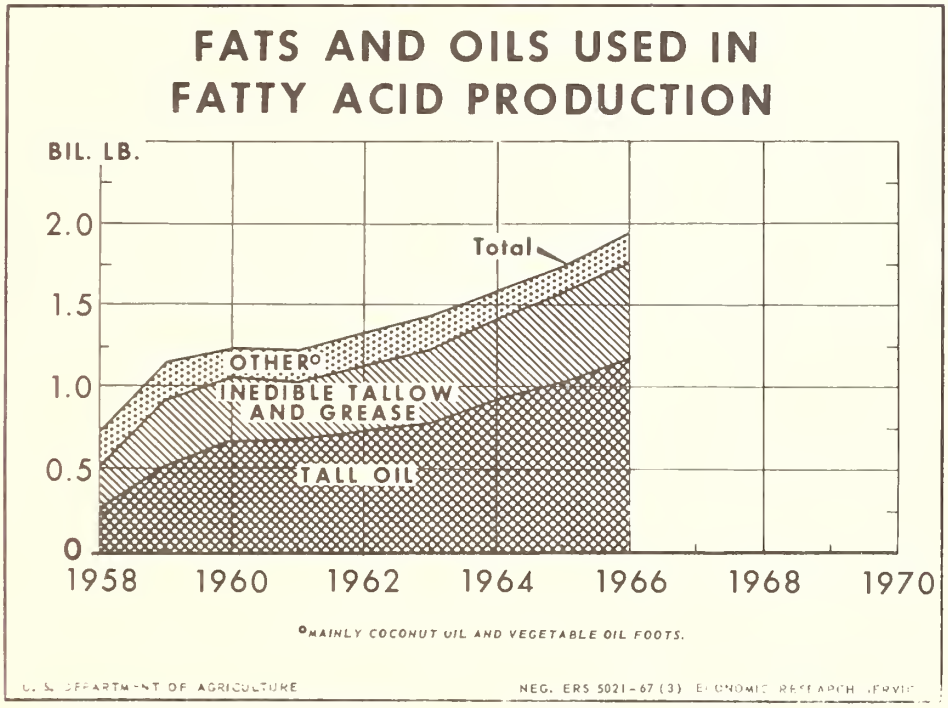
# FATTY ACIDS: AN EXPANDING MARKET FOR FATS AND OILS

By
George W. Kromer






Use of inedible fats and oils in U.S. fatty acid production has increased sharply since 1958, rising from 0.7 billion pounds that year to a record 1.9 billion in 1966. Tall oil, a byproduct of the wood pulp industry, made the greatest gain. Tall oil and inedible tallow and greases combined now account for about 90 percent of the total raw materials used.

The growth in fatty acid output has been stimulated by new uses and improved processing techniques. Fatty acids and derivatives continue to be the most promising market for inedible fats and oils as fatty acid production and its widely diversified uses continue to expand. (See page 27.)

Reprinted from the Fats and Oils Situation, FOS-237, April 1967, by the Economic and Statistical Analysis Division, Economic Research Service.

ERS-345

APRIL 1967

# FATTY ACIDS: AN EXPANDING MARKET FOR FATS AND OILS

by

GEORGE W. KROMER

U.S. production of fatty acids (all grades) has increased sharply from 462 million pounds in 1958 to a record 1,134 million pounds in 1966, according to Census data (table 17). A further increase to around 1,200 million pounds is estimated for 1967. The growth has been stimulated by new uses and improved processing techniques. Accordingly, the use of fats and oils in producing fatty acids has risen sharply. Inedible tallow and grease and tall oil currently comprise about 90 percent of the total raw materials used in fatty acid production in the United States.

The potential of fatty acids and their chemical derivatives continues to expand in almost every segment of today's industry in a wide array of products. Fatty acids are usually intermediates used in the further manufacture of everyday products in which they lose their identity, and they are generally unknown to the ultimate consumer. Fatty acids and derivatives are used in foods, emulsifiers, soap and detergents and other surface active agents, protective coatings, textile processing, rubber manufacture, lubricants, pharmaceuticals, cosmetics and toiletries, plastics and plasticizers, metallic soaps and greases, mining, metal working, waxes, candles, leather, printing ink, paper coatings, photographic supplies, napalm (jellied gasoline) and other miscellaneous items. Unfortunately, detailed data on the use of fatty acids in end-products are not available.

## SOURCE OF FATTY RAW MATERIALS

Raw materials for fatty acid production come from (1) fats and oils obtained by rendering and extraction, (2) byproduct fatty material from degumming, refining, deodorizing, bleaching, and other fat recovery and purification processes; and (3) byproduct from the manufacture of paper by the sulfate or kraft process (tall oil). The principal fats used in fatty acid production are: (1) Inedible tallow and grease; (2) tall oil; and (3) refining foots or soapstock obtained as a byproduct of the refining of edible vegetable oils.

Fatty acids make up about nine-tenths of the weight of the fats and oils (excluding tall oil) from which they are obtained. Glycerine represents around a tenth of the weight of the fats and oils from which it is split.

Fatty acids from low-priced vegetable-oil foots are limited to the raw material supply produced by the refining and purification of vegetable oils. In recent years, improvements in oil extraction and refining techniques and the alternative market of adding acidulated soapstock to animal feeds has reduced the volume of this raw material available for fatty acid production. This tightens the availability of a low cost fatty material already in limited supply. Crude vegetable oils, as distinct from foots, have been constantly priced above inedible tallow and grease.

Fatty acid production historically has been associated with soap and candle production and the up-grading of byproducts from other fat processing operations. But with improved processing techniques (mainly continuous fat-splitting and fractional distillation) closely akin to procedures used in the chemical industries, large nonfat processors have entered the field. As producers of industrial chemicals, the fatty acid industry has become more decentralized.

In recent years, tall oil has become an important source material for fatty acids. Crude tall oil contains around 7 percent neutral materials and

Table 17.--Fatty acids (all grades): Supply and disposition, 1943-67

| Calendar year | Supply | | | | Disposition | |
|---|---|---|---|---|---|---|
| | Production 1/ | Imports | Stocks, Jan. 1 2/ | Total | Exports | Domestic disappearance |
| | Mil. lb. | Mil. lb. | Mil. lb. | Mil. lb. | Mil. lb. | Mil. lb. |
| 1943 | 516 | 4 | 53 | 573 | 7 | 502 |
| 1944 | 541 | 2 | 64 | 607 | 5 | 547 |
| 1945 | 588 | 2 | 55 | 645 | 4 | 590 |
| 1946 | 621 | 1 | 51 | 673 | 3 | 611 |
| 1947 | 474 | 1 | 59 | 534 | 27 | 465 |
| 1948 | 425 | 1 | 42 | 468 | 25 | 403 |
| 1949 | 498 | 2 | 40 | 540 | 53 | 429 |
| 1950 | 651 | 3 | 58 | 712 | 60 | 584 |
| 1951 | 595 | 3 | 68 | 666 | 50 | 536 |
| 1952 | 548 | 4 | 80 | 632 | 40 | 517 |
| 1953 | 512 | 3 | 75 | 590 | 24 | 491 |
| 1954 | 500 | 3 | 75 | 578 | 15 | 487 |
| 1955 | 517 | 1 | 3/54 | 572 | 17 | 498 |
| 1956 | 545 | 1 | 56 | 602 | 27 | 514 |
| 1957 | 505 | 1 | 61 | 567 | 23 | 483 |
| 1958 | 462 | 1 | 61 | 521 | 47 | 423 |
| 1959 | 681 | 1 | 68 | 750 | 28 | 641 |
| 1960 | 708 | 1 | 78 | 787 | 45 | 646 |
| 1961 | 706 | 3 | 96 | 805 | 48 | 686 |
| 1962 | 785 | 4 | 71 | 860 | 49 | 728 |
| 1963 | 836 | 6 | 83 | 925 | 41 | 771 |
| 1964 | 936 | 7 | 112 | 1,055 | 64 | 910 |
| 1965 | 1,041 | 8 | 81 | 1,130 | 42 | 1,003 |
| 1966 4/ | 1,134 | 10 | 86 | 1,230 | 30 | 1,108 |
| 1967 5/ | 1,200 | 13 | 92 | 1,305 | | |

1/ Prior to 1949, includes fatty acids derived from tall oil.

2/ Prior to 1950, includes only fatty acids from fractionating stearic, oleic, and solid fatty acids.

3/ Method of reporting stocks changed; reported stocks for December 31, 1955, were 75 million pounds.

4/ Preliminary.

5/ ERS forecast.

Totals computed from unrounded numbers.

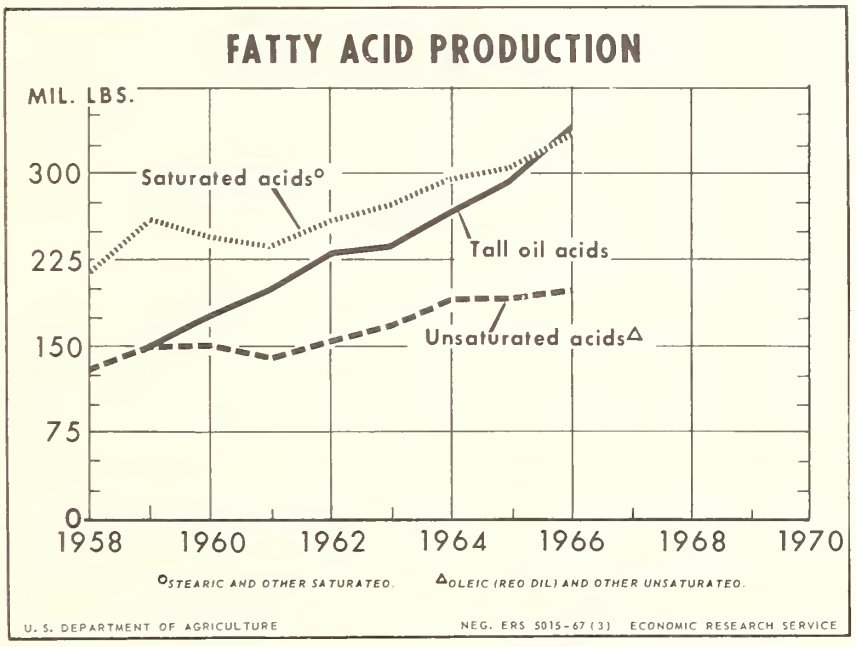
SOURCE: Bureau of the Census.

the balance is about equal parts of rosin and fatty acids. However, the fatty ratio may vary from around one-third to two-thirds of the total rosin-fatty acid content, depending upon where the pine trees are grown. According to the Pulp Chemicals Association, processing of crude tall oil by fractionation yields, on the average, the following products and percentages: Fatty acids, 25 percent, rosin acids, 40 percent, and secondary products (distilled tall oil, tall oil heads, and tall oil pitch), 35 percent. Increased capacity as well as improved techniques of fractional distillation of tall oil have boosted the output of tall oil fatty acids. Tall oil fatty acids are in strong demand because users have learned how to handle these acids and earlier prejudices have been largely overcome. Also the price of tall oil has remained relatively stable, with a constant and dependable source of supply.

## PRODUCTION OF TALL OIL FATTY ACIDS RISING RAPIDLY

Fatty acids may be divided generally into saturated and unsaturated acids. The saturated acids in their normal forms are solids at room temperature, and unsaturated acids under the same circumstances are liquids. It is possible to induce such a variety of chemical and physical modifications in fatty acids that in their numerous forms and combinations they make practically a continuous series from light liquids to dense, waxy solids.

The saturated acids (particularly stearic and palmitic) are used mainly in soap, detergents, cosmetics, candles, waxes and many chemical intermediates. The unsaturated acids (including oleic acid or red oil and tall oil fatty acids) go primarily into protective coatings, inks, metallic driers, soaps, detergents,



flotation agents, core oils, cutting oils, lubricating oils, and chemical intermediates.

Table 18 shows statistics on the production and disposition of saturated and unsaturated fatty acids, including tall oil fatty acids, as compiled by the Soap and Detergent Association (SDA). 1/ In recent years, the total for fatty acid production shown by SDA data has averaged about four-fifths of the total shown by Census. The difference probably reflects the stricter definition of production used in the SDA survey. The SDA excludes fatty acids manufactured as intermediates during continuous processes or further processed into other fatty acids as are operations involving only the hydrogenation of glycerides. The Census production data are much broader, covering "fatty acids, all grades."

The output of saturated and unsaturated fatty acids rose substantially during 1958-66, increasing 54 and 50 percent, respectively. However, the biggest increase was in tall oil fatty-acid production, which increased 170 percent during this same period. (See chart on page 29.) The rapid growth and wider acceptance of fatty acids and derivatives reflects the many technical advances made by the industry. Specialty items derived from fatty acids continue to be developed by basic producers and marketed within the industry on an expanding scale. According to the SDA shipments data for 1961-66, around 12 percent of U.S. fatty acid production entered captive use by these producers (table 18). Another 7 percent of total production was exported during the same period.

## TALLOW AND TALL OIL ACCOUNT FOR 90 PERCENT OF FATTY MATERIALS USED

The total of fats and oils used in producing fatty acids has increased from 0.7 billion pounds in 1958 to over 1.9 billion in 1966. Greater quantities of inedible tallow and greases and tall oil account for the increase (table 19). Coconut oil and vegetable oil foots make up most of the remainder and their usage remained relatively steady during this period (see cover chart). Other oils used in fat splitting include soybean, cottonseed, safflower, corn, palm, fish, linseed, castor and miscellaneous oils in smaller quantities.

While the use of inedible tallow and grease rose from 0.3 billion pounds to 0.6 billion during 1958-66 period, its share of the total of all fats and oils used remained around 31 percent. Tall oil, on the other hand, increased from 0.3 billion pounds to 1.2 billion, upping its share of the total raw materials used from 40 percent in 1958 to 60 percent in 1966. 2/ As shown in table 19, fatty acid production averaged around three-fifths of the total of all fats and oils used in its manufacture during 1958-66.

During 1935-39, soapmaking used about four-fifths of the U.S. production of inedible tallow and grease, and the output of animal fatty acids as industrial chemicals was relatively small. In 1966, about one-fourth of the total domestic use of inedible tallow was in soap and another fourth in fatty acids. Over a third was utilized in animal feeds. In addition, roughly one-half of the inedible tallow and grease produced in the United States has been exported in recent

1/ The Fatty Acid Producers' Council, a Division of the Soap and Detergent Association, is the source for data on fatty acid statistics other than tall oil. Data on the latter are provided by the Pulp Chemicals Association.

2/ The use of whole or crude tall oil in the distillation or fractionation process is reported by Census as consumed in "fatty acids;" the use in the acid refin- process is reported as consumed in "refining." The production of refined tall oil includes output of acid-refined tall oil and distilled tall oil (containing less than 90 percent free fatty acids not including resin acids).

Table 18.--Saturated, unsaturated, and tall oil fatty acids: Production and disposition, 1952-66

| Calendar year | Production | Disposition 1/ | | | |
|---|---|---|---|---|---|
| | | Domestic | Captive consumption | Exports | Total |
| | Mil. lb. | Mil. lb. | Mil. lb. | Mil. lb. | Mil. lb. |
| Saturated Fatty Acids 2/ | | | | | |
| 1952 | 175.3 | 146.1 | 25.6 | 6.8 | 178.4 |
| 1953 | 201.3 | 170.1 | 16.7 | 6.1 | 193.1 |
| 1954 | 185.1 | 162.6 | 17.6 | 7.7 | 187.8 |
| 1955 | 225.2 | 205.6 | 27.0 | 9.0 | 241.9 |
| 1956 | 228.3 | 201.9 | 26.4 | 6.5 | 235.0 |
| 1957 | 237.2 | 206.9 | 21.1 | 5.3 | 233.3 |
| 1958 | 214.5 | 191.5 | 21.0 | 5.8 | 218.4 |
| 1959 | 257.2 | 239.7 | 21.5 | 4.9 | 266.1 |
| 1960 | 245.7 | 223.8 | 27.4 | 4.9 | 256.1 |
| 1961 | 236.1 | 222.6 | 30.6 | 6.2 | 259.5 |
| 1962 | 259.8 | 241.2 | 30.0 | 5.8 | 276.9 |
| 1963 | 271.1 | 258.3 | 22.5 | 2.3 | 283.2 |
| 1964 | 297.9 | 282.3 | 24.6 | 3.6 | 310.2 |
| 1965 | 301.5 | 282.7 | 26.4 | 2.7 | 311.8 |
| 1966 | 331.9 | 303.8 | 27.1 | 3.5 | 334.4 |
| Unsaturated Fatty Acids 3/ | | | | | |
| 1952 | 190.2 | 143.8 | 25.6 | 6.8 | 198.7 |
| 1953 | 195.8 | 160.0 | 26.8 | 6.1 | 207.3 |
| 1954 | 186.5 | 152.9 | 28.6 | 7.7 | 196.1 |
| 1955 | 193.5 | 165.5 | 28.4 | 9.0 | 205.3 |
| 1956 | 177.2 | 146.4 | 26.7 | 6.5 | 186.1 |
| 1957 | 156.2 | 124.8 | 27.1 | 5.3 | 157.6 |
| 1958 | 130.9 | 107.7 | 25.9 | 5.8 | 136.9 |
| 1959 | 149.2 | 120.1 | 28.1 | 3.5 | 151.8 |
| 1960 | 149.7 | 120.9 | 28.6 | 4.9 | 154.1 |
| 1961 | 140.3 | 126.4 | 31.4 | 2.6 | 160.4 |
| 1962 | 154.1 | 131.0 | 34.3 | 2.1 | 167.4 |
| 1963 | 169.8 | 126.3 | 42.7 | 2.3 | 171.6 |
| 1964 | 191.3 | 143.1 | 51.1 | 6.0 | 200.1 |
| 1965 | 192.1 | 143.7 | 49.4 | 8.9 | 201.9 |
| 1966 | 196.1 | 147.0 | 53.7 | 5.3 | 206.0 |
| Tall Oil Fatty Acids | | | | | |
| 1959 | 149.6 | 122.7 | 2.9 | 12.5 | 138.1 |
| 1960 | 172.5 | 137.1 | 7.8 | 26.5 | 171.4 |
| 1961 | 195.6 | 170.0 | 11.7 | 29.8 | 211.4 |
| 1962 | 228.0 | 179.8 | 10.2 | 31.0 | 221.0 |
| 1963 | 238.7 | 189.1 | 12.2 | 37.1 | 238.2 |
| 1964 | 266.1 | 202.8 | 21.4 | 43.7 | 267.9 |
| 1965 | 298.2 | 236.6 | 19.8 | 45.7 | 302.0 |
| 1966 | 337.2 | 275.8 | 21.3 | 54.7 | 351.8 |
| Total | | | | | |
| 1959 | 556.0 | 482.6 | 52.5 | 20.9 | 556.0 |
| 1960 | 567.9 | 481.6 | 63.8 | 36.2 | 581.6 |
| 1961 | 572.2 | 519.0 | 73.7 | 38.6 | 631.3 |
| 1962 | 641.9 | 552.0 | 74.5 | 39.0 | 665.3 |
| 1963 | 679.8 | 573.7 | 77.4 | 41.7 | 692.9 |
| 1964 | 755.3 | 628.0 | 97.1 | 53.2 | 778.3 |
| 1965 | 791.8 | 662.9 | 95.5 | 57.3 | 815.7 |
| 1966 | 865.2 | 726.6 | 102.1 | 63.5 | 892.2 |

1/ Based on shipments. 2/ Includes stearic acid (40-50% stearic content), hydrogenated animal, vegetable, fish, and marine mammal fatty acids, high palmitic (over 60% palmitic), coconut-type acids (including coconut, palm kernel and babassu) and fractionated short chain fatty acids (such as caprylic, capric, lauric and myristic). 3/ Includes oleic acid (red oil), animal fatty acids other than oleic, vegetable and marine fatty acids.

SOURCE: Fatty Acid Producers' Council, Division of the Soap and Detergent Association; and the Pulp Chemicals Association for tall oil fatty acid statistics beginning with 1962.

years. Almost all of the tall oil produced in the United States is used domestically in making fatty acids.

The volume of fats and oils going into industrial use depends significantly on their supply, prices, and the nature of the markets. Agricultural byproducts such as fats and oils tend to show wide market fluctuations. Users accustomed to nonagricultural raw materials will often shun fats and oils because of their price instability. One reason tall oil has been able to capture a large share of the fatty acid market has been its constant and dependable supply and relatively steady price levels. In this respect, tall oil is more like a chemical product.

## PRICE TRENDS

Fatty acid production has continued upward despite the rise in raw material prices in recent years. This apparently has been possible because of the continued uptrend in the difference between prices of fatty acids and their raw materials.

In 1959, the average price of oleic acid (single, distilled, drums, N.Y.) was 18.3 cents per pound. The price of inedible tallow (No. 1 tanks, Chicago) was 5.4 cents. The spread between these two prices was 12.9 cents (table 20). In 1966, with oleic acid at 24.6 cents a pound, the difference between the two prices was 18.1 cents, an increase of 40 percent. Similarly, the price margin between stearic acid and inedible tallow widened, though by a smaller amount. In sharp contrast, the price of tall oil acids (tanks, works, less than 2 percent rosin acids) has held relatively stable at 9.0 to 9.6 cents per pound along with crude tall oil prices (tanks, works). The spread in prices between the tall oil acids and raw materials was 6.4 cents in 1966 compared with 6.1 cents in 1961.

Coconut oil prices have fluctuated widely, from 18.3 cents per pound (crude, tanks, Pacific Coast) in 1959 to 10.8 cents in 1962. Coconut oil is imported almost entirely from the Philippines and the supply varies with annual changes in copra production in that country. Coconut oil usually sells at a slightly higher price than domestic vegetable oils, such as soybean oil.

Under present conditions the prices of the crude edible vegetable oils are usually too high priced for fat splitting for use in industrial products but they are used in the food industry or for other special purposes. In 1962-66, the average price of soybean oil (crude, tanks, Decatur) was 10.0 cents per pound, nearly twice that of inedible tallow and three times the price of crude tall oil. Soybean oil is utilized primarily in food products (90 percent of total domestic disappearance last year) and its price is determined mainly in competition with other food fats and oils.

## OUTLOOK

The most promising market outlet for inedible fats and oils continues to be in chemical processing of fatty acids and derivatives. Fatty acid production and its widely diversified uses likely will continue to increase. This is in contrast to the fate of inedible fats and oils used in soap and protective coatings. Use of these has dropped sharply over the years due to increased use of synthetics. Chemical research and development probably will increase the importance of some minor uses as the industry devotes more time and effort to specialty and tailor-made products. The marketing of fatty acids and their derivatives is a very technical operation, and in many cases the products move directly from producer to fatty product manufacturers.

The supply and prices of raw materials are expected to be favorable for the fatty acid industry over the next few years. Inedible tallow and grease prices may average slightly below the 7 cents per pound level of the past 2 years as production continues to climb. But the key to tallow prices rests with the export demand, as about one-half the U.S. production moves abroad.

Table 19.--Fatty acid production and fats and oils used in manufacture, 1952-67

| Calendar year | Fatty acid production (all grades) | Fats and oils used in producing fatty acids | | | | | | Fatty acid production as % of total fats and oils used |
|---|---|---|---|---|---|---|---|---|
| | | Inedible tallow and grease | Tall oil 1/ | Coconut oil | Vegetable foots | Other | Total | |
| | Million pounds | Million pounds | Million pounds | Million pounds | Million pounds | Million pounds | Million pounds | Percent |
| 1952 | 548 | 187 | --- | 48 | 143 | 34 | 412 | 133 |
| 1953 | 512 | 252 | 2/ | 45 | 130 | 150 | 577 | 89 |
| 1954 | 500 | 242 | 2/ | 54 | 116 | 109 | 521 | 96 |
| 1955 | 517 | 278 | 2/ | 40 | 116 | 172 | 606 | 85 |
| 1956 | 545 | 286 | 161 | 45 | 99 | 54 | 645 | 84 |
| 1957 | 505 | 284 | 264 | 45 | 89 | 55 | 737 | 69 |
| 1958 | 462 | 256 | 293 | 39 | 83 | 51 | 722 | 64 |
| 1959 | 681 | 373 | 557 | 98 | 94 | 28 | 1,150 | 59 |
| 1960 | 708 | 386 | 674 | 83 | 77 | 24 | 1,245 | 57 |
| 1961 | 706 | 356 | 676 | 74 | 82 | 37 | 1,226 | 58 |
| 1962 | 785 | 411 | 720 | 56 | 92 | 41 | 1,319 | 59 |
| 1963 | 836 | 449 | 779 | 51 | 89 | 39 | 1,406 | 59 |
| 1964 | 936 | 485 | 925 | 54 | 79 | 55 | 1,598 | 59 |
| 1965 | 1,041 | 539 | 1,023 | 54 | 71 | 57 | 1,744 | 60 |
| 1966 3/ | 1,134 | 583 | 1,171 | 60 | 79 | 59 | 1,952 | 58 |
| 1967 4/ | 1,200 | | | | | | 2,050 | 58 |

1/ The use of whole or crude tall oil in the distillation or fractionation process is reported as consumed in fatty acids.
2/ Included in "other secondary products not shown separately" to avoid disclosure of figures for individual companies.
3/ Preliminary.
4/ ERS forecast.
SOURCE: Bureau of the Census.

Table 20.--Wholesale price per pound of selected fatty acids and fats and oils, 1950-66

| Calendar year | Fatty acid prices | | | | Fats and oils prices | | | |
|---|---|---|---|---|---|---|---|---|
| | Oleic acid, single distilled, drums, N.Y. | Stearic acid, double pressed, bags, N.Y. | Tall oil acids, tanks, works | | Inedible tallow No. 1, tanks, Chicago | Coconut oil, crude, tanks, Pacific Coast | Soybean oil, crude tanks, Decatur | Tall oil, crude, tanks, works |
| | | | 2% or more rosin acid | Less than 2% rosin acid | | | | |
| | Cents | Cents | Cents | Cents | Cents | Cents | Cents | Cents |
| 1950 | 17.2 | 17.0 | | | 7.6 | 18.4 | 14.0 | 2.1 |
| 1951 | 18.4 | 17.6 | | | 10.6 | 18.5 | 16.8 | 3.1 |
| 1952 | 13.7 | 12.3 | | | 4.4 | 13.6 | 11.0 | 2.8 |
| 1953 | 13.4 | 12.3 | | | 3.7 | 19.0 | 12.4 | 2.2 |
| 1954 | 16.6 | 14.4 | | | 6.1 | 16.2 | 13.3 | 2.0 |
| 1955 | 18.8 | 15.6 | | | 6.6 | 14.5 | 11.6 | 2.4 |
| 1956 | 19.4 | 16.2 | | | 6.1 | 14.2 | 13.2 | 2.5 |
| 1957 | 22.9 | 17.0 | | | 6.8 | 14.2 | 12.2 | 2.6 |
| 1958 | 18.8 | 17.7 | | | 6.9 | 14.6 | 10.5 | 2.8 |
| 1959 | 18.3 | 17.8 | | | 5.4 | 18.3 | 9.0 | 2.8 |
| 1960 | 17.4 | 16.9 | | | 4.5 | 14.3 | 8.8 | 2.8 |
| 1961 | 18.9 | 18.2 | 8.1 | 9.3 | 5.4 | 11.5 | 11.5 | 3.2 |
| 1962 | 20.6 | 19.3 | 7.6 | 9.4 | 4.5 | 10.8 | 9.0 | 3.5 |
| 1963 | 21.8 | 18.7 | 7.1 | 8.9 | 4.7 | 11.8 | 8.9 | 3.6 |
| 1964 | 22.8 | 19.9 | 7.5 | 9.5 | 5.9 | 13.4 | 9.2 | 3.6 |
| 1965 | 25.0 | 22.1 | 7.5 | 9.3 | 7.2 | 15.9 | 11.2 | 3.5 |
| 1966 1/ | 24.6 | 21.8 | 8.0 | 9.6 | 6.5 | 13.2 | 11.7 | 3.2 |
| 1967 | | | | | | | | |

1/ Preliminary.

Prices of tall oil have been relatively steady and are likely to continue so, as tall oil production continues its steady uptrend. As the demand for paper expands, the sulphate woodpulp industry expands, making possible increased output of tall oil from the increased amounts of byproduct liquors available. Continued improvement in the rate of recovery of crude black liquor soap may also boost tall oil output. In recent years, the average annual rate of increase in the output of sulphate woodpulp has been about 6 percent. The annual increase in tall oil production has been closer to 10 percent. According to trade reports, tall oil fractionation capacity (in terms of crude tall oil input) could reach about 875,000 tons per year in 1968 compared with 665,000 tons currently.

Supplies of edible vegetable oils (mainly soybean oil) will remain abundant during the next few years but prices likely will continue too high for the chemical industry, except in specialty products. Soybean crushings and soybean oil refining will continue to expand, thereby making more soybean oil foots available for the fatty acid industry.

* * * * * * * * * * * * * * * * * * * * *