thereby lessening the threat of hunger and malnutrition.

The view, six years later, is much different. The pace at which U.S. agricultural productivity had increased over the past 30 years has slackened, at least temporarily. Government-held stocks of food in the United States have all but disappeared. Food prices in the United States have soared to record highs. Efforts to improve the diets of low-income people have been expanded and the need for farm price supports has declined, so the U.S. Department of Agriculture budget is now dominated (two-thirds in fiscal year 1976) by domestic food assistance programs, primarily food stamps, rather than by aid to farmers.

The United States also has removed many export subsidies and has periodically resorted to export controls. Nearly all land formerly held out of production has been returned to cultivation.

Growth in per capita food production in most LDCs has slowed and in some areas -- such as Bangladesh, the Sahel of West Africa, and Ethiopia -- shortages have been severe. Food aid abroad by the United States was sharply cut in fiscal year 1974. Though budget levels for such aid now have nearly returned to earlier dollar levels, the volume of shipments is substantially lower because of higher prices.

The abruptness and magnitude of these changes have caused widespread confusion and uncertainty concerning the long-term prospects for world agriculture and, more specifically, the U.S. role. Has the world food situation become one of chronic shortage? Or do the recent shortages represent simply a brief interlude in earlier tendencies toward excess capacity and oversupply? Do the large exports of U.S. agricultural products of the past three years signal a new era of international trade, one in which U.S.-produced food assumes greater importance? And if so, what does this suggest with regard to the need for changes in U.S. agricultural policy?

The major purposes of this paper are to: (1) examine what has occurred over the past four or five years; (2) assess the permanence of recent changes and their long-term consequences; and (3) analyze the major policy alternatives available to the United States.

## CHAPTER II BACKGROUND

This section places recent events in their long-term perspective and discusses whether the current food shortages and high prices are grounded in **well-established** forces that are likely to persist into the future or, conversely, result from a unique set of circumstances that are **unlikely** to continue. First, it discusses some determinants of the current food situation, including weather, increasing affluence of the **world's** population, and devaluation of the **dollar**. Next, it discusses government food **policies** that both affect and respond to changes in production, the holding of stocks, and prices.

### Determinants of the Current Food Situation

**World** food production had increased steadily over the past two decades, at an average **annual** rate of 2.8 percent. This increase in **supply** is in part a response to increase in demand, generated by a growing world **population** and rising affluence. However, this trend toward increased production has been disrupted in the past five years by adverse weather conditions. At the same time, devaluation of the **dollar** increased foreign demand for U.S. food products.

### Weather

Despite the advanced state of technology, **agricultural** production is **still** heavily dependent on **favorable** weather; adverse weather **explains** much of the recent variability in food **supply**. There have been droughts in the southern Sahara, East Africa, Northwest India, the Soviet Union, and the **midwestern** United States; **torrential** rains in the **Philippines**; **floods** in the midwestern United States and Europe; warm winters (and increased susceptibility to winterkill) in the western part of the Soviet Union and the eastern United States; and early frost in the United States.

In the past, **fluctuations** in weather have often **resulted** in poor harvests. Yet, with land and grain reserves lower than they have been for **several** years, weather has affected the market more **directly** and dramatically.

Some regions are more vulnerable to the effects of weather than others. Oceania, Canada, Argentina, and eastern portions of the Soviet Union are **particularly susceptible**. For example, **only** one-third of the Soviet agricultural land **lies** south of the 49th **parallel**, with its attendant **longer** growing season, and only 1.1 percent receives as much as 28 inches of **annual rainfall**. This contrasts sharply with the United States, where all cropland lies below the 49th **parallel** and 60 percent receives at least 28 inches of rainfall annually. It has been estimated that the odds of weather sufficiently unfavorable to reduce wheat yields by at least 10 percent are one in eight for the United **States**, one in five for the Soviet Union, and one in three for **Canada**.<sup>1</sup> In contrast to Canada where wheat production is concentrated in a **relatively small** geographic area, the United States and the Soviet Union benefit from **having geographically** dispersed production regions that are less likely to be concurrently affected by adverse weather.

Does the poor weather of recent years mark the **beginning** of a major climatic change? Are the shifts in atmospheric circulation and declines in temperature that have been observed over the past 20 or 30 years indicative of a **long-term** shift in the tropical rain **belt**? Or was the period from the mid-1950s to the early 1970s one of unusually favorable weather conditions? The evidence to answer these questions is incomplete and **likely** to remain so for many **years**. What is more certain, however, is that precipitation **will** continue to be **highly** variable from year to year and region to region.

### Affluence

The demand for food **generally** increases with rising **income**, however, this demand varies among commodities and income **classes**. Within poorer countries where diets are **generally** inferior, the demand for food increases **proportionately** more in response to **rising** income than it does in developed countries. In addition, **higher** incomes normally result in a shift in the composition of the diet -- away from grain and toward more meat and fruit.

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1. U.S. National Oceanic and Atmospheric Administration, (unpublished materials, May 1974).

During the 1960s, the world enjoyed economic prosperity, with per capita gross national product (GNP) increasing an average of 3.9 percent annually in the developed world and 3.2 percent in the less developed countries. Though this rate of expansion slowed in 1970-71, it rebounded sharply in 1972-73. This growth in purchasing power, though not peculiar to the recent period of tight agricultural markets, is an important and persistent source of the rising demand for food.

The increasing demand for livestock products has been particularly important. Three to four times the calories in feed grains are needed to produce equivalent calories in poultry and pork and six to seven times the amount to produce equivalent calories in grain-fed beef, so increased meat consumption increases demand for feed grains. And, given the wide disparity in per capita levels of meat consumption, even within the developed countries, this demand is likely to continue to grow as incomes rise (see Table 1). Though per capital meat consumption more than doubled in Germany and increased eightfold in Japan between the late 1940s and 1970, Germany still lags behind the U.S. level by half and Japan is only one-sixth that of the United States.<sup>2</sup> In addition, protectionary agricultural policies of the European Economic Community and Japan, have caused meat prices to be substantially above world prices for most of the past decade. As a result, the consumption of meat has not increased as rapidly as it would have otherwise. But, as incomes continue to rise and if and when these countries liberalize their agricultural trade, the shift toward more meat and less grain in the diet will probably continue.

### Devaluation

As the dollar became over-valued relative to other currencies after the Korean War, foreign demand for U.S. products -- agricultural and nonagricultural -- weakened and contributed to the downward pressure on U.S. agricultural prices. With the devaluation of the dollar in August, 1971, and again in February, 1973, this effect was reversed. That is, the price of U.S. goods measured in many foreign currencies fell. Since two-thirds of U.S. agricultural exports go to countries

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2. Seafood continues to be the single largest protein source in the Japanese diet, though meat consumption has risen proportionately more than seafood in recent years.

Table 1--Per Capita Meat Consumption in Selected Countries  
Calendar Years 1948-50 and 1969-70

<u>Country</u>	<u>Grams per capita per day</u>	
	<u>1948-50</u>	<u>1969-70</u>
United States	224	302
<b>Australia</b>	300	300
Federal Republic of Germany	80	200
Italy	42	131
Japan	5	41
Spain	39	120
USSR	naa	106b

Source: UN Food and Agriculture Organization (FAO)  
"Agricultural Adjustment in Developing Countries,"  
prepared for the Seventeenth FAO Conference,  
C 73/16 (FAO, September 1973; processed), p. 121  
as quoted by Dale E. Hathaway, "Food Prices and  
Inflation," Brookings Papers on Economic Activity,  
Vol. 1 (Brookings Institution, 1974).

a. na: not available

b. 1965 data

that devalued the dollar by about 15 percent, the effect on U.S. export demand was significant.<sup>3</sup>

### Causes and Effects of Government Food Policies

The governments of the United States and most other nations intervene in the international and domestic agricultural markets for a variety of purposes.

In general, before 1972, the developed nations sought to maintain domestic farm prices above international price levels while the developing countries tried to hold their internal prices below world levels. Largely as a result of these policies, the world prices<sup>4</sup> of most major commodities were relatively stable between 1955 and 1972. Beginning in 1972, however, world prices rose abruptly as adverse weather limited supplies, and prices doubled and even tripled in only two years. World prices overtook the supported prices of the nations that export the most and exposed those nations' agricultural economies to world market conditions to an extent not experienced for many years. Prices fell slightly in 1975 as world food production turned upward, though they remained high by past standards.

A variety of policies are used by the different nations to intervene in the agricultural market. These include price supports, land diversion, and stockpiles to control production and the amount of grain reaching the market; the regulation of international trades and foreign and domestic food aid.

### Production

Between 1954 and 1973, world food production rose by 69 percent. With an increase in world population of 44 percent over the same period, food production per person rose 17 percent (0.8 percent per year). There have been significant differences in the rate of improvement among countries, however -- particularly between the developed and the less developed countries.

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3. G. Edward Schuh, "The Exchange Rate and U.S. Agriculture," American Journal of Agricultural Economics, Vol. 56, No. 1, (February 1974), pp. 1-13.

4. "World prices" as used in this discussion refer to prices quoted for commodities being exchanged on a competitive basis among countries.

Though improved techniques of food production have made it possible for the LDCs to keep pace and even slightly exceed the rate of growth of production in the developed countries, the much higher rate of population growth in the LDCs has offset much of this gain (see Figure 1). In most of these countries, the nutritional level is still quite low. On average, the caloric intake per capita is about two-thirds that of the developed countries. According to estimates of the Food and Agriculture Organization of the United Nations, about one of six people in the world live on diets that are insufficient in protein and energy,<sup>5</sup> in some of the less developed regions, it is closer to one out of three. The margin of gain in food production is so small in most of the LDCs that a poor harvest in one year, such as occurred in 1972, can more than wipe out the advances achieved over a decade. However, in some regions, such as Africa, per capita food production has been declining (see Figure 2). Thus, while the world generally is better able to feed itself today than it was 20 years ago, a large, if not increasing, distributional problem remains.

Food production in the United States has increased somewhat more slowly over the last two decades than it has elsewhere. This slower rate of growth is in part due to the effects of weather and disease, but prior to 1973, primarily to governmental actions. To avoid oversupply, several million acres were withheld from production under government farm programs from the late 1950s through the early 1970s. As recently as 1972-73, the United States set aside 62 million acres under government programs, the equivalent of 21 percent of all acreage planted to major crops in the United States that year. In 1973-74, almost 20 million acres were withheld. Nor was the United States alone in taking such action. The United States, Australia, and Canada combined reduced wheat production from 74.9 million tons to 53.7 million tons between 1968 and 1970. Although the incentives to withhold land from production were removed once the magnitude of the 1972-74 food shortage became apparent, agricultural production cannot be turned on and off at will. Recent trends in the production, distribution, and use of grain for the United States are shown in Figure 3.

### Stocks

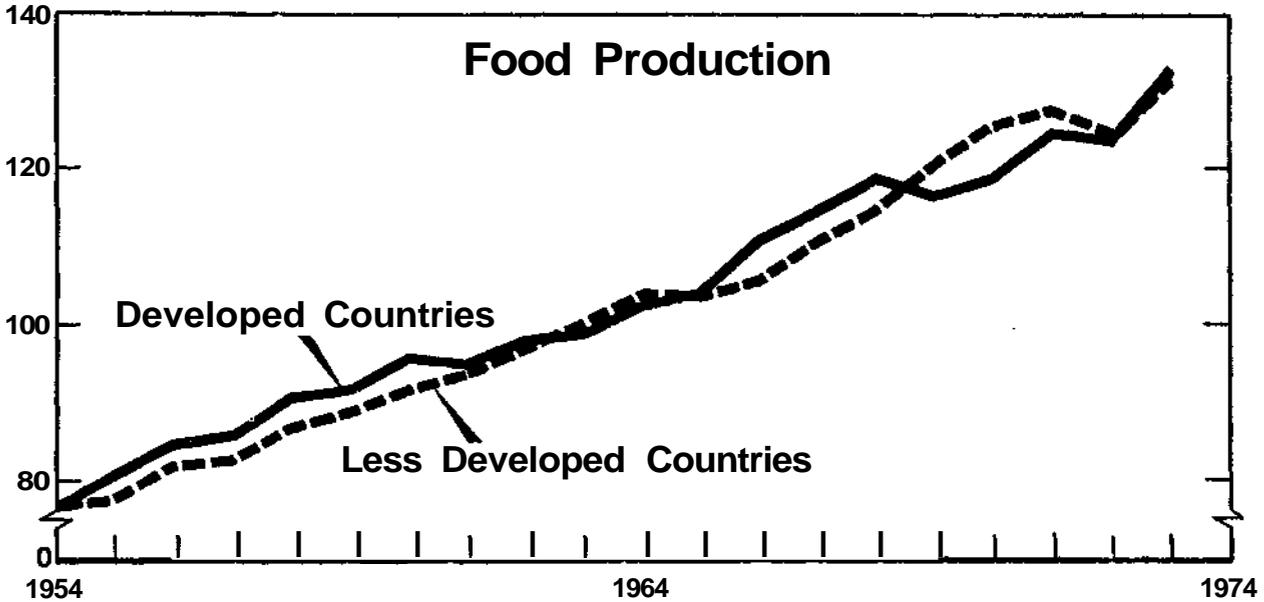
In principle, the major function of stocks is to smooth the flow of grain coming to market, to help match the variability of supply to

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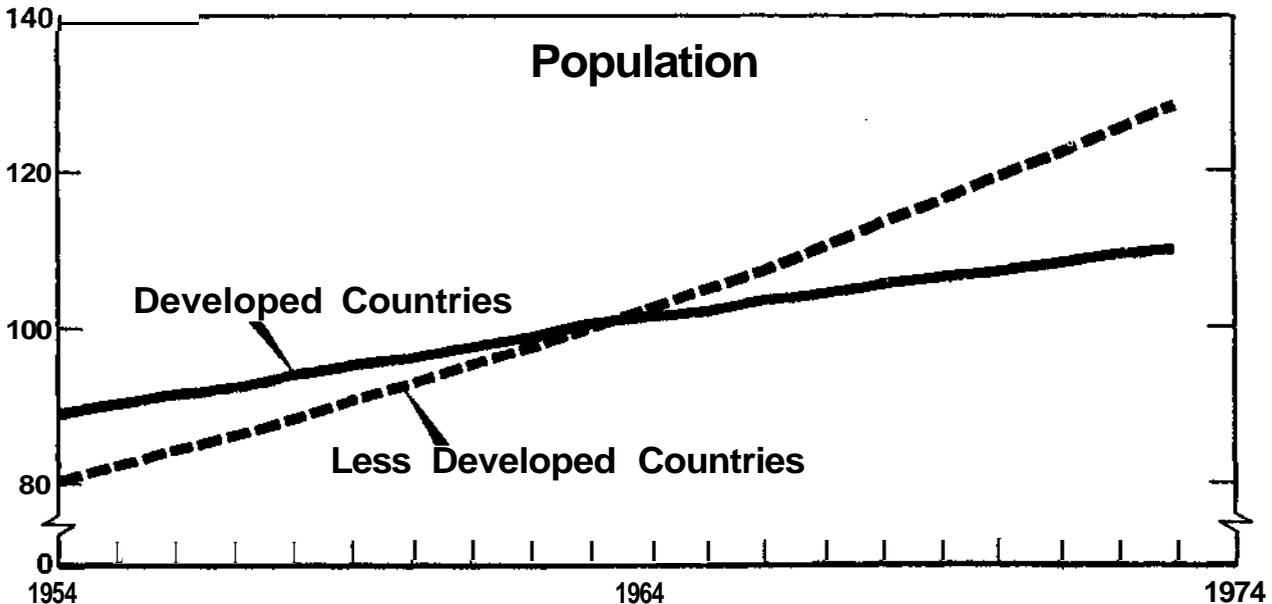
5. UN Food and Agriculture Organization, Assessment of the World Food Situation, Rome, 1974.

**Figure 1**  
**Trends in Food Production and Population in**  
**Developed and Less Developed Countries<sup>a</sup>**  
**(Calendar Years 1954-73)**

% OF 1961-65



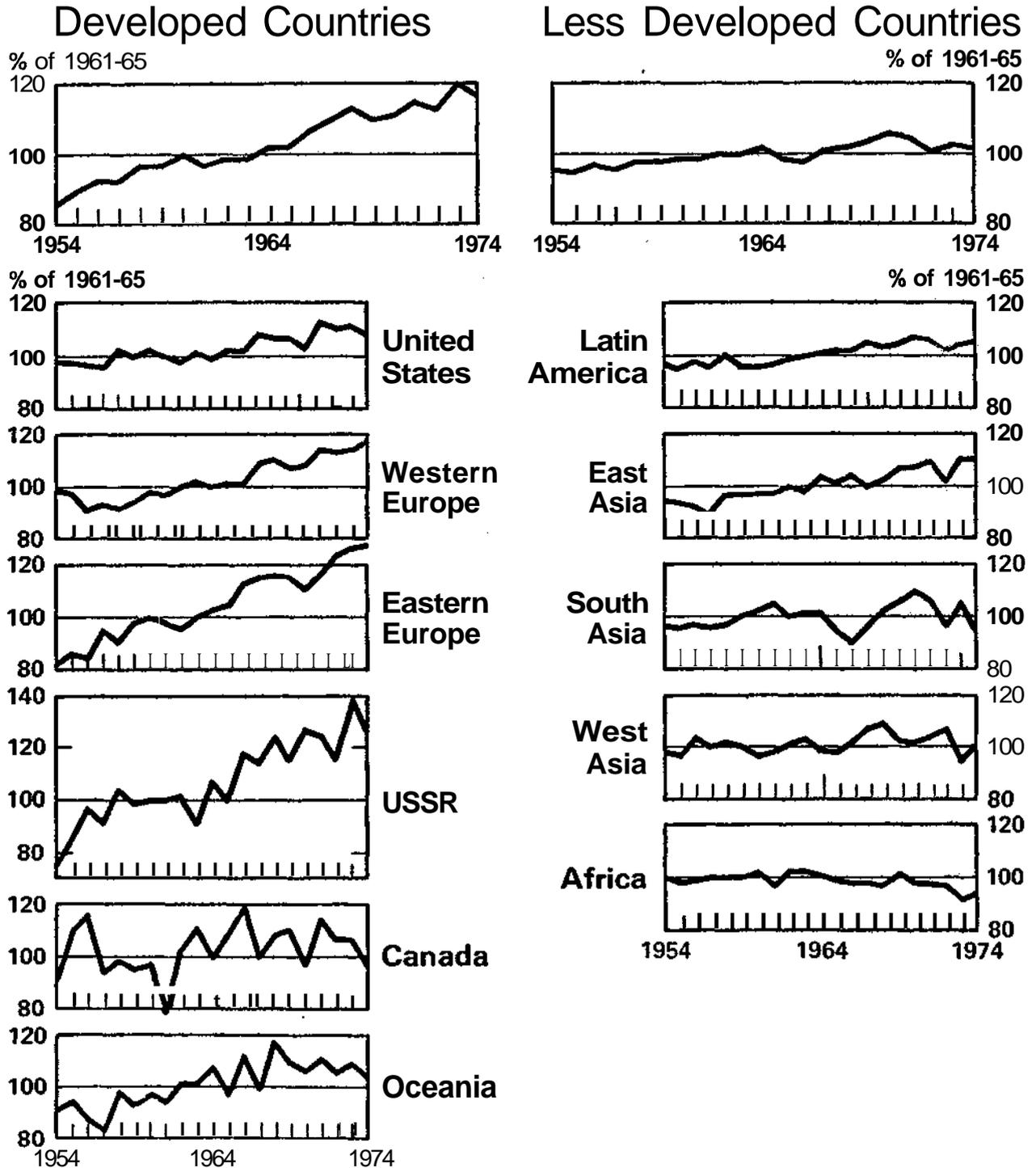
% OF 1961-65



<sup>a</sup> Data exclude Communist Asia

Source: U.S. Department of Agriculture (USDA) Economic Research Service,  
*The World Food Situation and Prospects to 1985*, Foreign Agricultural  
 Economic Report No. 98, (December 1974), p. 13.

**Figure 2**  
**Food Production Per Capita**  
 (Calendar Years 1954-74)

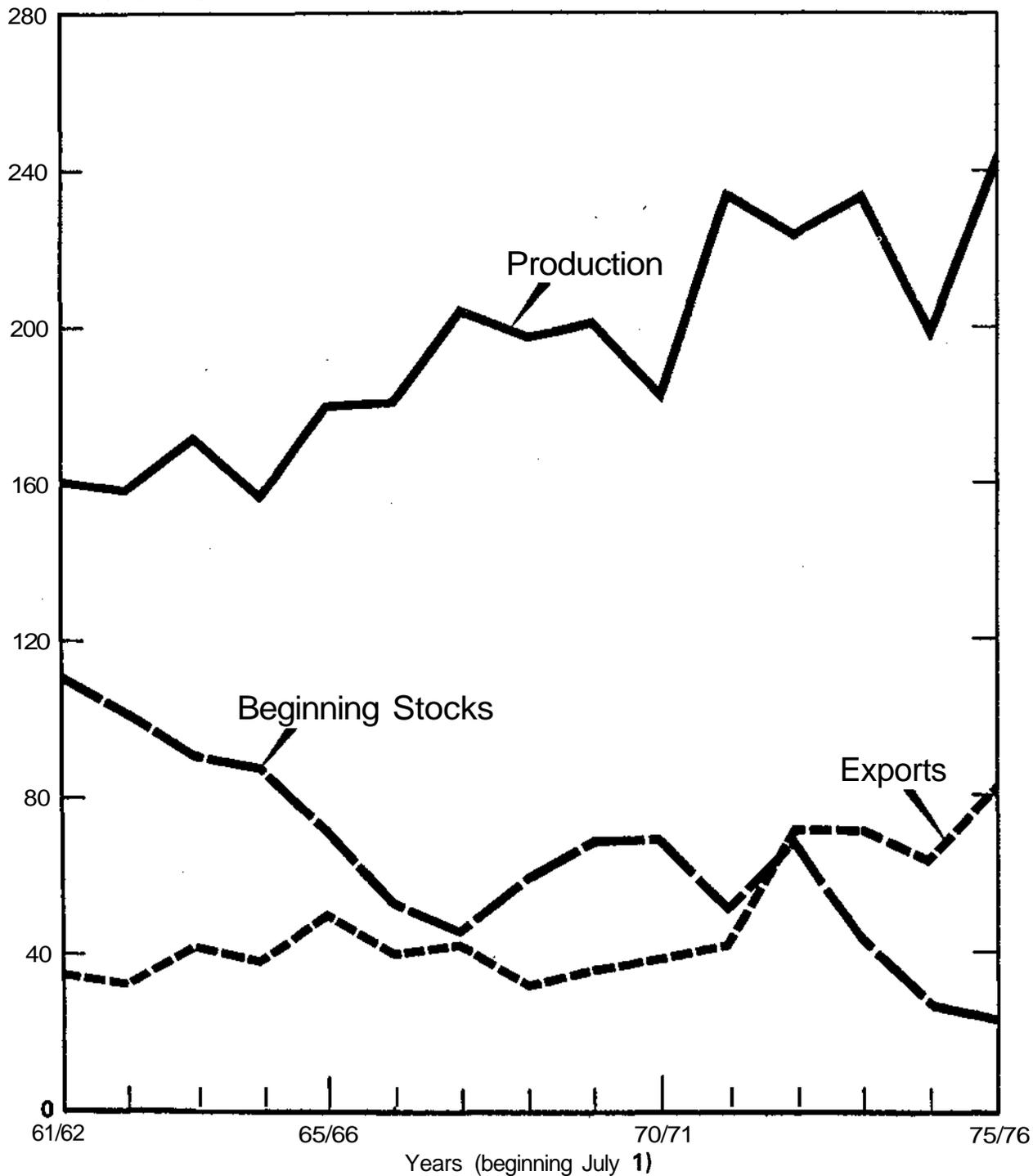


Source: USDA Economic Research Service, *The World Food Situation*, p. 15.

Figure 3

# U.S. Grain **Production**, Exports and Beginning Stocks (Crop Years 1961/62 - 1975/76)

Million Metric Tons



Source: USDA Foreign Agriculture Service, *Foreign Agriculture Circular: Grains, FG16-75* (December 22, 1975), p. 20, (see Appendix Table 1)

the relative stability of demand. Under free market conditions, grain traders respond to the opportunity for profit by holding stocks of grain for future sale at prices high enough to more than cover costs of storage.

However, stock accumulation has also been used as an instrument of government policy. As a result of actions taken by their governments to support domestic grain prices, Canada, and particularly the United States entered the 1960s with large grain stocks. Throughout the 1960s, end-of-year stocks of grain for the world were the equivalent of 20 percent or more of consumption. The United States accounted for a large share of these - as much as 60 percent of wheat stocks and nearly 80 percent of coarse grain stocks.<sup>6</sup> Though these policies were not undertaken to stabilize or dampen price increases, they had this effect. Thus, the comparatively large grain production shortfalls that occurred around the world in the mid-1960s were largely offset by the release of government-held stocks in combination with the return to production of land previously withheld. Any significant pressure to increase prices was thereby avoided. The largest year-to-year percentage change in U.S. export prices for wheat and corn between 1960 and 1971 was only 16 percent, compared to over 100 percent since 1971.

As a result of the continuing accumulation of surplus stocks, their occasional depressing effect on market price, and their high budget costs, the United States used various techniques to reduce stocks. These efforts contributed to a significant reduction through the early, and mid-1960s, but in 1968 the trend reversed and stocks began to rise again (see Figure 3). World stocks, heavily influenced by U.S. stock levels, followed a similar pattern. Thus, in the early 1970s, the U.S. and other major grain exporting nations renewed efforts to reduce stocks and curb production. Between 1970 and 1971, the four major exporters reduced their combined stocks by more than one-quarter. This was mostly a result of sharp reductions in acreage planted in Canada, Australia, and Argentina but also partly because of the 1970

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6. Coarse grains include corn, barley, oats, sorghum, and rye. With the exception of rye, these grains are also called feed grains, since they are used principally as feed for livestock, as opposed to wheat and rice, which are used principally as human food. Though these grains are not perfect substitutes, under certain price relationships they are substituted. When, for example, food grain prices decline to levels near the price of feed grains, they are used interchangeably as feed for livestock.

corn blight in the United States. By 1974, the stocks of these countries were **only** about 40 percent of the 1970 level. In the United States, **almost all** stocks of grain are now held by the private sector. With the exception of India, other nations made **little** or no effort to increase their holdings when stocks were plentiful and they were **unable** to do so once stocks had been reduced. As a **result**, world stocks as a percent of consumption **fell** sharply. They are currently about half the **level** of a decade ago with **little** prospect for increase in the year ahead.

Given the important role stocks play in regulating and **balancing** the **supply** and demand of grains, the historical relationship between the **level** of stocks and both the **level** and **stability** of grain prices has been **close**. This is **particularly** true when stocks are considered in relation to annual **use**.<sup>7</sup>

The ratio of end-of-year stocks to **total** use for the year, serves as a proxy for the **supply-demand** situation for the entire marketing year. A **low** ratio indicates that use is pressing against **availability** or at **least** that stocks are nearing minimum working stock levels. This, in turn, causes more active bidding among consumers, so prices rise. If the grain consumers could be assured that **supplies** from the next crop would remain in somewhat the same balance with future demand, there **would** be no reason for prices to rise. But, given the uncertainty of **agricultural** production, there is no assurance. Furthermore, there are reasons to **believe** that the nature of the demand for food has changed in such a way in recent years so as to diminish the responsiveness of demand to high **prices**.<sup>8</sup> Thus further pressure is added to increase prices and to cause wider **fluctuations** in price. Conversely, a high ratio indicates that **supplies** are abundant **relative** to demand.

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7. W.R. Bailey, F.A. Kutish, and A.S. Rojko, Grain Stocks Issues and Alternatives--A Progress Report, USDA, Economic Research Service, Agricultural Economic Research Report (February 1974), pp. 11-12.

8. Roger Gray, Grain Reserves Issues, (speech before the 1974 National Agricultural Outlook Conference, Washington, D.C., Dec. 9, 1974), pp. 6-8. The **principal** reasons for this, as suggested by Gray, are growing consumer **affluence**, increased importance of **livestock** products in the diet, expanded **role** of state trading, and the tendency to stockpile during periods of shortage.

Historically, when the ratio of end-of-year stocks to annual use has remained above a given level (around 15 or 20 percent for both wheat and corn), average market prices have varied little despite year-to-year changes in the ratio (see Figure 4). However, when the ratio has fallen below this level, prices have become increasingly sensitive to variations in supply. As can be seen from Figure 4, the ratio of ending stocks to annual use of corn has been quite low and prices have been correspondingly high the past two years. A similar situation has existed for wheat. In the absence of larger stocks, relative to use, prices are likely to remain high and unstable.

Production costs have also risen sharply, increasing by nearly 50 percent between 1972 and 1975. Though these higher costs probably did not contribute importantly to the rise in grain prices since 1972, they will significantly affect the future level of grain prices. Thus, even with larger stocks, it is unlikely that grain prices would return to earlier levels for sustained periods of time.

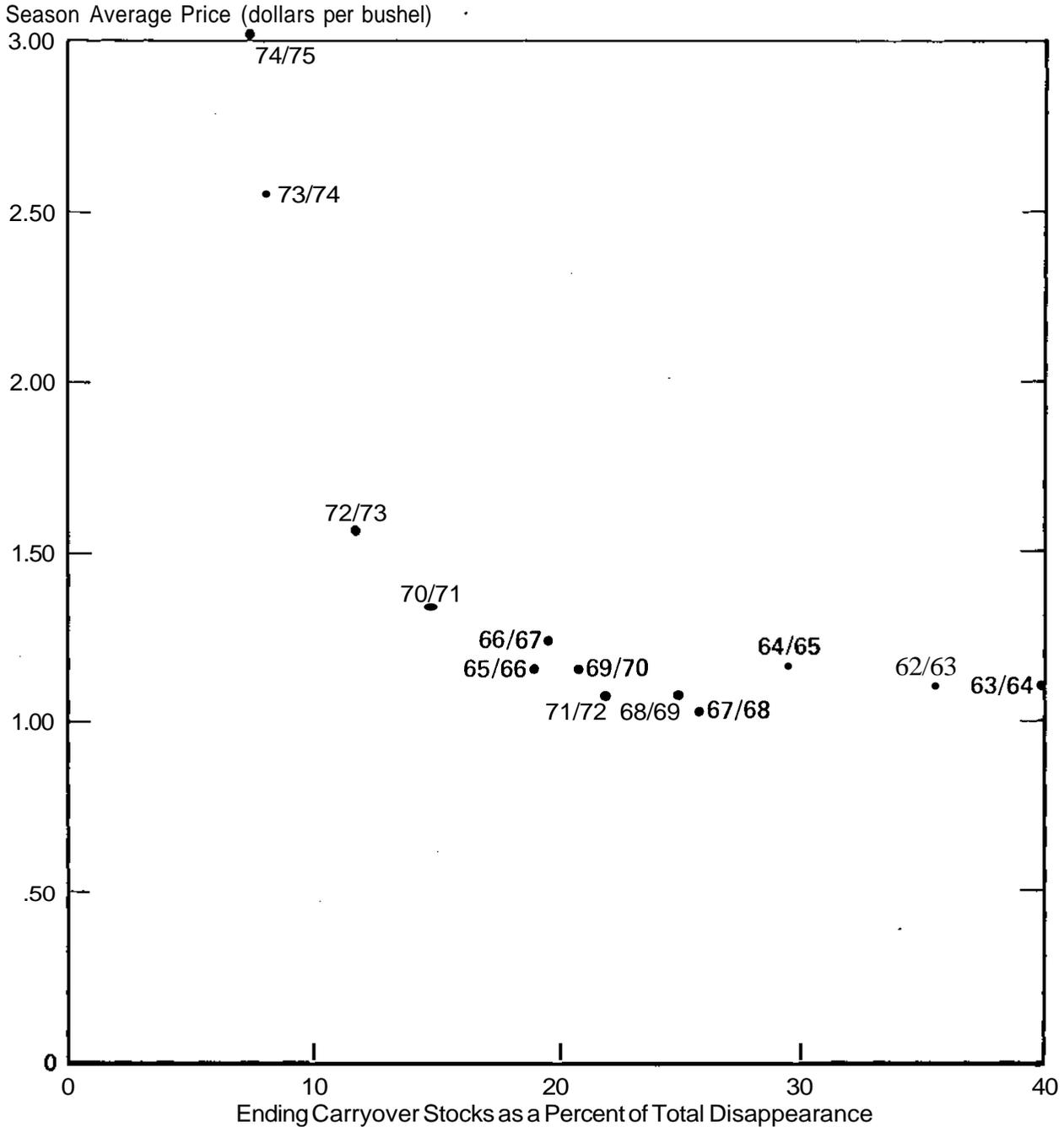
One of the major unanswered questions is how far the private sector will go toward replenishing stocks. In the past, large government stocks offered the private trade little or no incentive to hold stocks over and above those required for normal operating purposes. With government stocks depleted, the private trade will probably hold more, but how much more is uncertain. It is highly unlikely that expected profits will be large enough to cause the private trade to hold stocks as large as those formerly held by governments. The advantages and disadvantages of a grain reserve policy are discussed in Chapter V.

### International Trade

Ideally, international trade makes it possible for shortfalls in food production in one part of the world to be offset by surpluses in another part. In this regard, its function is similar to that of stocks. International trade also makes it possible for each region of the world to devote its resources to the production of those products (food and nonfood) for which it has a comparative economic advantage. In theory, all nations stand to gain from the pursuit of such a policy. In practice, however, free trade has proved to be elusive. Many of the food-deficit nations lack the financial means to compete effectively in the world market. Frequently, they cannot afford to cover their shortfalls by purchase from abroad. Also, many governments seek to isolate their domestic food economies from outside influence -- either to maintain low consumer food prices or to support high farm prices or both -- thereby inhibiting the free flow of goods.

# Figure 4

## Relationship Between Ending Carryover Stocks and Average Price for Corn (Crop Years 1962/63 - 1974/75)



Note: Crop year for each observation is shown.

Source: USDA, *Agricultural Statistics 1975*, (1975) pp. 29, 30; Economic Research Service, *Feed Situation*, FdS-260 (February, 1976), p. 2.

Despite these obstacles, the international trade of **agricultural** products serves an important role in the world economy. About 15 percent of the **world's** production of grain (excluding rice) now moves across **national** boundaries each year. This proportion has risen in recent years.

The pattern of world grain trade has shifted **significantly** over the past 40 years. In the latter **half** of the 1930s, all major regions of the world, with the exception of Western Europe, were **self-sufficient** in the production of grain, exporting at least marginal quantities to West European markets. Since then, Asia, Africa, Eastern Europe, and the Soviet Union have **all** become deficit grain traders **while** North America and **Australia** have become the principal sources of exports (see Table 2).

Around 20 percent of U.S. grain production was exported through the **1960s**, with as much as two-fifths of this being on **concessional** terms to developing countries. In **1972/73**, strong foreign demand caused U.S. exports to jump sharply, increasing the quantity of exports by about one-third over the **preceeding** year (see Figure 5). In **1973-74**, the quantity of exports continued to rise, though at a slower pace. Since then, the quantity of U.S. **agricultural** exports has **declined slightly** and then rebounded.

In the 10 years prior to **1972/73**, the current dollar value of U.S. **agricultural** exports exceeded the **value** of **agricultural** imports by \$1 to \$2 billion each year. As a **result** of the large increase in exports in **1973**, the U.S. **agricultural** trade balance rose sharply. In each of the past two **fiscal** years, the **agricultural** sector has registered a net export surplus of about \$12 billion, compared with deficits of about \$10 billion in the **nonagricultural** sector.

In the **1975/76** crop year, the United States is expected to export about one-third of its grain production -- over 60 percent of its wheat crop and about one-quarter of its corn. U.S. grain shipments abroad **will** account for just over **half** of **all** grain traded internationally (see Table 3), compared to an average of about 40 percent in the 1960s. U.S. exports of wheat this year **will** account for about 47 percent of total world shipments while U.S. coarse grain exports **will** account for about 56 percent of the world **total**. For all **agricultural** exports, including grain, the major foreign customers of the United States in **1974/75** were Japan (15 percent), Netherlands (8 percent), West Germany (7 percent), and Canada (6 percent). The Japanese and West European markets have been **highly** stable, due in part to measures taken by their governments to **stabilize** their **agricultural** sectors. The **centrally**

Table 2--The Changing Pattern of World Grain Trade,  
by Region, Selected Years 1934 - 1976  
(Million Metric Tons; (+) Indicates Net Exports,  
(-) Indicates Net Imports)

<u>Region</u>	<u>Annual Average</u>				
	<u>1934-38</u> <sup>a</sup>	<u>1948-52</u> <sup>a</sup>	<u>1960/61</u> <sup>b</sup>	<u>1970/71</u> <sup>b</sup>	<u>1975/76</u> <sup>b</sup>
North America	+5	+23	+39	+56	+95
Western Europe	-24	-22	-25	-30	-19
Australia & New Zealand	+3	+3	+6	+12	+11
Eastern Europe & USSR	+5	na	0	+1	-36
Africa	+1	0	-2	-5	-15
Asia	+2	-6	-17	-37	-46
Latin America	+9	+1	0	+4	+4

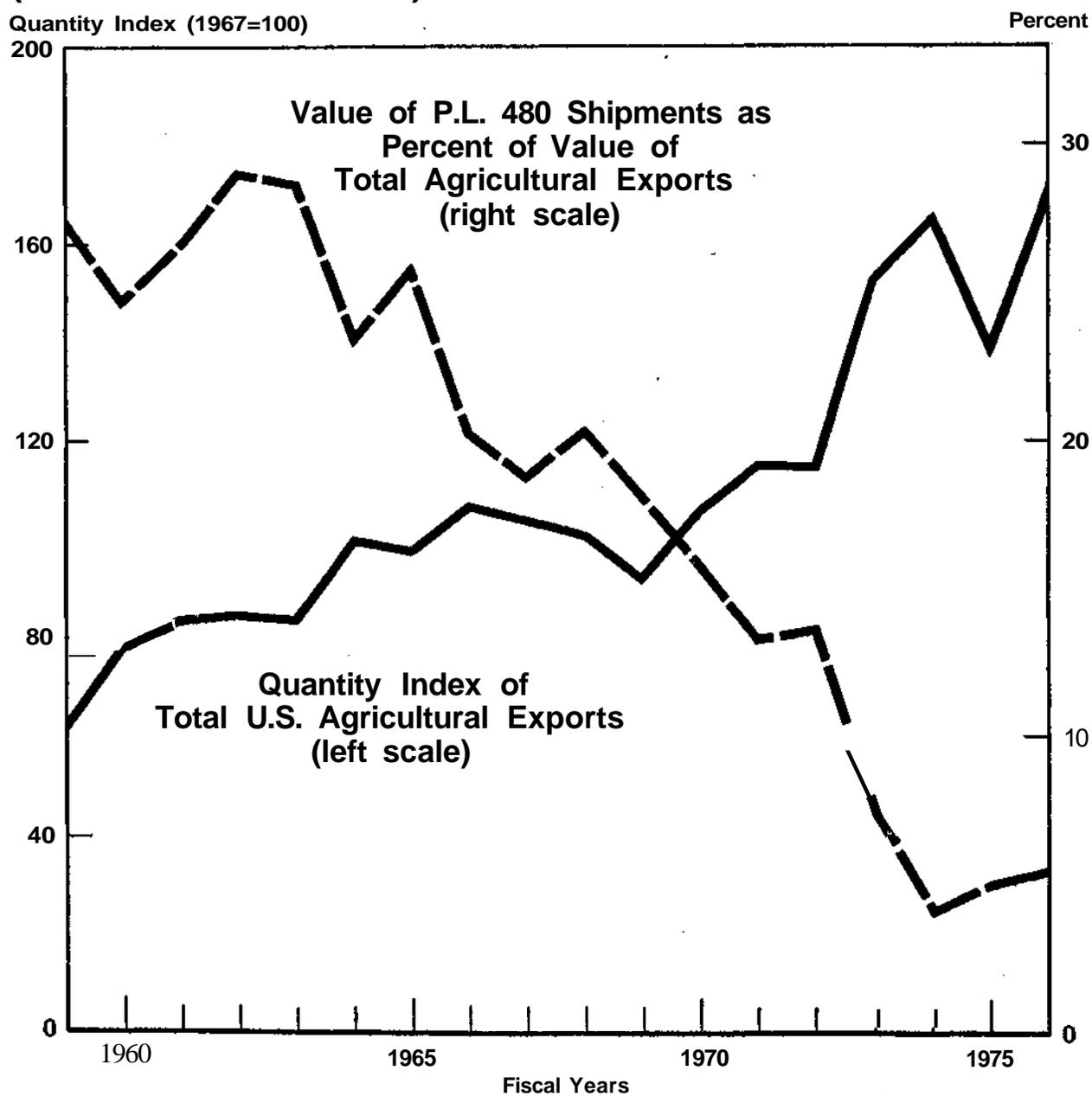
Source: Provided by Patrick O'Brien, Economic Research Service, USDA, from UN Food and Agriculture Organization, Production and Trade Yearbooks, 1954-74 and unpublished USDA data.

Note: Inequality of imports and exports due to variations in reporting periods and different marketing years.

a. Calendar years.

b. Fiscal Years.

**Figure 5**  
**U.S. Agricultural Exports: Quantity Index**  
**of Total Agricultural Exports and Value of P.L. 480**  
**Shipments as Percent of Value of Total**  
**(Fiscal Years 1959-76)**



Note: Data for 1967 are preliminary.

Source: USDA, *Agricultural Statistics*, 1975; U.S. Senate, Committee on Agriculture and Forestry, *Selected Material Relating to Public Law 480*, (Oct. 22, 1975); USDA, *Outlook for U.S. Agricultural Exports* (Nov. 17, 1975).

Table 3--U.S. Grain Exports  
(Crop Years 1961/62-1975/76)

<u>Crop Year</u>	<u>U.S. Exports (million metric tons)</u>	<u>U.S. Exports as a % of U.S. Production</u>	<u>U.S. Exports as a % of World Exports</u>
1961/62	35 MMT	22%	43%
1962/63	33	21	42
1963/64	41	24	43
1964/65	39	25	43
1965/66	50	28	46
1966/67	40	22	40
1967/68	42	21	43
1968/69	32	16	34
1969/70	36	18	35
1970/71	39	21	36
1971/72	42	18	37
1972/73	72	32	51
1973/74	72	31	48
1974/75	64 <sup>a</sup>	32 <sup>a</sup>	46 <sup>a</sup>
1975/76	82 <sup>b</sup>	34 <sup>b</sup>	51 <sup>b</sup>

Source: USDA, Foreign Agriculture Circular: Grains, FG16-75  
(December 22, 1975), pp. 20 and 24.

a. Preliminary

b. Projected

planned **economies**, in contrast, have entered the market **sporadically**, though with increasing frequency, in recent years. In 1972/73, for **example**, the Soviet Union was one of the United State's largest customers and in the following year the Peoples' Republic of China ranked fifth.

Soviet demand has had a **particularly destabilizing** effect on the **world** market. Soviet production is **highly variable** (see Figure 6), leading to wide variations in Soviet import requirements. Before 1972, the Soviet Union **internally** absorbed much of the shock associated with wide swings in Soviet grain production. This was done through **liqui-** dating **livestock** herds and reducing **internal levels** of consumption. Following poor crops in 1963 and 1965, the Soviet Union imports **equalled** only about one-third of its production shortage (see Figure 6). In 1972, the Soviets reacted **differently**, **apparently reflecting** a change in policy as well as a rare opportunity to buy large quantities of U.S. grain at a **substantial** price advantage. In that year, for the first time, Soviet imports of grain **equalled** and even **slightly** exceeded their shortage. Since then, the Soviets have continued to import as necessary to **fill** shortages. These actions in combination with the large **buildup** in livestock suggest a decision to **place** higher priority on improved diets for the Soviet **people**.<sup>9</sup>

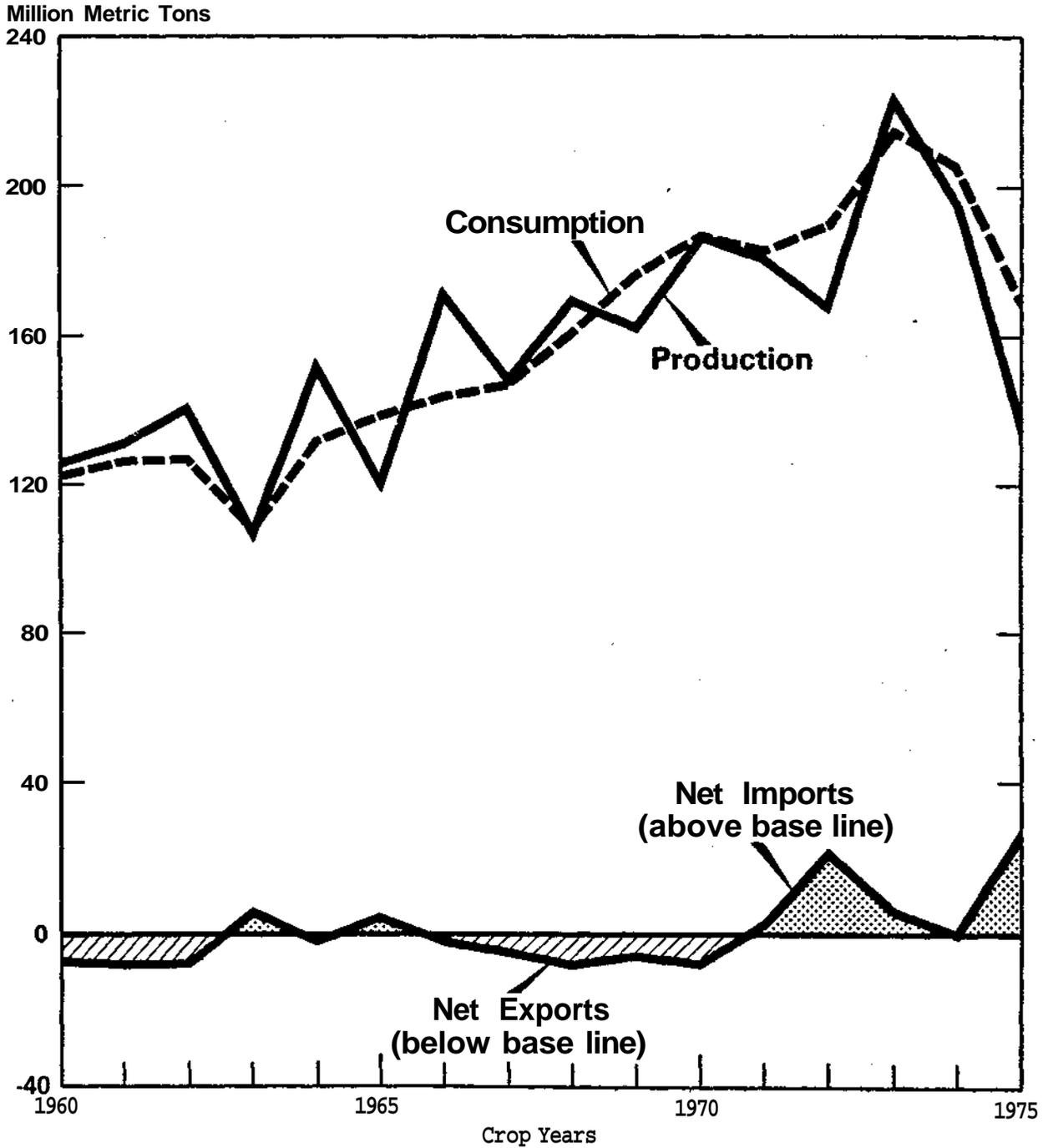
It has been estimated that between 1963 and 1974, the U.S.S.R. was **responsible** for 80 percent of the deviation from trend of world wheat **imports**.<sup>10</sup> As a major supplier of these imports -- over 60 percent in 1972/73 and 1973/74 -- the United States has been especially affected by the large variation in export demand. Furthermore, the Soviets have operated in secret and as a single buyer. **Unlike** the other major trading nations, the U.S.S.R. has resisted sharing information about

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9. The Soviets have reportedly decided to increase their per capita meat consumption to 82 **kilograms** per year, the amount determined by the U.S.S.R. Academy of Medical Sciences to be necessary for a satisfactory diet. George D. **Holliday** and John P. **Hardt**, Soviet Agriculture and the Grain Trade, Library of Congress, Congressional Research Service, Issue Brief IB75070 (Nov. 14, 1975). This compares with an estimate of Soviet meat consumption in 1974 of 55 **kilograms** and U.S. consumption the same year of 109 **kilograms**. USDA, Foreign Agriculture Service, Foreign Agriculture Circular: Grains, FG 1-76, (Jan. 21, 1976), p. 41.

10. Authur B. **Mackie**, "International Dimensions of **Agricultural** Prices," Southern Journal of **Agricultural** Economics, (July 1974), p. 18.

**Figure 6**  
**Soviet Union Grain Production, Consumption**  
**and Net Trade**  
**(Crop Years 1960-75)**



Source: USDA Foreign Agriculture Service, *Foreign Agriculture*, (Nov. 17, 1975), p.3 and *Foreign Agriculture Circular: Grains, FG1-76* (January 21, 1976) p. 25, (see appendix table 2).

crop conditions, stocks, or import requirements. Although this secrecy has **probably** enhanced the **Soviet's ability** to strike favorable trade agreements, it has **disadvantaged** other trading nations. Because of its **unpredictability**, this demand has been too **unreliable** to serve as a basis for **planned** increase in production by exporting nations. This has necessarily added to instability, since **world** commodity markets have had to accommodate **large** and sudden changes in the Soviet situation. The recent grains agreement between the United States and the Soviet Union (see Chapter IV) is expected to **help** reduce this uncertainty, if it **results** in the Soviet Union's covering a larger share of its production **shortfalls** by more **regular** purchases. Also by **dealing** in secret with a **small** number of very large U.S. grain exporting **firms**, the Soviet Union may have enabled these firms to profit at the expense of others.

Soviet imports were not the only cause of the instability and high **world** grain prices of the past four years, however. Of the increased U.S. export volume of feed grains, wheat, and **flour** between fiscal years 1972 and 1973, only about 40 percent was accounted for by shipments to the Soviet Union. U.S. exports to more traditional **customers**, such as Japan and the European Economic Community (EEC), increased sharply too. The volume of U.S. exports of these same commodities to Japan and the EEC, **collectively**, increased by 9.2 **million** metric tons or **nearly** 60 percent over the same period. In terms of their **dollar** value, U.S. food exports to both Japan and EEC countries increased by more than the amount of the grain sale to the Soviet Union. Furthermore, while the Soviets sharply **curtailed** grain imports in the two years following the 1972 sales, U.S. and world grain exports remained high as a result of increased demand **elsewhere**. **Albeit** inadvertently, Soviet imports since 1972 may have actually helped stabilize the world market because Soviet import requirements have tended to move in the opposite direction of other nations. Thus, although these sales have been important, they represent only one of **several** factors.

The EEC, Russia, Eastern Europe, and China, in **total**, account for about **half** of the world's total consumption of grain. In effect, these nations have opted out of a "free market" approach to **agriculture**. Instead, they have sought to **establish national policies** of agricultural resource adjustment independent of that of other nations and the **world** at large. Beyond coming at a high budget **cost**,<sup>11</sup> this independence

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11. Soviet **agricultural** subsidies, for example, have been estimated at \$28 billion in 1975. Holliday and Hardt, Soviet Agriculture, p. 2.

thwarts the **allocative effectiveness** of the **world pricing** system and **shifts** the brunt of adjustment onto those **nations** that attempt to maintain open agricultural economies. In the protected **countries**, producers and consumers are exposed to contrived prices, prices that do not **reflect world** market conditions. In periods of relative shortage, such as existed in 1973-75, this means that under conditions where domestic prices are held below levels on the **world** market, consumers use more food **and** farmers produce **less** than they would if prices were allowed to rise to market **clearing levels**. The **balancing** of supply and demand is therefore **left** to those markets in which price moves in response to actual market conditions. Thus, **while** the United States, and to a slightly lesser extent Canada and **Australia**, with their **relatively** free pricing systems, experienced price increases of 100 to 200 percent from **mid-1972** through 1974, grain prices in the major importing countries rose very **little** and in real (i.e. adjusted for **inflation**) terms, **actually declined** in some countries (see Figure 7). The effects of this are also reflected in the fact that nearly all the increase in the **world's** grain use between the period 1969-72 and 1974-75 (68 million tons out of 73 million tons) occurred in regions that protect their **agricultural** economies from outside influence, namely, the Soviet Union, China, and **Europe**.<sup>12</sup>

For those nations that remained exposed to the **world** market, the protective actions of other nations worsened the severity of the adjustment. Both farm and retail food prices were forced higher. Because of the higher grain prices, **livestock** herds were reduced more, further **destabilizing** the **livestock** sector. Stocks were **depleted** more rapidly; food aid was reduced more sharply.

### Food Aid

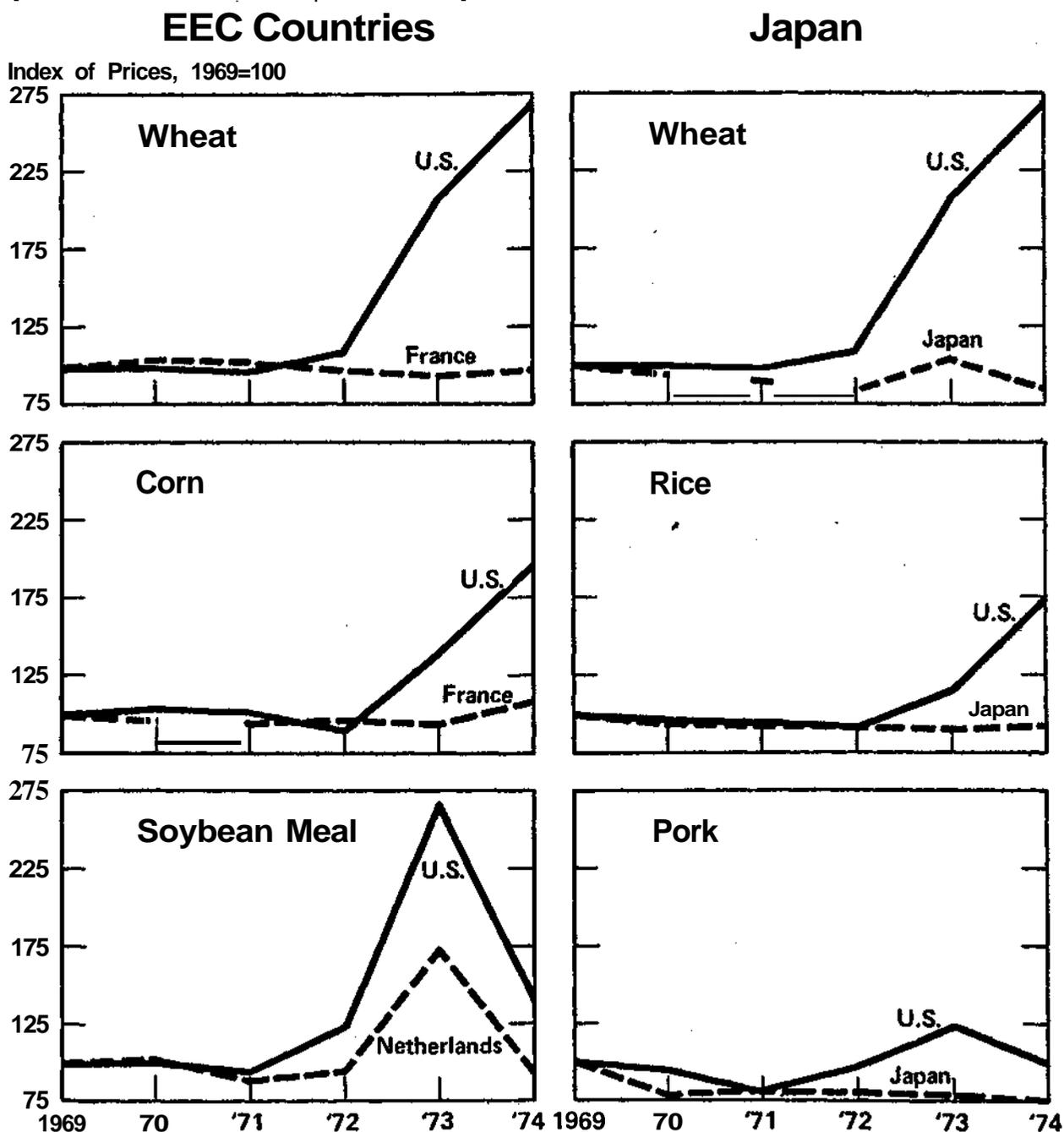
Recent changes in the world food situation have had a **particularly** telling effect on food aid programs. Between 1965 and 1973, nearly \$11 **billion** worth of food aid was provided worldwide, with the U.S. accounting for 80 percent of the **total**.<sup>13</sup> A number of developing nations have become

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12. D. Gale Johnson, "World Agriculture, Commodity Policy, and Price Variability," University of Chicago, Office of **Agricultural** Economics Research, Paper no. 75:20 (Aug. 8, 1975), p. 9.

13. USDA, Economic Research Service, The World Food Situation and Prospects to 1985, (December 1974) p. 54. This figure overstates the U.S. contribution to the extent most U.S. aid took the form of concessional sales while aid from most other countries was in the form of outright grants.

**Figure 7**  
**Indexes of Real Prices of Selected Agricultural**  
**Products in EEC Countries, Japan and the U.S.<sup>a</sup>**  
**(Calendar Years 1969-74)**



<sup>a</sup> Prices deflated by implicit GNP deflator.

Source: Glenn L. Nelson, *International Food Policy Issues and Domestic Price Stabilization*, (processed paper, prepared for Office of Raw Materials, Department of the Treasury, July 1975), p.28.

highly dependent on this aid; as much as **half** of the food grain deficit of the developing countries has been made up through food aid in **recent years**.

The U.S. food aid program was authorized under the Agricultural Trade Development and Assistance Act of 1954 (P. L. 480), which authorizes both concessional sales (Title I) and donations (Title II). The program was made possible by the accumulation of **large** government-held stocks of grain and other commodities. Beyond its humanitarian purposes, P.L. 480 has also been used to promote U.S. security and **political** goals and as a **tool** to affect U.S. farm prices. Its relative freedom from **Congressional** limitations has made it one of the most **flexible** foreign aid tools **available** to the Executive Branch. From 1960 through 1972 the program cost about \$1.2 **billion** per year. For most of this period, P.L. 480 shipments accounted for 20 to 25 percent of the dollar value of **all** U.S. agricultural exports. Prior to the recent shortages, P.L. 480 grain shipments averaged more than nine **million** metric tons per year.

With the disappearance of **surplus** stocks and the sharp rise in grain prices in **late** 1972, the volume of P.L. 480 grain shipments was cut to seven **million** tons in 1973 and to 3.2 **million** tons in 1974. Total commodity costs **fell** to \$978 **million** and then \$849 **million**, the equivalent of only 8 and 4 percent **respectively** of total **agricultural** exports in the two years. In line with the political uses of the program, over three-quarters of **all** concessional sales (Title I) in 1974 went to Indochina and the **Middle East**. Though outlays have since been raised to \$1 **billion**, the volume of grain remains substantially below pre-1973 **levels**.

This reduction in volume occurred because of **inflation** and because the need for **surplus** disposal all but disappeared. Since 1973, the alternative to government held stocks has been commercial **sales** at attractive prices on the world market. Though some nations, such as Japan, increased their food aid shipments under the **latter circumstances**, the United States chose to reduce its commitment. It is difficult to measure the **worldwide** need or demand for food aid and whether it has risen or **fallen** in recent years. Interest in the issue has **certainly** grown and several eligible countries have encountered production short-**falls** and diminished foreign exchange reserves on which to draw in filling the void. On the other hand, the high volume of aid characterized by earlier years was not just a function of need, but **also** of concerted U.S. efforts to dispose of **surpluses**.

Summary

The major **elements** of the world food situation then are these: World food production has tended to rise **gradually**, but with setbacks in 1972 and 1974. **Overall**, food production has increased faster than population. Yet, the much faster rate of population growth in the less developed countries, has caused them to increase their dependence on the developed countries to make up food deficits. Major grain exporting countries, concerned over the **rapidly** rising costs of government-held grain stocks, took steps in the late 1960s and early 1970s to restrain production and expand exports. These actions, coinciding with poor harvests in 1972 and 1974, resulted in a rapid reduction in world grain stocks, escalation of prices of **agricultural** commodities on the **world** market, a sharp rise in the level of **international** trade of food, and an erosion in food aid support by developed countries, **particularly** the United States.

CHAPTER III  
PREDICTING THE FUTURE

It is clear that the U.S. role in international agriculture underwent an important change in 1972-74. But how lasting will it be? Was the strong foreign demand of the past three years a temporary aberration that will soon be replaced by oversupply and depressed farm prices? Or, conversely, has the world entered an era of chronic shortage and high prices, wherein the large grain exporting countries will be under more or less constant pressure to allocate their grain output among an increasing number of food-deficit nations? Or, does the future lie somewhere between these extremes, with relatively tight supplies affected by occasional years of weather-induced shortage or surplus?

Predictions of food production are subject to large errors, given the unpredictability of so many of the key variables -- weather, disease, technology, and governmental policy. Still, it is possible to estimate a likely range of outcomes. Several recent studies agree substantially on the broad outline of what can be expected between now and 1985.<sup>14</sup> The central conclusions are:

- o Overall world food production will continue to increase with food supply rising faster than population, thereby allowing for a continued improvement in the per capita level of consumption.

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14. USDA, Economic Research Service, The World Food Situation and Prospects to 1985; UN Food and Agriculture Organization, Assessment of the World Food Situation; Leroy L. Blakeslee, Earl O. Heady, and Charles F. Framingham, World Food Production, Demand, and Trade (Ames, Iowa: Iowa State University Press, 1973); G.E. Brandow, "American Agriculture's Capacity to Meet Future Demands," American Journal of Agricultural Economics, Vol. 56, No. 5 (December 1974).

- o The present uneven distribution of food supplies will probably not improve as the less developed countries become somewhat more dependent (**relatively** and **absolutely**) on imports of grain. To what extent the LDC's **will** have enough foreign exchange to buy these imports is unknown. Only if the developing countries **significantly** accelerate their investments in agriculture is their dependence on **developed** country exports **likely** to be reduced.
- o As a group, developed countries will periodically be faced with excess production at prices that are **politically acceptable**. There is absence of agreement, however, over the extent of this **surplus** and the **likelihood** that it **will** result in a **reaccumulation** of large surplus stocks.
- o Most studies conclude that demand **will** continue to be of **sufficient** strength relative to **supply** to cause real prices of grain to rise, though prices are not expected to return to the high **levels** of 1974 for any extended period of time. Only when continued economic stagnation is assumed do the findings show **real** prices of grain resuming their earlier downtrend.
- o The demand for feedgrains will continue to grow as developed countries further expand livestock production. The major uncertainty is how consumption patterns in other nations (developed and less developed) **will** respond to rising incomes and how closely their consumption patterns will **follow** the U.S. trend away from food grains and toward **livestock** products.
- o Despite this agreement on **general** direction, the path from year-to-year remains highly uncertain. Dependent as the agricultural sector is on factors that are **unpredictable**, its potential for **volatility** remains high.

In summary, then, it appears likely that foreign demand for U.S. grain will remain strong into the **foreseeable** future. Though the magnitude cannot be predicted with any assurance, the effects of rising income, **population** growth, and decisions by the **centrally** planned economies to upgrade the diets of their citizens all argue in this direction. However, it is **equally** certain that this upward path will not be smooth. In particular, it will be buffeted by the effects of weather and shifts in governmental **policy**.

CHAPTER IV  
THE IMPACT OF HIGHER GRAIN EXPORTS  
ON THE U.S. ECONOMY

This chapter examines the impact of increased grain exports on the U.S. economy under conditions of a tight grain market such as presently exists. It **also** attempts to determine who gains and who loses and by how much. Some effects are not **readily** measurable; others can **only** be **roughly** estimated. There is no attempt to **conclude** whether an increase in grain exports to the Soviet Union or to other countries is on balance "good" or "bad." Rather, the purpose of this chapter is to present as complete a picture as possible of the economic effects of an increase in grain exports.

The Impact of Higher Grain Exports  
on the Domestic Food Sector

The effect of higher grain exports on the domestic food sector depends **largely** on whether the increased demand is temporary or permanent. In either case, the initial effects would include higher grain prices and pressures to increase livestock and food prices **generally**. However, if the increase in demand for grain is sustained over one or more growing seasons, grain producers **could** expand production, which **would** tend to reduce the initial increase in grain prices. Since acreage **idled** under previous farm programs has now been **released** for cultivation, most of the expanded production would have to be achieved either through the expanded use of resources other than land or by the diversion of acreage from other, **less profitable** crops.

If the increase in exports proved to be temporary, this supply response might result in a **glut** the **following** year, and temporarily **lower** prices. Livestock producers would tend to reduce their production of meat and dairy products in **respond** to the short supplies and higher costs of feed. **Also**, if the increase in grain exports were temporary, feed costs might **fall substantially** the **following** year, **leading** to increased **livestock** production. Thus, the livestock industry might be even more subject to boom or bust cycles than is **already** the case.

The important economic **consideration** is the total **level** of grain exports to all countries rather than the volume of shipments to any **single** country such as the Soviet Union. Nevertheless, as was discussed in Chapter II, **special** economic problems are associated with our grain trade with the Soviet Union because that country is both a large and an intermittent buyer. Because the Soviet Union acts as a single buyer in the world market, with information that others **don't** have about the world grain situation and the world grain market, additional **problems** occur.

### The Short-Term Impact

Once crops have been planted not much can be done to affect the **supply**,<sup>15</sup> of grain until the next planting season, which may be 12 months **later**. Therefore, an unexpected increase in grain exports results in higher grain prices as well as some combination of lower stocks of grain, reduced food aid, and/or a reduced level of domestic consumption. Over a longer period of time, grain producers can adjust to higher grain prices by increasing their usage of fertilizer and other inputs and perhaps by increasing the area planted.

In the United States, a relatively small proportion of the grain produced is consumed directly by people, primarily in the form of cereals and bakery products. A far higher proportion of the grain is used **indirectly** to feed **livestock** in the production of meat and dairy **products**.<sup>16</sup> Thus, the connection between higher grain prices and higher retail food prices is indirect and often **lags** by several months. Producers of meat and dairy products base production decisions **primarily** on the spread between their costs and their estimate of the price at which their products **will** be sold. The time required to produce meat and dairy products and to adjust to new market conditions is from one to two years for hogs, **substantially longer** for cattle, and substantially shorter for poultry. If grain prices suddenly rise, meat producers will cut back on the size of their herds and market early. Thus, the immediate response to higher grain prices may be

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15. Different growing seasons in the northern and southern hemispheres makes some limited adjustment possible in the interval, though most wheat and coarse grain production occurs in the northern hemisphere.

16. In the 1974/75 crop year, nearly 80 percent of U.S. grain consumption was in the form of animal feed.

**lower meat prices**, as producers increase the quantity of **livestock marketed**.

A recent study examined the effects on farm and food prices and on farm income if exports were to increase above their **July 1, 1975, level** by: (a) **10 million** tons (6.4 feed grains, 3.6 wheat) and (b) **20 million** tons (12 feed grains and 8 wheat and a slight increase of **25 million** bushels of **soybeans**).<sup>17</sup> The study indicates that an increase of 10 million tons under the relatively tight **supply/demand** situation that existed **in mid-1975** would increase corn prices for the 1975-76 crop year by 11 percent. An increase of an **additional 10 million** tons would more than double the effect of the first **10 million** increment. The **initial 10 million** tons would add 10 percent to net **realized** farm income and a further **10 million** would add an additional 14 percent to net farm income. The gains in farm income would accrue to grain farmers, while the incomes of livestock and dairy producers would be lower.

The effect of higher grain prices on particular categories of foods and the timing of these impacts can only be crudely predicted. The higher cost of grain would affect bakery and cereal products rather quickly. Yet grain accounts for only about 20 percent of the **retail** price of bakery and cereal products; **only** about one-sixth of the **consumer's** food **dollar** goes for these products. Thus, the **initial** impact on retail food prices would be **relatively small**. The increase in grain prices would be **reflected later** in higher prices for meat and dairy products, items that collectively **account** for almost half the **consumer's** food **dollar**.

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17. George E. Brandow, Impact of Russian Grain Purchases on Retail Food and Farm Prices and Farm Income in the 1975 Crop Year, Joint Economic Committee, September 29, 1975, 94 Cong. 1 sess. (1975) p. 8. The 10 million ton figure is approximately the magnitude of the Russian purchases from the U.S. that were announced in the summer of 1975 and the **20 million** figure is somewhat higher than the **17 million** ton maximum agreed to in **U.S.-Soviet** negotiations. However, in assessing the impact of Soviet purchases, the important consideration is the impact on total U.S. exports. Within **limits**, the **U.S.S.R.** can purchase grain elsewhere, for example, from Canada; and **Canada's** other customers might **fill** more of their requirements from the U.S. than they would in the absence of the **U.S.-Soviet** agreement.

The July 1, 1975 base **called** for net exports of: **40 million** tons of **feedgrains**, 1.1 billion bushels of wheat, and **450 million** bushels of soybeans.

In August, 1975, the U.S. Department of Agriculture estimated that a 10 million-ton-increase in grain exports would add about 1.5 percent to the food component of the Consumer Price Index (CPI) and that most of the increase would occur in 1976.<sup>18</sup> Since food accounts for about 25 percent of consumer expenditures, this increase in food prices would add about 0.4 percent to the overall CPI.

The impact of higher grain exports on food prices also depends largely on the size of the domestic stock of grain and on the total demand, domestic and foreign, for grain. If stocks were low and demand high, an increase in exports of 10 million tons would have a considerably greater effect on food prices than when the opposite conditions hold.

#### The Longer-Term Impact

If the increase in demand for grain were sustained over one or more years, grain producers would expand their output of grain. The prospect of higher grain prices would result in the use of more fertilizer and other resources. Moreover, the higher grain prices would encourage an increase in the acreage planted. The higher price level for grain, then, would stimulate more production in future years, which would tend eventually to bring down the price of grain. Higher grain prices would also reduce demand as livestock producers shortened feeding periods and made greater use of pasture and forage.

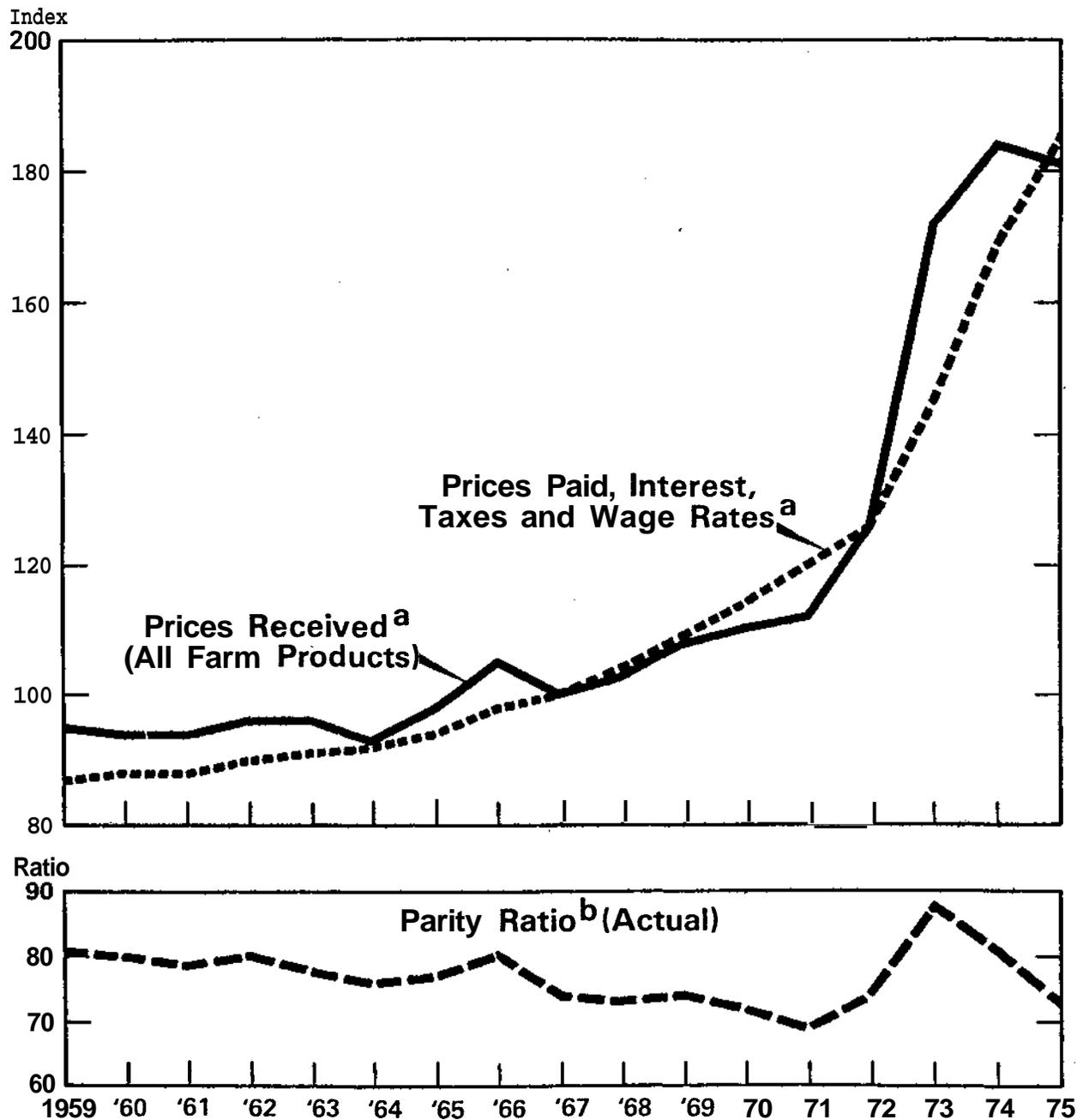
Although it is especially difficult to estimate how much grain production would increase as a result of higher prices, the increase in output would probably reduce the price of grain significantly below the level that would occur during the first year of higher exports.

Some of the short-term gains to farmers would be passed on to industries that supply fertilizer, farm equipment, and other resources. For example, higher grain prices have stimulated the demand for farm equipment, which has added to the number of jobs and to profits in

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18. USDA, Office of Communication, "Food Prices," Media Background, August 21, 1975. The Department of Agriculture's estimate of 1.5 percent is not directly comparable to Brandow's estimates of the impact on retail food prices since Brandow was comparing year-to-year levels, rather than the difference in food prices at the end of the year.

**Figure 8**  
**Prices Received and Paid by Farmers**  
**(Calendar Years 1959-75)**



<sup>a</sup> Index, 1967=100

<sup>b</sup> Ratio of prices received to index of prices paid, interest, taxes and wage rates on 1910-14:100 base.

Source: USDA, *Agricultural Statistics 1975*, p. 452;  
 Economic Research Service, *Agricultural Outlook, AO-8*  
 (March 1976) p. 25.

the **machinery** sector. This, in turn, can be expected to **result** in somewhat larger wage **settlements** in the farm equipment sector than otherwise would have occurred.

In the competitive farming sector, the sharp increase in net income associated with **higher** grain prices tends to be short-lived. This is because the greater incentive to expand output not only results in greater production **later** on, but also contributes to higher prices for farm resources. A **significant** share of the benefits goes to holders of the resource that can not be easily **expanded--productive** farm land. As the more expensive land is **sold**, higher costs **result** from the higher payments on farm debt. As shown in Figure 8, **although** the index of prices received by farmers increased sharply beginning in 1972, the index of prices paid by farmers had caught up by 1975. However, not **all** the increased prices paid can be attributed to the increased demand for farm resources. Other factors, such as the increased price of oil and general inflation affect **farmers'** costs.

Important effects on wealth accompany the appreciation of **land values**. For those recent entrants into farming who acquired their **land** at current high prices, this is a bona fide cost of production. Yet, for many other farmers who acquired their land five, ten or twenty years **earlier** at much lower **prices**, the current rate does not closely approximate cash costs. It must be considered a cost of production in the economic sense, however, since it represents a return the owner **could realize** if the chose to **sell** his land. For those farmers who **do not sell** but continue to farm, the higher cost of **land** represents an unrealized capital gain. The total capital gain for **all** farmers taken together can be quite **large**. It has been estimated that in 1973 real capital gains for farm real estate were \$22.4 billion, or the equivalent of 58 percent of the highest farm income in **history**.<sup>19</sup> In the **following** year, however, the index of prices paid by farmers for family **living** rose faster than **land values**, **resulting** in a **real** capital loss of \$5.5 **billion**, only the third such loss in the past 20 **years**.<sup>20</sup>

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19. Emanuel Melichar and Marian Sayre, "Capital Gains in the U.S. Farming Sector, Nominal and Real, 1940-1974," (paper presented at the annual meeting of the American Agricultural Economics Association, Ohio State University, Columbus, Ohio, August 11, 1975).

20. Ibid.

### Short-Term Impact on the Domestic Economy

Other sectors of the economy **also would** be affected by increased grain exports. For example, the higher food prices that result from increased grain exports eventually lead to higher wage rates. In turn, the higher wage rates contribute to higher overall prices and vice versa. The interaction of wages and prices affects both income and employment. Since many government income assistance programs are **linked** to the **level** of consumer prices, higher prices **also** mean increased government expenditures. Yet higher wages yield greater government revenues, thus offsetting at least part of the increased **expenditures**.

To learn how increased grain exports affect other parts of the economy, econometric models were used. These **models** are **necessarily** simplifications of the **real world**. As such, their results can be viewed **only** as approximations of what might **actually** occur **should** exports be increased. Since the accuracy of these models diminishes the further into the future they are used for forecasting, this analysis extended **only** two years ahead. Effects beyond that point can **only** be speculated upon. Furthermore, not **all** effects, even within a two year span, **could** be empirically estimated. As a **result**, some important gaps in understanding remain. **Until** these gaps are filled, one can only speculate about the full economic effects.

For **illustrative** purposes, it was assumed that grain exports **would** rise by **10 million** metric tons above the **level** of exports estimated in August, 1975, the time of the temporary embargo on further grain sales to Russia. As already noted, the **world** grain market was relatively tight during this period, as it has been for the past three years. On the basis of this assumed increase in grain exports, domestic economic effects were **estimated**.<sup>21</sup>

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21. The **macroeconomic models** of both Data Resources Inc. (**DRI**) and **Wharton** Econometric Forecasting Associates were used. Though the **results** from both models were **comparable**, the results reported in the text are from the **DRI model**, **unless** otherwise noted.

Since these models are designed primarily for estimating effects outside the agricultural sector, to activate them it was necessary to estimate the effect of the increased grain exports on the average price of **all** raw farm products. On the basis of earlier estimates by the Department of Agriculture and CBO estimates, it was determined that an increase of **10 million** metric tons in grain exports would cause average farm prices to gradually rise, peaking one year after the increased

### Impact on Prices and Wages

The computer **simulations** indicate that a 4 to 5 percent increase in the prices of raw farm products would result in an increase in the food component of the **CPI** of approximately 0.9 to 1.1 percent after a year, and the increase in the **total CPI would** amount to 0.2 to 0.3 percent after a year (see Table 4). At current food expenditure levels, this is equivalent to an **additional \$1.7 billion to \$2.1 billion** annually in U.S. consumer expenditures for food. Since there are no good substitutes for food, higher food prices do not result in large reductions in food consumption. Instead, consumers divert some income formerly spent for nonfood purposes to pay their higher foodbills.

**Also**, some of the increase in food prices is **likely** to result in higher wage rates. Though it is not evident in the first year, a **small** increase (0.1 percent) is noted in the second year.

It is difficult to assess the longer-term effect of an increase in consumer prices on wage rates. Some increase would take place relatively quickly, but it is probable that the full effect would occur over a period of several years. Using annual data and a simplified wage-price **model**,<sup>22</sup> it is estimated that a 5 percent increase in wholesale food prices would result in an increase in the **CPI** after five years of about 0.5 to 0.6 percent. The effects of **rising** food prices on money wages differ among sectors of the economy. The relationship is particularly strong in sectors with collective bargaining agreements and powerful unions. **The increase would be** most immediate in collective bargaining contracts that tie wage rates to changes in the **CPI**. Escalator clauses are more common during

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exports at about 4.5 percent about their initial level. Through the **following** year it was assumed average farm prices retreated by half of the earlier gain as grain production increased in response to the higher grain prices. Thus, two years after the increase in grain exports, average farm prices remained 2.25 percent above their initial **level**. Given the approximate nature of these price estimates, a range corresponding with a peak increase of 4 to 5 percent is used in the following analysis.

22. For a description of the **model**, see: Frank de Leeuw and Michael Owen, "A **Simplified** Wage-Price Model," (processed CBO **technical** paper, September 1975).

**Table 4--Estimated Impact on Prices and Wage Rates  
of a 10 Million Metric Ton Increase  
in U.S. Grain Exports  
(percent change)**

<u>Indicator</u>	<u>After One Year</u>	<u>After Two Years</u>
Wholesale Price Index	+0.6 to +0.8	+0.4 to <b>+0.5</b>
Consumer Price Index-Total	+0.2 to +0.3	+0.2 to +0.3
Consumer Price Index-Food Component	+0.9 to <b>+1.1</b>	+0.9 to <b>+1.1</b>
Gross National Product Deflator	+0.2	+0.2 to +0.3
Average Hourly Wage Rate	0.0	+0.1

Source: Based on CBO computer simulations using Data Resources Inc.  
• macroeconomic model.

**inflationary** periods than during periods of relative price **stability**. In 1974 an estimated 7.7 million workers -- approximately one-tenth of total **payrolls** -- were covered by **escalator clauses**.<sup>23</sup> Wage adjustments for workers covered by **cost-of-living** escalator clauses are **typically less** than proportional to changes in the CPI.

The response of wages to price changes is certainly more immediate for workers covered by **escalator clauses**. However, over a period of several **years**, there is no indication that workers covered by escalators obtain higher wages than workers covered by collective bargaining agreements without such **clauses**.<sup>24</sup> Wage escalators are generally absent in the construction industry, for **example**. Yet over a period of time construction wage rates appear to be **strongly** affected by changes in the **CPI**.<sup>25</sup>

### The Impact on Output and Employment

For the economy as a whole, an increase in grain exports would both **stimulate** and depress output. It is difficult to anticipate the net effect. Economic activity in the transportation and **grain-handling** sectors of the **economy**<sup>26</sup> would increase and grain producers would experience higher incomes as a result of higher grain prices. In response to the higher prices, grain farmers would also increase their output, thereby increasing the demand for farm resources such as fertilizer, farm **machinery**, and **cropland**.

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23. H.M. Douty, Cost of Living Escalator Clauses and Inflation, U.S. Council on Wage and Price Stability, Staff Report, (August 1975).

24. Ibid.

25. George Iden, "Wage Increases in the Construction Industry," Western Economic Journal, VIII, No. 4 (December 1970), pp. 431-436.

26. A recent USDA study reports that U.S. agricultural exports of \$22 billion in calendar year 1974 resulted in total business activity of \$43 billion, with about 70 percent of the additional economic activity accruing to nonfarm sectors. Thus, if it is assumed that domestic grain production expands to provide for the increase in export demand (which would not happen right away but might happen over a period of several years), each **dollar** of agricultural exports could be expected to stimulate another dollar of output in the economy. See: Gerald Schluter, "Impacts of Agricultural Trade on Food and Fiber Sectors of the U.S. Economy," Agricultural Outlook, Vol. 4 (September 1975).

On the other hand, with higher feed prices, **livestock** production would decline. Higher food prices would decrease the purchasing power of consumers. To pay the higher food **bill**, even after **allowing** for reduced levels of consumption, consumers would have to divert **income** from other **expenditures**, savings, or a combination of the two. Due to the higher **overall price level**, there would be a **slight** decline in the real **value** of such assets as money, bonds, and insurance policies, which would tend to reduce **consumers'** spending. Interest rates would increase somewhat, perhaps discouraging some types of investment.

There might also be a depressing effect originating in the government sector. The higher prices would be associated with somewhat higher money incomes, which would be taxed more heavily under the progressive income tax structure. **While** some types of government expenditures automatically rise and fall with changes in the price **level--such** as social security and food **stamps--many** government expenditures do not. To the extent tax revenues rose more than **expenditures**, the effect would be output-depressing.

The computer **simulations** of the effects of an increase in grain exports of 10 **million** tons indicate that GNP in current dollars would be increased by approximately \$3.3 **billion** to \$4.1 **billion** after a year and by approximately \$3.4 **billion** to \$4.3 **billion** after two years (see Table 5). However, the simulations indicate that real GNP (after adjusting for **inflation**) would be only slightly higher after a year. After two years, real output would **decline** by about \$1.1 **billion** to \$1.5 **billion** (in 1975 prices). The unemployment rate would be **essentially** unchanged, **increasing less** than 0.1 percent. Thus, there would be a **negligible** effect on output and **unemployment** for the first year, but the negative impact on output would become somewhat stronger between the first and second years. The **increase** in farm prices would have a rather immediate effect on farm **income**. For grain farmers, this would be due to **higher** grain prices. Livestock **marketings** would increase prompted by higher feed prices. **Prices** of bakery and cereal products would respond to higher grain prices; but **retail** food prices might **fall initially** as the **increased** livestock marketings depressed meat prices. Yet, after several months the higher grain prices would begin to be reflected not only in **higher** prices for cereal products, but **also**, more importantly, in higher **priced** meat.

This analysis may either overstate or understate the impact on output for several reasons. Changes in the money supply can influence the effect of increased grain exports on the rate of **inflation** and changes in output. The econometric models used in this analysis assumed the private financial system would expand the money supply somewhat in

Table 5--**Summary** of Domestic Economic Impacts of 10 Million Metric Ton Increase in U.S. Grain Exports in Crop Year 1975/76, After One and Two Years

(Increase (+) or Decrease (-) in Billions of Dollars)

<u>Item</u>	<u>After One Year</u>	<u>After Two Years</u>
Consumer Food Expenditures	+1.7 to +2.1	+1.7 to +2.1
Gross National Product (Current Dollars)	+3.3 to +4.1	+3.4 to +4.3
(Constant 1975 Dollars)	+0.4 to +0.6	-1.1 to -1.5
Farm Income	+2.1 to +2.6	+1.4 to +1.8
Federal Tax Revenues	+0.7 to +0.9	+0.9 to +1.1
Federal Expenditures	+0.2 to +0.3	+0.5 to +0.6
Balance of Payments	+1.4	+1.4

Source: Based on CBO computer simulations using Data Resources Inc, macroeconomic model.

response to higher interest rates. This expansion **would** cause both output and the rate of **inflation** to increase more than it would if the supply of money were held strictly constant.

Similarly, though it was assumed that monetary and fiscal policies **would** remain unchanged, the Federal Reserve Board could adjust the money **supply** to achieve a particular output or **inflation goal**. Should a contractive monetary **policy** be **followed** in this situation, for **example**, the rate of **inflation** and output would be **lower** than estimated. **Fiscal policy (including tax policy)** measures could be used to **similar** effect, with the nature of the response dependent on whether the dominant **goal** was to **stimulate** output or retard **inflation**.

**Also**, these estimates might somewhat overstate effects that would depress output. Though some **allowance** was made for an increase in grain production the year **following** the increase in exports, it might have a more depressing effect on grain prices than assumed. With the passage of time and a continuation of export demand at the higher level, producers would respond with increased output, and perhaps enough increase to cause grain prices to return nearer to their **earlier levels** than assumed in the **simulations**.

It might also be noted that the **implications** of an increase in farm prices are different, depending on whether the increase occurs as a **result** of a crop failure in this country or somewhere else in the **world**. The simulations pertain to the impact of a higher physical **volume** of exports, as would occur if a crop **failure** occurred in some other part of the world. If the crop **failure** occurred in the United States, farm income and the **level** of output in the economy **would** be somewhat **less** than the levels simulated for the higher export case. A **simulation** of the effects of higher farm prices **resulting** from a domestic crop failure indicate that **real GNP** after a year would be about \$2.1 billion (in 1975 prices) less than in the case described in Table 5.

The computer simulations **also** provide some additional insight into the impact of increased grain exports on the farm economy and related sectors. The simulations indicate that farm income **would** increase by \$2.1 billion to \$2.6 billion after a year and \$1.4 billion to \$1.8 billion after two years, as a result of an increase in grain exports of approximately 10 million tons. Investments in farm machinery and equipment are estimated to increase by over \$400 million the first year and over \$600 million the second year as a result of the higher farm income.

The Federal Budget

An increase in food prices and an increase in grain exports would affect the federal budget. The **inflationary** impact on the economy would **result** in higher tax receipts. The additional exports would lead to higher farm income and stimulate economic activity, **particularly** in the grain transport and processing sectors. Government programs indexed to the CPI or to **particular** indexes of food prices would require higher expenditures. In addition, subsidies to the farm sector might decline while those to the maritime industries might increase. A more **detailed list** of programs affected by higher grain exports and higher food prices is contained in **Table 6**.

The computer **simulations** indicate that an increase in **grain exports** of 10 **million** tons would raise tax revenues by \$0.7 **billion** to \$0.9 **billion** after a year and by \$0.9 **billion** to \$1.1 **billion** after two years. Federal government spending would increase by \$0.2 **billion** to \$0.3 **billion** after a year and by \$0.5 **billion** to \$0.6 **billion** after two years. The net effect would be to reduce the budget deficit by \$0.5 **billion** to \$0.6 **billion** after a year and by \$0.4 **billion** to \$0.5 **billion** after two years.

The expenditure **levels** for other programs not **included** in these simulations **could also** be affected. For example, farm price support payments might be reduced in some years since the higher grain prices caused by exports **would** lower the probability of market prices **falling** to support levels. **Currently**, however, grain prices are **sufficiently** above support **levels** so that the commodity programs would not be **substantially** affected by further increases in farm prices.

If the grain exports are carried in U.S. ships, government subsidies for the maritime industry **would** increase. At least **half** the grain shipped for food aid under PL-480 must be carried in U.S. ships, if **available**. The shippers receive a subsidy depending on how far the grain is shipped. The average shipping **subsidy** during Fiscal Year 1975 for wheat exported under PL-480 was approximately \$16 per ton to Egypt, and about \$23 per ton to India. **Total** PL-480 shipping subsidies in fiscal year 1975 were about \$44 **million**.

Grain shipped under **bilateral** agreements with the Soviet Union also **involves** subsidies for the maritime industry. In the recently **completed** agreement, U.S. ships are entitled to carry one-third of the grain or an amount equal to the volume shipped by Soviet vessels, whichever is larger. The agreement **calls** for a minimum base rate of \$16 per ton to be paid by the Soviets for grain shipped from a **Gulf** port to a **Black Sea** port, with an adjustment **formula** if shipping costs increase in the future. At the time the agreement was signed, this rate was substantially above the going rate of about \$10 per ton. Beyond this

**Table 6--Expenditures of the Federal Government  
Directly Affected by an Increase  
in Food Prices and Larger Grain  
Exports**

Major programs tied to the **CPI**:

- o Social Security (**OASDI**)
- o **Supplemental** Security Income (SSI)
- o **Railroad** Retirement
- o **Civil** Service Retirement
- o Foreign Service Retirement
- o **Military** Retirement
- o Tennessee **Valley** Authority (TVA) Retirement

Programs tied to food **prices**:

- o Food Stamps
- o Child Nutrition
- o Elderly Nutrition

Programs resulting in maritime operating subsidies:

- o Grain shipped under PL 480
- o Grain shipped under bilateral agreements

Farm price support programs

rate the U.S. Government pays an **additional** subsidy on grain shipped in U.S. vessels. Under a rather complicated formula, grain shipped by U.S. carriers to the Soviet Union at the current time would entail a U.S. subsidy of about \$16 per ton. Assuming U.S. carriers transport 6.1 million tons of a total sale of 17.5 million tons, U.S. taxpayers would pay a maritime subsidy of about \$98.2 million.

### The Impact of International Trade and the U.S. Balance of Payments

In 1975, agricultural products accounted for about \$22 billion in U.S. export earnings. The U.S. imported about \$10 billion in agricultural products (for example, coffee, tea, sugar, etc.), so that the net contribution of agricultural products to the U.S. trade account was around \$12 billion.

A major justification for **international** trade is its contribution to economic efficiency. In **principal**, it is more efficient for a country to emphasize items it can produce more **cheaply** than other countries, rather than to be self-sufficient. When countries trade such commodities, each of the trading countries **generally** achieves a higher standard of **living**. The advantages of international trade and the promotion of free markets have been a central focus of U.S. trade **policy**.

If U.S. grain exports increased in response to an increase in the world demand for grain, U.S. earnings from grain exports **would** increase. For **example**, an increase in grain exports of 10 million tons, half wheat and half corn, would add about \$1.4 billion to U.S. earnings from exports. In addition, the higher price level for grain on the world market would increase the price for U.S. grain exports so that the full effect on export earnings **would** be **substantially** above the \$1.4 billion in direct sales. Assuming **half** of all corn and wheat exports for the year were **sold** at the higher price, export earnings **would** increase by about another \$0.5 billion. In turn, the increase in export earnings **would** strengthen the value of the **dollar** vis-a-vis other currencies thereby reducing the price of imports, whether they were imports of oil or coffee or T.V. sets. Thus, an increase in grain exports would **lower** the cost of goods imported into the United States, increasing U.S. purchasing power. In addition, the reduced costs of imports would somewhat decrease U.S. prices; probably **only** partly offsetting the higher food prices. Although it would be **useful** to measure the favorable effects of an increase in U.S. grain exports on the exchange rate and indirectly on the U.S. price **level**, no such estimates are **available**.

Who Gains and Who Loses?

An increase in grain exports would make some **people** better off and others worse off. This section examines how these gains and losses would be distributed.

Consumers

The **loss** in purchasing power **resulting** from an increase in food prices would be proportionately greater for **low-income** and **larger families**. Consumer survey data for 1972 indicate that **four-person** families with incomes between \$3,000 and \$3,999 spent about 41 percent of their income on food. In contrast, four-person **families** with incomes of \$25,000 or more spent about 8 percent of their income on food. The **role** of family size is **illustrated** by the data for **families** with incomes between \$6,000 and \$6,999: Two-person **families** in this income category spent about 20 percent of their income on food, while **families** with six or more persons spent 38 percent on food <sup>27</sup> (see Table 7).

The regressive effect of rising food prices is to some degree mitigated by the food stamp and nutrition programs. More than **18 million** people participated in these programs in the third quarter of 1975.<sup>28</sup> **Nevertheless**, a recent study by the Census Bureau indicates that a majority of the poor, at **least** during **1974**, were not benefiting from the program. The Census study found that only 40 percent of **low-income families** and 20 percent of **low-income** individuals received benefits from the food stamp program in **1974**.<sup>29</sup>

The distribution of benefits stemming from the strengthened **value** of the dollar vis-a-vis foreign currencies is not known.

Producers

As indicated above, a **large** share of the **initial** gains from an increase in grain exports would go to grain farmers. Benefits **would** be

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27. U.S. Department of Labor, Bureau of Labor Statistics, Diary Data 1972, Consumer Expenditure Series, Report 448-1 (November 1975).

28. USDA, Economic Research Service, National Food Situation, November, 1975; p. 13.

29. John F. Coder, "Characteristics of Households Purchasing Food Stamps in 1974," U.S. Bureau of Census (1975).

Table 7--Proportion of Income Before Taxes Spent on Food  
by Income and Family Size  
(Calendar Year 1972, in Percentages)

All Income Before Taxes (in dollars)	Family Size						Total
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6+</u>	
All Families	16	14	15	16	17	20	16
Under 3,000	36	54	74	96 <sup>a</sup>	130 <sup>a</sup>	108 <sup>a</sup>	48
3,000 - 3,999	22	34	40 <sup>a</sup>	41 <sup>a</sup>	45 <sup>a</sup>	51 <sup>a</sup>	32
4,000 - 4,999	16	27	30	39 <sup>a</sup>	38 <sup>a</sup>	41 <sup>a</sup>	26
5,000 - 5,999	17	20	25	30 <sup>a</sup>	31 <sup>a</sup>	40 <sup>a</sup>	23
6,000 - 6,999	13	20	23	29 <sup>a</sup>	30 <sup>a</sup>	38 <sup>a</sup>	22
7,000 - 7,999	13	18	21	25	26 <sup>a</sup>	33 <sup>a</sup>	20
8,000 - 9,999	12	15	19	21	24	27	18
10,000 - 11,999	12	13	17	19	23	22	17
12,000 - 14,999	10	12	15	17	18	21	15
15,000 - 19,999	10 <sup>a</sup>	10	12	15	15	19	13
20,000 - 24,999	8 <sup>a</sup>	9	10	12	14	16	12
25,000 +	5 <sup>a</sup>	6	8	8	10	10	8

Source: Calculated from U.S. Department of Labor, Bureau of Labor Statistics, Diary Data 1972, Consumer Expenditure Survey Series, Report 488-1 (1975).

Note: Food expenditures include purchases with food stamps, while family income does not include the subsidized value of food stamps.

a. Estimate based on fewer than 70 observations.

concentrated among the **larger** producers. As of 1969, the latest year for which data are available, the largest 9 percent of **all** cash grain farms (about 33,000 farms) accounted for 35 percent of **all** grain sales from cash grain farms. Given recent trends, the **level** of concentration is probably somewhat higher now.

Also as **indicated earlier**, the **incomes** of livestock and dairy producers **would be reduced**,<sup>30</sup> though in **actuality**, many farmers produce both grain and livestock.

The gains to grain farmers and the losses to **livestock** farmers **would** both be reduced with the passage of time. Competition in the grain sector would lead to higher input prices and to an expansion in grain production. In the **livestock** sector, **higher** grain prices **would** tend to discourage production, depending on **producers'** **expectations** of future livestock **prices**, so that meat prices would rise, partially relieving the cost squeeze on producers.

#### Participants in the Grain Market

The outcome of **negotiations** among trading parties would have **significant** implications for who gains and who **loses** as a result of larger grain exports. Information accessibility and size of firm or **participant** are crucial factors in this process. For example, in 1972, when the U.S.S.R. dealt secretly with three or four **large** U.S. grain firms, **large** purchases were **concluded** at a **lower** price than if **knowledge** of this action had been **generally** known. Once these purchases were made known to the market, they had a major effect on price. But this occurred after the sale was completed. Again in 1975, the Soviet govern-

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30. A rough indication of the **relative** importance of this **loss** is suggested by **Brandow's** analysis. He estimated that **increasing** grain exports from an **additional** 10 million tons to an **additional** 20 million tons **would** cause farm income to rise another \$3.4 billion. Based on his **assumption** of the impact on grain prices, the effect on grain **farmers'** income would be plus \$4.5 billion. On the **assumption** that only **live-**stock producers lost, their loss amounted to \$1.1 billion (\$4.5 billion minus \$3.4 billion). This **probably** overstates the gains to grain farmers since their costs **would** probably go up somewhat, even **during** the first year.

ment entered the world grain market quietly, though by then the grain trade had begun watching the Soviet market more carefully and rumors of Soviet purchases preceded the announcement of sales. Before it was widely perceived, at least beyond the trade, the Soviet Union once again obtained commitments from U.S. grain firms for about 10 million tons. Since most of these purchases were reportedly made on a "cost-plus" rather than a flat, per unit basis, and since rumors of the sale caused market prices to rise quickly, the opportunity for the Soviet Union to obtain a price advantage was much lower in 1975.

The agreement reached with the Soviet Union in October, 1975 is expected to reduce some of the advantages that the Soviet Union has enjoyed in the grain market. During the five years beginning October 1, 1976, the agreement requires the Soviet Union to buy a minimum of 6 million tons of U.S. corn and wheat annually with an escape clause should the U.S. supply fall below 225 million tons. Should the Soviet Union wish to purchase more than 8 million tons of corn and wheat during any one of these years, the new agreement calls for government-to-government negotiation.

If the Soviet Union has an advantage over smaller participants in the grain markets, the large grain firms have an advantage vis-a-vis small firms. This stems in part from superior information and in part from size and control over export facilities. These firms have reportedly increased their ownership of subterminal elevators and unit trains. It is estimated that the largest five firms now own about half the port elevator capacity in the United States.<sup>31</sup> Size is important because the actions of a single large firm can affect market price. Unfortunately, little information is available on the operations of the large grain firms, so it is not possible to comment on the degree of concentration in the sector or on the profitability of the operations.<sup>32</sup>

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31. Congressional Research Service, Implications of H.R. 6546: A Bill which Authorizes the Commodity Credit Corporation to Become the Marketing Agent for All Export Sales of Grains and Soybeans, July 14, 1975, p. 16.

32. Prior to the recent surge in grain exports, it was estimated that 4 of the 20 major grain exporters handled up to 90 percent of U.S. grain exports. Ray A. Goldberg, Agribusiness Coordination (Harvard University: Boston, 1968), p. 74. It has been estimated that, since 1972, five firms have accounted for 85 percent of U.S. grain exports. They are: Cargill and Continental (25 percent each); Cook Industries (15 percent); and Bunge and Louis Dreyfus (10 percent each). Michael J. Phillips, "The Status of Cooperatives in the Imperfectly Competitive Grain Export Market," (paper presented at the American Agricultural Economics Association Meetings, Columbus, Ohio, August 10-13, 1975) as cited by Congressional Research Service, Implications of H.R. 6546, pp. 15-16.

## The Maritime Industry

The U.S. maritime industry would benefit from an expansion of grain exports, particularly if a cargo preference rule required a proportion of grain to be carried in U.S. ships. Because the U.S. maritime industry operates under higher costs than its international competitors, it is paid a subsidy to equalize costs. Moreover, when the U.S. Government is involved in an important way, as in the cases of PL-480 grain and grain shipped to the U.S.S.R., part of the grain must be shipped by U.S. carriers.

As noted above, the agreement with the Soviet Union calls for that country to pay shipping rates to U.S. carriers above the going rate. However, presumably it is the total cost of the grain that concerns the U.S.S.R. Therefore, if there were no subsidy, the U.S.S.R. would be willing to pay the same total amount if the cargo were carried more cheaply. Thus, the subsidy paid by the U.S.S.R. has implications for the division of proceeds among U.S. producers and grain handlers.

## Summary and Conclusions

An increase in grain exports would have far-reaching effects on the economy and on different groups of people, particularly if it occurred under a tight supply/demand situation such as presently exists.

Within the farm sector an increase of 10 million tons in exports would increase the net income from producing grain, while the net income from producing livestock would be decreased. If the increase in grain prices were expected to last for one or more seasons, producers could be expected to expand grain production in the future.

Little of the effect of higher grain prices would be felt immediately by consumers, since not much grain is consumed directly in the United States. After several months, the reduced grain supplies and higher grain prices would result in somewhat higher prices at the meat counter. Although many factors are involved, an increase in grain exports of 10 million tons for the 1975/76 crop year would increase retail food prices by about 1 percent after a year.

Higher grain exports and higher farm prices would both stimulate and depress output. On balance the net effect would be to stimulate real GNP slightly during the first year but decrease it slightly after two years.

Higher grain exports increase the **nation's** earnings of foreign exchange, which represents a claim on foreign goods and services. The United States is a major net exporter of grain, so that higher **world** grain prices have a **substantial** impact on the U.S. balance of payments.

On the whole, those with higher incomes probably benefit more than those with lower incomes; and, **larger** families **generally** would lose more than smaller ones. In addition, wage earners in some sectors of the economy are more **successful** in regaining **losses** in purchasing power than in other sectors. In **general**, workers in highly organized sectors are probably more successful in making up for higher food prices by obtaining higher money wages.

Initially, the gains from higher grain prices tend to be concentrated among **large** grain farmers and **probably** among **large** grain firms, although not much evidence is **available** concerning the latter group.

Further, the Soviet Union, as a **large** and secretive participant, has advantages relative to other **participants**. This advantage is expected to be somewhat reduced by the recently completed export agreement. In turn, the large grain firms may have advantages based on their size and access to information vis-a-vis **small** participants in the grain market.

CHAPTER V  
POLICY ISSUES AND OPTIONS

In **considering** the future **role** of U.S. **agriculture** in the world economy, several issues emerge; issues to which **policymakers will** be required to devote increased attention in the months ahead. To what extent should the United States, as a major supplier of world grain imports, seek to protect domestic producer and consumer prices from the **instability** of the world market? If such protection is sought, through what **policy** measures should it be achieved? How can the burdens of economic adjustment associated with instability in world agriculture be more equitably shared among nations? How can the international **political** leverage associated with U.S. **agricultural** productivity be used most effectively? How are U.S. food exports to be divided between **commercial** sales and food aid?

This chapter identifies and compares policy options designed to deal with the domestic price instability that **would** accompany an enlarged U.S. role in the world market. Before **the** discussion is narrowed, however, several **related policy** issues deserve mention.

As noted **earlier**, the **planned** economies and **particularly** the Soviet Union have negotiated **secretly** with a few large **sellers**. By **failing** to share market information and by engaging in **exclusive dealing**, the Soviet Union **established** the conditions for profiteering - by **itself** and by those few large grain **handling** firms that supply it. Since the records required to assess **actual** performance are not **available** to public scrutiny, it is not possible to **evaluate** the magnitude of the problem. **Clearly**, in 1972 the Soviet Union acquired grain at prices significantly **lower** than would have **prevailed** had its intentions been known by the market and by the U.S. Government (which paid large subsidies on the sales). Though by 1975 U.S. government export subsidies had been stopped and the **element** of surprise reduced, the opportunity for the Soviets to gain a price advantage remained. If the opportunities for such abuse are to be lessened, future public policy **will** need to devise means of further reducing the secrecy surrounding these transactions.

Another issue integral to agricultural export policy but too involved for treatment here is food aid. Food aid was an early casualty of the recent grain shortage, as noted in Chapter II. As government-held grain stocks were reduced and as the demand for commercial grain exports rose and with it the price, food aid shipments were drastically curtailed. Since then, the volume of PL 480 shipments has increased, but remains far below 1970-72 levels and is only about one-third the peak levels of the mid-1960s. It is probable that earlier levels of food aid were inflated above actual "need" by U.S. efforts to dispose of costly surplus stocks. Thus, a reduction in the level of aid is not necessarily "bad." It seems equally certain, however, that the very sharp curtailment in aid went beyond that which adjustment to a needs standard would have dictated. Reversal of this downtrend in Fiscal Year 1975 and 1976 would suggest as much.

Beyond freeing food aid from the uncertainty and instability that has characterized it in recent years, there is also need to reassess its missions and its performance in carrying out these missions. Scattered evidence at least suggests that food aid, by depressing recipient country food prices, has discouraged local food production and thereby forestalled development, rather than accelerated it.

Another important dimension of the issue that cannot be treated here in depth relates to the more general issue of domestic income maintenance policy. As noted in Chapter IV the inflationary impact of additional grain exports falls particularly hard on low-income consumers. Though food assistance programs, such as food stamps, are designed to ease this impact, a majority of those eligible do not participate. The problem therefore remains. And though the poverty problem clearly extends beyond the purchase of food alone -- and is therefore not susceptible to solution through food and agriculture policy -- an effective national income maintenance policy could go a long way toward mitigating the regressive effects of food price instability.

#### Fiscal Policy Issues

Changes in the world food and agricultural situation have caused some difficult problems in formulating U.S. fiscal policy. If prices in the economy were perfectly flexible the policy problem would be far less difficult -- food prices would rise when there was a crop failure and prices of other goods and services would fall. But this is not how a modern industrialized economy works. Wages and prices are relatively inflexible in some important sectors of the economy, so that an increase in food prices results in increased inflationary

pressures. The higher price level, taken alone, decreases purchasing power and output in the economy. However, since the United States is a major **agricultural** producer, the higher price for agricultural products, taken by **itself**, adds to purchasing power in the farm and food sector. The income effect in the food sector is, of course, greater when the crop **failure** occurs somewhere **else** in the world, compared with the situation in which the crop failure occurs in this country.

If there is a sudden sharp increase in farm and food prices, **policymakers** have three basic choices with regard to aggregate fiscal policy: (1) If fiscal and/or monetary policy did not change, the **overall price level** would be somewhat higher and output **would** be somewhat **lower** after 18 to 24 months. (2) If fiscal and/or monetary policy were made more expansionary, the negative effect on output might be offset, but the inflationary impact would be somewhat greater. (3) If fiscal and/or monetary policy were made more restrictive, the inflationary impact of higher food prices **would** be less, but the negative impact on output **would** be greater. Several factors, such as whether a shortage is domestic or foreign, may have a bearing on these decisions. In addition, the significance of the higher price **level** might be judged in the **general inflation** context -- a **slight** increase in food prices may be judged more serious in some situations than in others.

The prospect of higher food prices **also** raises a policy issue about the extent to which policies might be adopted to counteract some of the impact on consumers. In part, the impact of higher food prices on **low-income** people is offset by food stamps and **similar** programs. But the issue remains as to whether **additional** responses in fiscal and tax policy might be desired to offset some of the impact of higher food prices on the consumer.

#### Agricultural Policy: Issues and Options

Alternative **policy** approaches to this issue can be judged against several criteria. Different interests **look** to different criteria in evaluating performance. Not infrequently they are in **conflict**. For **example**, the grain farmer seeks higher grain prices, while the cattle feeder seeks lower grain prices to **lower** costs. Similarly, farmers generally prefer to see the prices of their products move higher while consumer preference is decidedly for lower **retail** food prices.

**Seldom**, however, does a single criterion offer sufficient basis for **taking** a policy position. The **world** is too **complicated** for that. Differing objectives with regard to the **level** of food prices is **illus-**

**trative.** In addition to **low** food prices, consumers **also** want an assured supply of high **quality** food in the future. Thus, they would not want prices to be so low that this **supply** would be interrupted, an **eventuality** that could **lead** to higher food prices. And, as tax-payers, they **probably would** not want to pay the farm program costs required to support farm incomes above those **levels** that would **result** from **ample supplies** at low prices. The farmer too, has other factors to consider, **including** the effect of higher farm prices on costs of production and foreign demand.

As a result of the interplay of these factors, it becomes necessary to consider a variety of effects. The policy options for **dealing** with this issue are therefore described in the context of their effects on:

- o The **level**, stability, and distribution of farm income.
- o The **level** and **stability** of consumer food prices.
- o **U.S. balance** of payments.
- o Government budget costs.
- o Administrative feasibility of government programs.
- o U.S. relations with foreign governments.

**Policy** options considered are: (1) continuation of current **policy**; (2) domestic reserves; (3) international reserves; (4) trade restrictions; (5) trade liberalization; and (6) **bilateral agreements**. This assessment is made on the basis of expected trends in world agricultural supply and demand as identified in Chapter III.

### Current Policy

Current **agricultural policy** is founded on a **philosophy** of minimizing government **involvement** in **agriculture** and maximizing use of the free market in **allocating** resources. It is made operational through

the **Agricultural** and Consumer Protection Act of 1973.<sup>33</sup> The principal aims of current **policy** are:

- o Maximum reliance on the market to **allocate** production resources and the flow of **agricultural** commodities to domestic and **international** markets.
- o High levels of agricultural exports.
- o Unrestricted production to assure adequate **supplies** of food and fiber for domestic and foreign users.
- o No **government-held** grain reserves.

Underlying these objectives is the expectation that the United States **could** return to a **surplus-position** in grains if exports were not actively sought or if government price incentives encouraged excess production. Because of the importance of exports to **full** utilization of current production capacity, a precipitous **decline** in exports **could** result in excess capacity. Likewise, significant increases in production could cause farm **prices** and incomes to **decline** and stocks to **accumulate** in government hands.

As discussed in Chapter II, actions taken since 1972 to counteract the effects of production **instability** and increased export demands on domestic prices have tended to be ad hoc and in conflict with other **policy** objectives. The domestic price effects of a tight grain **supply/demand** situation can be moderated in a number of ways: (1) Government-held stocks can be released, when they are **available**, (2) exports can be regulated, (3) food aid can be reduced, and (4) domestic consumption can **decline** (through price rationing), with the greatest initial reduction occurring in the **livestock** sector. Lacking a **large** stockpile from which to draw, the initial **U.S.** reaction to the recent shortage was to release those government stocks that remained, discontinue most export-subsidies, and reduce food aid sharply. However, these measures only dampened upward price pressure, causing the brunt of the

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33. Under this **law**, wheat, **feedgrain** and cotton producers are currently not restricted in production and become eligible for income support through deficiency payments if market prices **fall** below "target prices." Commodity loans provide financing and set a floor under farm prices. Current market prices are considerably above these support **levels**, **particulary** for wheat and **feedgrains**. If market prices **fall below** the support levels, the government is obligated to take over the commodity, at the option of the producer.

adjustment burden to fall on domestic consumption. As losses among livestock producers rose and the effects on retail food prices became more pronounced, the U.S. resorted to occasional trade intervention.

Export embargoes and informal export controls involving international negotiations were used. These actions appeared to do little to stabilize domestic prices and opposition from producers, foreign buyers, and recipients of food aid was intense. Use of these controls further added to market uncertainty.

Repercussions of the two years of severe shortfalls in world grain production between 1972 and 1975 resulted in record levels of U.S. agricultural exports, reduced grain stocks, higher grain and oilseed prices, and rising food prices. In the livestock sector, higher feedgrain and oilseed prices resulted in higher farm and retail prices and a decline in per capita meat consumption. Total net farm income reached a record \$33.1 billion in 1973, with lower levels in 1974 and 1975 but still about 50 percent higher than the \$18.2 billion earned in 1972. Grain producers captured a larger share of increases in farm income than livestock producers.

Current policy has coincided with strong overall farm prices and incomes, nearly full utilization of existing capacity, and important contributions to the U.S. balance of payments. Budget outlays in support of agricultural commodity programs have been reduced from nearly \$4 billion in Fiscal Year 1969 to about \$0.6 billion in Fiscal Year 1975. The efficiency of free market allocation has been used to greater advantage.

Against these benefits, food prices rose by over one-third between 1971 and 1974, food aid shipments were reduced to a fraction of earlier levels, and domestic commodity markets and prices became characterized by substantial instability and uncertainty. On balance, considering future trends and the likelihood that other nations will not materially change their agricultural policies, continuation of current policy would place the United States in a position of continuing to bear a disproportionate share of the shocks and adjustments in balancing world food supply and demand.

#### Domestic Reserve

A domestic grain reserve could be used to accomplish a variety of objectives, including price and income stabilization and foreign food aid. Reserves could be designed to function in a number of ways, depending on the principal objective to be pursued. For purposes of describing this option, it will be assumed the principal

objective would be price stabilization. An effective domestic reserve would accumulate stocks when excess production or inadequate demand caused farm prices to fall below a specified level. In periods of tight supplies or strong demand, stocks would be released when prices rise beyond a specified level, retarding further price rises. Implied in this concept of a domestic reserve is a set of price triggers, one above and one below the long run equilibrium or market clearing price. As changes in the cost of production and other factors cause the trend in the long run equilibrium price to change, the price triggers would be adjusted. Alternatively, the acquisition and release of stocks might be linked to a measure of quantity or to a combination of price and quantity triggers. Though it might be possible to devise a system whereby the private sector would hold these reserves, they would probably have to be government held or controlled. When stocks were being accumulated or released, some form of international trade intervention might be required.

The size of a domestic grain reserve would be a function of the degree of price stability sought, the extent to which trade intervention (including adjustments to food aid) would be used in concert with domestic reserves, and how much budget impact would be acceptable. Market instability can be measured in many ways. For example, reserve size might be related to deviations from trends in world imports. Recent analyses show that a reserve of 6 million metric tons (mmt) of wheat and 4 mmt of feedgrains would meet two-thirds of the above trend in world imports of these two grains.<sup>34</sup> A reserve of 10 mmt of wheat and feedgrains would therefore permit the United States to meet two-thirds of the deviations in world imports without materially affecting domestic prices. For deviations larger than these, both reserves and trade intervention would be required if domestic prices were to remain stable. Initial outlays for a 10 mmt reserve would be about \$1.2 billion at current prices with annual interest and storage costs of about \$180 million. Depending on operational guidelines, a domestic reserve could be nearly self-financing with sale prices set high enough to recover most costs.

A variation of this option, a combination of domestic and an international reserve, would be an international system of nationally held and controlled reserves. At a minimum, participating nations could agree to consult when market conditions warranted. In this way, participating nations would not yield sovereignty over decisions

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34. USDA, Economic Research Service, The World Food Situation and Prospects to 1985, Foreign Agricultural Economic Report No. 98 (December 1974), p. 43.

affecting their agricultural sectors while attempting to coordinate their actions with other nations. The U.N. Food and Agriculture Organization's proposed **International** Understanding on World Food Security follows this approach.<sup>35</sup>

An effective domestic grain reserve could provide several **benefits**. Price extremes would be **mitigated**, but could still serve as the principal **allocating** mechanism. More stable grain prices would **help** consumers by protecting them against sharp increases in **retail** food prices. Grain producers would have more **stable** prices and incomes. Livestock producers would benefit from more stable prices though income and prices would **still** be subject to **cycles** in beef and pork production. On the export side, the U.S. position in **international** markets could be enhanced by improving its capacity to meet commitments. Likewise, food aid commitments could be made with greater assurance. Budget costs, in comparison with the costs of **earlier** farm programs, would be relatively low.

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35. U.N. Food and Agriculture Organization, World Food Security: Proposal of the Director General, Rome, (August 1973).

36. A recent study conducted for the U.N. Food and Agriculture Organization estimates the "social value" of grain reserves. It does this by comparing increases in the U.S. price of corn that occurred in 1970 as a result of **shortfalls** in production with those that occurred as a **result** of shortfalls in 1974. In contrast to 1970, when stocks were high, in 1974 they were very **low**. In 1970, the marginal value of an **additional 0.5 billion bushels** of corn was about \$2.70 per **bushel**. In 1974, when stocks were low, the marginal value of a **comparable** quantity of corn was \$12.00 per **bushel**. Though grain cannot be bought and sold at its **marginal** value, since the marginal unit is indistinguishable from **all** other units and thus must share its **value** with **all** units, the researchers **conclude** that these marginal values offer "a fair measure of what stocks would have been worth in the two **circumstances**." They further note that a conservative estimate of the marginal value of an increment of **one half billion bushels** of corn at the time of their study (**late 1974**) would have been **around \$10 per bushel**. In other words, the **social value** of a reserve of that magnitude at that point in time would have approximated **\$5 billion**. See: Jimmy Hillman, D. Gale Johnson, and Roger Gray, Food Reserve Policies for World Food Security: A Consultant Study on Alternative Approaches, U.N. Food and Agriculture Organization, (January 1975).

Some disadvantages **would** have to be weighed against these benefits. Though consumers **would** gain from increased price stability, it is **possible** that **overall** farm income **would** be **lower**, though more stable. As noted before, however, the effect among farmers **would** not be uniform; most of the **loss** **would** be concentrated in grain farming while livestock producers would **realize** a gain in income. To the extent that the United States wished to prevent benefits from price **stabilization** from "**leaking**" to other countries, some trade intervention might be required. A domestic reserve **would** not **entirely stabilize** retail food prices, nor **would** any **single agricultural policy**, since the farm sector contributes only about 40 percent of the **retail value** of food. Another consideration is the ease with which the focus of a reserve program could be shifted from price **stabilization** to income support, resulting in a large and **costly** program resembling those of the 1950s and 1960s. **Public knowledge** of the triggers for the acquisition and **release** of stocks could also lead to a certain amount of manipulation in the **international** grain market, as other nations patterned their transactions to anticipated price changes. **Finally**, determining **precisely** when stocks should be acquired and released is **difficult**.

### International Reserves

Like a domestic reserve, an **international** reserve could serve **several** purposes, including **stabilization** of world prices and emergency food aid. **Generally**, an international reserve is viewed as operating to increase world price stability through the acquisition and **release** of reserve stocks from an **internationally controlled** stockpile. In obvious contrast to a U.S. domestic reserve, an **international** reserve would require the support and commitment of **several** nations. From the viewpoint of major exporters, such as the United States, **international** reserves offer a means to distribute the burden of **stockholding** more **equitably** than it was before 1972, when a few exporters, particularly the United States, held most of the world's grain stocks.

The U.S. position announced by Secretary Kissinger before the United Nations calls for a 30 million metric ton food grain (wheat and rice) reserve to be held by several nations. The larger trading countries have **talked periodically** over recent months to determine interest in this and other reserve proposals. Reports from the talks suggest **comparatively little** interest. A reserve of 30 million metric tons **would** meet an estimated 95 percent of the shortfalls from **world trend** food grain production<sup>37</sup> and provide a very high degree of protection

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37. USDA, Economic Research Service, The World Food Situation and Prospects to 1985 (December 1974), p. 43.

and **stability**. If the United States were to hold 20 percent of the reserve, annual interest and storage costs would be **about \$100 million**. Acquisition costs for the United States would be **about \$900 million**, assuming current prices.

As for a domestic reserve, the size of an international reserve would have to be **defined** in terms of the degree of price **stability** sought and budget **costs**. Added to these dimensions would be questions of equity (how would the costs and benefits from an international reserve be **shared**), trade **intervention**, and **compatibility** with domestic agricultural policies. For an **international** reserve to function as **well** in periods of **surplus** as in scarcity, participating nations would have to adjust domestic trade and **agricultural** policies. For example, tremendous pressures would be placed on an **international** reserve if U.S. price support policies **resulted** in large excess production, thus causing world prices to **fall** precipitously. On the other hand, if member nations were **unwilling** to reduce import restrictions and trade barriers to ease the burden of excessive production and stocks, this too would make ineffective the international reserve.

In short, an international reserve could **internalize** to a larger group worldwide effects of **unilateral** actions by major exporters and importers in response to domestic **problems**. However, a great **deal** of compromise and cooperation would be required. It is **highly** uncertain whether several nations could operate an effective **international** grain reserve. While support for an **international** grain reserve has been intense since 1972, any movement toward larger stocks in major exporting countries and increased production levels in other parts of the **world** would probably diminish that support, particularly if the major importing countries of the world **felt** that the United States and other large exporters would hold stocks ample to satisfy export **requirements**.

### Regulation of Trade

**International** trade can be regulated by a variety of devices including embargoes, quotas, tariffs, **variable** levies, **licensing**, state trading, export subsidies, and sanitary and health **regulations**. Such regulation is undertaken to protect domestic producers from foreign competition and sometimes in retaliation for regulation by others. It is **also** used, as in the case of the United States, prior to 1973,

to subsidize the export of commodities to maintain domestic prices above world levels. Most recently the U.S. has used trade regulations to protect domestic market prices from world market instability. Sometimes, as in the case of the OPEC countries' control of oil, such actions are taken to exercise monopoly power.

Trade regulations run counter to current U.S. policy in that they conflict with U.S. commitments to the General Agreement on Trades and Tariffs (GATT). By impairing the flow of trade among nations, such regulations discourage dependence on foreign suppliers -- even when foreign suppliers can produce the product more efficiently. While export controls can reduce domestic price instability, they do so at the expense of price instability in other nations. To an increasingly interdependent world, trade regulations affecting exports of a major supplier can significantly affect the economies of other nations. Conversely, a major supplier is subject to the effects of production instability and governmental policies in other parts of the world. Export trade restrictions nearly always undermine confidence in the reliability of suppliers. But when they are imposed intermittently and without advance notice, the effect can be particularly harmful.

To the extent that foreign customers for U.S. grain have alternative sources of supply in the short run, export restrictions will cause foreign prices to rise, but total export receipts to fall as the decline in the quantity exported more than offsets the increase in price. One recent study estimates that a 10 percent export restriction would lower export receipts by about 3.3 percent. For example, restricting U.S. exports of feedgrains in crop year 1974/75 by 10 percent, or 3.4 million metric tons, would have reduced export receipts by about \$160 million. Over the long run, customers faced with export restrictions look to alternative sources of supply. At least partly as a result of the soybean embargo in 1973, Japan has taken steps to lessen its dependence on the United States by turning to other suppliers, particularly Brazil.

In theory trade regulations can be implemented or rescinded with dispatch. In practice they rarely are and, instead, become impediments to adjustment. The effectiveness of export controls can also be impaired by the time lag between perception of need and actual implementation. Recent U.S. experience has shown export controls and subsidies to be difficult administrative mechanisms for timely adjustments in trade flows.

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38. Luther Tweeten, Formulating a National Food Policy for the Next Decade, Paper prepared for the Office of Technology Assessment, (94 Cong. 1 Sess.), December 19, 1975, p. 25.

Although trade regulations conflict with current U.S. policy, as a practical matter the United States will probably continue to use them in certain situations, even if in limited scope, while trade liberalization is pursued.

In contrast to a goal of trade liberalization, it has been suggested that the United States use its dominance in the world grain market as a bargaining tool for achieving other objectives. For instance, the United States might attempt to act as a monopolist similar to the oil cartel, and by reducing the supply of grain drive up the price. As the world's principal source of grain exports, the U.S. would bargain from a position of strength. Should other major exporters, such as Canada and Australia be included, the degree of control would be even greater. The relatively fixed demand for food causes prices to rise sharply in response to reductions in supply, though U.S. prices would fall for awhile. And, though other suppliers would react to the higher prices with increased production, biological, climatic, and institutional limits would control the extent of this increase, particularly in the short run. It has been suggested that the U.S. employ this tactic as a way of putting pressure on the oil cartel, yet that cartel is not very dependent on U.S. food.

However, there are also several drawbacks. First, the world supply of grain is substantially more responsive to price increases than is the supply of oil. And grain production is far less geographically concentrated. Second, a relatively affluent importer such as the Soviet Union has the option of turning to other, more expensive sources of food including, if necessary, expanded domestic production, or belt tightening. Third, though the United States is the principal source of world grain imports, most countries are not heavily dependent on these imports. Only about 11 percent of total world grain production is traded internationally. Fourth, such a policy would make food more expensive and thereby create hardships for poorer nations dependent on food imports. Attempts to use such a cartel selectively -- for example, against countries that refuse to participate in efforts to liberalize trade or share in the holding of stocks -- might be effective in the short run. They are likely to break down in the longer run, however, as the deficit nation develops other sources of supply.

### Trade Liberalization

As noted in Chapter II, much of the recent instability in world food prices can be traced to governmental interference in trade between countries. Elimination or reduction of this interference could substan-

tially reduce world price instability. Trade liberalization, however, is a policy option that cannot be unilaterally determined, but rather, one which must be determined in concert with major trading partners through negotiation. It is not, therefore, an option that can be specified with precision. The principal decisions revolve around (a) the vigor with which the United States pursues the negotiations and (b) the overall objectives to be sought. Though the major aim of the negotiations would be to reduce the degree of agricultural protection, probably by stages, it does not seem feasible to address this topic without also trying to reach agreement on the general nature of domestic agricultural policy. Trade restrictions and domestic agricultural policies are different facets of the same problem. Effective solutions are not likely to be found unless both dimensions are treated simultaneously.

However, the United States could take more specific actions to facilitate and improve the chances of success for these negotiations. One such action would be to assure foreign customers that the United States is a dependable source of supply -- through use of grain reserves, bilateral agreements, or other means. The increased use of trade restrictions by the United States since 1972, in combination with the reduction of government stocks, has caused concern among foreign customers. Some form of assurance seems to be a necessary precondition to serious trade liberalization. In addition, the United States must be prepared to remove some of its remaining trade barriers as a quid pro quo for the concessions of other governments. Although the U.S. has a comparative advantage in the production of agricultural products such as feedgrains, wheat, tobacco, and poultry, in the production of other farm products the United States is at a comparative disadvantage.<sup>39</sup> Those products include manufactured dairy products, sugar, wool, lamb, and mutton. For other commodities, the competitive position of the United States is uncertain. Therefore, further liberalization of U.S. terms of trade would probably require that existing protection of these commodities, as well as some nonagricultural products, be reduced or eliminated.

A policy of further trade liberalization has several arguments in its favor. If adopted on a wide scale, it would give the market more free reign to allocate resources, thereby increasing economic efficiency. Budget costs would be negligible, depending on the extent to which compensatory payments were used. Once trade became

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39. D. Gale Johnson, Farm Commodity Programs: An Opportunity for Change (Washington, D.C.: American Enterprise Institute for Public Policy Research, May 1973), p. 77.

more free and food deficit nations gained confidence in the dependability of their suppliers, worldwide grain stock requirements would be lowered. Shortfalls in one part of the world could more readily be filled through imports from other nations. Finally, trade liberalization would expand the market for commodities for which the United States has a comparative production advantage, thereby contributing to increased U.S. foreign exchange earnings.

Perhaps the most telling argument against pursuit of a policy of trade liberalization is the difficulty of persuading other nations that such a policy is in their long run interest as well as in the interest of the United States. Few human needs are more basic than the need for food. Add to this the powerful political and economic interests that have grown up around the agricultural sectors of most nations and you have a policy topic of great sensitivity. Few nations are eager to become heavily dependent on imports of food, if they can possibly avoid it. The limited success of past and ongoing attempts to negotiate more free agricultural trade testify to how deeply rooted these policies are in the domestic political affairs of all nations. Of a more mechanical nature, important measurement problems associated with trade negotiations further lengthen and complicate the process. Finally, some segments of the U.S. economy, including producers of certain agricultural products, would suffer from removal of U.S. trade barriers. Within agriculture, the dairy industry would probably be affected most severely. A recent Department of Agriculture study concluded that under conditions of free trade for dairy products, U.S. imports by 1980 would be over three times as high, both farm prices and U.S. milk production slightly lower, U.S. dairy producer incomes substantially lower, retail dairy prices about 3 percent lower, and the number of dairy herds down slightly, all relative to what is expected with a continuation of the present system of import quotas.<sup>40</sup>

### Bilateral Agreements

The United States could enter into agreements with other major importing countries similar to the one signed in October with the Soviet Union. Other countries have reportedly expressed interest in having such agreements.

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40. USDA, Economic Research Service, The Impact of Dairy Imports on the U.S. Dairy Industry, Agricultural Economic Report No. 278 (January 1975).

**Bilateral** agreements might also be made between the U.S. and other major grain exporting nations to **consolidate** their **influence** over conditions of grain trade. This power **could** be used to a variety of ends, including further trade **liberalization** and a more **equitable** sharing of the costs of holding stocks.

Such agreements **would** have **several advantages**. They would **entail** no direct budget costs. In comparison with **multilateral** agreements, they are much more **simple** to negotiate and implement. They can be patterned to unique **circumstances**, as exemplified by the United States-Soviet Union agreement. And, over the short run, increased export earnings might be **possible** if the agreement covered enough of total world exports.

Among the **disadvantages**, **limiting** participants to the agreement might hamper the competition of a **freely** operating market process. The terms of trade would therefore be determined in **isolation** of other important **factors**. Furthermore, it would be **difficult** to design an agreement that **would** be **sufficiently** dynamic and **flexible** to adjust to unforeseen circumstances. To the extent **flexibility** is achieved, perhaps by **calling** for a renegotiation of terms each year, the agreement would **lose** value as a basis for long-term planning. Agreements, **particularly** if they cover **long** periods of time or apply to situations of great uncertainty, often become impediments to needed adjustment -- or they are broken. Nations not covered by an agreement would **essentially** become **claimants** for whatever grain remained after the export agreements had been satisfied. In a tight market situation, they **could** have trouble satisfying import requirements. Such agreements **also** **conflict** with the spirit and the intent of the General Agreement on Tariffs and Trade. Finally, for **all** the reasons cited in Chapter II it can be argued that the United States-Soviet Union trade relationship is unique in several aspects and therefore required unique treatment that should not be repeated.

### Summary

Five alternatives to current policy were **selected** on the basis of their contribution to increased price and income **stability**. Each has been examined for its effects on key economic and **policy** indicators. Not all these effects have been quantified. Though some further quantification is possible with sufficient time and analytical resources, many of the impacts **would** remain **empirically unpredictable**.

A qualitative summary of the effects of these options in comparison with the effects of current **policy** appears in Table 8. The net effects described here are **judgmental**, **particularly** in those situations

Table 8--Effect of **Alternative** U.S. Agricultural Trade Policies  
In Comparison With Current Policy

Policy Options	Price & Income Stability	Farm Income	Consumer Food Prices	Balance Of Payments Surplus	Budget Costs	Administrative Feasibility	International Cooperation	Allocative Efficiency
Domestic grain reserve	+	-	-	0	+	-	+	+
International grain reserve	+	-	-	0	+	-	+	+
Regulation of trade	+	-	-	-	0	-	-	-
Trade liberalization	+	0	-	+	0	+	+	+
Bilateral agreements	+	0	0	0	0	0	0	0

Note: + means greater or higher than with current policy

- means less or lower than current policy

0 means no change, uncertain, or increases and decreases that are roughly offsetting

where there are offsetting effects. Consequently, the reader is altered not to accept this interpretation uncritically. It is offered strictly as a means of making very rough cross-comparisons of alternative policies.

In brief, all options would contribute to increased price and income stability, though in varying degree. This, of course, was the basis for their selection. Grain reserves, whether domestic or international, would probably lower total farm income more than would current policy. The adoption of a "price lid," as implied by use of grain reserves as well as trade regulation, would restrict price increases and decreases, as with the existing "price floors." As a result, the income of farmers, particularly grain farmers, would be slightly lower. Livestock producers and dairy farmers would benefit, however, as these options would retard feedgrain prices from rising as high as they can under current policy.

Consumers would benefit from most of the options in that the price lid on farm prices would, in turn, restrain retail food prices from sharp rises of the sort experienced in 1973 and 1974. With grain reserves, this benefit to consumers would be partially offset by the budget costs of such programs.

The reserves and trade regulation options would require greater government involvement. Again, the extent of that involvement would depend on the design of particular policy measures. Trade liberalization is the only option examined that would lessen government involvement. International economic relations, broadly defined, probably would be enhanced by adoption of either the reserves or the trade liberalization options. Only trade regulation would work against an improvement in these relations.

Of the five alternatives to current policy, only one -- trade liberalization -- would seem to be superior on all counts. Yet, it is also one of the most difficult to attain. As already noted, it requires a great deal of international cooperation as well as the sacrifice of some national autonomy. The bilateral agreements option is difficult to assess, largely because it can take so many different forms and, therefore, have different effects. The only major benefit of increased trade regulation is that it would probably result in greater price and income stability, vis-a-vis current policy. Both of the grain reserve options are characterized by a combination of advantages and disadvantages. Finally, it is important to recognize that most of these options are not mutually exclusive. It is, therefore, possible to adopt a combination of policies. The principal task then becomes one of orchestration and emphasis.



APPENDIX TABLES



APPENDIX TABLE 1  
U.S. GRAIN SUPPLY AND DISTRIBUTION  
(Crop Years 1961/62-1976/77)

Commodity and Crop Year	Beginning Stocks	Harvested Area	Yield	Production	Imports	Exports	Domestic For Feed	Consumption Total
	Million Metric Tons <sup>a</sup>	Million Hectare <sup>a</sup>	Quintal Per Hectare <sup>a</sup>	Million Metric Tons <sup>a</sup>				
<b>TOTAL GRAINS:</b>								
1961/62	115.7	64.1	25.1	161.0	.6	35.4	112.2	140.2
1962/63	101.7	59.7	26.7	159.3	.3	33.2	108.5	136.9
1963/64	91.2	61.5	27.9	171.5	.4	40.6	106.0	135.0
1964/65	87.5	60.1	26.2	157.4	.3	39.4	104.6	133.6
1965/66	72.2	59.5	30.3	180.0	.2	50.1	119.6	149.0
1966/67	53.3	60.3	30.0	180.5	.2	40.4	118.1	147.8
1967/68	45.8	65.0	31.4	203.9	.2	41.7	118.4	149.0
1968/69	59.2	62.1	31.8	197.7	.2	31.5	126.5	157.4
1969/70	68.2	58.5	34.3	200.9	.3	35.7	134.3	165.1
1970/71	68.6	58.3	31.4	183.1	.3	39.0	131.4	162.3
1971/72	50.7	63.0	37.1	233.6	.4	41.9	142.5	174.2
1972/73	68.6	57.5	38.9	224.0	.3	71.6	147.4	179.3
1973/74	42.0	63.6	36.6	233.0	.3	72.1	143.1	176.2
1974/75 <sup>b</sup>	27.0	67.5	29.5	198.9	.5	63.9	106.1	139.3
1975/76 <sup>c</sup>	23.2	70.4	34.6	243.3	.4	82.0	118.6	152.7
1976/77 <sup>c</sup>	32.2	--	--	--	--	--	--	--
<b>WHEAT:</b>								
1971/72	19.9	19.3	22.8	44.0	<sup>d</sup>	17.2	7.2	23.2
1972/73	23.5	19.1	22.0	42.0	<sup>d</sup>	32.2	5.2	21.4
1973/74	11.9	21.8	21.3	46.4	.1	31.2	3.8	20.5
1974/75 <sup>b</sup>	6.7	26.5	18.4	48.8	.1	28.3	2.0	18.6
1975/76 <sup>c</sup>	8.7	28.2	20.6	58.1	<sup>d</sup>	36.7	2.4	19.3
1976/77 <sup>c</sup>	10.8	--	--	--	--	--	--	--
<b>TOTAL COARSE GRAINS:</b>								
1971/72	30.8	43.7	43.4	189.6	.4	24.7	135.3	151.0
1972/73	45.1	38.4	47.4	182.0	.3	39.4	142.2	157.9
1973/74	30.1	41.8	44.6	186.6	.2	40.9	139.3	155.7
1974/75 <sup>b</sup>	20.3	41.0	36.6	150.1	.4	35.6	104.1	120.7
1975/76 <sup>c</sup>	14.5	42.2	43.9	185.2	.4	45.3	116.2	133.4
1976/77 <sup>c</sup>	21.4	--	--	--	--	--	--	--
<b>WHEAT:</b>								
1973/74	438	53.9	31.7	1,705	4	1,148	140	752
1974/75 <sup>b</sup>	247	65.6	27.4	1,796	2	1,039	74	686
1975/76 <sup>c</sup>	320	69.7	30.6	2,134	1	1,300-1,400	102-77	719-694
1976/77 <sup>c</sup>	436-361	--	--	--	--	--	--	--
<b>CORN:</b>								
1973/74	709	61.9	91.2	5,647	1	1,243	4,193	4,631
1974/75 <sup>c</sup>	483	65.2	71.3	4,651	2	1,145	3,182	3,632
1975/76 <sup>c</sup>	359	66.6	87.2	5,804	1	1,500-1,400	3,475-3,675	3,940-4,140
1976/77 <sup>c</sup>	724-624	--	--	--	--	--	--	--

Source: USDA, Foreign Agricultural Service, Foreign Agricultural Circular: Grains, FG 16-75, December 22, 1975, p. 20.

Notes: Does not include adjustment for transshipments; includes major products.

Commodity years as follows: July-June--wheat, barley, oats; October-September--corn, sorghum.

<sup>a</sup> As an aid in making international comparisons, metric measures are used. One metric ton equals 2,205 pounds or 1.1 short tons; one hectare equals 2.47 acres; one quintal equals 220.46 pounds.

<sup>b</sup> Preliminary.

<sup>c</sup> Projected.

<sup>d</sup> Less than 50,000 metric.

Appendix Table 2

Grain: Total Soviet Union Supply and Utilization  
(Crop Years 1960-75)

Crop Year	Grain production	Net grain trade <sup>b</sup>	Grain utilization <sup>a</sup>					Total utilization	Stock change
			Seed	Food	Industry	Livestock feed	Waste		
	Million metric tons	Million metric tons	Million metric tons	Million metric tons	Million metric tons	Million metric tons	Million metric tons	Million metric tons	
1960 .....	125.5	- 6	20	44	3	42	13	122	- 2
1961.	130.8	- 7	21	44	3	45	13	126	- 2
1962.	140.2	- 7	23	44	3	43	14	127	+ 6
1963 .	107.5	+ 6	23	44	3	33	5	108	+ 6
1964 .	152.1	- 1	22	45	3	45	17	132	-19
1965 .	121.1	+ 4	24	44	3	56	12	139	-14
1966 .	171.2	- 1	24	44	3	59	14	144	+26
1967 .	147.9	- 4	24	44	3	64	12	147	- 3
1968.	169.5	- 6	25	44	3	72	17	161	+ 3
1969.	162.4	- 5	23	45	3	83	23	177	-20
1970.	186.8	- 7	25	45	3	92	22	187	- 7
1971.	181.2	+ 2	26	46	3	95	13	183	0
1972.	168.2	+21	26	46	3	97	15	189	0
1973.	222.5	+ 6	26	46	3	104	36	215	+13
1974.	195.7	0	26	46	3	106	24	205	- 9
1975.	137.0	+26	26	45	3	82	14	170	- 7

Source: USDA Foreign Agriculture Service, Foreign Agriculture, November 17, 1975, p. 3 and Foreign Agriculture Circular: Grains, FG 1-76, January 21, 1976, p. 25.

<sup>a</sup> ERS and FAS estimates.

<sup>b</sup> Minus indicates net exports and a drawdown of stocks.