Fats & Oils News

Soy pioneer bows out, others grow bigger

The soy processing industry is undergoing major reshaping, with pioneer A. E. Staley Manufacturing Co. moving out of the business, major processor Cargill Inc. growing even larger and several firms starting up edible oil refining operations.

"What we're seeing is some of the traditional old hands are getting out, some new people are getting in, and some big operations are getting bigger," Don Morehart, Central Soya's director of marketing for its refined oil division, said.

According to American Soybean Association economist Tommy Eshleman, Cargill may have become temporarily the largest domestic soybean crusher when it purchased six soybean processing facilities from Ralston Purina. That purchase, first announced in October, was finalized Jan. 2, 1985. Ten days later, however, A. E. Staley Manufacturing Co. announced it had sold its soy processing business to Illinois-based Independent Soy Processors Co., owned by a general partnership of individuals associated with Archer Daniels Midland (ADM) and including ADM as a minority partner.

"Before the Ralston Purina purchase, Cargill was the second largest crusher, with ADM in first place," Eshleman said. "With an ADM-affiliated company buying Staley's five plants, ADM might be considered No. 1 again by a slight edge. If not No. 1, ADM is close to the top." He added, "There's no question, the two biggest are getting bigger. What we are seeing is just a natural survival of the fittest. The marginal producers are getting out and getting into more profitable operations."

For instance, Staley, also a major corn refiner, in October agreed to buy CFS Continental Inc., the nation's second largest supplier to the food service business. Ralston Purina, meanwhile, in October acquired ITT's Continental Baking Co.

The sale of soybean operations by both Ralston Purina and Staley is seen as a shift in their marketing emphasis from commodities heavily affected by grain price fluctuations to higher-priced consumer products with more stable earnings.

Eshleman said he believes such companies wouldn't have considered getting out of the industry except for the hard times of the past three to four years.

"For the last four years, the crushing industry in the U.S. and Western Europe has been depressed, chiefly because of farm prices and farm exports. It just hasn't been as profitable to crush," he said. Eshleman noted that U.S. soybean exports are increasingly in bean form, rather than meal or oil. "One reason for this is our main competition—South America, particularly Brazil and Argentina—encourages soybean meal and oil exports. So their crushing capacities are expanding."

However, in the U.S., there is an excess in crushing capacity, Eshleman noted. In 1979, a record 1.123 billion bushels of soybeans were crushed in the U.S. In the marketing year 1983/84, only 983 million bushels were crushed. "For the 1984/85 marketing year, we're estimating a crush of 1.01 billion bushels," Eshleman said.

The Ralston crushing facilities acquired by Cargill are in Bloomington, Illinois; Lafayette, Indiana; Iowa Falls, Iowa; Kansas City, Missouri; Louisville, Kentucky, and Raleigh, North Carolina. A seventh plant, at Memphis, Tennessee, was not offered for sale but instead was being scaled down for closing in February.

With the acquisition, Cargill has 20 soybean processing facilities in the Midwest and Southeast. Cargill's 14 other soybean processing plants, with daily crushing capabilities ranging from 20,000 bushels to 120,000 bushels, are in Osceola, Arkansas; Gainesville, Georgia; Chicago, Illinois; Cedar Rapids (two plants), Des Moines and Sioux City, Iowa; Wichita, Kansas; Savage, Minnesota; Fayetteville, North Carolina; Sidney, Ohio; Hartsville, South Carolina; Memphis, Tennessee, and Chesapeake, Virginia.

Cargill also has soy refineries in Gainesville, Chicago, Des Moines, Wichita, Fayetteville and Hartsville. A seventh, under construction in Sioux City, Iowa, is expected to be completed this summer. It will utilize crude oil produced at the Sioux City crushing plant, which is capable of crushing 16 million bushels of soybeans annually.

Other Cargill oilseed facilities include flax and sunflowerseed operations to produce linseed oil and sunflower oil at Riverside, North Dakota, and sunflowerseed cleaning and handling operations in Breckenridge, Minnesota. It also has corn processing plants in Dayton, Ohio; Cedar Rapids, Iowa, and Memphis, Tennessee. A fourth, under construction in Eddyville, Iowa, is expected to go on stream this spring. In addition, Cargill has four peanut facilities, in Dawson, Edison, Leslie and Sylvania, Georgia, for processing shelled peanuts and peanut butter.

The Staley operations purchased by Independent Soy Processors include an integrated soybean crushing and refinery complex in Des Moines, Iowa, and crushing facilities in Fostoria, Ohio; Mexico, Missouri; Frankfort, Indiana, and Champaign, Illinois. The Des Moines automated refinery can produce one million pounds of oil a day. ASA's "Soy Bluebook" shows the crushing capacities at Fostoria, Mexico, Frankfort and Champaign total nearly 6,000 tons of soybeans a day.

Richard Burkett, a spokesman for Independent Soy Processors, is an ADM company official. Burkett could not be reached for comment for this article. However, Independent Soy Processors began leasing the former Staley facilities to ADM the day the sale was completed.

Staley spokesman Dave Satterfield explained that the sale reflected a changing philosphy of the company: "The analysis of our soybean business probably would have taken place even without the CFS purchase. It just didn't fit in with the long term growth goals of our company."

Satterfield said that Staley will purchase soy protein on the open market for its edible soy concentrate products. Ralston Purina, likewise, said it will buy what it needs on the open market for manufacturing its animal feed products.

In other developments in the industry, Central Soya has started up its third edible oil refinery. The refinery, in Bellevue, Ohio, went on stream in late 1984. It is designed to process six tank cars (360,000 pounds) of oil a day. Other

Central Soya refineries are at Decatur, Indiana, and Chattanooga, Tennessee. The three refineries give Central Soya the capability of producing 42 tank cars (2,520,000 pounds) of oil a day.

Central Soya has nine soybean crushing facilities, seven of them domestic. According to ASA's "'84 Soya Bluebook," the domestic plants are rated to handle approximately 10,000 tons of soybeans a day. Locations are Bellevue, Chattanooga and Decatur, as well as Delphos, Ohio; Gibson City, Illinois; Indianapolis, Indiana, and Marion, Ohio. The two other facilities are in Utrecht, The Netherlands, and the Victory Soya Mills in Toronto, Canada.

In addition, a number of companies are entering the edible oil refining business.

A prime example is Ag Processing Inc., a cooperative based in Omaha, Nebraska. Ag Processing is constructing its first edible oil refinery to add to its six soybean crushing facilities. The refinery, expected to be completed in 1985, is adjacent to Ag Processing's crushing facilitiy in St. Joseph, Missouri. It is rated to handle 12 tank cars (720,000 pounds) of oil a day.

In addition to the St. Joseph plant, Ag Processing operates crushing plants at Van Buren, Arkansas; Dawson, Minnesota, and Eagle Grove, Sergeant Bluff and Sheldon, Iowa. Total crushing capacity is approximately 11,000 tons a day.

"With our capacity, we are the only major processor without a refinery. Building one was a logical expansion," Bill Lester, Ag Processing vice president, said.

Meanwhile, two poultry-related firms are constructing refineries.

Perdue Inc. of Salisbury, Maryland, is building its first edible oil refinery at Salisbury adjacent to an existing crushing operation. The new operation, scheduled to be completed in the spring, will have a 12 tank car (720,000 pounds of oil) a day capacity. Keith Darby, general manager of refined oil for Perdue, said the company in the past has sold the crude oil to other refineries. When Perdue's refinery goes on stream, he said, the resulting oil will be marketed as Perdue brand soybean salad oil, margarine oils and shortening oils.

In addition, Townsend's, an integrated broiler production company and competitor of Perdue, is building its own soybean refinery adjacent to its crushing facility in Millsboro, Delaware. Completion also is set for the spring. Seth Taylor, Townsend's merchandising manager, said the refinery will handle 12 tank cars (720,000 pounds) of oil a day.

According to ASA's "1984 Soya Bluebook," the Perdue crushing facility in Salisbury has a 700 ton a day capacity, while a second crushing plant, at Cofield, North Carolina, is rated at 600 tons a day. Townsend's existing Millsboro crushing facility is rated at 1,200 tons a day.

USDA Outlook: Export patterns shifting

A noticeable shift in oilseed markets has occurred during the past decade, according to a USDA Foreign Agricultural Service official who spoke at USDA's Outlook '85 conference held in December in Washington.

"There's been a shift in who's importing," Richard McDonnell said, pointing out that while the European Community and Western Europe remain important importers, developing countries represent the fastest growing oilseed markets.

According to figures cited by McDonnell for 1974/75 through 1978/79 and 1979/80 through 1983/84, the developing countries' share of world soybean and soybean meal imports has grown since 1974/75 while the developed countries' share has declined and the planned economies' share stayed essentially unchanged.

He pointed out that in 1974/75, Mexico, Taiwan, South Korea, Venezuela, Indonesia and Malaysia imported 1.1 million tons of soybeans; by 1983/84, the amount had nearly quadrupled.

"What's noteworthy here is that these six developing countries actually stepped up imports during a period when the world was experiencing an economic recession, a deterioration of the global debt crisis and the rapid rise in the value of the U.S. dollar—all factors that tend to limit import growth."

McDonnell said he doesn't believe such growth can be sustained at the same rate for the next 10 years but that there is room for continued growth. "Per capita consumption of meal and oils in these countries is far from saturated," he said.

The fastest growing vegetable oil importers, in terms of tonnage, have been developing and planned (Communist bloc) economies, McDonnell said. "The world's fastest growing oil market during 1976/77 and 1983/84 was the USSR, whose imports grew by 82,000 tons annually." The USSR, India, Pakistan, Nigeria and Turkey accounted for 40% of the growth in world vegetable oil trade during that time period. In the USSR and Nigeria, however, soy oil represented only a relatively small amount of the total growth in oil imports, while in the other three countries, soy oil accounted for 50% or more of the total oil import growth. India, Pakistan, Iran, Morocco and Turkey accounted for 55% of total world import growth for soy oil during the same time frame.

McDonnell said Communist bloc countries offer potential import growth but are unpredictable markets. Citing the USSR's purchase of 2.8 million tons of soybean meal in 1982/83, McDonnell said, "Most analysts were forecasting Soviet 1983/84 meal imports at 3 million tons or more." Actual Soviet imports for that year, however, totalled only 600,000 tons.

McDonnell said the EC accounted for 45% of U.S. soybean exports in the latter part of the 1970s. Currently, the European Community purchases only one third of U.S. soybean exports and 40% of U.S. soybean meal exports. (For further information on U.S. oilseed trade, see Tables I, II and III.)

World production of the major oilseeds in 1984/85

TABLE I

Soybean Trade (million metric tons)

	1983/84 Prelim.	1984/85 Est.
Exports		
World	26.1	26.7
U.S.	20.1	21.5
S. America	5.1	4.2
Imports		
EC	9.5	10.0
Other W. Europe	4.0	4.0
Japan	4.7	4.8
USSR and E. Europe	1.8	1.9
Selected LDC's[1]	4.2	4.4

[1] Mexico, South Korea, Taiwan, Indonesia, Malaysia and Venezuela.

Source: Foreign Agricultural Service, Oilseeds and Products Division, November 1984.

TABLE II

Soybean Oil Trade (1,000 metric tons)

	1983/84 Prelim.	1984/85 Est.
Exports		
World[1]	3,181	3,127
U.S.	823	680
EC[1]	334	366
Brazil and Argentina	1,362	1,450
Spain and Portugal	550	520
Imports		
India	750	600
Pakistan	350	330
Middle East/N. Africa	698	800
Latin America	566	585
Eastern Europe	108	158

[1] Excluding EC intra-trade.

Source: Foreign Agricultural Service, Oilseeds and Products Division, November 1984.

totalled 185.3 million tons, up nearly 20 million tons from the 165.7 million tons recorded for 1983/84.

Oilseed session panelists projected total domestic demand for fats and oils should grow by 350 million to 400 million pounds during 1984/85, while world vegetable oil consumption should grow 3.5% to 4%.

"However, if we don't see a larger pickup in meal demand, we're not going to see a normal increase in oil consumption," McDonnell said.

Speaking on the domestic soybean outlook, Roger Hoskin of USDA's Economic Research Service said soybean acreage rebounded in 1984 to 68.3 million acres. Although yields recovered from 1983 drought-reduced levels to 28.5 bushels per acre, it was the second year below trend, Hoskin said. USDA in early December estimated 1984 crop soybean production at 1,902 million bushels (51.76 million metric tons), a decline from the 2,028 million bushels estimated in September. Oilseed session discussant Dale Gustafson of the securities-commodities firm Drexel Burnham Lambert cautioned these figures might be revised further downward in January due to wet weather which delayed harvesting. USDA figures released in January, in

TABLE III

U.S. Production and Exports (1,000 metric tons)

	1983/84	1984/85
Sunflowerseed (Sep-Aug)		
Production	1,451	1,664
Exports	1,047	1,000
EC	375	
Mexico	458	
Portugal	160	
Sunflowerseed oil (Oct-Sep)		
Production	204	228
Exports	188	170
Egypt	55	
Venezuela	51	
Cottonseed oil (Oct-Sep)		
Production	352	552
Exports	137	256
Egypt	31	
Venezuela	55	
Peanuts (Aug-Jul)		
Production (in-shell)	1,495	1,998
Exports (shelled)	253	306
EC	137	
Canada	64	
Japan	26	

Source: Foreign Agricultural Service, Oilseeds and Products Division, November 1984.

fact, reduced the soybean production figure to 1,861 million bushels, soybean acreage to slightly more than 66 million acres and average yield to 28.2 bushels an acre.

Hoskin warned the crushing industry would find little relief in the one billion bushel crush projected for 1984/85. "The 'crush for oil' that was in evidence last spring will likely persist in 1984/85," he said. He pointed out that while historically 65% of the cash value of crush is contributed by soy meal versus 35% for oil, soybean oil's contribution during 1983/84 averaged 43%." He said soy oil's larger share is likely to continue for the 1984/85 marketing year as well, although at a smaller percentage than in 1983/84.

Predicting soybean ending stocks for 1984/85 to total 200 million bushels (5.4 million metric tons), Hoskin said slack soybean meal demand will limit crush and price performance. Soy meal domestic disappearance was forecast to reach 18.3 million tons in 1984/85, a 4% improvement over 1983/84 but not sufficient to overcome slack in meal exports, projected at 5.6 million tons, the second lowest since 1976.

Hoskin said lower soybean meal demand and lower meal prices will limit crush, resulting in only a 2.6% increase in oil production from the 1983/84 level. He predicted domestic soy oil disappearance to reach 9.75 billion pounds (4.4 million metric tons) in 1984/85.

Soybean oil prices, Hoskin said, will likely average 29 cents a pound in 1984/85 and should be relatively low near harvest and rise throughout the season. Agreeing, Gustafson estimated oil prices at 28 cents a pound and soybean meal at $150 a ton.

Claiming that fundamentals are similar for other U.S. oil crops, Hoskin said U.S. cottonseed production had rebounded to about 5.3 million tons in 1984/85, with crush

expected to rise sharply to 3.8 million tons. Meanwhile, sunflowerseed production was estimated to have increased to 1.83 million tons.

Oilseed panelists, citing poor demand, high interest rates, the strong U.S. dollar and increased world production, were pessimistic about prospects for growth of U.S. soybean exports in 1985.

"We're looking for an additional half million tons of soybeans imported by European countries, and only a slight increase by the USSR, Eastern Europe and Japan," said McDonnell.

The panel also predicted increasing competition in the soybean product share of the market, particularly from Argentina which is crushing more domestically and exporting the product, versus exporting the bean. In addition, panelists predicted a 10% increase in soybean acreage in Argentina during 1985 on the heels of a large increase last year.

Meanwhile, McDonnell noted, increasing palm oil production will offer strong competition in the next year and for the next four to five years.

Gustafson estimated the apparent product demand domestically for soybean oil, cooking oils and margarine at 11.5 billion pounds. He projected total U.S. demand for all fats and oils will go up 350 to 400 million pounds, with domestic soybean oil disappearance at 9.7 billion pounds and exports of 1.6 billion pounds.

He also predicted a domestic crush of 1,025 million bushels for the 1984/85 season, but added, "We have the potential for poor quality in soybeans and cottonseed because of free fatty acids in the crude oil. This could require more crude oil to meet domestic demand." For instance, he said, while normal refining loss is 7% to 8%, there could be as much as 15% to 16% loss in cottonseed refining this year.

Noting the importance of the meal and oil ratio in soybeans, Gustafson said the 1983/84 crop year produced a record oil yield of 11.3 pounds to the bushel, resulting in 510 million more pounds of oil, while the meal yield dropped dramatically. Based on temperatures in the late summer, Gustafson said, oil yields from the 1984 crop should run around 11.05 pounds per bushel, with meal projected to run about 47.5 pounds per bushel, compared to 47.3 pounds last year.

Gustafson projected domestic soybean meal disappearance at 19 million tons, with meal exports down 100,000 to 150,000 tons.

"We have seen an unnerving trend, that of consumer resistance to consuming red meat. So there is not the strong animal sector," he said. However, he added, 1985 should offer some erosion of the U.S. dollar and expansion of livestock numbers.

The panel noted protein feeds such as wheat and corn gluten have been substituted for soybean meal this year and that rapeseed production, up three-fold, and sunflowerseed production, up five-fold, will mean additional competition.

Hoskin said 1985 U.S. soybean acreage probably will remain the same as in 1984, ranging between 67 and 70 million acres. Outlining possible production based on three acreage alternatives and three yield alternatives (Table IV),

TABLE IV

1985 U.S. Soybean Production Alternatives

Yield	Assumed acreage planted (Assumed acreage harvested) 67.0 (65.7)	68.5 (67.2)	70.0 (68.7)
	(Million bushels)		
Low (28.5 bu/a 1983/84)	1870	1915	1960
Trend (30.7 bu/a)	2017	2063	2110
High (31.5 bu/a 1982/83)	2070	2115	2165

Hoskin said. "If 1984 yields are repeated in 1985, then regardless whether acreage is 67 million or 70 million, production will likely be about the same as this year's. However, if yields return to trends, production will exceed two billion bushels under all three acreage scenarios. If 1982 yields were repeated, production approaches 95% of record production on just 67 million acres."

U.S. crushing trends: fewer, larger plants

The fats and oils processing industry in the United States continues a trend of more production from fewer facilities, according to data from recently released preliminary reports of the 1982 Census of Manufactures.

There were a total of 233 vegetable oil mills operating in 1982, according to the preliminary reports, compared to 260 in 1977 (Table I). A total of 26,500 persons were employed at oil mills in 1982, compared to 28,500 at the time of the 1977 census.

Data on production at the nation's oil mills is shown in Table II. The preliminary reports show 40.8 million tons of soybeans were processed in 1982, compared to 23.4 million tons in 1977; cottonseed processing totaled 4.5 million tons in 1982, up from 3.9 million tons in 1977, and peanut usage was 133,900 tons in 1982, compared to 135,500 in 1977. Usage of sunflowerseed in 1982 was 389,200 tons, and usage of flaxseed was 286,600 tons; the reports did not provide 1977 usage for sunflowerseed or flaxseed.

Oil mill production figures reflect crude oil and once-refined oil production. Oil that is further refined is included in the report on shortening and cooking oils (Table III).

While consumption and usage of shortening and cooking oils has risen in the United States, generally lower prices for fats and oils in 1982 compared to 1977 mean that the value of production, while higher in current dollars, declined in terms of constant dollars.

The Census of Manufactures reports also show the reported quantity of oilseeds and oilseed products used by various other industries.

The pet food industry, for example, used about 177,900 tons of fats and oils in 1982, about the same as 1977's 178,600 ton usage. Pet food production used about 725,000 tons of soybean cake and meal and 14,800 tons of cottonseed cake and meal in 1982, compared to 616,400 tons and 51,700 tons, respectively, in 1977.

In the realm of human food, the 1982 report showed 105 million pounds of fats and oils were used in confectionery products and another 93.6 million pounds were used in chocolate and cocoa products. Comparable figures

TABLE I

Fats and Oils Manufacturing Units, Employes and Capital Expenditures[a]

	Year	Number of establishments	Number of employes (1,000)	New capital expenditures (million dollars)
Soybean oil mills	1982	137	9.3	115.8
	1977	121	9.4	72.3
	1972	94	9.1	41.9
	1967	102	8.0	21.2
	1963	102	6.5	10.2
Cottonseed oil mills	1982	77	5.1	59.6
	1977	97	5.2	13.0
	1972	115	5.5	9.9
	1967	150	5.4	4.9
	1963	188	8.5	12.5
Other vegetable oil mills	1982	29	1.3	6.9
	1977	42	1.5	7.4
	1972	31	1.1	3.0
	1967	41	1.7	1.9
	1963	47	2.0	1.6
Animal and marine fats and oils	1982	386	10.8	56.0
	1977	500	12.4	53.3
	1972	511	11.6	31.0
	1967	588	13.7	21.7
	1963	615	14.3	13.7

[a]Source: 1982, 1977 Census of Manufactures. Fiscal data reported in current dollars for year of report, not adjusted for inflation.

TABLE II

Fats, Oils, Byproducts Production (million pounds)

	1982	1977
Soybean oil mills		
Crude oil	11,107.3	8,847.6
Degummed	4,468.9	4,918.2
Nondegummed	6,638.4	3,353.0
Once refined oil	9,060.2	7,513.9
Cake, meal and other byproducts		
Meal	47,918.0	36,465.0
Flour and grits		907.5
Lecithin	84.4	98.2
Millfeed	1,633.4	1,285.4
Cottonseed oil mills		
Crude oil	1,553.7	1,276.5
Once refined oil	1,281.1	1,155.7
Cotton linters	739.8	669.5
Cake and meal	4,326.0	3,471.8
Hulls	2,563.6	1,995.4
Other byproducts	N.A.	187.5
Other vegetable oil mills		
Linseed oil		
Raw and boiled	141.2	222.9
Processed	154.9	249.2
Linseed cake and meal	296.2	426.8
Coconut oil, once refined	767.0	729.4[a]
Peanut oil		
Crude	157.6	245.4
Once refined	135.7	150.4
Peanut cake and meal	288.8	416.6
Sunflowerseed oil		
Crude	295.2	70.3[a]
Once refined	N.A.	N.A.
Sunflower cake and meal	457.0	N.A.
Animal and marine products		
Inedible tallow	3,677.7	
Grease	1,202.4	
Feed and fertilizer byproducts		
Meat and meal tankage	6,819.8	4,838.0
Meat meal and bone meal	5,419.8	3,536.6
Dry rendered tankage	1,400.0	1,274.6
Feather meal	376.8	346.6
Other byproducts	2,015.4	1,158.6
Fish and marine animal oil	298.8	212.3
Fish scrap and meal	667.8	551.2

[a]Data not provided in preliminary Census of Manufactures; figure from Current Industrial Report data.

TABLE III

Shortening and Cooking Oils—Quantity of Production for All Purposes (million pounds)

	1982	1977
Baking or frying fats (100% vegetable oil)	3,538.5	2,965.7
100% animal fat or blends of vegetable oil and animal fat	1,486.7	1,103.8
Hydrogenated oils other than baking or frying fats	31.9	309.2
Salad or cooking oils		
Soybean		
Partially hydrogenated	3,870.5	3,258.7
Other	509.5	227.4
Cottonseed	396.4	356.7
Mixtures of vegetable cooking and salad oils	260.1	364.0
All other cooking or salad oil	780.3	296.9
Vegetable oil winter stearin	85.4[a]	34.9[a]
Margarine oil, except corn	101.0	449.4
All other fully refined oils	138.9	119.4
Margarine	2,776.0	2,532.6

[a]Quantity of product shipments; production quantity figures not given in Census of Manufactures preliminary report.

from 1977 were 68.5 million pounds and 76.4 million pounds.

The cookies and crackers industry, during 1982, used 126,000 tons of 100% vegetable shortening, 261,700 tons of animal shortening and blends of animal and vegetable shortenings, 174,700 tons of lard and 134,900 tons of other fats and oils of all types. Comparable figures for 1977 were listed as 233,500 tons, 90,500 tons and 178,200 tons for the first three categories, respectively. No 1977 usage data for "other fats and oils" was given.

Producers of canned and cured seafoods used 50.4 million pounds of fats and oils (purchased as such) during 1982, the census reports said.

Natural and processed cheese manufacturers used about 87.9 million pounds of fats and oils in 1982; no 1977 usage figure was given.

Frozen food products, including frozen pot pies, other dinners, pizza and bakery goods, used about 292.6 million pounds of fats and oils in 1982, the report said; no figure for 1977 was listed.

Miscellaneous food products—including snack chips, sour cream dips, dry salad dressing mixes, dairy product substitutes and peanut butter—used approximately 571.3 million pounds in 1982 compared to 739.1 million pounds in 1977, according to the report. Such products also used about 589.5 million pounds of peanuts, most of which probably were used to produce the 734.7 million pounds of peanut butter produced in 1982, up from 595.3 million pounds produced in 1977.

The final report for the 1982 Census of Manufactures should be available sometime in 1985 and may be purchased through the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. *JAOCS* will publish the document number and its cost when that information becomes available.

Clinic salutes Cavanagh

Cottonseed processors were given some practical tips on evaluating incoming seed and heard of a new pre-extraction device at the 34th annual oilseed processing clinic held during late January in New Orleans by the Mississippi Valley Oilseed Processors Association.

The practical advice on "Cottonseed Requirement for

Crushing or Processing" came from former AOCS President George Cavanagh. The association dedicated the meeting to Cavanagh to recognize his contributions to the industry during more than 40 years with Ranchers Cotton Oil in California. Cavanagh retired from the firm recently.

Cavanagh's talk outlined ways to check seed quality. As seed is received, a quick physical examination for moisture or off-odor can indicate seed quality. A follow-up moisture test by a calibrated analyzer is recommended, he said. Such tests are used to decide whether and how to store seed, as well as how long it can safely be stored. Some mills use a mold inhibitor, such as propionic acid, for seed with over 12% moisture, he said, usually adding one or two pounds of inhibitor per ton of seed. In some cases, the inhibitor is mixed with diatomaceous earth for easier handling, he said.

Seed grade determination is based on foreign matter, moisture and volatile matter content, oil content, free fatty acids and nitrogen content, he said. National Cottonseed Products Association (NCPA) trading rules specify how these factors are weighted to determine seed grade.

Bill Hendrick, vegetable oil consultant, described the use of "expanders" in extrusion of oilseed before solvent extraction. Expanders extend extractor capacity with reduced steam usage in oil processing, Hendrick said.

An expander consists of a worm shaft inside a steel casing, he explained, similar to a screw press. The expander, however, is solid and does not permit oil to escape. The oily material is forced (under pressure) through dies at the end of the barrel, expanding as it is released, absorbing any free oil. The pellets from the expander must be handled gently to reduce breakage and fines, but all the fines are expanded, he said. With low- and medium-content oilseeds, such as cottonseed and soybeans, expanders do a suitable job of preparing the oilseeds for extraction; with high-content oilseeds, prepressing before the expander process seems to work best, he said.

Cottonseed and soybean material from the expander need to be reduced about 2% in moisture and cooled to 145 to 150 F before being fed to an extractor; corn germ, rice bran and similar materials must be heat dried, as they leave the expander with a 15 to 18% moisture content, Hendrick said.

The rapid expansion as the pellet leaves the dies creates a porous substance that presents a large surface area to the solvent in the extractor. "Because of this very large surface, intimate contact with the solvent is obtained and extraction is quite rapid with only a minimum of final solvent wash necessary," Hendrick said. Regular extracted flaked meats contain about 33% solvent and expander pellets contain about 20%, he said. The porosity increases drainage, and the increased specific weight of the material results in a 30% to 40% increase in extractor capacity, Hendrick said. In desolventization, steam consumption drops about 1,100 pounds an hour based on 440 tons of soybean or 660 tons of cottonseed per day, he added.

Expanders have been used about 25 years, but only about the past seven years in the United States, he said. Others at the meeting said expanders have been used on cottonseed by ADM and Anderson Clayton, on soybeans by Bunge and on corn by ADM.

Hendrick said expanders usually are installed just before the material enters the solvent plant, often using conveyors and elevators already installed. The expander uses about 550 pounds of steam per hour, again based on 440 tons of soybeans or 660 tons of cottonseed. Expanders can process about 40,000 tons of clean seed, properly prepared, before major maintenance is needed, he said.

J.R. Wilkerson of Chickasha Cotton Oil Co. in Fort Worth, Texas, reviewed export market potential for cottonseed oil. The NCPA, in cooperation with the USDA Foreign Agricultural Service, has sent trade teams to various nations to promote cottonseed oil. In Japan, cottonseed oil has been extensively promoted as a quality oil, Wilkerson noted, with a popular gift item being a package of three one-pound containers of cottonseed oil. Japan has begun to buy cottonseed from China, Wilkerson noted. In Venezuela, a cottonseed processing technician was sent to work with refiners, and the potential market for 1985 is estimated at 60,000 tons of cottonseed oil, Wilkerson said. In the Dominican Republic, where peanut oil is the traditional edible oil, cottonseed oil is now blended with peanut oil.

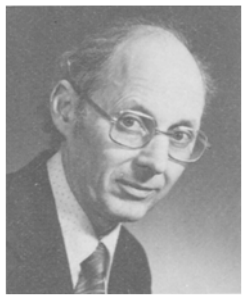
Alan Ater, vice president for commodity trading at Anderson Clayton, discussed the importance of export development, advertising and promotion, research, new uses and quality control to maintain and expand cottonseed oil markets. Quality control may be the most important factor in market penetration, Ater said, in that it is the one factor that individual oil mill operators can control. "Low quality or, almost as bad, inconsistent quality in oil, meal and linters causes our customers many problems," he said. "This naturally increases their cost and is reflected either in low prices or market share—sometimes both."

David Bush of Rogers Cottonseed Co. reported on that firm's continuing efforts with glandless cottonseed. Rogers grew about 23,000 acres of glandless cotton in 1984, he said. Researchers are working with 75 advanced strains and 2200 new progenies aiming toward the production of food-grade kernels and flakes. Glanded cottonseed contains gossypol, a toxic pigment for nonruminants, which must be removed to produce food or feed for nonruminants. That processing step is not necessary for glandless cottonseed.

Other reports at the meeting included papers on biotechnology, the National Cotton Council research program, use of cottonseed as shrimp feed, cogeneration, Cotton Incorporated's research program, several research projects aimed at identifying the characteristics in growing seed that might produce drought-resistant varieties and research relating to aflatoxin. Preprints of some papers are available from the USDA Southern Regional Research Center, PO Box 19687, New Orleans, LA 70179. Shirley Saucier of the center served as conference coordinator.

Profile: Frank Gunstone

A non-golfer at home in St. Andrews



Frank Gunstone, chemistry professor at the University of St. Andrews, Scotland, and AOCS Award in Lipid Chemistry winner for 1973, became a lipid scientist almost by accident.

It was 1943 when he was preparing to take finals for a chemistry undergraduate degree and "in wartime," he recalls, "we weren't entirely free agents." The British government was looking at the resources of the colonies and, that same year, asked T. P. Hilditch, noted chemist and Gunstone's professor at Liverpool University, to head a government-funded group to investigate new oilseeds. Hilditch told his chemistry class that he could employ two graduates in his labs to work on fats and oils research. Gunstone applied for, and was given, a job. In 1946, he left Liverpool with a Ph.D. degree in lipid chemistry. He has become the foremost British scientist engaged in the investigation of the chemistry of fatty acids and their derivatives and is noted particularly for his contributions to the knowledge of the chemistry of naturally occurring and synthetic oxygenated fatty acids.

Gunstone had always liked the idea of teaching, but in those days, he wanted to be a teaching missionary. The product of a Methodist upbringing, he had hoped to be accepted for service in China, but the church committee turned him down on the bases that they considered him unsuited to missionary life and that he would have been a bad investment.

Instead, Gunstone accepted a position as a lecturer in chemistry at Glasgow University, where he often found himself teaching students, older than he, who had been fighting men in the war. He remained heavily involved as a local preacher and, 18 months later, married Eleanor Hill, the girl from his Liverpool church, who wasn't too thrilled about moving to Glasgow, but agreed that it might be "better than China." For the two of them, 1948 began a long and cherished relationship with Scotland, which has become very much their home, even though, after 35 years, they're still not quite 'locals.' Gunstone remarks that his three children, all born and bred in Scotland, have had to live down the sad fact that both parents came from South of the Border.

In 1954, Gunstone was offered a position at St. Andrews, one of the most prestigious universities in Britain, where the chemistry department had only eight staff as opposed to a huge department at Glasgow. Dr. Gunstone felt that, by moving, he could have more influence in shaping the department and the kinds of chemistry courses taught. It was also, he says, a marvelous place to bring up a family.

A lovely old town on Scotland's east coast, St. Andrews is 50 miles from Edinburgh and a 20-minute bus ride from the nearest railway station. The only large hotel serves visitors to the world-famous Old Golf Course, part of the spectacular view from the picture windows in Gunstone's chemistry lab. He doesn't play, himself, and is often introduced by American friends as the 'Scotsman' who doesn't play golf or drink Scotch.

Gunstone has led research on organic chemistry, frequently returning to lipid chemistry, for the past 30 years. He was the first chairman for the lipid group of the Royal Society of Chemistry and has also chaired the oils and fats group of the Society of Chemical Industry. From 1962-68, he was a member of the Consultative Committee on Oils and Oilseeds, and the Tropical Products Institute; he belonged to the International Committee on Lipid Nomenclature from 1963-67. Gunstone has been a member of AOCS since 1967 and has received grants from the Science Research Council, the Carnegie Trust, the Ministry of Overseas Development, Procter and Gamble, Unilever Ltd. and other companies and organizations.

Five years ago, Kurt Berger of the Palm Oil Research Institute of Malaysia invited Dr. Gunstone to chair the PORIM advisory committee for technology and end use. Gunstone has since visited Malaysia four times and is now into his second three-year contract. This month he will be there to teach a course on fatty acids and lipids at PORIM for the third time.

As a teacher, his influence has spread far beyond the St. Andrews campus, through lecture tours in India and Argentina and through his textbooks, which include an authoritative work on fat chemistry. He is known for his painstaking presentation of material, his clarity of exposition and his empathy—Gunstone feels he usually has a good sense of what's going on on the other side of the bench. He remembers his own teacher, Professor Hilditch, with reverence, although Hilditch was a strict supervisor rather than a charismatic tutor, and there was a considerable gap in years between the two. Nevertheless, Gunstone says Hilditch was the acknowledged "giant" in fat chemistry in Europe in the second quarter of this century, and it definitely carried weight to have been one of his students. Besides, Hilditch always had a soft spot for Frank Gunstone, who was one of his few proteges to choose academia above industry.

In the 10 years since Gunstone won the AOCS Award in Lipid Chemistry (a framed certificate hangs on the wall of his office), he has directed much of his energy toward university administration. He was dean of the faculty of science for three years and vice principal of the university for four. Although there has been a drop in the rate of his publications, Gunstone has found his university activities

fulfilling and necessary. He says it was something he was invited to do and couldn't turn down. He was pleased to accept the challenge. The last three years, in particular, he says, have been tough ones for British universities, largely because of funding problems, and he has been able to play a significant role in guiding the university in new directions as a member of its restructuring committee.

In 'lab time,' Gunstone has continued his work on the chemistry of fatty acids, which, he claims, has usually been academic, not applied, that is, "industry is not waiting for my discoveries." Nevertheless, Gunstone's chemistry comes nearer to the real world than he'll admit. His collaboration with industrial concerns has fostered studies such as oxidation in the cold storage of meat and the use of antioxidants in fish meal. He's also participated in research projects with Cadbury Schweppes, investigating, in particular, the melting behavior of fats, which is important to the chocolate industry.

Frank Gunstone's fascination with fatty acids, and what can be done with them, has endured. Half of his PhD thesis concerned the autoxidation of fatty acids, a topic which has continued to interest him. Now Gunstone's own research assistants are studying autoxidation. He finds it amusing to think that the wheel has come full circle and he will end his academic life more or less where it began.

Gunstone, now only a few years from the mandatory retirement age of 65, is at the top of the ladder. As a professor (a status in Britain, rather than an occupation), he holds a personal chair in the chemistry department of some 18 faculty members. At present, his consulting activities mean he is always 'on call' for questions concerning the testing of primrose oil, or the viability of other new oilseeds. Once he limits his teaching and research activities, Gunstone believes his contact with industry will diminish, though he is anxious to continue in a consulting capacity as long as he is able.

He hates the thought of "just pottering, doing a little bit of chemistry." In fact, he hates to do anything half-heartedly. Several years ago, Gunstone and his wife purchased 25 acres of land with an old country house, parts of which are over 200 years old, which Gunstone says makes it "good business for the plumbers." Eighteen months ago, Eleanor Gunstone left her job at the marine laboratory working as a histologist and now devotes herself to politics and the administration of women's athletics in Scotland. Dr. Gunstone says he would enjoy "looking after" his estate, although "farming is too grand a word." He wouldn't even call himself a gardener, "just a tidier."

New Central Soya CEO

Donald P. Eckrich has been elected president and chief executive officer of Central Soya Co. Inc., effective Jan. 8, 1985. He succeeds Douglas G. Fleming, who announced his intent to retire early. Fleming will continue as Central Soya's chairman until the end of the company's fiscal year, Aug. 31, 1985. Eckrich, a director of Central Soya since October 1982, previously served for 10 years on the board of directors of Beatrice Foods Co.

Meanwhile, Central Soya shareholders have elected Joseph W. Gillespie, Ian M. Rolland and Thomas M. Shoaff to the board of directors.

In other company news, the board of directors has approved capital proposals for two of the company's soybean processing facilities. A $7.3 million project at Victory Soya Mills in Toronto, Ontario, Canada, includes a fluidized bed grain dryer and conditioner and extensive upgrading of processing equipment to improve efficiency and product quality. In addition, a fluidized bed dryer and conditioner will be installed at the Indianapolis, Indiana, plant in a $3.6 million project to increase plant capacity and expand the soybean meal product line.

Capital City buy out

Dillon, Read & Company, Inc., an investment banking firm, has announced that a group led by its affiliate, Saratoga Partners, has purchased Capital City Products Company from Stokely-Van Camp Inc., a wholly owned subsidiary of The Quaker Oats Company. The investor group includes the key executive officers of Capital City. Price for the transaction, which was concluded in December, was approximately $50 million.

Capital City, with headquarters in Columbus, Ohio, manufactures a number of detergent products as well as products derived from edible vegetable oils. Its facilities are in Kearny, New Jersey; Janesville, Wisconsin, and Columbus, Ohio.

Capital City said after the transaction that it would retain its current management team. Richard E. Helland, company president, has assumed the additional title of chief executive officer, while John B. LaFontaine continues to serve as executive vice president. Leonard J. Delehanty, former president of Stokely-Van Camp, is chairman of Capital City's board of directors.

In other company news, Steven J. Laning, director of research and development, has been appointed vice president of research and development.

Helland, LaFontaine and Laning are members of the AOCS.

New clay facility announced

American Colloid Company, a major producer of bentonite clay, has announced it expects a mid-1985 start-up for a new acid-activated clay production facility in Aberdeen, Mississippi.

Capacity of the plant was announced as 15,000 tons a year. Acid-activated clay is used for processing of animal and vegetable fats and oils as well as refining of mineral oils. The Aberdeen site already has a bentonite facility producing clays for the metal castings, agricultural and chemical industries.

Potential users interested in obtaining technical details and samples should contact John Hughes at American Colloid Company, 5100 Suffield Court, Skokie, IL 60077 (telephone 312 966 5720).

Fats & Oils News

Tofu standards drafted

The Standards Committee of the Soyfoods Association of America has drawn up standards for tofu to protect consumers and to provide the industry with guidelines for quality products. The association expects the Food and Drug Administration to use the standards as a reference in place of the brief description sheet previously used. The Soyfoods Association says it also intends to write standards for soy sauce, soymilk, miso and tempeh. Questions or suggestions concerning the standards may be directed to Tom Timmins, Chairman, Soyfoods Association Standards Committee, c/o Tomsun Foods, 305 Wells St., Greenfield, MA 01301. One of the committee members is AOCS member John DeMan of the Department of Food Science, University of Guelph, Ontario, Canada.

SRRC's Ory retires

Robert L. Ory, research leader for Biochemical Mechanisms Research, USDA Southern Regional Research Center, retired Jan. 3, 1985, after 32.5 years with the center.

Ory, a member of AOCS since 1971, is continuing work as a collaborator at the USDA laboratory. He also is retaining his position as adjunct professor of food science at Virginia Polytechnic and State University. Ory said he plans to do consulting work on food enzymes and peanuts, his primary research areas. Ory is general chairman of the 1987 AOCS annual meeting, slated for New Orleans.

Soymilk booklet available

The Taiwan office of the American Soybean Association has limited copies available of a booklet, "Soymilk: A Drink from the Great Earth," written by Steve Chen, ASA's country director in Taiwan. The booklet gives general information about soymilk, its nutritional properties, production and markets. For a copy, write to Steve Chen, American Soybean Association, PO Box 3512, Taipei, Taiwan R.O.C. 100.

More on lipoxygenase research

The December 1984 *JAOCS* article on soymilk mentioned work in Japan to develop a soybean cultivar devoid of lipoxygenase. Those interested in pursuing this topic may wish to consult two articles written by D. F. Hildebrand and T. Hymowitz concerning the absence of specific lipoxygenase isozymes in soybeans. The articles, based on research done at the Department of Agronomy, University of Illinois at Urbana-Champaign, are "Two Soybean Genotypes Lacking Lipoxygenase-1," published in *JAOCS*, May 1982, pp. 583-586, and "Inheritance of Lipoxygenase-1 Activity in Soybean Seeds," published in *Crop Science*, Vol. 22, July-August 1982, pp. 851-853.

FOSFA International

H. Fochem of Henkel & Cie GmbH of Dusseldorf, West Germany, has been elected president of FOSFA International. Other officers for the current year are J. Fabry, Lesieur Alimentaire in Boulogne Billancourt, France, vice president; J. W. Kendall, British Peanut Council Ltd. in London, honorary treasurer; M.M.F. McKenna, Croda Premier Oils Ltd. of Hull, England, assistant honorary treasurer. The other member of the executive council will be M. J. Dalton of Percy Dalton (London) Ltd., the immediate past president. FOSFA, the Federation of Oils, Seeds, and Fats Associations, is a group of firms involved in international trade.

FPRF elects new officers

The Fats and Proteins Research Foundation Inc. has elected Jack R. Barensfeld of A. W. Stadler Inc., Cleveland, Ohio, chairman for 1985. Other officers include Warren Alcock, Van Idestine Co. Inc. of Newark, New Jersey, vice-president, and Eddie Murakami, Baker Commodities, Los Angeles, California, as secretary-treasurer. Chief staff officers for the organization are David Gilcrest, president, and Larry Davis, director of technical services. The foundation, affiliated with the National Renderers Association, works to expand use of animal by-products through funding of research studies.

News briefs

AOCS member **Carole Ann Whittaker** has been elected to her third term as president of the Jojoba Growers Association. Another AOCS member, **Hal C. Purcell**, is vice president. The Jojoba Growers Association has helped form a Jojoba Industry Task Force to identify areas of research and development needed for commercializing jojoba.

Glenn F. Cunningham has joined the Birmingham, Alabama, office of Rust International Corporation as an industrial salesman.

Harshaw/Filtrol Partnership has named **John M. Stubbs** vice president of sales.

Mike Turpen has been appointed plant operations manager for Ag Processing Inc. at its plant in St. Joseph, Missouri.

Ralston Purina is among the companies that have joined the Soyfoods Association of America. Current president of the Soyfoods Association is Gary Baret, chairman of the board of Legume Inc. of Montville, New Jersey.

Escher Wyss GmbH of Ravensburg, West Germany, has changed its name to **Sulzer-Escher Wyss** to reflect its relationship to the Sulzer Group.

The **Synthetic Organic Chemical Manufacturers Association** has announced it will consolidate its Scarsdale, New York, and Washington, D.C., offices into a single location in the Washington area. The move is expected to be completed by Aug. 1, 1985.