

Economic Status of the Fats and Oils Industry¹

ROBERT M. WALSH, Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C.

AS a frame of reference we may examine the economic position of the fats and oils industry in 1954 in relation to the status of domestic agriculture, which supplies the bulk of raw materials for the industry.

Farm production, to meet strong domestic and export demands, increased 36% from 1939 to 1953. Prices of farm products rose sharply after the war following removal of ceiling-price control, started downward in 1948-49, only to rise to a new postwar peak in February 1951 following the outbreak of war in Korea. Since then the trend in prices received by farmers has again been downward, but costs of farm production have continued high.

Prices received by farmers declined 18% from February 1951 to February this year while prices paid by farmers for the goods and services required in production and for family living increased slightly. As a result, the agricultural parity ratio which stood at 113 in February 1951 had decreased to 91 by February 1954.

The downward adjustment in agricultural prices and income, beginning in 1951, originated in the export sector of the market for farm goods and in large marketings of beef cattle. Domestic production was stimulated and built up immediately after the war to help fill the vacuum for foodstuffs and fibers that existed in Europe and parts of Asia. Today world agricultural production is in better balance, and the need for imports from the United States, while continuing, is much less acute.

More recently, domestic demand for agricultural products has shown signs of slackening. While population growth continues at a high rate and is a strong underlying demand factor, industrial activity has weakened and the numbers of unemployed have increased. According to informed economists, it is likely that the value of the gross national product will be down in 1954, possibly by as much as 3 to 5% from the high level of 1953.

Production Trends for Fats and Oils

In the light of this general setting we may take a look at the development and present status of the glyceride-bearing raw materials. Total production of fats and oils from domestic materials increased from 8.7 billion lbs. in 1937-41 to 12.7 billion lbs. in 1953-54. Prominent in this increase were tallow and greases among the animal fats, and soybean oil, cottonseed oil, and linseed oil among the vegetable items.

Lard production, influenced by the recent downward phase of the hog-production cycle, will total about 2.2 billion lbs. in the present hog-marketing year (running through next September), only slightly larger than prewar. Inedible tallow and greases, on the other hand, have shown a spectacular gain, resulting from a high level of cattle production and from a steady growth in the scope of operations in the rendering industry. Output of these inedible fats is estimated at over 2.6 billion lbs. for 1953-54, about double the output of 15 years ago.

Partly offsetting this increase have been declines in butter and in fish oils. The use of milk in butter-making is a residual use, and, with expansion of urban markets for whole-milk products, less milk has gone into butter, a lower-return outlet. The rapid development and improvement of vegetable-oil margarines manufactured from comparatively low-cost raw materials, the removal of the federal tax on yellow margarine, and the relaxation of taxes and prohibitions on the sale of margarine in many states, also have contributed to the decline in production and consumption of butter. Fish-oil production has suffered as a result of the near disappearance of the California sardine or pilehard in West Coast waters, a phenomenon not clearly understood by fishery experts. Despite the declines in butter and fish oils, total production of animal fats in the present marketing year will be about 15% greater than in immediate prewar years.

The story of the soybean in the United States is one that has been frequently told, and many in the American Oil Chemists' Society had a part in its unfolding. After a quarter of

a century of experimentation, varieties of soybeans adapted to different sections of the country have been developed. Fitting well into the crop rotation and farmers' work schedules, this readily mechanized crop has taken hold in a relatively short time span to become one of the important cash crops in the Midwest and in parts of the South and Southeast. The acute need for vegetable oils and proteins during the war and early post-war years, and the continuing strong demand for oilseed meals, have presented a favorable economic climate for the expansion of this crop. Production of soybeans increased from 90 million bushels in 1939 to between 260 and 300 million bushels in each of the past four years. Production of soybean oil, including the oil equivalent of exported soybeans, now amounts to over 2.5 billion lbs. yearly, a five-fold increase since prewar.

Linseed oil from domestic flaxseed likewise has expanded, largely as a result of high prices for flaxseed in the latter 1940's and improved disease-resistant varieties and cultural practices. Flaxseed was formerly an import crop, with about half the requirements met by shipments from Argentina and Uruguay. Now the United States produces more than it needs, and some flaxseed and linseed oil has been exported in recent years. The government has acquired considerable stocks through its price-support programs.

Production of cottonseed oil has fluctuated with changes in the size of the cotton crop. Output is large this season. But restrictive acreage allotments and marketing quotas have been announced for 1954.

Although accounting for a relatively small part of the total oil production, tung nuts, safflower seed, and castor beans have shown notable expansion in the past few years. Production of tung oil this season is estimated to be close to 50 million lbs., a new high. Safflower seed is grown mostly under irrigation in California and furnishes several tank cars of oil each year for the paint and varnish trade. Castor beans, under government sponsorship, have been grown successfully on a commercial scale in parts of Texas, Oklahoma, Arkansas, New Mexico, Arizona, and California. The present availability of imported castor beans and oil, at moderate prices, makes the outlook for domestic beans dubious unless startling improvements in yield are made. The development of castor-bean hybrids, now under way, may provide a solution to this problem.

World Trends

We may turn now for a moment from the domestic to the world situation. World production of fats and oils, as estimated by the Foreign Agricultural Service, increased 13% from 1935-39 to 1953, a gain which was about in line with world population growth.

The edible vegetable oils—cottonseed, peanut, soybean, sunflower, olive, sesame, and rapeseed—as a group showed a 24% increase over prewar. Most of the gain in soybean oil and some of the increase in cotton oil took place in the United States, but increases over prewar in peanut, sunflower, olive, sesame, and rapeseed occurred in other countries of the world. Rapeseed oil, while used on a small scale industrially in the United States, finds its chief outlet in food uses in Europe and Asia.

Butter declined from prewar to 1953, but lard production increased.

The palm-type oils—coconut, palm, palm-kernel, and babassu—increased slightly on balance, with most of the gain taking place in palm oil in the Belgian Congo. Production of both coconut oil and palm oil in Indonesia remained below prewar levels.

Except for a major increase over prewar in output of tallow and greases (chiefly in the United States) and a slight increase in production of castor oil, the trend in world production of the industrial oils—linseed, tung, perilla, whale, and fish—has been slightly downward.

The failure of the industrial type of oils to expand in line with population and industrial growth fundamentally reflects the lack of an increased need for them. Raw materials of non-agricultural origin, particularly petroleum derivatives, are tending to supplant the natural glycerides in several important uses.

¹Presented at the annual meeting, American Oil Chemists' Society, San Antonio, Tex., April 12, 1954.

FATS, OILS, AND OILSEEDS: ESTIMATED WORLD PRODUCTION, SPECIFIED PERIODS, FAT EQUIVALENT

Item	Average 1935-39	Average 1945-49	1953 ¹	1953 as percent- age of 1935-39 ²
	<i>bil. lbs.</i>	<i>bil. lbs.</i>	<i>bil. lbs.</i>	%
Edible vegetable oils: Cottonseed, peanut, soybean, sunflower, olive, sesame, rapeseed.....	16.8	17.7	20.7	124
Palm oils: Coconut, palm kernel, palm, babassu.....	7.3	6.1	7.6	106
Butter (fat content).....	8.0	6.1	6.9	87
Lard.....	7.0	6.1	8.3	118
Tallow and greases.....	3.1	4.0	5.1	164
Industrial oils: Linseed, castor, oiticica, tung, perilla.....	3.1	2.9	3.0	95
Marine oils.....	2.1	1.2	1.8	84
Estimated world total.....	47.4	44.1	53.4	113

¹ Preliminary.² Calculated from unrounded numbers.

Source: Foreign Crops and Markets, U. S. Dept. of Agric., Vol. 68, No. 4 (Jan. 25, 1954).

Inventory Position

Following several years of high production, inventories of fats and oils in the United States were at a post-war high of 2.8 billion lbs. on October 1, 1953, the beginning of the present crop-marketing year. During the period after the war when fats were in short world supply, October 1 inventories in this country averaged 1.4 billion lbs. A normal inventory would lie somewhere between these two extremes.

Basically two factors in addition to the high production rate are responsible for the present high-inventory position for domestic fats and oils. One is the rapid recovery in world production of edible fats and oils since the war. The other is the serious inroad that synthetic materials have made in the market for industrial oils and fats.

Government policies and programs have contributed to the present high-inventory position of fats and oils. During the war, and in the immediate period thereafter, the programs were designed primarily to stimulate a high level of agricultural production, including the production of fat-and-oil bearing materials. A second objective was to maintain a parity of real income between the farm and non-farm sectors of the economy. Further increases in fats and oils production are not needed at the moment, but the objective of maintaining a parity of income remains. Through price-support operations the government has acquired large holdings of cottonseed oil, butter, and linseed oil. Financial losses to taxpayers are possible as the final result of these operations, but the holdings have a stabilizing influence over the market and will tend to dampen violent rises in prices to industrial users and consumers, such as we have witnessed in the past.

Government stocks on April 1, this year, including stocks purchased but not delivered, amounted to over a billion lbs. of cottonseed oil, about 350 million lbs. of butter, and over 300 million lbs. of linseed oil.

The Present Outlook

Trends in production, imports, exports, and in domestic consumption in the United States offer no great promise of substantial change in the foreseeable future in the high-inventory position for fats and oils. It may be significant however that exports from October through January in the current marketing year were at record levels. If continued, this will help bring about some downward adjustment in stock levels next October.

Lard production in the United States this season is at a low point in the current production cycle, and this is lending strength to the lard market. But the pig crop of 1954 will be larger than in 1953 as a result of a favorable ratio of hog prices to corn prices, and lard production will increase again beginning next fall. Tallow and grease output also may increase further.

Cotton acreage, under government programs, is being reduced this year, but so too is wheat acreage, with the result that soybean plantings, which are unrestricted, will be materially increased. As indicated by intentions of farmers reported as of March 1, soybean production may be 30% larger in 1954 than in 1953 and flaxseed production may be 25% larger.

It appears that total domestic output of fats and oils from 1954 crops and livestock may be somewhat greater than in the

current year. This is based, of course, on the assumption of moderately favorable growing conditions in the main producing areas.

Imports of fats and oils and oil-bearing materials have been equivalent to about a billion lbs. of fat a year. Such imports consist mainly of coconut oil and copra, castor beans and oil, palm oil, and olive oil.

Exports of fats and oils in the past three years have been characterized by two divergent trends. The trend in foreign shipments of edible fats and oils, particularly of lard and soybean oil, has been downward. The trend in the export movement of inedible tallow and grease, on the other hand, has been upward.

The sharp decline in exports of edible fats from the 1950 crop year to 1952-53 (a 31% drop) reflects improvement in edible fat and oil production in other countries as well as the much heralded dollar shortage. The more than doubling of exports of inedible tallow and greases, on the other hand, resulted from the abundance and cheapness of those fats in the United States. In a measure the increase in tallow and grease exports has cut into the foreign market for U. S. edible oils. Palm oil, formerly one of the leading industrial fats in Europe, is being replaced in the soap kettle by tallow and grease; and palm oil, in turn, is finding its way increasingly in Europe into edible uses, principally in margarine, in competition with cottonseed oil and soybean oil.

The early months of the 1953-54 marketing year witnessed an upturn in the export movement in fats and oils, chiefly in the form of soybeans, cottonseed oil, tallow and greases, and linseed oil. Part of this increased movement reflected sales at competitive world prices against foreign rather than U. S. currency under Section 550 of the Defense Production Act. Nevertheless there is little in the world situation today to indicate a sustained need for increased supplies of fats and oils (and oilseeds) from the United States for consumption in foreign markets unless serious attention is given to reported shortages of fats in Eastern Europe.

The domestic market likewise offers little immediate promise of absorbing the large inventories that have been accumulated. Domestic disappearance in the past three years, including disappearance of roughly a billion lbs. of imported oils, has held about steady at around 10½ billion lbs. while production has been around 12½ billion lbs. Domestic disappearance of fats and oils in food uses has increased about in line with population growth, but disappearance in industrial uses has declined.

The major decline in industrial uses occurred in the manufacture of soap, where synthetic detergents based chiefly on petroleum derivatives displaced nearly half-a-billion lbs. of fat in the past three years and now account for more than half of the total U. S. market for detergents. A lesser, but still significant decline occurred in the use of oils in drying-oil products. This was partly offset by a rise in use of oils and fats in other industrial products.

Marketing Trends

A leading world authority on trends and markets for fats and oils has stated that the problem of surplus production of fats and oils in the United States will be solved by population growth in this country. It is difficult to peer far in the future. Ten or 15 years from now we shall have many more millions of people. But can we be sure that crop and livestock production will not increase in about the same proportion? We may assume that consumption of fats in food products will continue to keep pace with population growth. But, unless the downward trend of use in industrial products is reversed, surpluses are likely to continue with us.

This situation presents a challenge, particularly to oil chemists, to find new ways to use the abundant supplies of the lower-priced fats and oils.

Fats and oils already are finding their way into new uses or expanded outlets to a certain extent. Use in margarine has expanded rapidly in the last few years. Over a billion lbs. of fats were consumed in margarine in 1952 and again in 1953. The consumption of butterfat in the form of butter however has gone down as margarine consumption has gone up. On balance, the use of fats and oils in table spreads is smaller today, *per caput*, than it was 15 years ago.

Edible oils and fats more recently have been incorporated into frozen desserts in direct competition with ice cream. The mellorine type of dessert, in which fats other than butterfat are used, is now legalized in 11 states, including Texas, which was one of the pioneering states in this field. Mellorine generally is sold at somewhat lower prices than ice cream. But iced milks and low butterfat ice creams are being offered on

competitive price terms. Whether this new form of competition for ice cream will enlarge the total market for fats remains to be seen. Other marketing factors, such as the sale of ice cream in larger-sized containers—half gallons and over—and the increased availability of frozen desserts through the establishment of special stores and stands for iced milks such as "Tastee Freez" and "Dairy Queen" may be equally as important, if not more so, in expanding the market for fats in this popular item of consumption.

Some, but not much, expansion of fats *per caput* in food uses is possible, but the major area for expansion would seem to lie in the non-food field. The Agricultural Marketing Service of the Department of Agriculture currently is making two surveys relating to market development, one in the field of drying-oil usage and one concerning industrial uses of fatty acids. Results to date indicate the greatest potentiality of expansion for fats and fatty acids is as chemical raw materials for a variety of industries. Future expansion will depend greatly on the knowledge of the chemical and physical properties of fats and oils and their derivatives, with which oil chemists are concerned, and on the industrial applications that are developed.

Another promising field seems to lie in increased use of fats in animal feeds. As a result of increased dependence on solvent extraction methods, most of the oil in oilseed meal is now removed, to be sold at prices 4 to 5 times as high per unit of weight as the meal itself. Thus it is economic to extract as much oil as possible from the meal. Numerous feeding tests are showing however that feeding efficiency is increased for some classes of animals when the fat content of the feed is higher than is found in usual feed mixtures. To the extent that this is true it should prove to be economic to add low-cost fats such as tallow and greases to the feed mixtures. Potentially, this offers a sizeable field for expansion in the domestic use of fats, and conceivably it could reduce our dependence on uncertain foreign outlets in utilizing the abundant supplies which the United States now produces.

Summary

In summary, production of fats from domestic materials has increased over 40% since prewar. The world shortage of edible fats of early postwar years has been overcome through increased production, and, with petroleum derivatives replacing fats in some industrial uses, the United States has a surplus of fats over domestic needs. Inventories have increased. The government, through price programs, has acquired substantial stocks of cottonseed oil, linseed oil, and butter. Recent trends offer little promise of change in the high-inventory position unless extraordinary measures are taken. Lard output, now relatively low, will rise again, beginning next fall. And the effect of 1954 cotton acreage restrictions on oil production will be more than offset by increased soybean and flaxseed plantings. Although exports of low-priced tallow and greases have been gaining, exports of edible oils have declined. Domestic disappearance of fats in food uses is rising in line with population growth, but industrial use is falling, particularly in the manufacture of soap. With an abundant supply of certain inedible fats available, there is opportunity and need for chemical discovery to support new uses based on quality products and for expansion of outlets in markets heretofore little used.

[Received April 20, 1954]

In a move designed to meet the increasing purchasing responsibilities of its Industrial Chemicals Division, AMERICAN CYANAMID COMPANY, New York City, has announced the creation of the Industrial Chemicals Division purchasing department and the appointment of Robert C. Brown as division purchasing agent. The new department will be responsible for procurement of certain division requirements for its several plants.

The dyestuff department of American Cyanamid Company, Bound Brook, N. J., has two new colors which round out its line of resin fast dyes. Both dyes, Calcodur Resin Fast Gray 2G and Calcodur Resin Fast Gray B, have been developed especially for dyeing viscose or cotton fabrics which have been given durable resin finishes.

Enlargement of the capacity of the concentrator at the Creighton Mine of the INTERNATIONAL NICKEL COMPANY, Canada, Ltd., to 12,000 tons of ore per day has been announced. This development, which adds 20% to the concentrator capacity, is a step in Inco's program of providing maximum nickel production for the requirements of the free world.

Committees Named by President

THE first of the 1954-55 appointments were announced in the May issue of the Journal, and now others have been completed, according to C. E. Morris, president of the American Oil Chemists' Society:

Bleaching Methods and Refining: T. C. Smith, chairman, Central Soya Company, Decatur, Ind.

Bleaching Methods subcommittee—H. E. Seestrom, chairman, Mrs. Tucker's Products, Sherman, Tex.

P. W. Bateman, A. E. Staley Manufacturing Company, Decatur, Ill.

G. H. Benek, Filtrol Corporation, Los Angeles, Calif.

G. F. Clark Jr., Bennett-Clark Company, Nacogdoches, Tex.

R. T. Clause, Procter and Gamble Company, Ivorydale, O.

W. T. Coleman, Western Cottonoil Division, Anderson, Clayton and Company, Abilene, Tex.

E. B. Freyer, Spencer Kellogg and Sons Inc., Buffalo, N. Y.

D. L. Henry, Law and Company, Atlanta, Ga.

K. E. Holt, Archer-Daniels-Midland Company, Minneapolis, Minn.

Duncan Macmillan, Northern Regional Research Laboratory, Peoria, Ill.

E. J. Mallen, Pembina Mountain Clays Ltd., Whittier, Calif.

G. R. Thompson, Southern Cotton Oil Company, Savannah, Ga.

Refining subcommittee—G. W. Holman, chairman, Procter and Gamble Company, Ivorydale, O.

P. W. Bateman, A. E. Staley Manufacturing Company, Decatur, Ill.

O. J. Fiala, Durkee Famous Foods, Louisville, Ky.

M. W. Formo, Archer-Daniels-Midland Company, Minneapolis, Minn.

D. L. Henry, Law and Company, Atlanta, Ga.

E. J. Heider, Wilson and Company Inc., Chattanooga, Tenn.

E. M. James, Lever Brothers Company, New York City

A. A. Kiess, Armour and Company, Chicago, Ill.

N. F. Kruse, Central Soya Company, Decatur, Ind.

J. R. Mays Jr., Barrow-Agee Laboratories, Memphis, Tenn.

H. S. Mitchell, Swift and Company, Chicago, Ill. (V. C. Mehlenbacher, alternate)

F. E. Sullivan, De Laval Separator Company, Poughkeepsie, N. Y.

H. E. Seestrom, Mrs. Tucker's Products, Sherman, Tex.

E. H. Tenent, Woodson-Tenent Laboratories, Memphis, Tenn.

Glycerine Analysis: W. D. Pohle, chairman, Swift and Company, Chicago, Ill.

J. T. R. Andrews, Procter and Gamble Company, Ivorydale, O.

H. C. Bennett, Los Angeles Soap Company, Los Angeles, Calif.

E. L. Boley, Armour Auxiliaries, Chicago, Ill.

W. C. Clark, Emery Industries, Cincinnati, O.

Harold Matthews, Lever Brothers Company, Edgewater, N. J.

W. A. Peterson, Colgate-Palmolive Company, Jersey City, N. J.

J. B. Segur, Miner Laboratories, Chicago, Ill.

Arnold Troy, E. F. Drew and Company, New York City

Membership: W. A. Peterson, chairman, Colgate-Palmolive Company, Jersey City, N. J.

G. C. Henry, Law and Company, Atlanta, Ga.

T. H. Hopper, Southern Regional Research Laboratory, New Orleans, La.

E. B. Kester, Western Utilization Research Branch, Albany, Calif.

J. C. Konen, Archer-Daniels-Midland Company, Minneapolis, Minn.

F. B. White, Foster Wheeler Corporation, New York City

R. W. Bates (*ex officio*), North American Laboratory Service Inc., Chicago, Ill.

Associates—

Allan Altman, Best Foods Ltd., Ayr, Ontario

H. C. Bennett, Los Angeles Soap Company, Los Angeles, Calif.