

Industry & Trade Summary

Fatty Chemicals



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UNITED STATES INTERNATIONAL TRADE COMMISSION

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PREFACE

In 1991 the United States International Trade Commission initiated its current *Industry and Trade Summary* series of informational reports on the thousands of products imported into and exported from the United States. Each summary addresses a different commodity/industry area and contains information on product uses, U.S. and foreign producers, and customs treatment. Also included is an analysis of the basic factors affecting trends in consumption, production, and trade of the commodity, as well as those bearing on the competitiveness of U.S. industries in domestic and foreign markets.¹

This report on fatty chemicals covers the period 1988-92 and represents one of approximately 250 to 300 individual reports to be produced in this series during the first half of the 1990's. Listed below are the individual summary reports published to date on the chemicals and textiles sectors.

<i>USITC publication number</i>	<i>Publication date</i>	<i>Title</i>
Chemicals:		
2458	November 1991	Soaps, Detergents, and Surface-Active Agents
2509	May 1992	Inorganic Acids
2548	August 1992	Paints, Inks, and Related Items
2578	November 1992	Crude Petroleum
2588	December 1992	Major Primary Olefins
2590	February 1993	Polyethylene Resins in Primary Forms
2598	March 1993	Perfumes, Cosmetics, and Toiletries
2736	February 1994	Antibiotics
2743	February 1994	Saturated Polyester Resins in Primary Forms
2741	February 1994	Natural Rubber
2747	March 1994	Fatty Chemicals
Textiles and apparel:		
2543	August 1992	Nonwoven Fabrics
2580	December 1992	Gloves
2642	June 1993	Yarn
2695	November 1993	Carpets and Rugs
2702	November 1993	Fur Goods
2703	November 1993	Coated Fabrics

¹ The information and analysis provided in this report are for the purpose of this report only. Nothing in this report should be construed to indicate how the Commission would find in an investigation conducted under statutory authority covering the same or similar subject matter.

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INTRODUCTION

This summary covers the Commission's Fatty Chemicals trade monitoring group, which is a group of chemicals, mostly of natural origin, corresponding roughly to the oleochemicals industry. Soap and detergents are not included in this summary. The period covered is 1988-92. The summary is organized by sections on U.S. and foreign market profiles, U.S. and foreign trade measures, U.S. and foreign markets, and U.S. trade balance.

Fatty chemicals are a loosely defined class, described more explicitly in the section below, originally isolated from, or related to, natural fats. The major production of these chemicals is still from natural fats and oils. The oxo-alcohols (detergent alcohols) in this group are produced in large quantities by synthetic processes. The most significant products comprising both production and imports are stearic acid and oleic acid.

Fatty chemicals are made from natural fats and oils by hydrolysis and transamination. Detergent alcohols and amines also can be made from petro-chemical feedstocks by synthetic processes. Natural feedstocks are animal fats, vegetable oils, and tall oil, a by-product of the kraft (sulfate) process for pulping softwoods (conifers). Animal fats and vegetable oils are esters of glycerine (sometimes called glycerol), a trihydric alcohol, while tall oil is a similar chemical where rosin plays a role similar to that of glycerine.

Fatty chemicals have no significant direct consumer uses. A large proportion of primary fatty chemicals are used to make related chemical products, in the same plant or elsewhere. The end uses for fatty chemicals depend primarily upon their surface-active and lubricating properties. Fatty chemicals are incorporated into a wide variety of formulated products, such as shaving creams, shampoos, and food and beverage products. Lubricating greases are often heavy-metal soaps of fatty acids.

U.S. INDUSTRY PROFILE

Industry Structure

Products

The oleochemicals (fatty chemicals) industry generally is defined by its raw materials (animal fats, vegetable oils, tall oil¹) and its basic production processes—hydrolysis and transamination. The products of the oleochemicals industry include fatty acids, related alcohols, amides, amines and esters, glycerine, and various mono- and diglycerides. There is no specific definition of what constitutes a fatty acid, but straight, or slightly branched carboxylic acids, saturated or unsaturated, with carbon chain lengths ranging between 6 and 24, are generally recognized to

¹ Tall oil is a byproduct of sulfate (kraft) pulping of softwoods (conifers).

be fatty acids. The other fatty chemicals are those related to such fatty acids. Figure 1 shows the principal features of the structure of the fatty chemicals industry.

The principal fatty acid composition of some important natural sources of fatty acids is shown in table 1. These principal fatty acids include lauric (12 carbon atoms), myristic (14 carbon atoms), palmitic (16 carbon atoms), stearic (18 carbon atoms), oleic (18 carbon atoms, 1 double bond), and linoleic (18 carbon atoms, 2 double bonds). The three 18-carbon fatty acids are readily interconverted by hydrogenation/dehydrogenation processes. The purity and composition of commercial fatty acids varies considerably. Some fatty acids are sold as mixtures in the proportions found in the fat or oil from which they were obtained. Fatty acids are separated and purified by distillation and/or crystallization.

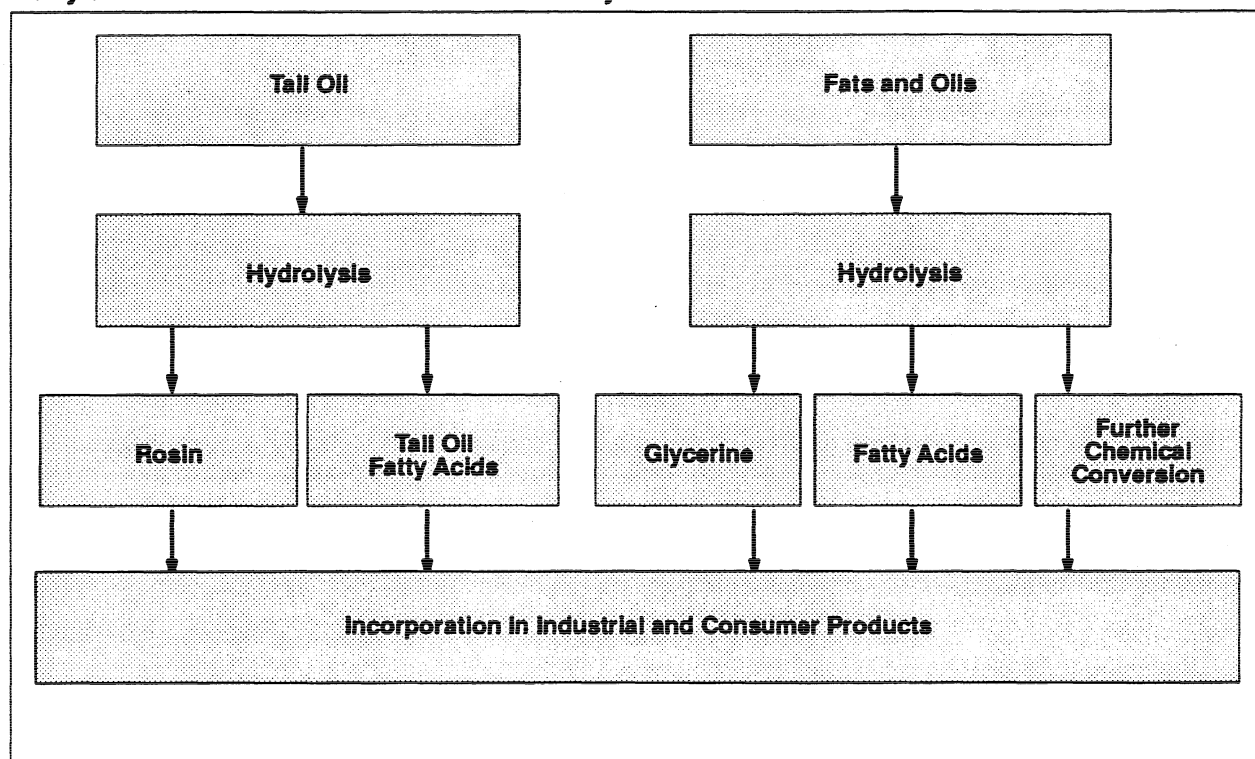
The Commission's Fatty Chemicals trade monitoring group includes principally the fatty acids (part of standard industrial classification (SIC) 2899), some fatty acid esters (SIC 2865) and salts, oleyl alcohol (SIC 2899), some other fatty alcohols made synthetically (SIC 2869), and acid oils, a by-product of vegetable oil refining (SIC 2074-6) too contaminated with breakdown products to be consumed by humans or animals. The oleochemicals industry, as normally defined, includes production of glycerine (SIC 2841) and glycerides (SIC 2899), but not synthetic (oxo) alcohols. The oleochemicals industry grew out of soap-making (SIC 2841), being based on closely related hydrolytic processes and the chemical products being used for closely related purposes. Many oleochemicals operations in the United States and abroad are associated with major soap and detergent manufacturers.

Tall oil fractionation produces a mixture of fatty acids, called tall oil fatty acid (TOFA), and rosin. The tall oil fatty acids are contaminated with difficult-to-remove rosin, which limits use of TOFA to industrial end uses, such as varnishes, inks, and coatings. Most tall oil processors are associated with, or subsidiaries of, pulp and paper companies.

Production Processes

The characteristic manufacturing process for oleochemicals is acid hydrolysis (soap is made by alkaline hydrolysis), either in a batch or continuous process. Hydrolysis (splitting) of animal fats and vegetable oils (trihydric esters of glycerine) occurs in step-wise sequence, i.e., one fatty acid comes off, then a second, then the third. Thus batch processing is suited to direct preparation of mono- and diglycerides (which can also be made indirectly, by complete breakdown to glycerine and the constituent fatty acids in continuous processes, separation and purification, followed by re-esterification to the desired products). Most fatty acid production employs continuous processing, which is more energy, labor, and capital efficient than batch processing, if the production

Figure 1
Fatty chemicals: Structure of the U.S. Industry



Source: Compiled by USITC staff.

Table 1
Typical principal fatty acid composition of commercially important sources of fatty chemicals
 (Percentage)

Source	Lauric	Myristic	Palmitic	Stearic	Oleic	Linoleic
Tallow (beef)	-	3	29	19	47	3
Cottonseed oil	1	21	2	-	33	44
Soybean oil	-	7	5	1	34	53
Palm oil	-	1	43	4	43	10
Palm kernel oil	47	14	9	1	19	1
Coconut oil	48	18	9	2	6	3
Tall oil	-	-	6	2	40	44

Note.—Percentages shown may not add to 100 percent because of other constituents not included as principal fatty acids.

Source: *Encyclopedia of Chemical Technology*, Third Ed., Vol. 4, "Carboxylic Acids," John Wiley & Sons, New York, 1978.

volumes warrant its use. However, batch processing is often preferred for processing uncommon vegetable oils because less product is off-grade due to start-up and shut-down associated with continuous processing. Batch processing is sometimes used with animal fats because animal fats may be difficult to bring up to the requisite purity and uniformity for continuous processing.

Transamination is similar to hydrolysis, except that ammonia is the reactant rather than water. Depending on processing conditions, the resultant products are fatty amides and amines, rather than fatty acids. Glycerine is a co-product of both hydrolysis and transamination.

Tall oil is fractionated into TOFA and rosin by a hydrolytic process similar to that used for fat splitting, but the chemical engineering details are different owing to the different characteristics of the two feedstocks.

Characteristics of the U.S. Industry

The U.S. industry is generally divided into three branches corresponding to the principal raw material—tall oil, vegetable oil, or animal fats—which affects both the processing and the products, and ultimately determines what the products can be used for. Tall oil fractionators normally do not handle vegetable oil or animal fats. The remaining producers are less specialized, using a variety of vegetable oils. Some also process tallow (beef fat), although most tallow is made into soap.

Four companies fractionate tall oil in 12 plants in the United States. There are about 12 companies producing the other fatty acids in about 20 plants in the United States. (The count is imprecise because several companies and plants have operations in both categories and because several companies are reorganizing and consolidating divisions after acquisitions.) The plants are principally located in the Southeast, the Midwest, and in California.

Statistical information on production, employment, earnings, R&D expenditures, capital investment, etc., is not available for this industry from government or industry sources. Several private sector organizations offer proprietary studies that estimate such parameters, particularly the production of various fatty chemicals and their consumption by end-uses. Such estimates are difficult to make because, like petrochemicals, oleochemicals are made from one another and considerable allowance must be made for the double-counting that occurs if one were to just sum the individual flows in the product streams. The major oleochemicals, particularly the fatty acids, are used both as final chemical ingredients incorporated into various consumer and industrial products and as intermediates in the manufacture of other fatty chemicals, such as esters, alcohols, amides, and amines.

Like other chemical process industries relying principally on continuous processing, the oleochemicals industry is not labor intensive (i.e., the fatty chemicals industry is relatively capital intensive), as relatively few people are needed to handle bulk inputs from tank cars or tank trucks, and the products are sold in bulk or bulk packages to other manufacturers. The chemical processing is largely automated, requiring few operators. While the processing plants may be moderately large, the technology changes slowly and regular maintenance can easily keep plants in operation for several decades, so capital consumption per unit of output is not significant. Relatively little product research is done by most oleochemical producers. Most process research tends to be done by the engineering-construction firms that hope to sell processes and equipment, but the small size of this industry, its lack of growth, and its slow capital replacement rate does not present a major business opportunity for process development by engineering firms.

The principal problems of the oleochemicals industry are those of any process industry manufacturing mostly commodity products, namely, relatively easy entry, imbalance of demand for co-products, periodic overcapacity, and consequent gluts. These problems are exacerbated by the relatively large number of producers, so any one producer is reluctant to reduce production. Inasmuch as fatty chemicals are intermediate industrial products, incorporated by other industries into their products, lower prices during periods of oversupply generally cannot effectuate market clearing. These problems are particularly onerous for the tall oil fractionators, who are limited to a single raw material, supply of which is tied to highly cyclical kraft pulp production. Further, tall oil has no other commercial uses, so the captive tall oil fractionators are under pressure to keep operating even if demand for their products is weak. Historically, the demand for rosin and for tall oil fatty acids have not been in balance.

Trends in the Industry

In production, there is a long-term trend to greater use of continuous processing, greater instrumentation and automation of process control, greater attention to energy efficiency, and more intensive processing to reduce release of residuals into environment.

The most important trend affecting the U.S. industry has been the acquisition of smaller companies by larger companies and by foreign companies, leading to consolidation, specialization, rationalization of operations and investment on a global scale, and the development of long-term integrated global investment, production, and marketing management strategies. While tall oil fractionators are being consolidated under the large U.S. pulp and paper companies, 9 of the 12 major fatty acid producers have been acquired by foreign companies within recent years.

Consumer Characteristics and Factors Affecting Demand

Fatty chemicals are used primarily as ingredients in formulated industrial or consumer products or as precursors of other chemicals. In either case, customers for oleochemicals are other manufacturers. Virtually all domestic sales of fatty chemicals are direct manufacturer-to-manufacturer transactions, although small quantities or imports may be handled by specialized dealers or agents. Fatty chemicals are bought by specification in quantities related to the purchaser's anticipated manufacturing consumption and price/shipping breakpoints (typically truckload quantities). Spot prices reflect supply/demand conditions, but there is little price discrimination between customers by suppliers. Prices of fatty acids are more variable than those of fatty chemicals several stages further advanced in chemical processing where the value-added is greater.

Fatty chemicals may be key ingredients providing essential performance characteristics of the final product, for example, detergents or lubricants, but a change in the price of fatty chemicals is unlikely to greatly stimulate or depress sales of the final product, and with it, the consumption of fatty chemicals incorporated in the final consumer or industrial product.

FOREIGN INDUSTRY PROFILE

The foreign oleochemicals industry has much the same characteristics and history as the U.S. industry. The dominant foreign oleochemical producers are detergent manufacturers who integrated backward into oleochemical production decades ago when tallow soap was the only available detergent. As in the United States, some producers specialize in tallow-based products, which in turn usually relates to indigenous beef and dairy cattle production.

Several large European and Japanese companies established large, modern facilities in tropical countries, particularly in Malaysia, Indonesia, and the Philippines, drawing on availability of supplies of palm, palm-kernel, and coconut oil. Generally organized as joint ventures between local investors and the foreign corporation, the foreign company usually providing most of the capital, technology, and technical, operational, and marketing management for oleochemicals manufacturing. Virtually all the fatty chemicals produced are exported, frequently to affiliates of the foreign investor, while the local partners have been more prominent in the associated oil seed plantations and agricultural operations. Table 2 shows the major export destinations for fatty acids and fatty alcohols produced in those three countries.

Outside the United States, tall oil processing is largely confined to Scandinavia, Austria, the United Kingdom, and Canada, i.e., countries with pine-based boreal and temperate forest products industries. A 1988 industry publication lists 26 major Western European

fat splitting plants, with an annual capacity of 1.2 million metric tons, 20 Southeast Asian major fatty acid producers with an annual capacity of 700,000 metric tons, and 9 Western European TOFA plants, with an annual capacity of 300,000 metric tons, compared with 16 major fat splitting plants in the United States (with indeterminate production capacity) and 18 TOFA plants with an annual capacity of 800,000 metric tons.²

As noted previously, several of these foreign companies have invested in the United States, primarily by acquisition of existing oleochemicals plants. As noted above, these companies are implementing global business strategies. For example, Henkel A.G. of Germany is emphasizing use of oleochemicals over petrochemicals. As a very large detergent producer, Henkel is in a position to substantially effectuate their chosen strategy without any reliance on independent detergent manufacturers who might have different preferences.

U.S. TRADE MEASURES

Tariff Measures

An explanation of tariff and trade agreement terms is contained in Appendix A. The appropriate provisions of the *Harmonized Tariff Schedule of the United States* (HTS) applicable to fatty chemicals are shown in table B-1. The table provides the 1993 column 1 rates of duty, preferential rates of duty, and U.S. exports and imports for 1992 for each 8-digit HTS subheading covering fatty chemicals. The trade-weighted average rate of duty on U.S. imports of fatty chemicals was 3.3 percent (ad valorem equivalent) in 1992. Although none of the imports of fatty chemicals were duty free under column 1 general rates, about 21 percent of the imports entered duty free under column 1 special rates.

The recently completed (December 1993) GATT Uruguay Round of trade negotiations may result in further reductions in U.S. and foreign duties on the articles covered by this summary. The Uruguay Round schedule of U.S. concessions was not available when this summary was prepared.

The North American Free Trade Agreement (NAFTA), as implemented by the North American Free Trade Agreement Implementation Act (Public Law 103-182, approved Dec. 8, 1993), provided for elimination of U.S. duties, effective January 1, 1994, on the articles covered by this summary imported from Mexico. Mexico is obligated to phase out its duties on imports of such goods from the United States over a 10-year period. The NAFTA became effective for both the United States and Mexico on January 1, 1994.

A factor in classification of fatty chemicals by U.S. Customs is their purity. For example, relatively impure crude fatty acids are classified in chapter 15 of the HTS, while more highly purified and differentiated fatty acids and their derivatives are classified in

² SRI International, *Chemical Economics Handbook*, "Fatty Acids," Menlo Park, CA, 1988.

Table 2
Fatty acids and fatty alcohols:¹ Patterns of exports from selected Southeast Asian countries to selected destinations, 1990²

Destination	Fatty chemical exporters ³					
	MYS	IND	PHL	MYS	IND	PHL
	(Million dollars)			(Million kilograms)		
United States	5	3	6	11	8	6
United Kingdom	23	4	4	78	16	6
Germany	16	7	6	43	20	10
Belgium	1	8	3	1	18	6
Japan	24	3	5	33	4	11
Korea	3	1	6	5	1	5

¹ This is *not* the same grouping of fatty chemicals as used elsewhere in this summary; this table represents the UN trade statistical groups for fatty acids plus fatty alcohols.

² Some countries report on a fiscal year basis, with varying ending dates. Note that values are believed to have been converted directly into dollars using annual average exchange rates rather than more frequently on the basis of the actual currency used in trade.

³ Country codes used in table: MYS = Malaysia, IND = Indonesia, PHL = Philippines.

Source: Compiled from United Nations Trade Statistics data tapes.

chapter 29. Subheading 3823.90.40 classifies materials of fatty origin that do not have a specific place in the HTS. Subheading 3823.90.40 also includes natural or artificial mixtures of fatty materials.

Nontariff Measures

Fatty chemicals sold for use as food additives or used in cosmetics or pharmaceuticals must meet the applicable standards under the Food, Drug and Cosmetic Act, administered by the U.S. Food and Drug Administration (FDA). These standards usually include certain purity requirements and "good manufacturing practice," a catch-all requirement that covers manufacturing processes and conditions. The FDA standards do not discriminate between products of U.S. and foreign origin. Any applicable laboratory testing fees, certification fees, or inspection fees must be paid by any producer selling fatty chemicals for such uses. However, the fees may be proportionately more burdensome for small producers than large producers and more burdensome for foreign producers than U.S. producers, as the travel costs for U.S. inspectors to visit foreign facilities are likely to be greater.

FOREIGN TRADE MEASURES

The classification of fatty chemicals used by other countries differs in detail and scope from that used by the United States in its HTS. However, the following tabulation is indicative of tariffs levied by major U.S. trading partners on certain types of fatty chemicals:

Country or region	Fatty Acids		
	Crude	Refined	Tall Oil
EU	7-8%	6.5-10%	4.5%
Japan	2.5%	3.9-4.6%	4%
Mexico	5%	15%	10%
Canada	13.1%	13.1%	Free

U.S. MARKET

Consumption and Production

No quantitative measures of U.S. production or apparent consumption of fatty chemicals are available from official or industry sources. However, shipments of fatty acids were estimated at approximately \$440 million in 1992. This estimate does not include the value of derivative fatty chemicals (which would have to be reduced by the value of the fatty acids consumed in their manufacture, if manufactured at a location other than that of the fatty acids) nor does it include the value of oxo-alcohols produced synthetically in petrochemical plants. Overall U.S. consumption of fatty chemicals is growing only very slowly. Modest increases in consumption in detergent, shampoo, etc. applications are offset by declines in usage of fatty chemicals in coatings, heavy greases, etc.

Imported fatty chemicals are considered to be of high quality, exceeding the quality available in the United States for similar grades, according to industry sources. Import penetration is increasing. As noted previously in the U.S. Industry Profile, several major companies are increasingly pursuing global business strategies for fatty chemicals that are not based on national boundaries. These strategies include specialization and greater reliance on fatty chemical production in Southeast Asia near low cost sources of tropical oils.

Imports

U.S. imports are a combination of high-valued specialty fatty chemicals from Europe and high grade/low priced basic fatty acids from Southeast Asian countries. Imports of the latter are accorded duty-free entry under provisions of the Generalized System of Preferences (GSP). During 1988-92, imports of fatty chemicals increased 64 percent by quantity to 99.0 million kilograms and 26 percent by value to

\$110.8 million (table B-2). Most of the increase in the quantity of U.S. imports since 1989 represents increased imports from Malaysia, which has added palm oil plantations and chemical processing facilities at a rapid rate. As noted previously, a considerable fraction of U.S. imports are from related companies abroad.

FOREIGN MARKETS

Foreign Market Profile

Virtually no information is available on consumption of fatty chemicals in foreign markets. Fatty chemicals are produced in significant amounts in only a few, primarily industrialized, countries. Southeast Asian production based on tropical oils is an important exception noted previously. Other countries lacking raw material sources import fatty chemicals, primarily stearic and oleic acids and oleyl alcohol, from these few producing countries. Based upon estimates of production capacity for various fatty chemicals, the United States represents about 45 percent of the total of world production capacity.³

³ USITC staff estimate, based on information contained in the *Chemical Economics Handbook*, published by SRI International.

U.S. Exports

During 1988-92, exports of fatty chemicals increased 146 percent by quantity to 210.4 million kilograms and 145 percent by value to \$273.3 million (table B-3). U.S. exports to neighboring countries, Canada and Mexico, represent the largest and third largest U.S. export markets for fatty chemicals, respectively. The Netherlands is the second largest export market. Exports to industrialized countries are a large proportion of U.S. exports. As with imports, a substantial proportion of U.S. exports are to affiliates of U.S. producers.

U.S. Trade Balance

As shown in table B-4, the overall U.S. trade surplus in fatty chemicals was as high as \$166 million in 1991, before declining slightly to \$163 million in 1992. The positive trade balance is primarily reflective of the fact that the United States is a principal producer of the raw materials from which fatty chemicals are made. In terms of total flow of trade (imports plus exports), the principal U.S. trading partners for fatty chemicals are Canada, the Netherlands, and Mexico.

APPENDIX A
EXPLANATION OF TARIFF AND TRADE AGREEMENT TERMS

TARIFF AND TRADE AGREEMENT TERMS

The *Harmonized Tariff Schedule of the United States* (HTS) replaced the *Tariff Schedules of the United States* (TSUS) effective January 1, 1989. Chapters 1 through 97 are based upon the internationally adopted Harmonized Commodity Description and Coding System through the 6-digit level of product description, with additional U.S. product subdivisions at the 8-digit level. Chapters 98 and 99 contain special U.S. classification provisions and temporary rate provisions, respectively.

Rates of duty in the *general* subcolumn of HTS column 1 are most-favored-nation (MFN) rates; for the most part, they represent the final concession rate from the Tokyo Round of Multilateral Trade Negotiations. Column 1-general duty rates are applicable to imported goods from all countries except (1) those enumerated in general note 3(b) to the HTS plus Serbia and Montenegro, whose products are dutied at the rates set forth in *column 2*, and (2) countries whose goods are subject to embargo. Goods from Albania, Armenia, Belarus, Bulgaria, the People's Republic of China, the Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Mongolia, Poland, Romania, Russia, Slovakia, Turkmenistan, and the Ukraine are currently eligible for MFN treatment, as are the other republics of the former Socialist Federal Republic of Yugoslavia. Among articles dutiable at column 1-general rates, particular products of enumerated countries may be eligible for reduced rates of duty or for duty-free entry under one or more preferential tariff programs. Such tariff treatment is set forth in the *special* subcolumn of HTS column 1. Where eligibility for special tariff treatment is not claimed or established, goods are dutiable at column 1-general rates.

The *Generalized System of Preferences* (GSP) affords nonreciprocal tariff preferences to developing countries to aid their economic development and to diversify and expand their production and exports. The U.S. GSP, enacted in title V of the Trade Act of 1974 and renewed in the Trade and Tariff Act of 1984, applies to merchandise imported on or after January 1, 1976 and before September 30, 1994. Indicated by the symbol "A" or "A*" in the special subcolumn of column 1, the GSP provides duty-free entry to eligible articles the product of and imported directly from designated beneficiary developing

countries, as set forth in general note 3(c)(ii) to the HTS.

The *Caribbean Basin Economic Recovery Act* (CBERA) affords nonreciprocal tariff preferences to developing countries in the Caribbean Basin area to aid their economic development and to diversify and expand their production and exports. The CBERA, enacted in title II of Public Law 98-67, implemented by Presidential Proclamation 5133 of November 30, 1983, and amended by the Customs and Trade Act of 1990, applies to merchandise entered, or withdrawn from warehouse for consumption, on or after January 1, 1984; this tariff preference program has no expiration date. Indicated by the symbol "E" or "E*" in the special subcolumn of column 1, the CBERA provides duty-free entry to eligible articles, and reduced-duty treatment to certain other articles, which are the product of and imported directly from designated countries, as set forth in general note 3(c)(v) to the HTS.

Preferential rates of duty in the special subcolumn of column 1 followed by the symbol "IL" are applicable to products of Israel under the *United States-Israel Free Trade Area Implementation Act* of 1985 (IFTA), as provided in general note 3(c)(vi) of the HTS. Where no rate of duty is provided for products of Israel in the special subcolumn for a particular provision, the rate of duty in the general subcolumn of column 1 applies.

Preferential rates of duty in the special subcolumn of column 1 followed by the symbol "CA" are applicable to eligible goods originating in the territory of Canada under the *United States-Canada Free-Trade Agreement* (CFTA), as provided in general note 3(c)(vii) to the HTS.

Preferential nonreciprocal duty-free or reduced-duty treatment in the special subcolumn of column 1 followed by the symbol "J" or "J*" in parentheses is afforded to eligible articles the product of designated beneficiary countries under the *Andean Trade Preference Act* (ATPA), enacted in title II of Public Law 102-182 and implemented by Presidential Proclamation 6455 of July 2, 1992 (effective July 22, 1992), as set forth in general note 3(c)(ix) to the HTS.

Other special tariff treatment applies to particular *products of insular possessions* (general note 3(a)(iv)), goods covered by the *Automotive Products Trade Act* (APTA) (general note

3(c)(iii)) and the *Agreement on Trade in Civil Aircraft* (ATCA) (general note 3(c)(iv)), and *articles imported from freely associated states* (general note 3(c)(viii)).

The *General Agreement on Tariffs and Trade* (GATT) (61 Stat. (pt. 5) A58; 8 UST (pt. 2) 1786) is the multilateral agreement setting forth basic principles governing international trade among its 111 signatories. The GATT's main obligations relate to most-favored-nation treatment, the maintenance of scheduled concession rates of duty, and national (nondiscriminatory) treatment for imported products; the GATT also provides the legal framework for customs valuation standards, "escape clause" (emergency) actions, antidumping and countervailing duties, and other measures. Results of GATT-sponsored multilateral tariff negotiations are set forth by way of separate schedules of concessions for each

participating contracting party, with the U.S. schedule designated as Schedule XX.

Officially known as "The Arrangement Regarding International Trade in Textiles," the *Multifiber Arrangement* (MFA) provides a framework for the negotiation of bilateral agreements between importing and producing countries, or for unilateral action by importing countries in the absence of an agreement. These bilateral agreements establish quantitative limits on imports of textiles and apparel, of cotton and other vegetable fibers, wool, man-made fibers and silk blends, in order to prevent market disruption in the importing countries—restrictions that would otherwise be a departure from GATT provisions. The United States has bilateral agreements with many supplying countries, including the four largest suppliers: China, Hong Kong, the Republic of Korea, and Taiwan.

APPENDIX B
STATISTICAL TABLES

Table B-1

Fatty chemicals: Harmonized Tariff Schedule subheading; description; U.S. col. 1 rate of duty as of Jan. 1, 1993; U.S. exports, 1992; and U.S. Imports, 1992

HTS subheading	Description	Col. 1 rate of duty as of Jan. 1, 1993		U.S. exports, 1992	U.S. imports, 1992
		General	Special ¹		
<i>Million dollars</i>					
1519.11.00	Stearic acid	3.3¢/kg + 6%	Free (A,E,IL,J) 1.6¢/kg + 3% (CA)	89	82
1519.12.00	Oleic acid	3.3¢/kg + 5%	Free (A,E,IL,J) 1.6¢/kg + 5% (CA)	6	2
1519.13.00	Tall oil fatty acids	5%	Free (CA,E,IL,J)	2	1
1519.19.20	Other industrial monocarboxylic fatty acids derived from coconut, palm-kernel or palm oil	5%	Free (A,E,IL,J) 2.5% (CA)	0	13
1519.19.40	Other industrial monocarboxylic fatty acids	5%	Free (E,IL,J) 2.5% (CA)	0	15
1519.20.20	Oleyl alcohol	7.9%	Free (E,IL,J) 3.9% (CA)	0	3
1519.20.40	Other industrial fatty alcohols derived from fatty substances of animal or vegetable origin	5%	Free ((E,IL,J) 2.5%	0	13
1519.20.60	Other industrial fatty alcohols	3.7%	Free (E,IL,J) 1.8% (CA)	0	1
2915.70.00	Palmitic, acid, stearic acid, their salts and esters	5%	Free (A,CA,E,IL,J)	23	10
2915.90.10	Other fatty acids of animal or vegetable origin	5%	Free (A,CA,E,IL,J)	0	9
2916.15.10	Oleic, linoleic or linolenic acids	4.9¢/kg + 5%	Free (CA,E,IL,J)	3	1
2916.15.50	Salts or esters of oleic, linoleic or linolenic acids	4.4%	Free (A,CA,E,IL,J)	3	>1
3823.90.40	Fatty substances of animal or vegetable origin and mixtures thereof	4.6%	Free (A,CA,E,IL,J)	24	10

¹ Programs under which special tariff treatment may be provided, and the corresponding symbols for such programs as they are indicated in the "Special" subcolumn, are as follows: Generalized System of Preferences (A); Automotive Products Trade Act (B); Agreement on Trade in Civil Aircraft (C); United States-Canada Free-Trade Agreement (CA); Caribbean Basin Economic Recovery Act (E); United States-Israel Free Trade Area (IL); and Andean Trade Preference Act (J).

Source: U.S. exports and imports compiled from official statistics of the U.S. Department of Commerce.

Table B-2
Fatty chemicals: U.S. imports for consumption, by principal sources, 1988-92

Source	1988	1989	1990	1991	1992
Quantity (1,000 kg)					
Germany	(1)	24,759	21,366	19,546	15,319
France	(1)	5,145	5,738	3,994	8,864
Netherlands	(1)	5,145	5,649	7,752	7,552
Malaysia	(1)	11,925	21,001	16,989	26,043
Canada	(1)	9,986	9,664	10,103	13,314
Philippines	(1)	7,048	8,340	6,579	7,317
United Kingdom	(1)	1,896	2,253	5,854	2,353
Japan	(1)	905	771	833	870
Denmark	(1)	768	683	611	124
All other	(1)	6,139	13,056	15,923	17,255
Total	60,252	74,223	88,522	88,184	99,011
Value (1,000 dollars)					
Germany	(1)	33,988	31,039	26,810	19,810
France	(1)	7,992	10,298	9,394	15,701
Netherlands	(1)	11,110	11,972	15,920	13,754
Malaysia	(1)	5,898	8,128	7,922	11,784
Canada	(1)	7,514	7,301	8,892	10,977
Philippines	(1)	7,443	7,048	5,840	6,298
United Kingdom	(1)	4,535	3,209	6,349	5,369
Japan	(1)	4,284	3,979	4,330	3,660
Denmark	(1)	2,045	1,900	3,379	3,617
All other	(1)	8,432	10,637	13,877	19,849
Total	87,720	93,242	95,509	102,711	110,839
Unit value (dollars per kg)					
Germany	(1)	1.37	1.45	1.37	1.29
France	(1)	1.55	1.79	2.35	1.77
Netherlands	(1)	1.97	2.12	2.05	1.82
Malaysia	(1)	.49	.39	.47	.45
Canada	(1)	.75	.76	.88	.83
Philippines	(1)	1.06	.85	.89	.86
United Kingdom	(1)	2.39	1.42	1.08	2.28
Japan	(1)	4.73	5.16	5.20	4.21
Denmark	(1)	2.67	2.78	5.53	8.06
All other	(1)	1.37	.81	.87	1.15
Average	1.31	1.26	1.08	1.16	1.12

¹ Country-level detail is provided only for years in which there are actual trade data under the *Harmonized Tariff Schedule of the United States* (HTS).

Note.—Because of rounding, figures may not add to the totals shown.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table B-3

Fatty chemicals: U.S. exports of domestic merchandise, by principal markets, 1988-92

Market	1988	1989	1990	1991	1992
Quantity (1,000 kg)					
Canada	(1)	28,171	36,824	41,888	43,028
Netherlands	(1)	34,724	23,511	35,283	35,367
Mexico	(1)	19,741	19,424	25,133	26,616
Japan	(1)	20,048	16,975	21,320	19,232
Germany	(1)	5,280	4,110	3,846	5,914
United Kingdom	(1)	5,280	6,408	11,089	10,979
South Korea	(1)	2,014	4,069	5,714	7,421
Taiwan	(1)	3,543	3,877	4,960	7,074
France	(1)	1,437	3,045	7,564	7,842
All other	(1)	23,288	36,106	40,721	46,913
Total	85,427	143,526	154,348	197,517	210,385
Value (1,000 dollars)					
Canada	(1)	37,160	41,539	46,050	45,486
Netherlands	(1)	40,761	33,298	43,761	39,318
Mexico	(1)	24,902	26,516	36,783	34,887
Japan	(1)	29,085	24,280	32,189	29,491
Germany	(1)	5,987	9,323	9,051	14,491
United Kingdom	(1)	6,189	12,671	17,670	13,350
South Korea	(1)	3,783	6,261	10,258	11,374
Taiwan	(1)	6,079	5,788	7,292	10,376
France	(1)	2,476	4,487	8,330	9,968
All other	(1)	37,579	46,030	56,877	64,415
Total	111,697	194,001	210,192	268,251	273,347
Unit value (dollars per kg)					
Canada	(1)	1.32	1.13	1.10	1.30
Netherlands	(1)	1.17	1.42	1.24	1.11
Mexico	(1)	1.26	1.37	1.46	1.31
Japan	(1)	1.45	1.43	1.51	1.53
Germany	(1)	1.13	2.27	2.35	2.48
United Kingdom	(1)	1.17	1.98	1.59	1.22
South Korea	(1)	1.88	1.54	1.80	1.53
Taiwan	(1)	1.72	1.49	1.47	1.47
France	(1)	1.72	1.47	1.10	1.27
All other	(1)	1.61	1.27	1.40	1.37
Average	1.31	1.35	1.36	1.36	1.30

¹ Country-level detail is provided only for years in which there are actual trade data under the *Harmonized Tariff Schedule of the United States* (HTS).

Note.—Because of rounding, figures may not add to the totals shown.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table B-4

Fatty chemicals: U.S. exports of domestic merchandise, imports for consumption, and merchandise trade balance, by selected countries and country groups, 1988-92¹

(Thousand dollars)

Item	1988	1989	1990	1991	1992
U.S. exports of domestic merchandise:					
Canada	(2)	37,160	41,539	46,050	45,486
Netherlands	(2)	40,761	33,298	43,761	39,318
Mexico	(2)	24,902	26,516	36,783	34,887
Germany	(2)	5,987	9,323	9,051	14,683
Japan	(2)	29,085	24,280	32,189	29,491
France	(2)	2,476	4,487	8,330	9,968
United Kingdom	(2)	6,189	12,671	17,670	13,350
Malaysia	(2)	239	196	201	414
South Korea	(2)	3,783	6,261	10,258	11,374
Taiwan	(2)	6,079	5,788	7,282	10,376
All other	(2)	37,340	45,834	56,676	64,001
Total	111,697	194,001	210,192	268,251	273,347
EU-12	(2)	62,290	66,412	87,270	87,962
NAFTA	(2)	62,062	68,055	82,833	80,373
ASEAN	(2)	4,955	6,640	9,018	10,747
U.S. imports for consumption:					
Canada	(2)	7,514	7,301	8,892	10,997
Netherlands	(2)	11,110	11,972	15,920	13,754
Mexico	(2)	708	1,319	1,727	2,555
Germany	(2)	33,988	31,039	26,810	19,810
Japan	(2)	4,284	3,979	4,330	3,660
France	(2)	7,992	10,298	9,394	15,701
United Kingdom	(2)	4,535	3,209	6,349	5,369
Malaysia	(2)	5,898	8,128	7,922	11,784
South Korea	(2)	11	0	0	9
Taiwan	(2)	3	38	0	254
All other	(2)	17,198	18,227	21,367	26,945
Total	87,720	93,242	95,509	102,711	110,839
EU-12	(2)	61,228	60,278	63,122	60,408
NAFTA	(2)	8,223	8,620	10,620	13,553
ASEAN	(2)	13,444	16,560	17,577	26,563
U.S. merchandise trade balance:					
Canada	(2)	29,646	34,238	37,157	34,488
Netherlands	(2)	29,651	21,326	27,841	25,564
Mexico	(2)	24,193	25,197	35,056	32,332
Germany	(2)	-28,002	-21,716	-17,759	-5,126
Japan	(2)	24,801	20,301	27,859	25,831
France	(2)	-5,515	-5,811	-1,064	-5,733
United Kingdom	(2)	1,653	9,462	11,321	7,981
Malaysia	(2)	-5,659	-7,932	-7,720	-11,370
South Korea	(2)	3,772	6,261	10,258	11,365
Taiwan	(2)	6,076	5,750	7,282	10,121
All other	(2)	20,143	27,607	35,308	37,056
Total	23,978	100,758	114,683	165,540	162,508
EU-12	(2)	1,062	6,134	24,148	27,554
NAFTA	(2)	53,839	59,435	72,213	66,820
ASEAN	(2)	-8,489	-9,920	-8,559	-15,816

¹ Import values are based on customs value; export values are based on f.a.s. value, U.S. port of export. U.S. trade with East Germany is included in "Germany."

² Country level detail is provided only for years for which there are actual trade data under the Harmonized Tariff Schedule of the United States (HTS).

