76TH CONGRESS, 1st Session } SENATE { DOCUMENT No. 62

FLAXSEED PRICES AND THE TARIFF

LETTER

FROM THE

SECRETARY OF AGRICULTURE

TRANSMITTING

IN RESPONSE TO SENATE RESOLUTION NO. 167, (75TH CONGRESS), A REPORT PREPARED IN THE BUREAU OF AGRICULTURAL ECONOMICS PERTAINING TO PRICES OF FLAXSEED

APRIL 13, 1939.—Referred to the Committee on Agriculture and Forestry and ordered to be printed, with illustrations

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1939

SENATE RESOLUTION 167, SEVENTY-FIFTH CONGRESS, THIRD SESSION

SUBMITTED BY MR. NYE

Whereas the Soil Conservation and Domestie Allotment Act of February 29, 1936, deelared it to be the purpose of Congress—

(A) To reestablish, at as rapid a rate as the Secretary of Agriculture determines to be practicable and in the general publie interest, the ratio between the purehasing power of the net income per person on farms and that of the ineome per person not on farms that prevailed during the five-year period August 1909–July 1914, inclusive, as determined from statistics available in the United States Department of Agrieulture and the maintenanee of sueh a ratio; and

Whereas, aceording to the United States Department of Agriculture, the priee of wheat has been higher than parity priee as determined by the Department of Agriculture sinee July 1936 and in June 1937 the priee of wheat at Minneapolis was 11 eents higher than parity; and

Whereas for a period of years the price of flaxseed has generally been just about twice the priee of wheat per bushel at Minneapolis; and

Whereas the priee of flaxseed at Minneapolis was 26 ecnts per bushel below parity priee, as established by the Department of Agriculture, in January 1936, and has been consistently lower sinee that time; and that in June 1937 the priee of flaxseed in Minneapolis was 41 eents below parity; and

Whereas the Department of Agriculture in its statement "Average Priees Received by Farmers for Farm Products July 15, 1937, with Comparisons" issued July 29, 1937, reveals under the heading "Price Relatives" (page 13) that using the index figure 100 (based on aetual prices rceeived by farmers 1909–1914) wheat increased from the index figure of 107 on July 15, 1936, to 128 on July 15, 1937; and during the same period eorn increased from 125 to 184; oats from 88 to 107; barley from 91 to 104; rye from 85 to 112; eottonseed from 138 to 157; while flaxseed gained but one point from 109 to 110; and

Whereas the two products of flaxseed are linseed oil and linseed meal and, aeeording to the United States Department of Labor, the priee of linseed oil in January 1936 was 10.1 eents per pound and in June 1937, 11.1 cents per pound (an inerease of 10 per eentum), and the priee of linseed meal in January 1936 was $30 per ton and $35.63 per ton in June 1937 (an inerease of 18.2 per centum), while the United States Department of Agrieulture gives the Minneapolis priee of flaxseed in January 1936 at $1.87 per bushel and in June 1937 $1.91 per bushel (an increase of two one-hundredths of 1 per eentum): Therefore be it

Resolved, That the Seeretary of Agriculture is hereby requested to make a thorough investigation of the influenees and faetors keeping the priee of flaxseed under parity and to report to the Senate the results thereof.

In partieular, but not to the exclusion of other matters, the Secretary of Agriculture is requested and directed to make and report to the Senate the results of an investigation and study of—

(1) The effeetiveness of the existing tariff on flaxseed.

(2) The effeetiveness of the existing tariff on linseed oil.

(3) The eompensatory relationship between the existing tariff on flaxseed and the existing tariff on linseed oil.

(4) The effeetiveness of the existing tariffs or exeise taxes on perilla oil and other oils entering into competition with linseed oil, as well as the effeetiveness of the existing tariffs and exeise taxes on oil-bearing seeds entering into eompetition with flaxseed; and be it further

Resolved, That the United States Tariff Commission is hereby requested to render sueh assistanee and eooperation as the Seeretary of Agrieulture may request to enable him to make this report to the Senate.

LETTER OF TRANSMITTAL

DEPARTMENT OF AGRICULTURE,
Washington, D. C., April 13, 1939.

The PRESIDENT OF THE SENATE.

SIR: Pursuant to the request made in Senate Resolution No. 167, Seventy-fifth Congress, third session, I am transmitting herewith a report prepared in the Bureau of Agricultural Economics pertaining to prices of flaxseed.

Sincerely yours,

H. A. WALLACE, *Secretary.*

CONTENTS

FLAXSEED PRICES AND THE TARIFF[1]

Summary

The primary purpose of the study here reported is to determine the influences and factors that have kept domestic prices of flaxseed under parity in recent years. Prices of flaxseed and of most other farm products in the United States have been below parity since 1920, although prices of some commodities, for example wheat in

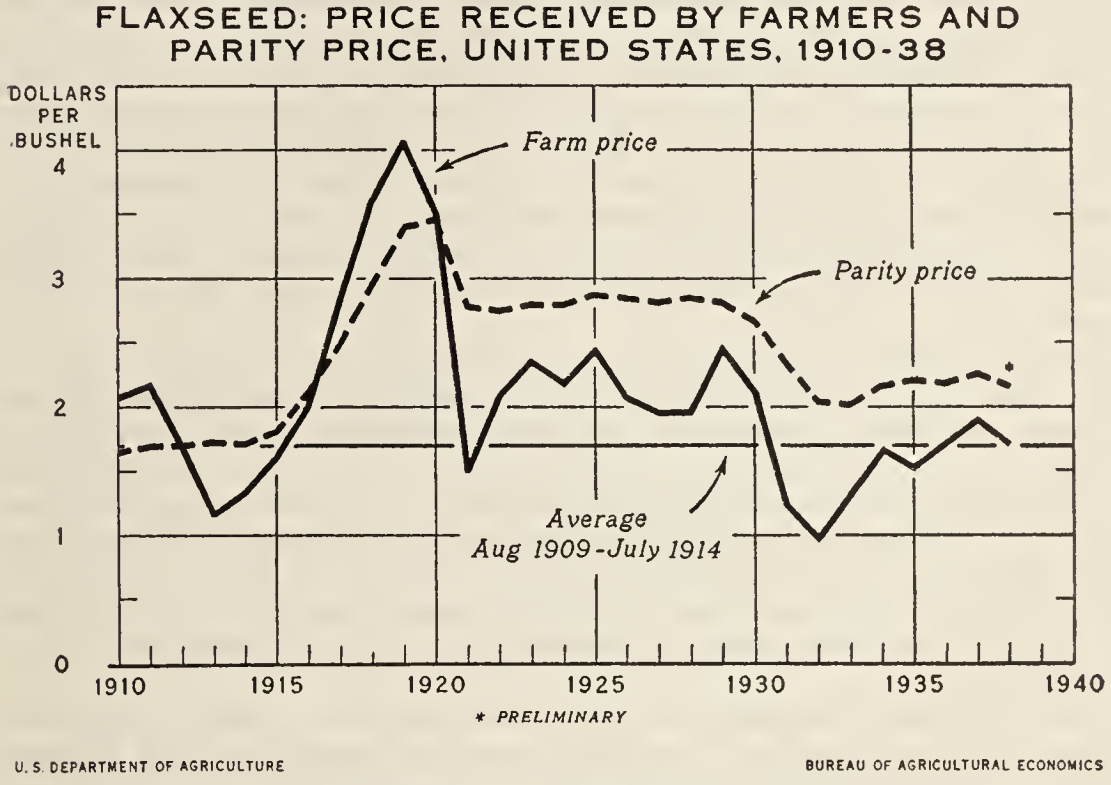

FIGURE 1.—The farm price of flaxseed has been below parity in every year since 1920. In 1938, the farm price of $1.71 per bushel was about equal to the average in the 5 years before the war, but was 44 cents, or 20 percent, below the parity price.

1925, have advanced to levels above parity in a few of the years. In 1938, the average price received by farmers for flaxseed was $1.71 per bushel; but the parity price of flaxseed in that year was $2.15 per bushel. These prices compare with an average for the 5 years, August 1909 to July 1914, of $1.69 per bushel (fig. 1).

Several factors have contributed to the keeping of flaxseed prices under parity since 1920: (1) World production of flaxseed was increased from an average of 111,000,000 bushels annually in the years 1909–13 to an average of 140,000,000 bushels annually in the years

[1] Prepared in the Bureau of Agricultural Economics by Robert M. Walsh, associate agricultural economist, under the general direction of Dr. O. C. Stine. C. F. Wells, agricultural economist, rendered valuable assistance in connection with methods of estimating tariff incidence. Anne Dewees, associate agricultural economist, and Georgia E. Cantrell, associate marketing specialist, assisted in assembling data.

1922–37. (2) The use of oils other than linseed oil in the drying industries also was increased; linseed oil, which accounted for about 90 percent of the total oil used for drying purposes in this country in the pre-war period, has accounted for less than 70 percent of the total, on the average, since 1930. (3) Chiefly because of increased world supplies of feed grains and high protein feeds, prices of linseed meal have been below "parity" since 1920; linseed cake and meal accounts for about 30 percent of the total value of flaxseed products in this country. (4) The margin between farm and retail prices of farm products generally was widened as a result of the higher processing and distribution costs brought about by the rise in industrial wage rates, salaries, freight rates, rents, and capital charges during the World War and immediate post-war years.

The total demand for drying oils apparently has not been much greater since the war than in the pre-war period. Because the drying oils are used chiefly in paints and varnishes, changes in the demand for such oils are determined largely by changes in the volume of building activity in important consuming countries. During the 1920's, building construction in the United States was considerably greater than in the pre-war period, but construction in other countries was only moderately active. From 1930 to 1938, on the other hand, building was very active in some foreign countries, but was at a low level in this country. Domestic construction was so low, in fact, that the recovery in prices of linseed oil and flaxseed, from 1934 to 1937, tended to lag behind the recovery in prices of other farm products.

Prices of flaxseed in the United States have been higher since the war than they would have been if the tariffs on flaxseed and linseed oil had not been increased. But the effect of the tariff increases on domestic prices of flaxseed was not sufficiently great to offset the effect of the larger world production of flaxseed and feeds in the post-war than in the pre-war period, the greater consumption of drying oils other than linseed oil, and the higher processing and distribution costs. In 1921, the tariff on flaxseed was increased from 20 to 30 cents per bushel, in 1922 to 40 cents, in 1929 to 56 cents, and in 1930 to 65 cents per bushel.

The available evidence indicates that domestic prices of flaxseed since 1930 have been 41 to 51 cents per bushel higher (about 49 cents on the average) than they would have been without a tariff. From 1922 to 1929, when the tariff was lower than it is at present, domestic prices apparently were about 23 cents per bushel higher than they would have been without a tariff. Domestic prices in the pre-war base period probably were not more than 10 or 15 cents per bushel higher than they would have been without a tariff. The tariff increases since the pre-war period thus have tended to increase prices of flaxseed in this country, but they also have tended to reduce imports and domestic consumption of flaxseed.

EFFECT OF TARIFFS AND EXCISE TAXES ON LINSEED OIL AND COMPETING OILSEEDS AND OILS

The present duty on flaxseed of 65 cents per bushel is offset in part by payments refunded on exports of products manufactured from imported flaxseed, under the terms of the drawback provision of the tariff act. Exports of such products consist chiefly of linseed cake

and meal, but also include small quantities of refined linseed oil, paints, varnishes, linoleum, oilcloth, and printing ink. During the 7 years 1931–37, refunds on exports of products ranged from 8 to 19 cents per bushel of flaxseed imported, and averaged approximately 11 cents per bushel.

The present duty on linseed oil of 4.5 cents per pound is more than compensatory in relation to the duty on flaxseed. A compensatory duty is one designed to compensate domestic manufacturers for the added cost of a raw material resulting from the tariff on the raw material. Where two or more products are obtained from an imported raw material, the compensatory duties usually are calculated on the basis of the relative values of the products at time of separation. In the United States, linseed oil represents about 70 percent of the total value of flaxseed products, while linseed cake and meal represent about 30 percent of the total value. Approximately 3 pounds of flaxseed are required to produce 1 pound of linseed oil. Calculating the compensatory portion of the duty on linseed oil as 70 percent of the duty on 3 pounds of flaxseed, it appears that the compensatory rate on oil would be 2.4 cents per pound without allowance for drawback, and actually has ranged from about 1.8 to 2.2 cents per pound with allowance for drawback.

Because the duty on linseed oil is more than compensatory in relation to that on flaxseed, the increase in the domestic price of linseed oil resulting from the duty on oil must be at least as great as the increase in the price of flaxseed in terms of oil as a result of the duty on flaxseed; otherwise linseed oil would be imported in preference to flaxseed. Actually, imports of linseed oil since the present duties have been in effect have been very small. The increase in the domestic price of flaxseed in terms of oil from 1931 to 1937, as a result of the tariff, ranged from about 1.6 to 2.0 cents per pound.

Of the oilseeds in competition with flaxseed, only two have been imported in appreciable quantities in recent years—perilla seed and hempseed. Prior to August 21, 1936, both these seeds were imported free of tax and duty; but on that date an excise tax of 2 cents per pound was imposed on imports of each of these seeds. This tax is prohibitive considering the lower rate of duty on flaxseed and the values of perilla and hempseed oils, per unit of seed, in comparison with the value of linseed oil, per unit of seed. Since 1936, practically no perilla seed or hempseed has been imported for crushing in this country, although hempseed continues to be imported in small quantities for use as birdseed.

Effective August 1936 an excise tax of 4.5 cents per pound was imposed on imports of perilla oil. The evidence available indicates that this tax is highly effective (possibly to the extent of 75 percent of the tax) in raising prices of perilla oil in this country. Hempseed oil, although relatively high in drying quality, is not now imported by the United States. The duty on hempseed oil is 1.5 cents per pound; in August 1936 an excise tax of 4.5 cents per pound was levied, making the total duty and tax on imports prohibitive. There is no duty or tax on tung oil, since tung oil with its high waterproofing and other special qualities is used largely for purposes for which linseed oil is not well adapted. Recent technical developments, however, have resulted in an increased use of tung oil in the general varnish field. Nor is there a duty or tax on imports of oiticica oil. Oiticica oil is produced only in Brazil, where the productive capacity is poten-

tially large. But production of oiticica oil to date has been very small compared with world production of linseed and other oils used primarily for drying purposes.

Of the other drying or semidrying oils imported by this country none competes to any great extent with linseed oil. Soybean oil (duty 3.5 cents per pound, but not less than 45 percent ad valorem) is used chiefly for edible purposes, although it also is used to some extent for drying purposes, particularly when mixed with perilla oil. Sunflower oil rendered unfit for food (excise tax 4.5 cents per pound) is relatively low in drying qualities and is imported in very limited quantities. Whale oil (duty 0.8 cent per pound, plus excise tax of 3 cents per pound) and fish oils (various duties and taxes) are imported largely for use in the manufacture of soap. The evidence available indicates a relatively high incidence of the duties and taxes on prices of these oils in this country.

I. Flaxseed Production and Trade

Flax was introduced into the United States with the earliest settlers. At first it was grown primarily for fiber, but as other textile-fiber crops were developed involving less hand labor in harvesting and preparation for market, flax-fiber production gradually was reduced until at present flax is cultivated for fiber in the United States only on a very limited scale. The flax plant has not been grown on any large scale for both fiber and seed. Different varieties usually are used for these purposes. In most European countries and in Japan, flax is cultivated chiefly for fiber; but in the United States, Canada, Argentina, and British India it is cultivated chiefly for seed. The Union of Soviet Socialist Republics is the only country which produces large quantities of both seed and fiber.

The flax plant has been grown for its seed in this country for more than a century. At the present time the United States ranks fourth in world production of flaxseed. Production in Argentina, the Union of Soviet Socialist Republics, and British India, however, accounts for about 80 percent of the world total. Production of flaxseed both in the United States and Canada in recent years has shown a downward trend, and in both countries flaxseed is now imported for crushing. The United States has been on a net import basis for flaxseed since 1908. And since 1914 more than half of the domestic supply of flaxseed, in most years, has been imported.

WORLD PRODUCTION OF FLAXSEED [2]

During the 10 years 1925–34, the average world production of flaxseed amounted to about 149,000,000 bushels annually. Argentina was the largest producing country, with approximately 50 percent of the world total. The Union of Soviet Socialist Republics was second in order of importance with about 18 percent of the total, British India third with somewhat more than 11 percent, and the United States fourth with nearly the same amount. The remaining 10 percent was scattered widely. Canada, Uruguay, Poland, and China, however, accounted for more than two-thirds of the remainder.

As shown in the accompanying world acreage map (fig. 2), flaxseed production in Argentina is concentrated largely in the north coastal

[1] Supplementary data on production and trade, and other matters, are given in appendix D.

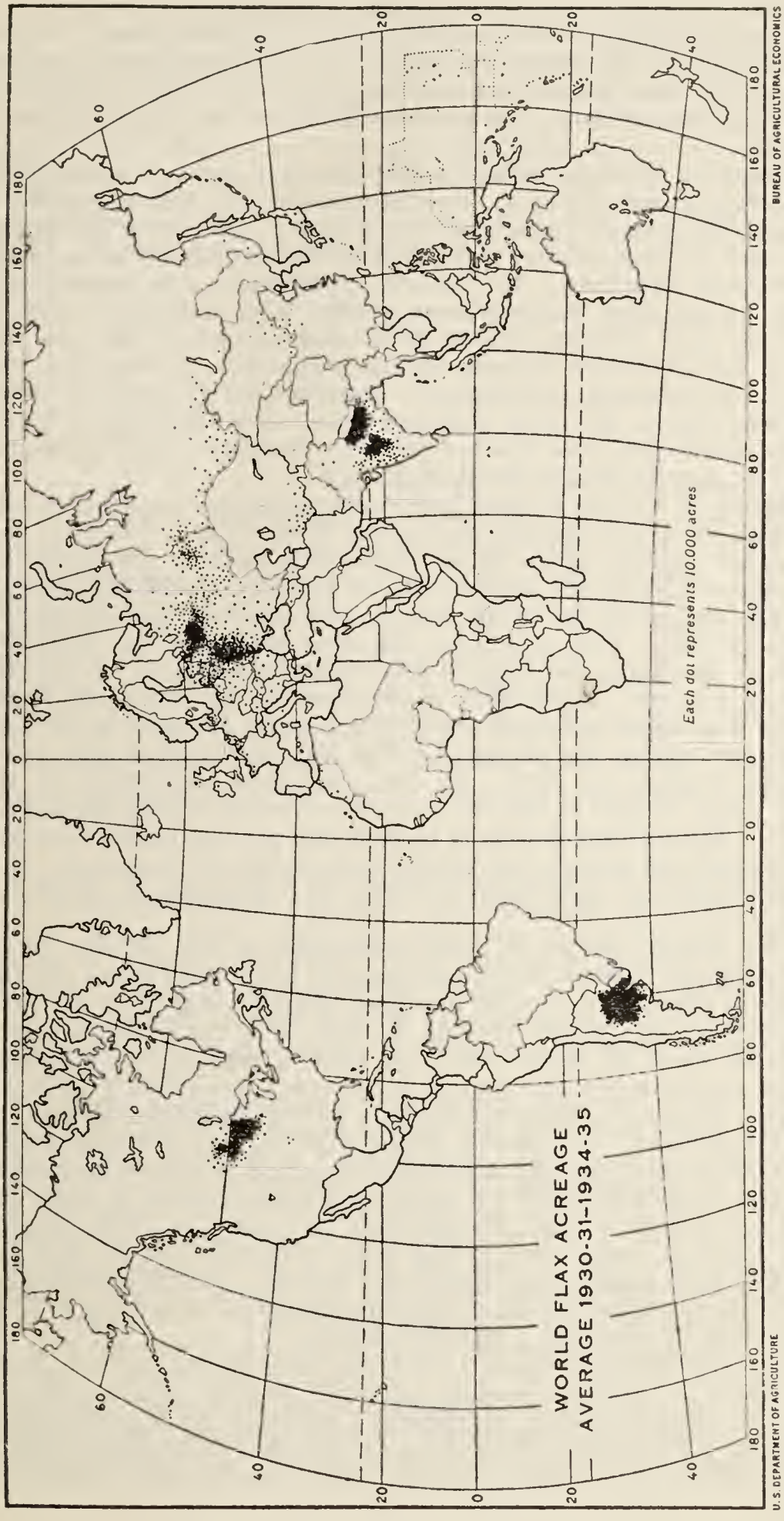

FIGURE 2.—About 80 percent of the world supply of flaxseed is produced in Argentina, the Union of Soviet Socialist Republics, and British India The United States produces about 10 percent but consumes nearly one-fourth of the total.

and north central areas of that country. And in India, production is concentrated largely in the central and northeastern areas. In the Soviet Union, flax production is scattered widely throughout European Russia, with the greatest concentration, however, in the area just east of the Baltic States, where flaxseed also is grown in fairly large amounts.

Flaxseed in North America during the first third of the present century was grown chiefly in the area extending northwestward from southern Minnesota to south central Alberta. The States of largest production in this country were Minnesota, North Dakota, South Dakota, and Montana. In Canada, production was concentrated largely in southern Saskatchewan, with some production also in Manitoba and Alberta. Since 1933 flaxseed production in this country has decreased sharply in the Dakotas and Montana, and increased in California and Kansas. In 1938 the four leading flaxseed producing States, in order of importance, were Minnesota, North Dakota, California, and South Dakota. Production in Kansas was almost as large as that in South Dakota.

Flaxseed production in most important producing countries, except Argentina, decreased sharply during the World War. Trends in production by countries since the war have been varied. Production in Argentina, which in the period 1909–13 averaged 31,000,000 bushels annually, amounted to 50,000,000 bushels in 1919, and 89,000,000 bushels in 1931. But after 1931, flaxseed production in Argentina decreased, averaging less than 70,000,000 bushels annually during the following 6 years. Production of flaxseed in the Union of Soviet Socialist Republics averaged 19,000,000 bushels annually in the pre-war period (within the present boundaries), but totaled only about 8,000,000 bushels in 1919. In 1931, however, production in the Soviet Union totaled 33,000,000 bushels and about 30,000,000 bushels in 1937. Flaxseed production in India in the pre-war period averaged about 20,000,000 bushels, but totaled only 10,000,000 bushels in 1919. By 1937, however, production in India had increased to 18,000,000 bushels.

In the United States, flaxseed production in the pre-war period averaged about 19,000,000 bushels annually, but totaled only 7,000,000 bushels in 1919. Production increased sharply from 1919 to 1924, amounting to 31,000,000 bushels in 1924, but the trend has been downward since the latter year. In 1938, a year of about average weather conditions, production in this country totaled only 8,000,000 bushels. Production trends in Canada have been similar to those in the United States. In Canada, flaxseed production, which averaged 12,000,000 bushels annually in the pre-war period, increased from about 5,000,000 bushels in 1919 to nearly 10,000,000 bushels in 1924, but decreased sharply during the following 10 years. In 1938, flaxseed production in Canada totaled less than 2,000,000 bushels, and was exceeded by production in Uruguay and Poland. Flaxseed production in Uruguay, like production in Argentina, increased from 1910 to 1930, and in 1938 amounted to 5,000,000 bushels.

World production of flaxseed, excluding production in China, averaged about 111,000,000 bushels annually in the 5 years 1909–13. Such production totaled 86,000,000 bushels in 1919, 130,000,000 bushels in 1924, 165,000,000 bushels in 1931, and 130,000,000 bushels in 1937, which was a year of relatively small production in Argentina.

PRODUCTION CHANGES IN THE UNITED STATES

During the 1920's flaxseed in the United States was grown largely in the area of greatest spring-wheat production—that is, chiefly in Minnesota, the Dakotas, and Montana. Formerly a pioneer crop, moving westward as new lands were developed, domestic flaxseed had been grown principally in the spring-wheat area since about 1900. During the past few years, however, there have been pronounced tendencies to reduce acreage in these States and to expand acreage in Kansas and California.

TABLE 1.—*Production of flaxseed and spring wheat by States, average 1927–36, annual 1937 and 1938*

[In thousands of bushels]

State	Average, 1927–36		1937		1938 [1]	
	Flaxseed	All spring wheat	Flaxseed	All spring wheat	Flaxseed	All spring wheat
Minnesota	5,572	16,484	4,077	29,572	4,756	35,465
North Dakota	4,896	81,391	1,548	57,005	1,490	79,839
South Dakota	1,720	25,387	228	14,276	382	26,201
Montana	796	31,940	43	15,527	210	47,768
Michigan	[2] 59	259	48	232	90	255
Wisconsin	72	1,296	42	819	44	901
Iowa	162	607	92	285	120	362
Missouri	14	111	20	88	20	88
Nebraska	50	2,355	----------	1,530	8	2,890
Kansas	240	225	331	12	367	70
California	----------	----------	660	----------	684	----------
Other	----------	46,427	----------	70,506	----------	50,325
United States	13,751	206,494	7,089	189,852	8,171	244,164

[1] Preliminary.
[2] Short-time average.

For the 10 years 1927–36, flaxseed production in Minnesota averaged 5,600,000 bushels annually, approximately 40 percent of the United States total. Although spring-wheat production increased sharply in Minnesota in the 2 years after 1936 flaxseed production decreased, totaling only 4,800,000 bushels in 1938. Reductions in other States were greater than in Minnesota, however, and in 1938 flaxseed production in Minnesota accounted for nearly 60 percent of the United States total.

In North Dakota, production was reduced from a 10-year (1927–36) average of 4,900,000 bushels to 1,500,000 bushels in 1938, although spring-wheat production showed little net change. Despite the marked reduction in flaxseed, however, North Dakota in 1938 was still the second largest flaxseed-producing State. In South Dakota, spring-wheat production increased slightly after 1936, but flaxseed production, which in the 10 years 1927–36 averaged 1,700,000 bushels annually, was reduced to only 380,000 bushels in 1938. In Montana, where spring-wheat production also increased, flaxseed production was reduced from an average of about 800,000 bushels for the 10-year period to 210,000 bushels in 1938.

Offsetting the reductions in Minnesota, the Dakotas, and Montana to some extent were increases in Michigan, Kansas, and California. The increase in Michigan, however, was small. In Kansas, flaxseed production increased about 50 percent from the 10-year average, and

in 1938 amounted to about 370,000 bushels, exceeding production in Montana and nearly equaling that in South Dakota. In California, where production was not reported prior to 1934, the amount of flaxseed produced in 1938 totaled nearly 700,000 bushels, and California had become the third largest flaxseed-producing State.

The decreases in production of flaxseed in Minnesota, the Dakotas, and Montana during the past few years have been due partly to the relatively narrow spread between prices of flaxseed and spring wheat, although other factors also have influenced acreage and production in these States. In a study made in 1930,[3] it was shown that flaxseed producers in the United States tend to vary the acreage planted to flax largely in response to changes in the ratio of returns per acre of flaxseed to returns per acre of spring wheat. In most flaxseed-

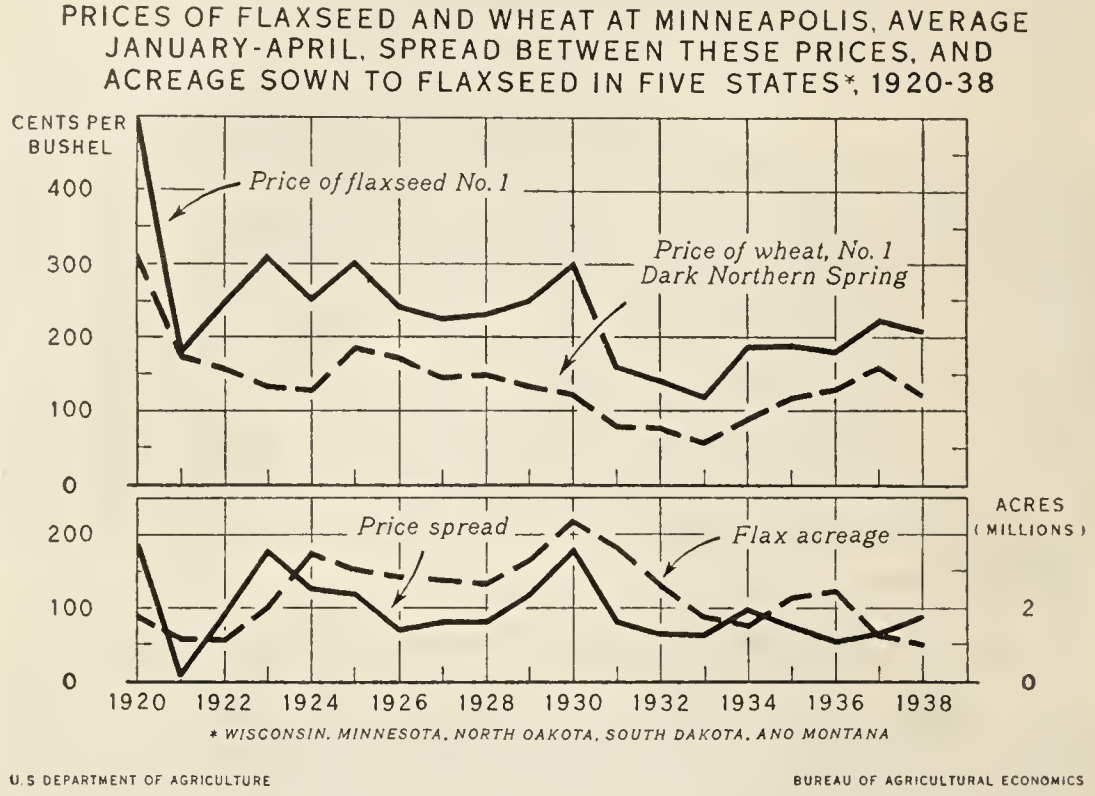

FIGURE 3.—Because flaxseed frequently is grown as an alternative crop to spring wheat, the acreage sown to flaxseed varies to some extent with the spread between prices of flaxseed and spring wheat. Other factors affecting flax plantings in recent years have included drought and grasshopper infestation during the growing season of preceding years, and lack of soil moisture at time of seeding.

producing States, wheat tends to outyield flaxseed by about 75 percent on a bushel basis. And flaxseed prices tend to be higher than wheat prices in about the same ratio. But world prices of flaxseed and wheat do not change in the same way because of differences in the supply and demand factors affecting prices of these commodities. Hence, considerable variation occurs in the ratio of flaxseed prices to wheat prices. Farmers to a large extent have the choice of planting flaxseed or spring wheat, and the difference between prices of flaxseed and spring wheat at time of planting tends to be reflected in the acreage sown to flaxseed. Acreage sown to flaxseed in the 5 States, Wisconsin, Minnesota, North Dakota, South Dakota, and Montana, is shown in figure 3 in comparison with the spread between

[3] F. F. Elliott and Oris V. Wells, Farmers' Response to Price in the Production of Flax, Bureau of Agricultural Economics (mimeographed), Washington, 1930.

prices of flaxseed and spring wheat at Minneapolis, averaged for the 4 months January–April each year from 1920 through 1938. Flaxseed usually is planted in these States during late April and May, following plantings of spring wheat.

Other factors influencing plantings of flaxseed in recent years, in the States enumerated, have included the occurrence of drought and grasshopper infestation during the growing season of preceding years, and deficiency of soil moisture, necessary to successful germination of flaxseed, at time of seeding. Severe droughts occurred in 1934 and 1936, with resultant heavy abandonment of flax acreage and low yields on the acreage harvested in those years. In 1935 and 1937, producers tended to limit their plantings of flaxseed because of the unfavorable growing conditions in the preceding year. The same might be said of grasshopper infestation, which was especially marked in the northwestern Plains States in the 3 years, 1931–33. And there were serious deficiencies of soil moisture at time of seeding in 1931, 1934, and 1936.

The increase in flaxseed production in Kansas in recent years apparently has been the result of efforts to restore flaxseed to a position of some importance as a cash crop.[4] These efforts have been encouraged by the agricultural extension services and by the maintenance of a flaxseed crushing mill at Fredonia, Kans. In California, similar efforts have been made to promote the production of flaxseed. In 1934, the first year in which this crop was grown on a commercial scale in California, 11,000 acres were planted.

Plantings increased to 47,000 acres in 1937, and totaled 40,000 acres in 1938. It is reported that a large increase is in prospect for 1939. At present, flaxseed in California is grown principally in the Imperial, San Joaquin, and Sacramento Valleys, largely under irrigation. Average yields of flaxseed in California have been much higher to date than in other States, partly because the land planted to flax is not noticeably infected with the wilt fungus so prevalent in other States, and partly because the soil on which flaxseed is grown in California is comparatively fertile, with the moisture supply controlled by irrigation.[5]

WORLD TRADE IN FLAXSEED, LINSEED OIL, AND LINSEED MEAL

Argentina during the period 1925–34 furnished about 80 percent of total world exports of flaxseed. British India was second in order of exports, and Uruguay third. Canada during this period ranked fourth, but following 1934 imports of flaxseed into Canada exceeded exports by a considerable margin. Other flaxseed-exporting countries were Lithuania, Union of Soviet Socialist Republics, Morocco, China, Eritrea, Rumania, and Latvia. Since 1934, however, the Soviet Union has exported no flaxseed.

The United States usually imports more flaxseed than any other country. During the period 1925–34 imports of flaxseed into this

[4] Flaxseed production in Kansas totaled more than 2,000,000 bushels in 1890, but decreased gradually thereafter until the World War, when, because of the strong demand for wheat, flaxseed production fell off sharply, Cf. F. E. Davidson and H. H. Lande, Flax Production in Kansas, Kansas State College of Agriculture and Applied Sciences, Agricultural Experiment Station Circular 191, Manhattan, Kans., 1938. Data on acreage sown by States from 1920 to 1938 are given in appendix D.

[5] Further information on flaxseed production in the United States is given in two fairly recent publications: (1) A. C. Dillman and T. E. Stoa, Flaxseed Production in the North Central States, U. S. Department of Agriculture, Farmers Bulletin No. 1747, 1935; and (2) A. C. Dillman and L. Gordon Goar, Flaxseed Production in the Far Western States, U. S. Department of Agriculture, Farmers Bulletin No. 1793, 1937.

country amounted to about 20 percent of total world imports. Imports into Germany, Netherlands, the United Kingdom, and France also were large, with Belgium, Italy, and Sweden also importing considerable quantities of flaxseed. Other flaxseed-importing countries were Czechoslovakia, Australia, Spain, Denmark, Norway, Poland, Japan, Finland, Yugoslavia, and Greece.

Argentina, the largest flaxseed producer, crushes only a small proportion of the crop produced in that country, exporting flaxseed in large quantities. Although Argentina also exports linseed cake and meal in small quantities, linseed oil is imported. A similar situation obtains in India, but the proportion of the flaxseed crop crushed in India is considerably larger than that in Argentina.[6] The Union of Soviet Socialist Republics at the present time is largely self-sufficient in its production and consumption of flaxseed, linseed oil, and linseed cake and meal.

The United States crushes more flaxseed than any other country, using both domestic and imported seed for this purpose. Most of the linseed oil produced in this country is retained for consumption; in addition, small quantities of linseed oil are imported. Nearly all of the linseed cake and meal produced from imported flaxseed, however, is exported from the United States.

Although the Netherlands is a large importer and crusher of flaxseed and exports considerable quantities of linseed oil, its requirements for livestock feed are large in relation to production and, hence, the Netherlands imports large quantities of linseed cake and meal in addition to that produced from imported flaxseed. The situation in Belgium, France, and Poland is similar to that in the Netherlands. The United Kingdom and Germany, on the other hand, import both linseed oil and linseed cake and meal, in addition to flaxseed.

The greater part of the flaxseed imported by the United States originates in Argentina (fig. 4). Formerly, Canada supplied a fairly large proportion of the flaxseed imported by this country, but in recent years imports of flaxseed from Canada have been comparatively very small. In years of short crops of Argentine seed, flaxseed has been imported by the United States from British India. In 1934, for example, India supplied nearly 30 percent of United States imports, while imports from Argentina amounted to slightly over 60 percent of the total. Usually, however, imports of Indian seed are comparatively small. Uruguay, China, and Mexico also supply small quantities of flaxseed to the United States. Most of the linseed oil imported by this country comes from the Netherlands. And the linseed cake and meal exported by the United States goes principally to the Netherlands and to the United Kingdom.

II. Price Relationships

PRICES OF FLAXSEED AND OTHER FARM PRODUCTS

During the period 1910–37, changes in average prices received by farmers for flaxseed in the United States followed the same general trends as changes in prices of other farm products. Prices of all farm products advanced to unusually high levels during the World War, but declined sharply in 1921. Some recovery followed in 1922 and 1923, and prices of farm products generally were comparatively stable during the remainder of the 1920's. A second sharp decline occurred

[6] Cf. Report on the Marketing of Linseed in India (Marketing series 8), Agricultural Marketing Office of India, Delhi, 1938, 352 pp., illus.

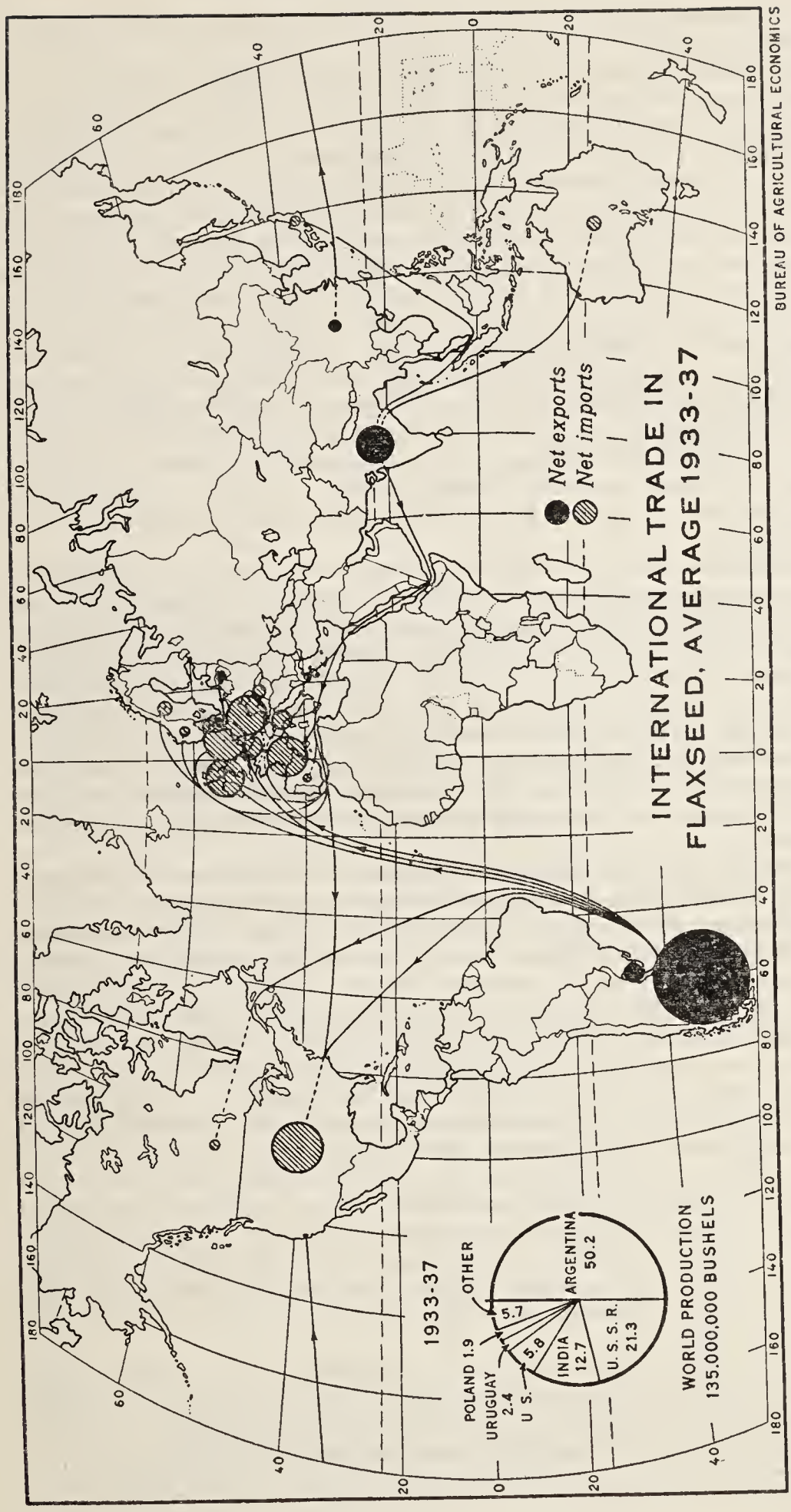

FIGURE 4.—Most of the flaxseed imported by the United States originates in Argentina. Small quantities also are imported from Uruguay, British India, and China. Canada formerly supplied flaxseed to this country, but now imports flaxseed on balance. Although the Union of Soviet Socialist Republics is the second largest producing country, in recent years it has exported very little flaxseed.

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during the early 1930's, which was followed however by recovery from 1933 to 1937.

Although there was a very marked rise in building activity in the United States during the 1920's, flaxseed prices did not advance any more sharply in that period than prices of many other farm products, the demand for which is not directly affected by changes in building activity. A sharp increase in building usually is accompanied by increased demand for linseed oil, the principal product of flaxseed, and hence results in higher prices for flaxseed. But the rise in building activity was not world-wide in scope, and the demand for linseed oil in most foreign countries did not increase greatly. Because flaxseed is traded internationally by the United States, prices of flaxseed in this country and in other important world markets tend to maintain approximately the same relationship to each other so long as the duty status of flaxseed remains unchanged, although some monthly fluctuations in the margin between domestic and foreign prices do occur.[7] Thus, the failure of building to increase greatly in other important flaxseed-consuming countries during the 1920's tended to prevent any marked increase in world prices of flaxseed, including prices in the United States.

Another factor which tended to prevent any marked rise in flaxseed prices during the 1920's was the increase in world flaxseed production following the World War. In the years 1909–13, world production of flaxseed averaged about 111,000,000 bushels annually. During the war, world production was curtailed sharply as a result of military operations in Europe and of the greatly increased demand for food crops. From 1919 to 1931, however, world production of flaxseed increased, and during the years 1925–29, averaged about 150,000,000 bushels annually. The use of substitutes for linseed oil, such as perilla oil, moreover, was much greater in the 1920's than in the pre-war period.

In 1934, prices of the grains and flaxseed in the United States averaged almost as high as in the 5 years from August 1909 to July 1914. With continued recovery in business activity after 1934, grain prices in 1937 were 20 percent higher than in the pre-war period, but flaxseed prices were only about 10 percent higher. Flaxseed in the United States is grown largely in the area of greatest spring wheat production, and competes to some extent with wheat, oats, and corn for acreage. Flaxseed also is related to cottonseed in that linseed cake and meal competes directly with cottonseed cake and meal as a high protein feed, although there is practically no competition between linseed oil and cottonseed oil, which is used largely in the manufacture of edible products. Cottonseed prices, influenced in part by the sharp decrease in hog numbers and curtailment of domestic lard production as a result of the 1934 drought, advanced relatively more in 1934 and 1935 than prices of grains and flaxseed. And in 1937, cottonseed prices were about 50 percent higher than in the pre-war period. Trends in prices of flaxseed, cottonseed, and grains from 1910 to 1937 are shown in figure 5.

The lag in the recovery of flaxseed prices after 1934, compared with prices of grains and cottonseed, was due in part to the lag in recovery of building activity compared with industrial production, while the severe droughts of 1934 and 1936 curtailed grain production.

[7] A discussion of monthly fluctuations in the international price margin is given in appendix B.

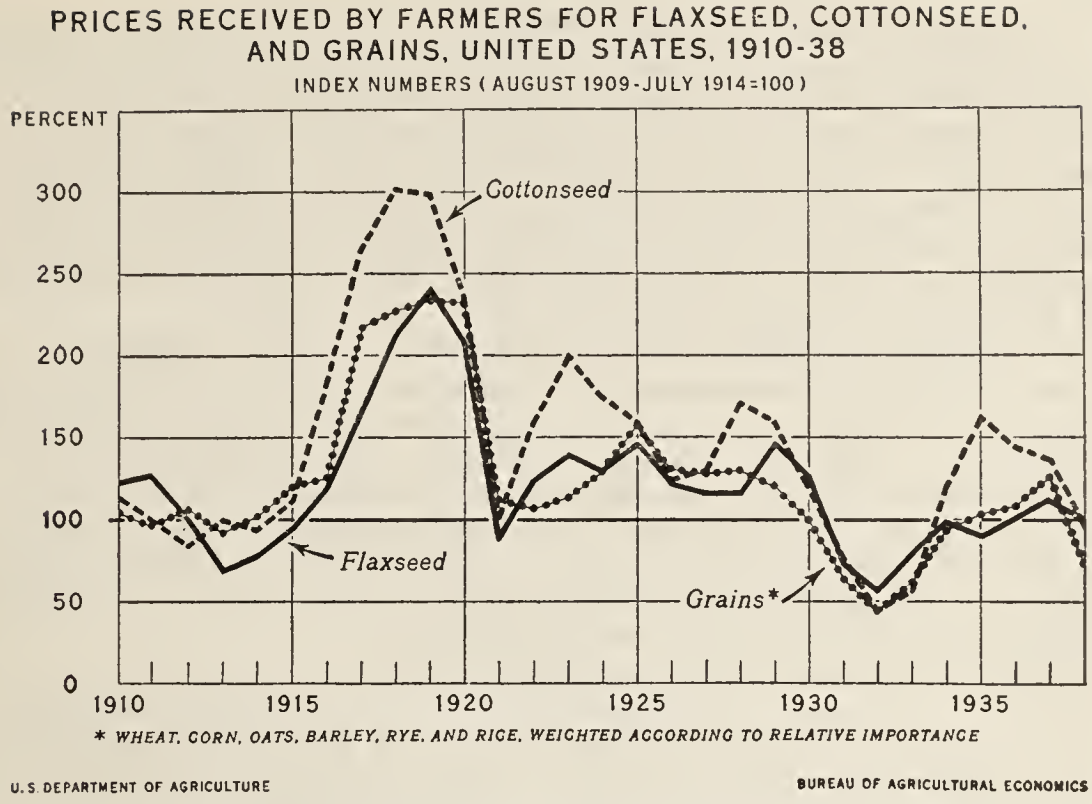

FIGURE 5.—Since 1910, prices of flaxseed, grains, and cottonseed have followed similar trends. From 1934 to 1937, however, the recovery in flaxseed prices was less marked than that in grains and cottonseed largely because of the lag in building activity. But in 1938 flaxseed prices declined much less than prices of most other farm products.

Changes in the demand for flaxseed are brought about largely by changes in the volume of building construction. The demand for cottonseed and the grains, on the other hand, is influenced more by changes in industrial production and consumers' incomes, since cottonseed oil, wheat, rye, and rice go almost directly into human consumption, while corn, oats, and barley go into human consumption largely through the medium of meats, and dairy and poultry products. The extent to which recovery in building activity has lagged behind recovery in world industrial production since 1933 is shown in the following table.

TABLE 2.—*Building activity and industrial production in the United States and foreign countries, 1929–37*

[Index numbers (1929=100)]

Year	Building activity [1]			Industrial production [2]		
	United States	5 foreign countries	United States and 5 foreign countries	United States	9 foreign countries	World
1929	100	100	100	100	100	100
1930	79	98	90	81	91	87
1931	55	78	69	68	82	76
1932	28	62	48	55	72	65
1933	27	75	56	64	79	73
1934	31	86	64	66	86	79
1935	36	96	72	76	92	86
1936	53	105	84	88	97	94
1937	54	102	83	92	106	101

[1] The 5 foreign countries included are United Kingdom, Germany, France, Netherlands, and Argentina. For description of index numbers and relative weights see appendix A.

[2] Bureau of Agricultural Economics; converted from 1923-25 base. Cf. Norman J. Wall, Monthly Index Numbers of World Industrial Production 1920–35, Bureau of Agricultural Economics, Washington 1936. (Mimeographed.) The 9 foreign countries included are United Kingdom, France, Germany, Italy, Japan, Canada, Czechoslovakia, Belgium, and Poland.

The lag in recovery in building from 1933 to 1937 occurred primarily in the United States. Foreign building, influenced largely by the marked activity in the United Kingdom after 1930 and the sharp rise in Germany after 1933, about kept pace with foreign industrial production. But since the United States is the largest single consumer of flaxseed as well as the most important industrial country, the pronounced lag in building in this country has had the effect of retarding the recovery in the total demand for flaxseed and linseed oil in important consuming countries.

In addition to differences in changes in demand, differences in changes in supply also tended to cause domestic prices of grains and cottonseed to advance relatively more from 1934 to 1937 than prices of flaxseed. Although flaxseed production decreased sharply in the United States after 1932, world production of flaxseed was only moderately reduced. And since the United States normally is on an importing basis for flaxseed, and domestic production of flaxseed is small in relation to the world total, the reduction in the domestic crop had comparatively little effect on flaxseed prices.

The supply situation was somewhat different with respect to wheat and corn. Domestic wheat production was much below average from 1933 through 1936, and corn production was sharply reduced by the severe droughts of 1934 and 1936. Both wheat and corn usually are exported from the United States. In the marketing years 1934–35 to 1936–37, however, the United States changed temporarily to a net import basis for these crops. Domestic prices of both wheat and corn were increased as a result of this change, as well as by the reduction in world supplies resulting from decreased production in the United States. Prices of rye, oats, and barley also advanced from 1934 to 1937, but in terms of their pre-war averages they were relatively no higher during the 3 years 1935–37 than flaxseed prices.

PRICES OF FLAXSEED AND PARITY

Prices received by farmers for flaxseed in the United States, like prices of most other farm products, have been below "parity" since 1920. In 1938, the average price received by farmers for flaxseed was $1.71 per bushel, compared with $1.69, the average for the 5 years from August 1909 to July 1914. Since prices paid by farmers, including interest and taxes, were 27 percent above the pre-war average in 1938, the parity price of flaxseed was $2.15 per bushel.

Parity prices, or fair exchange values, of most farm products, as defined by Congress, are determined by multiplying the base price of the commodity, i. e., the average price for the period August 1909–July 1914, by the current index (with a 1910–14 base) of prices paid by farmers for commodities bought, including interest and tax payments per acre of farm real estate, and freight rates.[8] Freight rates are not accounted for separately in the computation of parity prices, since prices paid by farmers for commodities include transportation costs from the factory to the store, and freight rates from the local

[8] Sec. 301, Agricultural Adjustment Act of 1938. Parity prices for tobacco are computed with the period August 1919–July 1929 as a base. Sec. a (1) of the Marketing Agreement Act of 1937 also sets up a post-war base for the determination of parity prices of potatoes, and under sec. 8e of the same act the use of a post-war base is permitted for any other commodity for which the Secretary "finds and proclaims" that the purchasing power during the pre-war base period cannot be satisfactorily determined from available statistics of the Department of Agriculture. Interest and tax payments are not included in computing parity prices when a post-war base is used.

shipping point to terminal markets are reflected in prices received by farmers for farm products.

In 1932 average prices received by farmers for flaxseed were 52 percent below parity. Prices of wheat were 63 percent below parity, and the general average of farm prices was 46 percent below parity. From 1932 to 1937, prices of farm products advanced sharply, while prices paid by farmers for commodities bought, including interest and tax payments, advanced by a comparatively slight amount. For the 3 years 1935–37, therefore, the average level of farm prices was only 13 percent below parity. Wheat prices were 17 percent below parity. But flaxseed prices were still relatively low, averaging 23 percent below parity.

Flaxseed prices in the 3 years 1935–37 did not reach so high a percentage of parity as prices of wheat and most other farm products largely for reasons already discussed (1) because of the lag in building activity, chiefly in the United States; and (2) because of the severe droughts of 1934 and 1936, which brought about marked increases in domestic prices of such commodities as wheat, corn, and hogs, but which had comparatively little effect on prices of flaxseed, normally imported in large quantities by this country.

With the recession in industrial production and with increased domestic and world supplies of grains in 1938, prices of wheat and most other farm products declined much more sharply with respect to parity than prices of flaxseed. Building activity in the United States in 1938 was somewhat greater than in 1937, but preliminary estimates indicate that world production of flaxseed in 1938 was larger than a year earlier. Flaxseed prices declined from 84 percent of parity in 1937 to 80 percent of parity in 1938. Wheat prices, however, declined to 59 percent of parity in 1938, while prices of all farm products combined declined to 75 percent of parity.

For reasons already stated, prices received by farmers for flaxseed were no higher during the 1920's than prices of many other farm products. Although prices of some farm products rose to levels above parity in a few years, for example wheat in 1925, average prices of all farm products combined have been below parity in every year since 1920. This situation was brought about largely by three factors: (1) The more rapid and thorough adjustment of industrial production than of farm production to changed demand conditions after 1920; (2) the decline in foreign demand for some American farm products after 1925 with increased foreign production; and (3) the increase in costs of processing and distributing farm products resulting from increased wage rates, salaries, freight rates, rents, and capital charges during and immediately following the war.

Production of most farm products in the United States increased sharply during and immediately following the World War as a result of the unusual European demand for such products in those years. But with the restoration of peace, the rehabilitation of European agriculture, and the resumption of normal shipping with Southern Hemisphere countries, the foreign demand for American farm products dropped about as sharply as it had increased. No correspondingly marked decline occurred in production of American farm products. The index of total agricultural production in the United States, on the contrary, showed an increase from 90 percent of the 1924–25 average in 1920 to 97 percent in 1925, and to 107 percent in 1931.

TABLE 3.—*Index numbers of prices received by farmers for flaxseed, wheat, and all farm products, prices paid by farmers, and ratio of prices received to prices paid, United States, 1910–38*

Year	Prices received by farmers (August 1909–July 1914=100)			Prices paid by farmers, including interest and taxes (1910–14=100)	Ratio of prices received to prices paid		
	Flaxseed	Wheat	All farm products		Flaxseed	Wheat	All farm products
1910	123	110	102	97	127	113	105
1911	127	98	95	100	127	98	95
1912	100	101	100	100	100	101	100
1913	69	90	101	102	68	88	99
1914	78	99	101	101	77	98	100
1915	94	127	98	107	88	119	92
1916	119	135	118	124	96	109	95
1917	168	230	175	148	114	155	118
1918	212	231	202	174	122	133	116
1919	240	244	213	201	119	121	106
1920	207	249	211	205	101	121	103
1921	89	132	125	164	54	80	76
1922	123	117	132	162	76	72	81
1923	139	111	142	165	84	67	86
1924	129	125	143	165	78	76	87
1925	145	171	156	170	85	101	92
1926	122	153	145	168	73	91	86
1927	116	136	139	166	70	82	84
1928	116	128	149	168	69	76	89
1929	145	116	146	166	87	70	88
1930	126	92	126	158	80	58	80
1931	73	55	87	138	53	40	63
1932	57	44	65	120	48	37	54
1933	78	66	70	119	66	55	59
1934	98	90	90	128	77	70	70
1935	90	98	108	130	69	75	83
1936	101	109	114	[1] 129	78	84	88
1937	112	121	121	[1] 134	84	90	90
1938	101	75	95	[1] 127	80	59	75

[1] Preliminary.

Bureau of Agricultural Economics.

In addition to the marked decline in foreign demand after 1920, a further decline occurred after 1925 as total foreign production of agricultural products increased to levels above those of the immediate pre-war years. Increases in foreign production took place both in Europe and in the surplus-producing Southern Hemisphere countries. Largely because of these increases, the European demand for exports of such American products as wheat, cotton, and hogs has weakened materially in recent years. Increased tariff and other trade restrictions imposed by some European countries after 1930, to encourage agricultural production in those countries, also have tended to reduce the demand for exports from this country.

Another factor which tended to hold prices of farm products below parity after 1920 was the increase in costs of processing and distributing farm products. Hourly earnings of industrial workers, as reported by the Bureau of Labor Statistics, increased from an index of 100 in 1913 to 234 in 1920, and remained well above 200 throughout the twenties. Similarly, freight rates were increased by about 75 percent from 1917 to 1921, and have since remained at a much higher level than in the pre-war period. Other processing and distribution costs for farm products, such as salaries, rents, and capital investment costs, also have risen in comparison with those of the pre-war period. As a result of the increase in processing and distribution costs for farm products, the margin between prices received by farmers and prices paid by consumers for farm products increased sharply during

the war and immediate post-war years, and has remained much wider since 1920 than in the period 1910–14.[9] In addition, interest and tax payments per acre of farm real estate, also a factor in computing parity prices, more than doubled from 1915 to 1920, and have since remained considerably larger than in the pre-war period.

TABLE 4.—*Production of wheat, cotton, and hogs in the United States and foreign countries, and net exports from the United States, specified periods*

Crop year	Wheat				
	Production				Net exports (including flour) from the United States [1]
	United States	Foreign, excluding Union of Soviet Socialist Republics and China	World, excluding Union of Soviet Socialist Republics and China	Foreign as percentage of world	
Average:	*Million bushels*	*Million bushels*	*Million bushels*	*Percent*	*Million bushels*
1909–13	682	2,324	3,006	77.3	[2] 146
1914–18	813	2,137	2,950	72.4	227
1919–23	844	2,300	3,144	73.2	226
1924–28	826	2,720	3,546	76.7	177
1929–33	792	3,023	3,815	79.2	87
1934–37	664	2,985	3,649	81.8	11

Crop year	Cotton				
	Production				Net exports from the United States [1]
	United States	Estimated foreign	Estimated world	Foreign as percentage of world	
Average:	*1,000 bales*	*1,000 bales*	*1,000 bales*	*Percent*	*1,000 bales*
1909–13	13,033				
1916–18	11,583	8,513	20,096	42.4	4,987
1919–23	10,536	9,052	19,588	46.2	5,558
1924–28	15,029	11,789	26,818	44.0	8,448
1929–33	14,381	12,051	26,432	45.6	7,868
1934–37	12,905	17,162	30,067	57.1	5,566

Calendar year	Hogs and hog products					
	Slaughter [3]				Net exports from United States [1]	
	United States	United Kingdom Irish Free State Germany, Denmark, and Netherlands	Total United States and 5 European countries	European countries as percentage of total	Pork	Lard including neutral lard
Average:	*Millions*	*Millions*	*Millions*	*Percent*	*Million pounds*	*Million pounds*
1909–13	54.5	24.7	79.2	31.2	419	514
1921–23	68.5	15.0	83.5	18.0	788	913
1924–28	68.8	25.9	94.7	27.3	429	776
1929–33	70.4	32.1	102.5	31.3	203	644
1934–37	60.3	32.0	92.3	34.7	76	273

[1] United States Department of Commerce.
[2] 1913 only.
[3] Total slaughter for the United States, United Kingdom, and Irish Free State; inspected slaughter for Germany; slaughter in export houses for Denmark; and export slaughter for Netherlands.

Bureau of Agricultural Economics. Foreign production data compiled from official sources and International Institute of Agriculture.

[9] A more complete discussion of the factors affecting the increase in the spread between prices received by farmers and prices paid by consumers for farm products is given by Richard O. Been and Frederick V Waugh, in Price Spreads Between the Farmer and the Consumer, Bureau of Agricultural Economics, Washington, 1936 (mimeographed).

PRICES OF FLAXSEED, LINSEED OIL, AND LINSEED MEAL

Changes in the price of flaxseed result directly from changes in prices of the linseed oil and the linseed meal produced from flaxseed—indirectly from changes in the factors affecting prices of the oil and meal. Flaxseed crushed in the United States yields about 33 percent of its weight in oil [10] and about 65 percent of its weight in cake and meal, with an average loss of about 2 percent resulting from dockage, i. e., unclean seed. The oil content of the seed is greater than the oil yield, since a certain proportion of the oil in the seed, usually 5 to 7 percent, remains with the meal after crushing. [10] These percentages are not constant, however. Considerable variation in oil content exists among different varieties of flaxseed, and in different seasons. Some variation in oil yield exists, moreover, as a result of differences in methods of oil extraction.

Assuming an average oil yield of 33 percent and average yield of meal of about 65 percent, a bushel of flaxseed weighing 56 pounds would yield 18.67 pounds of crude linseed oil and 36.4 pounds of linseed meal. By multiplying these weights by the per pound prices of linseed oil and meal at Minneapolis, a rough indication is given of the value of the oil and meal produced per bushel of flaxseed crushed. The price of flaxseed at Minneapolis is shown in figure 6 for the period 1927–38, in comparison with the estimated bushel equivalent value of linseed oil and meal. During this period changes in the price of flaxseed followed changes in the combined bushel equivalent value of the oil and meal rather closely.

Except for July and August 1930, when the price of flaxseed at Minneapolis dropped somewhat more sharply than that for linseed oil, the spread between prices of flaxseed and the estimated bushel equivalent value of linseed oil and meal was fairly constant, although there were some minor irregularities in the spread on a month-to-month basis. On the average, the value of oil produced per bushel of flaxseed is worth about 70 percent of the total value of oil and meal.

In figure 7, relative prices of flaxseed at Minneapolis are shown in comparison with relative prices of linseed oil and linseed meal. Although the price of meal did not reach so high a peak in late 1929 as prices of linseed oil and flaxseed, there was about as much variation in meal prices as in oil prices. The year-to-year changes in meal prices, however, were somewhat different from those in oil prices. In 1935 and 1936, for example, there was little change in the price of oil, whereas the price of meal dropped fairly sharply in 1935 and advanced sharply during the second half of 1936. Flaxseed prices tended to follow changes in prices of both oil and meal, with changes in oil prices, however, having much the greater influence.

Because the United States is a net importer of flaxseed and linseed oil and a net exporter of linseed cake and meal, domestic prices of those commodities are affected not only by domestic conditions of supply and demand but by foreign conditions as well. Prices of flaxseed, linseed oil, and linseed meal in the United States tend to change in the same direction and by approximately the same amounts as prices in other world markets.

[10] Anne Dewees, under direction of O. C. Stine, Oil Yield and Oil Content of Certain Oleaginous Materials. Bureau of Agricultural Economics, Washington, 1936, p. 5 (mimeographed).

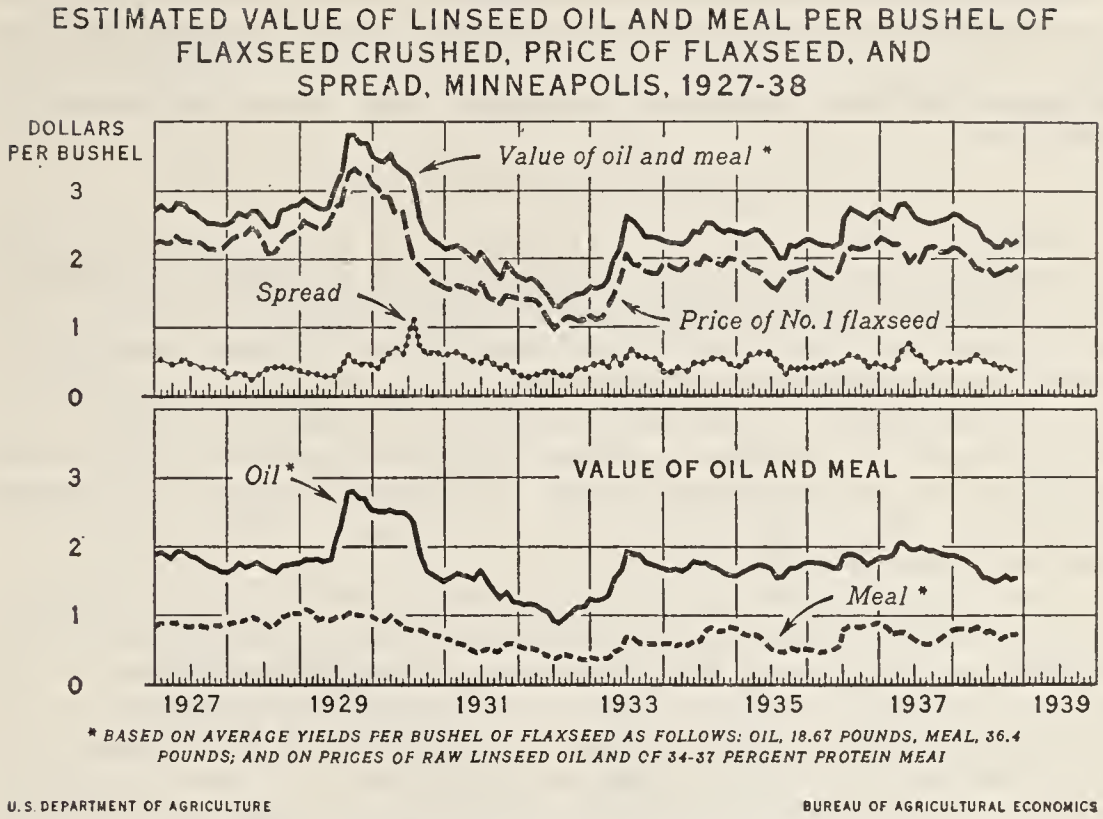

FIGURE 6.—Changes in flaxseed prices are brought about by changes in prices of both linseed oil and linseed meal. Changes in linseed-oil prices have the greater influence on flaxseed prices, however, since the value of linseed oil, in the United States, represents about 70 percent of the total value of flaxseed products.

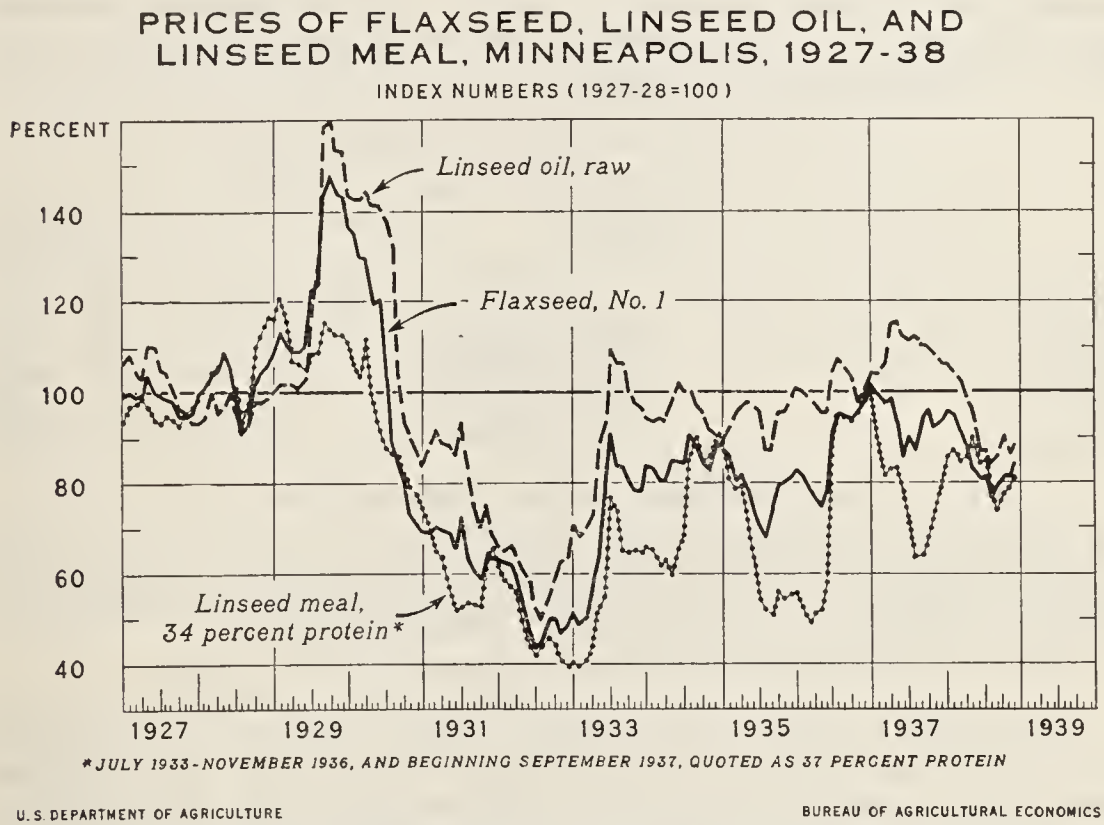

FIGURE 7.—Since 1927, flaxseed prices have fluctuated with prices of linseed oil and linseed meal. The marked rise in flaxseed prices in 1929 resulted chiefly from the rise in linseed-oil prices; but the decline in flaxseed prices in 1935 was due largely to the sharp decline in the price of linseed meal.

World prices of linseed oil are influenced chiefly by two factors—world supplies of flaxseed available for crushing and building activity. These two factors, however, do not entirely explain changes in prices of linseed oil, since several oils compete with linseed oil for drying purposes.

PRICES OF LINSEED OIL AND COMPETING OILS

Of the oils which compete with linseed oil, or have similar uses, tung oil, perilla oil, and certain fish oils, particularly menhaden and sardine, have relatively high drying qualities. Hempseed and oiticica oils, which have been imported by the United States in small quantities in recent years, also have relatively high drying qualities. Soybean oil, on the other hand, is relatively less high in its drying property and is used primarily for edible purposes, although frequently mixed with perilla oil for use in making paints and interior enamels. In recent years about 80 percent of the soybean-oil supply in this country has been used for edible purposes.

A useful rough indication of the drying quality of an oil is its iodine value or iodine number, which represents the percentage of iodine by weight that a fat or oil will absorb under specified conditions. The capacity of an oil to absorb iodine is associated with its capacity for absorbing oxygen quickly, which determines to a large extent the utility of the oil for drying purposes. In general, a fat or oil having an iodine number of less than 100 is classed as nondrying, one having an iodine number between 100 and 130 as semidrying, and one with a number above 130 as drying.[11] There are other properties of the drying oils, however, which make them useful for particular purposes.

The iodine number of an oil varies considerably with different samples and different methods of testing. In the following compilation, the range of iodine numbers for the principal drying oils are shown in order of maximum test.

TABLE 5.—*Iodine number for principal drying oils*

Oil	Iodine number	Oil	Iodine number
Oiticica	[1] 218	Whale	110–150
Perilla	185–206	Soybean	124–148
Linseed	179–204	Safflower	146
Sardine	160–190	Rubberseed	133–143
Menhaden	140–180	Herring	123–142
Tung	[2] 160–170	Poppy	132–140
Hempseed	150–166	Sunflower	120–136
Walnut (English)	140–152		

[1] Varies widely according to sample and method of determination.

[2] Does not fully show the high relative drying power of tung oil. It has been known to show an iodine number between 220 and 235 with methods causing the more complete absorption of iodine. C. C. Concannon, Tung Oil, Economic and Commercial Factors in the Development of a Domestic Tung Oil Industry. United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Trade Promotion Series, No. 133, 1932, p. 50.

Adapted from Statistical Bulletin 59, United States Department of Agriculture, p. 122.

The quantity of linseed oil used for drying purposes in the United States far exceeds that for any of the other drying oils. This has been because of the early development of its use as a drying oil, its general suitability for drying purposes, and its availability in large quantities. In 1937 approximately 68 percent of the total fats and oils used for drying purposes in the United States was linseed oil, while 18 percent

[11] George S. Jamieson, Vegetable Fats and Oils. New York, 1932, p. 341.

of the total was tung oil, 5 percent perilla oil, 5 percent fish oils, 2 percent soybean oil, and 2 percent other oils, including oiticica, hempseed, and sunflower oils.

A comparison of prices of the principal drying oils in recent years is shown in figure 8. During the period 1920–38, the price of tung oil at New York averaged about 25 percent higher than that of linseed oil, while the price of perilla oil averaged about 5 percent higher. The

PRICES OF LINSEED, TUNG, AND PERILLA OILS AT NEW YORK, MENHADEN OIL AT BALTIMORE, AND SARDINE OIL, PACIFIC COAST, 1927-38

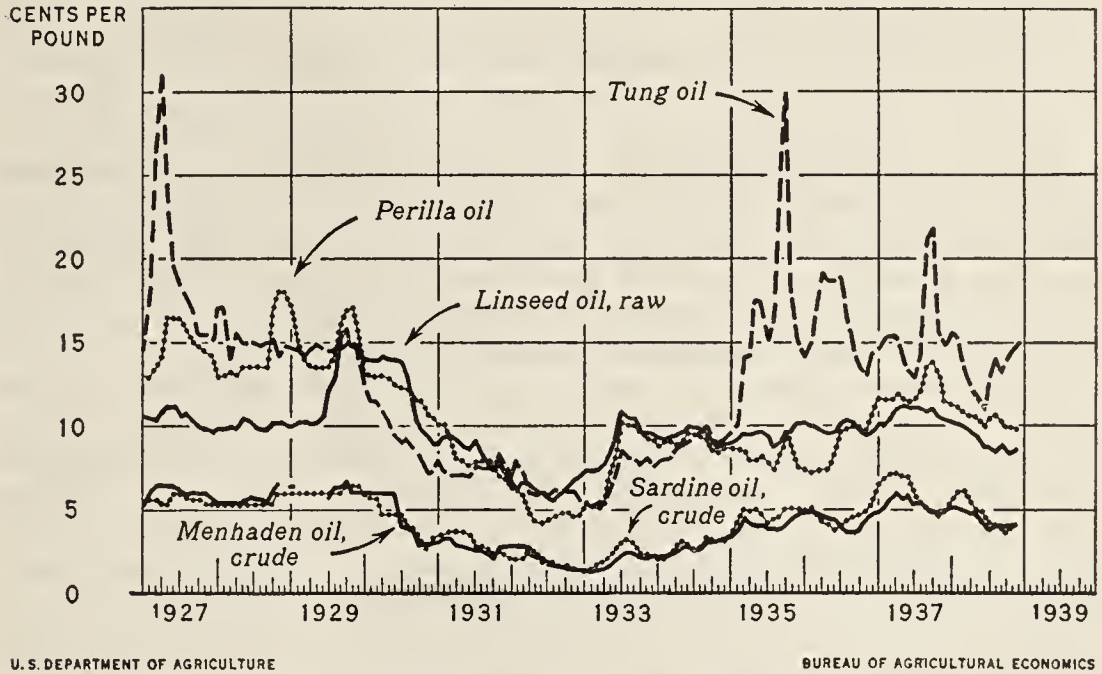

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Figure 8.—During the 1920's, domestic prices of tung oil and perilla oil were higher than prices of linseed oil. But because of increased tariffs on flaxseed and linseed oil in 1929 and 1930, and other factors, prices of linseed oil, from 1930 to 1934, were high compared with prices of other drying oils. However, the price of tung oil rose sharply after 1934, partly as a result of an improved demand for that oil. And in 1936 the price of perilla oil was increased materially by the imposition of an excise tax on imports.

price of soybean oil, however, averaged nearly 5 percent lower than that of linseed oil, while prices of fish oils, at Baltimore and Pacific coast markets, averaged less than half as high as the price of linseed oil. Fish oils, although relatively low in price, are not correspondingly cheap for drying purposes, since the cost of converting crude fish oils to a condition suitable for drying purposes is considerably greater than such costs for other drying oils.

TABLE 6.—*Average price per pound of crude drying oils, New York, Baltimore, and Pacific-coast markets, specified periods*

Period	Linseed oil (barrels), New York	Tung oil (barrels), New York	Perilla oil (drums),[1] New York	Soybean oil		Menhaden oil[1] (tanks), Baltimore	Sardine oil (tanks), Pacific coast
				Imported (barrels), New York	Domestic (drums), New York		
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1920–38	10.9	13.9	11.5	[2] 10.2	[2] 10.2	5.0	----------
1920–29	12.4	16.2	13.8	12.2	----------	6.3	----------
1930–34	9.1	7.8	8.4	----------	7.1	2.7	2.8
1935–38	9.8	15.6	9.9	----------	9.0	4.5	5.0

[1] Perilla-oil prices quoted in barrels prior to 1930, and menhaden-oil prices in barrels prior to 1925. The cost of barrels and drums generally is included with the price of oil, whereas the cost of tanks is not.
[2] Imported basis, 1920–29; domestic basis, 1930–38.

Bureau of Agricultural Economics. Compiled from the Oil, Paint, and Drug Reporter. Prices are averages of high and low each month or of Saturday quotations each week.

A significant variation in the relative levels of prices occurred during the 5 years, 1930–34, which apparently was responsible, at least in part, for an increase in the domestic consumption of other drying oils at the expense of linseed oil. During the 5 years, 1930–34, the average price of linseed oil at New York was higher than that of any of the other drying oils, although linseed-oil prices in the 1920's had been exceeded by prices of both tung oil and perilla oil. The relative strength in prices of linseed oil during this 5-year period was due to a combination of several factors.

Domestic production of flaxseed was reduced from an average of 17,800,000 bushels in the 10 years, 1920–29, to an average of only 11,500,000 bushels in the period, 1930–34, although world production showed little change. Accompanying this decrease in domestic production was an increase in tariff rates on flaxseed and linseed oil imported by the United States. In 1929 the duty on flaxseed was increased from 40 to 56 cents per bushel, and in 1930 to 65 cents; while the duty on linseed oil in 1929 was increased from 3.3 to 3.7 cents per pound, and in 1930 to 4.5 cents. There is no duty on tung oil or perilla oil, although in August 1936 an excise tax of 4.5 cents per pound was imposed on imports of perilla oil.

The decrease in domestic production of flaxseed, together with the imposition of higher duties on flaxseed and linseed oil, had the effect of strengthening linseed-oil prices in the United States, compared with prices of tung and perilla oils. However, there was another factor which tended to produce the same result, and that was the relatively greater depreciation of currencies in China and Japan than in Argentina. Most of the world supply of tung oil is produced in China; and of perilla oil, in Japan; while Argentina furnishes nearly all of the flaxseed imported by the United States.

The Chinese yuan which was worth about 46 cents in United States currency in 1928 and 42 cents in 1929, declined in value to about 22 cents in 1931 and 1932. With the revaluation of gold and the silver purchase program inaugurated by the United States Government in 1933, however, the yuan strengthened in terms of United States currency despite a slight reduction in its silver content.[12] In 1933, the average value of the yuan was about 29 cents, and in 1934 about 34 cents.

In Japan, gold payments were suspended in December 1931, following suspension of such payments in Great Britain. The yen, which was worth approximately 49 cents in United States currency in 1930 and 1931, depreciated to about 21 cents in early 1933, although the value of the yen has since recovered somewhat. The price of perilla oil in the United States was well maintained relative to linseed oil prices in 1930 and 1931, but declined relatively more than linseed oil prices in 1932. The price of tung oil, a Chinese product, on the other hand, declined most sharply relative to linseed oil prices in 1930 and 1931.

The value of the Argentine peso also declined in terms of United States currency during the early 1930's, but the depreciation of the peso was relatively less than that in either the yuan or the yen. The average exchange value of the yuan declined nearly 50 percent from 1925–29 to 1932–33, and the value of the yen declined about 40 percent during this period; but the decline in the value of the peso amounted only to about 30 percent.

[12] New yuan dollar, containing 23.4934 grams of pure silver, replaced old yuan dollar, containing 23.9025 grams of pure silver, on April 10, 1933, Federal Reserve Bulletin, May 1933.

TABLE 7.—*Chinese yuan, Japanese yen, and Argentine peso: Average rates of exchange in United States currency, 1925–37*

Year	Yuan	Yen	Peso	Year	Yuan	Yen	Peso
	Cents	*Cents*	*Cents*		*Cents*	*Cents*	*Cents*
1925	56.9	41.0	40.2	1932	21.7	28.1	25.7
1926	50.0	47.1	40.5	1933	28.6	25.6	32.0
1927	43.9	47.4	42.4	1934	34.1	29.7	33.6
1928	46.1	46.4	42.5	1935	36.6	28.7	32.7
1929	41.9	46.1	41.9	1936	29.8	29.0	33.1
1930	29.9	49.4	36.7	1937	29.6	28.8	33.0
1931	22.4	48.9	29.4				

Compiled from monthly issues of the Federal Reserve Bulletin. Annual figures are averages of daily quotations based on noon buying rates for cable transfers in New York City.

After 1934, the price of tung oil at New York, aided by the increased demand for such oil for industrial purposes, advanced sharply in relation to the price of linseed oil, more than regaining its former price premium. The price of perilla oil, however, remained lower than that of linseed oil through most of 1936. But in 1937 and 1938, largely because of the excise tax of 4.5 cents imposed on imports in August 1936, prices of perilla oil also regained their former premium over prices of linseed oil.

TABLE 8.—*Ratio of prices of specified crude drying oils to the price of linseed oil at New York, 1920–38*

Year	Tung oil, New York	Perilla oil, New York	Soybean oil, domestic, New York	Menhaden oil, Baltimore	Sardine oil, Pacific coast
	Percent	*Percent*	*Percent*	*Percent*	*Percent*
1920	102	82	----------	48	----------
1921	138	81	----------	43	----------
1922	118	112	----------	48	42
1923	181	114	----------	49	43
1924	122	109	----------	51	45
1925	97	108	----------	51	45
1926	129	122	----------	58	60
1927	186	142	----------	58	54
1928	152	144	----------	56	54
1929	120	123	----------	51	50
1930	77	97	82	37	35
1931	88	96	81	32	36
1932	100	78	68	30	30
1933	76	87	73	20	24
1934	96	97	80	28	29
1935	181	87	104	43	49
1936	164	90	93	44	46
1937	145	112	92	48	56
1938	148	114	79	48	52

In the above table, prices of various drying oils are shown as percentages of linseed-oil prices, illustrating not only the decline in prices of other oils in terms of linseed-oil prices after 1929, but also the degree of variation between prices of these oils and linseed oil over a period of years. Prices of closely competitive products, because of their interchangeability, tend to remain constant in relation to each other. It will be observed that prices of all of the oils enumerated vary widely with respect to the price of linseed oil, reflecting differences in adaptability for particular drying purposes. The variation is especially wide for tung oil, which although high in drying qualities,

is used largely for industrial purposes for which linseed oil is not well suited.[13]

As previously noted, soybean oil, which is relatively low in drying quality, is used largely for edible purposes, although also valuable as a drying oil when mixed with oils of higher drying properties. The fish oils are used largely in the manufacture of soap. Both menhaden oil and sardine oil, however, are relatively high in drying qualities, and are used to some extent as drying oils. Although prices of menhaden oil and sardine oil vary considerably with respect to the price of linseed oil, they tend to remain fairly constant with respect to each other. Perilla oil is perhaps the closest competitor with linseed oil, but this oil also has special qualities which make it useful for particular purposes.

Despite the lack of a high degree of interchangeability between other drying oils and linseed oil, as indicated by the price relationships, there is some substitution of other oils for linseed oil when the price of the latter is comparatively high. This is shown by the relative increase in consumption of other oils in the drying industries during the period following 1929, when domestic prices of linseed oil were maintained at levels higher than those of the other drying oils as a result of the tariff increases in 1929 and 1930, and of the depreciation of Chinese and Japanese currencies.

Of the total consumption of oils in the drying industries in the United States, the proportion of linseed oil decreased from 85 percent in 1929 to 61 percent in 1936, although returning to 68 percent of the total in 1937, largely because of the imposition of the excise tax on perilla oil. The physical volume of linseed oil consumed in the drying industries decreased from nearly 800,000,000 pounds in 1929 to less than 400,000,000 pounds in 1933, but increased to nearly 600,000,000 pounds in 1937. Consumption of tung oil for drying purposes, which decreased only slightly during the early 1930's, in 1937 amounted to 151,000,000 pounds compared with 110,000,000 pounds in 1929. Consumption of perilla oil increased from 6,000,000 pounds in 1929 to 105,000,000 pounds in 1936, but decreased to 39,000,000 pounds in 1937, after the imposition of the excise tax. Consumption of fish oils for drying purposes about doubled from 1929 to 1937, and marked increases occurred in the consumption of other oils in the drying industries.

It is probable that if the tariff rates on flaxseed and linseed oil had not been increased in 1929 and 1930, consumption of other oils for drying purposes would not have increased so greatly, although technological developments may have brought about some increase in such consumption. As shown later, the present duties on flaxseed and linseed oil have had the effect of raising the price of linseed oil in this country by 1.6 to 2.0 cents per pound above the level which would obtain if there were no duties. From 1922 to 1929, the domestic price of linseed oil apparently was about 0.8 cent per pound higher than it would have been without the tariffs on flaxseed and linseed oil; and in the pre-war years 1909–13, the price of linseed oil apparently was raised 0.3 to 0.5 cent per pound by the tariffs.

[13] In spite of the high drying qualities of linseed oil and its general adaptability, it has several disadvantages. Among these are its tendency to yellow with age and the difficulty of combining it with synthetic resins, cheaper than imported fossil resins and of increasing importance in the drying-oil industries. Because of this second factor, linseed oil has been largely displaced by tung oil in the varnish field. Cf. Ernest W. Grove and Dallas W. Smythe, Competition Between Linseed and Other Drying Oils, With Particular Reference to California, University of California, Agricultural Experiment Station, Berkeley, 1936, p. 12. See also, C. C. Concannon, Tung Oil: Economic and Commercial Factors in the Development of a Domestic Tung Oil Industry, United States Department of Commerce, Washington, 1932, pp. 41–61.

TABLE 9.—*Estimated consumption of oils in the drying industries, United States, 1912–14 and 1925–37*

Year	Linseed oil [1]	Tung oil [1]	Perilla oil [1]	Fish oils [2]	Soybean oil [2]	Other oils [3]	Total	Linseed oil as percentage of total
	Mil. lb.	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*	*Percent*
1912	461	43	([4])	22	----------	----------	526	88
1913	603	42	([5])	11	----------	----------	656	93
1914	510	30	([5])	14	----------	----------	554	92
1925	726	87	6	30	----------	----------	849	86
1926	714	92	7	18	----------	----------	831	86
1927	756	85	5	20	----------	----------	866	87
1928	785	95	2	24	----------	----------	906	87
1929	789	110	6	21	----------	----------	926	85
1930	544	100	9	25	----------	----------	678	80
1931	471	90	11	27	9	4	612	77
1932	354	74	11	20	12	3	474	75
1933	376	102	25	22	14	5	544	69
1934	409	117	24	25	13	7	595	69
1935	465	129	60	32	18	9	713	65
1936	478	121	105	40	17	19	780	61
1937	571	151	39	44	17	12	834	68

[1] Total domestic disappearance, 1912–30; total disappearance less small quantities used in the manufacture of soap, shortenings, and miscellaneous products reported by the Bureau of the Census beginning 1931.
[2] 1912–14, two-thirds of factory production of menhaden oil; 1925–30, two-thirds of total disappearance of menhaden oil; 1931–37, as reported by the Bureau of the Census.
[3] Bureau of the Census, comparable data not available for years prior to 1931. Other oils include hempseed oil, oiticica oil, sunflower oil, castor oil, and miscellaneous.
[4] Imports not reported prior to October 1913.
[5] Less than 500,000 pounds.

Bureau of Agricultural Economics. For use of specified drying oils by industries, see tables in appendix D.

Although imports and domestic consumption of flaxseed and linseed oil probably would be larger than they are if there were no tariffs on these products, domestic prices would be lower and hence it is likely that the production of flaxseed in this country would be smaller than it is. Flaxseed prices in the United States, since 1930 apparently have been about 49 cents per bushel higher than they would have been if there were no duties on flaxseed and linseed oil. In the period 1922–29, domestic flaxseed prices apparently were about 23 cents per bushel higher than they would have been without duties; and in the years 1909–13 domestic prices apparently were 10 to 15 cents per bushel higher than they would have been without tariffs on imports of flaxseed and linseed oil.

PRICES OF LINSEED MEAL AND COMPETING FEEDS

The factors affecting prices of linseed cake and meal are distinctly different from those affecting prices of linseed oil. Linseed cake and meal is useful primarily as a high-protein feed for livestock. It competes directly with such products as cottonseed cake and meal, soybean cake and meal, and peanut cake and meal, the first two of which are produced in fairly large quantities in this country. In other countries, peanut, or groundnut, cake and meal is used extensively as a high-protein feed.

Other feeds competing with linseed cake and meal are the feed grains and certain byproduct feeds. The principal feed grains in the United States are corn, oats, barley, and grain sorghums. Byproduct feeds include wheat millfeeds, gluten feed and meal, distillers' and brewers' dried grains, dried beet pulp, and rice millfeeds.

In figure 9, average prices of linseed meal at Minneapolis are shown for the years 1927–38 in comparison with average prices of cottonseed meal at Memphis, soybean meal at Chicago, and peanut meal at southeastern mill points; also in comparison with average prices paid by farmers for feed in the United States. During most of the period for which prices of soybean meal are available, prices of linseed meal and soybean meal fluctuated near the same levels. Prices of cottonseed meal and peanut meal at southern markets, however, were lower on the average than linseed meal prices at Minneapolis. Differences in the place of production and the resultant added cost of shipment to important livestock-feeding areas account largely for the differences in price levels. Although the protein contents and feeding values of cotton-seed and peanut meals are as high as or higher than those of linseed and soybean meals, cottonseed and peanut meals are produced in States where the demand for such meals for livestock feeding is limited. Linseed and soybean meals, on the other hand, are produced largely in States where intensive livestock feeding is carried on.

Fluctuations in prices of linseed and other high-protein meals tend to follow the same general course, with changes in prices of the different high-protein meals in relation to each other occurring largely as a result of relative changes in supplies and in shipping costs arising both from variations in freight rates and in average distances of shipment. As indicated below, supplies of linseed cake and meal for domestic consumption varied from 22 percent of total supplies of five high-protein feeds in the marketing year 1927–28 to 5 percent of the total in 1937–38. In the latter year, linseed-meal prices were high compared with prices of other high-protein feeds and with feed prices generally.

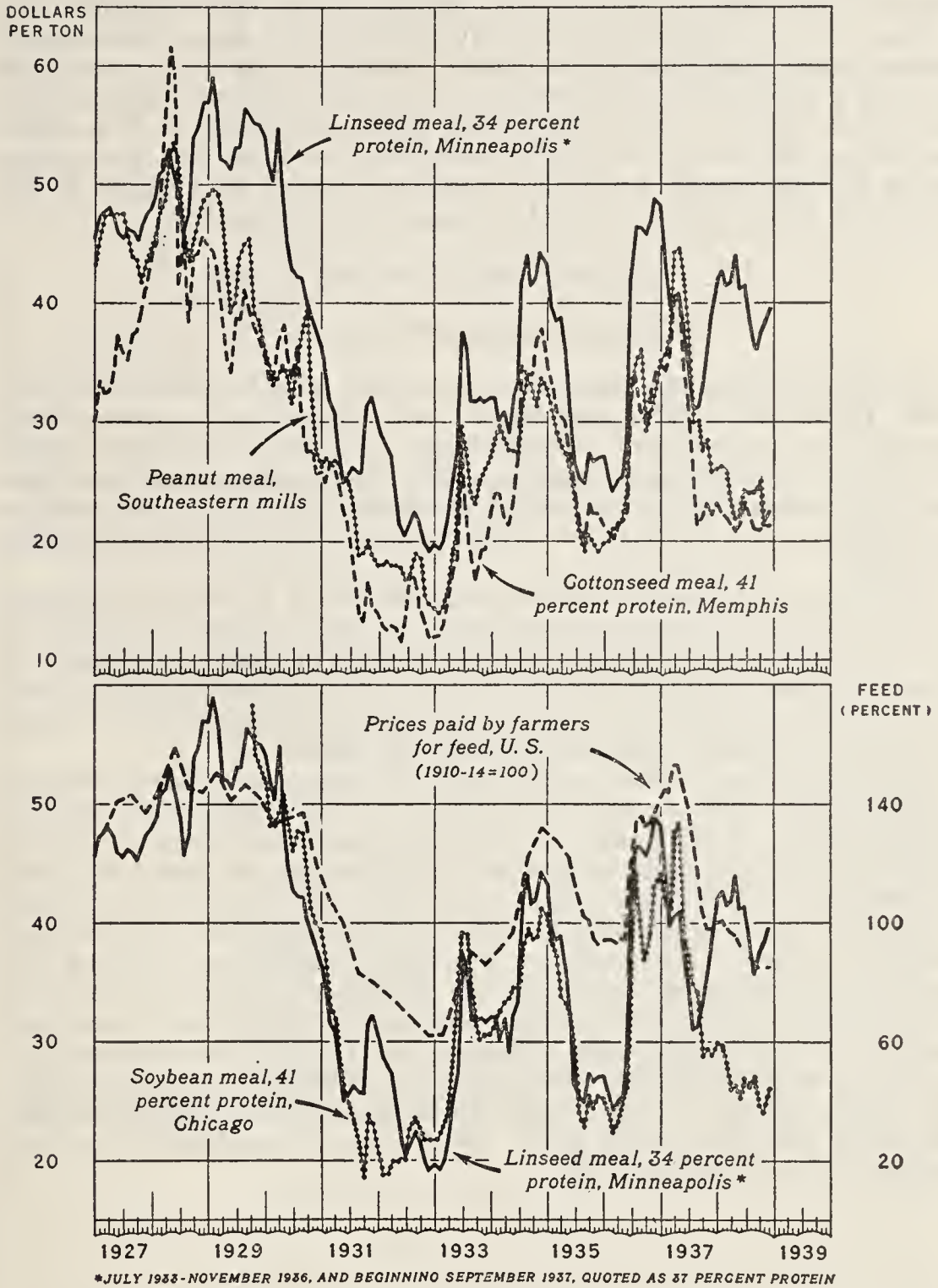
TABLE 10.—*Supplies of oilseed cake and meal, and feed grains, United States, 1925–38*

Year beginning October—	Cotton-seed cake and meal [1]	Linseed cake and meal [1]	Soybean cake and meal [2]	Copra cake and meal [2]	Peanut cake and meal [2]	Total cake and meal	Linseed as percentage of total cake and meal	Feed grains [3]
	1,000 tons	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*Percent*	*1,000 tons*
1925	2,192	478	28	93	12	2,803	17.1	107,162
1926	2,429	462	32	91	10	3,024	15.3	98,938
1927	1,691	530	62	100	22	2,405	22.0	100,054
1928	2,048	476	91	115	17	2,747	17.3	102,855
1929	2,181	396	112	115	35	2,839	13.9	95,798
1930	2,011	370	122	102	17	2,622	14.1	84,966
1931	2,281	222	132	79	13	2,727	8.1	97,868
1932	1,962	220	113	100	17	2,412	9.1	113,768
1933	1,776	161	99	122	11	2,169	7.4	91,720
1934	1,633	222	287	116	49	2,307	9.6	59,510
1935	1,787	286	620	134	50	2,877	9.9	90,137
1936	2,158	303	548	142	69	3,220	9.4	62,720
1937	2,739	206	732	123	52	3,852	5.3	97,165

[1] Production plus imports, less exports.
[2] Production plus imports.
[3] Production of corn and grain sorghums, plus farm stocks of corn, oats, barley, and grain sorghums on Oct. 1.

Bureau of Agricultural Economics.

PRICES OF LINSEED, COTTONSEED, PEANUT, AND SOYBEAN MEALS AT SPECIFIED MARKETS, AND INDEX NUMBERS OF PRICES PAID BY FARMERS FOR FEED IN THE UNITED STATES, 1927-38



*JULY 1933-NOVEMBER 1936, AND BEGINNING SEPTEMBER 1937, QUOTED AS 37 PERCENT PROTEIN

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FIGURE 9.—Prices of linseed meal change in much the same way as prices of other high-protein feeds and feed grains. Differences in supply, however, tend to cause some disparity of movement. In 1938, for example, the supply of linseed meal was relatively small, and prices of linseed meal were high in comparison with those of other feeds.

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Supplies of linseed cake and meal for domestic consumption during the period 1925–37 were almost negligible in relation to total supplies of feed grains, amounting on the average to less than one-half of 1 percent of the total supplies of corn, oats, barley, and grain sorghums on farms. And total supplies of the five high-protein meals for domestic consumption, including linseed meal, were only about 3 percent as large as supplies of the feed grains. Because supplies of linseed cake and meal and of other high-protein feeds constitute such a small percentage of feed grain supplies and have a similar use, changes in prices of high protein feeds are determined largely by changes in the supply of and demand for the feed grains in this country.

III. Flaxseed Prices and the Tariff

TARIFF RATES, 1897–1938

There have been six tariff acts during the past 40 years—in 1897, 1909, 1913, 1921, 1922, and 1930. In addition, many duties were changed by Presidential proclamation in 1929. And since 1930, various revenue acts have been passed in which excise taxes have been levied on imports of a number of the oilseeds and oils in competition with flaxseed and linseed oil. These excise taxes have had the effect of tariffs.

The duty on flaxseed was reduced from 25 to 20 cents per bushel in 1913, but was increased to 30 cents in 1921, 40 cents in 1922, 56 cents in 1929, and 65 cents, the present rate, in 1930. The duty on linseed oil was reduced from 2.67 cents to 2 cents per pound in 1909, and to 1.33 cents in 1913; but this duty was increased to 3.3 cents in 1922, 3.7 cents in 1929, and 4.5 cents in 1930.

Changes in rates of duty or of tax for the principal oilseeds and oils in competition with flaxseed and linseed oil are shown in the accompanying table. Both perilla seed and hempseed were free of duty in 1930, but at the present time a tax of 1.38 cents per pound is levied on imports of perilla seed, and a tax of 1.24 cents on hempseed. Perilla oil, also free of duty in 1930, is now subject to a tax of 4.5 cents per pound. Hempseed oil has been dutiable at 1.5 cents per pound beginning with 1922. To this duty was added an excise tax of 4.5 cents in 1936, making the total rate now in effect 6 cents per pound, which is prohibitive. Except for tung oil and oiticica oil, other imported oils which are used to some extent for drying purposes are comparatively low in drying qualities and are imported chiefly for edible purposes or for soap. Both tung oil and oiticica oil are imported free of tax and duty.

TABLE 11.—*Tariff rates and excise taxes on specified oilseeds and oils useful for drying purposes, United States, 1897–1938*

Commodity	Unit	Rate of duty							Excise tax added by revenue act effective—			Total duty and excise tax, July 1, 1938
		Tariff Act of—					Presidential proclamation June–July 1929	Tariff Act of 1930	May 10, 1934	Aug. 21, 1936	July 1, 1938	
		1897	1909	1913	1921	1922						
OILSEEDS		*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Flaxseed	Bushel of 56 pounds	25.00	25.00	20.00	30.00	40.00	56.00	65.00				65.00
Do	Pound equivalent	.45	.45	.36	.54	.71	1.00	1.16				1.16
Perilla seed	Bushel of 56 pounds	Free	25.00	20.00	20.00	Free	Free	Free				
Do	Pound or pound equivalent	Free	.45	.36	.36	Free	Free	Free		2.00	1.38	1.38
Hempseed	Pound	Free	Free	Free	Free	Free	Free	Free		2.00	1.24	1.24
Poppy seed	Bushel of 56 pounds	15.00	15.00	[1] 15.00	[1] 15.00							
Do	Pound or pound equivalent	.27	.27	.32	.32	.32	.32	.32				[2] .16
Soybeans	Bushel of 60 pounds	Free	45.00	Free	Free							
Do	Pound or pound equivalent	Free	.75	Free	Free	.50	.50	2.00				2.00
OILS												
Linseed oil	Gallon	20.00	15.00	10.00	10.00							
Do	Pound or pound equivalent	2.67	2.00	1.33	1.33	3.30	3.70	4.50				4.50
Perilla oil	Pound	Free	Free	Free	Free	Free	Free	Free		4.50	4.50	4.50
Hempseed oil	Gallon	10.00	10.00	3.00	3.00							
Do	Pound or pound equivalent	1.33	1.33	.40	.40	1.50	1.50	1.50		4.50	4.50	6.00
Poppy oil	Gallon	20.00	20.00	15.00	6.00							
Do	Pound or pound equivalent	2.67	2.67	2.00	.80	2.00	2.00	2.00				2.00
Sunflower oil rendered unfit for food	Ad valorem (percent)	Free	Free	15	15	20	20	Free				
Do	Pound	Free	Free					Free	3.00	4.50	4.50	4.50
Soybean oil	Gallon	Free	Free	Free	20.00							
Do	Pound or pound equivalent	Free	Free	Free	2.67	2.50	2.50	[3] 3.50				[3] 3.50
Whale oil	Gallon	8.00	8.00	5.00	5.00	6.00	6.00	6.00				
Do	Pound or pound equivalent	1.07	1.07	.66	.66	.80	.80	.80	3.00	3.00	3.00	3.80
Herring, menhaden, and sod oils	Gallon	8.00	8.00	3.00	3.00	5.00	5.00	5.00				
Do	Pound or pound equivalent	1.07	1.07	.40	.40	.66	.66	.66	3.00	3.00	3.00	3.66
Fish oils, n. s. p. f.	Gallon	8.00	8.00	3.00	3.00							
Do	Pound or pound equivalent	1.07	1.07	.40	.40				3.00	3.00	3.00	3.00
Do	Ad valorem (percent)					20	20	20				20

[1] According to tariff act, bushel of 47 pounds.

[2] By trade agreement Feb. 1, 1936.

[3] But not less than 45 percent ad valorem.

Basic data compiled from:

Tariff acts passed by the Congress of the United States, from 1789 to 1897, 689 pp., Washington, D. C., 55th Cong., 2d sess., H. R. Doc. 562, 1898.

Comparison of Tariff Acts of 1909, 1913, and 1922 (revised to June 1, 1924). Prepared for the use of the Committee on Ways and Means, House of Representatives. Washington, 1924.

Revenue Act of 1934, 102 pp., Washington, D. C., 73d Cong., H. R. 7835, 1934.

Revenue Act of 1936, 121 pp., Washington, D. C., 74th Cong., H. R. 12395, 1936.

Revenue Act of 1938, 152 pp., Washington, D. C., 75th Cong., H. R. 9682, 1938.

Before attempting to measure the effectiveness of the existing duties and excise taxes in raising domestic prices of imported oilseeds and oils useful for drying purposes, two preliminary matters should be considered. These are: (1) the way in which the drawback provision of the Tariff Act of 1930 affects the duty on flaxseed; and (2) the compensatory relationship between the present duty on flaxseed and that on linseed oil.

THE DRAWBACK ON FLAXSEED

The present duty on flaxseed is 65 cents per bushel, or 1.16 cents per pound. But because of the drawback provision of the tariff act, and the fact that much of the linseed cake and meal produced from imported flaxseed is exported with benefit of drawback, part of the duty on flaxseed is refunded. The relevant provision for payment of drawback on imported flaxseed as stated in section 313 (a) of the Tariff Act of 1930 is as follows:

ARTICLES MADE FROM IMPORTED MERCHANDISE

Upon the exportation of articles manufactured or produced in the United States with the use of imported merchandise, the full amount of the duties paid upon the merchandise so used shall be refunded as drawback, less 1 per centum of such duties. * * * Where two or more products result from the manipulation of imported merchandise, the drawback shall be distributed to the several products in accordance with their relative values at the time of separation.

Because the United States normally is a surplus feed producing country, much of the linseed cake and meal produced from imported flaxseed usually is exported, with domestic flaxseed importers taking advantage not only of the drawback provision but also of the generally higher European prices of cake and meal. Feed production in Europe is less than feed requirements, and considerable quantities of oilseed cake and meal as well as other feeds are imported into Europe. Other products of imported flaxseed exported by the United States, with benefit of drawback, include mixed paints and varnish, linoleum, oilcloth, electrical apparatus, and printing ink. But the value of exports of these products is small compared with that of linseed cake and meal. Most of the linseed oil produced from imported flaxseed is retained for consumption in this country.

For the period 1931 through 1937 the drawback refunded, on the average, was equivalent to about 11 cents per bushel of flaxseed imported. The drawback, however, was not equally distributed among importers in different sections of the country. On the Atlantic coast, exports of products made from imported flaxseed were relatively large, and the drawback deduction, on the average, probably was somewhat greater than 11 cents per bushel of flaxseed imported. On the Pacific coast, on the other hand, most of the products obtained from imported flaxseed were retained for consumption, and the drawback deduction was considerably less than the national average. But the quantity of flaxseed imported on the Pacific coast is only a very small fraction of total imports for the United States.

TABLE 12.—*Flaxseed: Imports, duty collected, drawback paid, and duty less drawback per bushel of imports, 1931–37*

Year	Imports of flaxseed	Total duty collected on flaxseed imported	Drawback paid for exported articles made from imported flaxseed				Drawback paid per bushel of flaxseed imported		Total duty less total drawback per bushel of flaxseed imported	Total duty per bushel of flaxseed imported
			Flaxseed whole	Linseed cake and meal	Linseed oil and products containing linseed oil	Total	On linseed cake and meal	On linseed oil and products containing linseed oil		
	1,000 bu.	*1,000 dol.*	*1,000 dol.*	*1,000 dol.*	*1,000 dol.*	*1,000 dol.*	*Cents*	*Cents*	*Cents*	*Cents*
1931	14,476	9,410	----	1,690	28	1,718	11.7	0.2	53.1	65
1932	7,672	4,987	(1)	1,411	24	1,435	18.4	.3	46.3	65
1933	13,966	9,078	----	1,062	27	1,089	7.6	.2	57.2	65
1934	14,170	9,211	(1)	1,795	22	1,817	12.6	.2	52.2	65
1935	17,560	11,414	(1)	1,421	32	1,453	8.1	.2	56.7	65
1936	15,365	9,987	----	1,501	30	1,531	9.8	.2	55.0	65
1937	28,032	18,221	----	2,898	31	2,929	10.3	.1	54.6	65
Average	15,892	10,330	(1)	1,682	28	1,710	10.6	.2	54.2	65

[1] Less than $500.

Basic data compiled from Foreign Commerce and Navigation of the United States, Bureau of Foreign and Domestic Commerce.

COMPENSATORY RELATIONSHIP OF TARIFFS ON FLAXSEED AND LINSEED OIL

A compensatory duty is defined as "a duty designed to compensate manufacturers for the higher cost of their raw materials, insofar as such higher cost is directly caused by the tariff".[14] As usually determined, a compensatory duty, or the compensatory portion of a duty, on a manufactured product is computed by multiplying the duty per unit of raw material by the number of units of the raw material required to produce one unit of the product. For example, if 3 pounds of flaxseed are required to produce 1 pound of linseed oil, the compensatory portion of the duty per pound on linseed oil would be three times the duty per pound of flaxseed.

The total duty on a manufactured product usually is higher than the purely compensatory rate indicated by the yield of and the duty on the raw material. Processing or extraction costs also add to the total costs of the finished product, and some protection because of the processing costs usually is allowed in establishing the total rate of duty on the finished product. Otherwise it might be cheaper to import the finished product than to import the raw material and process it in this country.

In cases where two or more products are obtained from an imported raw material the calculation of duties on the finished products compensatory to the duty on the raw material ordinarily is made on the basis of the relative values of the products at time of separation. For the United States as a whole, the value of linseed oil produced per unit of flaxseed amounts on the average to about 70 percent of the total value of products, while the value of cake and meal amounts to about 30 percent of the total. Thus, assuming that the relative values

[14] Dictionary of Tariff Information. United States Tariff Commission, Washington, D. C., 1936, p. 176.

for oil and meal are about the same from year to year, and that no drawback is refunded on the duty on flaxseed, the compensatory portions of the duties on oil and meal would be computed as follows:

	Cents
Duty per pound of seed	1. 16
Total duty on 3 pounds of seed [15]	3. 48
Compensatory duty per pound of oil (70 percent of total duty)	2. 44
Compensatory duty on 2 pounds of cake and meal (30 percent of total duty)	1. 04
Compensatory duty per pound of cake and meal	0. 52

For the purpose of the above calculations it is assumed that no drawback is refunded on the duty on flaxseed. But small quantities of linseed oil are exported with benefit of drawback, and, on the Atlantic coast especially, large amounts of cake and meal are exported. It was found that during the period 1931–37 the average drawback refunded, for the country as a whole, was equivalent to about 11 cents per bushel of flaxseed imported. The drawback may be considered as a deduction from the duty on the accounts of those importers who crush flaxseed and export a part of the products. Allowing for the 7-year national average drawback paid, the compensatory portions of the duties on oil and meal would be computed as follows:

	Cents
Duty, less 1931–37 average drawback refunded, per pound of seed	0. 96
Total duty (less drawback) on 3 pounds of seed	2. 88
Compensatory duty per pound of oil (70 percent of total duty)	2. 02
Compensatory duty on 2 pounds of cake and meal (30 percent of total duty)	0. 86
Compensatory duty per pound of cake and meal	0. 43

The total duty on linseed oil is 4.5 cents per pound. The compensatory portion of this duty, for the country as a whole, averaged about 2 cents per pound during the years 1931–37. But because of variations in the amount of drawback refunded (as well as in the relative values of oil and meal) the compensatory portion of the duty on linseed oil varied in different sections of the country, and in different years, from about 1.8 cents to 2.4 cents per pound, the maximum compensatory rate without allowance for drawback.

EFFECTIVENESS OF THE TARIFF ON FLAXSEED [16]

When a tariff is imposed on imports of a commodity previously free of duty, or when an existing tariff is increased, the differential between domestic and foreign prices of the commodity, if imports continue, tends to be widened by the full amount of the increase in duty. Part of the widening of the differential results from increased prices in the domestic market, and the remainder from reduced prices in foreign markets. Because of the many factors affecting prices, however, it usually is not possible to measure the extent to which domestic prices have been raised and foreign prices reduced, as a result of the increase in duty, by means of a direct comparison of historical price series.

The effectiveness of a tariff in raising domestic prices is determined by two general factors (1) the relation of domestic production and

[15] The average oil yield from both domestic and imported flaxseed is estimated to be about 33 percent by weight. See mimeographed report by Anne Dewees under direction of O. C. Stine, Oil Yield and Oil Content of Certain Oleaginous Materials, Bureau of Agricultural Economics, Washington, D. C., 1936.

[16] A more detailed and more technical discussion of the method of determining the effectiveness of the tariff on flaxseed is given in appendix C.

consumption of the commodity to foreign production and consumption; and (2) the average or typical percentage changes in domestic production and consumption resulting from a given percentage change in price in this country compared with the typical percentage changes in foreign production and consumption resulting from the same percentage change in the foreign price.

1. If domestic consumption of the commodity is small compared with total foreign consumption, and the commodity remains on an import basis after the imposition of the tariff, most of the tariff incidence would fall on domestic prices, assuming that the percentage changes in production and consumption in response to a given percentage change in price are the same in both domestic and foreign markets. But if domestic consumption is large compared with total foreign consumption, and if domestic production also is relatively large, most of the tariff incidence would fall on foreign prices.

2. If the percentage change in domestic consumption of the commodity usually is *smaller* in response to a given percentage price change than that in foreign consumption, other things remaining equal, the tariff would tend to raise prices in this country *more* than it would tend to lower prices abroad. Conversely, if the percentage change in domestic consumption usually is *larger* in response to a given percentage price change than that in foreign consumption, other things remaining equal, the tariff would tend to raise prices in this country *less* than it would tend to lower prices abroad. Similar statements may be made with regard to changes in domestic and foreign production in response to price changes. The response-to-price factor, however, apparently is not of great importance in connection with the effectiveness of the duty in raising prices of flaxseed in this country, because it is probable that the typical responses of domestic producers and consumers to price changes are not sufficiently different from those of foreign producers and consumers to cause domestic prices to be increased much more or much less than foreign prices are lowered as a result of an increase in the tariff in this country.

The approximate effectiveness of a tariff in raising domestic prices of a commodity, in cases where the response-to-price factor may be omitted, may be determined from the following formula, in which Δy represents the change in the domestic price resulting from the imposition of a tariff and T represents the tariff rate.[17]

$$\Delta y = \frac{\text{Average foreign production} + \text{consumption}}{\text{Average world production} + \text{consumption}} \cdot T$$

The present tariff on imports of flaxseed of 65 cents per bushel has been in effect since June 18, 1930. During the years 1930–31 to 1937–38, production of flaxseed in this country averaged 8,000,000 bushels annually, net imports averaged 15,100,000 bushels, and consumption, not allowing for changes in stocks, averaged 23,100,000 bushels. World production of flaxseed during this period averaged about 144,500,000 bushels annually, and world consumption was approximately the same. Foreign production of flaxseed during the 8-year period averaged about 136,500,000 bushels annually, and foreign consumption averaged about 121,400,000 bushels (world consumption minus domestic consumption). Substituting the average foreign and world production and consumption figures in the formula,

[17] The derivation of this formula is indicated in appendix C.

it appears that the net tariff paid on imports of flaxseed into the United States, i. e., the tariff rate after adjustment for drawback, was approximately 90 percent effective in raising prices of flaxseed in this country.[18]

It may be argued that in computing the relative incidence of the tariff on domestic prices, production and consumption data should be omitted for countries which are not very active in world trade. In the case of flaxseed, this would exclude the Union of Soviet Socialist Republics, China, and possibly some other countries. The exclusion of production and consumption for these countries from the foreign and world totals would reduce the ratio of foreign to world production and consumption. This would mean that the incidence of the tariff on United States prices would be somewhat less than that computed above. However, the exclusion of data for any flaxseed producing or consuming country does not seem to be justified, since some foreign trade in flaxseed or flaxseed products is carried on by all countries included in the world-production totals. Although the foreign countries named are not at present participating in world trade in flaxseed to any great extent, they are potentially large exporters or importers of flaxseed, and changes in production of and demand for flaxseed within those countries have some effect on world prices of flaxseed. The Soviet Union, for example, exported considerable quantities of flaxseed during the 1920's, but with sharply increased industrial production and building activity in more recent years practically no flaxseed has been exported.

As previously shown, of the total duty of 65 cents per bushel now levied on flaxseed by the United States, an average of 11 cents was refunded as drawback during the years 1931–37. Hence, during the 7 years 1931–37 prices of flaxseed in the United States were about 49 cents per bushel higher on the average (90 percent of 65 minus 11 cents) than they would have been without the tariff. Considerable variation in the amount by which domestic prices were raised occurred, however, because of variations in the amount of drawback. In 1932 the amount of drawback paid was equivalent to about 19 cents per bushel of flaxseed imported, while in 1933 the amount paid was equivalent only to about 8 cents per bushel of imports. Hence the amount by which domestic prices of flaxseed were raised varied from about 41 to 51 cents per bushel. Variations also have occurred by regions. On the Pacific coast and in other sections where exports of products made from imported flaxseed have been small, and where drawback refunds also have been small, prices of flaxseed have been increased more as a result of the traiff than on the Atlantic coast, where the drawback is an important element in importers' calculations. Nearly 90 percent of all the flaxseed imported by the United States, however, usually comes in at Atlantic coast ports.

The average price received by farmers for flaxseed during the years 1931–37 was 147 cents per bushel. And cash farm income from sales of flaxseed averaged about $12,000,000 annually. If there had been no tariff, prices received by farmers for flaxseed, on the average, would have been 49 cents lower than they were, and cash farm income from flaxseed would have been less by about $4,000,000, or 33 percent, assuming that the same amount of flaxseed would have been produced

[8] $\triangle y = \frac{136.5+121.4}{144.5+144.5} \cdot T = .89\ T$

89 percent, rounded to the nearest 5 percent.

in this country. Actually, less flaxseed might have been produced, and the reduction in farm income from this source probably would have been greater than the amount indicated.

EFFECTIVENESS OF EXCISE TAXES ON OILSEEDS IN COMPETITION WITH FLAXSEED

Of the oilseeds which compete with flaxseed, only two have been imported in any appreciable quantity by the United States in recent years, perilla seed and hempseed. Prior to August 21, 1936, both these seeds were imported free of duty. On that date, however, an excise tax of 2 cents per pound was imposed on imports of these seeds. This tax was prohibitive, considering the lower rate of duty on flaxseed. Effective July 1, 1938, the excise tax on perilla seed was reduced to 1.38 cents per pound, and the tax on hempseed to 1.24 cents.

Since the present duty on flaxseed is 1.16 cents per pound without allowance for the effect of the drawback, and approximately 0.96 cent per pound net if the drawback is considered, the existing tax on perilla seed is still slightly more than equivalent to the duty on flaxseed, on the basis of the relative values of the oil per unit of seed. The average oil yield from perilla seed is about 37 percent, slightly higher than that from flaxseed, which is approximately 33 percent. The 1920–38 average price of perilla oil at New York of 11.5 cents per pound also was higher than that of linseed oil, which averaged 10.9 cents per pound. In other words, a unit of perilla seed during the period 1920–38 was worth approximately 1.18 times as much as a unit of flaxseed, in terms of the value of the oil which may be extracted from the seed. But the total import tax and duty rates on perilla seed and flaxseed are, respectively, 1.38 and 1.16 cents per pound. The tax on perilla seed is 1.19 times the total duty on flaxseed, and 1.44 times the approximate net duty on flaxseed after deduction of the tariff drawback.

Only limited price data are available for hempseed oil, which indicate however that prices of hempseed oil are lower on the average than prices of linseed oil. And the average oil yield for hempseed is lower than that from flaxseed in the ratio of 24 to 33 percent. The excise tax on hempseed of 1.24 cents per pound, on the other hand, is somewhat higher than the total duty on flaxseed of 1.16 cents, and considerably higher than the net duty on flaxseed of about 0.96 cent per pound.

Hence, it appears that the present excise taxes on both perilla seed and hempseed are prohibitive in relation to the duty on flaxseed. Legally a drawback may be refunded on exports of products manufactured from imported perilla seed and hempseed, but with imports virtually excluded by present excise tax rates, domestic crushings of these seeds are negligible and no products manufactured from imported seed have been exported since the taxes have been in effect.

Prior to August 1936, small quantities of perilla seed were imported for crushing in this country. But since that date only negligible quantities of such seed have been imported.

Hempseed prior to 1934 was imported chiefly for bird seed. In 1935 and early 1936 hempseed was imported in fairly large quantities for crushing. Since August 1936, however, practically no hempseed has been imported for crushing in this country, although some hempseed continues to be imported for use as bird seed.

TABLE 13.—*Net imports of perilla seed and hempseed into the United States, by years, 1931–37, and by quarters, 1938*

Year and period	Perilla seed	Hempseed	Year and period	Perilla seed	Hempseed
	1,000 pounds	*1,000 pounds*		*1,000 pounds*	*1,000 pounds*
1931	----------	3,596	1937	200	477
1932	----------	6,375	1938:		
1933	789	4,538	January–March	2	110
1934	2,181	12,981	April–June	----------	114
1935	2,783	116,719	July–September	----------	70
1936	3,743	63,132	October–December	----------	514

Compiled from Foreign Commerce and Navigation of the United States, Bureau of Foreign and Domestic Commerce.

If the present taxes on perilla seed and hempseed were removed, or substantially reduced, while the duty on flaxseed remained, both perilla seed and hempseed probably would again be imported for crushing. This would tend to reduce consumption of imported flaxseed in this country, but probably would not have any pronounced effect on flaxseed prices. The reduction in foreign supplies of perilla seed and hempseed resulting from our increased takings would result in increased consumption of flaxseed outside the United States. And the increased foreign demand for flaxseed would largely offset the decreased demand in the United States, with the result that world prices of flaxseed, including prices in the United States, would show little change.

EFFECTIVENESS OF THE TARIFF ON LINSEED OIL

The duty on linseed oil cannot be less effective in raising prices of such oil in this country than the corresponding effectiveness of the duty on flaxseed, without causing linseed oil to be imported in preference to flaxseed. It was found that the duty on seed, allowing for the effect of the tariff drawback, was about 90 percent effective in raising prices of flaxseed in this country. Hence, domestic prices of linseed oil, as a result of the duty on flaxseed, apparently have been increased at least by 1.6 to 2.0 cents per pound (90 percent of 1.8 to 2.2 cents, the approximate range in the compensatory rates of duty on oil allowing for variations in the drawback on flaxseed).

Imports of linseed oil during the years 1930–31 to 1937–38 averaged less than 1 percent of imports of flaxseed in terms of oil. A portion of the linseed oil imported usually is processed and exported in the form of refined oil or of manufactured products such as paint and oilcloth. Such oil, in effect, enters almost free of duty, since under the drawback provision of the tariff act 99 percent of the duty on the imported crude oil used to manufacture products for export is refunded. Another portion of the imports of linseed oil enters at Gulf ports, where frequently it is cheaper to pay the full duty of 4.5 cents per pound than to pay transportation and handling costs from eastern or midwestern flaxseed crushing centers.[19]

[19] Flaxseed crushing mills are confined largely to the east and west coasts and to the area about the Great Lakes. In 1929, mills were located at the following places: New York City and Amsterdam, N. Y.; Edgewater and Newark, N. J.; Philadelphia; Buffalo; Cleveland; Toledo; Chicago; Milwaukee and Superior, Wis.; Minneapolis, St. Paul, and Red Wing, Minn.; Des Moines, Iowa; Fredonia, Kans.; and Portland, Oreg. There were 10 mills in the eastern seaboard area, 4 in Buffalo, 2 in Ohio, 15 in the Middle West and 1 on the Pacific coast. Linseed oil: Supplementary report of the United States Tariff Commission to the President of the United States, U. S. Tariff Commission, Washington, 1929, p. 7.

Since 1929 several mills on the Pacific coast have undertaken the crushing of flaxseed. In 1938, 2 flaxseed-crushing mills were in operation at Portland, Oreg., and 6 in California—2 in the San Francisco Bay region and 4 in southern California.

Special conditions in some recent years have made it possible to import linseed oil at eastern ports, for domestic consumption, paying the full rate of duty. In 1933, for example, domestic flaxseed production was sharply reduced, and in the fiscal year 1933–34 imports of linseed oil were fairly large. In that year flaxseed imported from Argentina was shipped as far west as Minneapolis for crushing, although Argentine seed usually gets no farther west than Buffalo. Linseed oil prices at Minneapolis consequently were higher than they would have been if the supply of domestic seed had been large enough to meet the needs of the midwestern mills and if there had been no inland transportation costs on imported seed to consider. Hence, it was possible for imported linseed oil, paying the full duty of 4.5 cents per pound, to compete directly with midwestern oil at some point between the eastern port of entry and Minneapolis.

The presence of substitute oils may be thought by some to have reduced the effectiveness of the duties on flaxseed and linseed oil in raising prices of these products in the United States. But all of the important substitutes for linseed oil are present in foreign markets as well as in the domestic market, and their presence does not materially affect the price incidence of the duties. The presence of substitutes, however, does tend to cause a transfer in demand from linseed oil to substitute oils in the United States, when the duties on flaxseed and linseed oil are increased, and a transfer in demand from substitute oils to linseed oil in foreign countries. But these transfers in demand are reflected largely in changes in consumption rather than in prices.

(1) The effect of the imposition of duties on flaxseed and linseed oil is to widen the spread between prices of these products in the United States and in other important world markets, raising prices in this country and lowering prices abroad. (2) Because the substitutes for linseed oil are present both in the domestic and foreign markets, and are internationally traded by the United States, their prices in this country, assuming no duties on the substitutes, must maintain approximately the same relationship to prices abroad whether or not duties are imposed on flaxseed and linseed oil. (3) Hence prices of linseed oil in this country necessarily must rise in relation to prices of the substitutes, with the imposition of duties on flaxseed and linseed oil, and part of the demand for linseed oil will be transferred to the substitutes. Similarly, prices of linseed oil in foreign countries necessarily must fall in relation to prices of the substitutes, and part of the demand for the substitutes will be transferred to linseed oil. (4) If the transfers in demand in the United States and abroad are about offsetting, the international prices of the substitutes will tend neither to rise nor to fall, and the effect of the transfers in demand will be reflected largely if not entirely in decreased consumption rather than decreased prices of linseed oil in this country, and in increased consumption rather than in increased prices of linseed oil abroad. In the event that the transfers in demand are about offsetting, therefore, the price incidence of the duties on flaxseed and linseed oil would be largely unaffected by the interactions in demand resulting from the presence of substitutes.

There is no way of determining exactly whether the transfer in demand from linseed oil to substitutes in this country is about offset by the opposite transfer in demand abroad when duties are imposed on flaxseed and linseed oil But the presumption is strong that these

transfers in demand are about offsetting so long as flaxseed, linseed oil, and substitute oilseeds and oils are available in both domestic and foreign markets. Hence, although imports and domestic consumption of flaxseed and linseed oil undoubtedly have been reduced as a result of our duties on these products, the presence of substitutes does not appear to have affected the price incidence of the duties materially.

Essentially the same conditions obtain with regard to the price incidence of the duties or excise on each of the substitute oilseeds and oils in the presence of other substitutes, which include flaxseed and linseed oil.

EFFECTIVENESS OF TARIFFS AND EXCISE TAXES ON OILS IN COMPETITION WITH LINSEED OIL

The principal oils used for drying purposes in the United States may be classified in three groups: (1) oils used primiarly for drying purposes; (2) oils used primarily for edible purposes; and (3) oils used primarily for soap. In the first group are linseed oil, tung oil, perilla oil, oiticica oil, and hempseed oil. In the second group are soybean oil, sunflower oil, and poppy oil. Imports and consumption of poppy oil in this country, however, are negligible. In the third group are whale oil and most of the fish oils. All of these oils are imported by the United States, except some fish oils which have been on an export basis in recent years.

TABLE 14.—*Net imports of specified oils into the United States, 1928–38*

[Net exports indicated by minus sign]

[In millions of pounds]

Year	Linseed oil and oil equivalent of flaxseed	Tung oil	Perilla oil	Oiticica oil [1]	Hempseed oil	Soybean oil	Sunflower oil [2]		Whale oil	Fish oils [3]
							Edible	Rendered unfit for food		
1928	323.1	103.0	2.0	--------	—	5.1	--------	----------	48.4	39.9
1929	455.8	113.5	5.6	--------	—	11.4	--------	----------	56.6	37.1
1930	234.5	120.1	8.8	--------	(4)	2.9	(4)	(4)	52.7	30.0
1931	266.7	74.7	13.3	--------	—	—.5	27.5	0.2	81.2	30.9
1932	145.5	72.6	16.5	--------	—	—2.3	4.8	7.6	42.1	14.7
1933	265.9	114.5	22.8	--------	.1	2.1	14.1	13.8	43.0	(4)
1934	264.0	110.0	25.2	--------	.4	.8	10.0	7.5	15.8	—4.1
1935	325.7	120.1	72.3	--------	.3	10.1	37.1	.2	20.2	—2.4
1936	283.7	134.8	117.9	2.9	(4)	.2	24.7	.5	17.6	—.9
1937	518.4	174.9	43.6	3.6	—	16.5	.2	.3	44.4	—.7
1938	283.2	107.5	31.8	5.3	(4)	2.2	(4)	.1	22.1	—2.1

[1] Not reported prior to 1936.
[2] Not reported prior to 1930.
[3] Does not include cod oil or fish-liver oils.
[4] Less than 50,000 pounds.

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States, Bureau of Foreign and Domestic Commerce.

Tung oil and oiticica oil are imported free of tax and duty. Tung oil is produced chiefly in China, although tung nut trees are now under cultivation in a number of other countries, including the United States. Oiticica oil is produced only in Brazil, where production to date has been very small compared with world production of linseed and other drying oils.

Tung oil has not been considered highly competitive with linseed oil because of its high waterproofing and other special properties which make it more valuable for special industrial uses than for use as a general drying oil. Also, its price usually is higher than that of linseed oil. Although the development of synthetic resins in recent years has made tung oil more important than formerly in the general varnish field, the degree of competition between tung oil and linseed oil still is not very great, judging from the fact that the ratio of the price of tung oil to that of linseed oil has varied widely.

Although there is no duty on perilla oil, an excise tax of 4.5 cents per pound was imposed on imports of such oil in August 1936. Reliable estimates of world production and prices of perilla oil are not available. Practically all of the world supply of perilla oil is produced in Japan and in the Japanese leased territory, Kwantung. The seed is grown chiefly in Manchuria, with some production in Chosen. Reports from semiofficial sources indicate that production of perilla seed averages 200,000,000 to 300,000,000 pounds annually. If 250,000,000 pounds of seed are crushed, with an average oil yield of about 37 percent, production of perilla oil would amount to approximately 92,000,000 pounds annually.

Imports of perilla oil by the United States for the 2 years 1937–38 averaged 38,000,000 pounds. If it is assumed with a given percentage rise in domestic prices and an equivalent percentage fall in foreign prices, that the exporting countries would tend to decrease their exports to this country by about the same amount as consumers in this country would tend to decrease consumption,[20] the formula used in connection with the duty on flaxseed may be used to determine the approximate incidence of the excise tax on perilla oil. Substituting estimated foreign and world production and consumption figures in this formula, it appears that the excise tax on perilla oil was somewhere near 75 percent effective in raising prices of such oil in the United States. With a tax of 4.5 cents per pound, this estimate would indicate that prices of perilla oil in this country may have been increased by about 3.4 cents per pound as a result of the imposition of the tax. This indication is roughly substantiated by the increase in prices of perilla oil which took place in late 1936 and early 1937 in relation to prices of linseed oil and tung oil, for which there were no changes in duty status in 1936.[21]

Hempseed oil is produced in fairly large quantities in Europe and China, but imports and consumption of such oil in the United States have been extremely small. The duty on hempseed oil is only 1.5 cents per pound, but with the excise tax of 4.5 cents imposed in August 1936, the total rate of 6 cents per pound now in effect is prohibitive. Practically no hempseed oil has been imported since 1936.

Soybean oil is used largely for edible purposes, but it also is a competitor with linseed oil in the drying industries, particularly when mixed with perilla oil. Soybean oil has been imported in relatively small quantities in recent years, largely because production of such oil from domestically produced soybeans has become fairly large.[22] The United States is now the third largest soybean-producing country,

[20] In other words, if it is assumed that the elasticity of supply of imports at a given domestic price is not greatly different from the elasticity of demand for imports at that price. Some of the implications of such an assumption are discussed in appendix C.

[21] Fig. 8.

[22] Cf. Ernest W. Grove, Soybeans in the United States; Recent Trends and Present Economic Status, U. S. Department of Agriculture, Tech. Bull. No. 619, Washington, 1938.

being exceeded only by China and Manchuria. Other important producing countries are Chosen, Japan, Netherlands India, and Union of Soviet Socialist Republics. Available information indicates that total world production of soybeans amounts to about 400,000,000 bushels or 24,000,000,000 pounds annually. With an oil yield of approximately 14 percent, 24,000,000,000 pounds of soybeans would, if crushed, produce about 3,360,000,000 pounds of soybean oil. Not all soybeans are crushed for oil, however, since some soybeans are used for seed, ground for food, or used for other purposes.

For the 3 years 1935–37, factory production of soybean oil in the United States averaged 175,000,000 pounds annually,[23] and production plus net imports averaged 184,000,000 pounds. The quantities produced and consumed in the United States, however, were relatively small in relation to the world totals, and it is probable that the present duty of 3.5 cents per pound (but not less than 45 percent ad valorem) is highly effective in raising prices of such oil in this country, in years in which soybean oil is imported.

Consumption of soybean oil in the United States prior to 1935 was relatively small. But with the marked increase in domestic soybean production and with the development of edible uses for soybean oil, consumption has increased sharply in the past few years. The marked reduction in the supply of lard as a result of the droughts of 1934 and 1936 also was partly responsible for the increase in soybean-oil consumption. The estimated average disappearance of soybean oil in the United States during the period 1925–34 was 24,000,000 pounds annually, of which about half was accounted for by uses in the drying industries. For the 3 years 1935–37, disappearance averaged nearly 170,000,000 pounds annually, of which less than 10 percent was accounted for by uses in the drying industries, while nearly 80 percent went into the manufacture of edible products. Hence, it appears that while soybean oil continues to compete to some extent with linseed oil, in recent years it has competed principally with edible fats and oils, particularly with lard and cottonseed oil. But competition between soybean oil and lard and cottonseed oil does not affect the incidence of the duty on soybean oil materially, so long as cottonseed oil and lard are exported or imported by the United States.

Sunflower oil, produced chiefly in the Soviet Union, was free of tax and duty prior to 1934, when imported in a form rendered unfit for food. In May 1934, an excise tax of 3 cents per pound was imposed on the first domestic processing of this oil. This tax had the effect of a tariff; and imports of such oil decreased from 13,800,000 pounds in 1933 to 7,500,000 pounds in 1934, and to only 200,000 pounds in 1935. The excise tax on sunflower oil, rendered unfit for food, was increased to 4.5 cents per pound in August 1936, when it was changed from a tax on first domestic processing to one directly on imports. Since imports and consumption of sunflower oil rendered unfit for food in the United States are now extremely small in relation to world production and consumption, it is probable that the present tax is nearly 100 percent effective in raising prices of such oil in this country.

Information now available indicates that world production of whale oil, excluding sperm-whale oil, in recent years has averaged nearly 1,000,000,000 pounds annually. Production in the United States in 1937 totaled 68,000,000 pounds,[24] and production plus net imports

[23] Animal and Vegetable Fats and Oils, Bureau of the Census.
[24] Animal and Vegetable Fats and Oils, Bureau of the Census.

totaled 112,000,000 pounds. In terms of the world totals, however, these figures are relatively small and it is probable that the present duty and excise tax of 3.8 cents per pound [25] is highly effective (possibly 85–90 percent) in raising prices of whale oil in this country.

No estimates of world production and consumption of fish oils are available. It is probable, however, that United States production and consumption of fish oils are relatively small in relation to the world totals, and that the combined duty and excise tax of approximately 3.66 cents per pound [26] also is highly effective in raising prices of such oils in this country, in periods when fish oils are imported for consumption in the United States.

Appendix A. Building Activity in the United States and Foreign Countries

BUILDING-ACTIVITY DATA

Changes in the world demand for linseed oil are associated with changes in building activity in the principal flaxseed-consuming countries. Linseed oil, in the form of paints and varnishes, is used extensively on new building constructions and maintenance of existing structures, although also used to some extent in the manufacture of such products as linoleum, oilcloth, printing ink, and soap, and occasionally for edible purposes.

Building cycles in the various foreign countries do not, as a rule, coincide with those in the United States. Warren and Pearson have compiled a long-time index of building activity in the United States which, after 1900, shows marked cyclical peaks for the periods 1905–9 and 1922–29. During the past 40 years the number of new houses built in London reached a cyclical high about the turn of the century and building construction was very active from 1926 to 1936, particularly in the early thirties, when building activity in the United States was relatively low. The number of new houses built in Glasgow also showed marked cyclical peaks about the turn of the century and again in the late twenties and early thirties. In Hamburg, peaks in the total number of new buildings constructed occurred in 1910 and 1928. In Sweden, peaks in construction occurred in 1904 and in 1932. In the Netherlands, building construction was moderately active from 1900 to 1913, and very active from 1921 to 1935. Construction activity in Canada was at a maximum in 1912 and again in 1929.[27] For recent years, the League of Nations has brought together indexes for a number of additional countries, in which building activity also shows diverse trends.[28]

Building activity in the United States may be taken as an approximate indication of the total demand for drying oils in this country. For foreign demand, a combined index of building activity in some of the leading linseed oil consuming countries other than the United States would serve the same purpose. Because of the diverse trends in building activity in the several countries of the world, it would be

[25] The duty is 6 cents per gallon of 7.5 pounds, or 0.8 cent per pound, to which an excise tax of 3 cents per pound was added on May 10, 1934.

[26] The duty is 5 cents per gallon of 7.5 pounds, or 0.66 cent per pound, for herring oil, menhaden oil, and sod oil; 6 cents per gallon, or 0.8 cent per pound, for seal oil; and 20 percent ad valorem for all other marine-animal oils not specifically provided for. To these duties was added an excise tax of 3 cents per pound in May 1934. Cod oil, however, is duty and tax feee.

[27] George F. Warren and Frank A. Pearson, World Prices and the Building Industry, New York, 1937, ch. 12.

[28] League of Nations Monthly Bulletin of Statistics, Geneva, September 1938.

desirable to include as many countries as possible in the combined index. But consumption of linseed oil outside the United States is concentrated largely in a few countries. Of these countries, building data are available only for Germany, the United Kingdom, France, the Netherlands, and Argentina.

For the United States, the F. W. Dodge Corporation reports the value of building contracts awarded each month in 37 States east of the Rocky Mountains. A recent study also is available showing annual estimates for the entire country of the total value of actual new building construction, building alterations, and maintenance of existing structures.[29] This study affords a rough check on the representativeness of the Dodge series. In the accompanying table, the estimated values of total construction and maintenance in the United States are shown in relation to values of building contracts awarded in 37 States. The two series are similar, except that the Dodge series for 37 States shows more pronounced cyclical variation. The greater stability in the total value series reflects its more complete coverage, particularly with regard to small building projects and maintenance items.

TABLE 15.—*Estimated value of new construction and maintenance in the United States, and value of building contracts awarded in 37 States, 1919–37*

Year	Value of new construction and maintenance, including work relief, United States		Value of building contracts awarded in 37 States [2] [3]	Year	Value of new construction and maintenance, including work relief, United States		Value of building contracts awarded in 37 States [2] [3]
	Actual [1]	Relative [2]			Actual [1]	Relative [2]	
1919	$7,785,000,000	65	63	1929	13,406,000,000	112	117
1920	8,322,000,000	70	63	1930	11,729,000,000	98	92
1921	7,815,000,000	65	56	1931	8,618,000,000	72	63
1922	9,193,000,000	77	79	1932	5,372,000,000	45	28
1923	10,855,000,000	91	84	1933	4,016,000,000	34	25
1924	11,989,000,000	100	94	1934	5,055,000,000	42	32
1925	13,007,000,000	109	122	1935	5,622,000,000	47	37
1926	13,722,000,000	115	129	1936	8,086,000,000	68	55
1927	13,881,000,000	116	129	1937	8,450,000,000	71	59
1928	13,638,000,000	114	135				

[1] U. S. Department of Commerce, op. cit.
[2] 1923–25=100.
[3] Federal Reserve Board (F. W. Dodge series).

The monthly value data as reported by the Dodge Corporation have been converted to index numbers and adjusted for typical seasonal variation by the Federal Reserve Board, which publishes such figures currently. A further adjustment has been made by the Bureau of Agricultural Economics to eliminate the effect of changes in building costs, thus roughly converting the index to a volume basis. The data used to represent cost of building are those computed by the Associated General Contractors of America from average wage rates in the building trades (weight 40) and average wholesale prices of building materials (weight 60). These data are published currently in the Survey of Current Business.

[29] Lowell J. Chawner and others, Construction Activity in the United States, 1915–37, U. S. Department of Commerce, Domestic Commerce Series No. 99, Washington 1938.

TABLE 16.—*Value of building contracts awarded in 37 States, adjusted for building costs, 1919–38*

[Index numbers, 1923–25=100; adjusted for seasonal variation]

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year [1]
1919	------	------	------	------	------	------	------	------	------	------	------	------	64
1920	------	------	------	------	------	------	------	------	------	------	------	------	51
1921	39	39	43	50	53	56	59	63	67	68	70	70	56
1922	73	75	83	87	90	94	98	96	87	80	80	83	85
1923	89	89	88	86	82	82	76	74	79	83	90	92	84
1924	95	96	97	96	95	91	88	86	92	98	99	98	94
1925	97	103	107	111	118	123	131	138	136	134	134	139	123
1926	142	140	130	127	121	123	127	135	133	134	135	134	132
1927	135	132	128	128	128	128	129	127	128	128	129	132	129
1928	138	139	140	140	140	140	133	131	134	136	132	126	136
1929	119	117	120	122	120	125	124	121	110	107	103	102	116
1930	94	103	101	101	105	99	96	82	82	78	77	74	92
1931	72	79	78	74	66	64	63	61	61	57	51	40	64
1932	33	29	29	30	31	33	33	37	37	36	33	35	33
1933	27	23	17	18	20	22	26	29	36	45	58	69	31
1934	58	52	38	36	29	29	30	30	32	34	34	34	36
1935	30	31	29	30	30	34	40	44	49	56	70	78	42
1936	69	58	53	53	52	58	66	70	66	63	64	73	62
1937	70	67	61	57	60	64	71	65	59	55	59	65	63
1938	55	54	49	55	54	57	63	70	83	87	102	[2] 104	[2] 69

[1] Computed from annual data.
[2] Preliminary.

Bureau of Agricultural Economics. Compiled from Federal Reserve Bulletins and Survey of Current Business: Value of contracts awarded in 37 States (F. W. Dodge Corporation), adjusted for seasonal variation; divided by the construction cost index (Associated General Contractors), converted from 1913 base.

A similar index of building activity is available for the United Kingdom. The Ministry of Labor in that country compiles monthly figures on the total value of building permits granted by 146 local authorities in Great Britain, representing a population of about 18,000,000. These figures have been converted to index numbers, and adjusted to eliminate seasonal variation and changes in building costs. The adjusted figures are published currently in the monthly trade supplements of the Economist.

According to information assembled by the League of Nations, two series of index numbers of building activity are available for Germany, one based on permits granted and one on buildings completed. Two similar series are available for the Netherlands. The index numbers based on permits granted or buildings begun have been taken in each case, because such series are more nearly comparable with available indications for other countries. The data for Germany represent the volume of building construction for about 100 towns (cities), and for the Netherlands for the entire country. For France, a series is available indicating changes in the number of permits granted in the principal towns. The data for Argentina are based on the number of permits granted for Buenos Aires only.

TABLE 17.—*Building activity in 5 foreign countries, 1926–37*

[Index numbers, 1929=100]

Year	Germany, permits [1]			United Kingdom [3]	France, permits number, total [4]	Netherlands, [5] construction begun, dwellings, residential	Argentina, Buenos Aires, permits, surface area, total	Combined index of building activity, 5 countries
	Apartments, residential	Cubic space other than residential	Combined columns 1 and 2 [2]					
Relative weights	----------	----------	31.0	29.0	18.0	12.0	10.0	100
1926	36.6	----------	36.6	93.3	32.7	101.3	61.2	73
1927	52.9	----------	52.9	89.2	65.0	100.2	68.3	73
1928	79.0	----------	79.0	90.8	78.9	104.1	80.0	86
1929	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100
1930	78.9	75.2	76.4	109.2	111.4	110.6	89.1	98
1931	36.2	38.4	37.7	103.3	101.6	103.3	59.9	78
1932	24.8	20.4	21.9	95.0	81.3	71.5	42.2	62
1933	29.6	22.8	25.1	122.5	74.0	117.1	40.4	75
1934	40.9	49.5	46.6	146.7	66.7	100 1	52.4	86
1935	59.1	82.7	74.8	166.7	55.7	80.0	48.3	96
1936	88.6	113.6	105.3	178.3	52.8	59.0	44.0	105
1937	74.0	119.0	104.0	164.2	46.3	70.0	58.2	102

[1] 1926–27, 93 towns; 1928–32, 96 towns; 1933, 100 towns; 1934–37, 102 towns.
[2] Index for apartments, residential, 1926–28; beginning 1929, indexes for apartments, residential, and for cubic space, other than residential, combined, using weights of 1 and 2, respectively.
[3] Value of building plans approved by 116 local authorities, based on a 12-month moving average, adjusted for changes in building costs. Compiled from the Economist.
[4] Principal towns.
[5] Whole country.

Bureau of Agricultural Economics. Basic data compiled from League of Nations Monthly Bulletin of Statistics, September 1938, and the Economist (United Kingdom). Combined index weighted according to relative consumption of flaxseed in each country.

METHOD OF COMPUTING WEIGHTS

The importance of the various countries in affecting the demand for linseed oil probably would be best indicated by the relative amount of linseed oil consumed in each country. No yearly estimates of actual consumption of linseed oil are available by countries, except for the United States, where apparent domestic disappearance of the various oils has been computed from data on production, foreign trade, and stocks,[30] and for the United Kingdom, where annual trade estimates are available for recent years. Although annual data on stocks of flaxseed and linseed oil are not available for most countries, estimates of average consumption of flaxseed for oil may be made on the basis of the average production, balance of foreign trade, and seed requirements for planting of each country. If the averages are made to cover a sufficient period, changes in stocks will largely cancel, and, for practical purposes, can be ignored.

Nearly one-fourth of the total world consumption of flaxseed, exclusive of seed requirements for planting, during the 10 years 1925–34, was consumed in the United States, according to the estimates shown in the following table. The Union of Soviet Socialist Republics consumed more than 15 percent of the total; Germany, about 12 percent; the United Kingdom, about 11 percent; France, 7 percent; British India, 5 percent; and the Netherlands and Argentina, each about 4 percent. Consumption in Italy, Canada, and Japan was relatively small.

[30] Anne Dewees. Fats and Oils and Oleaginous Raw Materials—Production, Prices, Trade, Disappearance in the United States, 1912–35, U. S. Department of Agriculture, Statistical Bulletin No. 59, Washington 1937.

TABLE 18.—*Production, foreign trade, seed requirements, and estimated consumption of flaxseed in specified countries, average 1925–34*

Country	Production of flaxseed	Net imports (+) or net exports (−)		Requirements of seed for planting [1]	Estimated consumption, excluding seed for planting	Consumption as a percentage of world total
		Flaxseed	Linseed oil in terms of flaxseed			
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Percent*
United States	15,858	+16,576	+213	1,505	31,142	24.1
Union of Soviet Socialist Republics	26,156	−420	−36	(5,516)	20,184	15.6
Germany	[2] 148	+13,428	+1,497	(33)	15,040	11.6
United Kingdom	----------	+12,138	+1,630	(28)	13,740	10.6
France	528	+8,353	−93	(58)	8,730	6.7
British India	17,016	−8,338	+63	(2,618)	6,123	4.7
Netherlands	309	+13,504	−8,209	(27)	5,577	4.3
Argentina	73,868	−62,731	+22	6,403	4,756	3.7
Italy	254	+2,460	+169	(33)	2,850	2.2
Canada	3,392	−1,218	+100	216	2,058	1.6
Japan	148	+475	−33	(30)	560	0.4
Total (11 countries)	137,677	----------	----------	----------	110,760	85.6
Estimated world total	149,245	----------	----------	(19,800)	129,445	100.0

[1] Figures in parentheses are arbitrary estimates based on assumed requirements of 1 bushel of seed per harvested acre in Europe and Japan, and 0.8 bushel in India. In the United States seed requirements are approximately 0.6 bushel per harvested acre, and in Argentina, about 1 bushel, according to official estimates.

[2] 4-year average.

Bureau of Agricultural Economics. Data on production, foreign trade, and requirements of seed for planting compiled from official sources.

INDEX OF BUILDING ACTIVITY, 1926–37

Index numbers of building activity for the United States may be combined with those for the five foreign countries to obtain a rough index of building activity in the leading flaxseed-consuming countries for which building data are available. For the six countries, United States, United Kingdom, Germany, France, Netherlands, and Argentina, flaxseed consumption, exclusive of seed requirements, averaged 79,000,000 bushels annually during the 10 years 1925–34. The United States consumed 40 percent of this amount. Hence, in combining the index numbers, the series for the United States has been given a weight of 40 and that for the five foreign countries a weight of 60.

TABLE 19.—*Building activity in the United States and 5 foreign countries, 1926–37*

[Index numbers, 1929=100]

Year	United States [1]	Five foreign countries [2]	United States and 5 foreign countries	Year	United States [1]	Five foreign countries [2]	United States and 5 foreign countries
1926	114	73	89	1932	28	62	48
1927	111	73	88	1933	27	75	56
1928	117	86	98	1934	31	86	64
1929	100	100	100	1935	36	96	72
1930	79	98	90	1936	53	105	84
1931	55	78	69	1937	54	102	83

[1] Value of building contracts awarded in 37 States adjusted for building costs; converted from 1923–25 base.

[2] Germany, United Kingdom, France, Netherlands, and Argentina.

Although changes in building activity for the five foreign countries combined were somewhat like those in the United States, the increases in building activity in Germany and the United Kingdom after 1932 were much greater than in this country, where such activity remained at a relatively low level from 1933 through 1937. Building activity for the five foreign countries combined was slightly greater in 1936 and 1937 than in 1929, while in the United States building activity in 1936 and 1937 was only slightly more than half as great as in 1929.

Appendix B. Flaxseed Price Analysis

Flaxseed prices in the United States are affected by a number of factors. Among these are changes in world production and stocks of flaxseed, linseed oil, and competing oilseeds and oils; building activity; technological changes in the drying oils industries affecting the demand for linseed oil; and changes in world supplies of and the demand for livestock feed. In addition, variations in currency exchange rates, and in tariff and trade regulations affecting flaxseed and related products also have some effect on flaxseed prices. The factors having the most pronounced influence on flaxseed prices apparently are changes in world production and stocks of flaxseed and linseed oil, and changes in building activity.

Data with regard to stocks of flaxseed are available only for the United States, Canada, and Argentina; no data are available for India and Europe, where accumulations or depletions of such stocks probably exert a considerable influence on world prices of flaxseed. In the three countries for which data on stocks are available, the proportion of the crop carried over at the end of the marketing season varies considerably from year to year. For the three countries combined, end-of-season stocks from 1925–26 to 1936–37 varied from 3 to 14 percent of production. Stocks in Argentina, which exports most of the flaxseed produced, were relatively small; but stocks in the United States and Canada at the end of the marketing season were comparatively large, averaging more than 25 percent of production.[31]

In countries which utilize large quantities of the drying oils, changes in stocks of such oils perhaps are more important in their effect on prices than changes in stocks of flaxseed. Estimates of stocks of the drying oils are available only for the United States, where at the end of the flaxseed marketing season stocks of linseed oil usually are larger than stocks of flaxseed in terms of oil. During the 10 years 1925–34, domestic stocks of linseed oil on June 30 averaged 124,000,000 pounds, almost twice as large as the 69,000,000 pounds oil-equivalent of flaxseed on hand. Stocks of other drying oils also were relatively large.

In view of the lack of adequate world data on stocks, it is necessary to use production data only to represent changes in world supplies of flaxseed. The approximate relationship of flaxseed prices at Minneapolis to world flaxseed production during the period 1926–37 is shown in section A of figure 10, with the effect of changes in building activity in important flaxseed-consuming countries considered in section B. The computed coefficient of correlation (R) for this multiple relationship is 0.94. With only 12 years of observation, however, there undoubtedly is considerable error involved in this and other measurements, particularly since the data for each series are serially related.

[31] For data see appendix D.

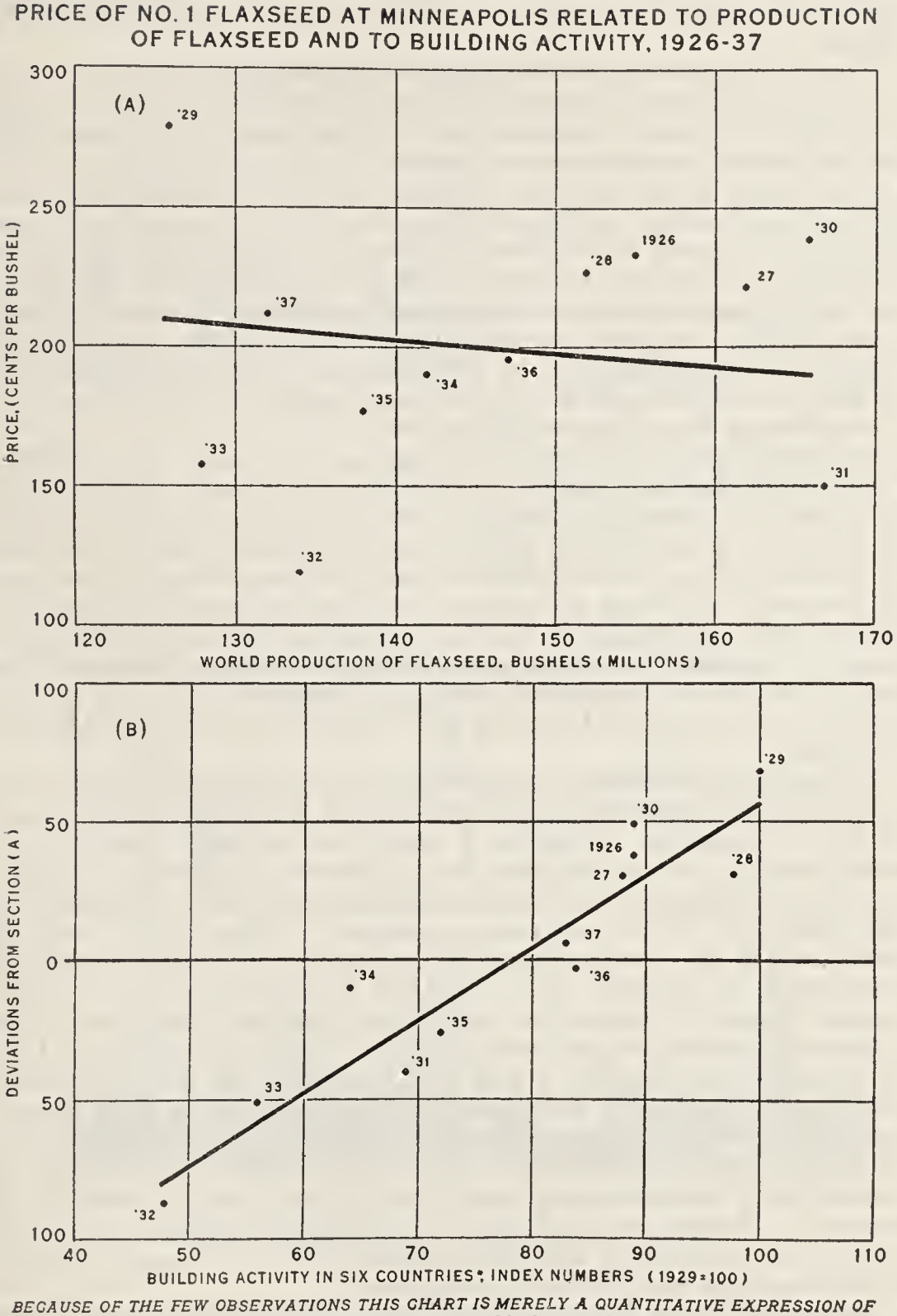

FIG. 10.—Flaxseed prices are influenced by a number of factors. Among the more important are changes in world production and stocks of flaxseed, and changes in building activity. Changes in production alone do not appear to have had much effect on flaxseed prices in recent years. But changes in building activity apparently have had a marked influence.

Despite the fact that considerable error is involved in correlation analysis based on time-series data, particularly when the period included is comparatively short, certain tentative conclusions may be stated.

The computed slope of the partial regression line in section A ($b_{12.3}$) is -0.52, which would indicate that with a change of 1,000,000 bushels in world production of flaxseed, the price per bushel of flaxseed would tend to change in the opposite direction by approximately half a cent. Or, expressed in another way, with an increase of 1 percent in world flaxseed production, measured from the point of averages, flaxseed prices would tend to decrease by four-tenths of 1 percent. These indications, however, are based on the assumption that the slope of the partial regression line is significantly different from zero, which it is not. The computed standard error of the slope is 0.37. For the measurement of the slope to be significantly different from zero it would have to be larger than twice the standard error; in other words, it would need to be larger than ± 0.74.

Although flaxseed prices do not appear to change very greatly in response to changes in world production of flaxseed, flaxseed prices do appear to change significantly with changes in building activity. The computed slope of the partial regression line in the lower section of the chart ($b_{13.2}$) is 2.62, which would indicate that, with a change of 1 point in the index of building activity, the price of flaxseed per bushel tends to change in the same direction by approximately 2.6 cents. Expressed in percentages of the mean values for the 12-year period, this would mean that, with an increase of 1 percent in building activity, the price of flaxseed also tends to increase approximately 1 percent.

If the effect of factors other than world flaxseed production and world building activity were considered, it is possible that the slope of the regression line in section A would be steepened somewhat. In other words, it is possible that the dependence of changes in flaxseed prices on changes in world flaxseed production actually is greater than that indicated by the correlation analysis. Other factors were not considered in the correlation chiefly because of difficulties of measurement, but also because the statistical significance of a correlation analysis based on time series, involving a comparatively few number of years, diminishes rapidly as additional variables are added. Other factors affecting flaxseed prices not considered in the quantitative analysis are, as already indicated, changes in world stocks of flaxseed, changes in world supplies of linseed oil and other drying oils, changes in the comparative demand for the various drying oils arising from technological developments and other causes, and changes in the demand for linseed cake and meal. In addition, changes in tariff and other trade regulations affecting flaxseed, linseed oil, and competing oilseeds and oils also should be considered.

In general, tariff increases result in changes in the relative price levels of internationally traded commodities by acting as a wedge between prices in the importing country affected and other countries. Prices are increased in the importing country by the tariff, other things remaining equal, and decreased in other countries. The relative incidence of the tariff depends largely on the importance of the country directly affected as a producer and consumer of the commodity in question. In 1929 and 1930, the tariffs on flaxseed and linseed oil were increased sharply by the United States, causing a

relative increase in the price of flaxseed in this country compared with prices in Argentina and India, and in the flaxseed importing countries of Europe.

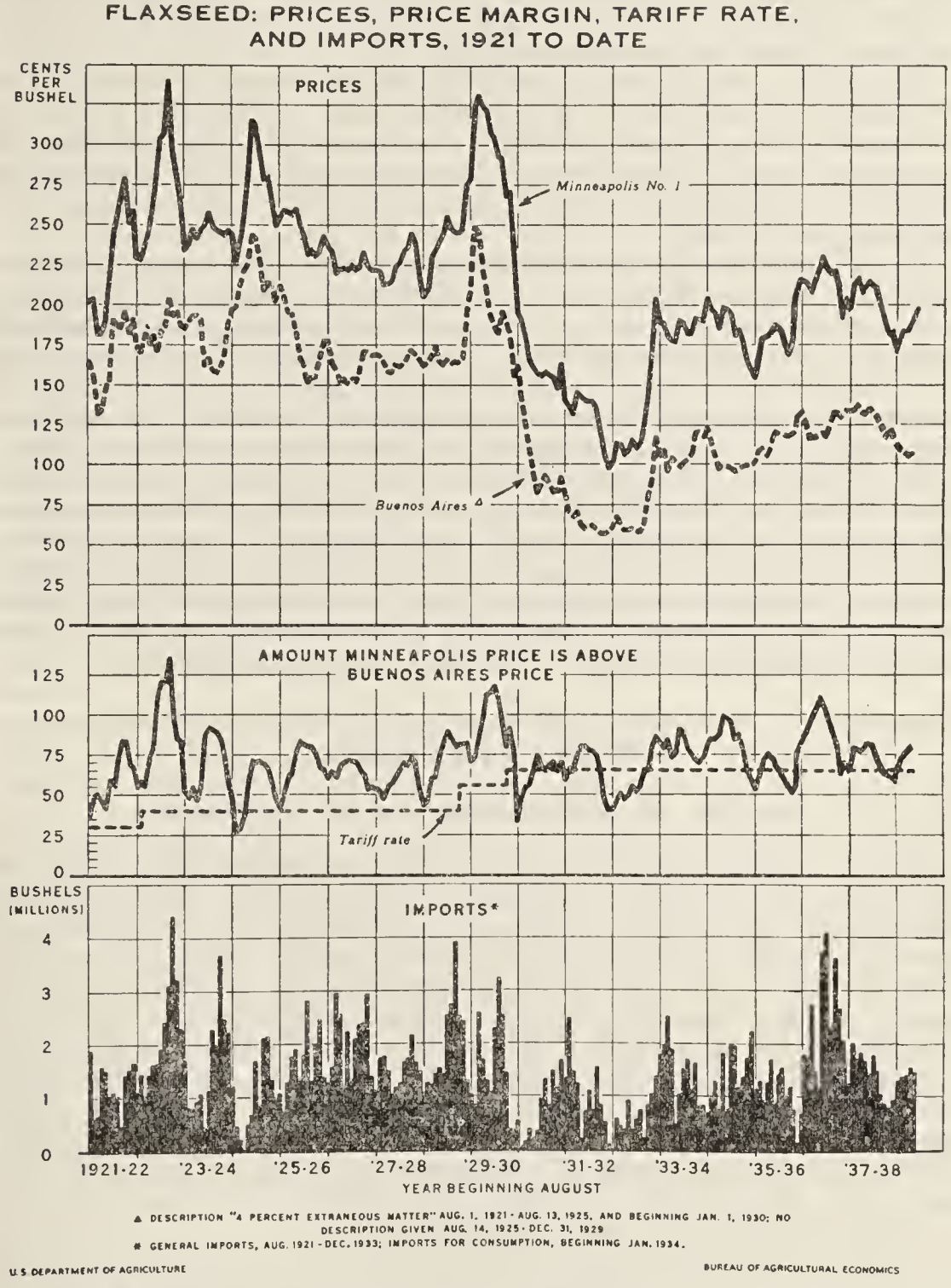

FIGURE 11.—Flaxseed prices in the United States tend to change in the same way as prices in Argentina and other important world markets. But domestic prices are higher than those in Argentina because the United States is on an import basis. Variations in the price margin are due largely to changes in shipping costs and tariff rates, to seasonal differences in supply, and differences in domestic and foreign demand. In general, imports of flaxseed tend to be large when the price margin exceeds the shipping cost and tariff differential.

Over a period of years, prices of flaxseed in the United States and foreign countries follow similar trends. This is illustrated in the top section of figure 11 in which prices of No. 1 flaxseed at Minneapolis are shown in comparison with prices of a nearly comparable grade of

flaxseed at Buenos Aires. On a month-to-month basis, however, considerable diversity of price movement occurs. In the lower two sections of figure 11, fluctuations in the margin between prices of flaxseed at Minneapolis and Buenos Aires, and in imports of flaxseed, are shown. Usually, imports are large when the price margin is wide, and small when the margin is narrow.

During the period 1921–22 to 1937–38, the margin between prices of flaxseed at Minneapolis and Buenos Aires varied from a high of 137 cents per bushel in April 1923 to a low of 27 cents per bushel in September 1924. But this was an extreme variation. For the period as a whole, the monthly average price margin varied from about 55 to 85 cents per bushel.

The fluctuations in the margin between prices of flaxseed at Minneapolis and Buenos Aires were due partly to seasonal supply factors, and partly to other causes. In most years, the margin was relatively narrow in August and September, when supplies of flaxseed from the domestic crop were first available, while supplies in Argentina were seasonally small; and the margin was relatively wide in January and February, when new-crop supplies in Argentina were first available, while supplies of domestic flaxseed were seasonally small. Other factors affecting the price margin included comparative changes in the demand for flaxseed in the United States and foreign countries, determined largely by the relative levels of building activity; depreciation of Argentine currency after 1929, which tended to bring about lower prices of flaxseed in Argentina in terms of United States currency; and changes in ocean and inland transportation costs.

Appendix C. Method of Determining Effectiveness of the Tariff on Flaxseed

METHOD OF DETERMINING TARIFF INCIDENCE

When a tariff is imposed on a commodity previously free of duty or when an existing duty is increased, the increase in the differential between prices in the importing and exporting markets does not measure the effect of the duty on prices in the importing market, since part of the duty usually is reflected in lower prices for the commodity in the exporting market. Economic theory and statistical analysis provide a method of determining the effectiveness of a tariff in raising prices in the importing market, provided the required data can be obtained. This method is based on what usually is called "equilibrium" price analysis, and involves a consideration of the conditions which must obtain if equilibrium is to be restored after the imposition of the duty. Assuming that imports continue after the imposition of the duty, these conditions are—

1. *The new domestic price must exceed the new foreign price by the full amount of the duty plus the cost of transportation.*—Before a duty is imposed, prices of the commodity in the domestic market presumably will equal prices in the foreign market, allowing for transportation costs. Under the duty, imports will tend to be reduced and domestic prices increased. But the reduction of imports will tend to lower foreign prices, since the exporter will lose part of his market. Hence, the duty acts as a wedge driven between domestic and foreign prices and serves to increase the spread between the two. Obviously, the spread will not widen on the average by more than the duty, since an

increase in the spread greater than the duty would cause importers to buy in the relatively cheaper foreign market until domestic prices were reduced or foreign prices increased. On the other hand, the spread must widen by an amount at least equal to the duty, since an increase in the spread of less than that amount would cause importers to refrain from buying in the foreign market until domestic prices were increased or foreign prices reduced.

2. *The quantity of imports demanded must equal the quantity of exports supplied.*—If at any new domestic price after the imposition of a duty, our willingness to take imports exceeds the willingness of foreigners to supply us with imports at the corresponding new foreign price, the new prices will not be in equilibrium, but will tend to rise in both countries until equilibrium of both demand and supply has been obtained. Similarly, if our willingness to take imports is less than that of the foreigner to supply us with imports, prices in both countries will tend to fall until the demand for and supply of imports are in balance.

If these conditions are fulfilled, a set of four curves representing the average responses of domestic and foreign producers and consumers to changes in price may be constructed, assuming that the necessary data are available. These curves are called the domestic and foreign curves of supply and demand. From these four curves, two net curves of supply and demand, a "supply of imports curve" and a "demand for imports curve" may be derived by subtracting geometrically first the foreign-demand curve from the foreign-supply curve, and second the domestic-supply curve from the domestic-demand curve.[32]

Assuming no duty or freight and no change in exchange rates, a demand for imports curve, DI, and a supply of imports curve, SI, may be constructed, as shown in figure 12, which will indicate at the point of intersection the equilibrium price, P, and the equilibrium quantity of imports, Q. If a duty, T, is imposed, the effect is to raise the entire curve SI by the full amount of the duty, because at any given quantity of imports the supply-price in the United States would have to be higher than the former supply-price for that quantity by the full amount of the duty if equilibrium were to be restored. The new equilibrium price in the domestic market, P′ would then be at the intersection of the new supply of imports curve, SI′, and the original demand for imports curve, DI, since it is only these two curves which are in terms of the United States market price after the duty is in effect.

It is clear that P′ exceeds P by less than the full amount of the duty in the illustration given; also that the amount by which P′ exceeds P is determined by the relative slopes of the two curves, DI and SI′. The more inelastic is the demand for imports curve compared with the supply of imports curve at any given quantity (i. e., the steeper DI is compared with SI′), the greater will be the increase in P′ compared with P. With the domestic price exceeding the foreign price by the full amount of the duty, it follows that the new equilibrium foreign price, P″, will equal P′ minus the duty.

The precise calculation of the demand for imports curve and the supply of imports curve requires a correspondingly precise knowledge

[32] For a discussion of the method of constructing these curves, see Henry Schultz, Correct and Incorrect Methods of Determining the Effectiveness of the Tariff, Journal of Farm Economics, November 1935.

of the domestic and foreign supply and demand curves. If these "curves" are straight lines on arithmetic scales, it is important to know the relative slopes of the lines, since the relative slopes will determine the incidence of the tariff.

The slope of a supply or demand curve at any given point is a function of the elasticity at that point and the associated quantity produced or consumed. Thus, two factors are involved, one of which, average quantity, is known with reasonable certainty.

SUPPLY OF AND DEMAND FOR IMPORTS WITH AND WITHOUT A TARIFF

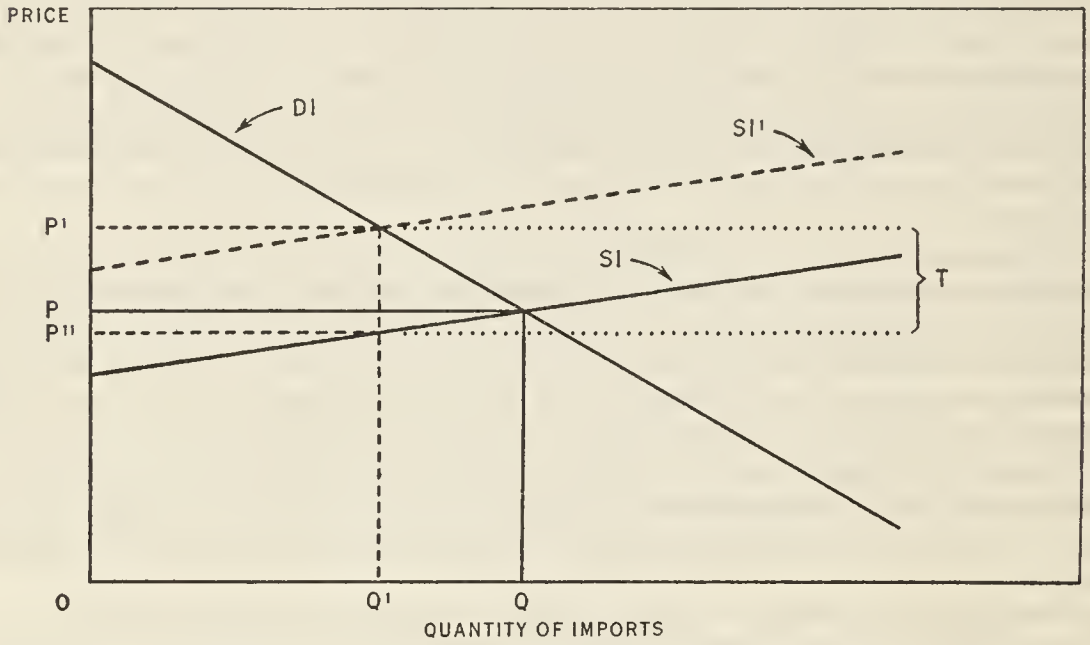

FIG. 12.—When a tariff is imposed on an imported commodity, the margin between the domestic and foreign prices is widened by the full amount of the duty, T. To determine the relative effect on domestic and foreign prices, the supply of imports "curve", SI, may be raised vertically by an amount equal to T to put the curve on a domestic-price basis after the imposition of the duty. The point at which the raised curve, SI', intersects the demand for imports curve, DI, indicates the new "equilibrium" price in the domestic market. The amount by which the domestic price will be raised, and the foreign price lowered, depends on the relative slopes of the intersecting curves. P represents the original domestic and foreign prices, which are assumed to be equal, P' the new domestic price, P'' the new foreign price, Q the original quantity of imports, and Q' the new quantity of imports.

EFFECTIVENESS OF THE TARIFF ON FLAXSEED

An attempt was made by Professor Renne of the University of Montana to measure the effectiveness of the tariff on flaxseed, using the equilibrium method.[33] This study covered the period from September 21, 1922, to May 14, 1929, during which the duty was 40 cents per bushel. Renne computed the elasticities of supply and demand for flaxseed in the United States and in foreign countries. Using the following formula developed by the late Professor Schultz,[34] Renne found that the duty was about 77 percent effective in raising prices of flaxseed in the United States:

$$\Delta y = \frac{n_f X_{df} - e_f X_{sf}}{n_d X_{dd} + n_f X_{df} - e_d X_{sd} - e_f X_{sf}} T \qquad (1)$$

[33] Roland R. Renne, The Flaxseed Market and the Tariff, Montana Agricultural Experiment Station Bull. 272, 1933; and, Verification of Tariff Effectiveness by Different Statistical Methods, Journal of Farm Economics, October 1934.

[34] Op. cit.

In this formula, Δy represents the increase in the domestic price resulting from the duty, X_{df} and X_{sf} the quantities of flaxseed demanded and supplied in foreign markets, X_{dd} and X_{sd} the corresponding quantities in the domestic market, n_d and e_d the domestic elasticities of demand and supply derived from domestic prices, n_f and e_f the foreign elasticities of demand and supply derived from foreign prices after adjustment to the domestic price level, and T the rate of the duty.

Applying the figure of 77 percent ($\Delta_y = 0.772T$) to the tariff of 40 cents, Renne stated that flaxseed prices in the United States were about 30 cents per bushel higher than they would have been without the tariff. Subsequently, he modified this finding to allow for the effect of the tariff drawback for exports of linseed oil, linseed cake and meal, and other products made from imported flaxseed, and for the effect of the difference in the quality of imported and domestic seed, deducting 10 cents for these factors.[35] The net tariff on flaxseed paid by importers thus amounted to about 30 cents. Of this, 23 cents, or 77 percent, represented the amount by which the domestic price was raised, and 7 cents the amount by which foreign prices were lowered, according to Professor Renne's corrected findings.

If it is assumed that the elasticities of both domestic and foreign demand are equal to -1 (the demand curves have negative slopes), and that the elasticities of supply are equal to $+1$ (positive slopes) equation (1) may be expressed in the following terms:

$$\Delta y = \frac{\text{Average foreign production} + \text{foreign consumption}}{\text{Average world production} + \text{world consumption}} T \quad (1a)$$

For the period 1923–28, average production and consumption figures, as determined by Renne, were as follows:

TABLE 20.—*Average production and consumption of flaxseed, United States, foreign, and world, 1923–28*

[In millions of bushels]

Item	United States	Foreign	World
Production	22.7	123.2	145.9
Consumption	[1] 42.3	[2] 103.6	145.9
Total	65.0	226.8	291.8

[1] Production plus net imports.
[2] World production minus United States consumption.

Foreign production plus consumption of flaxseed during the 6-year period was equivalent to about 77.6 percent of the world total. Renne, using his estimated elasticities of supply and demand, and the above production and consumption figures, found that the tariff on flaxseed was about 77.2 percent effective. It is apparent from the closeness of these results that the introduction of measures of elasticity different from unity did not alter the results materially. In general, it will be found that unless the domestic elasticities of supply and demand are greatly different from the foreign elasticities, the quantities produced

[35] Schultz, op. cit.: and Renne, A Reply to Professor Schultz, ibid., p. 645.

and consumed at home relative to those produced and consumed abroad are the dominating factors in determining the effectiveness of a tariff on an imported product, and that equation (1a) may be used to determine the approximate incidence of a tariff on domestic prices.

During the period 1930–31 to 1937–38, both production and consumption of flaxseed in the United States were smaller than in the 1920's. On the consumption side, this reduction was due largely to the marked decrease in building activity and in utilization of drying oils in this country. Variations in total foreign building since the early 1920's have been much less pronounced than in the United States, but both production and consumption of flaxseed have increased in foreign countries in recent years.

TABLE 21.—*Average production and consumption of flaxseed, United States, foreign and world, 1930–31 to 1937–38*

[In millions of bushels]

Item	United States	Foreign	World
Production	8.0	136.5	144.5
Consumption	[1] 23.1	[2] 121.4	144.5
Total	31.1	257.9	289.0

[1] Production plus net imports.
[2] World production minus United States consumption.

Foreign production and consumption of flaxseed during the period 1930–31 to 1937–38 amounted to about 89.2 percent of the world total. Hence, if it is assumed that the elasticities of supply and demand are equal, disregarding signs, it would appear that the tariff on flaxseed was somewhere near 89.2 percent effective in raising prices in the United States. Renne found that the elasticities of demand for flaxseed were approximately as follows: Foreign, −1.06, domestic, −0.503. For the elasticities of supply, Renne's estimates were: Foreign 0.455, and domestic, 1.22. Rounding to the nearest tenth; i. e. to −1.1 and −0.5, and to 0.5 and 1.2, respectively, and substituting these values and the average production and consumption figures for the period 1930–31 to 1937–38 in equation (1), it would appear that the tariff during the past 8 years was about 90.4 percent, effective in raising prices of flaxseed in the United States.

It is statistically impossible to make accurate estimates of the elasticities of supply and demand at the equilibrium point on the basis of historical data covering a period of only 6 or 8 years. The equilibrium method requires a correlation analysis to determine each measure of elasticity, in which price and all other important factors affecting production or consumption must be considered. In the case of elasticities of demand for flaxseed, some of the factors affecting consumption, in addition to price, are changes in building activity and in supplies of feed other than linseed meal. And in the case of elasticities of supply, factors affecting production, in addition to flaxseed prices, are prices of closely competing crops, such as wheat in the United States, and other factors such as deficiency of soil moisture at time of seeding. Thus at least four series of data are involved in each analysis. It cannot be assumed that the data for each year are wholly independent of those for other years, or are

randomly distributed, two basic requirements in correlation analysis, or that the "independent" variables are wholly independent of each other. And with four variables and only 6 or 8 years of observation, the calculated slopes of the demand and supply curves would not be significantly different from the slopes of similar curves computed from any four series of data chosen at random.

The elasticities of supply and demand estimated by Renne on the basis of only 6 years of observation, therefore, probably are not highly accurate. Nevertheless, on the basis of reasonableness, there is considerable justification in the belief that if the elasticities were accurately known they would not differ enough from Renne's elasticities to alter the end results materially.

An elasticity of domestic demand of -0.503, as estimated by Renne, would indicate that flaxseed consumers in the United States respond to a 1-percent increase in price by reducing their takings of flaxseed by about 0.5 of 1 percent, other things remaining equal. In other words, this figure would indicate that the demand for flaxseed in the United States is relatively inelastic, and that consumers are not greatly influenced by changes in price in their takings of flaxseed. A foreign elasticity of -1.06 on the other hand, would indicate that foreign consumers tend to vary their takings of flaxseed in about the same proportion as variations in price; or to seek substitute commodities when the price of flaxseed goes up and to return to the use of flaxseed when flaxseed prices go down. Judging from the fact that the use of alternative oilseeds and oils is greater abroad than it is in this country, there is considerable justification for assuming that the foreign demand for flaxseed may be somewhat more elastic than the domestic demand.

Similarly, it may be assumed that the foreign supply of flaxseed is somewhat less elastic than the domestic. In the United States, flaxseed production is a relatively minor enterprise, even in the areas of most intense production. Hence, producers are influenced to a considerable extent by price changes in their plantings. In Argentina, the Union of Soviet Socialist Republics, and British India, where most of the foreign flaxseed is produced, flaxseed production is of greater importance in the agricultural economy and probably tends to vary less with price changes than in the United States. Hence, Renne's estimated elasticity of supply of 1.22 for the United States as compared with 0.455 for other countries is not unreasonable.

The substitution of arbitrary estimates of elasticity in equation (1), with differences of as much as 900 percent between the domestic and foreign elasticities, gives results similar to those already obtained. Three sets of arbitrary estimates were made under the following conditions: (1) With domestic demand less elastic than the foreign, and with the elasticities of supply the same; (2) with domestic supply more elastic than the foreign, and with the elasticities of demand the same; and (3) with domestic demand less elastic and domestic supply more elastic than the foreign.

The above conditions represent three possible phases of the general situation believed to obtain with regard to the relative domestic and foreign elasticities of supply and demand for flaxseed, although differences between the domestic and foreign elasticities probably are not nearly so extreme as 900 percent. It will be noted that the assumed elasticities tend to be compensating; that is, the domestic elasticity of demand is assumed in two out of the three cases to be less than the

foreign, while the domestic elasticity of supply is assumed in two out of the three cases to be greater than the foreign. If noncompensating elasticities are assumed, the results obtained would be considerably different from those secured under the above conditions. For example, the incidence of the tariff would be approximately 45 percent on the domestic price if the domestic elasticities of both supply and demand were 10 times as great as the foreign elasticities, with the average domestic and world production and consumption of flaxseed of the period 1930–31 to 1937–38. On the other hand, if the foreign elasticities of both supply and demand were 10 times as great as the domestic elasticities, the tariff would be about 99 percent effective in raising domestic prices. However, for reasons already stated, neither of these extreme situations appears to have any basis in fact.

TABLE 22.—*Estimated effectiveness of the tariff on flaxseed in raising domestic prices of flaxseed, under specified conditions, 1930–31 to 1937–38*

Condition	Assumed elasticities				Production and consumption				Effectiveness of the tariff
	Foreign		Domestic		Foreign		Domestic		
	Demand	Supply	Demand	Supply	Production	Consumption	Production	Consumption	
					Mil. bu.	*Mil. bu.*	*Mil. bu.*	*Mil. bu.*	*Percent*
1	−1.0	1.0	−0.1	1.0	136.5	121.4	8.0	23.1	93.8
2	−1.0	0.1	−1.0	1.0					86.8
3	−1.0	.1	−.1	1.0					92.8

Using Renne's elasticities of demand and supply, it was found that the present tariff on flaxseed, after allowance for the effect of the tariff drawback, was about 90 percent effective in raising flaxseed prices in the United States. Assumed elasticities of plus-or-minus 1 gave nearly the same result; and the assumed elasticities shown above also yield about the same result. It may be concluded, therefore, that the present tariff on flaxseed during the years in which it has been in effect has brought about an increase in domestic prices equal to about 90 percent of the net tariff rate.

Appendix D. Supplementary Data

Acreage, Production, Yield

Table 23.—*Flax: Acreage, and seed and fiber production, by countries, average, 1925–34*

Country	Acreage	Seed production		Fiber production
		Quantity	Percentage of world total	
North America:	*Acres*	*Bushels*	*Percent*	*Pounds*
United States	2,472,000	15,858,000	10.62	
Canada	498,000	3,392,000	2.27	
Mexico	7,000	60,000	.04	
Europe:				
Union of Soviet Socialist Republics	5,466,000	26,156,000	17.51	895,553,000
Poland	264,000	2,297,000	1.54	97,769,000
Lithuania [1]	178,000	1,227,000	.82	62,938,000
Latvia	134,000	671,000	.45	39,844,000
Estonia	70,000	342,000	.23	18,458,000
Finland [1]	12,000			3,372,000
Germany	34,000	[2] 148,000	.10	[3] 46,772,000
France	60,000	528,000	.35	41,450,000
Belgium	46,000	399,000	.27	30,428,000
Netherlands	27,000	309,000	.21	17,014,000
Italy	32,000	254,000	.17	5,166,000
Czechoslovakia	37,000	237,000	.16	16,931,000
Austria	6,000	46,000	.03	8,670,000
Rumania	53,000	341,000	.23	9,213,000
Hungary	19,000	148,000	.10	7,064,000
Yugoslavia	31,000	38,000	.03	22,047,000
Bulgaria	1,000	7,000	.00	241,000
Cyprus	2,000	17,000	.01	
Northern Ireland	23,000			9,398,000
Ireland (Irish Free State)	5,000	30,000	.02	1,692,000
Asia:				
India	3,272,000	17,016,000	11.39	
Turkey [4]	21,000	162,000	.11	
Japan	29,000	148,000	.10	44,792,000
China		[5] 2,106,000	1.41	
Africa:				
Morocco	49,000	410,000	.27	
Egypt	3,000	38,000	.03	1,965,000
Tunisia	5,000	35,000	.02	
Eritrea		26,000	.02	
South America:				
Argentina	6,506,000	73,868,000	49.46	
Uruguay	298,000	2,885,000	1.93	
Oceania:				
New Zealand	5,000	69,000	.05	
Australia	1,000	10,000	.01	
Other countries [6]	11,000	62,000	.04	1,177,000
Estimated world total, including China	19,677,000	149,340,000	100.00	1,381,954,000

[1] Flax and hemp.
[2] 4-year average.
[3] 2-year average.
[4] 7-year average.
[5] Average 1929–31.
[6] Other countries include: Spain, Sweden, Chile, Chosen, Algeria, and Kenya.

Bureau of Agricultural Economics. Compiled from official sources and the International Institute of Agriculture.

TABLE 24.—*Flaxseed: Production, world and selected countries, average, 1909–13, annual 1919–38*

[In thousands of bushels]

Year	Estimated world, excluding China [1]	Argentina	Union of Soviet Socialist Republics	United States	India [2]	Canada	Poland	Lithuania [3]	Uruguay
Average, 1909–13	110,802	31,117	[4] 18,983	18,534	19,870	12,041	1,703	([5])	[6] 951
1919	86,000	49,890	[7] 8,000	6,770	9,560	5,473	556	827	932
1920	113,000	60,006	9,204	10,900	16,920	7,998	637	1,011	966
1921	76,000	36,046	9,752	8,107	10,920	4,112	856	909	519
1922	99,000	47,577	11,043	10,520	17,560	5,008	1,816	1,108	719
1923	125,000	58,005	13,379	16,563	21,480	7,140	2,129	1,056	1,178
1924	130,000	45,084	15,747	31,220	18,640	9,695	1,872	1,332	1,542
1925	158,000	75,113	21,259	22,334	21,160	6,237	2,250	1,571	2,030
1926	153,000	80,783	19,684	18,531	17,080	5,995	2,472	1,574	1,970
1927	160,000	82,672	19,684	25,174	17,440	4,885	2,790	1,405	1,954
1928	150,000	78,377	23,690	19,118	15,080	3,614	2,413	1,000	2,030
1929	124,000	50,004	28,060	15,924	14,080	2,060	3,173	1,718	3,216
1930	164,000	78,342	28,242	21,673	16,840	4,399	2,335	1,532	5,056
1931	165,000	89,067	33,217	11,755	16,640	2,465	1,941	1,003	4,841
1932	132,000	62,006	31,395	11,511	18,160	2,719	1,640	626	1,475
1933	126,000	62,595	29,307	6,904	17,600	632	1,774	823	2,876
1934	140,000	79,720	27,019	5,661	16,080	910	2,179	1,014	3,402
1935	135,000	59,445	29,133	14,520	17,920	1,667	2,793	1,487	3,007
1936	144,000	76,200	29,526	5,273	16,640	1,795	2,820	1,444	3,011
1937	130,000	60,604	---	7,089	17,800	698	2,964	1,401	3,728
1938 [8]	---	63,776	---	8,171	---	1,389	---	1,182	5,039

[1] The estimated totals include arbitrary estimates for a few minor producing countries, and for some years for which data are unavailable.

[2] In addition to reported production of flaxseed in India, the Indian Government, in "Area and yield," estimates production in some small areas of some of the British Provinces, and beginning with the crop harvested in 1926 of certain Indian states. In this table these estimates of additional production, averaging about 140,000 bushels annually prior to 1926 and about 1,250,000 bushels annually since that date, have been added to the reported production.

[3] Flax and hemp.

[4] Production within the present boundaries.

[5] Not available.

[6] Average 1910–13.

[7] Estimate of the Bureau of Agricultural Economics.

[8] Preliminary.

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere, which immediately follow; thus, for 1937, the crop harvested in the Northern Hemisphere countries in 1937 is combined with the Southern Hemisphere harvest which begins late in 1937 and ends early in 1938.

TABLE 25.—*Flaxseed: Acreage, yield, and production in the United States and Argentina, 1919–38*

Year	United States				Argentine			
	Area		Yield per harvested acre	Production	Area		Yield per harvested acre	Production
	Sown	Harvested			Sown	Harvested		
	1,000 acres	*1,000 acres*	*Bushels*	*1,000 bushels*	*1,000 acres*	*1,000 acres*	*Bushels*	*1,000 bushels*
1919	1,600	1,293	5.2	6,770	4,364	4,281	11.7	49,890
1920	1,745	1,647	6.6	10,900	4,769	4,676	12.8	60,006
1921	1,180	1,143	7.1	8,107	3,892	3,603	10.0	36,046
1922	1,125	1,113	9.5	10,520	4,317	4,275	11.1	47,577
1923	2,045	2,015	8.2	16,563	5,391	5,361	10.8	58,005
1924	3,570	3,535	8.8	31,220	6,322	5,379	8.4	45,084
1925	3,100	3,022	7.4	22,334	6,201	6,062	12.4	75,113
1926	2,923	2,736	6.8	18,531	7,288	7,127	11.3	80,783
1927	2,819	2,763	9.1	25,174	7,055	6,891	12.0	82,672
1928	2,702	2,611	7.3	19,118	6,943	6,568	11.9	78,377
1929	3,363	3,049	5.2	15,924	7,092	5,231	9.6	50,004
1930	4,466	3,780	5.7	21,673	7,511	6,628	11.8	78,342
1931	3,724	2,431	4.8	11,755	8,640	8,178	10.9	89,067
1932	2,691	1,988	5.8	11,511	7,401	6,394	9.7	62,006
1933	1,812	1,341	5.1	6,904	6,855	4,877	12.8	62,595
1934	1,588	995	5.7	5,661	8,102	7,104	11.2	79,720
1935	2,392	2,096	6.9	14,520	6,573	5,607	10.6	59,445
1936	2,548	1,126	4.7	5,273	7,438	6,622	11.5	76,200
1937	1,346	934	7.6	7,089	7,023	5,666	10.7	60,604
1938	1,096	954	8.6	8,171	6,608	----------	----------	63,766

Bureau of Agricultural Economics. Argentine data compiled from official sources.

TABLE 26.—*Flaxseed: Acreage sown, by States, United States, 1920–38*

[In thousands of acres]

Year	Wisconsin	Minnesota	North Dakota	South Dakota	Montana	Total, 5 States	Michigan	Iowa	Missouri	Nebraska	Kansas	Wyoming	California	Total, United States
1920	9	358	818	220	301	1,706	------	11	------	4	23	1	------	1,745
1921	6	350	443	231	119	1,149	------	8	------	2	20	1	------	1,180
1922	4	310	525	166	88	1,093	------	8	------	3	20	1	------	1,125
1923	8	527	1,072	290	112	2,009	------	7	------	4	24	1	------	2,045
1924	8	712	1,972	555	250	3,497	------	8	2	5	57	1	------	3,570
1925	11	740	1,503	570	212	3,036	------	10	2	6	45	1	------	3,100
1926	11	814	1,320	536	179	2,860	------	15	2	7	38	1	------	2,923
1927	10	757	1,294	527	165	2,753	------	19	5	7	30	5	------	2,819
1928	9	726	1,085	627	191	2,638	------	19	3	9	23	10	------	2,702
1929	7	512	1,580	760	426	3,285	2	13	2	20	23	18	------	3,363
1930	7	742	2,150	830	606	4,335	3	20	2	28	42	36	------	4,466
1931	7	861	1,860	530	356	3,614	4	23	2	6	65	10	------	3,724
1932	6	689	1,320	256	336	2,607	6	19	2	3	49	5	------	2,691
1933	4	735	715	123	151	1,728	8	28	3	2	40	3	------	1,812
1934	5	725	613	68	67	1,478	9	26	4	1	57	2	11	1,588
1935	6	705	1,187	260	93	2,251	10	21	5	4	61	2	38	2,392
1936	4	856	1,324	177	49	2,410	11	15	5	4	58	1	44	2,548
1937	4	473	622	90	23	1,212	8	8	5	------	65	1	47	1,346
1938 [1]	4	458	404	50	60	976	10	10	4	1	55	------	40	1,096

[1] Preliminary.

Bureau of Agricultural Economics.

TABLE 27.—*Flaxseed: Production, by States, United States, 1920–38*

[In thousands of bushels]

Year	Wisconsin	Minnesota	North Dakota	South Dakota	Montana	Total, 5 States	Michigan	Iowa	Missouri	Nebraska	Kansas	Wyoming	California	Total, United States
1920	86	3,401	4,109	2,090	910	10,596	----	104	----	36	159	5	-----	10,900
1921	48	3,150	2,709	1,404	572	7,883	----	68	----	16	134	6	-----	8,107
1922	52	3,255	4,950	1,458	588	10,303	----	76	----	24	110	7	-----	10,520
1923	100	5,006	7,875	2,414	880	16,275	----	63	----	44	173	8	-----	16,563
1924	88	8,117	15,974	4,713	1,845	30,737	----	79	13	18	370	3	-----	31,220
1925	148	7,400	9,789	3,781	760	21,878	----	105	12	51	284	4	-----	22,334
1926	126	7,652	7,424	2,200	652	18,054	----	165	12	56	239	5	-----	18,531
1927	120	7,343	10,433	5,125	1,650	24,671	----	200	28	60	165	50	-----	25,174
1928	108	5,808	8,029	3,101	1,556	18,602	----	190	18	68	150	90	-----	19,118
1929	77	4,608	6,394	3,144	1,195	15,418	20	117	10	134	126	99	-----	15,924
1930	77	7,420	8,256	3,299	1,780	20,832	28	230	12	154	273	144	-----	21,673
1931	66	6,027	4,051	528	463	11,135	40	184	9	21	346	20	-----	11,755
1932	66	6,339	2,992	776	749	10,922	63	171	10	18	312	15	-----	11,511
1933	40	4,365	1,674	115	192	6,386	72	182	14	12	236	2	-----	6,904
1934	59	3,850	908	35	92	4,944	90	96	9	-----	280	----	242	5,661
1935	66	6,432	5,126	950	319	12,893	99	171	10	28	348	4	570	14,520
1936	40	3,523	608	132	52	4,355	60	80	20	2	168	----	588	5,273
1937	42	4,077	1,548	228	43	5,938	48	92	20	-----	331	----	660	7,089
1938 [1]	44	4,756	1,490	382	210	6,882	90	120	20	8	367	----	684	8,171

[1] Preliminary.

Bureau of Agricultural Economics.

SUPPLY AND DISTRIBUTION

TABLE 28.—*Flaxseed: Supply and distribution in the United States, year beginning July 1, 1921–38*

[In thousands of bushels]

Year beginning July 1	Supply				Distribution			
	Carry-over, July 1	Production	Net imports	Total supply	Seed requirements	Crushings	Other	Total disappearance
1921	5,680	8,107	13,630	27,417	597	23,504	1,929	26,030
1922	1,387	10,520	25,006	36,913	1,079	31,062	1,274	33,415
1923	3,498	16,563	19,577	39,638	1,864	36,202	[1] 284	37,782
1924	1,856	31,220	13,419	46,495	1,633	40,724	165	42,522
1925	3,973	22,334	19,354	45,661	1,551	38,037	1,360	40,948
1926	4,713	18,531	24,224	47,468	1,491	40,582	[1] 255	41,818
1927	5,650	25,174	18,112	48,936	1,430	43,243	93	44,766
1928	4,170	19,118	23,494	46,782	1,738	39,595	430	41,763
1929	5,019	15,924	19,652	40,595	2,317	35,504	[1] 448	37,373
1930	3,222	21,673	7,813	32,708	1,959	27,054	1,212	30,225
1931	2,483	11,755	13,849	28,087	1,422	23,700	65	25,187
1932	2,900	11,511	6,213	20,624	990	17,370	164	18,524
1933	2,100	6,904	17,901	26,905	871	23,006	515	24,392
1934	2,513	5,661	15,332	23,506	1,278	20,720	[1] 673	21,325
1935	2,181	14,520	15,388	32,089	1,369	26,544	845	28,758
1936	3,331	5,273	26,096	34,700	770	30,340	251	31,361
1937	3,339	7,089	17,861	28,289	627	25,870	[1] 407	26,090
1938	2,199	8,171	----------	----------	----------	----------	----------	----------

[1] Deficit not accounted for.

Bureau of Agricultural Economics.

TABLE 29.—*Flaxseed: Supply and distribution in Canada, year beginning Aug. 1, 1925–38*

[In thousands of bushels]

Year beginning Aug. 1	Supply			Distribution			
	Carry-over Aug. 1	Production	Total supply	Net exports or net imports (−)	Seed requirements	Crushing	Other disappearance
1925	1,540	6,237	7,777	2,329	367	2,280	199
1926	2,602	5,995	8,597	2,739	238	2,251	1,410
1927	1,959	4,885	6,844	2,386	189	2,583	390
1928	1,296	3,614	4,910	1,377	191	2,526	255
1929	561	2,060	2,621	−1,210	291	2,590	313
1930	637	4,399	5,036	1,995	314	1,938	789
1931	834	2,465	3,299	−548	227	1,862	437
1932	1,321	2,719	4,040	794	122	1,479	465
1933	1,180	632	1,812	−421	113	1,142	507
1934	471	910	1,381	−899	107	775	1,085
1935	313	1,667	1,980	−865	234	1,874	468
1936	269	1,795	2,064	−813	121	2,246	95
1937	415	698	1,113	−1,100	----------	----------	----------
1938	219	1,389	1,608	----------	----------	----------	----------

Bureau of Agricultural Economics. Compiled from Annual Reports of the Grain Trade of Canada.

TABLE 30.—*Flaxseed: Supply and distribution in Argentina, year beginning Jan. 1, 1921–38*

[In thousands of bushels]

Year	Supply			Distribution			
	Carry-over, Jan. 1	Production	Total supply	Exports	Seed requirements	Crushing	Other
1921	6,079	60,006	66,085	53,436	3,100	850	1,733
1922	6,966	36,046	43,012	36,909	3,186	500	[1] 92
1923	2,510	47,577	50,087	40,777	3,752	829	155
1924	4,574	58,005	62,579	53,453	5,708	799	776
1925	1,843	45,084	46,927	37,821	5,703	484	1,288
1926	1,626	75,113	76,739	65,866	5,905	536	975
1927	3,457	80,783	84,240	74,585	5,511	478	704
1928	2,962	82,672	85,634	76,547	6,299	641	146
1929	2,001	78,377	80,378	63,677	7,086	531	650
1930	8,434	50,004	58,438	46,047	7,086	657	524
1931	4,124	78,342	82,466	74,022	7,139	683	499
1932	123	89,067	89,190	79,823	6,299	638	543
1933	1,887	62,006	63,893	54,812	6,299	574	607
1934	1,601	62,595	64,196	54,109	6,693	596	586
1935	2,212	79,720	81,932	69,982	5,905	637	543
1936	[2] 4,865	59,445	64,310	58,576	6,693	717	[1] 3,523
1937	[2] 847	76,200	77,099	70,493	6,693	725	[1] 1,812
1938	[2] 1,000	60,604	61,604	----------	----------	----------	----------

[1] Deficit not accounted for.
[2] Preliminary.

Bureau of Agricultural Economics. Compiled from official publications or records of the Argentine Government.

International Trade

Table 31.—*Flaxseed: International trade, averages, 1925–29, 1930–34, annual, 1935–37*

[In thousands of bushels]

Country	Average, 1925–29		Average, 1930–34		1935		1936		1937 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES										
Argentina	63,699	0	61,763	0	69,982	0	58,576	0	70,943	2
British India	9,442	763	8,594	597	5,171	551	12,381	553	8,851	436
Canada	2,828	568	686	510	21	633	180	1,293	13	1,211
Uruguay	2,084	0	3,333	0	2,779	0	3,028	0	2,916	0
Lithuania	811	0	405	0	502	0	937	0	814	0
Union of Soviet Socialist Republics [2]	778	0	61	0	0	0	0	0	0	10
Latvia	644	560	197	189	101	149	85	105	146	73
Morocco	363	0	359	0	334	0	377	0	438	0
Eritrea [2]	188	0	80	0	--------	0	--------	0	--------	0
China	117	0	392	0	930	0	1,449	0	479	0
Rumania	56	9	153	0	244	0	69	0	12	1
Total	81,010	1,900	76,023	1,296	80,064	1,333	77,082	1,951	84,607	1,733
PRINCIPAL IMPORTING COUNTRIES										
United States	0	20,540	0	12,611	0	17,560	0	15,365	0	28,032
Netherlands	208	13,639	139	13,715	137	15,842	181	13,012	236	12,622
Germany	80	13,602	33	13,366	0	9,737	1	8,617	0	7,100
United Kingdom	0	13,439	0	10,837	0	10,273	0	10,905	0	11,441
France	20	7,368	19	9,377	7	9,973	6	11,121	4	10,788
Belgium	301	4,052	196	4,856	200	4,862	222	4,320	146	4,113
Italy	1	2,380	0	2,540	0	2,839	0	2,132	0	3,183
Sweden	0	1,477	0	1,583	0	1,637	0	1,442	0	1,885
Australia [2]	0	957	0	774	0	1,564	0	1,277	0	1,406
Czechoslovakia	10	885	11	1,002	1	1,060	1	956	1	1,076
Denmark	0	696	0	749	0	1,005	0	801	0	895
Spain	3	663	0	760	0	996	0	--------	0	--------
Norway	0	602	0	642	0	957	0	845	0	953
Poland	275	522	15	411	46	1	139	1	0	1
Japan	0	464	1	487	4	855	0	506	1	317
Finland	0	222	0	148	0	147	0	242	0	289
Yugoslavia	0	[2 3] 188	1	212	1	330	0	169	1	357
Greece	3	118	1	178	0	212	0	127	0	210
Total	901	81,814	416	74,248	396	79,850	550	71,838	389	84,668

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] Includes cottonseed and hempseed.

Bureau of Agricultural Economics. Compiled from official sources except where otherwise noted.

TABLE 32.—*Linseed oil: International trade, averages 1925–29, 1930–34, annual 1935–37*

[In thousands of pounds]

Country	Average, 1925–29		Average, 1930–34		1935		1936		1937 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES										
Netherlands	158,136	833	147,196	765	190,819	98	159,083	252	197,631	75
United Kingdom	49,400	47,546	3,032	65,180	33,282	99,228	27,859	48,756	26,329	83,899
Belgium	23,503	2,303	23,199	1,377	12,575	6,301	10,315	6,351	14,719	2,058
France	4,378	8,138	10,494	3,310	27,042	753	27,044	·473	24,384	615
Sweden	1,267	668	1,051	433	23	5,071	12	5,292	28	1,796
Japan	445	0	763	0	1,554	0	1,867	0	1,472	0
Total	237,129	59,488	185,735	71,065	265,295	111,451	226,180	61,124	264,563	88,443
PRINCIPAL IMPORTING COUNTRIES										
Germany	8,343	43,213	7,346	27,872	99	24,528	75	41,976	36	51,366
Switzerland	27	13,286	27	17,142	460	18,933	583	14,190	1,034	11,505
Brazil	0	9,558	0	3,488	0	510	0	308	0	[2] 397
Austria	459	8,997	131	9,759	289	10,433	80	10,628	0	10,404
United States	2,351	7,946	1,002	3,285	986	2,232	973	760	987	402
Finland	0	5,380	0	5,684	0	8,735	0	7,084	0	8,835
Netherland India	0	5,161	0	3,622	0	2,765	0	4,291	0	[3] 3,445
Australia [2]	25	4,968	49	2,276	55	--------	79	1,991	110	1,576
Egypt	3	4,935	1	1,142	1	913	2	1,211	0	1,197
Union of South Africa	0	4,770	0	5,165	0	7,593	0	8,371	0	8,081
Hungary	12	4,246	287	547	0	435	0	204	0	424
New Zealand	2	3,789	0	2,871	0	6,547	0	6,365	0	6,164
Italy	403	3,574	206	3,287	222	3,085	564	2,509	524	1,965
Norway	54	3,314	131	3,408	190	1,633	106	1,556	180	1,496
Chile	4	2,712	[4] 6	1,281	1	1,217	1	976	--------	1,434
Ireland	0	2,319	0	3,210	0	2,934	0	201	0	[2] 201
British India	728	2,092	557	1,514	646	1,536	1,057	1,065	2,026	1,124
Denmark	419	2,081	15	1,098	9	95	7	116	15	155
Algeria	71	1,862	64	2,937	28	3,621	12	3,278	--------	4,062
Portugal	[2] 60	[2] 1,750	35	1,824	28	2,709	13	2,049	--------	1,427
British Malaya	126	1,550	71	1,105	75	1,228	153	1,581	124	1,996
Bulgaria	0	1,484	0	1,063	0	668	0	497	0	854
Yugoslvaia	52	1,390	1	990	1	188	1	155	0	116
Czechoslovakia	257	1,369	247	267	1,672	20	1,019	42	331	9
China	0	1,242	[5] 34	1,261	1	1,455	26	992	64	823
Manchuria	([6])	([6])	0	[5] 392	0	156	0	200	0	132
Philippine Islands	0	1,210	0	1,455	0	1,422	0	1,851	0	2,403
Colombia [2]	0	1,058	0	773	0	968	0	1,184	0	1,173
Venezuela	0	911	0	914	0	607	0	--------	0	--------
Peru	0	905	0	551	0	752	0	711	0	941
Canada	49	819	29	2,955	162	1,658	14	2,920	8	4,248
Argentina	265	743	46	397	73	296	79	271	0	298
Morocco	0	723	0	3,993	0	4,440	0	3,895	0	4,325
Tunisia	0	668	0	893	0	840	0	1,293	0	1,606
Indochina	88	525	109	425	15	461	7	397	--------	--------
Greece	[5] 55	419	6	239	[2] 2	32	[2] 4	127	[2] 220	208
Total	13,853	150,969	10,400	119,085	5,015	115,645	4,855	125,245	5,659	134,792

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] Java and Madura only.
[4] 4-year average.
[5] 3-year average.
[6] Not shown prior to 1932; included with data for China.

Bureau of Agricultural Economics. Compiled from official sources except where otherwise noted. Conversions made on the basis of 7.5 pounds to the gallon.

TABLE 33.—*Linseed cake and linseed meal: International trade, averages 1925–29, 1930–34, annual 1935–37*

[In thousands of pounds]

Country	Average, 1925–29		Average, 1930–34		1935		1936		1937 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES										
United States	640,163	42,464	392,309	26,797	464,921	20,980	418,062	37,532	687,091	24,515
British India	119,226	0	105,919	0	146,189	0	131,696	0	106,122	0
Czechoslovakia	16,306	2,350	12,135	3,385	1,569	2,627	3,131	1,164	11,874	31
Sweden	8,102	6,387	21,346	3,178	10,627	8,450	14,140	8,034	5,386	9,931
Poland	19,303	2,114	19,987	2,100	5,331	0	5,755	0	2,218	0
Brazil	3,825	0	12,097	0	23,464	0	25,878	0	-------	0
Uruguay	2,566	0	4,133	0	4,346	0	3,127	0	-------	0
Argentina	-------	0	[2] 20,468	0	17,809	0	31,349	0	26,069	0
Australia [3]	1,530	4	2,864	[4] 3	4,029	0	998	0	-------	0
Spain	[5] 37,174	0	-------	0	-------	0	-------	0	-------	0
Total	848,195	53,319	591,258	35,463	678,285	32,057	634,136	46,730	838,760	34,477
PRINCIPAL IMPORTING COUNTRIES										
Netherlands	32,256	518,159	34,488	270,251	246	113,338	734	105,147	3,827	161,897
United Kingdom	46,093	188,097	30,362	178,987	3,658	274,279	1,705	176,452	4,500	167,756
Belgium	[4] 59,852	[4] 172,286	72,130	231,408	4,160	280,365	50,905	301,116	75,150	369,581
Denmark	309	144,955	8,238	49,751	5,073	40,408	2,339	82,316	877	55,773
Germany	[2] 129,366	[2] 220,528	65,379	186,662	0	87,788	473	17,863	0	20,559
Ireland	0	58,476	0	49,338	0	31,484	0	21,061	0	35,457
Norway	734	10,313	4,976	3,756	0	1,722	5,793	1,536	2,425	9,419
Finland	0	4,190	0	2,023	0	944	0	3,419	0	1,482
Canada	0	1,159	0	240	0	242	0	213	0	163
Ceylon	0	62	0	57	0	183	0	25	0	64
Total	268,610	1,318,225	215,573	972,473	13,137	830,753	61,949	709,148	86,779	822,151

[1] Preliminary. [2] 1934 only. [3] Year ending June 30. [4] 3-year average. [5] 2-year average.

Bureau of Agricultural Economics. Compiled from official sources.

TABLE 34.—*Flaxseed: Imports, by countries of origin, into the United States, 1919–37*

[In thousands of bushels]

Year	Argentina	Canada [1]	British India	China	Other	Total [2]
1919	12,354	1,279	0	7	396	14,036
1920	22,778	1,638	0	63	162	24,641
1921	8,885	3,095	0	134	212	12,326
1922	12,213	2,254	12	214	221	14,913
1923	21,151	3,008	40	68	66	24,332
1924	13,838	2,750	0	1	(3)	16,589
1925	10,537	5,917	0	7	48	16,510
1926	19,443	3,043	(3)	1	62	22,550
1927	19,365	2,411	0	9	35	21,821
1928	14,941	2,599	0	0	39	17,579
1929	23,120	1,063	59	0	(3)	24,243
1930	11,526	915	0	0	222	12,662
1931	13,264	1,214	2	0	(3)	14,480
1932	7,400	519	0	0	(3)	7,919
1933	11,288	383	2,037	10	107	13,825
1934 [4]	8,592	330	4,221	418	609	14,170
1935 [4]	16,151	72	934	300	102	17,560
1936 [4]	13,167	530	1,294	369	4	15,365
1937 [4]	27,385	2	362	163	120	28,032

[1] Includes imports of other foreign flaxseed shipped through Canadian ports.
[2] Total of unrounded figures.
[3] Less than 500 bushels.
[4] Imports for consumption beginning 1934.

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States.

TABLE 35.—*Flaxseed: Exports, by countries of destination, from Argentina, 1927–36*

[In thousands of bushels]

Year	United States	Canada	United Kingdom	Netherlands	Belgium	Germany	France	Sweden	Italy	Other	Total
1927	17,490	186	11,373	18,820	6,815	10,609	4,164	1,398	946	2,784	74,585
1928	14,940	194	11,673	21,335	6,640	10,652	5,346	1,670	1,483	2,614	76,547
1929	21,971	841	6,666	14,455	4,090	6,138	4,232	1,290	1,081	2,913	63,677
1930	11,204	279	6,159	12,133	3,921	4,335	3,786	1,284	639	2,307	46,047
1931	12,927	553	12,606	21,355	8,140	5,685	6,939	1,775	1,775	2,267	74,022
1932	7,149	447	13,291	24,899	9,499	9,303	7,650	1,808	2,331	3,446	79,823
1933	10,029	945	4,070	13,921	6,332	5,016	7,492	1,285	1,899	3,823	54,812
1934	7,584	1,525	2,599	17,238	4,403	5,490	8,094	943	2,244	3,989	54,109
1935	15,363.	1,292	7,244	17,296	5,557	5,729	8,524	1,290	2,223	5,464	69,982
1936	14,383	1,898	2,305	15,526	5,071	3,887	9,133.	837	2,289	3,247	58,576

Bureau of Agricultural Economics. Compiled from Annuario del Commercio Exterior de la Republica Argentina.

TABLE 36.—*Flaxseed: Exports by countries of destination, from British India, 1919–37*

[In thousands of bushels]

Year	United States	United Kingdom	Netherlands	Belgium	France	Italy	Germany	Japan	Australia	Other countries	Total
1919	(1)	9,608	----	981	1,733	419	----	(1)	396	204	13,341
1920	(1)	5.508	8	753	475	379	4	(1)	606	108	7,839
1921	(1)	1,520	254	500	1,049	310	78	(1)	490	64	4,264
1922	(1)	6,595	426	1,230	1,969	1,162	162	(1)	445	415	12,404
1923	(1)	7,996	1,058	1,107	3,065	1,027	273	(1)	514	316	15,357
1924	(1)	4,347	548	1,429	3,418	1,711	282	(1)	607	669	13,010
1925	(1)	5,228	927	1,635	2,565	1,558	536	(1)	831	967	14,246
1926	(1)	1,717	201	676	2,031	1,269	487	(1)	585	491	7,455
1927	(1)	2,437	190	256	2,327	1,521	670	204	785	280	8,670
1928	(1)	924	26	66	2,123	1,212	301	720	842	621	6,835
1929	(1)	3,135	282	510	2,007	1,080	431	536	972	1,052	10,005
1930	(1)	2,354	912	534	1,034	1,409	422	162	531	3,097	10,455
1931	(1)	565	16	30	1,520	606	372	149	363	879	4,500
1932	(1)	434	8	10	1,101	411	351	107	394	272	3,088
1933	2,559	6,029	155	405	1,736	879	426	56	457	1,195	13,897
1934	2,810	5,217	5	40	646	461	268	(1)	849	733	11,028
1935	1,241	2,462	40	94	184	255	154	(1)	439	302	5,171
1936	666	9,199	252	58	394	76	579	(1)	673	484	12,381
1937	290	5,679	20	----	270	53	302	(1)	907	1,330	8,851

[1] Included in other countries.

Bureau of Agricultural Economics. Compiled from Accounts Relating to the Sea-borne Trade and Navigation of British India.

Production, Trade, Stocks, and Disappearance

Table 37.—*Linseed oil: Production, trade, stocks, Dec. 31, and apparent disappearance, United States, 1912–37*

[Net exports are indicated by a minus sign]

Year	Production	Net exports or net imports	Stocks, Dec. 31	Apparent disappearance	Year	Production	Net exports or net imports	Stocks, Dec. 31	Apparent disappearance
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*		*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1912	461,656	−1,017		460,639	1925	763,822	11,120	155,847	726,085
1913	613,977	−10,718		603,259	1926	720,110	12,474	174,243	714,188
1914	507,422	2,355		509,777	1927	776,714	−1,579	193,862	755,516
1915	511,588	−9,382		502,206	1928	751,445	−1,792	158,033	785,482
1916	531,586	−5,469		526,117	1929	763,576	7,753	140,856	788,506
1917	482,199	−10,852		471,347	1930	516,326	533	113,423	544,292
1918	375,452	−5,610		369,842	1931	520,735	−859	154,484	478,815
1919	452,928	4,824	81,406	457,752	1932	326,569	−817	121,770	358,466
1920	485,272	29,833	104,111	492,400	1933	405,948	10,429	157,736	380,411
1921	482,918	56,574	123,728	519,875	1934	370,769	[1] 2,128	113,721	416,912
1922	456,514	141,434	81,564	640,112	1935	502,043	1,246	146,526	470,484
1923	653,564	40,084	97,512	677,700	1936	455,959	−213	117,300	484,972
1924	705,586	10,860	106,990	706,968	1937 [2]	665,099	−585	191,483	590,331

[1] Imports for consumption, beginning January 1934.
[2] Preliminary.

Bureau of Agricultural Economics. Compiled as follows: Production, 1912, 1914, 1916–18, Supplement to U. S. Department of Agriculture Bulletin No. 769; 1913, 1915, oil equivalent of production of flaxseed preceding year minus seed requirements and plus net imports of flaxseed. Production and stocks, 1919–35, Bureau of the Census, Animal and Vegetable Fats and Oils; production is from domestic and imported flaxseed; stocks are mill and warehouse (or crushers) stocks and do not take account of stocks in hands of local dealers, in transit, etc. Trade figures, Foreign Commerce and Navigation of the United States and December issues of the Monthly Summary of Foreign Commerce of the United States. Apparent disappearance computed from table.

Table 38.—*Tung oil: Trade, stocks Dec. 31, and apparent disappearance, United States, 1912–37*

[In thousands of pounds]

Year	Imports	Re-exports	Net imports	Stocks Dec. 31	Apparent disappearance
1912	42,787	80	42,707		42,707
1913	42,587	182	42,405		42,405
1914	30,137	106	30,031		30,031
1915	33,976	109	33,867		33,867
1916	57,649	132	57,517		57,517
1917	41,091	244	40,847		40,847
1918	42,718	1,105	41,613		41,613
1919	53,853	2,493	51,360	14,846	51,360
1920	67,962	2,883	65,079	20,485	59,440
1921	27,249	819	26,430	9,292	37,623
1922	79,089	2,703	76,386	17,984	67,694
1923	87,292	3,463	83,829	19,322	82,491
1924	81,588	2,213	79,375	20,661	78,036
1925	101,554	2,567	98,987	32,943	86,705
1926	83,004	5,579	77,425	18,090	92,278
1927	89,650	5,287	84,363	17,785	84,668
1928	109,222	6,186	103,036	25,454	95,367
1929	119,678	6,191	113,487	29,411	109,530
1930	126,323	6,259	120,064	49,894	99,581
1931	79,311	4,643	74,668	33,402	91,160
1932	75,922	3,328	72,594	30,915	75,081
1933	118,760	4,216	114,544	41,750	103,709
1934	[1] 110,007		110,007	31,495	120,262
1935	120,059		120,059	19,008	132,546
1936	134,830		134,830	28,981	124,857
1937 [2]	174,885		174,885	48,656	155,210

[1] Imports for consumption, beginning January 1934.
[2] Preliminary.

Bureau of Agricultural Economics. Compiled as follows: Trade figures, Foreign Commerce and Navigation of the United States. Stocks, Bureau of the Census, Animal and Vegetable Fats and Oils. Apparent disappearance computed from table. Production from domestically produced nuts is reported with production of other oils.

TABLE 39.—*Perilla seed and oil: Imports, stocks, Dec. 31, and apparent disappearance, United States, 1913–37*

[In thousands of pounds]

Year	Imports for consumption				Stocks, Dec. 31	Apparent disappearance
	Seed [1]	Oil equivalent (37 percent)	Oil	Total		
1913			[2] 76			76
1914			42			42
1915			79			79
1916			168			168
1917			976			976
1918			922			922
1919			4,743			4,743
1920			7,582			7,582
1921			652			652
1922			2,208			2,208
1923			6,441			6,441
1924			3,016			3,016
1925			6,017			6,017
1926			7,401			7,401
1927			5,358			5,358
1928			2,011			2,011
1929			5,574			5,574
1930			8,838		757	8,838
1931			13,286		1,690	12,353
1932			16,525		6,144	12,071
1933	789	292	22,776	23,068	2,690	26,522
1934	2,181	807	25,164	25,971	3,772	24,889
1935	2,783	1,030	72,328	73,358	12,873	64,257
1936	3,743	1,385	117,903	119,288	19,761	112,400
1937 [3]	200	74	43,591	43,665	23,694	39,732

[1] 1922–30, imports of perilla seed are included with sesame seed. 1931–32, no imports of perilla seed reported.
[2] Oct. 1–Dec. 31, not previously reported.
[3] Preliminary.

Bureau of Agricultural Economics. Compiled as follows: Imports, Foreign Commerce and Navigation of the United States. Stocks, Bureau of the Census, Animal and Vegetable Fats and Oils. Apparent disappearance computed from the table.

TABLE 40.—*Hempseed and hempseed oil: Imports, production, stocks, Dec. 31, and apparent disappearance, United States, 1929–37*

[In thousands of pounds]

Year	Hempseed, imports for consumption	Hempseed oil			
		Factory production	Imports for consumption	Stocks, Dec. 31	Apparent disappearance
1929	5,847				[1]
1930	5,394		40		[1]
1931	3,596				[1]
1932	6,375				[1]
1933	4,538		60		[1]
1934	12,981	[2](2,000)	413		[2](2,413)
1935	116,719	17,077	340	[3] 8,000	9,417
1936	63,132	13,720	1	2,013	19,708
1937 [4]	477	[5]		[5]	2,013

[1] Included with other oils prior to 1934.
[2] It is believed that prior to 1934 imported hempseed was used almost entirely for purposes other than crushing, probably chiefly for birdseed. The Oil, Paint, and Drug Reporter quotes prices of domestically crushed hempseed oil beginning January 1933, but there are no reports of factory production in 1933 or in 1934. However, on the basis of the excess of 1934 imports of seed over the average amount of seed imported in the period 1929–33, it seems probable that about 2,000,000 pounds of hempseed oil may have been domestically produced in 1934.
[3] Estimated.
[4] Preliminary.
[5] Not separately reported.

Bureau of Agricultural Economics. Compiled as follows: Imports from Foreign Commerce and Navigation of the United States. Production and stocks, Bureau of the Census, Animal and Vegetable Fats and Oils.

TABLE 41.—*Soybean oil, crude: Production, trade, stocks, Dec. 31, and apparent disappearance, United States, 1910–37*

[In thousands of pounds]

Year	Factory production	Imports	Exports	Re-exports	Net imports	Stocks Dec. 31	Apparent disappearance
1910					[1] 20,152		20,152
1911					[1] 32,242		32,242
1912		24,959		184	24,775		24,775
1913		14,221		36	14,185		14,185
1914		12,555		3	12,552		12,552
1915		21,335		76	21,259		21,259
1916		145,409		2,063	143,346		143,346
1917		264,926		3,977	260,949		260,949
1918		335,984		545	335,439		335,439
1919		195,808	[2] 27,715	17,833	150,260	68,830	150,260
1920		112,214	43,512	3,228	65,474	31,243	103,061
1921		17,283	1,944	511	14,828	11,141	34,930
1922	751	17,294	2,458	419	14,417	5,480	20,829
1923	1,404	41,679	1,356	172	40,151	9,451	37,584
1924	950	9,125	2,264	277	6,584	2,836	14,149
1925	2,520	19,493	520	1,748	17,225	2,458	20,123
1926	2,646	30,712	1,567	545	28,600	7,723	25,981
1927	3,088	14,915	5,444	1,184	8,287	6,291	12,807
1928	4,716	13,116	7,142	852	5,122	6,073	10,056
1929	11,009	19,489	7,967	129	11,393	15,631	12,844
1930	14,387	8,348	4,962	517	2,869	15,178	17,709
1931	39,150	4,916	4,551	898	[3] −533	18,650	35,145
1932	39,445	405	2,647	46	[3] −2,288	16,552	39,255
1933	26,533	3,669	1,569		2,100	13,534	31,651
1934	35,366	[1] 2,829	2,040		789	19,007	30,682
1935	105,056	14,249	4,111		10,138	31,090	103,111
1936	225,297	[4] 4,217	4,029		[4] 188	34,416	222,159
1937 [5]	194,411	[4] 22,259	5,748		[4] 16,511	62,317	183,021

[1] Imports for consumption 1910–11 and beginning January 1934. Not separately reported prior to July 1910.
[2] July–December. Not separately reported prior to July 1919.
[3] Net exports.
[4] Excludes free for export.
[5] Preliminary.

Bureau of Agricultural Economics. Compiled as follows: Production and stocks, Bureau of the Census, Animal and Vegetable Fats and Oils. No domestic production reported prior to 1922. Reports do not state whether from domestic or foreign materials, 1922–35. Stocks are crude plus refined converted to crude basis (using 0.94). Trade figures 1911–17, Monthly Summary of Commerce and Finance of the United States, December issues: 1918–35, Foreign Commerce and Navigation of the United States. Crude and refined not separately reported. Used as crude. Apparent disappearance computed from table.

TABLE 42.—*Fish oils: Production, trade, stocks Dec. 31, and apparent disappearance, United States, 1912–37*

[In thousands of pounds]

[Net exports are indicated by a minus sign]

Year	Production	Imports for consumption	Exports	Net imports or net exports	Stocks Dec. 31	Apparent disappearance
1912	35,898	4,059	9,375	−5,316	----------	30,582
1913	----------	4,256	8,906	−4,650	----------	----------
1914	19,110	2,631	1,164	1,467	----------	20,577
1915	----------	2,697	941	1,756	----------	----------
1916	24,005	14,106	954	13,152	----------	37,157
1917	23,355	12,930	894	12,036	----------	35,391
1918	14,098	13,223	4,251	8,972	----------	23,070
1919	22,591	4,066	8,142	−4,076	30,958	18,515
1920	38,378	4,319	3,212	1,107	37,532	32,911
1921	51,368	1,278	805	473	23,030	66,343
1922	61,626	2,414	4,698	−2,284	29,519	52,853
1923	72,920	5,376	750	4,626	30,842	76,223
1924	58,965	5,633	395	5,238	28,496	66,549
1925	90,931	5,196	614	4,582	31,292	92,717
1926	71,720	15,383	809	14,574	42,135	75,451
1927	68,957	39,913	692	39,221	59,038	91,275
1928	79,006	40,749	882	39,867	42,696	135,215
1929	102,138	38,206	1,120	37,086	73,020	108,900
1930	99,009	31,034	1,079	29,955	125,764	76,220
1931	64,011	32,523	1,598	30,925	101,377	119,323
1932	85,359	16,154	1,477	14,677	109,213	92,200
1933	128,547	5,852	5,849	3	110,437	127,326
1934	215,870	2,220	6,364	−4,144	170,403	151,760
1935	228,641	868	3,276	−2,408	164,215	232,421
1936	266,836	1,287	2,154	−867	160,542	269,642
1937 [1]	196,546	1,252	1,949	−697	106,462	249,929

[1] Preliminary.

Bureau of Agricultural Economics. Compiled as follows: Production, 1912, 1914, 1916–18, Supplement to U. S. Department of Agriculture Bulletin No. 769. Production and stocks, 1919–35, Bureau of the Census, Animal and Vegetable Fats and Oils. Trade figures, imports for consumption: 1912–17. Quarterly Reports of Imported Merchandise Entered for Consumption in the United States and Duties Collected Thereon; 1918–34, Foreign Commerce and Navigation of the United States; 1935, United States Tariff Commission. Exports, 1912–17, December issues of Monthly Summary of Foreign Commerce of the United States; 1918–35, Foreign Commerce and Navigation of the United States. Apparent disappearance computed from table. Fish oils include: Herring, menhaden, sod, eulachon, other fish, and other fish and animal oils. Various combinations represented in different years. Do not include fish-liver oils, other than small amounts that may be included with exports.

Consumption of Drying Oils by Industries

Table 43.—*Consumption of linseed, tung, and perilla oils by industries, United States, 1931–37*

LINSEED OIL

[In millions of pounds]

Year	Factory consumption [1]								Estimated consumption other than factory, mostly in paints [3]	Total apparent disappearance [4]
	Paint and varnish	Linoleum and oilcloth	Printing ink	Edible products	Soap	Miscellaneous	Loss, including foots	Total [2]		
1931	231.6	47.9	11.8	----------	1.5	6.0	----------	298.8	180.0	478.8
1932	173.8	32.4	9.1	----------	1.0	3.5	----------	219.7	138.7	358.5
1933	193.0	33.0	10.9	----------	1.0	3.5	----------	241.3	139.1	380.4
1934	205.7	32.1	12.6	----------	1.0	7.0	----------	258.5	158.4	416.9
1935	230.1	41.8	14.3	0.1	1.2	4.2	(5)	291.7	178.8	470.5
1936	233.3	50.1	15.0	----------	1.5	5.5	----------	305.3	179.6	485.0
1937	267.2	68.2	20.3	1.5	1.4	16.5	0.2	375.2	215.1	590.3
TUNG OIL										
1931	72.9	7.3	1.0	----------	----------	1.2	----------	82.3	8.8	91.2
1932	59.2	7.3	.7	----------	----------	.8	----------	67.9	7.1	75.1
1933	76.7	11.7	1.5	----------	(5)	1.6	----------	91.5	12.2	103.7
1934	88.2	12.9	1.7	----------	(5)	3.2	----------	106.0	14.3	120.3
1935	98.4	10.4	2.0	----------	----------	3.4	----------	114.3	18.3	132.5
1936	94.6	7.1	2.3	----------	(6)	3.8	----------	107.9	17.0	124.9
1937	105.7	7.2	2.8	----------	----------	4.7	----------	120.4	34.8	155.2
PERILLA OIL										
1931	2.9	0.7	(5)	----------	----------	1.1	----------	4.7	7.6	12.4
1932	3.2	1.7	0.1	----------	----------	.8	----------	5.8	6.3	12.1
1933	6.5	5.8	.4	----------	----------	1.4	----------	14.2	12.3	26.5
1934	9.9	4.5	.6	----------	----------	1.1	----------	16.1	8.8	24.9
1935	27.2	9.6	.8	0.1	(5)	3.9	(5)	41.6	22.6	64.3
1936	53.2	17.7	1.9	----------	(5)	7.0	----------	80.0	32.4	112.4
1937	31.8	8.1	1.8	----------	(5)	1.0	----------	42.5	----------	[6] 39.7

[1] Compiled from animal and vegetable fats and oils, Bureau of the Census.
[2] Total of unrounded figures.
[3] Total apparent disappearance less total factory consumption, computed from unrounded figures.
[4] Computed from reported factory production, net imports or net exports, and changes in stocks
[5] Less than 50,000 pounds.
[6] Less than reported factory consumption due to method of estimating.

Bureau of Agricultural Economics.

TABLE 44.—*Consumption of soybean and fish oils by industries, United States, 1931–37*

SOYBEAN OIL

[In millions of pounds]

Year	Factory consumption [1]								Estimated consumption other than factory [3]	Total apparent disappearance [4]
	Paint and varnish	Linoleum and oilcloth	Printing ink	Edible products	Soap	Miscellaneous	Loss, including foots	Total [2]		
1931	6.3	2.6	(5)	11.5	3.8	2.1	1.6	27.9	7.3	35.1
1932	7.5	4.1	(5)	5.1	5.6	1.9	1.2	25.3	14.0	39.3
1933	8.6	5.6	0.1	1.0	4.2	2.6	.9	23.0	8.7	31.7
1934	10.5	2.8	.1	3.3	1.4	2.1	.8	20.9	9.8	30.7
1935	13.0	4.8	.1	63.6	2.5	1.7	5.5	91.2	11.9	103.1
1936	14.5	2.9	.1	149.8	5.0	3.4	9.0	184.6	37.6	222.2
1937	16.1	.9	.1	138.1	10.3	3.0	9.9	178.5	4.5	183.0
FISH OILS										
1931	12.1	14.8	(5)	16.7	58.4	17.1	1.6	120.7	----------	[6] 119.3
1932	7.6	12.0	0.1	11.5	49.1	12.7	.7	93.7	----------	[6] 92.2
1933	8.8	13.2	.1	9.3	52.2	21.9	.8	106.2	21.1	127.3
1934	11.7	13.3	.1	10.8	64.5	25.2	.9	126.5	25.3	151.8
1935	18.3	13.9	.4	27.7	110.0	35.6	3.2	208.9	23.5	232.4
1936	23.2	16.2	.2	40.3	128.0	36.9	3.2	248.0	21.6	269.6
1937	27.3	16.8	.3	21.3	123.9	38.0	1.6	229.1	20.9	249.9

[1] Compiled from animal and vegetable fats and oils, Bureau of the Census.
[2] Total of unrounded figures.
[3] Total apparent disappearance less total factory consumption, computed from unrounded figures.
[4] Computed from reported factory production, net imports or net exports, and changes in stocks.
[5] Less than 50,000 pounds.
[6] Less than reported factory consumption due to method of estimating.

Bureau of Agricultural Economics.

PRICES

TABLE 45.—*Flaxseed: Average price per bushel of 56 pounds, Minneapolis, Winnipeg, Buenos Aires, Hull, and Bombay, by months, 1925–38*

Year beginning August	Minneapolis No. 1	Winnipeg, No. 1, C. W.	Buenos Aires [1]	Hull		Bombay, Bold
				La Plata	Bombay [2]	
1925:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
August	254.0	239.7	212.3	242.5	269.3	242.6
September	259.1	236.8	206.7	234.2	261.2	235.8
October	258.2	233.4	195.4	223.4	251.5	234.5
November	256.5	228.0	194.0	223.1	245.0	220.9
December	260.5	226.1	183.3	220.0	244.1	220.1
January	250.3	213.8	167.0	199.6	220.1	201.2
February	242.7	204.8	161.2	197.7	217.8	201.6
March	231.5	191.6	151.3	177.1	202.8	189.7
April	234.4	196.2	154.7	182.7	207.4	186.8
May	230.4	193.1	155.5	179.6	204.7	187.0
June	233.3	194.6	166.1	189.4	215.7	195.1
July	243.6	207.6	177.9	202.9	227.4	202.7
Average	253.0	213.8	177.1	206.0	230.6	209.8
1926:						
August	237.5	210.8	177.3	200.0	225.9	199.7
September	233.3	205.4	163.5	188.3	211.1	194.7
October	220.5	192.4	159.4	189.2	209.0	188.7
November	222.4	191.0	153.3	197.9	214.7	190.3
December	223.7	187.7	153.3	201.2	213.3	188.3
January	222.6	186.8	150.7	201.4	213.4	191.2

See footnotes at end of table.

TABLE 45.—*Flaxseed: Average price per bushel of 56 pounds, Minneapolis, Winnipeg, Buenos Aires, Hull, and Bombay, by months, 1925–38*—Continued

Year beginning August	Minneapolis No. 1	Winnipeg, No. 1, C. W.	Buenos Aires [1]	Hull		Bombay, Bold
				La Plata	Bombay [2]	
1926:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
February	225.4	190.5	153.8	208.4	224.1	198.5
March	222.2	189.5	152.1	178.9	214.4	192.6
April	223.8	191.5	158.3	183.3	215.0	192.5
May	233.7	200.2	171.1	198.1	224.3	200.7
June	224.7	199.2	171.2	198.4	225.0	201.3
July	222.6	194.9	168.1	192.3	219.1	199.4
Average	225.2	195.0	161.0	194.8	217.4	194.8
1927:						
August	222.2	197.0	168.6	191.6	217.9	191.9
September	221.4	195.3	168.4	191.4	214.0	190.9
October	212.7	187.8	164.8	189.2	210.2	184.7
November	213.0	183.1	158.0	186.3	209.1	185.1
December	214.8	180.2	157.9	189.3	210.9	186.4
January	224.5	183.0	162.4	189.1	213.6	186.5
February	226.8	183.6	161.1	189.0	213.8	182.9
March	233.0	190.3	163.0	191.0	215.3	183.8
April	235.9	193.9	167.1	194.2	208.3	189.0
May	245.6	200.9	172.1	197.7	223.7	194.5
June	238.2	197.0	168.5	192.4	217.1	191.1
July	220.9	186.5	165.9	191.4	216.5	192.2
Average	220.8	189.9	164.8	191.0	214.2	188.2
1928:						
August	205.2	182.0	162.1	185.6	213.8	185.9
September	209.2	186.2	163.4	185.4	215.1	186.9
October	228.4	192.8	168.4	192.3	225.8	193.9
November	234.7	195.9	173.4	203.4	[3]	195.8
December	238.8	190.7	164.8	209.8	[3]	197.0
January	245.1	191.9	162.7	198.0	[3]	197.5
February	255.5	204.7	165.4	194.4	[3]	204.2
March	248.7	207.5	163.9	190.8	[3]	201.8
April	245.4	202.5	165.2	197.3	219.3	196.3
May	245.4	205.6	164.1	196.4	218.3	193.9
June	247.6	212.0	166.0	189.1	[3]	190.7
July	276.1	254.4	193.9	222.3	240.6	207.1
Average	228.8	202.2	167.8	197.1	[4] 222.2	195.9
1929:						
August	279.4	260.8	209.1	239.9	[3]	222.1
September	323.1	283.7	249.5	277.3	286.2	250.7
October	331.5	290.9	245.8	274.0	292.1	250.2
November	324.0	271.9	225.7	260.1	282.4	242.7
December	321.6	264.1	208.8	263.5	280.0	240.1
January	308.0	252.2	193.7	221.6	258.1	229.0
February	304.8	249.9	187.0	211.4	233.8	215.8
March	292.4	243.9	182.2	206.6	220.4	206.8
April	291.8	243.0	195.9	218.9	233.4	217.1
May	268.2	218.9	188.6	212.7	226.9	208.8
June	271.2	211.8	179.3	205.0	219.7	199.4
July	232.1	178.6	156.0	184.0	201.4	182.3
Average	311.3	247.5	201.8	231.2	[4] 248.6	222.1
1930:						
August	195.5	162.4	162.4	191.1	[5]	195.2
September	190.3	143.4	142.8	169.1	[5]	183.6
October	179.7	129.2	125.2	147.9	[5]	159.8
November	165.2	105.3	109.1	125.8	[5]	140.5
December	160.9	97.9	95.6	114.1	[5]	131.9
January	157.4	95.0	82.2	101.7	[5]	120.9
February	155.8	96.9	88.3	108.6	[5]	133.4
March	158.2	103.3	93.8	113.5	[5]	136.7
April	156.8	104.0	88.5	108.9	[5]	131.2
May	154.5	106.1	83.4	103.9	126.3	119.9
June	148.1	107.0	83.9	101.7	122.4	114.7
July	163.7	118.3	92.5	110.1	131.0	120.3
Average	176.3	114.1	104.0	124.7	[4] 126.6	140.7
1931:						
August	140.8	103.9	82.0	100.3	123.7	109.2
September	137.0	93.7	70.6	88.6	111.7	97.0

See footnotes at end of table.

TABLE 45.—*Flaxseed: Average price per bushel of 56 pounds, Minneapolis, Winnipeg, Buenos Aires, Hull, and Bombay, by months, 1925–38*—Continued

Year beginning August	Minneapolis No. 1	Winnipeg, No. 1. C. W.	Buenos Aires [1]	Hull		Bombay, Bold
				La Plata	Bombay [2]	
1931:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
October	131.9	84.1	67.5	86.2	105.4	88.2
November	146.2	94.1	71.3	89.8	104.9	87.0
December	143.2	81.8	62.5	78.3	93.4	79.4
January	140.6	83.9	60.3	75.4	95.5	82.3
February	140.1	88.5	61.8	76.1	100.2	90.3
March	139.9	90.9	62.2	77.8	101.3	89.8
April	134.7	88.4	59.7	74.3	92.2	83.2
May	121.0	74.1	57.2	71.2	86.1	79.4
June	105.4	62.2	56.7	68.9	84.8	73.8
July	97.9	59.5	57.9	69.8	85.5	77.3
Average	136.3	83.8	64.1	79.7	98.7	86.4
1932:						
August	101.4	62.7	60.9	72.8	92.0	78.3
September	113.5	70.9	67.1	80.8	97.9	85.3
October	113.1	64.6	62.2	74.7	92.6	79.6
November	106.3	60.8	58.9	71.6	86.7	76.0
December	108.9	60.7	58.9	72.5	90.5	75.5
January	115.9	67.6	60.1	73.9	93.2	79.5
February	110.2	64.9	58.5	71.5	88.9	75.3
March	113.5	66.2	58.5	70.6	84.5	69.7
April	127.5	71.3	62.1	74.1	85.8	70.4
May	143.4	96.2	78.1	91.9	106.1	86.9
June	171.9	121.3	92.2	106.3	119.2	96.2
July	204.5	151.5	117.4	130.7	143.0	119.8
Average	117.7	79.7	69.6	82.6	98.4	82.7
1933:						
August	188.3	132.9	105.6	124.0	130.0	111.6
September	188.4	141.7	109.8	126.3	133.0	112.8
October	180.5	127.4	95.6	114.0	124.4	101.6
November	177.4	141.0	104.2	124.3	143.8	116.4
December	176.9	142.3	101.1	121.7	141.4	113.6
January	190.3	147.3	98.8	118.2	139.2	112.4
February	188.8	149.3	100.3	118.4	140.8	116.1
March	181.9	149.3	102.7	120.6	141.3	117.6
April	182.1	150.1	107.0	124.0	148.0	123.5
May	191.4	157.4	120.2	137.3	161.5	134.2
June	190.6	162.5	120.8	137.4	161.7	134.0
July	190.2	161.7	117.0	132.6	153.9	128.3
Average	187.2	146.9	106.9	124.9	143.2	118.5
1934:						
August	204.8	166.6	124.0	142.5	162.1	133.9
September	197.8	156.1	112.6	130.9	150.6	121.7
October	190.1	136.4	104.4	123.7	141.2	115.9
November	185.6	137.5	98.0	116.0	139.6	114.5
December	198.6	141.9	99.2	116.3	147.2	120.3
January	197.4	143.9	99.2	117.4	156.8	129.0
February	194.0	142.0	97.9	114.0	148.5	122.2
March	181.1	137.1	95.9	111.0	137.7	113.0
April	184.8	140.2	97.1	114.6	145.2	120.1
May	177.4	133.9	98.4	115.7	149.2	124.1
June	165.3	121.2	99.4	115.5	146.7	120.3
July	159.1	122.4	99.2	115.5	146.9	122.0
Average	190.5	139.9	102.1	119.4	147.6	121.4
1935:						
August	153.3	123.5	101.4	117.0	146.4	122.1
September	167.8	135.3	107.9	119.9	150.6	124.7
October	179.5	139.2	109.9	128.8	160.5	128.1
November	180.2	139.6	105.0	122.8	156.0	126.1
December	183.3	144.4	112.7	129.8	159.2	128.9
January	187.4	159.5	120.4	137.9	167.0	137.0
February	184.2	159.2	119.2	136.6	163.4	133.7
March	175.7	157.1	117.8	135.4	161.7	133.7
April	171.8	149.2	117.2	134.4	161.5	134.8
May	168.7	145.0	117.8	133.0	159.1	133.8
June	177.0	145.8	120.4	137.8	163.7	137.1
July	205.9	165.1	128.5	146.5	176.5	151.4
Average	173.4	146.9	114.8	131.7	160.5	132.6

See footnotes at end of table.

TABLE 45.—*Flaxseed: Average price per bushel of 56 pounds, Minneapolis, Winnipeg, Buenos Aires, Hull, and Bombay, by months, 1925–38*—Continued

Year beginning August	Minneapolis No. 1	Winnipeg, No. 1. C. W.	Buenos Aires [1]	Hull		Bombay, Bold
				La Plata	Bombay [2]	
1936:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
August	215.1	177.3	132.9	155.6	189.9	163.2
September	214.3	167.6	126.1	148.3	175.2	140.6
October	212.9	163.6	116.6	139.5	164.6	130.6
November	216.1	159.4	115.9	136.1	165.8	131.9
December	221.4	167.7	116.9	143.7	180.0	139.5
January	228.6	169.4	118.2	147.2	181.4	138.5
February	222.7	170.0	117.5	143.4	173.5	135.6
March	220.2	179.0	125.0	151.6	181.8	146.4
April	221.0	182.4	132.5	163.8	193.3	149.5
May	210.5	172.9	132.0	163.2	193.9	152.2
June	192.1	165.5	129.1	160.4	190.2	147.3
July	203.0	179.7	134.1	164.1	193.8	153.1
Average	213.8	171.2	124.7	151.4	182.0	144.0
1937:						
August	196.9	173.3	133.9	164.8	194.8	152.3
September	213.1	175.9	134.2	164.7	194.7	153.8
October	216.9	178.0	138.4	168.7	197.5	152.6
November	207.3	174.1	131.1	158.1	189.2	146.0
December	210.4	170.0	130.9	153.3	188.5	148.4
January	216.4	176.5	135.2	159.1	189.9	152.0
February	214.2	173.6	133.5	157.3	182.3	147.0
March	205.7	162.4	129.2	153.7	174.1	142.3
April	199.3	151.5	125.8	149.3	166.6	137.1
May	186.0	146.3	121.0	145.3	161.3	132.6
June	181.0	141.3	117.3	139.5	156.7	127.1
July	182.6	143.7	121.4	144.8	161.4	131.8
Average	206.7	163.9	129.3	154.9	179.8	143.6
1938:						
August	173.1	140.9	113.3	135.0	154.1	131.5
September	179.0	134.1	109.3	131.8	152.7	141.9
October	184.3	131.5	107.5	129.5	147.4	----------
November	184.2	134.8	104.7	123.7	144.2	----------
December	190.0	143.0	----------	----------	----------	----------

[1] Series carries description "4-percent extraneous matter" throughout most of the period.
[2] Prior to Sept. 12, 1936, price quoted as Calcutta.
[3] No quotations.
[4] Average of months shown.
[5] Calcutta prices not given from Aug. 1, 1930, to Apr. 30, 1931.

Bureau of Agricultural Economics. Compiled as follows:

Minneapolis.—Daily Market Record, Minneapolis. Average of daily prices weighted by carlot sales.

Winnipeg.—1925 to July 1930, Report on the Grain Trade of Canada, Ottawa, annual. August 1930 to date, Canadian Grain Statistics, Ottawa, weekly. Average of daily cash closing prices, basis in store at Fort William and Port Arthur. Converted at par, April 1925 to August 1931; at current monthly average rates of exchange beginning September 1931.

Buenos Aires.—1925 to December 1929, The Review of the River Plate, Buenos Aires, weekly. Average of quotations for Thursday of each week. January 1930 to date, Revista de la Bolsa de Cereales, Buenos Aires, weekly. Average of daily official market prices for merchandise of export grade. Converted at current monthly average rates of exchange.

Hull.—August 1925 to December 1929, London Grain, Seed, and Oil Reporter, daily. January 1930 to date, Oil, Paint and Drug Reporter, New York, weekly. Monthly prices are averages of daily quotations and are converted from pounds sterling per ton to cents per bushel of 56 pounds at current monthly rates of exchange.

Bombay.—August 1925 to November 1925, International Yearbook of Agricultural Statistics, Rome. Monthly price is an average of first week in each month.

December 1925 to date, Indian Trade Journal, Calcutta, weekly. Monthly price is an average of Friday quotations.

TABLE 46.—*Linseed oil, raw: Average price per pound, in tank carlots, Minneapolis, by months, 1925–38*

Year beginning August	August	September	October	November	December	January	February	March	April	May	June	July	Average year ended December	Average year ended following July
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1925	------	------	------	------	------	11.1	9.9	10.2	9.0	------	------	11.3	------	------
1926	11.4	10.5	10.2	10.0	10.1	10.0	10.2	9.8	9.7	10.4	10.4	9.9	10.4	10.2
1927	9.8	9.4	9.1	9.0	8.8	8.8	8.9	9.4	9.0	9.2	9.4	9 0	9.7	9.2
1928	8.8	8.7	9.2	9.2	9.3	9.4	9.6	9.6	9.6	9.5	9.7	11.2	9.1	9.5
1929	12.2	14.9	15.0	14.4	14.4	13.5	13.4	13.4	13.6	13.3	13.3	13.0	11.6	13.7
1930	12.4	9.8	8.8	8.4	8.2	7.9	8.2	8.6	8.4	8.3	8.1	8.8	11.8	8.8
1931	7.9	7.1	6.6	7.1	6.4	6.2	6.1	6.2	6.1	5.8	5.5	4.9	7.8	6.3
1932	4.7	5.2	5.5	5.9	6.0	6.6	6.4	6.6	6 9	8.2	8.8	10.3	5.7	6.8
1933	10.0	10.0	9.4	9.2	9.1	8.9	8.8	8.9	8.8	9.2	9.6	9.4	8.5	9.3
1934	9.4	9.1	9.0	8.6	8.5	8.4	8.7	9.0	9.1	9.2	9.1	9.0	9.0	8.9
1935	8.2	8.2	9.0	9.0	9.3	9.5	9.4	9.3	9.2	9.0	9.0	9.8	8.8	9.1
1936	10.1	9.9	9.7	9.2	9.5	9.8	9.8	10.0	10.8	10.9	10.6	10.5	9.5	10.1
1937	10.6	10.4	10.4	10.2	10.0	10.0	9.8	9.6	9.3	8.9	8.2	8.2	10.3	9.6
1938	7.9	8.1	8.5	8.1	8.3	------	------	------	------	------	------	------	8.7	------

Bureau of Agricultural Economics. Compiled from the Oil, Paint, and Drug Reporter. Prices are simple averages of quotations for Saturday of each week.

TABLE 47.—*Linseed oil, raw: Average price per pound, carlots, in barrels, New York, by months, 1920–38*

Year	January	February	March	April	May	June	July	August	September	October	November	December	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1920	23.6	23.6	23.4	23.9	22.7	21.8	20.7	19.0	16.1	15.3	12.1	10.9	19.4
1921	10.3	8.8	8.8	8.1	9.0	9.9	10.1	10.0	10.0	9.1	8.9	9.1	9.3
1922	8.9	10.5	11.2	10.5	12.0	11.3	11.3	11.5	11.6	11.8	11.5	11.7	11.2
1923	11.1	12.4	13.5	15.4	15.4	14.9	13.9	12.7	11.1	12.4	12.1	12.2	13.1
1924	12.2	12.4	12.3	12.0	12.4	12.3	13.1	13.7	13.6	13.7	14.4	14.5	13.0
1925	15.4	15.5	15.3	14.0	14.0	14.0	13.0	13.5	13.7	13.2	12.8	12.5	13.9
1926	11.8	11.3	11.0	10.8	10.8	10.6	11.8	11.7	11.2	10.7	11.4	10.6	11.1
1927	10.6	10.4	10.3	10.8	11.2	11.2	10.6	10.7	10.3	9.9	9.8	9.6	10.4
1928	9.8	9.8	9.9	9.8	10.4	10.3	10.0	9.8	9.8	10.2	10.2	10.0	10.0
1929	10.0	10.2	10.2	10.1	10.2	10.6	12.2	12.8	15.4	15.8	14.8	14.7	12.2
1930	14.0	14.0	14.0	14.2	14.0	14.0	13.9	13.0	10.4	9.8	9.4	9.0	12.5
1931	8.8	9.2	9.4	9.1	8.8	8.6	9.1	8.3	7.6	7.3	7.5	7.0	8.4
1932	6.7	6.1	6.7	6.6	6.1	5.9	5.6	5.5	6.0	6.3	6.7	6.9	6.3
1933	7.3	7.2	7.4	7.7	8.6	9.4	10.8	10.5	10.4	9.6	9.6	9.5	9.0
1934	9.2	9.2	9.3	9.3	9.6	9.9	9.8	9.8	9.4	9.1	8.7	8.8	9.3
1935	8.9	9.2	9.5	9.5	9.6	9.6	9.3	8.7	9.0	9.7	9.7	10.1	9.4
1936	10.1	10.0	9.9	9.6	9.5	9.6	10.1	10.3	10.2	9.7	9.4	9.7	9.8
1937	10.2	10.0	10.4	11.2	11.3	11.1	11.1	11.1	10.9	11.0	10.4	10.3	10.8
1938	10.2	10.1	9.8	9.6	9.3	8.7	8.7	8.4	8.9	8.8	8.4	8.6	9.1

Bureau of Agricultural Economics. Compiled from the Oil, Paint, and Drug Reporter. Average of the high and low price per pound each month, 1920–26; beginning 1927, average of quotations for Saturday of each week.

TABLE 48.—*Linseed oil, naked: Average spot price per pound, Hull, by months, 1925–38*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1925	------	------	------	------	------	------	8.8	9.0	8.7	8.3	8.1	7.6	------
1926	6.8	6.8	6.5	6.5	6.6	7.1	7.5	7.5	6.8	6.7	6.7	6.7	6.8
1927	6.7	7.0	6.8	6.8	7.2	7.4	7.0	6.9	6.8	6.7	6.5	6.2	6.8
1928	6.2	6.1	6.3	6.4	6.5	6.3	6.2	6.0	6.2	6.4	6.4	6.3	6.3
1929	6.1	6.3	6.2	6.1	6.2	6.3	7.5	8.1	9.3	9.7	9.4	9.7	7.6
1930	9.6	9.4	8.4	8.8	8.9	9.2	7.8	7.4	6.8	5.7	5.6	4.7	7.7
1931	3.9	4.0	4.0	3.8	3.5	3.4	3.9	3.4	3.1	2.9	2.9	2.3	3.4
1932	2.3	2.4	2.4	2.3	2.2	2.1	2.1	2.3	2.6	2.5	2.5	2.5	2.4
1933	2.7	2.5	2.4	2.5	3.3	3.8	4.5	4.3	4.3	3.9	4.5	4.5	3.6
1934	4.3	4.3	4.3	4.3	5.0	5.2	4.9	4.9	4.5	4.2	4.1	4.3	4.5
1935	4.6	4.7	4.5	4.5	4.8	4.9	4.8	5.1	5.3	5.8	5.6	5.9	5.0
1936	6.1	6.0	5.8	5.9	5.6	5.7	6.1	6.0	5.8	5.4	5.5	6.0	5.8
1937	6.0	5.9	6.3	6.5	6.6	6.6	6.8	6.8	6.7	6.7	6.3	6.3	6.5
1938	6.4	6.2	6.0	5.6	5.3	5.0	5.2	4.7	4.9	4.7	------	------	------

Bureau of Agricultural Economics. Compiled from the London Grain, Seed, and Oil Reporter. Monthly prices are averages of Wednesday quotations, and are converted from the English pound per ton to United States cents per pound at current monthly rates of exchange.

TABLE 49.—*Chinawood or tung oil: Average price per pound, in barrels, New York by months, 1920–38*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1920	22.8	24.8	24.2	24.5	23.0	19.0	18.8	17.5	17.8	17.0	14.2	12.5	19.7
1921	10.5	10.0	9.8	9.2	12.4	13.1	14.8	16.0	14.8	14.0	15.0	13.8	12.8
1922	13.2	14.4	14.0	13.8	13.8	13.8	12.4	12.6	12.4	12.6	12.8	13.1	13.2
1923	15.2	18.2	22.5	37.5	33.0	25.8	24.0	22.8	22.9	21.6	21.1	21.2	23.7
1924	20.8	19.1	17.6	15.4	14.6	13.1	13.5	14.5	15.2	16.0	15.8	15.6	15.9
1925	15.1	14.0	13.2	13.0	12.9	13.2	13.6	13.2	13.6	13.4	13.2	13.1	13.5
1926	13.0	12.8	12.1	11.2	11.8	13.5	15.1	17.0	18.1	16.6	15.8	14.1	14.3
1927	14.6	18.0	26.0	31.0	23.5	19.5	18.5	17.6	17.0	15.4	15.4	15.1	19.3
1928	17.0	17.1	14.0	15.6	14.9	14.9	15.0	14.8	15.0	15.2	14.2	14.8	15.2
1929	14.7	14.6	14.1	14.6	14.9	14.6	14.4	14.6	14.6	15.1	14.9	14.5	14.6
1930	12.5	11.5	11.4	10.9	10.2	9.4	9.0	9.2	8.7	8.1	7.2	7.3	9.6
1931	7.8	7.3	7.1	7.1	7.1	7.0	7.6	7.4	7.5	7.4	8.4	7.3	7.4
1932	7.0	7.9	7.2	6.0	5.8	6.0	5.7	6.2	6.1	6.0	6.0	5.5	6.3
1933	5.3	5.1	5.4	5.3	6.1	7.1	8.7	8.1	7.8	7.6	8.0	7.5	6.8
1934	7.8	8.0	8.1	8.6	8.8	[1] 9.1	9.3	9.6	10.0	9.1	8.9	9.2	8.9
1935	9.7	10.0	[2] 14.2	[2] 14.2	[2] 17.5	[2] 17.4	[2] 15.1	16.3	[2] 26.3	[2] 29.9	[2] 18.2	[2] 15.2	17.0
1936	14.1	15.0	16.9	19.2	18.7	18.7	18.9	16.5	14.4	13.5	13.0	14.3	16.1
1937	14.6	15.4	15.4	15.3	13.8	13.1	12.9	14.3	[2] 21.2	[2] 21.8	[2] 15.6	14.8	15.7
1938	15.6	15.3	13.3	12.5	11.4	10.9	13.0	14.0	13.1	13.8	14.5	15.0	13.5

[1] Beginning June 1934 reported in drums.
[2] Nominal.

Bureau of Agricultural Economics. Compiled from the Oil, Paint, and Drug Reporter. Average of the high and low price per pound each month, 1920-29; beginning 1930, average of quotations for Saturday of each week.

TABLE 50.—*Perilla oil: Average price per pound, New York, by months, 1920–38*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average [1]
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1920	22.5	21.9	21.8	20.8	18.5	17.0	14.2	12.2	12.1	11.6	10.5	8.5	16.0
1921	8.4	7.4	6.5	6.2	6.6	7.0	7.0	9.2	7.5	8.5	8.5	------	7.5
1922	11.2	11.2	11.2	------	13.0	13.5	13.5	13.5	13.5	------	12.5	13.2	12.6
1923	14.0	15.2	15.8	16.4	16.2	15.5	14.8	14.5	14.4	14.0	13.8	14.2	14.9
1924	14.0	14.2	14.6	14.5	14.2	13.8	13.8	14.2	14.2	14.2	14.5	14.5	14.2
1925	14.5	14.8	15.0	14.9	14.8	14.8	14.8	14.8	15.2	15.6	15.4	15.2	15.0
1926	15.2	15.2	14.6	13.7	13.5	13.0	13.0	13.0	12.9	12.5	13.2	13.1	13.6
1927	13.0	12.8	13.5	14.1	16.5	16.5	16.5	15.8	15.0	14.8	14.4	14.2	14.8
1928	12.9	13.0	13.2	13.0	13.5	13.5	13.5	13.5	13.5	16.8	18.0	18.0	14.4
1929	17.0	14.9	14.0	13.5	13.5	13.5	13.5	14.5	16.0	16.8	17.0	15.5	15.0
1930	13.2	12.9	12.9	12.9	12.8	12.3	12.2	12.2	11.5	11.5	10.7	10.5	12.1
1931	10.0	10.0	9.2	8.0	7.8	7.5	7.9	7.9	7.9	7.4	6.9	6.8	8.1
1932	6.2	6.1	5.7	4.7	4.2	4.1	4.3	4.5	4.7	4.8	4.5	4.6	4.9
1933	5.3	5.1	5.0	5.3	6.9	8.1	10.2	10.0	9.9	9.5	9.2	9.1	7.8
1934	8.7	9.0	9.1	8.8	9.1	9.6	9.4	9.3	9.1	8.6	8.3	8.7	9.0
1935	8.7	8.5	8.4	7.9	8.0	8.2	7.7	7.3	8.3	9.7	8.5	7.5	8.2
1936	7.4	7.2	7.3	7.4	7.4	8.5	9.7	9.8	9.9	9.8	9.7	10.9	8.8
1937	11.7	11.6	11.6	11.9	11.5	11.3	11.6	12.1	13.6	13.9	12.8	11.5	12.1
1938	11.3	11.1	10.6	10.6	10.3	9.9	10.5	10.7	10.2	10.0	9.9	9.8	10.4

[1] Where prices are missing, average is for months shown.

Bureau of Agricultural Economics. Compiled from the Oil, Paint, and Drug Reporter. Average of the high and low price per pound each month, 1920–29; beginning 1930, average of quotations for Saturday of each week. Since Jan. 11, 1930, reported in drums, prior to that date, in barrels.

TABLE 51.—*Soybean oil, domestic,[1] crude: Average price per pound, in barrels, New York, by months, 1929–38*

Year beginning October	October	November	December	January	February	March	April
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1929	13.00	13.00	12.50	11.75	11.50	10.72	10.40
1930	9.30	8.50	8.30	7.38	7.50	7.50	7.45
1931	5.65	5.55	5.18	4.81	4.45	4.45	4.45
1932	4.40	4.25	4.20	4.35	4.50	4.72	4.90
1933	7.60	7.30	6.98	6.80	7.05	7.30	7.30
1934	7.30	7.55	8.70	9.30	9.85	10.80	10.30
1935	9.80	9.80	9.80	9.55	8.90	8.80	8.42
1936	9.40	9.60	10.70	11.50	11.50	11.50	11.50
1937	7.97	7.75	7.07	7.30	7.75	7.90	7.40
1938	6.69	6.68	6.68	----------	----------	----------	----------

Year beginning October	May	June	July	August	September	Average year ended December	Average year ended following September
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1929	10.64	10.80	10.72	10.38	10.18	----------	11.30
1930	7.30	7.30	7.30	7 20	6.55	10.27	7.63
1931	4.40	4.15	4.12	4.12	4.12	6.82	4.62
1932	6.30	7.05	8.20	9.05	[2] 8.20	4.33	5.84
1933	7.30	7.30	7.30	7.30	7.30	6.60	7.24
1934	10.30	10.26	9.42	8.90	9.45	7.38	9.34
1935	8.00	7.85	9.30	9.60	9.60	9.83	9.12
1936	11.30	10.42	10.30	9.42	9.05	9.14	10.50
1937	7.21	7.15	7.36	7.31	6.75	9.94	7.41
1938	----------	----------	----------	----------	----------	7.18	----------

[1] Domestic oil not quoted prior to October 1929, as production in this country had not reached commercial proportions.

[2] Beginning this date reported in drums.

Bureau of Agricultural Economics. Compiled from the Oil, Paint and Drug Reporter.

TABLE 52.—*Menhaden oil, crude: Average price per pound, f. o. b. Baltimore, by months, 1920–38*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average [1]
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1920	12.3	13.0	13.0	12.3	11.3	10.0	9.0	8.3	7.7	6.3	5.4	4.3	9.4
1921	4.3	4.0	4.1	3.7	3.7	4.0	3.9	3.6	4.3	4.1	4.3	4.5	4.0
1922	4.9	5.3	5.3	5.3	5.0	4.7	5.1	5.4	5.3	5.1	6.5	6.3	5.4
1923	6.5	6.7	6.9	------	------	6.7	6.0	5.3	6.0	6.3	6.7	6.5	6.4
1924	6.3	6.3	7.2	6.3	6.3	5.8	5.7	6.7	6.7	6.8	7.4	7.5	6.6
1925 [2]	7.3	7.3	7.3	7.3	------	------	7.0	6.8	6.8	7.2	6.9	7.0	7.1
1926	7.0	7.0	7.0	------	------	6.3	6.3	6.3	6.2	6.0	6.0	5.7	6.4
1927	5.3	5.9	6.4	6.4	6.4	6.4	6.1	5.7	6.0	5.9	5.9	5.6	6.0
1928	5.3	5.3	5.3	5.3	5.5	5.7	5.6	5.5	5.3	6.0	6.6	------	5.6
1929	6.4	------	------	------	------	------	5.7	6.3	6.3	6.7	6.0	6.0	6.2
1930	6.0	6.0	6.0	6.0	6.0	6.0	3.8	3.7	3.6	2.8	2.9	2.9	4.6
1931	3.0	3.3	3.3	2.7	2.7	2.6	2.5	2.5	2.2	2.0	2.6	2.7	2.7
1932	2.7	2.7	2.7	2.2	2.1	2.0	1.6	1.6	1.5	1.4	1.3	1.3	1.9
1933 [3]	1.3	1.2	1.3	1.4	1.7	2.0	2.2	2.3	2.3	2.0	2.0	2.2	1.8
1934	2.1	2.1	2.2	2.6	2.7	2.8	2.4	2.6	3.0	3.0	3.0	3.2	2.6
1935	3.3	3.7	4.5	4.0	3.9	4.0	3.7	3.7	3.7	4.0	4.4	4.7	4.0
1936	4.8n	4.8n	4.6n	4.5n	4.3	4.3	3.7n	3.6n	3.6n	3.7	4.4n	4.7n	4.3
1937	4.8	5.1	5.7n	6.0n	5.6n	5.8n	5.3n	5.3n	4.9n	4.7n	4.6n	4.8n	5.2
1938	5.0n	5.0n	4.9n	4.7n	4.7n	4.1n	3.7	4.0	4.0	4.0	4.0n	4.1n	4.4

[1] Where prices are missing, average is for months shown.
[2] Beginning 1925, quotations are in tanks; prior to that date in barrels.
[3] For year 1933, quotations were nominal.

Bureau of Agricultural Economics. Compiled from the Oil, Paint, and Drug Reporter; average of the high and low price per pound each month, 1920-29; beginning 1930, average of quotations for Saturday of each week.

TABLE 53.—*Sardine oil: Average price per pound, Pacific coast, in tanks, by months, 1922–38*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1922	4.1	4.5	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	5.2	5.5	4.7
1923	5.5	6.0	6.0	6.1	6.1	6.1	5.6	5.1	5.1	5.1	5.1	5.1	5.6
1924	6.0	6.0	6.0	6.0	6.0	5.3	5.3	6.0	6.0	6.0	6.0	6.0	5.9
1925	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	7.3	7.3	7.3	6.3
1926	7.3	7.3	6.9	6.7	6.7	6.7	6.5	6.5	6.5	6.5	5.6	5.6	6.6
1927	5.6	5.6	5.6	5.3	5.3	6.0	6.0	5.7	5.7	5.7	5.3	5.3	5.6
1928	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	6.0	6.0	5.4
1929	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.4	6.4	6.4	6.1
1930	5.8	5.7	5.7	4.7	4.7	4.7	4.7	3.9	3.7	3.2	2.6	3.3	4.4
1931	3.4	3.5	3.7	3.7	3.7	3.4	2.7	2.8	2.5	2.3	2.5	2.2	3.0
1932	2.1	2.0	2.1	2.7	2.3	1.9	1.9	1.9	1.5	1.7	1.4	1.3	1.9
1933	1.2	1.3	1.8	1.8	2.2	2.7	3.0	3.2	2.9	2.3	2.3	2.2	2.2
1934	2.0	2.0	2.2	2.8	3.1	2.9	2.5	2.7	3.3	3.2	3.0	3.1	2.7
1935	3.6	4.2	5.0	4.8	4.9	4.6	4.1	4.3	4.4	5.0	5.0	5.0	4.6
1936	4.9	5.0	4.4	4.2n	4.0n	3.7n	4.0n	4.2n	4.4n	4.6	4.9	5.5	4.5
1937	6.4	6.9	7.2	7.2	6.9n	6.9n	5.9n	5.3	4.8n	4.7n	4.8	4.9	6.0
1938	5.5	6.0	6.2	5.4	4.9	4.8	4.2	4.0	3.7	3.7	3.9	4.1	4.7

Bureau of Agricultural Economics. Compiled from the Oil, Paint, and Drug Reporter. Prices are averages of Saturdays during the month. Prices quoted in gallons and converted to pound price on basis of 7.5 pounds to gallon.

TABLE 54.—*Linseed meal, 34-percent protein:* [1] *Average price per ton, Minneapolis, by months, 1927–28 to 1938–39*

Year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
1927–28	$45.50	$46.25	$45.95	$45.30	$46.40	$47.45	$48.00	$49.00	$50.80	$51.40	$53.00	$51.10	$48.35
1928–29	49.10	45.75	47.55	53.85	54.90	57.00	56.90	59.00	56.60	52.10	51.90	51.20	52.99
1929–30	53.05	53.10	56.40	55.70	55.10	55.00	54.10	51.75	50.30	54.75	48.70	44.75	52.72
1930–31	42.75	42.20	42.10	40.25	38.90	37.90	36.40	34.65	31.60	30.75	27.70	24.95	35.85
1931–32	25.60	26.20	25.75	25.70	31.40	32.10	30.15	28.75	28.00	27.30	24.25	21.40	27.22
1932–33	20.40	21.40	22.40	21.50	19.80	19.15	19.70	19.30	20.00	21.65	25.20	27.50	21.50
1933–34	37.40	36.10	31.75	31.70	31.90	31.65	32.00	31.90	30.15	30.90	29.20	32.25	32.24
1934–35	33.40	41.75	44.00	41.40	42.00	44.30	43.25	39.65	38.40	38.80	36.00	31.00	39.50
1935–36	26.50	25.30	24.88	27.40	26.63	27.00	27.13	25.50	24.20	25.03	25.38	28.60	26.13
1936–37	42.12	46.38	46.30	45.75	46.75	48.80	48.25	44.12	39.80	40.50	40.75	38.00	43.96
1937–38	34.62	31.00	31.25	33.12	35.90	39.00	42.00	42.62	41.40	41.75	44.00	41.10	38.15
1938–39	41.40	38.40	35.90	37.75	38.50	39.75	------	------	------	------	------	------	------

[1] Quoted as 37-percent protein July 1933–November 1936 and September 1937–December 1938.

Bureau of Agricultural Economics. Compiled from reports made to the Bureau. Quoted "per ton, bagged, in carlots, sight-draft basis."

TABLE 55.—*Soybean meal, 41-percent protein: Average wholesale price per ton, bagged, Chicago, 1929–30 to 1938–39*

Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Average
1929–30	$58.30	$54.20	$53.05	$51.80	$48.25	$48.20	$50.15	$50.70	$48.75	$46.00	$47.80	$47.50	$50.39
1930–31	44.00	41.20	40.00	39.30	36.60	33.15	31.90	28.60	25.80	24.90	23.35	21.40	32.52
1931–32	18.60	23.85	23.00	20.45	18.75	18.90	19.90	19.95	20.20	20.05	22.60	23.70	20.83
1932–33	22.75	21.70	21.70	21.70	21.70	22.60	23.70	28.30	28.85	39.20	39.00	34.85	27.17
1933–34	31.70	30.15	30.50	30.60	31.50	32.50	33.25	33.60	34.50	34.50	37.75	39.50	33.34
1934–35	38.50	38.85	41.20	40.70	38.45	37.10	33.80	33.20	31.70	29.05	24.00	22.85	34.12
1935–36	25.60	24.40	25.50	25.15	23.90	22.30	23.30	24.80	26.10	38.90	44.30	39.70	28.66
1936–37	36.90	39.15	43.00	44.10	41.50	41.10	47.60	48.35	39.20	37.30	34.90	34.20	40.61
1937–38	28.80	29.50	28.80	30.00	29.60	28.10	26.00	26.30	25.30	26.95	26.15	26.95	27.71
1938–39	24.60	24.40	26.20	------	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics.

TABLE 56.—*Cottonseed meal, 41 percent protein: Average price per ton, bagged, carlots, at Memphis, 1921–22 to 1938–39*

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
1921–22	$37.00	$38.20	$35.70	$35.00	$36.30	$37.10	$39.30	$45.10	$47.60	$49.25	$47.50	$44.75	$41.07
1922–23	35.50	34.30	40.25	46.00	45.40	45.75	45.00	43.65	43.10	42.40	40.80	41.40	41.95
1923–24	43.20	42.90	44.90	47.40	45.00	43.60	41.00	39.60	39.50	39.50	40.25	43.60	42.54
1924–25	43.60	41.40	40.75	38.75	39.25	37.70	35.75	35.90	36.80	38.35	38.80	41.50	39.05
1925–26	44.10	36.90	34.35	34.10	34.00	32.60	31.10	31.00	31.95	30.70	31.00	31.10	33.58
1926–27	32.10	28.90	23.90	23.65	24.50	30.10	33.50	32.40	32.50	34.00	37.35	36.00	30.74
1927–28	35.25	37.40	37.70	39.60	41.40	44.40	45.10	49.30	55.50	61.50	59.00	41.50	45.64
1928–29	45.60	38.40	43.90	44.15	45.60	44.90	44.40	42.70	38.75	35.50	34.25	38.75	41.41
1929–30	38.65	41.05	39.30	37.85	37.05	35.45	33.50	33.60	36.75	38.05	35.50	33.60	36.70
1930–31	36.25	30.90	27.50	27.60	25.60	25.75	24.90	26.45	26.25	24.55	22.40	21.20	26.61
1931–32	17.30	13.80	13.20	16.60	14.45	13.80	12.80	12.45	12.85	12.60	11.50	13.15	13.70
1932–33	17.35	16.75	14.40	13.35	11.80	11.85	12.00	13.10	15.20	17.50	18.60	27.65	15.80
1933–34	22.90	18.40	16.70	19.25	19.25	22.50	24.00	24.00	22.00	21.25	23.25	27.05	21.71
1934–35	34.80	33.90	33.90	37.00	37.75	34.60	33.25	30.80	30.45	30.00	26.95	24.30	32.31
1935–36	21.50	20.30	23.15	22.25	22.20	21.20	20.60	20.10	21.40	21.55	22.50	32.10	22.40
1936–37	33.95	30.95	29.90	32.25	34.20	34.65	34.30	35.30	40.15	40.30	34.55	31.55	34.34
1937–38	25.90	21.30	21.95	23.00	22.05	23.25	22.30	21.90	21.40	20.80	21.25	23.25	22.38
1938–39	22.05	21.00	20.90	21.75	22.80	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics.

TABLE 57.—*Peanut meal: Average price per ton, f. o. b. southeastern milling points, by months, 1923–24 to 1938–39*

Year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average [1]
1923–24	-------	-------	-------	$52.67	[2] $51.00	[2] $50.50	[2] $45.75	[2] $43.00	$43.00	-------	-------	[2] $44.75	$47.24
1924–25	-------	-------	$40.00	40.55	41.00	40.25	[3] 38.69	38.20	38.69	$38.25	$37.65	38.50	39.18
1925–26	$39.00	$38.62	38.81	38.85	38.75	39.62	40.00	40.00	40.00	40.60	42.00	42.25	39.88
1926–27	43.00	42.25	43.00	43.00	43.25	45.56	47.30	47.50	47.50	47.50	47.50	45.92	45.27
1927–28	43.88	43.58	41.70	43.33	44.81	45.50	47.62	[3] 48.67	[3] 51.40	53.50	52.25	46.25	46.87
1928–29	43.50	45.45	47.38	48.75	49.10	49.62	49.50	47.94	43.38	39.25	40.00	43.88	45.65
1929–30	45.00	45.50	39.17	38.50	36.30	35.06	33.06	33.80	34.75	33.75	31.50	34.50	36.74
1930–31	37.00	40.00	33.00	27.70	26.19	27.00	26.50	26.80	26.62	25.06	25.00	23.00	28.66
1931–32	18.80	19.00	20.00	18.81	[4] 17.94	18.00	18.30	[5] 17.88	[5] 17.88	[5] 17.70	16.69	17.40	18.20
1932–33	19.00	18.50	15.44	14.75	14.31	13.88	14.56	15.94	19.30	20.33	29.58	27.65	18.60
1933–34	24.17	23.08	25.05	25.88	27.10	28.56	29.75	28.62	27.65	27.58	27.42	30.75	27.13
1934–35	33.62	33.20	31.25	33.75	32.70	31.25	29.12	28.12	27.33	26.25	24.00	20.83	29.28
1935–36	19.16	20.65	19.56	19.05	19.83	20.00	21.00	20.83	21.50	23.55	33.00	35.00	22.76
1936–37	36.00	29.25	30.17	31.95	35.12	35.75	37.10	44.25	44.67	42.35	37.75	29.94	36.19
1937–38	30.00	27.50	28.45	25.84	26.00	26.25	26.15	23.38	21.70	22.00	24.31	24.07	25.47
1938–39	24.06	25.19	21.60	21.25	-------	-------	-------	-------	-------	-------	-------	-------	-------

[1] Where prices are missing, average is for months shown.
[2] 46 percent protein.
[3] 43 percent protein.
[4] 43 percent protein in 2 weeks of month.
[5] 42 percent protein.

Bureau of Agricultural Economics. Compiled from market reports of the Division of Fruits and Vegetables. Prices are for 45 percent protein unless otherwise stated.

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