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World Oilseed Markets—Government Intervention and Multilateral Policy Reform

Thomas W. Bickerton
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World Oilseed Markets--Government Intervention and Multilateral Policy Reform. By Thomas W. Bickerton and Joseph W. Glauber, Commodity Economics Division, Economic Research Service, U.S. Department of Agriculture, Staff Report No. AGES 9021.

Abstract

Government programs and policies have helped to shape the prevailing patterns of trade and production in global oilseed, oilseed meal, and vegetable oil markets. This report evaluates the adjustments that likely would occur in global oilseed and oilseed product markets if these policies and programs were removed. The effect of policy reform on world oilseed production and trade would be relatively small when compared with trade liberalization's effects on other agricultural commodities. Adjustments to liberalization would vary among regions and within individual oilseed sectors. Low-cost oilseed and vegetable oil producers, like the United States, Argentina, Canada, Indonesia, and Malaysia, could benefit, although their gains would be modest. Gains to Brazilian oilseed producers could be very small. High-cost producers, like EC farmers, could expect a significant reduction in their share of global oilseed production and exports.

Keywords: Oilseeds, meal, vegetable oil, protein feeds, soybeans, soybean meal, soybean oil, cottonseed, cottonseed meal, cottonseed oil, peanuts, peanut meal, peanut oil, sunflowerseed, sunflowerseed meal, sunflowerseed oil, rapeseed, rapeseed meal, rapeseed oil, flaxseed, linseed meal, linseed oil, copra, coconut meal, coconut oil, palm oil, palm kernels, palm kernel meal, palm kernel oil, GATT, trade liberalization.

1301 New York Avenue, NW.
Washington, DC 20005-4788

March 1990

Foreword

This report is a product of the trade liberalization project conducted in the Commodity Economics Division (CED) of the Economic Research Service (ERS). Eleven commodity monographs in the series "World Commodity Markets: Government Intervention and Multilateral Policy Reform" are anticipated from this study. The objectives of this series are to describe the role of individual commodities in world agricultural markets, to provide an overview of current policies for specific commodities throughout the world, and to evaluate the effects of a reduction in government supports and artificial barriers that hinder free competition among countries in the production and trade of commodities.

The monographs draw on earlier and ongoing analyses of government intervention and trade liberalization conducted by ERS in support of the Uruguay Round of multilateral trade negotiations, particularly calculations of producer and consumer subsidy equivalents and analyses of multilateral liberalization based on ERS's Static World Policy Simulation Model (SWOPSIM). The commodity reports build on these efforts and others in the agricultural economics profession to bring a commodity focus to ERS's work on global policy reform.

CED's study has been coordinated by Nicole Ballenger, Kate Buckley, and Joy Harwood. Pat O'Brien, Tony Grano, and Fred Hoff provided vision, direction, and support. Alden Manchester coordinated the outside reviews. Anticipated commodity reports and authors include:

Beef--Bill Hahn
Coarse Grains--Bengt Hyberg, Stephanie Mercier, and Lin Hoffman
Dairy--Don Blayney, Dick Fallert, and Bill Paddock
Fruits, Vegetables, Wine, and Tropical Beverages--Kate Buckley
Oilseeds--Tom Bickerton and Joe Glauber
Poultry--Bob Bishop, Stephanie Mercier, Lee Christensen, and Larry Witucki
Pork--Shayle Shagam
Rice--Nathan Childs
Sugar--Ron Lord and Bob Barry
Tobacco--Verner Grise
Wheat--Joy Harwood and Ken Bailey

The staff of the Commodity and Trade Analysis Branch, CED, made special contributions to this report, including Sharon Sitzman, whose programming skills made possible development of comprehensive summary production and trade tables, and Linda Beeler, who produced the graphs. Members of the Agriculture and Trade Analysis Division of ERS, World Agricultural Outlook Board, and Foreign Agricultural Service also generously provided needed data and helpful editorial comments.

For a current listing of ERS work in support of the Uruguay Round, see Bibliography of Research Supporting the Uruguay Round of the GATT, Agriculture and Trade Analysis Division, Economic Research Service, U.S. Dept. of Agr., AGES 89-64, Dec. 1989.

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Summary

The elimination of policies and programs that distort agricultural trade could produce significant changes in regional oilseed and oilseed product demand and supply. Because governments have generally intervened less in oilseed and oilseed product markets than in other commodity markets--global oilseed producers receive far less assistance than do dairy, sugar, and grain producers--adjustment to trade liberalization in the oilseed complex would be much less severe.

The United States and other efficient, low-cost producers of oilseeds and oilseed products would benefit from higher global import demand following the removal of production and trade subsidies and other forms of intervention. Additional probable beneficiaries include Argentina, Canada, and the major palm oil producers, Malaysia and Indonesia. Gains to Brazilian oilseed producers might be minimal.

U.S. gains would occur in soybean and soybean product markets, depending on the direction that prices move and changes in foreign demand and production. Other U.S. oilseed sectors would likely benefit as well, with the exception of the peanut complex, which has been subject to a great deal of government intervention in contrast to other U.S. oilseed sectors.

The degrees to which world oilseed production, trade, and consumption adjust significantly depend on cross-commodity price realignments, particularly between soybeans and corn. If U.S. grain target prices and deficiency payments were terminated with the elimination or scaling back of commodity programs, U.S. soybean producer incentives would rise relative to corn producer incentives. Soybean area would rise too, as land was released from domestic grain programs with base acreage requirements. In South America, cross-commodity price realignments could strengthen in favor of coarse grains.

The EC is likely to undergo the greatest adjustment to trade liberalization because its support for oilseed production has been significant. If EC producer payments were to fall to world market price levels, its oilseed production and vegetable oil exports would sharply decline. As a result, EC imports of oilseeds and vegetable oils would increase following trade liberalization, while protein meal trade could decline slightly. EC demand for foreign oilseeds with high oil content, like sunflowerseed and rapeseed, could increase relative to demand for soybeans, which have a lesser oil content. Declines in EC oilseed output would strengthen world prices.

The degree to which EC oilseed and oilseed product imports rise also depends on the EC's internal price realignment between soybeans and corn. EC grain import policies and production subsidies have driven down the soybean-corn price ratio within the EC. With the end of these import barriers to corn, the EC soybean-to-corn price ratio would rise, causing livestock producers to reduce oilseed protein's current high share in feed rations and increase corn's share. In addition, EC feed requirements would fall if livestock numbers were to decline with the removal of support to the animal sector.

World agricultural commodity prices, in general, would likely rise to replace the stream of income to producers no longer provided by government programs. Price changes for oilseeds, and for soybeans in particular, likely would be small. Soybean prices could decline very slightly. Vegetable oil prices probably would rise, strengthening the prices of high-oil-content seeds.

World Oilseed Markets—Government Intervention and Multilateral Policy Reform

Thomas W. Bickerton
Joseph W. Glauber

Introduction

Negotiations to liberalize global agricultural commerce continue among major trading nations under the GATT (General Agreement on Tariffs and Trade). If negotiators agreed to eliminate or significantly reduce existing trade-distorting policies, world patterns of oilseed production and trade would change. Large adjustments within certain markets, like the European Community (EC), would likely occur.

The purpose of this report is to identify adjustments that likely would occur in major oilseed and oilseed product markets based upon the current framework of production, trade, and government intervention. The report indicates likely changes in each of the major oilseed sectors, which include soybeans, cottonseed, sunflowerseed, rapeseed, flaxseed, copra, peanuts, and palm kernels as well as related meals and vegetable oils.

This report first provides a perspective on the current round of GATT trade talks by reviewing how previous GATT rounds have affected world oilseed and oilseed product trade and by surveying proposals made to date by GATT participants during the current negotiations.

The report then describes the prevailing pattern of world oilseed production and trade and notes the factors that determine prices, demand, and supply. Next, it identifies policies and programs of major producers and traders that distort oilseed and oilseed product trade. Estimations of the amount of support given to regional oilseed producers are cited. Also, support provided to the oilseed sector as a whole is compared with that given to other agricultural commodity sectors. The report concludes by describing the likely impact that liberalization would have on major producers and traders.

Agriculture and the GATT

International negotiations targeted at reducing intervention in agricultural trade have made limited progress to date, particularly when compared with progress achieved in industrial trade. Throughout the history of the negotiations, countries obtained numerous waivers for intervention in agriculture. For example, in 1955, the United States obtained a waiver under rules allowing it to restrict imports of commodities that interfere with the operation of domestic farm programs. A subsequent application by the EC of

variable import levies and export restitutions likewise removed a major part of its agricultural trade from GATT rules.

Over time, the United States, the EC, and other countries have implemented numerous programs and policies that increasingly have distorted the flow of agricultural trade. Tariffs and other border measures represent the most direct forms of trade distortion; production subsidies represent more indirect forms.

The goal is to reduce intervention in trade. All parties want to stay as far as possible from the path taken in the 1930's when an escalation of tariffs and other border measures helped reduce U.S. agricultural export trade to practically zero by the end of that decade.

The latest round of negotiations began in September 1986 in Uruguay, where GATT contracting parties proposed to liberalize world agricultural trade. GATT membership includes almost 100 countries, accounting for four-fifths of world trade (table 1) and more than two dozen other nations which adhere to its rules on an informal basis. Despite its large membership, GATT does not include some important trading nations, among which are Taiwan, China, the Soviet Union, China, Czechoslovakia, and East Germany.

The GATT

The GATT was negotiated at the end of World War II to provide an international forum to promote reduced government interference in all international trade. Its signatories agree to adhere to the following provisions: to treat member nations equally (all countries receive unconditional most-favored-nation treatment, which means that any concession granted applies equally to all contracting parties); to work toward eliminating quantitative restrictions in trade; to restrict the use of trade-distorting subsidies; and to agree to meet with member countries for the purpose of resolving trade disputes (5).[1]

The goal of liberalizing agricultural trade is difficult to achieve. The success of negotiations depends, in part, on how well mechanisms can be worked out to ensure the welfare of producers and consumers upon the elimination of trade-distorting policies.

A Major GATT Achievement: Free Entry of Soybeans into the EC

Seven previous rounds of negotiations were held under the GATT. Although these rounds primarily focused on manufactured goods, several important agreements were achieved which significantly affected global oilseed and oilseed product trade.

During the Dillon Round (1960-61), EC negotiators agreed to exempt oilseeds and oilseed meal from tariffs. As a result, oilseeds and oilseed meals entered the EC at world market prices.

This agreement, which went into effect in 1963, benefited U.S. and other oilseed producers in several ways. Not only did it permit free entry of soybeans and soybean meal into the EC's import market, but the simultaneous

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[1] Underscored numbers in parentheses refer to sources listed in the References section.

Table 1--GATT Countries

Contracting parties to the GATT (96)

Antigua and Barbuda	Germany, Fed. Rep.	Niger
Argentina	Ghana	Nigeria
Australia	Greece	Norway
Austria	Guyana	Pakistan
Bangladesh	Haiti	Peru
Barbados	Hong Kong	Philippines
Belgium	Hungary	Poland
Belize	Iceland	Portugal
Benin	India	Romania
Botswana	Indonesia	Rwanda
Brazil	Ireland	Senegal
Burkina Faso	Israel	Sierra Leone
Burma	Italy	Singapore
Burundi	Jamaica	South Africa
Cameroon	Japan	Spain
Canada	Kenya	Sri Lanka
Central African Rep.	Korea,	Suriname
Chad	Kuwait	Sweden
Chile	Lesotho	Switzerland
Colombia	Luxembourg	Tanzania
Congo	Madagascar	Thailand
Cote d'Ivoire	Malawi	Togo
Cuba	Malaysia	Trinidad and Tobago
Cyprus	Maldive	Turkey
Czechoslovakia	Malta	Uganda
Denmark	Mauritania	United Kingdom
Dominican Republic	Mauritius	United States of America
Egypt	Mexico	Uruguay
Finland	Morocco	Yugoslav
France	Netherlands	Zaire
Gabon	New Zealand	Zambia
Gambia	Nicaragua	Zimbabwe

Acceded provisionally (1) Tunisia

application of import duties on feed grains further boosted oilseed protein meal consumption by EC livestock feeders. Coupled with the Common Agricultural Policy system of grain target, threshold, and intervention prices, oilseed protein meal became cheaper relative to grain in the EC than in the rest of the world.

The Kennedy Round (1963-67) was marked by U.S. refusal to accept an EC-proposed market-sharing agreement guaranteeing U.S. exports a specific share of the EC market. The subsequent deterioration of U.S. market share there has complicated relations between the United States and the EC.

At the next round of negotiations (1974-79), held in Tokyo, participants agreed to two proposals, which subsequently have affected the way trade is conducted. First, parties agreed to legitimize the idea of special and differential treatment for less developed countries. This agreement has allowed less developed countries the rights of membership without strict adherence to corresponding obligations (27).

Second, participants agreed to allow export subsidies to continue on primary goods (agricultural products), but specified that subsidies should not be used by member states to acquire more than an equitable share of world export trade of a particular product. Because of the difficulty of defining what constitutes an equitable share, this agreement to tolerate continued export subsidies probably contributed to the subsequent proliferation of disputes between the United States, the EC, and other traders.

Current GATT Round Focuses on Agriculture

The current round, begun in September 1986 in Punta del Este, Uruguay, marks the first time that agricultural issues are a major focus of negotiations. The current round is scheduled to conclude in December 1990. Fourteen other categories of issues are also included in the negotiating agenda.

Initial Participant Proposals

Six countries or country groups have submitted comprehensive proposals to be considered by the GATT agricultural negotiating group in the Uruguay Round (table 2). Most of the proposals are quite lengthy and complicated, and they represent a wide variety of approaches. At one end of the continuum are the proposals of the United States and the Cairns Group (Argentina, Australia, Brazil, Canada, Chile, Colombia, Fiji, Hungary, Indonesia, Malaysia, New Zealand, the Philippines, Thailand, and Uruguay) which favor largely eliminating policies that distort trade. At the other end is the EC plan, which offers only minor changes in existing programs. Proposals by Japan, the Nordic countries (Finland, Iceland, Norway, and Sweden), the Group of Net Food Importing Countries (Egypt, Mexico, Jamaica, and Peru), Austria, Switzerland, and South Korea advocate varying degrees of reform (14).

A midterm ministerial review in Montreal in early December 1988 ended in a deadlock between the United States and the EC. At the December meetings, the EC refused to accept any language in agreements implying a total elimination of farm programs and the United States balked at settling for anything less (14).

At followup meetings in Geneva in early April 1989, the United States and the EC exhibited increased flexibility and the parties eventually reached an

Table 2--Main elements of major negotiating proposals

United States (submitted October 25, 1989)
- Replace nontariff barriers with tariff-rate quota system, to be phased down to zero or low levels over a 10-year period (tariffication).
- Phase out export subsidies over a 5-year period.
- Assign domestic policies to three groups: those to be phased out (payments tied to output); those to be disciplined (input, investment subsidies); and those to be permitted (income support, environmental, disaster assistance, research, education).
- Treatment of less-developed countries based on level of development in each.

European Community (submitted December 20, 1989)
- Reduce support and protection. Commitments would be expressed in terms of an aggregate measure.
- A form of tariffication could be accepted.
- Variable levies would be converted to fixed and variable components, fixed component reduced in line with other commitments and variable component to fluctuate according to market conditions. Deficiency payments to be included in tariffication.
- Flexibility in application of GATT rules to less-developed countries according to their actual level of development.

Cairns Group (submitted November 20, 1989)
- Prohibit measures not explicitly provided for in GATT rules (includes variable levies and quantity restraints--amounts to tariffication).
- All tariffs bound at low levels or zero.
- Prohibit new and phase out existing export subsidies.
- Reduce internal support through use of an aggregate measure of support (AMS) where calculable, otherwise through commitments to reductions in support prices and budget expenditures.
- Similar internal policy categories to U.S. proposal.
- Measures in less-developed countries which encourage development to be exempt.

Japan (submitted November 27, 1989)
- Emphasizes special nature of agriculture and food security.
- Insists on countries' right to support certain level of self-sufficiency in "basic foodstuffs."
- Export subsidies should be reduced and eliminated.
- Domestic support with no (or negligible) trade-distorting effects should be permitted; other policies reduced through commitments based on an aggregate measure of support.
- Domestic support with no (or negligible) trade-distorting effects should be permitted; other policies reduced through commitments based on an aggregate measure of support.
- Allow less-developed countries a longer time frame to achieve Uruguay Round goals.

Nordic Group (submitted December 19, 1989)
- Support gradual change in level and form of border protection.
- Tariffication is among feasible alternatives.
- Most export subsidies should be eliminated. Trade-distorting domestic subsidies should be displaced.
- Objective needs of individual less-developed countries must be considered.

Net Food Importing Developing Countries
- Negotiators should consider interests and problems of importers.
- Should continue special treatment of less-developed countries and food aid.
- Increased financial assistance should be given to food importing developing countries to compensate for post-liberalization price increases.
- Stricter discipline applied to export subsidies.

Source: (14).

agreement calling for "substantial, progressive reductions in agricultural protection" in the long term. The agreement also froze protection at current levels for 1989. A framework has thus been established for further negotiations and dialogue will continue, with high hopes for achieving substantial progress in agriculture (14).

In October 1989, the United States submitted a proposal with a detailed breakdown of policies that are present in the current policy environment. Certain types of programs, including export subsidies, import quotas, variable levies, and any price support mechanisms that distort world prices, are listed as policies to be eliminated over varying lengths of time. Certain programs which are aimed at correcting market failures, such as bona fide food aid and disaster assistance and environmental goals, as well as decoupled direct payments, are designated as permissible. Policies which fall between these categories, such as input and investment subsidies that are equally available to all producers, are to be closely scrutinized and policed by GATT rules (14).

The EC opposes radical changes in world agricultural trade. Its proposal focuses on short-term efforts and maintenance of market shares. While the EC promotes the aim of progressively reducing support to re-establish balanced markets, it remains opposed to distinguishing between border and domestic policies that distort trade. EC officials are concerned about the cost to European agriculture under a free-trade regime at low world prices and are reluctant to expose their agricultural sector to such pressures by complete elimination of their support policies. One urgent concern of the EC is the relative free entry of nongrain feed substitutes and protein meals into their market, which have been displacing higher priced domestic grains. The EC insists on the importance of being able to "re-balance" support and protection between such commodities (14).

The Nordic Group proposal also implies resistance to wholesale changes in agricultural policies. Its suggestions on trade reform are couched in terms of improving market access through reduction of tariffs, import levies, and quantitative restrictions, rather than elimination of those instruments. Priority should be placed on replacing the most trade-distorting policies with more decoupled forms of support with clearly defined objectives. The Nordic countries are prepared to work toward elimination of most of their export subsidies.

Of the major groups submitting proposals prior to the midterm review, only the food-importing group did not clarify or amplify their original position. The food-importing group proposal focuses on resisting any overall price increases which would affect consumers in developing countries, though it supports "improving discipline" in the use of subsidies and elimination of policies such as quotas, voluntary export restraints (VER's), and other trade restrictions (14).

Japan is the largest single major agricultural importer to introduce a proposal to GATT. The main focus of the Japanese proposal is on nontrade issues, such as food security. The Japanese prefer self-sufficiency programs for their basic foodstuffs, rather than relying on stockpiling or stable importation arrangements. They want to maintain the ability to use quantitative restrictions under Article XI for food security reasons. Restrictions on variable levies and minimum support prices recognized for nonagricultural goods should be enforced in agricultural trade, and export

subsidies should be progressively reduced and eventually eliminated. Certain subsidies or expenditures which are devoted to improving infrastructure and social welfare, such as those named in both the U.S. and Cairns Group proposals, are also suggested for exemption by Japan (14).

All major proposals call for harmonization of sanitary and phytosanitary standards and ultimately elimination of scientifically unjustified elements of sanitary and phytosanitary regulations of traded agricultural products. Differential treatment of developing countries is permitted in all major proposals, generally to be geared toward the level of general and agricultural development currently existing in each country. The role of an aggregate measure of support (AMS), envisioned as substantial after the first round of proposals, has been downplayed in the most recent proposals. Since the midterm review ended in April 1989, several other countries who are participants in the GATT Negotiating Group on Agriculture have also submitted proposals (14).

Negotiations continue toward achieving freer trade in agricultural goods. By the end of the current GATT round, agreements could be reached that would alter global oilseed and oilseed product markets, just as past negotiations have helped shape regional oilseed and oilseed product trade.

World Oilseed Production and Trade

Oilseeds and oilseed products are the second-largest category of agricultural commodities, in terms of value, traded in world markets. Their contribution to U.S. agricultural export earnings is significant: Sales of oilseeds, oilseed meals, and vegetable oils accounted for more than one-fifth of U.S. agricultural export earnings during fiscal 1986-88 (fig. 1).

About two-thirds of U.S. agricultural export earnings from oilseeds come from sales of soybeans and soybean products. Throughout the 1980's, U.S. farmers generally earned almost twice as much income from soybeans as from wheat. Only corn brought U.S. producers higher cash receipts from farm marketings.

U.S. soybean farmers depend on export markets for a significant share of their earnings, shipping abroad more than half of all domestically produced soybeans in 1987. Three-fourths of these were shipped as unprocessed soybeans; the remainder went abroad as meal.

Oilseed and Oilseed Product Demand

Although most countries and regions of the world cultivate oilseeds, their domestic demand for oilseed products generally exceeds local output. This is particularly true for oilseed meal in the EC, Eastern Europe, the Soviet Union, China, Japan, and many other Pacific Rim countries. With respect to vegetable oil, this is true for India and Pakistan. Shortages of protein feed and oil can be met either by importing oilseeds and processing them or by importing the processed products. The ratio of raw seed to product imports depends on the country's oilseed crushing capacity, the relative prices of oilseeds and oilseed products, and local tastes for fats and oils.

Even major oilseed producers--like the United States, Brazil, and Argentina, which are self-sufficient in oilseed meals--import some combination of oilseeds and oilseed products. All three, for example, import tropical oils.

Determinants of Demand for Oilseeds

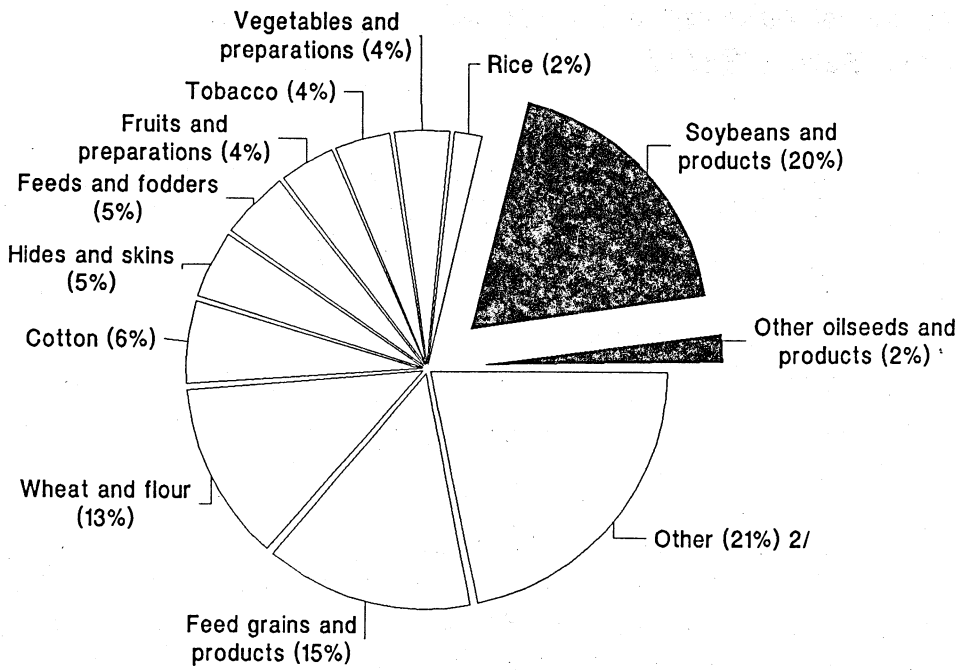
Demand for oilseeds is determined primarily by the demand for the products processed from the raw seed, namely oilseed meal and vegetable oil. Thus, prices for raw seeds are closely linked to the value of processed products by the following price relationship:

$$P_{sd} = [(1/A) * P_{ml}] + [(1/B) * P_{oil}] - P_p$$

where P_{sd} denotes the price per ton of the oilseed; A, the amount of seed necessary to produce 1 ton of meal; P_{ml}, the price per ton of its meal; B, the amount of seed necessary to produce 1 ton of oil; P_{oil}, the price per ton of its oil; and P_p, the cost of crushing 1 ton of the oilseed (10, p. 120).

Most oilseeds are crushed, but there are important exceptions. Among the major exceptions are U.S. peanuts, most of which are not crushed. The United States and Indonesia send the bulk of their peanut output directly into food channels rather than to processors. In contrast, most foreign peanuts are crushed. In the Far East, some soybeans are processed directly into food. Also, in the EC, small amounts of soybeans are toasted and fed whole to livestock without being crushed. In the United States, small amounts of cottonseed are similarly used for livestock.

Figure 1--Oilseeds accounted for more than one-fifth of U.S. agricultural export earnings 1/



1/ Fiscal years 1986-88 average.
2/ Major components of "other" include sugar and tropical products, nuts and preparations, and live animals.

Determinants of Demand for Oilseed Meals

A complicated set of demand and supply interrelationships determines oilseed meal prices. Demand for oilseed meal is driven by the demand for balanced feed concentrates, which depends on livestock numbers and regional feeding practices. Soybean meal and corn are two of the most important feed concentrates, and a complementary relationship normally exists between them in most countries. A notable exception to this complementary relationship is in the EC, where substitution among these feed ingredients is more common.

Demand for protein meal has risen as more livestock are being fed concentrates rather than grazed and as the mix of livestock units shifts more to poultry, a higher protein-consuming animal unit. More protein is being substituted for carbohydrates in animal diets to achieve leaner meats and higher levels of animal productivity. In countries with efficient livestock sectors, concentrates' share of feeds consumed often exceeds one-third. (Efficient livestock sectors are characterized by a low ratio of feed per unit of animal product.)

Determinants of Demand for Oils

Most oil produced from oilseeds is consumed as food, usually substituting for animal fats. Only a small fraction of oil produced from oilseeds is used for industrial purposes. Industrial usage has declined as synthetic materials continue to replace vegetable oils in soaps, paints, and other industrial products. Growth in population and income drive the demand for oils. During the 1980's, world population increased at 1.5-2 percent annually. Income growth depends upon a continued ability of the large developed economies to avoid a recession and the ability of many debtor countries to service their obligations without suffocating consumer demand. Taste, culture, and climate also shape regional oil consumption patterns. In the past, liquid oils from oilseeds and nuts were traditional in tropical and semitropical climates; solid fats and oils--butter, margarine, shortening, and hydrogenated vegetable oils--were more widely consumed in the cooler temperate-zone countries.

Increased awareness about nutrition affects consumer preferences. In particular, concern about the need to reduce the level of saturated fats in diets is raising the demand for liquid oils at the expense of tropical oils and animal fats.

Price Relationships

Prices for oilseeds and oilseed products depend on complementary and substitutional relationships among the oilseeds, oilseed products, and non-oilseeds. Disturbances in one complex invariably cause adjustments in others.

Oilseed and Nonoilseed Price Relationships

Complementary and substitutional relationships between oilseed meals and feed grains strongly affect their relative prices. Corn and soybean meal prices tend to move in the same direction, keeping the proportion of the two roughly in balance in animal feed rations.

Livestock producers, particularly in the United States and the EC, constitute a sophisticated industry, often relying on computerized optimal feed ration

programs to select feed ingredients. Producers' demand for different meals depends both on the composition of their livestock and on relative oilseed meal prices. Different types of animals require different proportions of protein meals and cereal grains in their rations. Gone are the days when pigs and chickens depended on table scraps and unused grain in a farmer's crib.

Relative fiber content is relevant too. Two nonruminants--pigs and chickens--demand the highest ratio of protein content in their feed rations; however, they cannot tolerate much fiber. Ruminants--cattle, sheep, and goats--require a smaller share of protein.

Because the proportion of protein meal to grain can vary within a limited range, the relative prices of protein and grain affect demand for one another. Since the ideal ration is one that maximizes animal production at the lowest cost, a wide differential between oilseeds and grains motivates producers to alter the makeup of their feed rations. For example, EC farmers use a high protein meal content in their feed rations because EC protectionist grain policies have reduced the soybean meal-to-corn price ratio.

Oilseed and Oilseed Product Complementary Price Relationships

Oilseed meal and oil are considered to be joint products. Joint products are two or more products produced in a single production process. When a particular type of oilseed is crushed, a fixed proportion of meal and oil results. For instance, a mill that crushes 100 tons of soybeans produces about 79 tons of soybean meal and 18 tons of soybean oil. The remainder is waste.

The joint product nature of oilseeds ties meal and oil markets closely together, readily transmitting disturbances from one to the other. For example, higher demand in soybean meal markets will upset the existing equilibrium between supply and demand in soybean oil markets. The consequent higher meal price induces oilseed crushers to process additional soybeans, thus increasing the supply of oil as well as meal. In the absence of any other market disturbances, the soybean oil price will fall as indicated in figure 2.

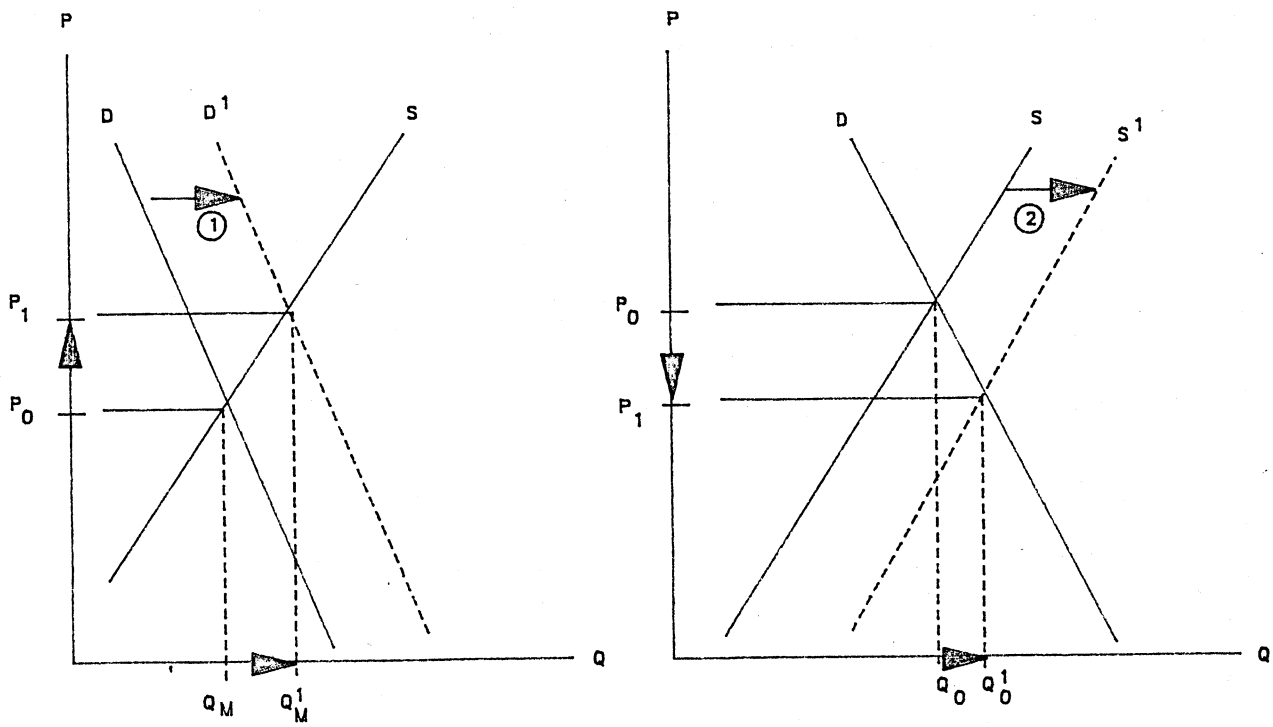
Demand for soybean meal has driven global soybean crush in recent years, resulting in large stocks of soybean oil in the United States. Throughout the 1980's, meal has accounted for more than 60 percent of total soybean product value. However, for higher oil-content seeds like rapeseed and sunflowerseed, the demand for oil rather than meal has been a more important determinant for crush volume.

The Special Case of Palm Oil. The joint product relationship between meal and oil applies only to some of the products in the palm oil complex: palm kernel oil and palm kernel meal. These two products result from processing the kernels taken from the mesocarp of the palm fruit. However, the fruit of the palm itself, when processed, yields only oil.

Oilseeds and Oilseed Product Substitutional Relationships

The relative substitutability among oilseed and oilseed products significantly affects demand. Two factors determine the extent to which oilseeds are substitutable: their respective meal and oil content and their degree of digestibility. Different types of oilseeds yield widely different proportions

Figure 2--The complementary price relationship between meal and oil



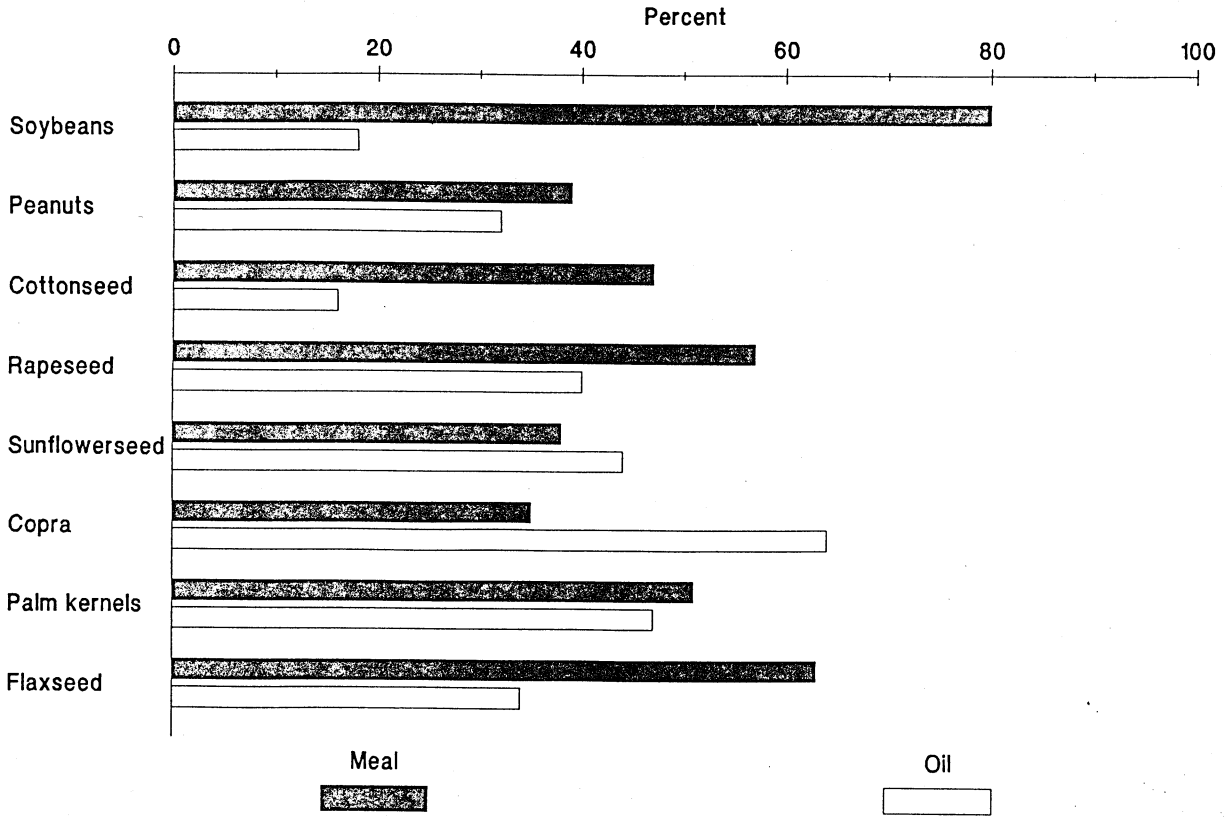
of meal and oil. For example, soybeans yield the largest proportion of meal among the major oilseeds (fig. 3). Flaxseed and rapeseed yield less meal than soybeans.

In addition, different types of oilseeds and oilseed meals have different degrees of digestibility. Nevertheless, some substitution is possible among the oilseed meals. Soybean meal is the best meal for protein efficiency, closely followed by cottonseed and sunflowerseed meals (7). Soybean meal is the meal most widely used in the United States and most countries.

On balance, other oilseed meals are less palatable and have a lower nutritional value than soybean meal. Meal consumption patterns are not static, however. For example, in the EC, the largest soybean meal import market, the amount of rapeseed meal consumed in feed rations is increasing as a result of the development and spread of less toxic new varieties of rapeseed.

In contrast to oilseed meals, vegetable oils are highly substitutable. Vegetable oil prices therefore tend to remain much closer to one another than do oilseed meal prices. A slight price differential among soybean oil and other oils is often sufficient to switch consumers' and manufacturers' preferences in many markets. This has been somewhat less true for oils containing lauric acid, like palm oil, palm kernel oil, and coconut oil, for

Figure 3--Typical meal and oil yields



which industrial demand is larger. Regional vegetable oil demand is also influenced by local tastes and climate in addition to nutritional concerns.

Soybeans and Soybean Products

Soybean meal and soybean oil are consumed in far greater volume than are any other oilseed meals and vegetable oils. Soybean meal is the preferred oilseed meal for most livestock rations, and soybean oil is an attractive choice for human diets because it is relatively inexpensive, low in saturated fat content, and does not add a distinctive taste to food.

Although soybean meal and oil's shares of total consumption have declined since the late 1970's, soybean meal accounts for more than one-half of foreign oilseed meal usage, and soybean oil accounts for more than one-fifth of foreign vegetable oil usage (fig. 4). In the United States, soybean's shares of total meal and oil consumption are higher, often exceeding 85 percent and 75 percent, respectively.

Soybeans and soybean products dominate global oilseed production and trade. Soybeans account for about one-half of the more than 200 million tons of oilseeds produced annually during 1985/86-1987/88 (fig. 5 and table 3). Cottonseed, peanuts, rapeseed, and sunflowerseed account for 10-20 percent each; and flaxseed, copra, and palm kernel account for about the remaining 5 percent.

Figure 4--Soybean's share of foreign meal and oil use

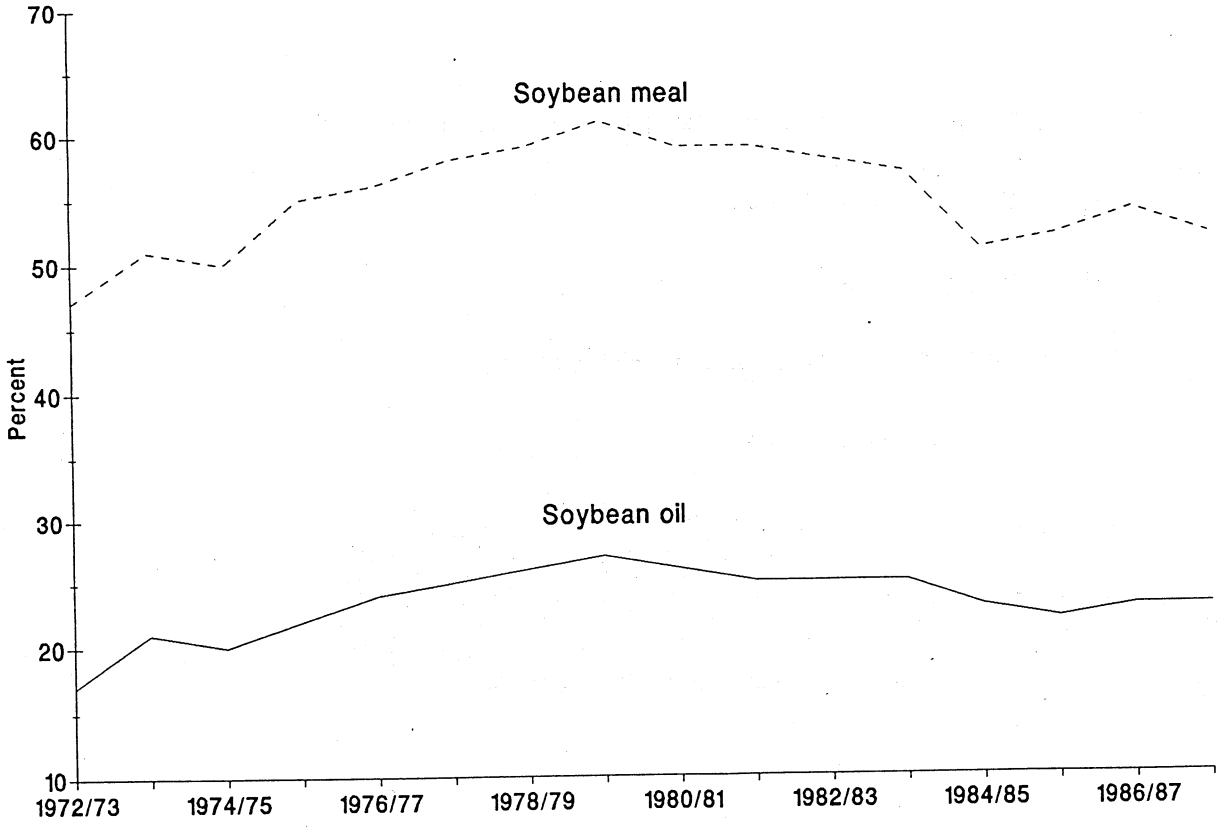


Figure 5--World oilseed production, by type

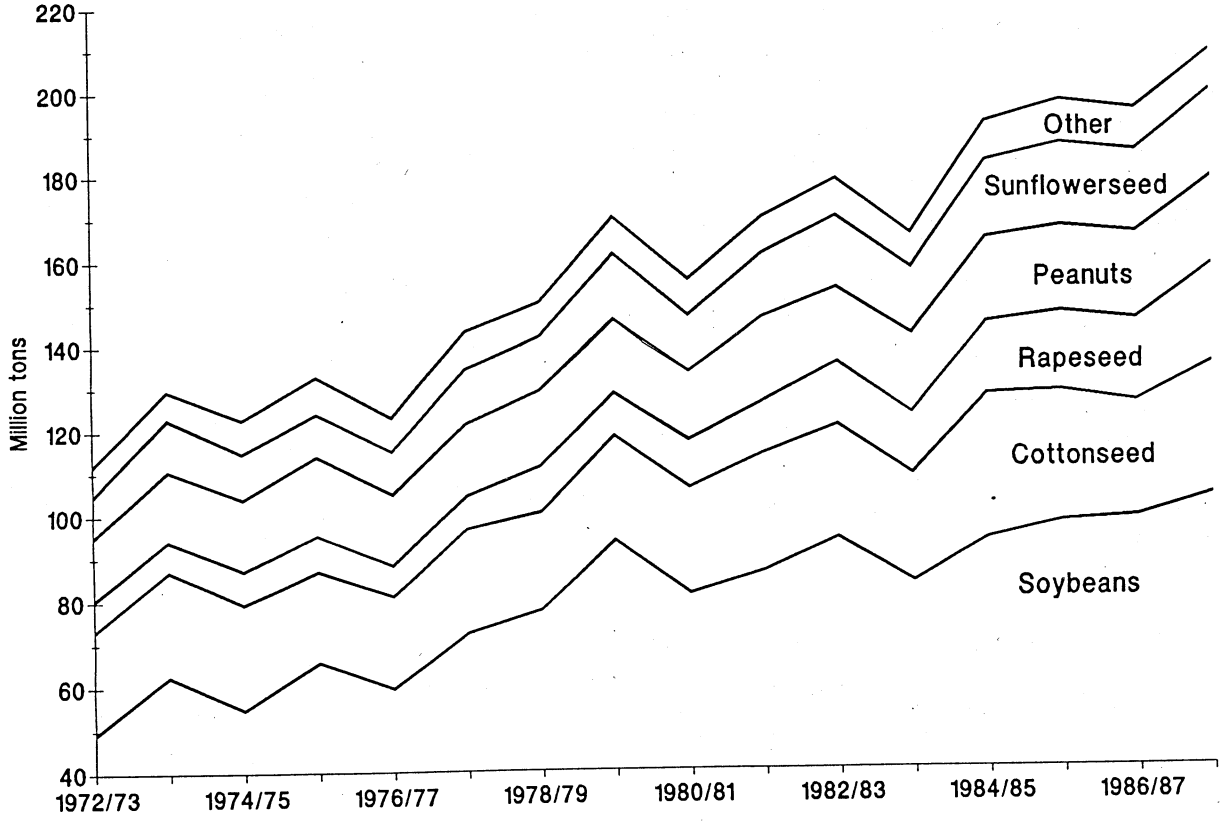


Table 3--Major world oilseeds 1/

Commodity	Share of world trade	Leading exporters	Share	Leading importers	Share	Share of world production	Leading producers	Share	Share of world consumption	Leading consumers	Share
	Percent		Percent		--Percent--			--Percent--			Percent
Soybeans	75.8					49.9			51.6		
		United States	73.7	EC-12	48.0		United States	54.4		United States	37.1
		Brazil	8.8	Japan	17.0		Brazil	16.6		Brazil	15.9
		Argentina	7.0	Taiwan	6.7		China	11.5		EC-12	15.7
		China	5.3	USSR	6.0		Argentina	8.1		Argentina	6.7
Rapeseed	11.5					10.2			11.6		
		EC-12	45.1	EC-12	51.9		China	29.7		China	29.0
		Canada	41.5	Japan	36.5		EC-12	21.8		EC-12	24.1
		E. Europe	10.3	Mexico	5.3		Canada	18.2		India	14.0
		OW Europe	2.1	USSR	2.9		India	13.8		E. Europe	8.8
Sunflowerseed	5.3					10.0			10.5		
		EC-12	64.7	EC-12	74.9		USSR	27.9		USSR	24.3
		United States	15.9	Mexico	15.7		EC-12	16.9		EC-12	19.6
		Argentina	10.5	E. Europe	4.9		Argentina	15.8		Argentina	16.4
		E. Europe	5.7	United States	.8		E. Europe	12.2		E. Europe	13.3
Cottonseed	.7					14.9			14.2		
		Australia	30.8	Japan	56.9		China	22.9		China	21.9
		China	21.0	EC-12	13.9		USSR	16.3		USSR	17.7
		Thailand	8.8	Mexico	13.5		United States	15.2		United States	12.3
		Togo	8.7	Lebanon	7.1		India	11.2		Pakistan	10.0
Peanuts	3.5					10.1			6.5		
		China	27.6	EC-12	45.4		China	31.1		India	41.2
		United States	26.8	Japan	9.6		India	26.6		China	31.0
		Argentina	13.1	Canada	7.6		United States	8.6		Senegal	4.4
		EC-12	4.2	Singapore	6.9		Senegal	3.9		Burma	4.2
Copra	.9					2.4			3.0		
		Philippines	32.0	EC-12	30.3		Philippines	43.8		Philippines	43.7
		Papua New Gui	25.1	Japan	25.4		Indonesia	26.2		Indonesia	25.1
		New Hebrides	9.6	So. Korea	10.0		India	6.9		India	6.9
		B. Solomon Is	8.7	Singapore	8.5		Sri Lanka	3.2		Sri Lanka	3.2
Palm kernel	.4					1.3			1.6		
		Nigeria	54.6	EC-12	93.4		Malaysia	53.7		Malaysia	55.8
		Papua New Gui	18.9	Japan	6.0		Indonesia	12.4		Indonesia	13.2
		Cameroon	6.0	Malaysia	.6		Nigeria	11.5		Nigeria	7.4
		Guinea-Bissau	5.2				Benin	2.9		EC-12	3.2
Flaxseed	1.9					1.2			1.1		
		Canada	90.7	EC-12	67.7		Canada	36.3		Argentina	25.6
		EC-12	6.0	Japan	12.4		Argentina	22.3		EC-12	22.9
		United States	2.2	United States	9.7		India	25.3		India	17.9
		Argentina	1.0	E. Europe	8.5		United States	9.5		United States	14.4

1/ All numerical references are to 1985/86-1987/88 averages. Totals may not sum to 100 percent due to rounding. Data appearing in the table for the EC include intra-Community trade.

Soybeans and soybean meal account for an even larger share of world oilseed and oilseed meal trade, about 70-75 percent in recent years (tables 3 and 4). Rapeseed ranks a distant second to soybeans, accounting for 11 percent and 5 percent of world oilseed and meal trade, respectively. Next is sunflowerseed, whose share of global oilseed and meal trade is roughly 5 percent. The remaining 10-20 percent share of trade is accounted for by five other oilseeds: peanuts, cottonseed, flaxseed, copra, and palm kernels.

The only oilseed product market where soybeans have not captured the largest share is in world vegetable oil trade (table 5). There, palm oil ranks first, accounting for more than a third of world vegetable oil trade. Soybean oil captures roughly one-fifth of global exports. Next are sunflowerseed oil, coconut oil, and rapeseed oil, at 5-15 percent each. The remaining 10-20 percent of global trade is divided among cottonseed, peanut, olive, and palm kernel oils.

World Soybean and Product Supplies

Four producers account for about nine-tenths of global soybean output and exports: the United States, Brazil, Argentina, and China (table 3). Throughout the 1980's, the U.S. shares of global soybean production and trade have gradually declined (figs. 6 and 7).

United States. The United States typically produces more than 50 percent of global soybean output. Roughly one-half of U.S. soybeans is exported either as unprocessed beans or soybean meal. Often more than 40 percent of U.S. soybean shipments goes to the EC; another 30-35 percent goes to Japan, Taiwan, and South Korea (fig. 8).

The largest share of U.S. soybean meal has gone to the EC (fig. 9). Other important markets such as the Soviet Union have been growing more rapidly in recent years, contributing significantly to U.S. soybean meal export growth. Soybean meal usually accounts for all but 3-4 percent of U.S. oilseed meal exports. U.S. soybean oil, mostly shipped under export assistance programs, primarily goes to developing countries (fig. 10).

Brazil and Argentina. Although Brazilian soybean production has continued to trend upward, Brazil has not significantly increased its aggregate shares of global soybean and soybean meal trade since the mid-1970's (fig. 11). Argentina's soybean output has grown at a faster rate than Brazil's, and its aggregate share of world soybean and soybean meal exports has increased throughout the last two decades (fig. 12). Brazilian and Argentine soybean production usually accounts for about one-quarter of global output.

Brazilian and Argentine soybeans and soybean products are priced to move on world markets, in contrast to the U.S. policy of using the Commodity Credit Corporation to buy and stock soybeans when prices fall to nonrecourse loan levels. Although Brazil also has a type of nonrecourse loan, its low rate rarely contributes to the building of stocks. Stocks are usually maintained at low levels in both Argentina and Brazil as storage costs are high, particularly because of triple-digit inflation.

Like the United States, Brazil and Argentina send the largest share of their soybeans and soybean meal exports to the EC. Japan is a major purchaser of soybeans, and the Soviet Union and Eastern Europe are important markets for

Table 4--Major world oilseed meals 1/

Commodity	Share of world trade	Leading exporters	Share	Leading importers	Share	Share of world production	Leading producers	Share	Share of world crush	Leading crushers	Share
	Percent		Percent			--Percent--			--Percent--		Percent
Soybean meal	76.5					63.38			63.0		
		Brazil	30.8	EC-12	51.9		United States	37.2		EC-12	28.5
		United States	24.1	E. Europe	14.5		EC-12	15.9		United States	28.0
		EC-12	19.1	USSR	8.4		Brazil	15.7		E. Europe	7.3
		Argentina	16.0	Venezuela	2.6		Argentina	6.7		USSR	5.8
Rapeseed meal	5.3					10.8			10.9		
		EC-12	37.5	EC-12	57.8		China	29.7		EC-12	27.3
		China	28.4	Japan	12.0		EC-12	23.5		China	25.0
		Canada	22.3	United States	9.0		India	15.6		India	14.6
		E. Europe	5.2	South Korea	8.2		E. Europe	8.3		Japan	9.7
Sunflower-seed meal	5.1					7.5			7.5		
		Argentina	67.0	EC-12	88.2		USSR	24.2		EC-12	36.0
		EC-12	25.0	Cuba	5.8		EC-12	22.1		USSR	24.2
		United States	2.6	E. Europe	4.0		Argentina	15.7		E. Europe	11.3
		India	1.7	Canada	.8		E. Europe	10.7		China	7.6
Cottonseed meal	2.7					10.3			10.3		
		China	43.0	EC-12	69.8		China	21.9		China	18.2
		Paraguay	9.9	E. Europe	7.4		USSR	17.5		USSR	17.5
		Argentina	7.1	So. Africa	6.1		United States	12.1		United States	12.0
		Brazil	6.2	So. Korea	4.9		Pakistan	9.8		Pakistan	9.8
Peanut meal	2.0					4.1			4.1		
		India	38.2	E. Europe	44.9		India	42.6		India	36.6
		Senegal	25.7	EC-12	34.9		China	30.6		China	28.2
		China	14.5	USSR	6.1		Senegal	4.3		E. Europe	7.2
		Sudan	7.6	Thailand	5.8		Burma	4.0		EC-12	5.6
Copra meal	3.6					1.7			1.7		
		Philippines	57.0	EC-12	97.3		Philippines	43.2		EC-12	66.7
		Indonesia	33.1	OW Europe	2.1		Indonesia	26.0		India	7.1
		EC-12	3.6	Malaysia	.4		India	7.4		Indonesia	4.6
		Papua New Gui	1.6	Singapore	.1		Malaysia	2.8		Philippines	3.4
Palm kernel meal	3.1					1.3			1.3		
		Malaysia	72.2	EC-12	99.6		Malaysia	57.4		EC-12	80.5
		Indonesia	15.7	OW Europe	.4		Indonesia	12.5		Nigeria	3.5
		Nigeria	5.1				Nigeria	7.2		Benin	2.0
		EC-12	1.7				EC-12	3.7		China	1.9
Linseed meal	1.7					1.1			1.2		
		Argentina	54.8	EC-12	95.4		Argentina	26.1		EC-12	55.3
		EC-12	33.3	E. Europe	2.3		EC-12	22.7		India	17.2
		United States	10.7	OW Europe	2.0		India	18.8		United States	9.0
		India	.4	United States	.4		United States	14.7		E. Europe	7.4

1/ All numerical references are to 1985/86-1987/88 averages. Totals may not sum to 100 percent due to rounding. Data appearing in the table for the EC include intra-Community trade.

Table 5--Major world oils 1/

Commodity	Share of world trade	Leading exporters	Share	Leading importers	Share	Share of world production	Leading producers	Share	Share of world crush	Leading crushers	Share
	Percent		Percent			--Percent--			--Percent--		Percent
Soybean oil	22.3					30.0			29.8		
		EC-12	36.7	EC-12	14.5		United States	38.0		United States	33.4
		Argentina	23.0	Iran	11.0		Brazil	16.8		Brazil	13.5
		Brazil	18.3	India	9.9		EC-12	15.5		EC-12	10.0
		United States	17.4	Pakistan	8.7		Argentina	6.4		China	5.3
Palm oil	35.3					16.7			16.8		
		Malaysia	69.4	EC-12	18.2		Malaysia	57.2		India	11.5
		Indonesia	12.6	India	15.8		Indonesia	16.1		EC-12	11.3
		Singapore	9.8	Singapore	11.4		Nigeria	7.6		Nigeria	8.6
		EC-12	2.8	Pakistan	8.6		Ivory Coast	2.6		Indonesia	8.3
Rapeseed oil	9.5					13.9			13.6		
		EC-12	71.0	EC-12	30.2		China	25.9		China	28.0
		Canada	15.6	India	17.3		EC-12	25.8		India	16.5
		E. Europe	5.9	United States	7.4		India	12.5		EC-12	15.7
		OW Europe	4.1	Morocco	6.7		E. Europe	9.6		Japan	9.6
Sunflower-seed oil	12.0					13.8			13.8		
		Argentina	38.5	EC-12	23.1		USSR	26.6		USSR	29.3
		EC-12	8.0	Egypt	13.5		EC-12	20.7		EC-12	19.0
		E. Europe	15.7	USSR	11.9		Argentina	16.5		E. Europe	10.5
		United States	11.3	Algeria	6.7		E. Europe	13.3		Turkey	5.9
Cottonseed oil	1.9					6.7			6.9		
		United States	49.6	Egypt	36.8		USSR	19.4		USSR	19.5
		Brazil	29.2	Venezuela	19.7		China	18.1		China	18.1
		Argentina	6.3	Japan	10.6		United States	13.9		United States	9.0
		Paraguay	6.2	El Salvador	9.1		India	8.9		India	8.9
Peanut oil	2.0					6.0			6.1		
		Senegal	30.8	EC-12	79.6		India	42.1		India	42.3
		China	19.1	Hong Kong	9.4		China	27.3		China	25.5
		Argentina	16.6	OW Europe	3.2		Senegal	5.1		EC-12	7.8
		EC-12	12.4	United States	1.7		Burma	4.8		Burma	4.8
Coconut oil	8.8					6.0			5.9		
		Philippines	69.2	EC-12	38.8		Philippines	44.3		Indonesia	20.9
		Indonesia	8.4	United States	36.3		Indonesia	24.4		EC-12	19.0
		EC-12	4.4	USSR	3.8		India	7.0		United States	16.0
		Malaysia	3.4	China	2.8		Sri Lanka	3.1		Philippines	9.8
Palm kernel oil	4.1					2.3			2.3		
		Malaysia	76.4	EC-12	49.9		Malaysia	54.4		EC-12	31.1
		Indonesia	10.7	United States	26.1		Indonesia	13.8		United States	15.8
		EC-12	5.4	Singapore	4.0		Nigeria	7.7		Indonesia	7.3
		Ivory Coast	2.0	So. Africa	3.9		EC-12	3.3		Malaysia	7.2
Linseed oil	1.5					1.3			1.2		
		Argentina	55.6	USSR	39.4		Argentina	24.0		India	18.5
		EC-12	41.2	EC-12	24.4		EC-12	23.7		USSR	16.5
		United States	1.8	E. Europe	21.7		India	17.3		EC-12	16.4
		Japan	.7	China	8.0		United States	15.0		E. Europe	15.8
Olive oil	2.7					3.4			3.6		
		EC-12	81.5	EC-12	58.1		EC-12	80.5		EC-12	73.1
		Tunisia	11.3	United States	12.8		Tunisia	6.3		United States	3.8
		Turkey	4.7	Libya	10.0		Turkey	4.4		Syria	3.6
		Argentina	2.1	USSR	5.2		Syria	3.0		Turkey	3.4

1/ All numerical references are to 1985/86-1987/88 averages. Totals may not sum to 100 percent due to rounding. Data appearing in the table for the EC include intra-Community trade.

Figure 6--World soybean production and U.S. share

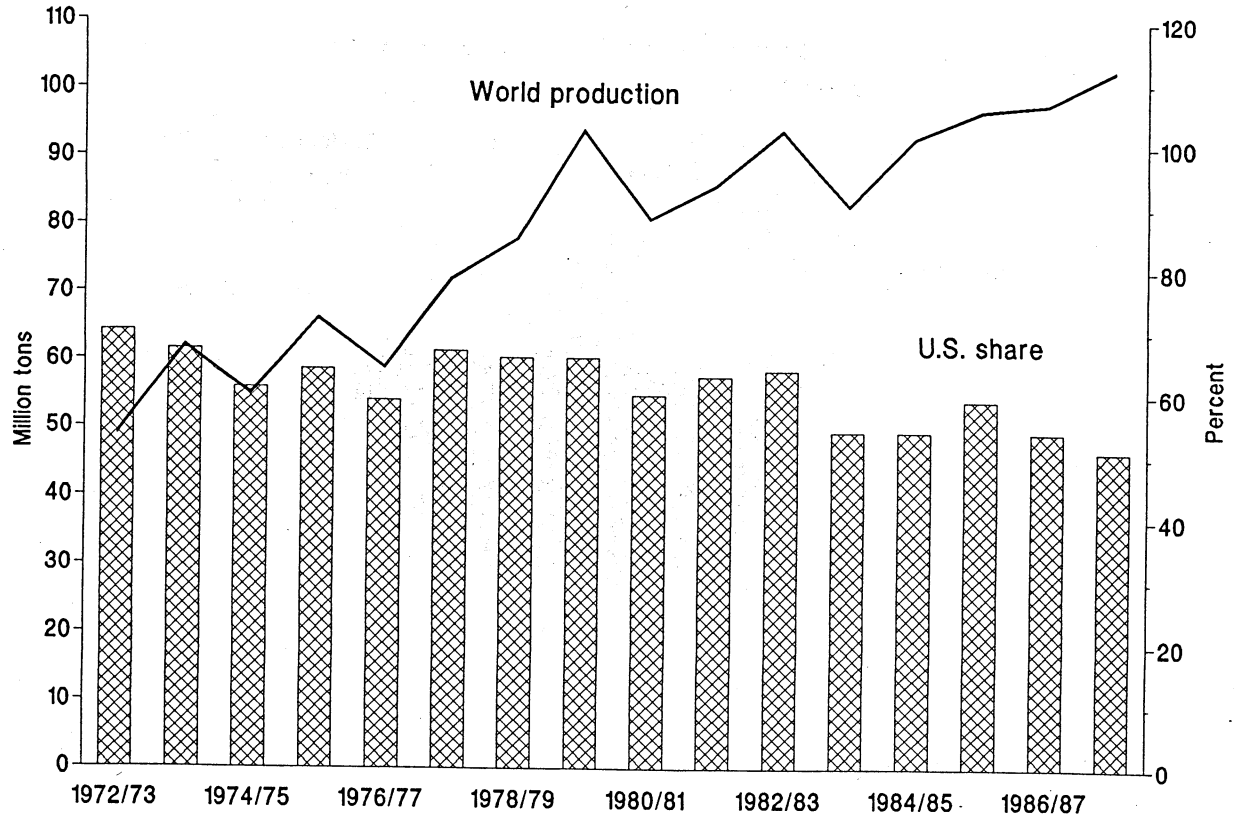
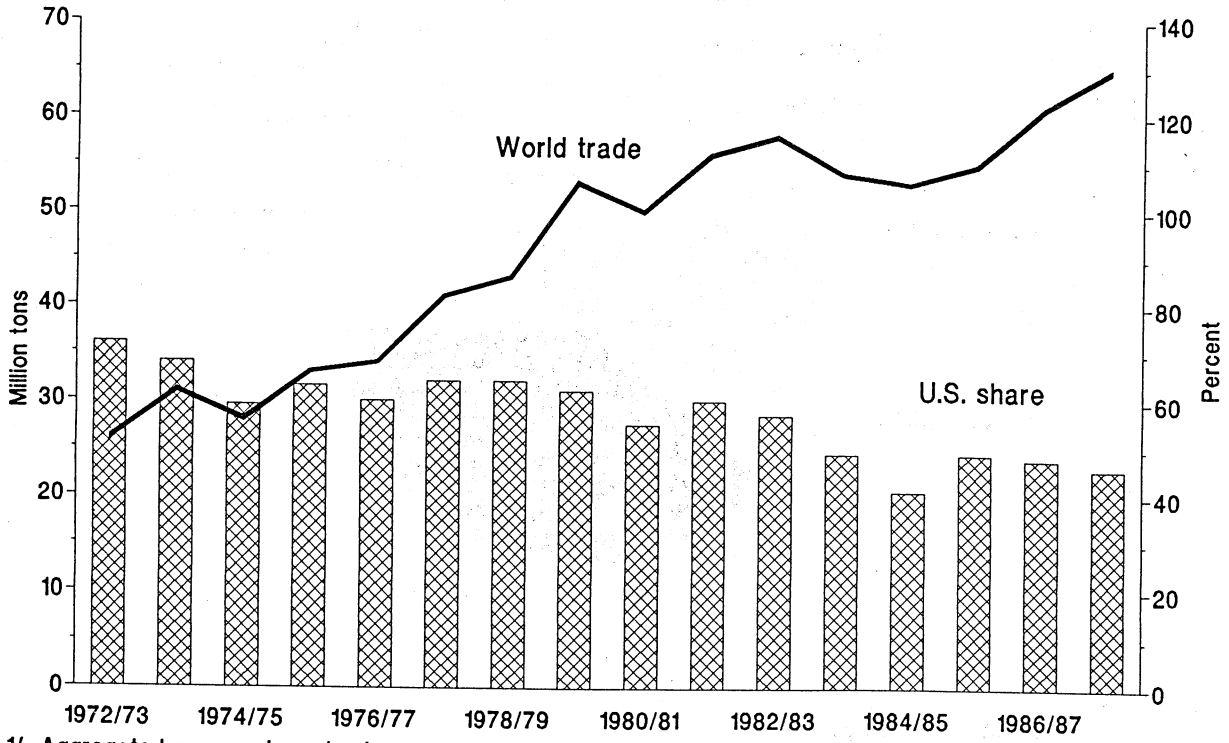
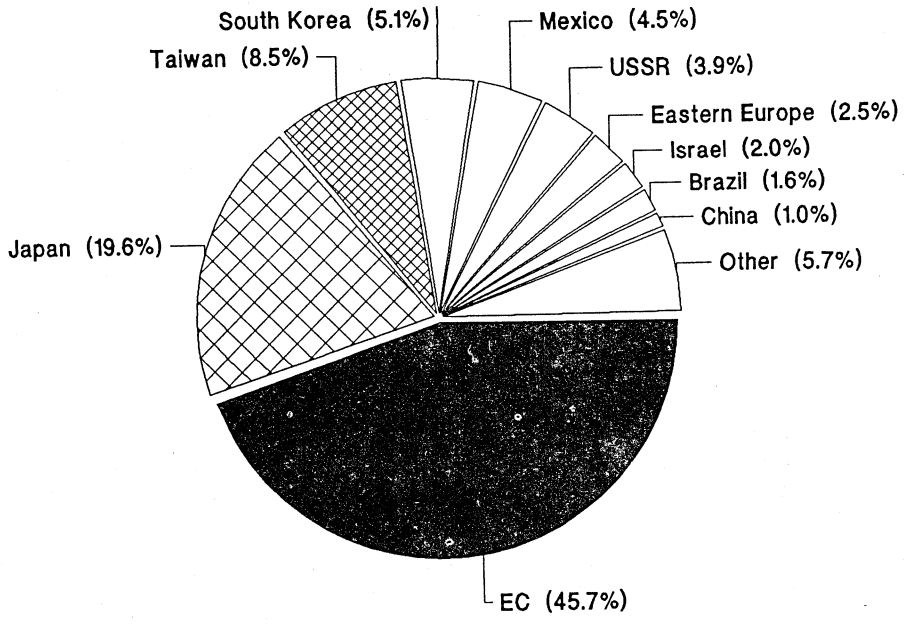


Figure 7--World soybean and soybean meal trade and U.S. share 1/



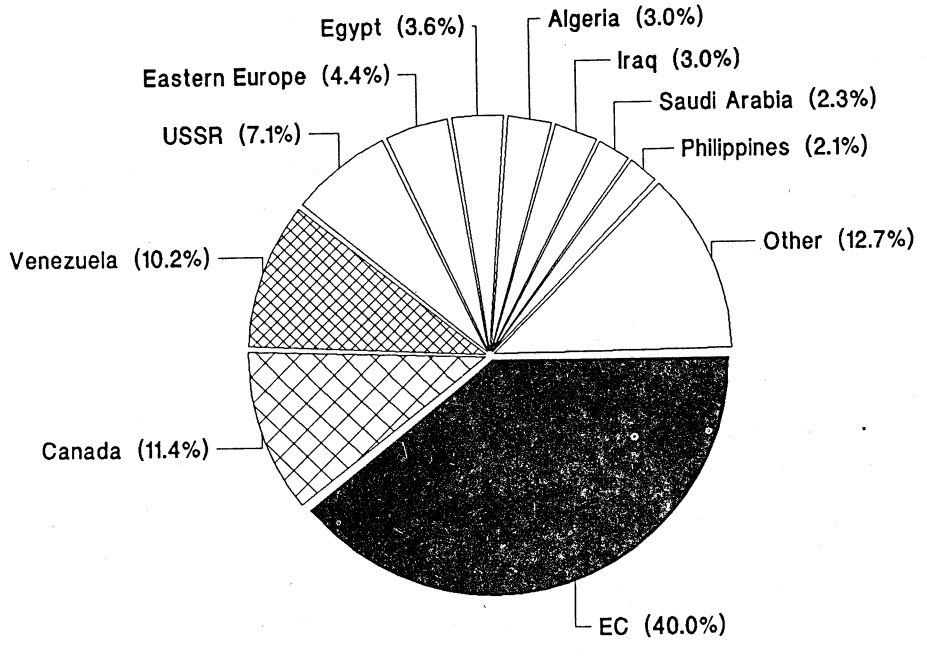
1/ Aggregated on a soybean basis.

Figure 8--U.S. soybean export markets 1/



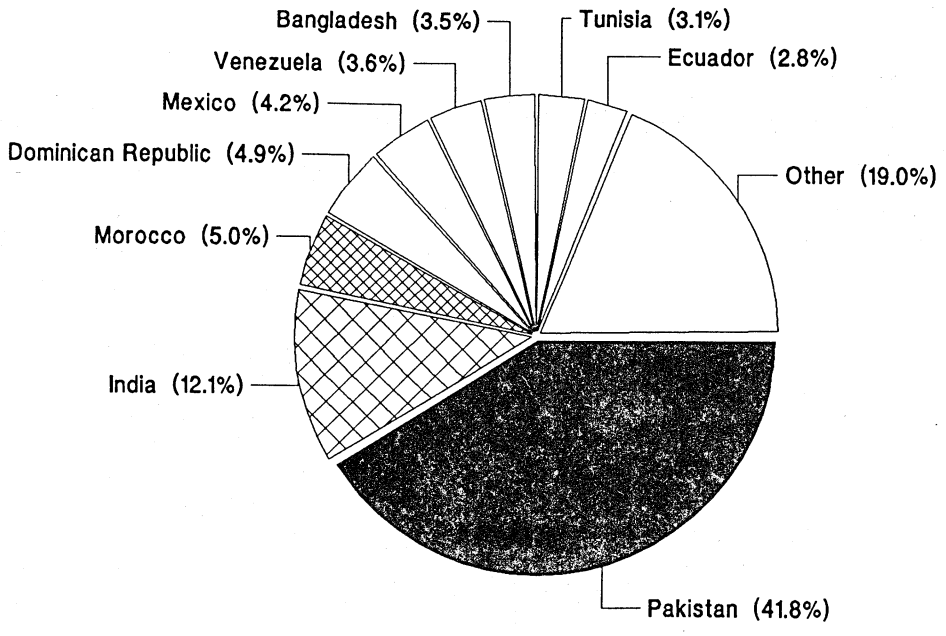
1/ Fiscal year 1986-88 average.

Figure 9--U.S. soybean meal export markets 1/



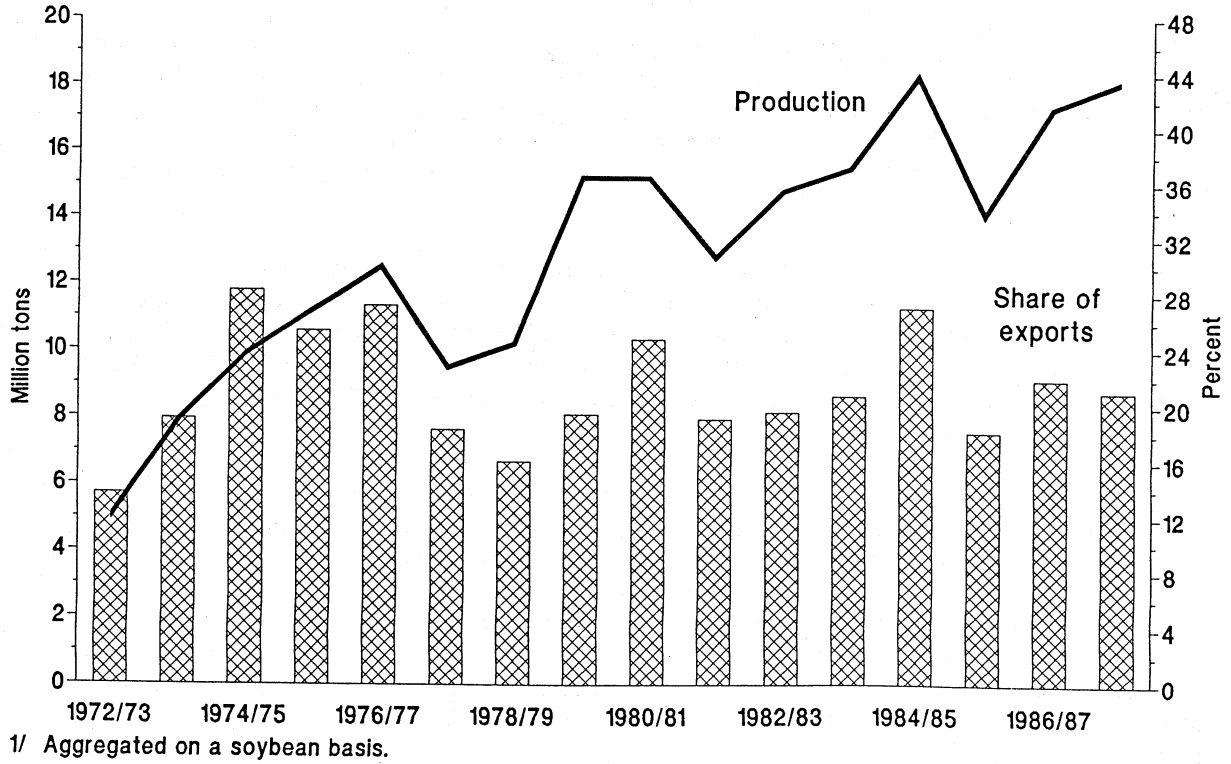
1/ Fiscal year 1986-88 average.

Figure 10--U.S. soybean oil export markets 1/



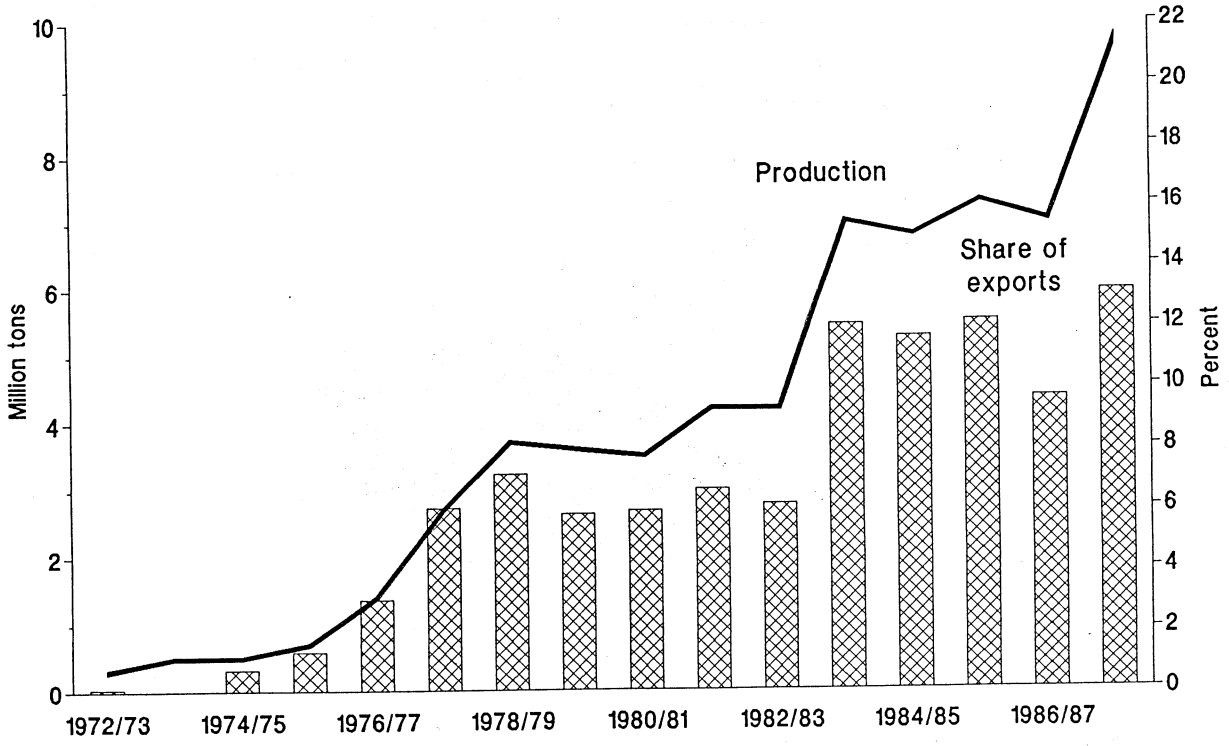
1/ Fiscal year 1986-88 average.

Figure 11--Brazilian soybean production and share of world soybean and soybean meal exports 1/



1/ Aggregated on a soybean basis.

Figure 12--Argentine soybean production and share of world soybean and soybean meal exports 1/



1/ Aggregated on a soybean basis.

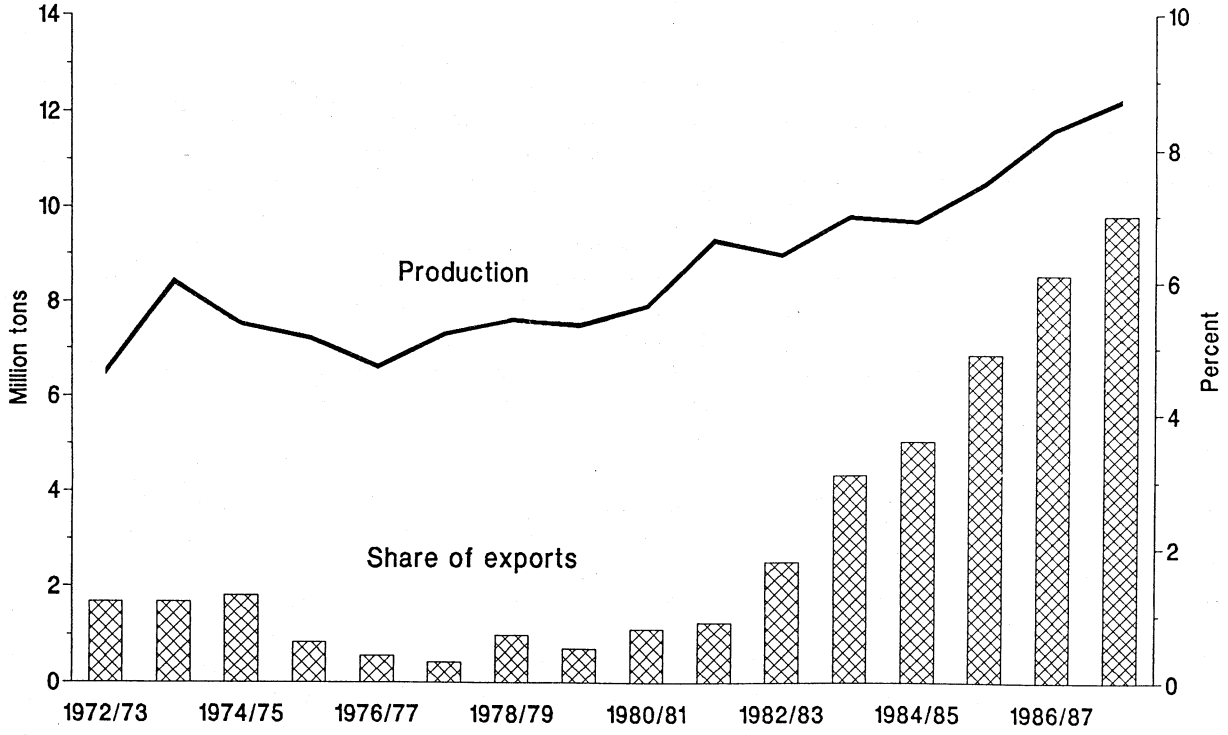
both soybeans and soybean meal. The largest soybean oil export markets for Brazil and Argentina are frequently India, Iran, and China.

China. China's soybean production generally accounts for about one-tenth of global soybean output. In contrast to other major soybean producers, China has tended to export a small share of its total domestic production. Since the early 1980's, China, like Argentina, has expanded its exports and captured a larger share of global trade in soybeans and, more recently, soybean meal (fig. 13).

Although most of China's soybeans are processed for food, the share of soybeans crushed is increasing. In contrast to most other countries, the demand for oil rather than for meal is driving crush as incomes rise. Instead of using the increased amount of processed meal at home, China is exporting it, primarily to Japan, the Philippines, South Korea, Thailand, Malaysia, the EC, and Eastern Europe.

Annual exports of more than a million tons of soybean meal have exacerbated China's continued shortage of feed ingredients. The Government has opted to increase export earnings partly because of internal distribution difficulties. Japan and South Korea are important soybean meal export destinations. The use of other oilseed meals for feed is not as efficient because China mainly raises hogs and chickens. Fish, cottonseed, and rapeseed meals are toxic to these animals in large quantities (36). China also usually exports over a million tons of soybeans, primarily to the Soviet Union and Japan.

Figure 13--China's soybean production and share of world soybean and soybean meal exports 1/



1/ Aggregated on a soybean basis.

Other Producers. Paraguay and the EC also produce over a million tons of soybeans annually. The former is a long-time producer and exporter, but the EC's ascension among global soybean producers is more recent and sudden. Between 1984 and 1988, EC soybean output rose tenfold in response to price supports set well in excess of world market levels. Nonetheless, EC soybean production remains less than 2 percent of global output and accounts for only 1 of every 10 tons of soybeans consumed by the EC. More than 90 percent of EC soybeans are produced in Italy.

Paraguay exports a full range of soybean products; the EC exports soybean meal and oil, and the volume of its oil shipments is significant. The EC typically exports 400,000-800,000 tons annually to non-EC countries, frequently ranking first or second among global soybean oil exporters.

The EC's proximity to protein-deficient Eastern Europe, the Soviet Union, and other West European countries often enables it to earn significant revenue from exporting soybean meal. During 1985/86-1987/88, EC soybean meal exports exceeded 1.9 million tons annually.

World Import Demand

More than two-thirds of global soybeans and soybean meal is consumed in the United States, the EC, the Soviet Union, Eastern Europe, and Japan. Aside from the United States, all meet their domestic needs for the most part through imports.

EC. The EC is the world's largest importer of oilseeds and oilseed meal. Total EC imports of soybeans and soybean meal often approach or exceed 30 million tons (on a soybean basis), dwarfing the imports of other large importers (tables 3 and 4).

EC demand for oilseeds and oilseed meal is large because of the high price ratio between grains and oilseeds that results from the implementation of its Common Agricultural Policy (CAP). These CAP price distortions have significantly increased oilseed meals' share of EC feed rations.

The overwhelming bulk of EC oilseed imports is soybeans. In recent years, EC soybean imports have accounted for almost one-half of global imports. Imports of soybeans alone (11.3 million tons in 1988/89) continue to exceed the burgeoning output of all EC oilseeds (11 million tons). The EC's shares of global soybean and soybean meal imports have trended downward in recent years because of the EC's heavy subsidization of domestic oilseed production beginning in the early 1980's (figs. 14 and 15).

EC derived demand for imported soybean protein is almost evenly divided between soybeans and soybean meal. The EC's import mix of soybeans and soybean meal depends on crushing margins that are determined by the relative prices of soybeans to soybean meal and oil. Soybean meal has accounted for the overwhelming share of EC oilseed meal imports. Volume of EC soybean meal imports is 3-4 times greater than the world's second and third ranked importers of soybean meal, Eastern Europe and the Soviet Union.

Japan. As in a number of East Asian countries, expanding livestock sectors have increased Japan's demand for oilseeds and feed grains in animal rations. Japan meets the overwhelming share of its needs through imports. Its small domestic soybean production, supported by government assistance, is used mainly for human consumption. Agriculture in Japan is generally private and small scale.

Japanese soybean imports exceed 4 million tons annually, second in volume only to the EC. Imports of U.S. soybean meal are small relative to imports of soybeans because the Japanese prefer to process soybeans to satisfy domestic demand for vegetable oil, soymilk (a watery extract), tofu (a protein curd), and other food products. About one-quarter of soybeans are not crushed but go directly into food channels. In contrast, in the United States, crushing accounts for more than 90 percent of soybean consumption. Oil, crushed from soybeans, accounts for more than three-fourths of total Japanese vegetable oil consumption.

However, in recent years, Japan's large purchases of Chinese meal have induced the Japanese to reduce soybean crushing, consequently increasing their demand for alternative sources of vegetable oil. This has encouraged rapeseed imports because rapeseed has a higher oil content. Soybean meal from China has made inroads into the Japanese import market because of its low transportation cost relative to that of North and South American soybean product exporters.

The Soviet Union. The Soviet Union is forecast to move ahead of Japan as the second largest importer of soybeans and soybean meal (aggregated together) in 1989. For the foreseeable future, Soviet purchases of soybeans and soybean meal are expected to remain high and not exhibit the wide swings of past imports, particularly imports of soybean meal (fig. 16). The upward trend in

Figure 14--EC oilseed production and imports

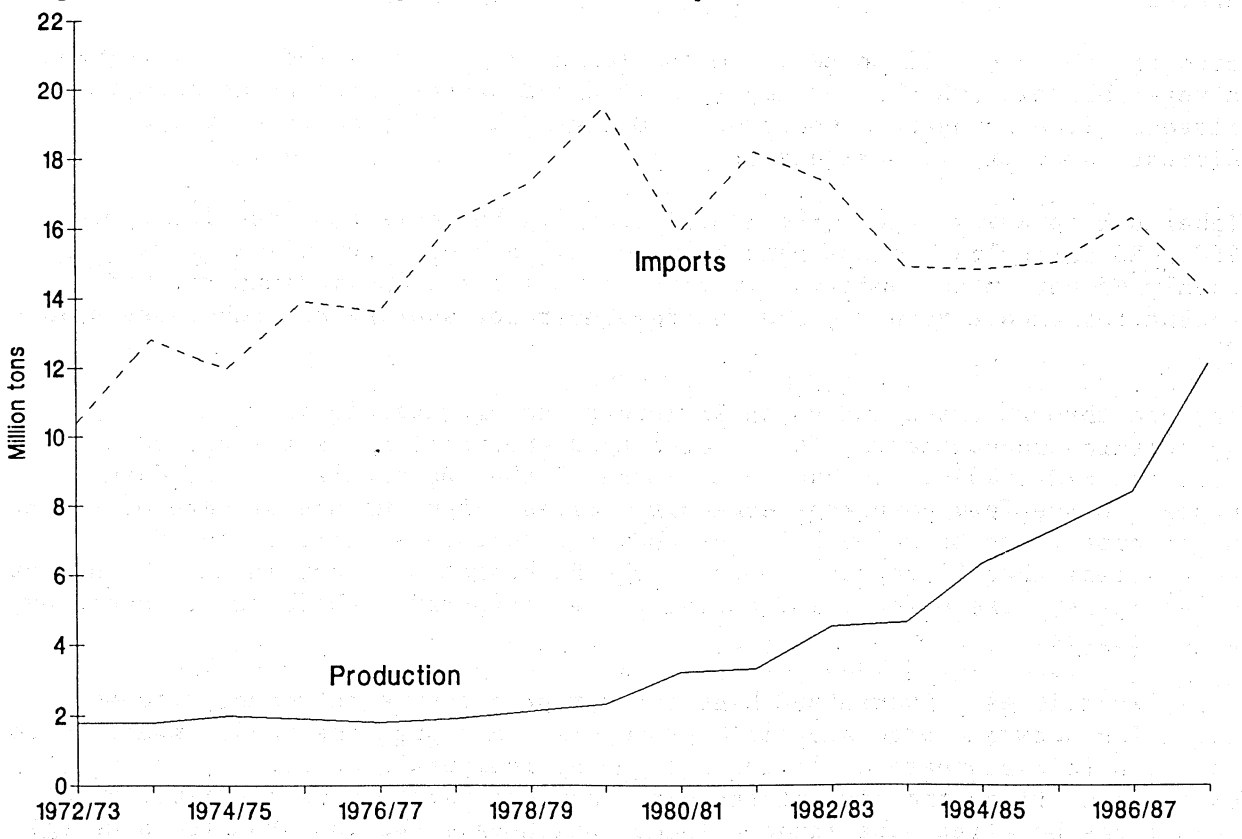


Figure 15--EC share of world soybean and soybean meal imports

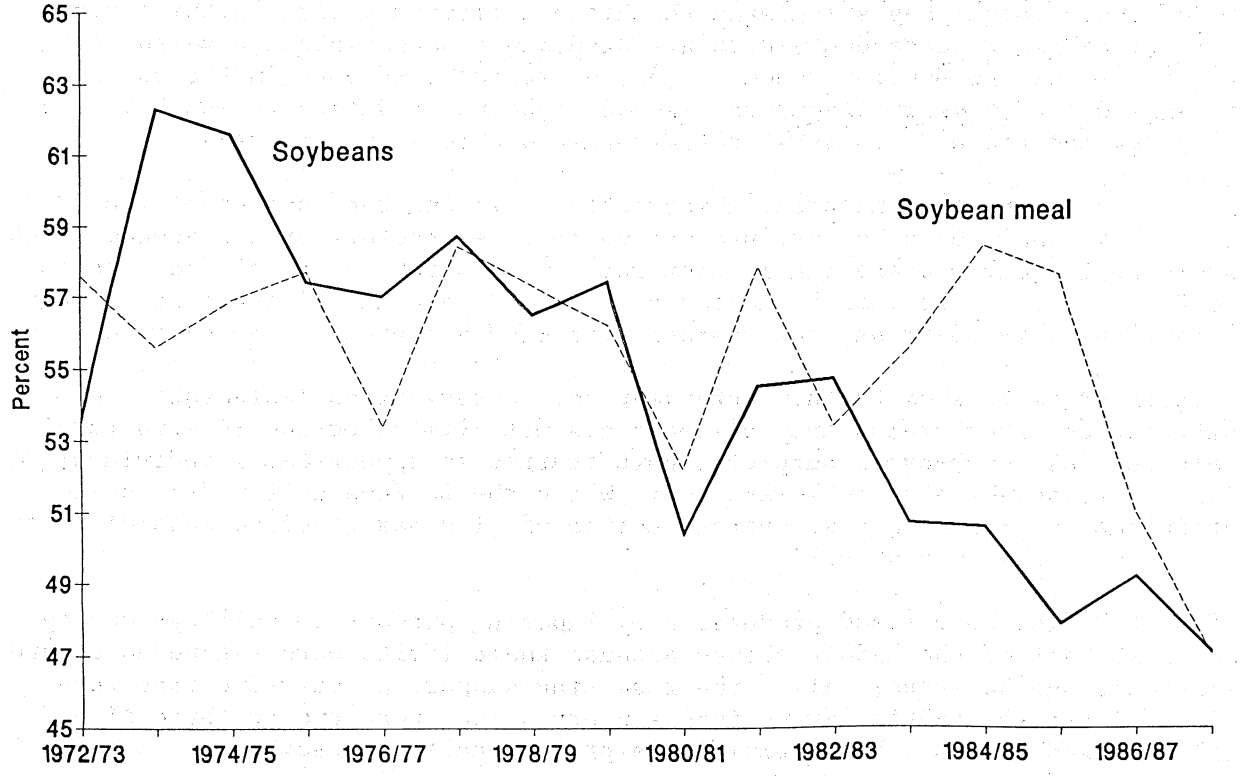
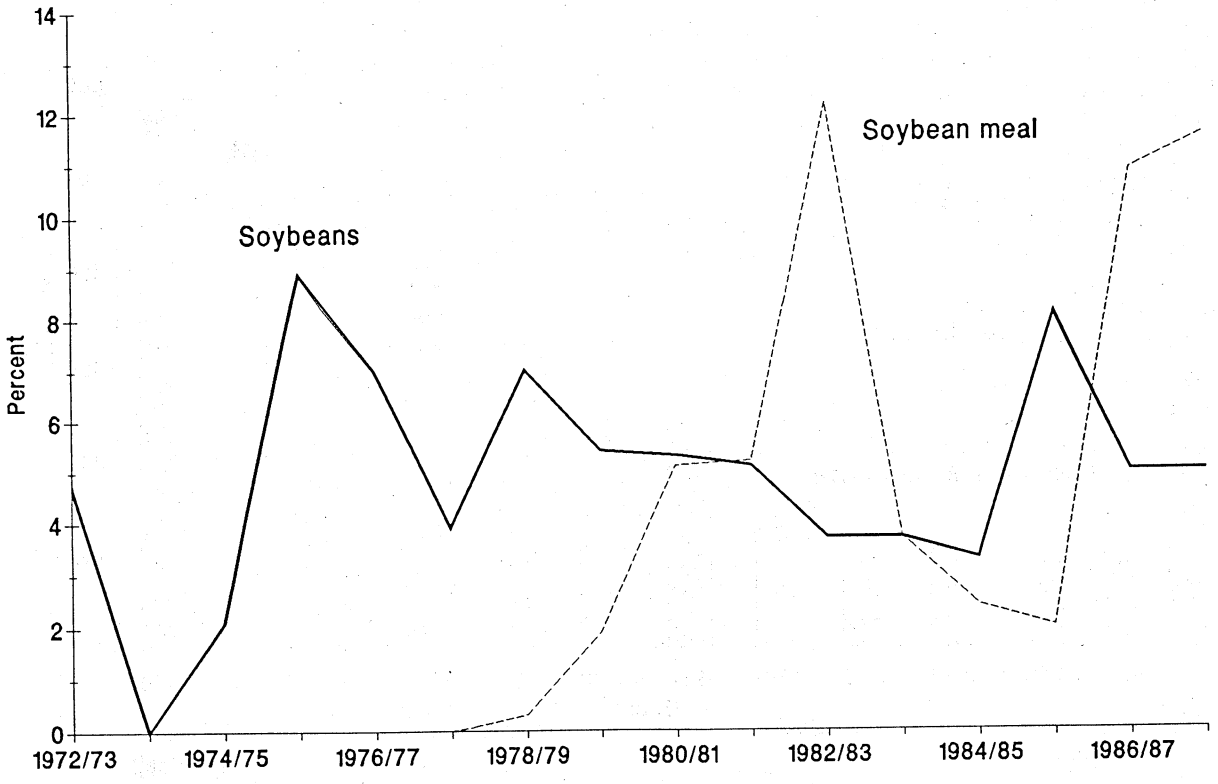


Figure 16--Soviet Union's share of world soybean and soybean meal imports



Soviet soybean meal imports since the mid-1980's is likely the result of General Secretary Gorbachev's initiative to increase the protein content of concentrated feed (20).

Prior to the Soviet leadership change in 1986, oilseed meal's share of feed rations was relatively low. As a result, Soviet animal productivity was poor, particularly for a developed country. Per capita meat consumption in the Soviet Union is less than that of the United States and all but one EC country (Portugal). The Soviet protein shortage is estimated at 10-15 million tons in soybean meal equivalent. The government daily Pravda indicated that one-third of poultry feed, one-third of hog feed, and one-half of cattle feed domestic output are deficient in protein (33). Overall, oilseed meal accounts for only 9 percent of Soviet mixed feeds (33).

Soviet average soybean meal imports during 1987-88 are twice as large as those averaged during the previous 2 years. The United States has been a direct beneficiary of these policies since 1987, when the USSR re-entered U.S. soybean meal markets after almost a 10-year absence to make unprecedented purchases. Soviet purchases of U.S. soybean meal have exceeded 1 million tons annually, roughly one-third of all U.S. soybean meal exports. As the Soviets' feeding of protein meal has increased, so too has their importing of corn for feeding, reflecting the complementary relationship between the two concentrates.

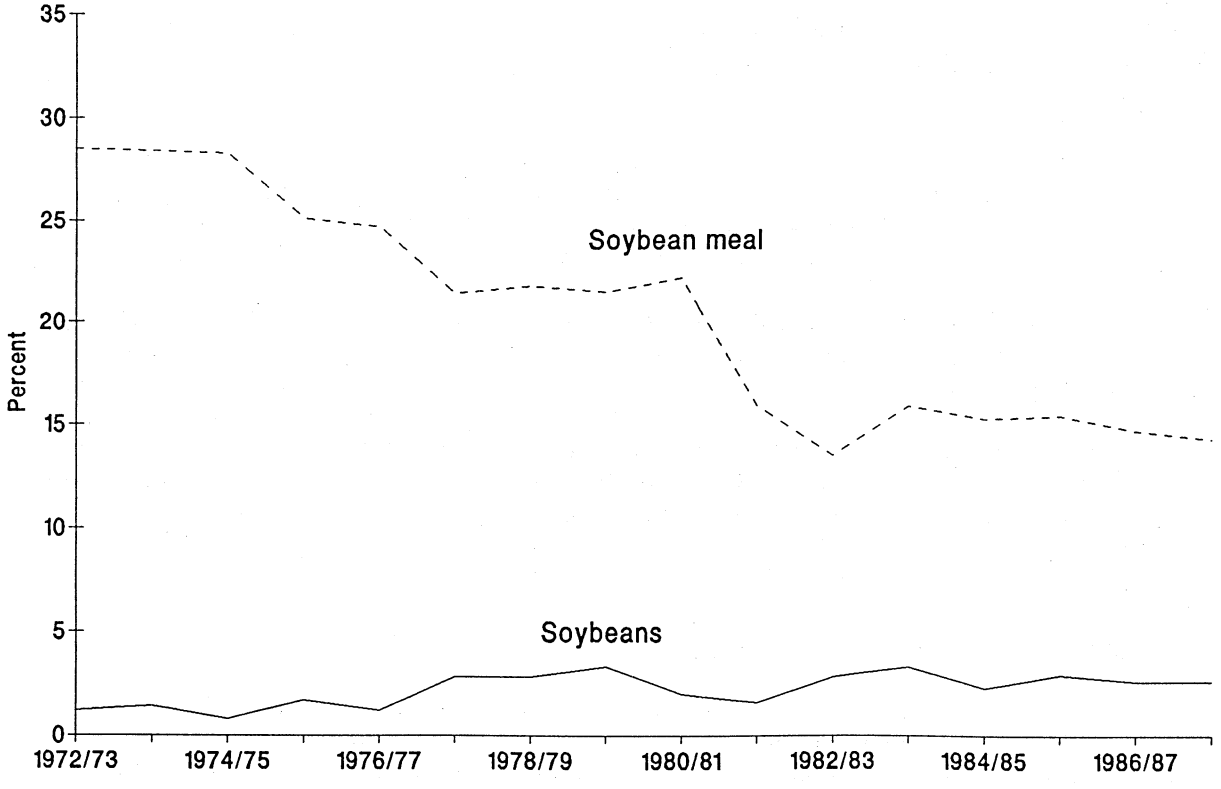
However, higher purchases of soybean meal have reduced the volume of Soviet soybean imports somewhat, with soybean imports averaging 1.0 million tons

during 1987-88, compared with 1.9 million tons during the previous 2 years. More than half of Soviet soybean imports come from the United States. If the Soviets were to reduce soybean imports much more, their vegetable oil imports would likely rise in order to offset the loss of oil processed from imported soybeans that is needed to raise domestic vegetable oil consumption.

Soviet crushing capacity limitations likely are the reason that soybean import levels are not higher. Over the last two decades, specialized Soviet soybean crushing capacity has stagnated despite the announcements that domestic soybean and other oilseed production was to expand significantly (2). The Soviet Union approved joint ventures with a foreign multinational firm directed toward increasing Soviet crushing capacity, which may permit larger soybean imports in the future.

Eastern Europe. Eastern Europe is among the top four importers of soybeans and soybean meal. Eastern Europe's share of global soybean meal imports has declined by about one-half since the early 1970's (fig. 17). This decline occurred because of the region's high foreign debt, hard currency and credit shortages, and self-imposed austerity programs. By the mid-1980's, the debt service ratio (the ratio of interest plus debt repayments to the sum of hard-currency nonsocialist merchandise exports and the net balance of invisibles) for most of Eastern Europe was high. The debt service ratio for Poland was 109 percent; Hungary, 70 percent; Yugoslavia, 45 percent; and Czechoslovakia, Romania, and East Germany, 26-31 percent each. All of these countries are large purchasers of soybeans or soybean meal or both (29).

Figure 17--Eastern Europe's share of world soybean and soybean meal imports



Soybean meal still accounts for the overwhelming share of aggregated soybean and soybean meal imports because demand for soybean oil is not high. Eastern Europe meets much of its vegetable oil demand by crushing domestic rapeseed and sunflowerseed. Demand for oils is relatively weak because consumers still favor animal fats.

Eastern Europe is a major buyer of U.S. soybean and soybean meal exports. Oilseeds and products usually account for more than one-half of total U.S. agricultural exports to Eastern Europe.

Other Importers. Taiwan and South Korea together constitute the fifth largest group of soybean and soybean meal importers, often purchasing more than 3 million tons annually (on a soybean basis). The bulk of their imports are soybeans. Among other noteworthy importers are Canada and Venezuela, whose mixes of purchases are heavily weighted in favor of soybean meal.

Rapeseed (Canola) and Rapeseed Products

Global rapeseed production has grown faster than any other major oilseed during the last two decades. Between 1973 and 1988, rapeseed output increased at an average annual rate of 7 percent, compared with 4 percent for soybeans.

Although rapeseed accounts for only for about one-tenth of global oilseed production, it has become the second-most-traded oilseed. Between 1980 and 1988, world rapeseed exports increased by more than 90 percent, and rapeseed meal and oil exports more than doubled.

Rapeseed products have become increasingly competitive with soybean products in international oilseed markets. The volume of rapeseed meal fed to livestock has increased because more digestible varieties of rapeseed have been developed which are low in glucosinolate, a compound that limits rapeseed's use in feed.

The amount of rapeseed oil going into human diets has also increased as varieties have been developed which are low in erucic acid, a compound which is linked to heart disease. The older varieties contained more than 40 percent erucic acid. Canadian plant breeders reduced that percentage to 2 percent, calling the rapeseed produced from these new varieties "canola."

Rapeseed oil imports into the United States have grown since the mid-1980's as oil produced from these new varieties received increasing approval from nutritionists particularly because of its low saturated fat content. Rapeseed oil is the least saturated (6 percent) of all vegetable oils, compared with 15 percent for soybeans, 51 percent for palm oil, 66 percent for butter, and 92 percent for coconut oil. In 1985, the Food and Drug Administration granted GRAS (Generally Regarded As Safe) status to low-erucic-acid rapeseed oil. In 1987, the American Health Foundation of New York named one retail brand of rapeseed oil its product of the year.

World Rapeseed and Product Supplies

Virtually all of the world's rapeseed is produced outside the United States. Rapeseed sowing is spreading slowly in the United States. Although no official surveys have been taken, total acreage is estimated to be between 65,000-200,000 acres. Its rate of growth in the United States depends on whether base acreage requirements for program crops are eased in subsequent

U.S. farm legislation and on rapeseed's profitability compared with program crops like winter wheat.

Canada, China, the EC, India, and Eastern Europe are the major rapeseed producers (table 3). Canada, China, and the EC dominate global rapeseed complex trade.

Canada. Ranking first among rapeseed exporting countries, Canada accounted for 41 percent of global rapeseed exports, 22 percent of rapeseed meal exports, and 16 percent of rapeseed oil exports during 1985/86-1987/88. (Most EC rapeseed trade reflected in tables 3-5 is internal.)

Japan is Canada's major rapeseed export market, taking more than 80 percent of Canadian rapeseed exports in recent years. Increased Canadian rapeseed shipments are primarily responsible for reducing soybean's share of overall Japanese oilseed imports 5-10 percent over the last 10 years. Canadian exports of rapeseed meal cut into demand for soybean meal in Japan and South Korea. Canadian rapeseed oil exports go to India, the United States, and traditional U.S. vegetable oil export markets such as Mexico and Morocco.

China. China is almost as dominant in global rapeseed meal markets as Canada, often capturing about 30 percent of global trade. Rapeseed meal is the only product from the rapeseed complex which China exports in large quantities even though China is frequently the largest rapeseed producer in the world. Most rapeseed exports go to Europe and Japan. China consumes most of its rapeseed and rapeseed oil internally. Rapeseed is the major edible oil in south and central China.

EC. The EC now ranks first among global rapeseed producers after a decade of strong growth. Like China, the EC ships relatively little rapeseed outside its borders. In contrast to China, rapeseed meal exports occur only infrequently because of the EC's deficiency in oilseed protein.

The EC is a major global exporter of rapeseed oil. Most of this oil competes with U.S. soybean oil and sunflowerseed oil in Algerian, Moroccan, Tunisian, and Indian markets.

Other Suppliers. India and Eastern Europe produce the remaining quarter of global rapeseed output, most of which they process domestically. India, deficient in vegetable oil, exports most of the meal processed from domestic and imported seed. The largest share of Indian rapeseed meal has gone to the Soviet Union in recent years. Eastern Europe consumes most of the meal and oil internally. However, Poland exports rapeseed because its output often exceeds its domestic oilseed crushing capacity.

World Import Demand

Japan and West Germany usually account for more than one-half of global rapeseed imports. Japan, the United States, and South Korea are the three largest rapeseed meal importers, excluding intra-EC trade. The United States, India, Algeria, Morocco, and recently China are the largest rapeseed oil importers, excluding intra-EC trade.

Sunflowerseed and Sunflowerseed Products

Sunflowerseed is the third-most-traded oilseed. Its meal, relatively high in fiber, is used as roughage in ruminant feeds (for cattle, sheep, and goats). When used in nonruminant feeds (for pigs and chickens), it is most effective when combined with high-lysine supplements such as meat scrap or fish meal (7). Consumer preferences for sunflowerseed oil are strong in North Africa, Europe, the Soviet Union, Mexico, Cuba, and Venezuela. In the United States, sunflowerseed oil has only a small share of the market despite having the second-lowest saturated fat content of any major oilseed.

World Sunflowerseed and Product Supplies

Global output of sunflowerseed exceeds 20 million tons, about the same share of total oilseed production as rapeseed (table 3). The Soviet Union, EC, and Argentina generally account for more than half of global output. Argentina and the United States account for most global sunflowerseed exports. (Most EC sunflowerseed trade reflected in tables 3-5 is internal.)

United States. Despite declining domestic sunflowerseed output, the United States often ranks first in sunflowerseed exports and second in sunflowerseed oil exports among exporting countries. Assisted by Government export aid, a large volume of U.S. sunflowerseed exports has gone to Mexico. Prior to 1985, the EC was a large importer of U.S. sunflowerseed. U.S. sunflowerseed oil often goes to the Middle East, North Africa, Latin America, and western Asia. The United States exports little sunflowerseed meal.

Argentina. Argentina also accounts for a major share of global sunflowerseed and product exports. Argentina produces four to five times U.S. sunflowerseed output and generally ranks second in sunflowerseed exports and first in sunflowerseed meal and oil exports. Most Argentine sunflowerseed exports go to Eastern Europe and Mexico; meal, to the EC and Cuba; and oil, to North Africa, the EC and the Soviet Union. Argentina's sunflowerseed oil exports are about two to three times those of the United States.

Other Suppliers. The Soviet Union and EC process virtually all of their sunflowerseed output. Both consume all of the meal produced and export several hundred thousand tons of oil. Most EC sunflowerseed oil goes to North Africa, and Soviet sunflowerseed oil goes primarily to Cuba and Nicaragua.

World Import Demand

Import demand for sunflowerseed is concentrated primarily in the EC and Mexico. The EC also accounts for most global imports of sunflowerseed meal. The largest sunflowerseed oil importers in recent years have been Egypt and Algeria, followed by Turkey, the Soviet Union, Venezuela, and Cuba.

Cottonseed and Cottonseed Products

Cottonseed production depends on the size of the world cotton crop, which is primarily driven by the demand for cotton fiber. The seed is separated from the fiber and crushed to produce protein meal and oil. Cottonseed meal's use in some livestock rations is limited because it contains a toxic substance, gossypol. As a feed, its most important use is to be fed whole, primarily to dairy cows. Cottonseed oil, with almost twice the saturated fat content of soybean oil, is used in margarine, cooking oils, and inedible products.

World Cottonseed and Product Supplies

China, the United States, the Soviet Union, and India are the major producers of cottonseed, accounting for about two-thirds of global output (table 3). They crush the bulk of their cottonseed and do some whole cottonseed feeding. Less than 1 percent of the more than 30 million tons of cottonseed produced is traded in world markets. Australia, the United States, and China together frequently account for the largest share of global exports from the cottonseed complex.

Australia. Australia, although a minor producer, has been the largest exporter of cottonseed during in recent years, accounting for about 30 percent of global exports.

United States. The United States, often the second-largest producer of cottonseed, is the largest exporter of cottonseed oil, capturing about one-half of global trade. The largest U.S. export markets are Venezuela, El Salvador, Japan, and Egypt. The United States also exports small amounts of cottonseed and cottonseed meal, usually less than 60,000 tons annually.

China. China, the largest producer, typically consumes all of the oil and more than 80 percent of the meal produced from cottonseed. Nonetheless, China dominates world cottonseed meal trade, exporting 3 to 4 times the volume of its closest competitors, Argentina and Brazil. The bulk of Chinese meal exports goes to the EC, Mexico, and Japan.

Other Suppliers. The Soviet Union, whose cottonseed output usually exceeds 4 million tons, consumes virtually all the meal and oil processed from its cottonseed. Important, but lesser, product exporters are Argentina, Brazil, and Paraguay, which account for more than 20 percent of global cottonseed meal trade and more than 40 percent of global cottonseed oil trade.

World Import Demand

Japan, the EC, and Mexico are the largest import markets for cottonseed. The EC imports most cottonseed meal traded in world markets. Egypt is by far the largest importer of cottonseed oil, followed at some distance by Venezuela, Japan, and El Salvador.

Peanuts and Peanut Products

Peanuts are consumed as food and crushed to obtain meal and oil. In the United States, peanuts are primarily used for food. Peanut butter is the most important U.S. peanut product. Abroad, peanuts are primarily used for their meal and oil value. Peanut meal is a highly palatable, quality protein feed supplement used in livestock and poultry feeds (7). Meal containing aflatoxins (produced by molds) has to be avoided to avoid economic losses. Peanut oil's low saturated fat content helps maintain its popularity with consumers.

World Peanut and Product Supplies

Global output exceeds 20 million tons. China and India are the major producers, typically accounting for more than 50 percent of production (table 3). Lesser producers are the United States, Senegal, Nigeria, and Argentina.

Peanuts, rather than their byproducts, account for most trade in the peanut complex. Peanut meal and peanut oil trade are relatively small, ranking second-to-last among the major oilseeds. The United States, China, Argentina, India, and Senegal capture the major share of peanut and peanut product export trade.

China. The Chinese consume peanuts both whole and as peanut oil. Peanut exports represent a small fraction of China's annual domestic output and are a good foreign exchange earner. China often captures the largest share of global exports, usually more than one-quarter. Since 1986, China has increased its export market share, benefiting from U.S. peanut production problems. Most of China's peanuts go to Japan, the EC, Canada, and Hong Kong (for transshipment). China exports only small quantities of peanut meal and peanut oil.

United States. The United States often accounts for one-quarter or more of world peanut exports, even though its domestic output usually represents less than 10 percent of global production. The United States dominates world edible peanut trade. The EC is the major export market for U.S. peanuts, followed at some distance by Canada and Japan.

Argentina. Argentina, a minor producer, often ranks third among world peanut exporters, accounting for more than 10 percent of global exports. Like the United States, Argentina sends the bulk of its exported peanuts to the EC. Argentina also exports large quantities of peanut oil and smaller amounts of peanut meal.

Other Suppliers. India, often the first- or second-largest producer of peanuts, accounts for more than one-quarter of global output. India crushes its output, consumes the oil, and exports most of the meal. Indian peanut meal exports usually account for about 40 percent of global peanut meal exports. Senegal, like India, processes the bulk of its production and exports the products, frequently capturing second place in peanut meal exports and first place in peanut oil exports.

World Import Demand

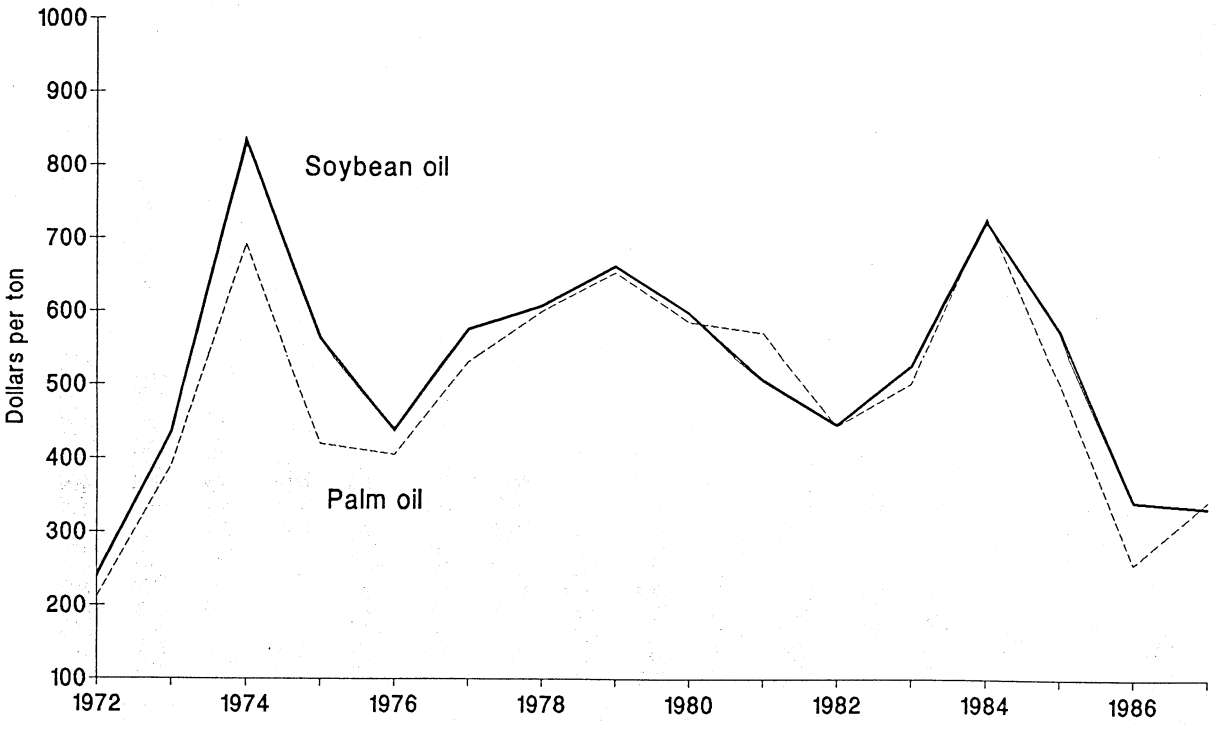
The EC often takes about one-half of global peanut imports, one-third of peanut meal imports, and three-fourths of peanut oil imports. Eastern Europe, the largest purchaser of peanut meal, accounts for more than 40 percent of world trade.

Palm Oil

Palm oil is the most important vegetable oil against which U.S. soybean oil competes. Palm oil frequently sells at a discount to soybean oil (fig. 18). Large discounts generally reflect a buildup in supplies of palm oil relative to soybean oil.

Palm oil is used in the manufacture of a myriad of edible processed products as well as in the soap and candle industries. Palm oil and other tropical oils contain a high proportion of saturated fats. Palm oil has a saturated fat content of about 50 percent, more than three times that of unhydrogenated soybean oil. Palm oil ranks second in consumption among the vegetable oils and first among traded oils.

Figure 18--Soybean oil and palm oil prices 1/



1/ Soybean oil-Dutch, f.o.b. ex-mill. Palm oil-c.i.f. N.W. Europe. Calendar year.
Source: (23).

Since 1987, palm oil producers have become increasingly alarmed about maintaining their export levels because of U.S. consumer concerns about saturated fats. Should such concerns spread, per capita consumption of tropical oils in developed countries would fall. The bulk of palm oil imports goes to less developed countries. EC and U.S. palm oil imports usually total less than one-quarter of world imports.

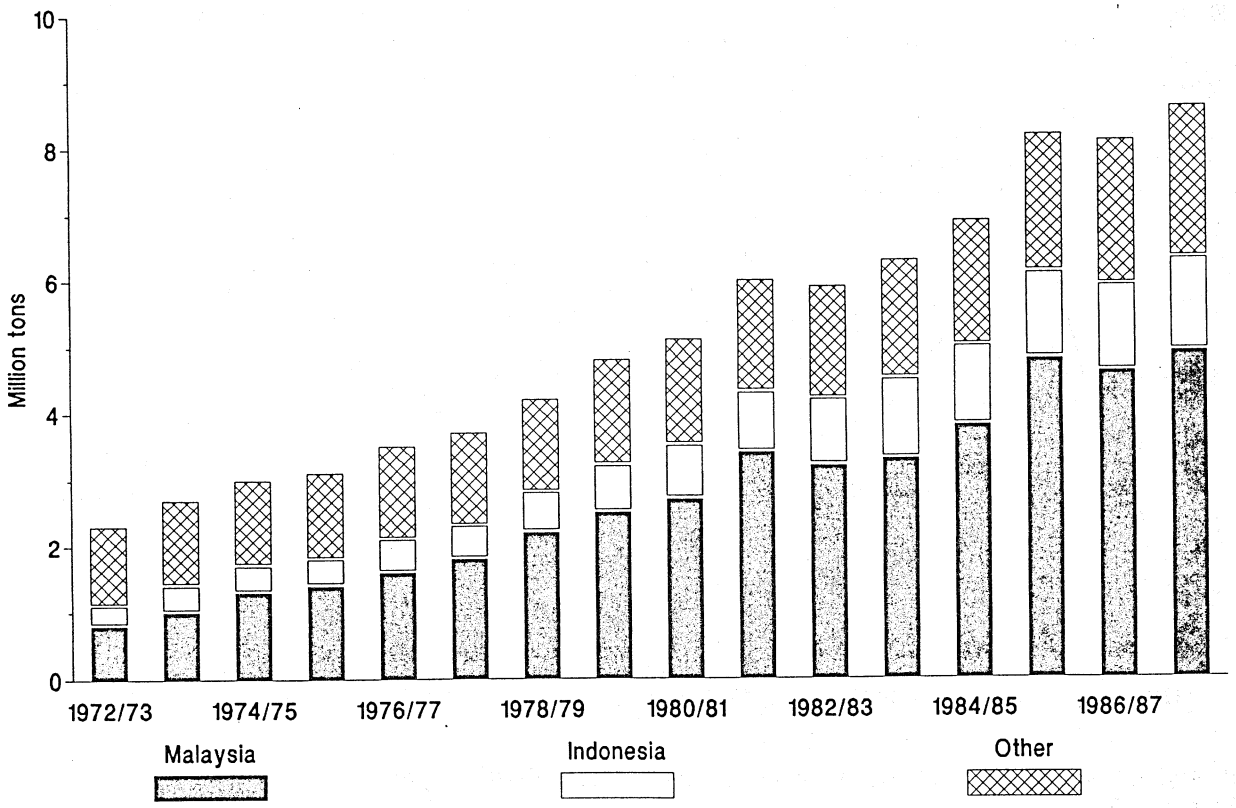
Palm Oil Supplies

Palm oil output reaches 9-10 million tons, compared with 15-16 million tons of global soybean oil production. Since the mid-1960's, world palm oil output generally doubled about every 6-8 years.

Malaysia and Indonesia, low-cost producers, together account for roughly three-fourths of world palm oil production (fig. 19) and more than 80 percent of the 5-6 million tons traded in world markets (table 5). Because palm oil is produced year round, it readily competes against South American soybean oil produced from soybeans harvested in the first part of the calendar year as well as against U.S. soybean oil produced from the crop harvested in the fall.

Malaysia. Malaysia produces more than one-half of global palm oil output. Malaysia exports more than 80 percent of its 5-6 million tons of output, about three-fourths of global exports. The value of Malaysian palm oil exports exceeds $2 billion annually and accounts for 11 percent of gross national product.

Figure 19--Palm oil production



Most of Malaysia's palm oil shipments go to countries which also purchase U.S. soybean oil. India has been Malaysia's largest purchaser in recent years, taking about one-quarter of Malaysian palm oil exports. Pakistan, Malaysia's third-largest customer, has taken more than one-tenth of palm oil shipments. Other large importers of Malaysian palm oil are the EC and the United States. To counter the adverse publicity about palm oil's high saturated fat content and to protect its export market shares, the Palm Oil Research Institute of Malaysia (PORIM), a part of the Ministry of Primary Industries, has funded research to further improve the health properties of the oil and to promote the oil in the United States.

Indonesia. The second-largest producer of palm oil, Indonesia, accounts for 10-15 percent of global output and exports. Its primary outlets are the EC, India, and Pakistan.

World Import Demand

The EC and India are the largest importers of palm oil, accounting for about one-third of global shipments. Lesser but important palm oil markets are China, many developing countries, the Soviet Union, and the United States. Palm oil represents 2-3 percent of total U.S. vegetable oil consumption. In 1987/88, U.S. palm oil imports fell as price differentials narrowed (fig. 18). Adverse publicity in the United States given to oils with high saturated fat content contributed to the import decline.

Palm Kernel Oil and Palm Kernel Products

Palm kernels removed from palm fruit are processed into meal and oil. The meal is used as cattle feed due to its high fiber content, and the oil is used as a substitute for coconut oil. Because palm kernel oil is similar in composition to coconut oil, it is also very high in saturated fat (16).

World Palm Kernel Oil and Meal Supplies

The same countries that produce and export palm oil also process the residual kernels into palm kernel oil and meal (table 5). Two to three million tons of palm kernel are produced annually but less than half is exported. Most kernels are processed and exported as meal and oil.

Palm kernel meal exports generally make up about 3-4 percent of world oilseed meal trade. Palm kernel oil exports usually reach 4-5 percent of the 10 major vegetable oils traded in world markets.

World Import Demand

U.S. imports of palm kernel oil are second only to those of the EC. However, the United States imports virtually no palm kernel meal or palm kernels. The largest importer of palm kernel meal and palm kernels is the EC. The distorted price relationship in the EC between protein and energy feed ingredients makes palm kernel meal attractive to the cattle feed industry as a midlevel protein feed ingredient.

Flaxseed (Linseed) and Linseed Products

Weakened demand for flaxseed (also called linseed) products is reflected in the decline in global output for flaxseed. In the United States, area has fallen over the past 20 years to a small fraction of its former area. Demand exists for flaxseed meal although it has some disadvantages compared with other meals: It is low in a number of vitamins and its proteins do not effectively make good the deficiencies of cereal grains in swine rations (7).

Virtually all demand for linseed oil is industrial. Demand for linseed oil has declined because of the increased use of latex paints and plastic-like substitutes. Linseed oil is primarily used in paints for its excellent drying qualities (18).

Flaxseed and Product Supplies

Flaxseed output is the smallest of all eight major oilseeds, totaling less than 2 million tons annually. Argentina, Canada, and India are the largest producers of flaxseed, amounting to about 80 percent of global output (table 3).

Global flaxseed exports are small. Less than one-half million tons of flaxseed and linseed meal are traded annually. Canada dominates global flaxseed exports but is a small linseed product exporter. Flaxseed and meal are the main flaxseed complex commodities that the United States exports in

modest volume, accounting for about one-tenth of global trade. Global linseed oil exports are small, usually 20,000-30,000 tons.

World Import Demand

The EC takes about two-thirds of global imports of flaxseed, and Japan takes slightly over 10 percent. Most import demand for linseed meal and oil is concentrated in the EC.

Copra and Copra Products

Copra is produced from coconuts. Its meal has the lowest amount of protein by weight among the major oilseed meals and is most often fed to ruminants. As a feed component, copra meal, like whole cottonseed, promotes a highly saturated butterfat from dairy animals. Coconut oil, like palm kernel oil, is a lauric oil. Lauric oils contain considerably more saturated fatty acids than do the soft oils (soybean, olive, sunflowerseed, rapeseed, peanut, and cottonseed oils). In the edible oil industries, demand for coconut oil (and palm oil) is related to its relatively high melting point. The fatty acid and soap industries are also large consumers of coconut oil.

Copra and Copra Product Supplies

The Philippines and Indonesia produce about 60-70 percent of global copra output (table 3). The Philippines is the dominant exporter of raw copra and processed products. Indonesia, also a major exporter, primarily ships out processed products.

World Import Demand

The EC purchases virtually all of the copra meal available on world markets and much of the copra. Japan and South Korea often take about one-third of world copra imports. The United States imports virtually no copra or copra meal. However, the United States and the EC are the major importers of coconut oil, each importing more than one-third of the 1.4-1.6 million tons of coconut oil traded on world markets.

Olive Oil

Olive oil is primarily used as a salad and cooking oil. Mediterranean consumers, in particular, pay a premium for olive oil compared with other edible vegetable oils. Inedible grades are used in the manufacture of textiles and soap.

Olive Oil Supplies

The EC (primarily Italy, Spain, and Greece) produces 80-90 percent of the 1.4-1.8 million tons of global olive oil processed annually (table 5). Minor producers, like Tunisia and Morocco, occasionally produce 100,000 tons or more.

World Import Demand

Aside from intra-EC trade, the United States is the largest importer of olive oil, taking around 50,000-60,000 tons annually. Libya and the Soviet Union take most of the remaining olive oil.

Policies and Programs Affecting Oilseed and Oilseed Product Trade

Years of government intervention have helped to shape the existing patterns of international oilseed and oilseed product output and trade. This intervention has reduced the gains from trade for efficient, low-cost producers of oilseeds, like the United States. Countries possessing a comparative advantage in soybean production now export fewer oilseeds and often at a higher cost than they would in the absence of policies affecting trade. Consumers and taxpayers pay the cost of these programs.

Arguments for Intervention

Among the most frequently cited arguments for government intervention in agriculture are the need to stabilize farm incomes and output and to protect the nation from unfair foreign trade policies. It is argued that food production is too important to be left to market forces and that, without substantial government intervention, farm income and prices would be highly unstable. After all, the imposition of numerous government programs and policies on agriculture has not proved disastrous for farmers, with perhaps the exception of the agricultural sector in the Soviet Union.

Economist Lester Thurow suggested that U.S. agricultural policies should be emulated in other sectors of the economy because "in agriculture what started as a desperate effort to prop up a very large, sick industry in the 1930's ended as an industry that is the world's most efficient" (10, p. 4).

Similarly, Kenneth Boulding noted that price supports have promoted efficiency because "the uncertainty involved in meaningless market fluctuations discourages innovation and investments" (10, p. 4).

Production Instability

Among the justifications for more intervention in agriculture than in nonagricultural sectors is that the agricultural sector is subject to a greater degree of instability. In contrast to industrial output, food production is subject to bad weather, and even good weather can bring on bad times for farmers by depressing prices.

A related issue is food security. The EC and Japan often use this argument to defend their agricultural subsidies. They cite the severe deprivations caused by wars and lesser disturbances caused by embargoes.

Price and Income Instability

Another justification for intervention is that foreign supply and demand fluctuations shift prices, sometimes producing damage within and outside the agricultural sector. Even if farmers in one country tend to benefit from relatively stable weather patterns, as do U.S. farmers in most years, producer and consumer prices are subject to the demand shocks produced by countries with less stable climatic conditions, like the Soviet Union. Because large price swings destabilize farmer incomes and consumer purchasing patterns, stabilization is a frequent element of most legislated intervention designed to protect farmers and to deal with marketing agricultural products (13).

Nonetheless, price movements are a desirable feature of free markets; they signal producers about the needs of the marketplace. When price movements are

suppressed by government intervention, policy-determined relative prices become more relevant for producers than do market prices. As a result, a gap usually is created between supply and demand.

In the United States, program-legislated prices interfere with Corn Belt farmers responding to signals from the international oilseed markets. At planting time, as the drought of 1988 began, Corn Belt farmers did not intend to increase soybean area relative to corn area even though the soybean-to-corn futures price ratio was rising. Grain target prices and base acreage requirements were nullifying the long-time positive correlation between the soybean-to-corn market price ratio and the soybean-to-corn acreage ratio for U.S. Corn Belt farmers (11).

Unfair Foreign Trade Policies

Intervention in one country's commodity markets often transmits undesirable disturbances into another country's commodity markets, whether or not the primary purpose of the domestic intervention is to burden one's neighbors. Each successive round of government intervention invariably sets off subsequent retaliatory rounds in foreign countries. For example, EC subsidization of its oilseed sector, intended to benefit local producers and processors, has reduced demand for oilseed and oilseed product imports. The United States was compelled to initiate its Export Enhancement Program (EEP) because of EC export subsidization.

Consequences of Intervention

Although there are strong arguments for government intervention in agriculture, intervention's effects must be weighed against some adverse consequences: high costs, wasted resources, market disequilibrium, and production and trade share distortions.

Government Expenditures Rise

Government intervention usually entails government expenditures. These expenditures generally rise to offset continued similar escalations in other countries. Over 40 percent of the support given to U.S. farmers merely offsets the losses created by the policies of other industrial market economies (25). For example, U.S. funding of the EEP had to adjust in order to offset subsidized EC agricultural exports. By mutually reducing these export subsidy programs, taxes could be reduced.

Resources Are Wasted

When intervention creates subsidies that push producer prices higher than market prices, land, labor, and capital are drawn from efficient sectors into less efficient ones. Higher cost producers can afford to continue production.

Market Disequilibrium Often Results

When producer subsidies override market signals, disequilibrium in markets results. Surpluses grow, encouraging the use of export subsidies. Export subsidies often lead to trade disputes and further intervention which may affect production, consumption, and stocks. Retaliation directed against a country implementing protectionist policies also affects other countries.

Production and Trade Shares Are Distorted

When producer subsidies override market signals, patterns of global production and trade are altered. Efficient, low-cost producers often export less to countries and regions where subsidies have guaranteed a place in the local market for high-cost producers.

Types of Intervention

Preferences for particular types of intervention vary with different countries and with different groups within a country. Producers often prefer programs that guarantee commodity prices, provide direct payments, subsidize inputs, restrict land use, enlarge exports, and impose quotas and levies on foreign imports. Consumers often favor consumer subsidies, export controls, and stock-building programs and policies which ensure food availability.

Whatever the mix of programs, gains accrue to some group. And whoever gains from the intervention invariably benefits at the expense of someone else--producers, consumers, and taxpayers in either the home country, abroad, or both.

Nonagricultural Policies That Distort Trade

The types of intervention implemented by a country are not determined solely within the agricultural sector. Countries pursue multiple objectives in choosing agricultural policies. Agricultural policies are subordinate to a number of policies and programs which seek to promote general economic growth and stability. Some policies and programs complement one another; some work at cross-purposes.

Macroeconomic Policies

Budgetary problems often require implementation of fiscal and monetary policies that affect agricultural trade flows. In the United States during the early 1980's, the high value of the dollar dampened demand for U.S. oilseeds as well as for other agricultural exports. The U.S. dollar decline since 1985 has clearly contributed to the subsequent rise in U.S. exports.

Inflationary macroeconomic policies in major oilseed producers likewise have affected oilseed output and exports. Concerns that U.S. inflation would remain high led to specified rather than indexed price support adjustments for program crops in the Agriculture and Food Act of 1981. Because the specified increases proved to be greater than what the inflation-adjusted hikes would have been, Corn Belt farmers had even more incentive not to shift corn base acreage and plant soybeans.

In Argentina, fiscal and monetary policies have dampened incentives to produce soybeans. A huge federal deficit and high foreign debt have induced the Argentine Government to introduce various revenue-raising schemes. The Government imposed a multiple foreign exchange rate scheme in 1988 which for a time penalized the agricultural sector in order to increase government export revenues. In Argentina, as in many other developing countries, the agricultural sector is the largest source of export earnings.

In Eastern Europe, austere fiscal policies implemented in the early 1980's by countries burdened with high foreign debt dampened oilseed and oilseed product

import demand to such a degree that demand remains below levels reached during the late 1970's.

Identifying Global Intervention

The remainder of this chapter describes one method used to quantify government intervention and then identifies those policies and programs that most distort international oilseed and oilseed product trade. To present a comprehensive list and intelligible short description of all current global domestic and foreign trade-distorting regulations within one document is virtually impossible because of their number, complexity, and continual revision.

Readers desiring a more complete identification of foreign trade intervention should consult Trade Policies and Market Opportunities for U.S. Farm Exports, published by the U.S. Department of Agriculture's Foreign Agricultural Service. This report is issued annually and is mandated by the provisions of the Food Security Act of 1985.

Measuring the Impact of Trade-Distorting Policies

Even more difficult than keeping track of the number of programs and policies that distort world trade is quantifying their effects on world trade. Rarely are commodity markets affected by a single type of intervention. This makes sorting out and measuring the results of programs difficult.

Each type of intervention generally reallocates gains or losses among producers, consumers, and taxpayers. Determining who benefits or loses is just as important as determining how much was gained or lost.

The degree to which a particular type of intervention affects global trade depends on the size of a country's economy and its degree of involvement in world trade. EC oilseed production subsidies affect world trade far more than do Japanese oilseed production subsidies; the EC's large oilseed output displaces far more imports than does Japan's small production.

The PSE/CSE Concept

Given the many types of intervention used by governments, there was a need to develop a measure which quantified the level of intervention associated with existing agricultural programs. The U.S. Department of Agriculture and the Organization for Economic Cooperation and Development use producer and consumer subsidy equivalents (PSE's and CSE's) to measure and compare the level of government intervention in agricultural commodity markets. The concept of PSE's and CSE's was introduced 15 years ago by agricultural economist Tim Josling of the Food Research Institute of Stanford University (1).

A PSE is a measure of government support given to producers. A CSE is a measure of the subsidy necessary to compensate consumers for the elimination of agricultural and food programs (1). Together these equivalents indicate the net transfer to agriculture from other sectors of the economy.

PSE's and CSE's can be either positive or negative, depending on the type of intervention. When the net effect of government action is to subsidize agricultural production, PSE's are positive. When governments tax producers, PSE's are reduced and may even be negative.

Two common ways of expressing these equivalents are on a percentage basis and on a per-unit basis. On a percentage basis, PSE's are the total value of support for a commodity divided by the total producer revenue for that commodity, including revenues from market sales and government payments. On a per-unit basis, PSE's are the total value of subsidies divided by the quantity of output (4).

On a percentage basis, CSE's are calculated as the total value of support divided by total consumer expenditures. On a per-unit basis, they are calculated as the total value of subsidies divided by total quantity consumed.

In some cases, such as deficiency payments, government expenditures are used as a proxy for the value of the subsidy equivalent associated with this type of intervention. Other PSE components, such as those associated with import quotas or variable levies, are calculated by using the difference between the price received by farmers and a reference price. This price "gap" is then multiplied by total production to obtain the subsidy equivalent of the policy tool. The reference price is an estimate of the price farmers would receive if the country unilaterally removed policies that affect producer returns, such as import quotas and variable levies. The reference price may be a price in international markets, such as a border price, or a price in a nearby country relatively unaffected by government intervention.

Benefits of Using PSE's and CSE's

The major benefit of using PSE's and CSE's is that a "common denominator" can be assigned to a wide range of government interventions, enabling cross-country and cross-commodity comparisons (1). The various types of intervention have been placed into five general categories: border measures and market price supports; direct producer income support; input subsidies; domestic marketing subsidies; and long-term structural measures (table 6). Virtually all of these affect international oilseed production and trade.

Calculating PSE's and CSE's

PSE's are generally calculated at the farm-gate level; CSE's are usually derived at the wholesale or retail level. An example of how PSE's are calculated follows. Table 7 shows how PSE's were calculated for EC soybean producers in 1986 (31).

Row (1) indicates EC soybean output of 912,000 tons (Portuguese and Spanish output is not included in this example). In 1986/87, the producer price received by EC soybean farmers was the equivalent of 507 ECU's per ton, more than twice the world market price. (ECU = European Currency Unit. In 1986, 1 ECU = 1.02 U.S. dollars.) Thus, total soybean value to producers was 462 million ECU (row 3). Producer value includes revenue from crop sales (production times price).

Row (6) shows that of the 462 million ECU received by producers, 200.4 million ECU came from policy transfers. Deficiency payments accounted for 200.2 million ECU, which were paid to soybean crushers and then passed back to producers in the form of higher prices. Payments from structural programs, which included research, advisory, and rural development services, totaled another 200,000 ECU. As indicated in row (7), producers earned about 43 percent of their soybean revenues from generous CAP payments [row (6)

Table 6--Categories of policies measured by PSE's

I. Border measures and price supports
   A. Pricing policies
      1. Tariffs
      2. Import/export subsidies
      3. Variable levies
      4. State marketing agencies
      5. Export credit guarantees
      6. Marketing loans
      7. Tiered pricing systems
      8. Certain tiered exchange rate systems
      9. Food aid and concessional sales
      10. Other import/export incentives
   B. Quantitative barriers
      1. Import/export quotas
      2. Voluntary export quotas
      3. Licensing restrictions
   C. Qualitative restrictions
      1. Quality standards
      2. Labeling standards
      3. Safety and sanitary regulations
   D. Price stabilization scheme payins/payouts (schemes that require government support on average or border measures)

II. Direct income support to producers tied to production
   1. Direct payments and deficiency payments
   2. Crop insurance and disaster payments
   3. Income tax concessions

III. Input subsidies
   1. On purchased inputs (fuels, fertilizer, seed, chemicals, irrigation, feed subsidies on meat production)
   2. On factors of production (land, labor, and capital, concessionary taxes on agricultural land, storage cost subsidies, labor subsidies)

IV. Domestic marketing subsidies
   1. Transportation subsidies
   2. Marketing credit
   3. Promotional programs
   4. Inspection services

V. Long-term structural measures
   1. Research programs
   2. Advisory services
   3. Rural development

Source: (32, p. 5).

Table 7--Calculating the 1986 EC-10 PSE for soybeans 1/

Category	Units	Values
(1) Production	1000 tons	912
(2) Producer price 2/	ECU/ton 3/	507
(3) Value to producers	million ECU	462
Policy transfers to producers:		
(4) Deficiency payments	million ECU	200.2
(5) Structural policy	million ECU	.2
(6) Total policy transfers	million ECU	200.4
(7) PSE (per-unit value)	Percent	43.4
(8) PSE (per-unit quantity)	ECU per ton	219.7
(9) PSE (per-unit quantity)	US$/ton	216.2

1/ Spain and Portugal, which joined the Community in 1986, are not included in the PSE calculations because they were not fully integrated into the Common Agricultural Policy. Since Spain and Portugal are very small producers of soybeans, their omission is not considered significant.
2/ Includes the transfer to producers from deficiency payments.
3/ ECU = European Currency Unit. In 1986 1 ECU = 1.02 U.S. dollars.

Source: (31).

divided by row (3)]. On a per-unit basis, EC producers earned roughly $216 per ton of soybeans as a result of intervention programs.

Shortfalls of Using PSE's and CSE's

PSE's and CSE's are valuable estimation tools, but users of PSE's and CSE's must be aware of their limitations. As with any conceptual tool, PSE's and CSE's are more appropriate in some situations than in others.

First, year-to-year comparisons of PSE's and CSE's may be difficult because of exchange rate changes. Another situation that makes year-to-year comparisons of PSE's and CSE's difficult occurs when international prices have fluctuated significantly. For example, suppose the EC maintained its current producer prices for oilseeds but the world price of oilseeds (the EC's import price) declined. In this case, the EC's oilseed PSE would increase, although its farm revenue (expressed in ECU's) might remain unchanged. On the other hand, the EC could increase its oilseed producer price and register a lower PSE if, simultaneously, world prices were to rise relatively more than its internal prices.

Care needs to be used when comparing PSE's even within the same time period. Although two countries' PSE's may be identical in magnitude, the relevant policies implemented by the two countries may have quite different effects on domestic and international markets. The PSE approach assumes that a dollar expenditure in one program has the same effect on producer revenue as a dollar spent in another program. For example, it is assumed that a dollar paid out as a deficiency payment to an oilseed producer has the same value to a producer as a dollar spent on soybean research or input subsidies. It also assumes that the benefits of research accrue only to that country and in the current year.

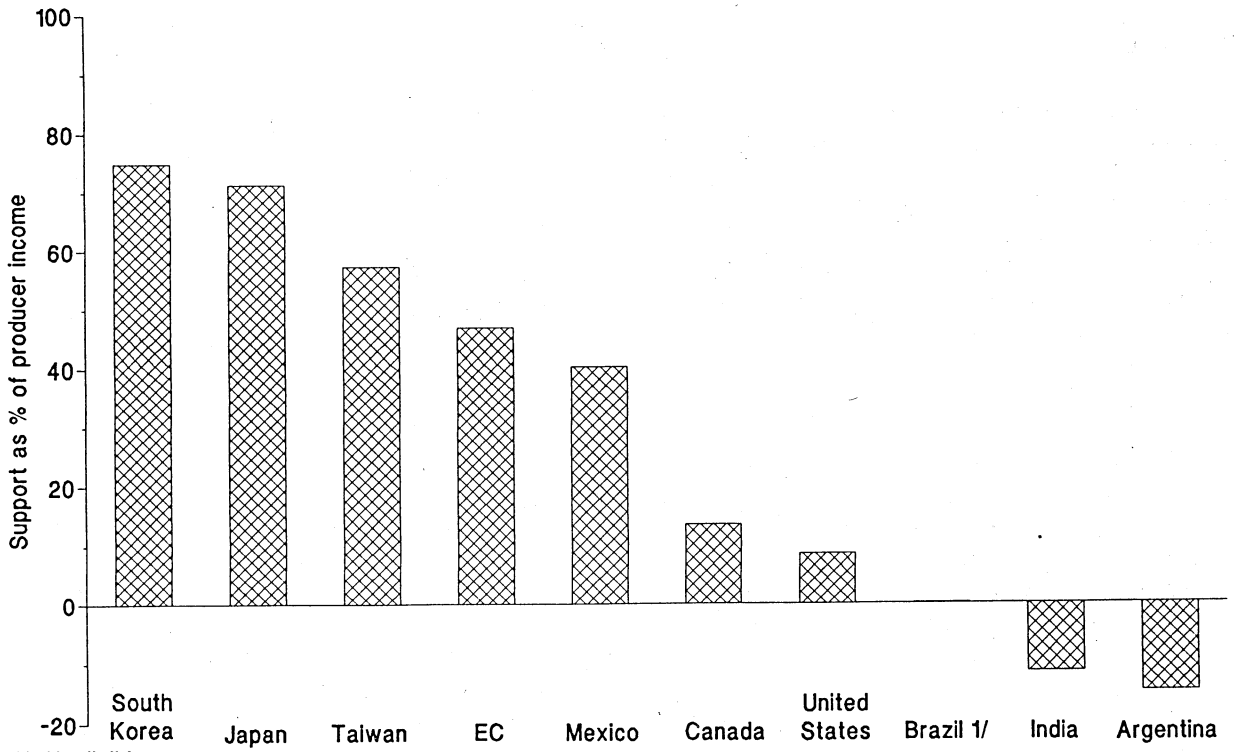
A country's or region's relative share of global production or trade is also critical to evaluating the importance of its PSE's and CSE's on global trade.

A country with a small PSE and a large world share of production or trade could have a greater influence on trade and international prices through its policies than a country with a smaller share (1). For example, although Taiwanese assistance to its soybean producers was larger than the EC's when measured in PSE's (fig. 20), Taiwanese production, because of its small size, displaced far fewer soybean imports than did EC production. PSE's and CSE's do not directly show the effect of government intervention on production, consumption, or trade. Rather, they convey an estimate of the monetary equivalent of the various forms of intervention in agriculture.

Estimating PSE's and CSE's is subjective in some cases because the estimates depend on an analyst's judgment. When estimating PSE's for inputs into non-specific commodity programs, which include subsidies for fuels, fertilizers, and pesticides, researchers might weight the support differently. Allocating gross expenditures on individual crops is difficult to do with precision. Similar difficulty is encountered when measuring the influence of subsidized interest rates that are available in place of actual commercial interest rates.

The PSE approach does not provide an estimate of what the world price of the commodity would be with the elimination of an existing type of intervention. In the small country case, the current world price could be used since a minor market actor would have negligible influence on world price. However, deciding what the world price might be with the termination of some intervention by a major producer or trader would not be so easy.

Figure 20--PSE's for soybeans, 1982-86 average



1/ Negligible.
Source: (31, pp. 22-23).

Finally, PSE's do not include an estimate of the amount of revenue forgone by producers who elect to participate in acreage reduction and supply control programs. For example, U.S. acreage set-asides are assigned a PSE of zero, rather than a negative value, since no price distortion can be observed. This is important because the period over which some U.S. PSE's are calculated is "the period during which the United States had its largest acreage idling program ever (20 percent of cropland acreage in the PIK program of 1983)" (10, p. 51). Equally difficult to measure are the effects on producers and consumers of export assistance programs which include food aid, export credits, and export credit guarantees (1).

For these reasons and others, Uruguay Round negotiators from the United States, the Cairns Group, and other countries have decided to limit their reliance on the PSE in their agricultural reform proposals. They have proposed that reform commitments be largely policy- and commodity-specific, with a disaggregated PSE being used as supplementary commitments.

PSE Measurements of Government Intervention

The degree to which government intervention affects agricultural markets varies by commodity. For example, world oilseed and oilseed product trade is directly affected by fewer trade-distorting programs than world grain trade. Calculations of PSE's reflect this. A study of 106 country-commodity pairs from an 18-commodity-by-17-country matrix found that PSE's were highest for sugar and dairy and they were lowest for oilseeds and cotton during 1982-86. Grain PSE's fell between these two extremes. Total transfers to oilseeds as a percentage of producer income were about one-half those of feed grains and less than one-fourth those of dairy (fig. 21) (31, p. 13).

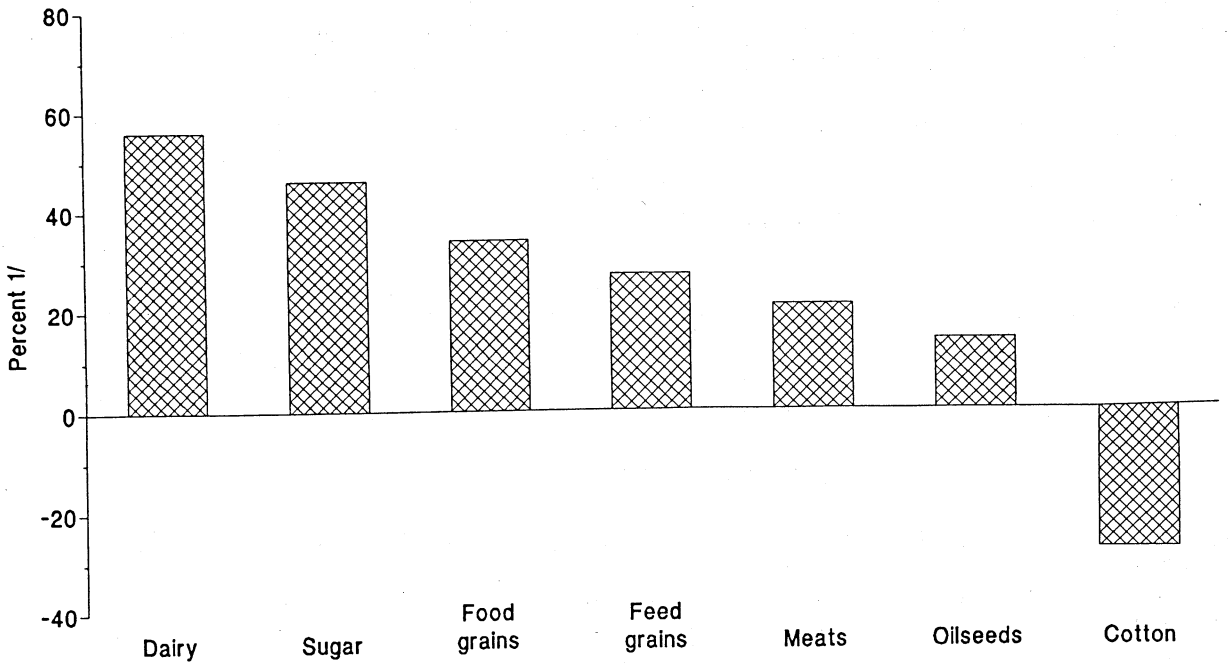
Most of the value of global oilseed PSE's can be attributed to industrialized country intervention. The average PSE for oilseeds (excluding oilseed products) in less-developed countries was slightly negative, reflecting substantial taxation, particularly in Argentina and Brazil (31, pp. 18-19). The governments of less-developed countries typically tax agricultural producers and subsidize consumers.

Among the five general categories of government intervention, producer input subsidies and structural support programs were responsible for the largest share of the PSE's in the less-developed countries--Argentina, Brazil, and India. There, aggregate PSE's were negative for the price support component, indicating that producer prices were below international price levels. However, positive transfers from other policies more than offset these negative transfers to soybeans (31, pp. 18-19).

In the industrialized countries--the United States and the EC--border measures, price supports, and income support were the most important instruments of government intervention and assistance. In the United States, some small benefit to soybean producers came from the nonrecourse loan program. But soybeans and sunflowerseed have no target prices, deficiency payments, and other elements that characterize U.S. grain programs. Most U.S. intervention in the oilseed sector occurs in the peanut production and oilseed product export assistance sectors.

Virtually every country of the world intervenes in oilseed and oilseed product markets. The most important of these policies and programs are highlighted in

Figure 21--Global PSE's by commodity, 1982-86 average



1/ Value of subsidies\producer income.
Source: (31, p. 16).

the following sections for the major oilseed producers and traders which include the United States, the EC, Brazil, Argentina, and Malaysia.

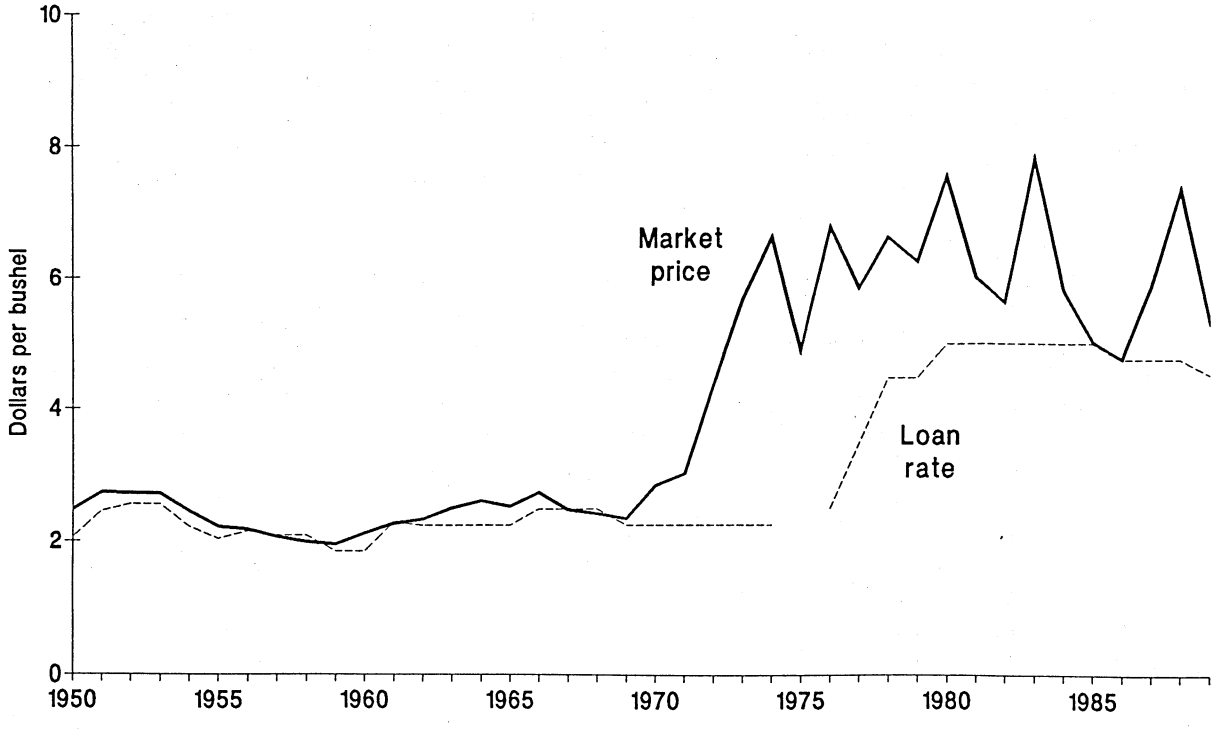
U.S. Policies and Programs

The United States currently operates price support programs for soybeans and peanuts. Producers of cottonseed are indirectly supported through the upland cotton program for lint. Other oilseed producers, most notably sunflower producers, currently receive no direct support. However, the U.S. subsidizes exports of domestically produced vegetable oils through the EEP and other specialized assistance programs for cottonseed and sunflowerseed oils. The U.S. imposes an import quota for peanuts and applies tariffs on foreign vegetable oils.

Soybeans

Soybean price supports have been in effect since 1941, with the exception of 1975 (6). These supports have been provided as nonrecourse loans, with all farmers eligible for soybean loans through the Commodity Credit Corporation (CCC). The season average price of soybeans has met or exceeded the loan rate in all but a few years (fig. 22). Years of high production and low prices have occasionally led farmers to place substantial quantities of soybeans under price support. CCC acquisitions of soybeans under price supports have generally been relatively small, but acquisitions rose markedly between 1984 and 1987 when domestic market prices declined sharply.

Figure 22--Soybean loan rate 1/



1/ There was no loan program in 1975.

Acreage restrictions and marketing quotas have never been used to control soybean production. However, supply control programs for wheat, feed grains, and cotton have, at times, included provisions to restrict or allow the substitution of soybeans for these crops on their allotted acreages. While these provisions may have affected soybean acreage, government efforts to affect soybean production have focused on changes in price supports and program provisions for soybeans and competing crops.

The Agriculture and Food Act of 1981 was enacted at a time of growing concern by policymakers over farm income levels, commodity price erosion from inflation, and rising production costs from inflation. Under the 1981 Act, minimum target prices and loan rates were set for the 1982-85 food grain, feed grain, and cotton crops at levels higher than for the 1978-81 period governed by the Food and Agriculture Act of 1977. Higher loan rates for competing crops combined with lower soybean prices in the early 1980's placed soybeans at a relative disadvantage to program crops such as corn and cotton. As a result, soybean acreage declined.

Food Security Act of 1985. Congress passed the Food Security Act of 1985 to revise U.S. Government support for soybeans and other commodities that affect soybean acreage, including upland cotton, feed grains, and wheat. The act covers crop years 1986-90 and set 1986 and 1987 soybean loan rates at $5.02 per bushel. Loan rates in 1988-90 are based on 75 percent of the average price received by producers in the preceding 5 marketing years, excluding the high and low years. Declines are limited to 5 percent per year and the minimum support price is $4.50 per bushel.

The Secretary was granted discretionary authority in the 1985 Act to reduce the loan rate up to 5 percent per year to maintain soybean competitiveness in the world market. However, the minimum loan rate of $4.50 was maintained. The Secretary used this authority to set the loan rate at $4.77 in 1986. The effective loan rate was reduced to $4.56 under provisions of the Balanced Budget and Emergency Deficit Control Act of 1985 (also known as Gramm-Rudman-Hollings). The Secretary set the loan rate at $4.77 again in 1987 and 1988. The 1989 loan rate was set at $4.53.

Indirect effects of the 1985 Act on soybeans flow from provisions for other crops which are alternatives for soybean farmers. The act authorizes deficiency payments and paid land diversion for wheat, rice, feed grains, and cotton, and storage payments for grains. Soybean farmers do not face acreage reduction requirements such as those faced by cotton and grain farmers, but the acreage controls for those crops affect soybean acreage because soybeans cannot be planted on reduced, set-aside, or diverted program acreages.

Another effect of the 1985 Act has been to keep soybean acreage low by widening the difference between target prices and loan rates for grains and cotton. What effect does this have on soybean acreage? The Government has provided a strong incentive for program participation by farmers growing grains and cotton and enhanced the effectiveness of supply controls stipulated in the act, since this was done at a time when market prices were relatively low. Because these target prices are attractive relative to soybean market prices, and the supply control comes from diverting acreage, soybean acreage is depressed.

Permanent land diversion (10 years or longer) is another important program in the conservation reserve provisions of the 1985 Act. The Conservation Reserve Program has removed approximately 25 million acres of erodible cropland from production, with a goal of 40 million acres by 1990. This and other provisions which increase prices of competing commodities and remove available cropland will tend to reduce soybean acreage and production and maintain higher soybean prices.

The Disaster Assistance Act of 1988 gave the Secretary of Agriculture discretionary authority to permit producers to plant soybeans on a portion of 1989 wheat, feed grain, upland cotton, extra-long staple cotton, and rice permitted acreage. The amount must be between 10 and 25 percent of the permitted program crop acreage. The provision may be extended to the 1990 crop if the Secretary determines there is an insufficient supply of soybeans. After the signup period, if the Secretary determines that, based on additional soybean and sunflower plantings, the average market price will be less than 115 percent of the loan rate established for the previous crop, the Secretary will prorate the planting of soybeans allowed on permitted acreage to as low as zero percent so the average soybean price does not fall below 115 percent of the previous year's loan rate.

Marketing Loan Program. The 1985 Act also gives the Secretary of Agriculture discretionary authority to implement marketing loans for soybeans. Marketing loans would allow soybean producers to repay their nonrecourse loans at the world market price, when world prices are below the loan rate. This would encourage producers to redeem soybeans pledged as loan collateral and market them at prices near or below loan rates rather than forfeit them to the CCC.

To date, the Secretary has chosen not to implement the soybean marketing loan. A 1987 study indicated that a soybean marketing loan would have had only a minimal impact on the 1987 soybean crop. The Disaster Assistance Act of 1988 mandates that the Secretary of Agriculture submit a statement to Congress giving the reasons for implementing or not implementing the soybean marketing loan for the 1989 and 1990 crops.

There are currently no quotas or tariffs on soybean imports into the United States. Soybean oil imports are charged a 22.5-percent ad valorem tariff. Tariffs for soybean meal imports have been negligible.

Peanuts

The peanut program dates from the early 1930's (28). While the programs have varied from one period to another, several key peanut program features have remained in place through the years, including marketing quotas, price supports, and acreage allotments (acreage allotments were suspended in the Agriculture and Food Act of 1981).

Marketing quotas and acreage allotments have been in effect for peanuts since 1949. The quotas originally were set above U.S. domestic needs to help alleviate the world food shortage. The national allotments were lowered each year from 1949 until 1954 when the legal minimum (established in 1941) of 1.61 million acres was reached. Until they were suspended beginning with the 1982 crop, the allotments remained at the legal minimum, except for some increases for types of peanuts in short supply, primarily Valencias.

To protect the domestic peanut price support program, the U.S. Government has, since 1953, set an annual import quota of 1,709,000 pounds (shelled basis), which is small compared with about 1.6 billion pounds used in domestic foods.

The United States maintains relatively small duties on imports of peanuts and peanut products. Shelled peanuts are charged 3 cents tariff per pound; unshelled peanuts, 4.25 cents per pound; peanut meal, 0.3 cent per pound; peanut oil, 4 cents per pound; and peanut butter, 3 cents per pound.

Before 1978, the price support was based on parity and supports were substantially above world market price levels. Because of this, quantities taken under loan grew and Treasury costs for operating the program mounted, since the CCC had to dispose of surplus stocks at a price below the support.

Concern about Treasury costs and the competitive position of peanuts in both domestic and foreign markets prompted major changes in the Food and Agriculture Act of 1977. The new peanut legislation was introduced to reduce Government costs and was envisioned as a transition to bring production into line with demand with minimal economic hardship to peanut producers.

Unlike the voluntary programs for wheat, feed grains, rice, and cotton, the peanut program is still mandatory. Under mandatory programs, if at least two-thirds of the producers voting in a referendum approve the program, it becomes binding on all producers.

The 1977 Act implemented a two-price poundage quota program and retained some elements of the old program such as acreage allotments and price supports. The acreage allotment system remained as an integral part of the new program. Producers still were required to have an allotment if they wished to grow and

market peanuts. The minimum national acreage allotment was set at 1.614 million and apportioned among the States generally as in the past. The 1977 Act required that transfers of allotments within a county be allowed. Under the previous program, transfer of allotment within a county was permitted only if the Secretary of Agriculture approved it.

In addition to acreage allotments, each allotment holder was given a poundage quota. Producers could produce in excess of their quota, within their acreage allotments, but the quantity on which they could receive the higher of the two price support levels was limited to the quota. Peanuts in excess of quota are referred to as additionals.

Even though quota and additional peanuts were grown in the same field, there was a significant difference in the application of the program. Producers grew quota peanuts mainly for the domestic market for edible uses and seed for the next year's crop, thus being assured of the higher of the two price supports. Quota peanuts could be contracted any time before harvest or placed under quota loan at harvest.

The 1981 Act, which covered the 1982-85 crops, further modified the peanut program. The 1981 Act maintained the two-tier price system and continued the reduction in the poundage quota. A major change was the suspension of acreage allotments. Quota support prices were limited to quota holders and applied to the poundage quota, but since acreage constraints were removed, anyone was allowed to produce peanuts. However, additional peanuts were eligible only for the lower support price, and they were subject to marketing controls.

Under the 1985 Food Security Act, the two-tiered price support program for quota and additional peanuts was continued through 1990. The program is mandatory after a January 1986 referendum approved it for the 1986-90 marketing years.

The 1985 Act established that the annual national poundage quota must be set at a level equal to the estimated quantity of peanuts that will be devoted to domestic edible, seed, and related uses but not less than 1.1 million tons. The national quota level must be announced by December 15 preceding the marketing year. The 1986 national quota was allocated among States based on their 1985 allocations. Individual farm quotas were then granted to farms that had a quota in 1985. The national quota was 1.355 million tons in 1986 and 1987. The quota was increased to 1.4022 million tons for 1988 and to 1.44 million tons for 1989.

The national average support rate for the 1986 crop of quota peanuts was set at the 1985 rate, adjusted for increases in an index of commodity and service prices, interest, taxes, and wages paid by producers during calendar years 1981-85. The 1986 quota support rate was $607.47 a ton. The support rate for the 1987-90 crops is the rate for the previous crop, adjusted to reflect any increases in the costs of production (excluding any change in the cost of land) during the previous calendar year. The support rate cannot be increased by more than 6 percent from the previous year. The quota support rate remained at $607.47 a ton for 1987 and increased to $615.27 and $615.87 a ton for 1988 and 1989.

The price support level for additional peanuts is set at a level that ensures no loss to CCC from sales or disposal of the peanuts. In determining this level, USDA must consider the demand for peanut oil and peanut meal, the

expected prices for other vegetable oils and protein meals, and the demand for peanuts in foreign markets. The additional support rate has remained at $149.75 a ton for 1986-89. USDA has maintained for the 1986-89 peanut crops a minimum price of $400 a ton for additional peanuts sold for export edible use.

Other Programs Affecting Oilseeds

The EEP was authorized under the 1985 Food Security Act to enable U.S. exporters to compete with subsidized EC exports by meeting prevailing world prices for specific commodities in targeted markets. Under the EEP, the CCC awards bonuses to exporters, allowing them to sell designated U.S. commodities in specific markets at prices below those in the United States. Bonuses are awarded in the form of dollar-denominated generic certificates that can be redeemed for CCC-owned commodities or traded on the market. Any U.S.-produced vegetable oil is eligible for an EEP bonus.

Under the Disaster Assistance Act of 1988, the Secretary must use funds available under Section 32 of PL 320 to purchase sunflowerseed and cottonseed oil in fiscal years 1989 and 1990. The purchases are designed to facilitate additional export sales of sunflowerseed and cottonseed oil at competitive prices.

Tariffs are currently applied on imports of foreign vegetable oils, including soybean, corn, peanut, safflower, cottonseed, edible rapeseed, and sunflower oil. Tariffs vary by oilseed, including a 22.5 percent ad valorem tariff which is applied on imports of foreign soybean oil.

EC Policies and Programs

Highly protective government intervention in the oilseed and grain sectors has significantly altered EC oilseed production, consumption, and trade patterns. Support prices for oilseeds, far in excess of world market prices, have caused EC oilseed output to soar since the beginning of the current decade, reducing EC oilseed and oilseed product import levels. During 1982-86, PSE's for oilseeds were higher than for grains. For example, EC soybean and rapeseed producers earned more than 40 percent of their revenues from CAP payments while wheat and most other grain producers earned 20-30 percent from the CAP (31, p. 52).

The rising wave of EC oilseed output has significantly reduced U.S. oilseed and oilseed product sales to the EC. EC price supports for peas, sweet lupins, and field beans also have dampened EC import demand for protein. However, not all of the decline in the demand for imports from the United States can be attributed to higher EC production of oilseeds and other protein crops. Greater export competition from South American oilseed producers has also been a factor in the decline of U.S. oilseed exports to the EC.

EC imports of oilseeds and meal were freed of border restrictions in the early 1960's as a result of the Dillon Round (1960-61) of the multilateral trade negotiations held under the GATT. However, the EC continued to maintain duties on vegetable oil imports.

The Evolution of Intervention Under the CAP

Ever since the creation of the EC in 1957, intervention in EC agricultural markets has distorted EC oilseed consumption, production, and trade. Much of

the intervention under the EC's CAP affected oilseed markets indirectly through EC grain policies. Although oilseed production subsidies were introduced in 1966, their impact on oilseed production was small until the end of the 1970's.

Grain prices are relatively high because the CAP sets producer prices for grains that are often 50 percent above world market prices. These high internal prices are maintained by a system of variable levies which prevent grain imports from underpricing EC grains.

EC intervention in grains has affected oilseeds in two ways. First, by pushing up feed grain prices, the CAP enlarged internal EC demand for oilseed proteins and nongrain energy feeds, such as manioc. Duty-free imports of oilseeds and oilseed meals encouraged EC livestock producers to substitute these cheaper protein and energy imports for more costly domestic and imported grains. The EC's high grain-to-oilseed price ratio resulted in a rise of protein meals' share of livestock rations from 13 percent in 1972 to 22 percent in 1987/88. In contrast, grain's share declined from 72 percent to an estimated 55 percent over the same period (fig. 23).

Second, by pushing up producer incentives to expand grain output, the CAP signaled to producers that oilseed acreage should be reduced relative to grains. The EC found it necessary to reverse this signal toward the end of the 1970's when continued large structural grain surpluses seemed certain. This subsequent intervention took the form of higher support prices for oilseeds which drew acreage into oilseeds and out of grains (fig. 24).

The EC Support Mechanism

Government support payments reach EC oilseed producers through processors. The government pays oilseed crushers a subsidy equal to the difference between the CAP support price and the EC-calculated world price of the oilseed. For soybeans, this arbitrary support price is called a guide price; for rapeseed and sunflowerseed, it is called a target price.

Producers are able to receive a payment from crushers that is at least as great as the intervention price, the minimum price for oilseeds (fig. 25). When supply exceeds demand, producers sell into intervention stocks held by the government and receive the intervention price (set slightly below the guide or target prices). The intervention price is the price level that triggers EC purchases. However, actual producer sales to intervention are rare (21).

When oilseeds are exported--usually rapeseed--the EC awards an export subsidy equivalent to the difference between the world price and a price between the existing intervention and guide or target prices (21).

Price supports for domestically produced oilseeds usually have been well above world market levels. These supports led to the most dramatic increase in production and costs of any sector in the history of the CAP (9). From 1984-88, EC budget expenditures for the oilseed sector more than tripled. As support rose, so did production, boosted by improved yields. Producer incentives for growing oilseeds increased further because of a decline in the support prices for grains relative to oilseeds (fig. 26). Producers increased oilseed output at an average annual rate of 18 percent over the past 10 years. EC expenditures on oilseeds are high relative to those for other commodities.

Figure 23--Shares of oilseed meal and grain in concentrated feed, EC versus U.S.

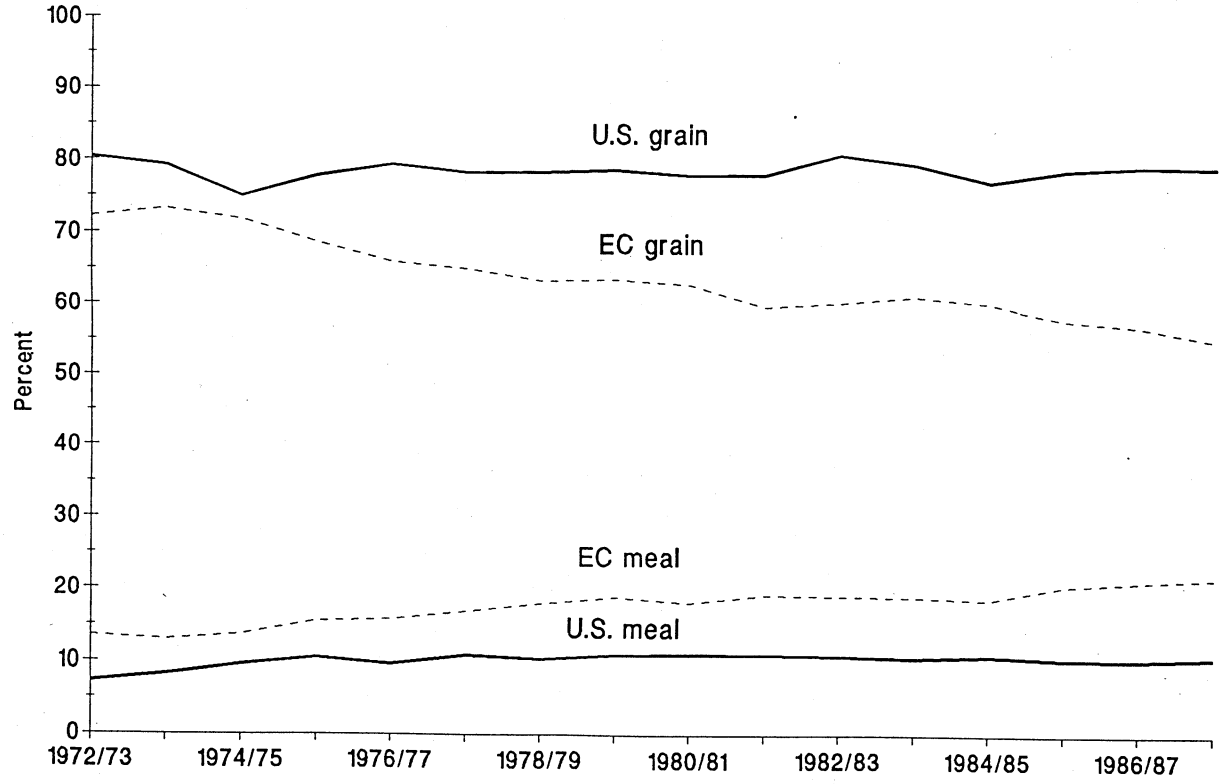


Figure 24--EC changes in cropland area

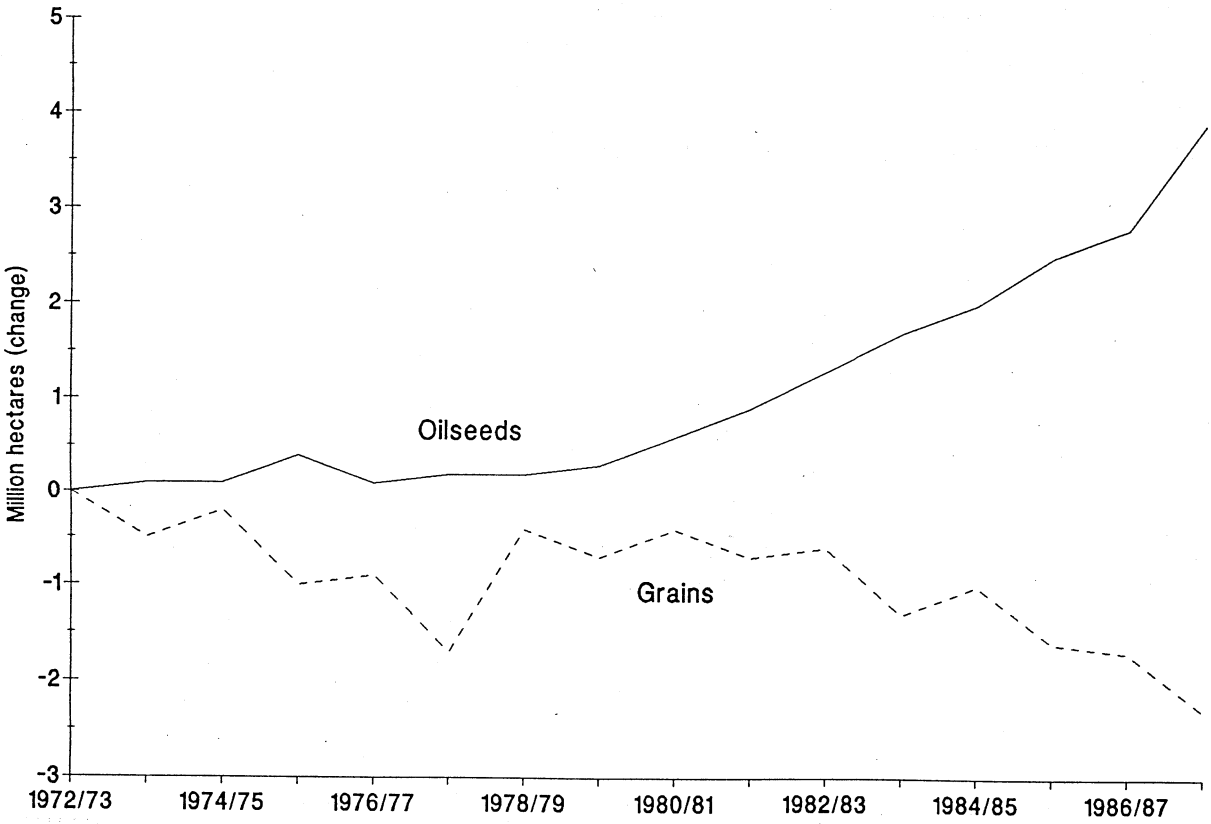
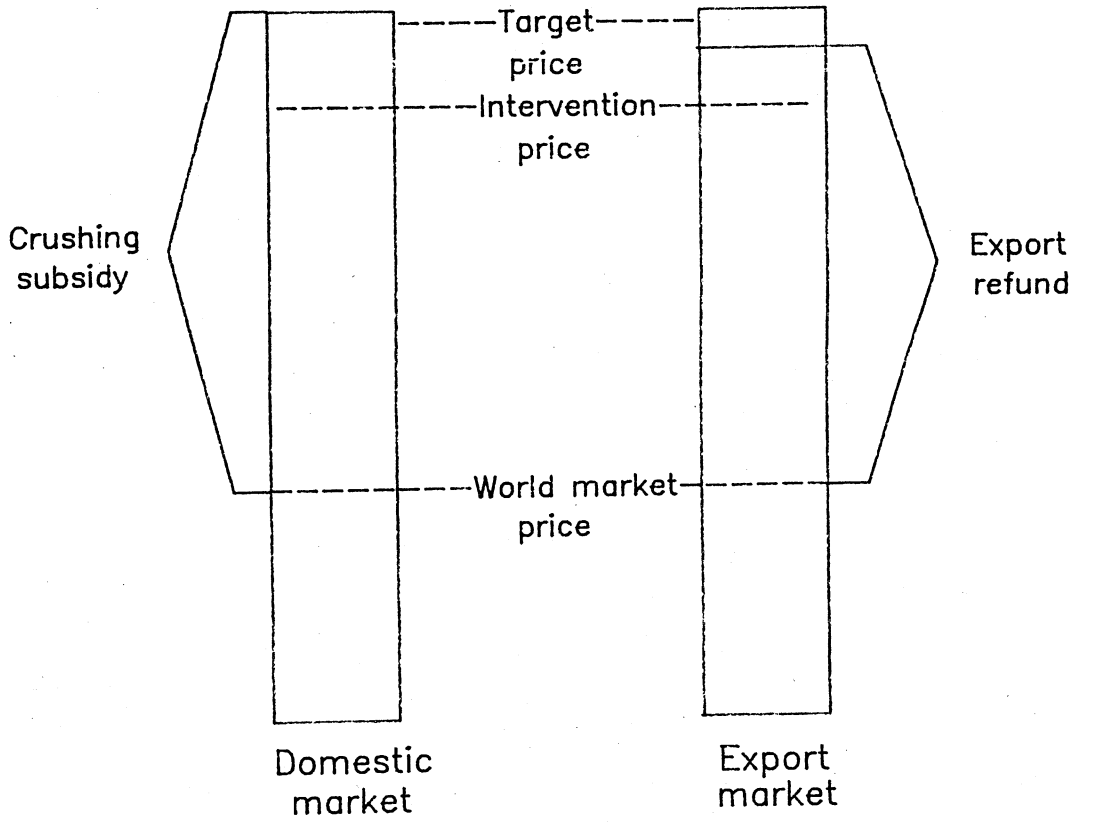
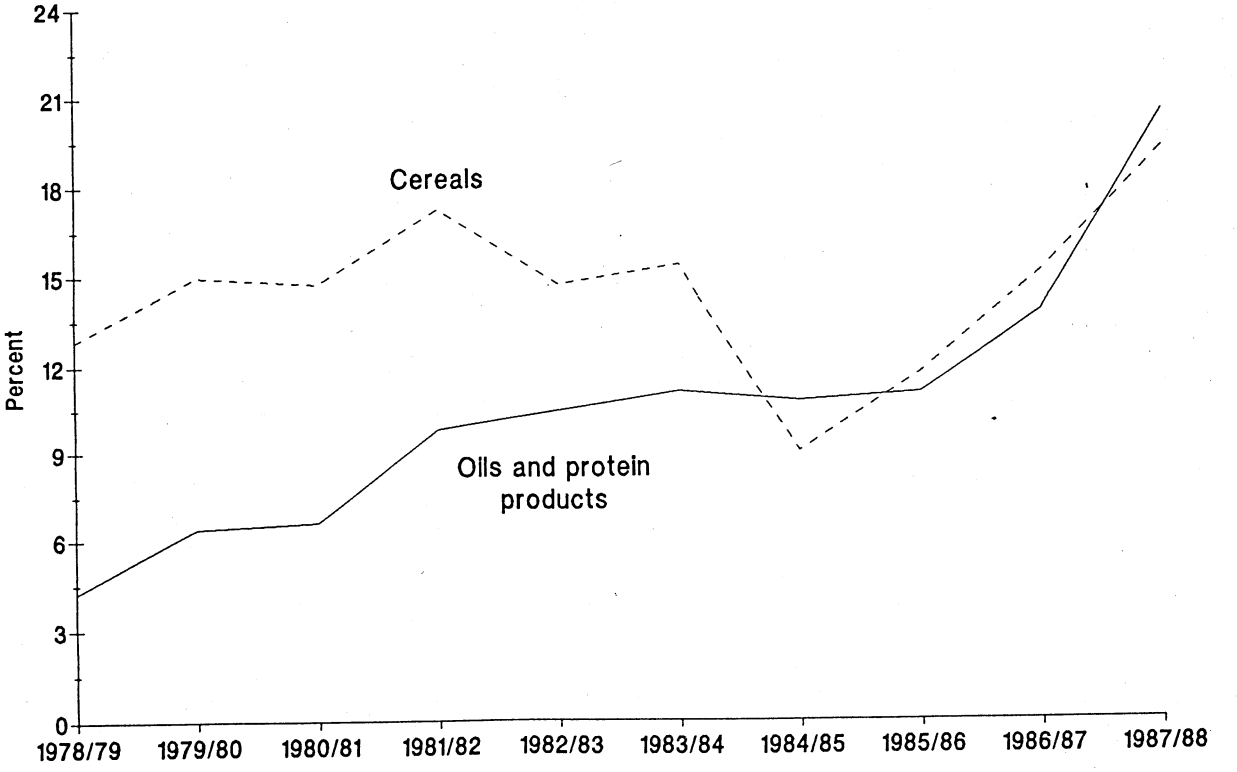


Figure 25--EC oilseed support mechanism



Source: (21).

Figure 26--Oilseed and cereal shares of EC agricultural expenditures



At times, the level of support for 1 ton of oilseeds has been about 12 times that for 1 ton of grain, and the subsidy per hectare has been 5-6 times larger than for grains (22).

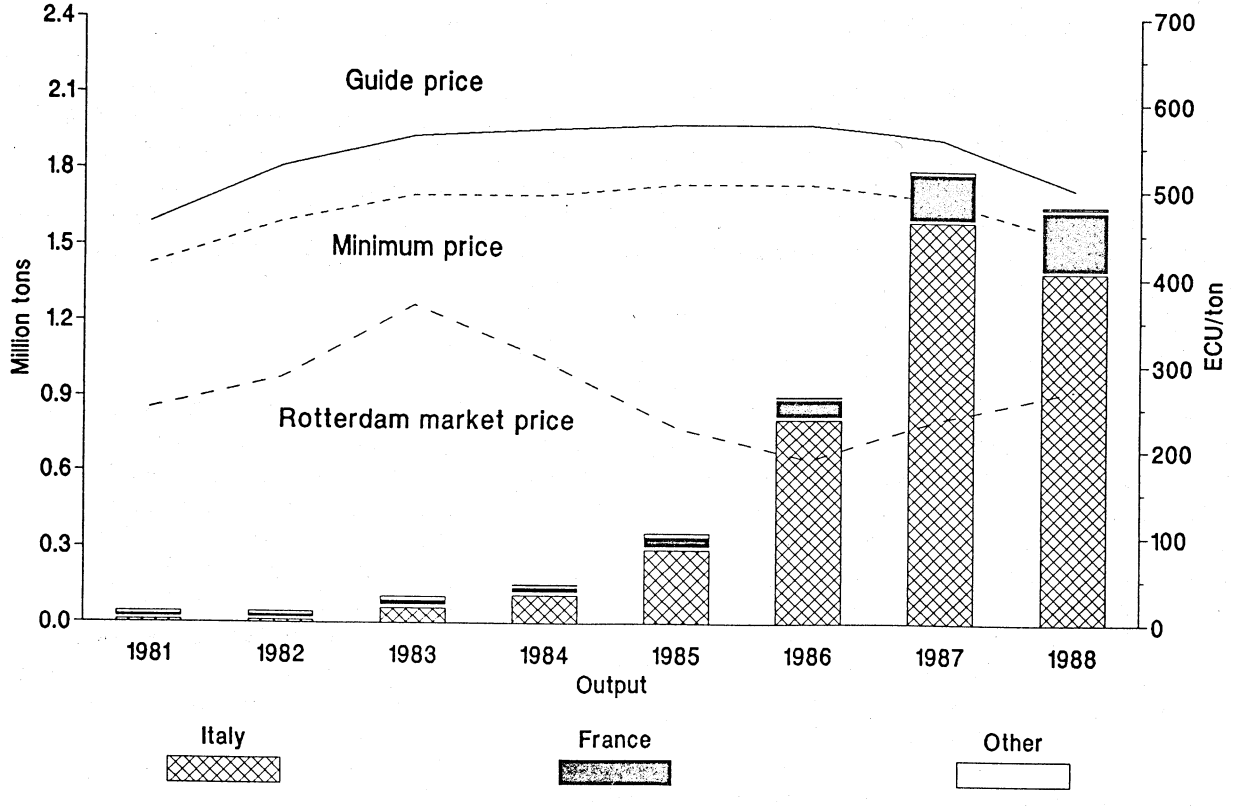
Spending on oilseeds and olive oil increased from 1.8 billion ECU in 1984 to an estimated 4.7 billion ECU in 1989, which exceeded the cost of supporting cereals and was second only to the dairy sector. Over a slightly longer period (1980-87), grains' share of EC expenditures rose from 15 to 18 percent, while oilseeds' share of EC expenditures rose from 6 to 14 percent.

The Impact of Intervention on the EC Soybean Sector

Between 1977 and 1986, the EC soybean support price has ranged from 50 percent above to almost 200 percent above the world price. Although it has fallen recently, the EC soybean price remains well above the world market price. These incentives induced producers (primarily Italian and French farmers) to increase output from 8,000 tons to 1.8 million tons from 1977 to 1987 (fig. 27).

Despite the large percentage increase in soybean production, the absolute volume of EC soybean output is small. Domestic soybean output accounts for only about one-tenth of EC soybean consumption and less than 1 percent of

Figure 27--EC soybean output and prices



total EC oilseed consumption. The EC remains the world's largest importer of soybeans and soybean meal.

The Impact of Intervention on the EC Sunflowerseed Sector

Because EC sunflowerseed price supports ranged from 40 to 80 percent above world prices, EC sunflowerseed output rose from about 500,000 tons in 1977 to 4.1 million tons by 1988 (fig. 28).

Production has increased to such an extent that the EC sunflowerseed imports have fallen below 200,000 tons. At the beginning of the 1980's, domestic sunflowerseed production, primarily in France and Spain, accounted for only a small share of EC consumption. Spain, a large sunflowerseed producer, significantly boosted EC output with its accession into the Community in 1986 because domestic prices were raised to the higher EC support levels. The EC also has become a net exporter of sunflowerseed oil since 1986 as net sunflowerseed oil exports roughly tripled.

The Impact of Intervention on the EC Rapeseed Sector

Rapeseed, grown largely in France and England, has claimed the largest share of EC oilseed production, accounting for more than one-half of EC output. Support equivalent to almost triple world prices pushed EC rapeseed output to six times its 1977 levels (fig. 29).

As a result of this explosion in output, the EC has begun to dispose of its surplus rapeseed with the help of export subsidies. In addition, rapeseed oil exports have risen. With intra-EC trade excluded, EC rapeseed oil exports doubled between 1986/87 and 1987/88 and exceeded 600,000 tons.

The EC remains a net importer of oilseed meals, including rapeseed meal. Rapeseed meal has become increasingly competitive with soybean meal in feed rations. EC agricultural ministers have implemented incentives for farmers to switch to "double 00" rapeseed varieties. These varieties are far more digestible than older rapeseed varieties because they are lower in erucic acid and glucosinolate. To encourage the switch, production and crushing aids will be paid only for the "double 00" rapeseed starting in 1992/93.

The Impact of Intervention on the EC Olive Oil Sector

EC assistance to olive oil producers is substantial but it has not risen as fast as assistance to other oilseeds. The olive oil regime provides production aids to growers and consumption subsidies to bottlers, resulting in a lower retail price to EC consumers. An additional goal is to ensure an adequate income for farmers in poorer regions of the EC (35, p. 43). The regime includes export subsidies and variable import levies to protect domestic producers from competition from foreign olive oil. These levies eliminate any difference between high EC domestic prices and low foreign prices. Although CAP olive oil expenditures are estimated at about 40 percent of the support given to other oilseeds, olive oil production has trended slightly downward through the current decade.

Consequences of EC Oilseed Intervention

EC intervention not only distorted EC feed use patterns but also increased CAP expenditures, contributing to greater income inequities between farmers,

Figure 28--EC sunflowerseed output and prices

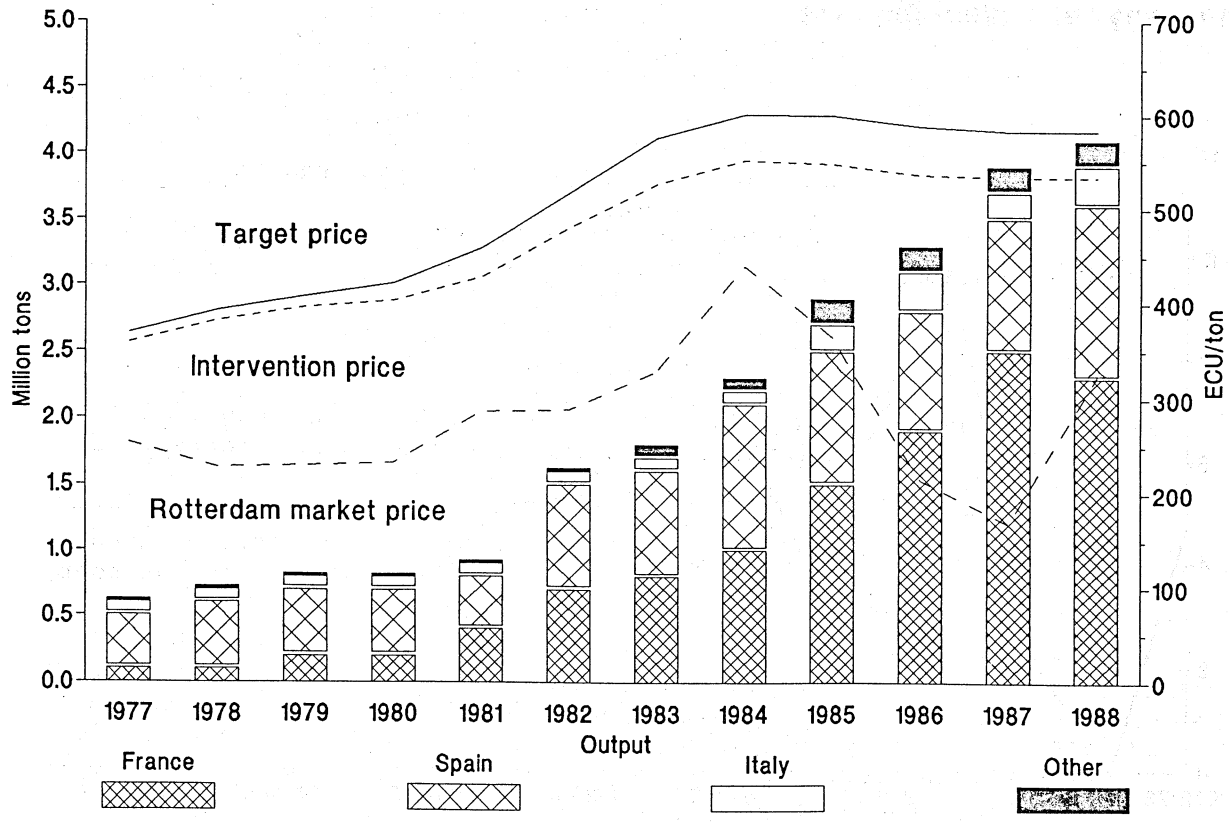
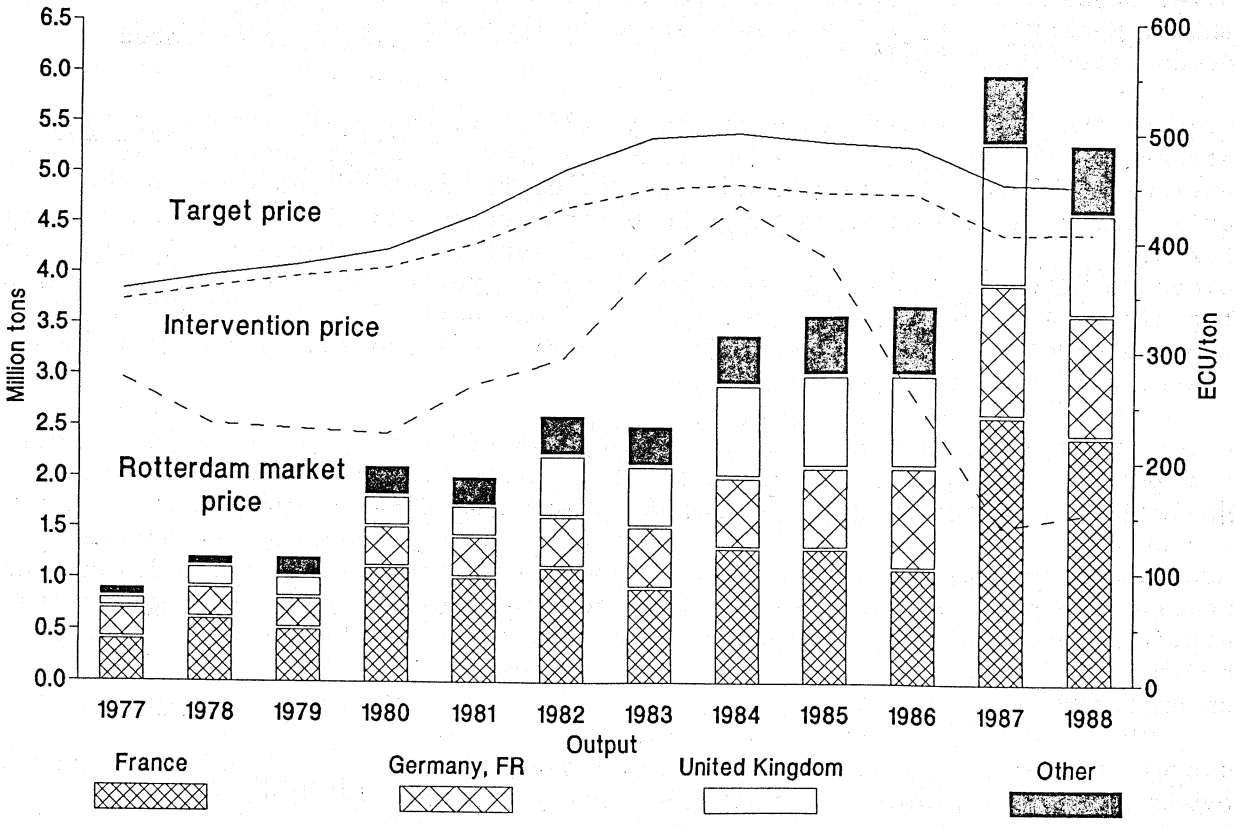


Figure 29--EC rapeseed output and prices



wasted resources, and an oilseed surplus on top of existing grain surpluses.

Moreover, the high oil content composition of EC oilseeds added to surpluses in vegetable oils which contributed to reduced crusher margins on imported oilseeds, like soybeans. Consequent EC vegetable oil exports displaced shipments from traditional exporters.

Higher CAP Spending. EC agricultural spending has more than doubled since 1980. EC agricultural expenditures were allocated in the following way: roughly 45 percent of outlays are used for price and income supports, 35 percent for export refunds, and the remainder for storage and other assistance (8).

Financed through taxes and variable import and producer levies, CAP expenditures accounted for 60-80 percent of the total EC operating budget since the mid-1970's. Consumers pay much of the additional cost of farm support in the form of higher commodity prices. Agriculture's share of the EC budget appears to be so much larger than agriculture's share of the U.S. budget (less than 20 percent) because the EC budget does not include high-cost budget items, like defense and social welfare programs, which are financed by member states.

Income Inequities. Guaranteed high support prices have introduced income inequities between large and small producers. Although the CAP's intent is to provide a fair standard of living for the agricultural population, which is two to three times the size of the U.S. farm population, the distribution of support has benefited the largest farms, which have the lowest unit costs (3).

Opportunity Costs. EC intervention in oilseeds and other sectors created other costs that, although less visible, are real. First, there is the cost of excessive use of inputs drawn into oilseed production by high supports. Use of these inputs has stimulated the highest oilseed yields in the world. During 1985-87, EC rapeseed yields averaged 3.0 tons per hectare versus 1.4 tons in Canada; EC sunflowerseed, 1.55 tons versus 1.47 tons in the United States and 1.37 tons in Argentina; and EC soybeans, 3.0 tons versus 2.3 tons in the United States, 2.2 tons in Argentina, and 1.7 tons in Brazil.

Second, there is also the opportunity cost of keeping land and people in agriculture that could be more productive in other sectors of the economy. EC farm size is small, averaging 12 hectares. Only 4 percent of all farmers in the EC cultivate more than 50 hectares, while 62 percent cultivate fewer than 10 hectares. In contrast, the average size of U.S. farms is 180 hectares.

Disequilibrium Invites Further Intervention. Intervention implemented to shift acreage from grains into oilseeds has not eliminated the EC structural grain surplus. Moreover, surpluses have started to appear among individual EC oilseeds (rapeseed and sunflowerseed). While the EC remains far from self-sufficient in oilseed meals, overproduction of oils has required subsidies for disposing of the surplus oil.

Efforts to slow EC oilseed production by imposing production ceilings during the first half of the 1980's slowed because these limits were ratcheted upward as production increased. Also, the resulting support price reductions were relatively small, particularly since support prices were two to three times world oilseed prices. For example, the price penalty for soybeans,

sunflowerseed, or rapeseed exceeding their production ceilings was a reduction in support prices of only 10 percent (8). Other equally ineffective solutions were also proposed to slow the growing costs of the CAP. These proposals ranged from very protectionist trade proposals to cost containment schemes.

The February 1988 EC Summit. For the first time, the EC implemented strict cost containment measures in early 1988 directed toward correcting the fundamental cause of EC oilseed disequilibrium: open-ended production incentives. Limitations on price cuts for oilseeds were removed.

These new measures established individual oilseed production targets, called Maximum Guaranteed Quantities (MGQ), at the beginning of each season. When EC production of a particular oilseed exceeds the MGQ, price penalties automatically go into effect. These price penalties increase the risk for farmers, particularly for those on poorer land and those in debt whose margins would be squeezed. However, these price cuts are not cumulative. At the end of the marketing year, administered prices effectively return to their previous levels.

Calculating Price Support Reductions. The following illustrates how EC support reductions occur for oilseeds. In 1988, the EC set a MGQ for sunflowerseed at 2 million tons, excluding Spanish and Portuguese output, whose substantial production will not fully be taken into account until 1992. (Spain and Portugal, assigned separate output ceilings and lower support prices, are being phased into the EC over 5 years.)

Support prices were cut 0.45 percent for each 1 percent of excess output. Because 1988 EC-10 sunflowerseed output reached 2.79 million tons, 40 percent above the MGQ, its support price was to be cut about 18 percent (0.45 times 0.40) in 1989. Target and guide prices were to be reduced by 0.5 percent for each 1 percent overshoot in the next 2 years.

MGQ's were also set for other oilseeds. As a result, automatic price cuts for rapeseed were implemented. The relative effectiveness or ineffectiveness of MGQ's is determined by a number of developments. First, support price reductions can be offset by fluctuations in green rates. Green rates are special agricultural rates of exchange at which policy prices, set in ECU's, are converted into local currencies. Second, because EC support prices remain significantly higher than world market prices, cuts in the range of 20 percent are not likely to seriously erode existing production incentives. And third, price relationships with grains are important.

Additional measures subsequently have been introduced to discourage oilseed output. The 1988/89 price support package, adopted in July 1988, reduced base oilseed supports to 1985/86 levels. Also, a voluntary set-aside program for 1989 was announced but its impact on output will likely be limited because it is a general area set-aside rather than a crop-specific acreage program. And, unlike U.S. set-aside programs, eligibility for price and income supports provided by the CAP is not tied to producer participation. Since individual governments share unequally in set-aside costs, their willingness to set effective incentives remains doubtful. The EC budget's share progressively falls from 50 percent to 15 percent as per acre payments rise. Therefore, the higher the payment, the greater the share that will have to be borne by the individual government.

Interest in participating is reported to be weakest in the southern areas of the EC, where much soybean and sunflowerseed output occurs. Only one country, the Netherlands, has agreed to offer the maximum payment to encourage program participation. France, the largest producer of EC oilseeds, has offered less than 50 percent of the Netherlands' proposed payment. Only 1-2 percent of the EC's total arable land is likely to be affected by the set-aside program.

Outlook for the EC

Unless trade liberalization leads to a significant modification of EC production and trade policies, EC costs will continue to climb. As world prices of oilseeds and other commodities fall to pre-1988 drought levels, the costs of EC subsidies and levies will remain at high levels. Furthermore, Spain and Portugal's entry into the EC support regime will increase spending. At present, Spanish and Portuguese oilseed producers are receiving supports that are lower than other EC farmers. Their subsidies will gradually rise to parity by the time Spain and Portugal are fully integrated into the EC. If the U.S. dollar declines in value, further depressing the world price of soybeans, EC export subsidies and price supports would become more expensive.

Without trade liberalization or substantial policy reform, EC oilseed output will remain high. However, the output growth is likely to be slower than that recorded between 1980-87 primarily because of EC implementation of production controls. As long as the EC maintains support prices far above world market prices, legislated price cuts of 10-20 percent will exert little restraint on producer incentives.

Brazilian Policies and Programs

Brazilian soybean farmers are able to compete with U.S. and other low-cost producers in international markets even though they receive very little support from the government. Brazilian soybean PSE's were negligible in 1982-86 when compared with EC PSE's (fig. 20). Brazil is a major world producer of soybeans primarily because of its favorable topography, climate, and large availability of underutilized land. The land's production potential far exceeds domestic needs.

Soybeans dominate the oilseed complex, accounting for 90 percent of Brazilian oilseed output. Cottonseed ranks second in volume, and peanuts rank third. Only soybeans and soybean products are exported in large quantities; most of the cottonseed and peanuts are consumed internally.

Some differences exist between Brazilian and U.S. soybean products. Brazilian soybean meal is higher in protein than most U.S. soybean meal exports (47-48 percent versus 44 percent) and therefore earns a higher price from EC importers who treat U.S. and Brazilian meal as separate ingredients in their livestock rations (39). Although about one-half of U.S. soybean meal produced is in the 47-percent protein range, most of this higher protein meal is consumed domestically. U.S. lower protein content soybean meal most often competes with Brazil and Argentina in export markets.

Another characteristic feature of Brazilian soybeans is the presence of a reddish dust, which normal cleaning fails to remove. However, this feature does not appear to have offset demand by those who prefer the soybean's higher meal content. The reddish hue can be removed with additional bleaching, but that adds to processing costs.

Brazilian Profit Incentives

Rising global soybean prices in the late 1960's and early 1970's induced Brazilian growers to become major producers. The brief U.S. soybean embargo of 1973 also increased Japanese and likely other soybean importers' interest in non-U.S. sources of supply. (Japan funded several hundred Japanese farmers to grow soybeans in Brazil) (30).

Brazilian farmers saw that higher returns could be earned from soybeans than other competing crops in many areas. Soybeans expanded onto traditional crop acreage, particularly grain land and pastures, as well as onto virgin lands. The Government even paid farmers to uproot coffee trees in the early days of expansion (40). Soybeans were considered to be less of a risk than coffee.

When the Government pursued a policy of self-sufficiency in wheat by establishing high wheat support prices, farmers chose to double-crop wheat with soybeans because of favorable world soybean prices. The fact that the same machinery could be used for both crops encouraged soybean expansion. Credit subsidies for wheat production also encouraged double-cropped soybeans.

A major incentive for government promotion of export crops like soybeans is that they generate tax revenue. Sales from the soybean complex often earn more revenue than other agricultural commodities. Over the last two decades, these earnings helped the Government service foreign debt, finance borrowing for capital investment, and pay for imported petroleum.

The Changing Direction of Government Production Policies

Government policies have been inconsistent in the degree of support of soybean expansion. Over the last two decades, the Government's most important policy instruments have been input subsidy programs, export controls, and taxes. For example, in the early 1970's, the Government assisted soybean expansion by making easy credit available to agricultural producers. In 1973, commercial banks were required to commit 15 percent of their deposits to agricultural loans (12).

However, at times the Government has intervened to slow soybean expansion. In 1985 and in 1988, the Government shifted its support away from soybeans in favor of greater support of basic food crops like corn. The Government's two policy tools for accomplishing this were subsidized credit and minimum price programs. The Government increased corn producers' access to subsidized interest rates and reduced soybean producers' access by altering production loan schedules. Such credit programs influence producer incentives because of soaring inflation. As a result, small producers have been able to borrow up to 70-100 percent of the basic cost of production; larger producers have received lesser rates. Similar credit has been available in the past for purchasing equipment and, in some cases, land (40).

The Government can also manipulate minimum prices to favor corn over soybeans. The minimum support price for soybeans usually is set below the anticipated market price (which reflects a similar situation in the United States, where CCC loan levels are usually below world price). However, the support prices for corn tend to be much closer to the anticipated market price and therefore are often an important factor affecting the mix of corn and soybean area planted. The Government used both of these policies in 1988 to prevent

soybean expansion from cutting too deeply into corn area when global soybean prices rose in reaction to the drought in the United States.

Government attempts to control inflation by regulating wholesale and retail prices have often reduced domestic consumption of soybean products, primarily oil, thus encouraging their export. Periodic soybean oil shortages have occurred at the ceiling price when either not enough oil was produced or when crushers refused to sell their inventory, opening the door to imports. The Government also imposes a small sales tax on soybean oil (40).

Intervention in Trade

The two primary tools of government intervention in soybean and soybean product trade are import-export controls and differential taxes. The Foreign Trade Department of the Banco do Brazil (CACEX) exercises control over trade.

CACEX has operated a "drawback" system that effectively controls the level of soybean imports in order to ensure that a sufficient quantity of soybeans is available to domestic crushers. Drawback allows soybeans and some other oilseeds to be imported tax free via loans which are available at very favorable interest rates. However, the Government requires meal and oil obtained from them to be re-exported. Processors benefit as these imports enable them to use their excess capacity.

CACEX also influences imports by manipulating the time period in which the processed products must be re-exported. In 1988, CACEX minimized soybean imports by reducing the time period required to re-export the meal and oil from the date the import permit was issued. To further reduce the incentive to import soybeans, CACEX at times has required that crude soybean oil be refined before being re-exported.

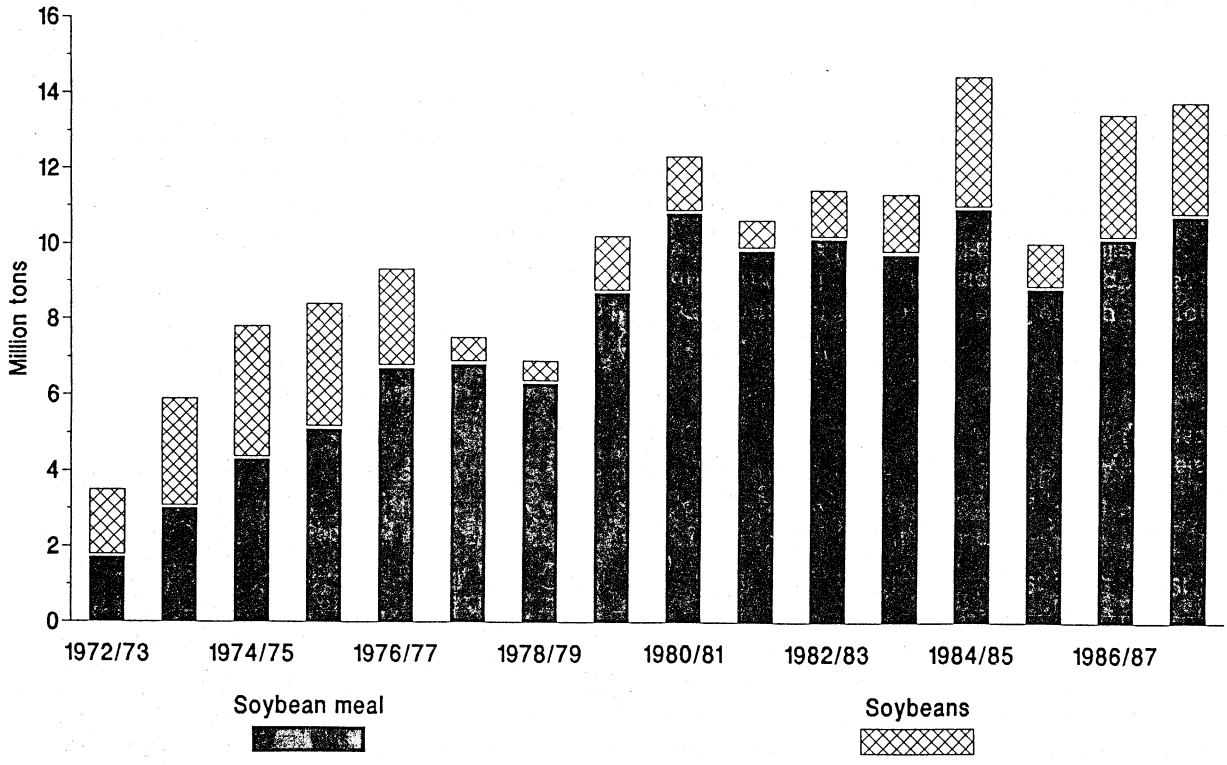
The Government also manipulates the mix of exports through its export registration system. Soybean exports are controlled to ensure positive crushing margins to the industry. Also, soybean meal and soybean oil export volumes are often manipulated through the tax system which works to subsidize their export and through value-added taxes which favor processed product exports over raw products. Tax adjustments are often made to compensate for variations in the foreign exchange rate.

Value-added taxes, called ICM's (Tax on the Circulation of Merchandise and Services), have been applied at different rates to different types of exports. Soybeans are taxed at a higher rate than soybean meal and soybean oil. As a result, the export mix is heavily weighted in favor of soybean meal and soybean oil (fig. 30). These differential tax polices are responsible for Brazil's becoming the largest exporter of soybean meal in the world.

Brazilian soybean meal exports have exceeded those of the United States every year since 1980, even though Brazilian soybean production is often only one-third of U.S. production. Similarly, Brazilian soybean oil exports sometimes exceed those of the United States. Only about one-quarter of Brazilian soybean meal was consumed domestically between 1978 and 1986. In contrast, about two-thirds of Brazilian soybean oil was consumed domestically.

Although these differential taxes encourage processed soybean product exports relative to raw soybean exports and contribute to government revenues, they also reduce the potential competitiveness of Brazilian soybean complex

Figure 30--Brazilian soybean and soybean meal exports 1/



1/ Aggregated on a soybean basis.

exports. Some of the tax is likely shifted forward, increasing the price paid by foreign buyers and reducing the price obtained by Brazilian exporters. The volume of overall exports thus is lower than it would be in the absence of these taxes.

Crushers have been compensated to some degree through subsidized credits. They also have benefited from export quotas on soybeans which determine the profitability of crushing and the attractiveness of investments in crushing facilities.

The distorting effect on exports of Brazil's differential taxes has prompted complaints by processing groups in the EC and the United States since the mid-1970's. The latest occurred in 1983, when the U.S. National Soybean Processors Association filed a complaint about various export programs, including the differential taxes, under Section 301 of the Trade Act of 1974, claiming that the differential taxes were an unfair trade practice that injured U.S. soybean and soybean product exports.

Outlook for Brazil

As long as market returns favor soybeans over other domestic crops, Brazil will remain a major global producer and exporter of soybeans and soybean products. Brazil relies on the substantial tax revenues earned from its oilseed complex to make payments on foreign debt, currently in excess of $114 billion. In 1988, Brazil earned more export revenue ($3.1 billion) from the

soybean complex than from any other agricultural sector, including coffee ($2.3 billion).

Because no dramatic improvement in yields is expected--yields have not improved significantly since the mid-1970's--changes in output will depend on area adjustments. Because of the Government's interest in not allowing export crops to crowd out the production of food crops--corn, manioc, rice, and dry beans--no sharp increase in soybean area is expected. Improvements in Brazil's infrastructure could encourage more output by reducing internal transportation costs. Most soybeans are trucked to export terminals.

With inflation continuing at a triple-digit rate, reduced consumer purchasing power would depress domestic demand for soybean meal and soybean oil and encourage their disposal abroad. As long as Brazil's regime of differential taxes continues to favor soybean products, Brazil will maintain its disproportionately large share of global soybean meal trade.

Argentine Policies and Programs

Argentina successfully competes with other major exporters in the soybean and soybean product markets even though its producers receive less support from the Government than most soybean producers in other countries. The aggregate effect of all government policies was negative, based upon the soybean PSE's estimated for 1982-86, totaling almost 15 percent of total product value. Argentine soybean producers are more heavily taxed than farmers of the other major producing countries.

Nonetheless, Argentine farmers generally produce soybeans at a lower cost than do Brazilian farmers because the richness of Argentine soils requires less application of fertilizers and other chemicals. Like Brazil, Argentina exports most of its soybean crop as high-valued processed products (fig. 31). The protein content of Argentine meal is higher than much of the U.S. soybean meal against which it competes.

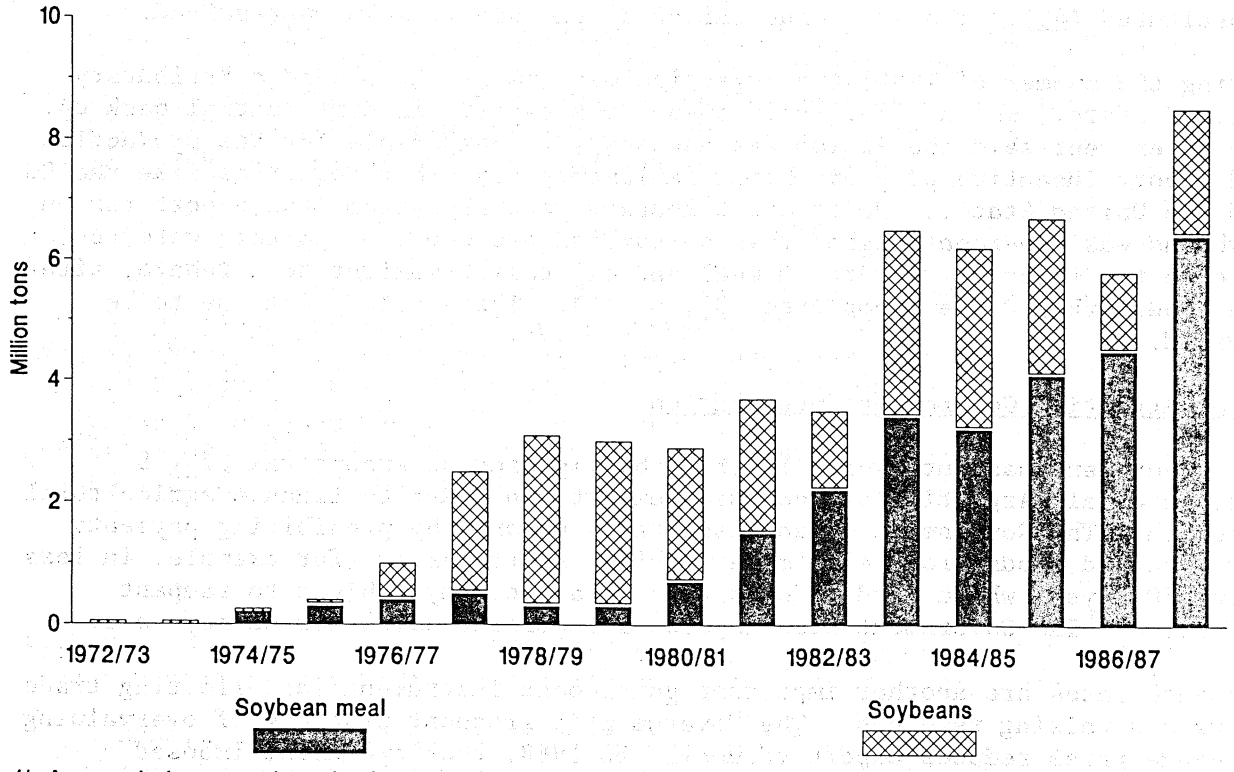
High world soybean prices in the early 1970's induced Argentine farmers to shift large areas into soybean production. Argentina's climate, land base, and topography are even more favorable for growing soybeans than Brazil's. Argentine soybean yields continue to rise, whereas Brazilian soybean yields have flattened out. In addition to soybeans, Argentina is a major producer of sunflowerseed, flaxseed, cottonseed, and peanuts. Soybeans account for the largest share of oilseed output. In contrast to Brazil, Argentina consumes only a fraction of its soybean production and exports 90 percent or more of its soybean meal and oil. Because Argentine beef cattle are primarily grass-fed, domestic demand for meal is less.

Government Intervention Weighted Toward Border Measures

The Argentine Government affects soybean and product trade primarily through export taxes (retentions) and exchange rates. Export tax rates often have depended on the regime in power.

As in other less-developed countries, export taxes are a major government revenue earner in Argentina because they are easier to administer than many other taxes. Besides, the tax base in Argentina is small. Export taxes play a major role in enabling the Government to finance domestic programs and service foreign debt, now above $55 billion. The agricultural sector is the

Figure 31--Argentine soybean and soybean meal exports 1/



1/ Aggregated on a soybean basis.

largest earner of foreign revenue. Agricultural exports accounted for almost two-thirds of total Argentine export earnings in 1987. The oilseed complex earned 48 percent of Argentina's $5.6 billion agricultural exports and almost one-third of total exports. The value of oilseed complex exports exceeded grain exports by 2.5 times.

The Argentine National Grain Board (NGB) collects export taxes and exerts considerable control over trade through quotas, internal price ceilings, and licensing requirements to ensure the adequacy of domestic supplies. It also administers the Government's price support program for grains, manages state-owned storage facilities, collects special-purpose levies, and until 1979 was the sole owner and operator of all port elevators (40).

Differential Taxes Influence Soybean Complex Export Mix

Like Brazil's, Argentina's use of differential taxes in the oilseed complex has encouraged product exports. Processed products often account for almost four-fifths of total oilseed complex export earnings. Soybean meal exports are generally more than double soybean shipments (fig. 31). In fact, Argentine soybean meal exports are only 2-3 million tons less than U.S. soybean meal exports even though U.S. soybean output is 30-40 million tons higher.

Argentina's differential taxes and their effect on trade were the basis for two Section 301 complaints by the U.S. National Soybean Processors Association (NSPA), in 1983 and 1986. Following negotiations with the United States, the

Argentine Government lowered the soybean differential. Subsequently, the Argentine Government announced that export taxes would be eliminated within 180 days. However, they were not terminated even though the World Bank granted it a "restructuring loan" with the provision that a land tax be substituted (40). The key issue raised by the NSPA remains unresolved.

During the summer of 1988, the Argentine Government introduced a "tributary return" system, which effectively pushed the export tax differential back up. The Government said the action was necessary to compensate for the production and export incentive programs being implemented by other countries like the EC and the United States. Under the tributary returns system, the export tax on soybeans was 8 percent higher than on soybean products. Exporters were to receive the tributary return on meal and oil taxes, similar to a rebate, after the paperwork had been completed (35, p. 46). These rates continue to be revised.

Other Argentine Government Intervention

The Government has intervened in trade by imposing an export tax of 1.5 percent on all Argentine agricultural exports in order to finance agricultural research. The Government often discourages exports by prohibiting payments for imported goods from being made within a short period (for example, in less than 180 days), which burdens exporters in an economy subject to rampant inflation. The Government also imposes a 5-percent sales tax on soybeans.

Exchange rates are another important government instrument for affecting trade flows and raising revenues. The Government's frequent practice of overvaluing exchange rates reduces export volumes. In 1988, the Government imposed multiple exchange rates under the Primavera Plan, which put the agricultural export sector at a disadvantage compared with manufacturing sectors. This measure dampened producer incentives to increase soybean sowing following the 1988 U.S. drought by cutting expected returns. The Government's likely motivation was to reap a portion of the expected windfall from the soaring world agricultural prices caused by the drought in the Northern Hemisphere.

On the production side, the Argentine Government provides less assistance to domestic producers than Brazil. For example, the Argentine Government usually does not subsidize interest rates for farmers despite high inflation.

Outlook for Argentina

Potential returns from global commodity markets will continue to significantly determine the mix between oilseeds and grains in Argentine crop area. Soybean output is likely to increase faster than area because of the good record of yield increases. Existing intervention through differential export taxes means that Argentina will continue to maintain a large share of global soybean meal and oil markets. Argentina's financial difficulties and small tax base discourage any government initiative to eliminate export taxes.

Malaysian Policies and Programs

Malaysia is a major competitor of the United States in world vegetable oil markets. More than 1 of every 3 tons of vegetable oil traded in the world markets is palm oil; 3 of every 4 tons of this comes from Malaysia. Malaysia is also the largest exporter of palm kernel oil, a byproduct of the palm plant. Because the cost of production for palm oil is generally lower than

that of soybean and many other vegetable oils, little government assistance is needed to make palm and related oils competitive in world markets.

Government Assistance Significant In Early Days

Malaysia's economy depends heavily on commodity exports (accounting for about 75 percent of gross national product). Realignments in world commodity prices encouraged Malaysia to become a major producer of palm oil in the 1960's. As the relative price of rubber declined in international markets, the Government encouraged the expansion of palm trees on rubber plantations. Such assistance was important to producers since maximum output only occurs 15-25 years after planting.

Over the last three decades, palm oil has played a dominant role in the government's effort to expand the agriculture sector. The Federal Land Development Agency (FELDA) provided a major boost to palm production in the early 1960's. At that time, the Government held a majority interest in most estate companies, and FELDA expanded cultivation to small landholders through land resettlement schemes. Also, international lending institutions like the World Bank and the Asian Development Bank have played a major role in palm oil's expansion. Institutional loans were granted to support palm oil's development in order to raise employment and incomes.

Government Support for Expansion Continues. During 1986-90, the Government will allot more than 100,000 hectares for oil palm to its land development agency, FELDA. FELDA will be responsible for the processing, transport, and marketing of the settlers' produce (38).

Differential Taxes

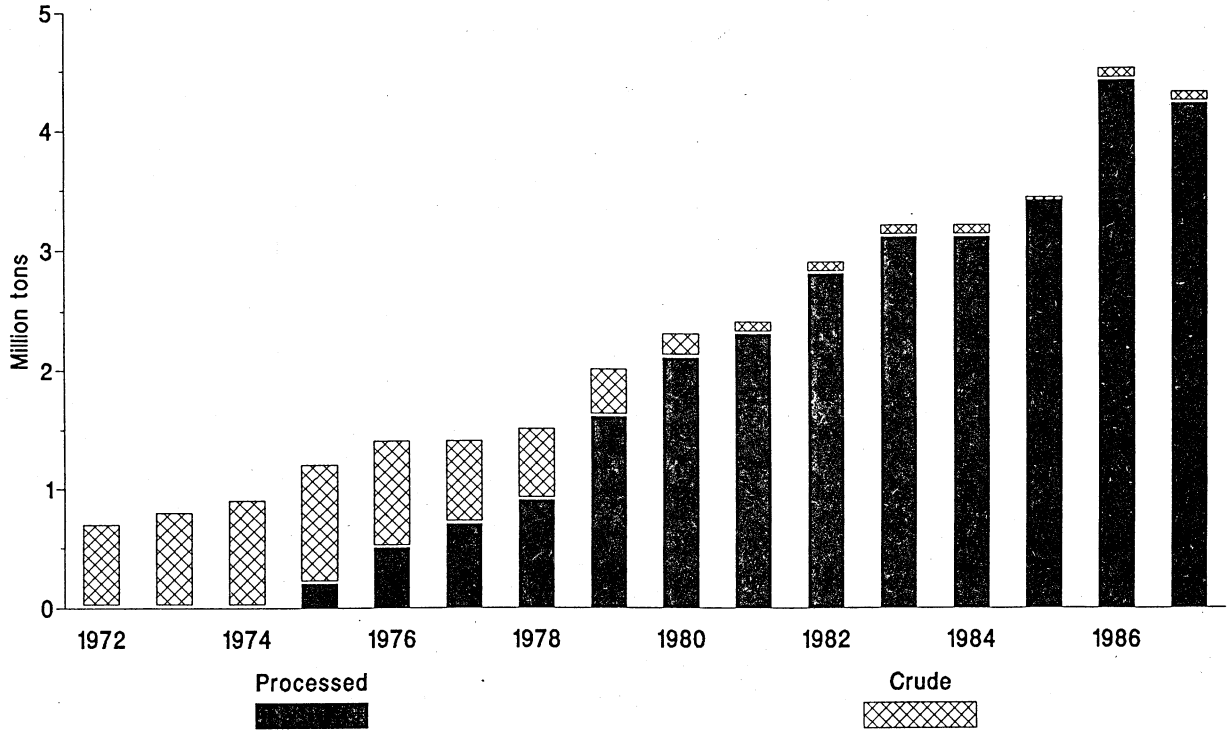
As in Brazil and Argentina, differential taxes have shaped the mix of exports from the Malaysian oilseed complex. Malaysia's system of differential taxes has encouraged domestic refining of crude palm oil into higher value products. This has increased export revenues and has made refined palm oil more competitive with soybean and sunflowerseed oils.

The Malaysian export tax system operates in the following way: (1) export duties rise in proportion to the rise in the world price of palm oil; (2) the rate of duty is inversely proportional to the degree of processing (39). Fully refined oils are exempted from most export duties. This system creates a disincentive to export crude palm oil and, at the same time, creates a large, low-priced source of supplies for local processors. As indicated in figure 32, processed oil has almost completely replaced crude palm oil in exports. Palm and palm kernel oil exports contribute about one-fifth of total agricultural exports. Shipments of agricultural goods abroad account for almost 40 percent of all Malaysian exports.

Other Intervention

The Malaysian Government also has provided financial incentives to invest in processing facilities, supported research on end uses, and assisted the private sector in developing markets abroad. Government assistance is likely to continue to improve the perceived nutritive profile of palm oil, particularly in the developed countries.

Figure 32--Malaysian palm oil exports 1/



1/ Calendar years.
Source: (17).

Although there are no direct export subsidies, the Malaysian Government grants pre- and post-shipment credits at subsidized rates. However, these subsidies are relatively small in relation to the total value of palm oil exports (34).

Funding From Abroad Also Assists Malaysia's Development of Foreign Markets. In the past, the Islamic Development Bank has approved funding to finance Malaysian exports, including specific allocations to finance palm oil imports to Pakistan.

Outlook for Malaysia

Existing commodity prices favor a continued expansion of oil palm acreage. Oil palm competes primarily with cocoa and rubber for area. Both public and private estates are expected to strive for a good mix of these three crops (38). Copra (coconut) development is not likely to cut into oil palm's growth because the Government eliminated subsidies for copra expansion under the Coconut Smallholder Development Scheme in 1987. Palm oil output is likely to expand in the short run as trees planted in the 1970's come into their period of maximum output. In the long run, increased competition is likely to come from Indonesia.

Malaysia's ability to maintain its large share of global vegetable oil markets will depend on the magnitude of the price differential between palm oils and competing oils and on how world consumers, primarily in developed countries, react to the campaign to reduce saturated fats in their diets.

Effects of Eliminating Intervention in Trade

If negotiations succeed, adjustments that would occur in global oilseed and oilseed product markets after the reduction of government intervention depend on three factors: (1) the amount of government intervention removed, (2) the degree of multilateral trade liberalization achieved, and (3) the strength of cross-commodity price effects resulting from liberalization achieved in related commodity markets, like those of grains and livestock, which could significantly affect the demand and supply of oilseeds and oilseed products.

Global oilseed producers generally receive far less support than producers of other commodities, like grain, sugar, and dairy products. Therefore, global oilseed and product markets are expected to undergo much less adjustment than most other agricultural commodity markets. However, because the level of intervention varies significantly from region to region, adjustments within different geographical areas will vary. For example, changes within the EC would likely be large because EC oilseed producers receive a great deal of government support.

Although intervention in oilseed markets is relatively limited, it varies among individual oilseeds. In the United States, for example, intervention is greater in peanut markets than in soybean markets. The U.S. peanut sector therefore could face significant adjustments.

Major Assumptions of This Study

Three assumptions shape the conclusions cited in this report. First, the study assumes nearly complete implementation of the initial U.S. zero option proposal made during the current Uruguay Round. Developing countries, like Brazil, Argentina, and Malaysia, could receive special treatment in the long-term reform process. However, the United States and other developed countries have insisted that special and differential treatment be, for the most part, transitional in nature and take into account the individual economic and agricultural development of each country. Second, the study assumes multilateral trade liberalization among GATT industrialized countries. Multilateral liberalization would produce larger gains for GATT participants than would unilateral liberalization. Third, the study assumes non-GATT countries, like most centrally planned countries, do not liberalize.

Sources Used To Assess Trade Liberalization's Effects

Both qualitative and quantitative analyses were relied on for these results. Some important sources of information were studies using mathematical models that simulated the effects of eliminating government intervention in agricultural commodity markets. These models were particularly important in assessing likely cross-commodity effects between oilseeds and nonoilseeds, which would significantly affect oilseed product demand and supply.

Ideally, a properly constructed mathematical model allows a large number of economic variables in multiple markets to be treated in a consistent and systematic way. However, with greater specificity comes greater controversy about assumptions, particularly about the values that supply and demand elasticities would have in a world free of government intervention. And despite the often-deserved criticism which econometric models receive, including the Lucas criticism that models estimated using data under past

policy regimes may not be relevant to current or future market conditions, econometric models represent the best forecasts of many agricultural economists.

Diverse results were obtained from the different models used to simulate trade liberalization because most incorporated different representations of trade liberalization, structures, base periods, and other assumptions. Among the models used by USDA's Economic Research Service to assess likely impacts of trade liberalization was an 11-region, 22-commodity static world net trade model, called SWOPSIM (26). The SWOPSIM results that appear in this study are based on SWOPSIM's most recent run, which used 1986 as a representative base year. Choice of a different base year would influence model results.

Only a few of the largest trade models incorporated oilseeds as a separate commodity. Those that did incorporated oilseeds in a very limited way, probably because of the complexity of simultaneously trying to model the myriad of general nonoilseed commodities. Rarely were oilseeds and oilseed products subdivided into more than two categories. SWOPSIM provided the most elaborate model, dividing the huge complex of oilseeds and products into six categories: soybeans, soybean meal, soybean oil, other oilseeds, other meals, and other oils. However, greater model specificity would be needed in order to estimate likely adjustments in global oilseed markets in each of the more than two dozen oilseed and oilseed product markets.

Country coverage in econometric models often was limited too. Although producers in developed economies were usually subdivided into a number of countries and regions, important oilseed producers in developing economies, like Argentina and Brazil, were most often lumped together with other developing countries. Consequently, SWOPSIM model results were ambiguous about adjustments that might occur in Brazil and Argentina.

General Effects on Agricultural Markets

Virtually all studies on the probable impact of trade liberalization concluded that consumer prices for most agricultural products would rise. Increases were expected to be largest for commodities whose protection was highest, such as sugar, beef, and dairy. Cereal and coarse grain prices--commodities that receive less government support--were usually forecast to rise by about one-quarter or more above the current market price range. In contrast, overall producer prices for most commodities were forecast to decline in many industrial countries. As a result, production of most commodities was forecast to fall below the surplus levels of recent years.

According to USDA's SWOPSIM model, total U.S. farm output would remain almost unchanged. However, EC and Japanese output would decline. Farm output was forecast to rise in those countries that had the least protection prior to trade liberalization, like Australia and New Zealand (25).

Effects on Oilseed and Oilseed Product Markets

Trade liberalization is expected to produce little change in global oilseed prices because governments have not extensively intervened in oilseed markets to produce a glut of excessive output, characteristic of grains in recent years. For example, global oilseed stocks did not rise to the heights that grain stocks reached in the mid-1980's.

Sharp price adjustments, however, would occur within certain regional and country markets with the elimination or sharp reduction in subsidized producer prices. These adjustments are noted in the individual commodity sections included in this chapter. The EC is the major market where internal price adjustments would likely be significant for the entire spectrum of oilseeds.

Producer Price Changes

The few studies that include oilseeds in their models support the view that producer price declines will be relatively small for oilseeds compared with other commodities. USDA's SWOPSIM model forecasts that U.S. producer prices for domestic oilseeds and oilseed products generally would decline slightly, only a fraction as much as wheat and coarse grain producer prices fall.

World soybean prices would fall even less than U.S. soybean producer prices. World prices, in fact, might not decline at all if foreign demand for soybean protein were to rise more in non-EC countries than anticipated by SWOPSIM because of the lowering of oilseed protein prices relative to feed grain prices.

Only modest adjustments in U.S. producer prices for other oilseeds would likely occur, with the exception of peanut producer prices which would decline. Overall net income for the U.S. oilseed sector and for soybean producers could rise, even though gross receipts could decline with freer trade, because per bushel costs would fall.

In contrast, the decline in EC oilseed producer prices would be greater than U.S. producer price reductions, according to SWOPSIM. EC producer prices for wheat and coarse grains could fall by the same large percentage as their U.S. counterparts. Oilseed producer prices among developing exporters were forecast to rise less than anticipated producer price increases for wheat and feed grains (25).

Cross-Commodity Price Changes

Abrupt changes in price ratios between commodities would produce sharp adjustments in demand among substitutes, like oilseed meals and feed grains. The greatest adjustment in demand for oilseeds and oilseed meals would likely occur in the EC, because government levies have created a large price gap between duty-free imports and domestic oilseeds and grains whose prices are arbitrarily set. This EC practice increased demand for nongrain feeds, resulting in cheaper oilseed meal being substituted for more expensive domestic grain. This resulted in soybean meal and tapioca capturing much of barley and corn's share of livestock rations.

Trade liberalization would reduce the EC's high grain-to-oilseed price ratio, encouraging corn substitution for oilseed meal. If the corn-to-soybean price ratio were to fall sharply, the EC livestock feed industry could increase corn's share of feed rations enough to offset most of the higher demand for imported soybean meal caused by expected sharp cutbacks in domestic EC oilseed production. EC corn imports rather than oilseed imports could jump sharply.

Econometric models suggest varying degrees of change in the EC import mix between oilseeds and grains. SWOPSIM forecasts a very large increase in EC corn imports and a slight decline in aggregate EC soybean and soybean meal

imports. If the corn-to-soybean price ratio realignment were less severe than anticipated, EC soybean and soybean meal import demand could be higher.

Changes in EC import demand also depend on the magnitude of the cutback in its domestic oilseed production. Were trade liberalization to ratchet down internal producer prices, farmers with higher average costs would be forced out of production. EC oilseed output, currently at 11-12 million tons, would decline but probably not to the 3 million tons recorded at the beginning of the 1980's.

SWOPSIM forecasts a moderate decline in EC soybean output and another model, built by Paarlberg and Yamazaki at Purdue University, forecast the virtual elimination of EC soybean production. However, the Paarlberg-Yamazaki model does not take into account possible effects produced when EC grains and other oilseeds also are liberalized (24).

EC rapeseed and sunflowerseed cutbacks would be large, stimulating EC import demand for foreign oilseeds having a relatively high oil content in order to help satisfy EC vegetable oil tastes. World prices of higher content oilseeds could increase slightly relative to soybeans after government intervention is removed.

EC exports of rapeseed oil might continue after trade liberalization, but at much lower levels. For sunflowerseed and oil, the EC would return to the ranks of a net importer. Imports of soybeans could also be stimulated by higher crush margins for soybeans in response to higher vegetable oil prices and reduced EC production of vegetable oils from their high oil content oilseeds.

Comparative Advantage Determines Reallocation of Gains

Trade liberalization would concentrate production in the countries with the greatest comparative advantage (that is, those with the lowest opportunity costs). These countries' oilseed and oilseed product exports would increase.

Model results support this view. However, no model forecasts more than moderate gains for oilseed exporters, which appears consistent with the low level of assistance presently accorded to oilseed producers. SWOPSIM forecasts that the volume and value of U.S. oilseed and oilseed product trade would rise slightly with trade liberalization (26). SWOPSIM and other models also foresaw revenue gains from the oilseed complex trade for developing countries.

Benefits flowing to the United States, Argentina, Brazil, Paraguay, Malaysia, Canada, and other low-cost competitors would come from less competitive producers like the EC, whose domestic output would decline, dependence on imports could increase, and subsidized oilseed and product exports would end.

Individual country gains and losses depend on how complete trade liberalization is and how cross-commodity prices adjust. Cross-commodity price movements will determine shifts in the production mix among each of the oilseeds and grains that compete for sown area. Trade flows would be affected by policies and programs that are excluded from trade liberalization.

Soybean Market Adjustments: U.S. Production To Rise

Although trade liberalization is not expected to significantly change global output of soybeans, a larger share of world production is expected to be grown by low-cost producers, like the United States, and less by high-cost producers, like the EC. SWOPSIM forecasts virtually no increase in global soybean output. World soybean trade would increase slightly as more soybeans came from low-cost producers.

Modest increases in soybean output would likely occur in the United States. U.S. soybean output would rise as additional area became available for allocating to soybeans, especially if coupled with greater relative declines in producer prices for grains than soybeans.

If world prices were to strengthen for grains and weaken slightly for soybeans, the past several decades of strong South American soybean expansion could slow and possibly decline somewhat as more crop area returned to grains, particularly to corn. However, additional virgin land remains in Brazil that could come into the production of soybeans, other oilseeds, and grains.

Under trade liberalization, EC exports of rapeseed, butter, soybean meal, and vegetable oils would decline. Greater demand for soybeans and soybean meal could also occur in Japan, Taiwan, Korea, and the centrally planned economies, whose livestock sectors' demand for oilseed meal could increase if soybean and soybean meal prices were to fall.

The value of soybean oil trade would rise as a result of the elimination of export subsidies by the EC and United States. SWOPSIM results show the value of soybean trade changing very little, the value of soybean oil trade rising slightly, and the value of soybean meal trade declining by a small amount.

United States

Under trade liberalization, U.S. soybean acreage would likely increase, depending on cross-commodity price effects in the United States and elsewhere, the amount of area released from U.S. land retirement programs, and the strength of foreign demand. SWOPSIM indicated a slight rise in U.S. soybean production; the Paarlberg-Yamazaki model foresaw no growth in U.S. production.

The SWOPSIM scenario of a slight rise in production appears more likely and perhaps even underestimates a possible jump in U.S. soybean output. To understand why U.S. soybean acreage would likely increase, it is important to understand how the current program for soybeans and competing crops affects soybean planting decisions. The U.S. soybean program consists primarily of a nonrecourse loan program. There are no deficiency payments for soybeans, nor have there been acreage restrictions or marketing quotas to control soybean production. While price supports for soybeans have been in effect since 1941, the program has been largely inconsequential. The season-average price of soybeans has met or exceeded the loan rate in all but a few years. As a result, CCC acquisitions of soybeans under price supports have been small relative to other program crops such as corn.

Government programs for feed grains and upland cotton have placed soybeans at a competitive disadvantage because feed grain and cotton programs provided high income support through deficiency payments. High target prices have allowed corn and upland cotton producers to remain relatively well insulated

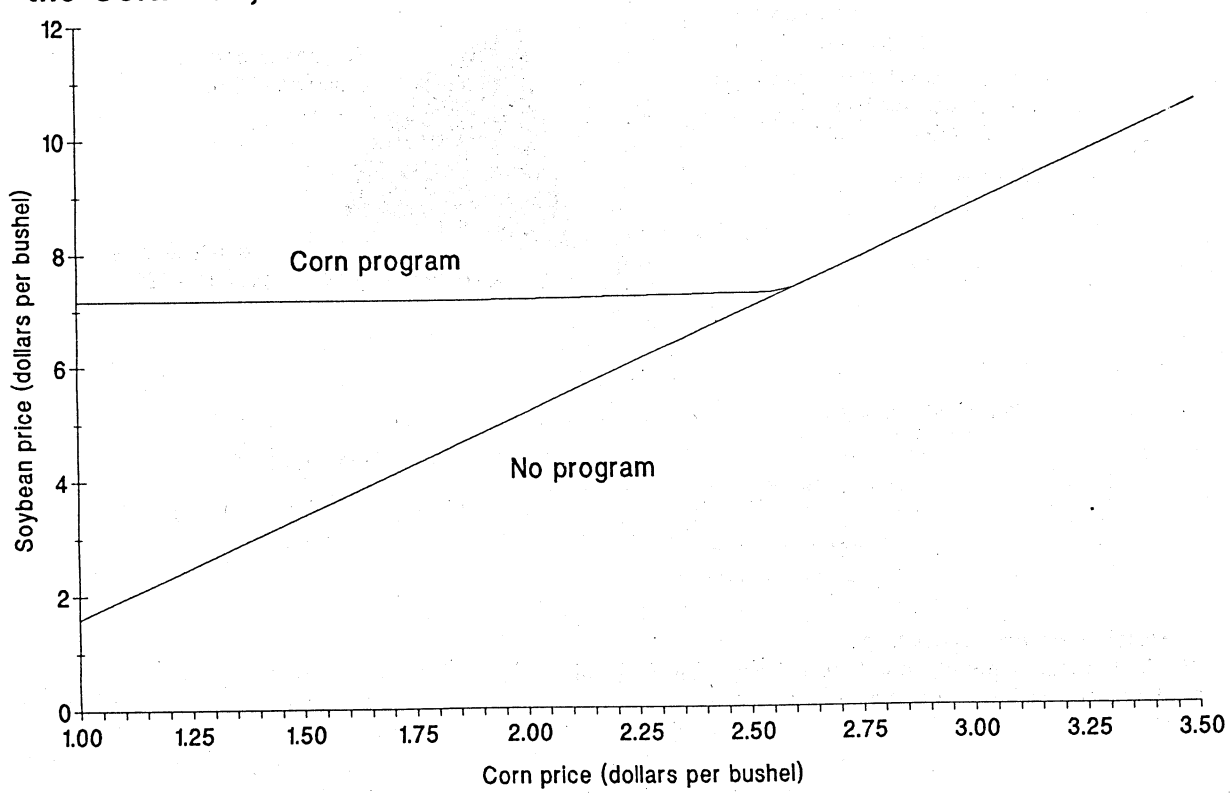
from fluctuating market prices. This prevented responses to favorable soybean prices. For example, despite a rise in the soybean-to-corn market price ratio from 2.75 in 1987 to almost 3.0 in 1988, U.S. soybean acreage was virtually unchanged.

U.S. producers have been desensitized to the soybean-corn market price ratio because the corn program provides per-acre net returns that compare favorably with those of soybeans and are less affected by market price variability. Figure 33 shows the breakeven prices facing a producer in the Corn Belt using data from the 1986 crop year. At the breakeven price, the per-acre net return for planting soybeans is equal to the per-acre net return for planting corn. For soybean prices less than the breakeven prices, producers will plant corn; for prices greater than breakeven prices, producers will plant soybeans.

Note that there are two lines in the figure. The diagonal line represents the breakeven prices for soybeans assuming no programs. The second line represents breakeven prices for soybeans assuming deficiency payments, paid land diversion payments, and nonrecourse loans for corn producers.

The corn program effectively places a plateau on the breakeven price relationship. For corn prices below $2.65 a bushel, the line is relatively flat. High income supports compensate corn producers when corn prices fall below these levels. At a target price for corn of $3.03 per bushel, a corn loan rate of $1.84, and an acreage reduction program requirement for corn participants of 20 percent, soybean prices would have to exceed about $7.15 a

Figure 33--Breakeven price for U.S. soybeans in the Corn Belt, 1986/87



bushel to make soybeans more attractive than corn (11). (This ignores the cost of losing base acreage.)

For the 1986/87 marketing year, corn prices averaged $1.50 a bushel while soybean prices averaged only $4.78. With the corn program in place, the effective corn price (including government payments) was almost $2.40 a bushel. These prices favored the planting of corn over soybeans.

How would trade liberalization have affected planting decisions? Assuming little change in market prices, removal of the corn program would have made soybeans more attractive than corn. Soybeans' breakeven price would have had to fall below $3.38 a bushel to make corn a more favorable planting alternative. Even with a 10-percent increase in corn prices (to $1.65 a bushel), it seems unlikely that trade liberalization would cause soybean prices to fall more than the necessary 18 percent ($3.93 a bushel) to continue to keep corn more profitable than soybeans. This would suggest a likely increase in soybean acreage.

There are a number of caveats. First, the breakeven price analysis is based on regional averages. For individual farmers, corn may continue to be an attractive crop despite the relative drop in the price ratio. Hence, the aggregate soybean supply curve may not respond as rapidly to the change in relative prices.

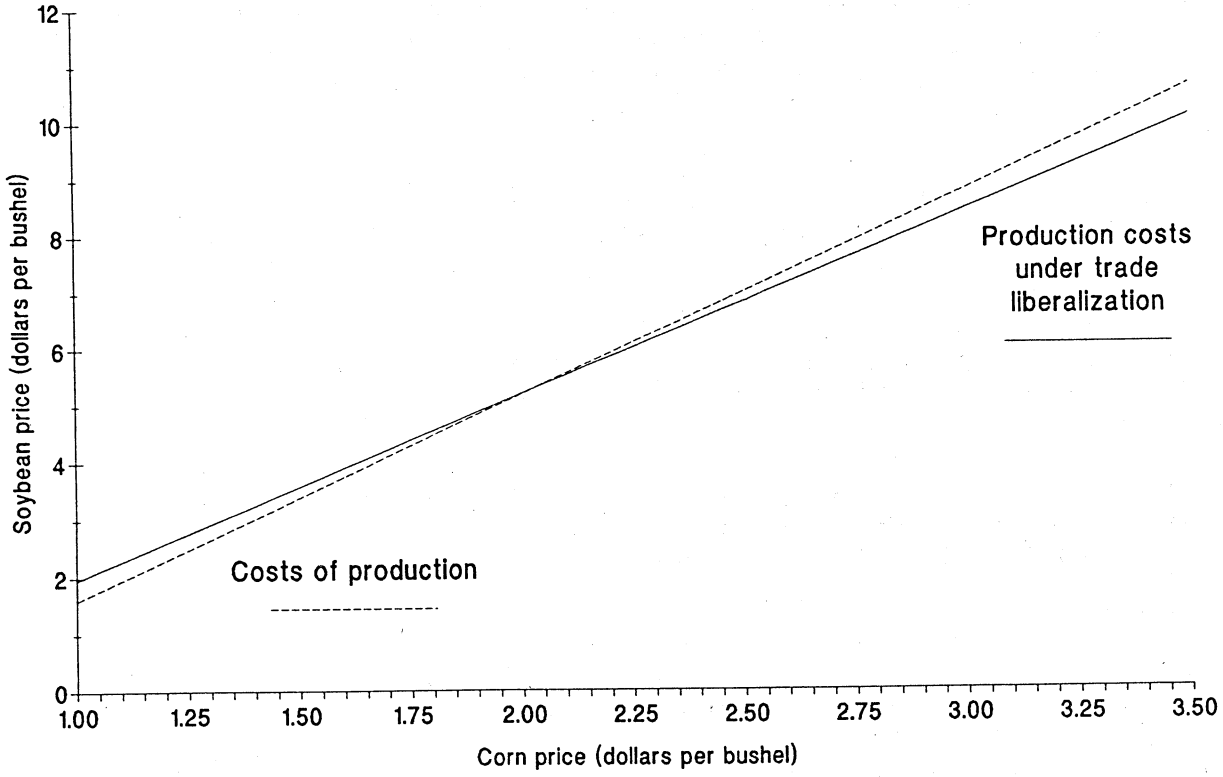
Secondly, production costs may differ greatly with trade liberalization. The costs of production for corn and soybeans are similar for most inputs except fertilizer. In 1986, per-acre fertilizer costs for corn producers averaged $45.51, while costs for soybeans were only $5.63. With trade liberalization, corn producers could potentially cut fertilizer use although corn yields could fall as a result. Figure 34 shows the effect on the corn-soybean breakeven line when corn producers reduce fertilizer costs by 50 percent, assuming a concomitant 10-percent reduction in corn yields. Given a 10-percent increase in corn prices, soybean prices would still have to fall over 15 percent (to $4.06) to encourage farmers to plant corn over soybeans. The analysis suggests that even with shifts in the cost of production, trade liberalization would likely result in increased soybean acreage.

Another important uncertainty is the change in the strength of foreign demand, particularly EC demand, for U.S. soybean complex products. In the EC and elsewhere, shifts in the prices and production of other oilseeds, grains, and livestock will be critical determinants.

The post-liberalization mix of U.S. soybean complex exports--soybeans versus soybean meal--will depend on prevailing crush margins. SWOPSIM projects a larger share of raw soybeans. The mix of U.S. soybean complex exports will also depend on the degree to which Brazil and Argentina reshuffle their soybean complex export mixes and on whether they alter current policies that favor product exports.

Removal of the import tariffs on foreign-produced vegetable oils would likely have little impact on vegetable oil use. The United States would continue to hold a competitive advantage for vegetable oils that are domestically produced.

Figure 34--Effect of trade liberalization on the breakeven price in the Corn Belt, 1986/87



Argentina and Brazil

Liberalization would likely strengthen world grain prices and therefore weaken the soybean-corn price ratio. As a result, Argentine and Brazilian soybean expansion would at least slow. No dramatic swing in soybean area would likely occur from trade liberalization because there is more at work in these countries than just the effects of relative prices. Even before the recent increase in the relative price of soybeans, Argentine soybean area was expanding. In Brazil, corn is a major food crop in a subsistence sector. Therefore, production is probably not greatly affected by relative prices.

The direction that soybean revenues take for South American growers also depends on adjustments in EC demand for soybeans and soybean meal imports and on the magnitude of U.S. soybean area increases.

Two other factors internal to Argentina and Brazil also will affect returns to soybean producers there: the reduction in domestic government intervention, including a vast array of internal tax and credit mechanisms, and the elimination of differential export taxes, which up until now have favored product exports over raw seed exports.

Since Argentine and Brazilian PSE's have been slightly negative in the past, the reduction of government intervention there could contribute to a slight increase in producer returns for a number of crops, including oilseeds.

If world grain prices were to strengthen, Argentine total crop area, which has remained fairly stable in recent years, would reverse its recent trend toward a larger share of oilseeds and back to more grains. Argentina, like the United States, has a competitive advantage over Brazil in corn production. Brazilian corn yields tend to be about one-half to one-quarter below Argentine and U.S. corn yields. Within the Argentine oilseed sector, incentives to grow high-oil-yielding seeds like sunflowerseed would strengthen, particularly if EC import demand for sunflowerseed rose.

Higher world grain prices would also cause Brazilian producers to increase grain area. Because Brazil has large uncultivated tracts of land that will continue to be added to its agricultural base, it could expand both corn and soybean output. However, any continued growth in Brazilian soybean area would likely be slow, because Brazil's soybean yields are lower than those of the United States and Argentina and have exhibited a flat trend over the past 20 years. Second, Brazilian cost competitiveness would erode as soybeans are introduced farther inland unless infrastructure improvements were made to cut high internal transportation costs.

The elimination of Brazilian and Argentine differential export taxes could boost oilseed producer incentives as well as cause a greater share of their oilseed output to be exported in raw form. Although these differential export taxes have allowed Brazil and Argentina to gain larger shares of global oilseed product markets in the past, these taxes have inhibited oilseed production and the overall volume of exports.

A 1984 USDA study of Brazilian soybean and soybean product differential taxes concluded that these taxes are counterproductive over the long run. Brazilian export volumes of soybean meal and oil are actually lower because these taxes reduce production incentives to Brazilian soybean farmers (40). Less soybean production occurred since the 1970's and consequently less meal and oil were crushed than would have been the case if production incentives had not been reduced by these taxes. (An argument could be made, however, that drawback compensated for some of this.) Since Brazil pushed fewer soybeans into export markets, world oilseed prices were higher than otherwise, thus encouraging U.S. and other foreign soybean production.

The Argentine and Brazilian Governments would likely resist elimination of export taxes because of the large revenues they presently earn, regardless of whether their oilseed sectors were less competitive than they would be in the absence of these taxes.

Rapeseed (Canola) Market Adjustments: Canada Could Gain Market Share

The elimination of generous EC producer subsidies and trade barriers would certainly reduce EC rapeseed output, which accounts for more than one-fifth of global rapeseed production. As EC production fell, Canada could increase its output.

Cross-commodity price alignments after trade liberalization appear to favor rapeseed expansion in Canada. Barley, the main alternative to rapeseed, would closely compete for acreage. Smaller acreage could be allocated to oats, corn, and soybeans. Canada is a net importer of soybeans and soybean meal. SWOPSIM indicates that coarse grain and soybean producer prices would fall much more than other oilseed producer prices (mainly rapeseed).

Because of the expected cutback in rapeseed output in the EC, Canada's export shares of global rapeseed and rapeseed oil exports could rise. No significant expansion of rapeseed meal market share is expected for Canada which would likely consume any increase in its domestic meal output. Other factors unrelated to policy may be decisive in determining the competitive position of rapeseed, such as the degree to which U.S. rapeseed production increases.

Sunflowerseed Market Adjustments: U.S. and Argentine Gains Likely

The EC, the world's second-largest producer of sunflowerseed, would have to abandon recently achieved self-sufficiency in this commodity under trade liberalization. The EC, which now produces almost one-fifth of global production, would have to return to U.S. and Argentine markets to satisfy its domestic needs. A sharp reduction in EC sunflowerseed production would strengthen world sunflowerseed and product prices, encouraging greater output outside the EC.

Argentina could continue its dominance in the international trade of sunflowerseed, meal, and oil. Gains could be recorded by U.S. producers, who could increase their production and commercial sales of sunflowerseed, and who would no longer need subsidized export programs after the virtual end of subsidized EC sunflowerseed oil exports.

The world's largest sunflowerseed producer, the Soviet Union, could meet little if any of the EC's renewed demand for foreign sunflowerseed because the Soviet Union itself remains far from self-sufficient in both oilseed meal and vegetable oil. Although a large supplier of sunflowerseed and sunflowerseed oil to the EC in the early 1970's, the Soviets have reduced these exports to a trickle as their own vegetable oil imports have risen to try to meet official consumption targets.

Peanut Market Adjustments: Regional Adjustments Foreseen

Trade liberalization would not significantly affect the current volume of global production and trade in peanuts and peanut products. However, regional adjustments would occur in those major producers in which there had been significant government intervention.

Producers in the United States could experience a substantial one-time loss in the value of peanut farm poundage quotas used for meeting domestic demand. Domestically consumed peanuts now are sold at a high regulated price, while exported U.S. peanuts are sold at what they will bring on the world market. Trade liberalization would lower U.S. peanut producer prices. U.S. peanut production (now less than 10 percent of global output) could decline and U.S. import restrictions on peanuts would also be lifted. Because domestic peanut prices would fall, U.S. peanut consumption would rise.

In India, peanut production could decline slightly because of the termination of domestic policy support. However, this would not necessarily affect world peanut and peanut oil trade because India exports only a small fraction of its peanut output, processing virtually all of its crop to obtain peanut oil. Indian imports of substitute vegetable oils like soybean and palm oils could rise to replace lower domestic output.

Export opportunities could increase for the major peanut meal exporters (China, Senegal, and the Sudan) as a result of a likely cutback in Indian

peanut meal exports, which currently account for almost two-fifths of global exports. The United States is a minor exporter of peanut meal.

China's and Argentina's exports would likely expand beyond their current two-fifths share of global peanut trade. The major peanut oil exporters (Senegal and Argentina) could expand their current share of global trade of about 50 percent, depending on how developing countries are treated in trade liberalization.

Palm Oil Market Adjustments: Potential Malaysian and Indonesian Gains

Trade liberalization could increase demand for palm and palm kernel oils, which would benefit Malaysia and Indonesia, low-cost producers accounting for about three-fourths of global production and 90 percent of exports. The key factors that would strengthen demand are a reduction in EC oilseed production, a decline in Indian domestic vegetable oil output, and the elimination of subsidized EC and U.S. exports of vegetable oils and their substitutes. The end of subsidized U.S. and EC exports would make palm and palm kernel oils more price competitive. Slight reductions in India's domestic production of vegetable oils would also provide a boost for palm.

Malaysia's and Indonesia's supply response would be slow, since producers of palm and palm kernel oil have little flexibility over production in the short run. Therefore, higher would prices for vegetable oils would prevail initially. Over the long run, oil palm expansion would increase. Indonesia already plans a large rise in planted area. Malaysia also would be capable of shifting further resources into palm production in its eastern regions.

Nutrition Issue Jeopardizes Palm's Liberalization Gains

Eliminating tariffs in the United States and elsewhere suggests that palm oil consumption in developing and developed countries could rise. However, palm producers must successfully counter the aggressive campaign that highlighted the possible deleterious health effect of consuming oils that have a high saturated fat content. If palm producers are unsuccessful, Malaysian and Indonesian palm oil and palm kernel exports would fall, particularly to U.S. and EC markets, despite their easier access after trade liberalization.

Other Oilseed and Oilseed Product Market Adjustments

Copra and product exporters likely could expect roughly the same outcome from trade liberalization as palm and palm kernel exporters. Coconut oil shares a nutritional profile similar to palm kernel oil. In global flaxseed markets, some decline in Canadian output is likely and a larger reduction in EC output appears certain. Nonetheless, Canada would remain the dominant flaxseed exporter. Argentina and the United States could increase their shares of flaxseed and flaxseed product exports. Olive oil output and exports from the EC would fall sharply, given the current high production, consumption, and export subsidies allocated to Community producers and distributors. EC agreement to eliminate support for its olive oil producers would be difficult to achieve because olives are grown in economically depressed areas that have few alternatives for land use.

Conclusions

Adjustments to liberalization would vary among countries and within individual oilseed sectors. No severe adjustment for the U.S. oilseed sector as a whole is foreseen. U.S. output of soybeans and most other oilseeds likely would increase because of relatively larger declines in the prices of nonoilseed crops and additional acreage coming into use. Soybean prices could decline very slightly, but sunflowerseed prices probably would rise. Producer prices for peanuts would fall, contributing to a slight decline in U.S. peanut output.

The elimination of trade-distorting government intervention would have the greatest effect on the EC. The EC oilseed sector would shrink significantly because support is much higher there than for other global producers. EC exports of oilseeds, vegetable oils, and butter would decline sharply or cease in some cases.

The contraction of the EC oilseed sector probably would strengthen its import demand for oilseeds, with the greatest rise in demand for oilseeds with a high oil content, like sunflowerseed. The strength of other demand and supply shocks emanating from the EC would depend on how liberalization affects other agricultural sectors, like grains and livestock.

Global soybean exporters may not significantly benefit from the contraction of EC oilseed output. The degree to which EC oilseed and oilseed product imports, particularly soybean meal imports, fall or rise depends on internal EC price realignments. With the end of corn import barriers, the EC soybean-corn price ratio would rise, causing livestock producers to reduce oilseed protein's current high share in feed rations and increase corn's current low share.

Global oilseed output would not significantly increase, but production would be more concentrated among the lowest cost producers, like the United States, Argentina, Brazil, Malaysia, and Indonesia. These producers could earn higher export revenues by increasing sales to current customers, including the EC and other high-cost oilseed producers which cut back their production after policy reform, and by capturing the EC's share of oilseed and oilseed product import markets in Eastern Europe, the Soviet Union, North Africa, and elsewhere.

Adjustments in world soybean trade could be relatively small. The U.S. share of world soybean complex trade volume could increase because higher world grain prices probably would induce South American competitors to plant more wheat and corn at the expense of soybeans. (U.S. relative prices for producers would move in the opposite direction with the end of U.S. deficiency payments.)

Argentine total crop area, which has remained fairly stable in recent years, probably would reverse its recent trend toward more oilseeds and move back to more grains. Brazil could increase both grain and soybean output with trade liberalization. However, soybean area expansion likely would be slowed. Trade liberalization probably would not induce a dramatic swing in soybean area because more factors are at work in Brazil and Argentina than just relative prices. Furthermore, if Brazil and Argentina eliminated the differential export taxes that currently skew their oilseed complex exports heavily in favor of meal and oil, their shares of soybean product exports could decline.

Trade in other oilseeds would increase. Oilseeds that compete with soybeans and possess a higher oil content would benefit from larger EC demand caused by the decline in EC output of sunflowerseed and rapeseed, both relatively high oil-content oilseeds. EC imports of vegetable oil would likely rise and strengthen world oil prices in general.

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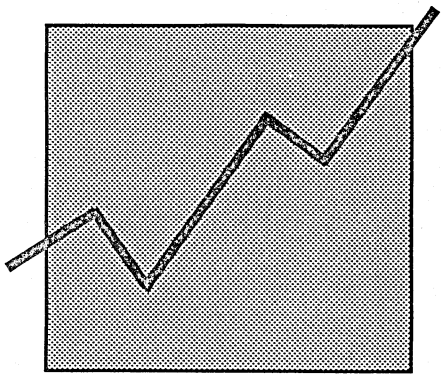

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