Fats, Oils Production on the Rise

Price increases in past season attributed to reduced soy oil, palm oil supplies

World fats and oils production is rebounding from last year's unanticipated decline that sent prices upward and temporarily made oil, not protein, the dominant fraction in oilseed crushing.

Worldwide production of five major edible oils was higher in the second quarter of 1984 than during the first quarter. Third quarter production is expected to be higher than second quarter production. The normal cycle is for production to decline through the second and third quarters before rising in the fourth quarter, after northern hemisphere crops are harvested.

The two key factors this past year were the relatively small U.S. soybean harvest and a decline in palm oil production in Malaysia (Table 1). Sunflower, rapeseed and coconut oil production also declined for 1983/84, but the decline was not as dramatic as that for soy and palm oils. The third quarter of 1984 will be one of tight supplies until the U.S. soybean harvest begins in the fourth quarter.

The 1983 U.S. soybean harvest was approximately 43.3 million metric tons (MT), compared to the 1982 harvest of 60 million MT (2.2 billion bushels). The decline resulted from less acreage (69.8 million acres harvested in 1982 vs. 62.2 million in 1983) and lower yields (31.9 bushels/acre in 1982 vs. 25.7 bushels/acre in 1983). Acreage was lower principally because of a federal crop reduction program for feed grains and cotton that led to an acreage reduction for virtually all major U.S. crops. Yields were lower because of a drought. For 1984, however, the forecast is for a soybean harvest of 1.8 billion (50 million MT) to 2.2 billion bushels (61 million MT). That forecast was made by the U.S. Department of Agriculture in mid-June. The most important variable will be the weather during the growing and harvesting seasons.

Malaysian palm oil production dropped from 3.4 million MT in calendar year 1982 to about 3.02 million MT in calendar year 1983. The decline has been attributed to stress reaction by trees to overproduction in previous seasons and to dry weather (see separate article on Malaysia). By mid-June 1984, however, palm oil production was higher than had been anticipated for the second quarter of 1984, leading to a decline in palm oil prices. Total 1984 palm oil production in Malaysia has been forecast at 3.4 million MT to 3.6 million MT.

Prices for fats and oils worldwide rose in late 1983 and into 1984 as the short supplies became apparent. A year ago on the Chicago Board of Trade, soybean oil for delivery in July 1984 could be bought for 20 cents a pound; by June of 1984, that oil cost 34 cents a pound and had been as high as 39 cents a pound. Malaysian palm oil, available for $419 a metric ton in Europe in April 1983, cost $951 a metric ton in May 1984.

Oil became the dominant economic factor in oilseed crushing. Normally it is the demand for protein for livestock feed that determines crushing volumes. But reduced oilseed supplies pushed oilseed protein prices high enough that livestock feeders used alternate feedstuffs or reduced hard size. There are no alternates to fats and oils for human foods.

While fats and oils may be substituted for each other, soy oil and palm oil are the dominant oils in international trading. As their prices rose, traders purchased other oils. But the supply was not adequate to meet demand, and all edible oil prices began rising. Coconut oil production was down already with the result that a ton of coconut oil that cost $429 in Rotterdam in December 1982 would bring $969 a year later. Cottonseed oil prices rose from $495 a ton to $798 a ton in Rotterdam in the same period.

World stocks of fats and oils are relatively small in relation to the rate of use. *Oil World*, the weekly German fats and oils publication, estimated in mid-June

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TABLE 1

Oilseed, Palm Oil Production in Selected Nations (1,000 Metric Tons)

	Soybean		Cottonseed		Peanuts		Sunflower		Rapeseed		Palm oil	
	82/83	83/84	82/83	83/84	82/83	83/84	82/83	83/84	82/83	83/84	82/83	83/84
United States	60,677	43,421	4,304	2,791	1,560	1,495	2,419	1,447				
Brazil	14,750	15,100	1,198	921	250	250	4	10			18	21
China (mainland)	9,030	9,760	7,196	9,275	3,916	3,951	1,286	1,350	5,656	4,287	89	95
Argentina	4,000	5,800	220	278	250	230	2,300	2,200				
Paraguay	531	550	141	168	37	37						
USSR	580	670	5,094	5,000	1	1	5,341	5,300	55	69		
India	491	700	2,670	2,770	5,553	7,300	225	360	2,472	2,700		
Pakistan	3	11	1,648	952	84	85	18	19	246	242		
Senegal			34	38	899	550						
Sudan			368	370	497	522						
South Africa	26	32	53	73	89	67	202	190				
Spain	9	4	93	47			750	750	16	12		
Canada	857	708					94	51	2,246	2,676		
Hungary								590		100		
Poland									433	555		
Nigeria											345	352
Malaysia											3,252[1]	2,783[1]
Indonesia	590	625			740	775					879	949
Ivory Coast											150	125
Mexico	550	620	300	365	50	65	13	10	1	1	2	2
Totals[2]	94,365	80,517	27,366	27,417	17,575	18,843	16,504	15,683	15,071	14,527	6,437	6,275

[1] Calendar year 1982 and calendar year 1983.

[2] Totals include production in other nations not included on chart.

Source: USDA reports; ag attache and ag counselor reports; Oil World.

TABLE 2

World Production of Selected Fats and Oils (1,000 Metric Tons)

	1982/83	1983/84
Soy	13,616	13,160
Palm	6,006	5,586
Sunflower	5,809	5,699
Rapeseed	5,365	5,104
Cottonseed	3,346	3,364
Peanut	3,173	3,324
Coconut	2,669	2,483
Olive	1,903	1,456
Palm kernel	731	769
Linseed	689	697
Fish	1,300	1,196
Butter (product weight)	6,369	6,914
Tallow & grease	6,157	6,264

Animal, marine and palm products are calendar year estimates for first year shown; split year for vegetable oils other than palm, palm kernel includes northern hemisphere crops harvested in the late months of first year listed, southern hemisphere crops harvested in first months of second year listed.

Source: USDA Foreign Agricultural Circular GOP 6-84.

that by the end of September world stocks of major edible oils would represent about 4.7 weeks usage. A year ago, end-of-September stocks were equivalent to 6.5 weeks uage, and two years ago there was a 7-week supply available.

The U.S. Department of Agriculture's mid-June estimate of 1983/84 world oilseed production was 165.6 million MT. The total 1982 production was about 180 million MT. The 1984/85 forecast, assuming normal growing conditions around the world, is 175 million MT to 189 million MT. Anything over 180 million MT would be a new record (Table 2).

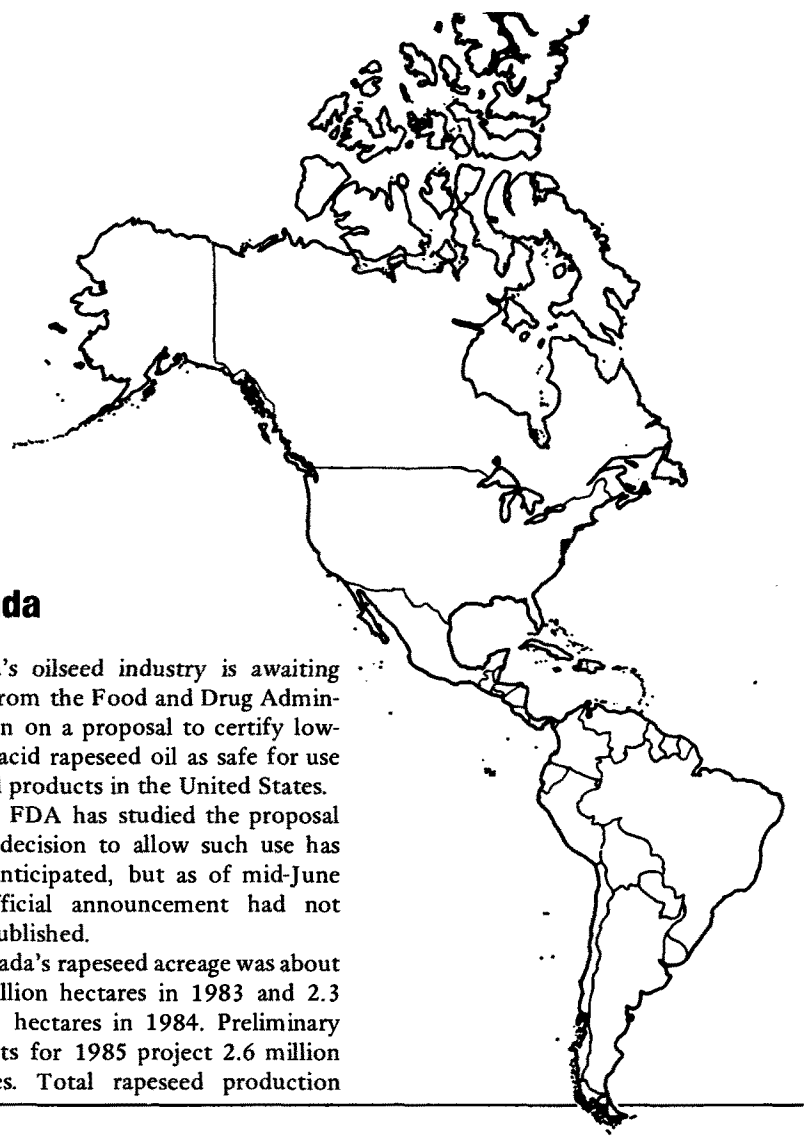
Prices thus could be expected to remain relatively high until traders have a good idea of the size of the U.S. soybean crop. The American Soybean Association's weekly newsletter, *Update*, quoted analysts in mid-June as expecting prices of $6.40 a bushel if the U.S. has a harvest of more than 2 billion bushels. If the Soviet 1984 grain and oilseed harvest is below average, U.S. soybean prices could be about $7.00 to $7.50 a bushel. A hot, dry summer that reduces U.S. soybean yields for the second consecutive year and a Soviet crop far short of expectations could push soybeans to $11 or more a bushel, *Update* quoted one analyst as saying. In mid-June, Chicago Board of Trade prices for 1984 crop soybeans ranged from $7.50 to $7.80 a bushel.

The production decline has created a temporary decline in international trade of fats and oils, but 1984/85 is expected to show a return to the steady growth anticipated through the end of the century. Despite efforts by importing nations to become self-sufficient in fats and

oils, demand is expected to increase to where fats and oils exports worldwide are about 40 million MT by the end of the century, compared to about 13 million MT now. India is trying to improve oilseed production, but may import 1.4 million MT of fats and oils this coming year to meet demands of an increasing population and higher per capita consumption. Nations with cooler climates are increasing their production of rapeseed. In England, increasing domestic production of rapeseed has made rapeseed oil the major edible oil, supplanting soy oil. In Latin America several nations are expanding palm oil plantations in order to reduce the cost of importing fats and oils or oilseeds.

Given normal weather conditions during the last half of 1984 and first part of 1985, the forecast is for a return to normal oilseed and fats and oils production. Fats and oils prices will moderate if that happens, which will mean increased consumption.

The country-by-country reports that follow are based primarily upon annual reports filed with the Foreign Agricultural Service by the agricultural officers at U.S. embassies around the world. This information has been supplemented with data appearing in trade publications or provided in talks to various meetings involving fats and oils.



Canada

Canada's oilseed industry is awaiting word from the Food and Drug Administration on a proposal to certify low-erucic acid rapeseed oil as safe for use in food products in the United States.

The FDA has studied the proposal and a decision to allow such use has been anticipated, but as of mid-June the official announcement had not been published.

Canada's rapeseed acreage was about 1.8 million hectares in 1983 and 2.3 million hectares in 1984. Preliminary forecasts for 1985 project 2.6 million hectares. Total rapeseed production

was 2.25 million metric tons (MT) in 1982, an estimated 2.68 million MT in 1983 and a potential 3.1 million MT in 1984.

Strong demand was depleting rapeseed stocks during the summer of 1984.

The hot weather of 1983 that cut U.S. soybean yields also cut Canada's soybean yields by 17%. Total production was about 708,000 MT, compared to 1982's 857,000 MT and a forecast of 850,000 MT this year.

Mexico

Soybean oil and sunflower oil comprise about two-thirds of the vegetable oils produced and consumed in Mexico.

Soy oil production is estimated at 288,000 metric tons (MT) for 1984 and forecast for 297,000 MT for 1985. Sunflowerseed oil production for those same years is estimated at 185,000 MT and 203,000 MT. Mexico imports about two-thirds of the soybeans it crushes and almost all its sunflowerseed. Mexico produced about 620,000 MT of soybeans in 1983 and imported about 1 million MT for 1984; sunflowerseed production was about 10,000 MT with imports of 450,000 MT. Rapeseed imports may reach 70,000 MT during 1984.

Oilseed production was approximately 1.03 million MT in 1983 and 1.16 million MT in 1984. It is forecast at 1.30 million MT for 1985, with most of the increases coming from increased cottonseed production.

Government price control policies influence oil consumption and production. Mexico is expected to import about 10% of its vegetable oil needs, below the 20% level of a few years ago.

Dominican Republic

The Dominican Republic imports 60% to 65% of its domestic vegetable oil needs, with soybean oil the dominant oil.

For 1984, total oil production is expected to be about 20,500 metric tons (MT), mostly coconut and peanut oils plus soy oil from a crushing plant processing imported soybeans. Imports are estimated at 65,000 MT, including 35,000 MT of soy oil, 15,000 MT of cottonseed oil and 15,000 MT of sunflower oil.

An oil palm plantation established in 1982 is expected to begin producing in 1985, perhaps about 2,000 MT of palm oil. A new 2,000 hectare cotton project also is coming into production.

Brazil

Brazilian oilseed production for 1984 should reach 16.3 million metric tons (MT), including a record 15.1 million MT of soybeans. The relatively small 1983 U.S. harvest sent soy prices higher during the last quarter of 1983, spurring Brazilian farmers to plant a record 9.25 million hectares of soybeans.

Acreage should increase at planting time later this year, but how much depends on where prices are, according to a USDA report from Brazil. World prices around $7/bushel would mean only modest acreage increases. Even modest increases could mean another record soybean harvest of possibly 17.4 million MT as the 1984 yield was below average at 1,665 kilograms per hectare, compared to 1983's 1,831 kilograms per hectare.

Brazil crushes almost all of its soybean production, with the crush in 1984 expected to total 13 million MT and exports estimated at 1.5 million MT. Total soy oil production will be about 2.4 million MT with about 1.5 million MT consumed domestically and 1.0 million MT exported.

Brazil uses various financing incentives and export regulations to assure sufficient domestic supplies of soybean oil, an important food staple in a country troubled by high inflation rates. Various export rules also were manipulated by the Brazilian government last year to try to assure as high a price as possible for its soy product exports, an attempt to improve the nation's international trade balance.

Brazil's total vegetable oil production is estimated at 2.6 million MT for 1984 and should go over 2.8 million MT in 1985. The 1984 figure includes 2.4 million MT of soy oil, 140,000 MT of cottonseed oil, 46,000 MT of peanut oil and 21,000 MT of palm oil. About half the cottonseed oil and nearly all the peanut oil is expected to be exported.

Cottonseed acreage declined last season to 1.9 million hectares from 2.1 million hectares the previous year, as growers felt they would get a better return from soybeans. Anticipated cottonseed acreage for the 1985 harvest is 2.05 million hectares, but soybean prices at planting time will affect producers' final planting decisions.

An indication of Brazil's financial situation is reflected in the exchange rate with the U.S. dollar. In January 1982, the exchange rate was 133.77 cruzeiros to the dollar; in January 1983 it was 273.91 cruzeiros to the dollar, and in December 1983 it was 979 cruzeiros to the dollar.

Argentina

Record yields at 2.25 tons per hectare in 1984 boosted Argentina's soybean production to an all-time high of 5.8 million metric tons (MT), compared to the 4.0 million MT harvest of 1983. Normal yields are about 2.0 tons/hectare.

Spurred by differential export taxes favoring products over soybeans, Argentina's crushing industry is expected to crush a record 3.7 million MT, compared to the record 2.36 million MT crushed the previous season.

Initial forecasts for 1985 are for a crop of 5.5 million metric tons, which assumes normal yields on slightly increased acreage, and a crush of 3.75 million MT.

Soybean exports totaled 2.36 million MT in 1983. Exports are estimated at 1.85 million MT for 1984 and forecast at 1.5 million MT for 1985. Soy oil production for 1984 is estimated at 610,000 MT, with 525,000 MT exported and 74,000 MT for domestic food use.

Sunflowerseed oil is the preferred edible oil in Argentina, with about 272,000 MT expected to be used out of a total supply of 888,000 MT. Exports are expected to be about 570,000 MT. Sunflowerseed production was about 2.3 million MT in 1983 and in 1984, but exports rose to about 140,000 MT from 3,000 MT.

Paraguay

Soybean production continues to increase in Paraguay with about 80% of the harvest exported. Cottonseed is the second largest oilseed in volume and provides most of the vegetable oil used domestically.

Soybean production for 1984 is

estimated at 550,000 metric tons (MT), up from the previous year's 520,000 MT, but still below expectations because of weather conditions. About 430,000 MT are expected to be exported this year. For 1985, production is forecast at 650,000 MT. Production could reach 1 million MT annually within five or six years.

Cottonseed production is estimated at 168,000 MT for 1984, up from the rain-damaged 1983 harvest of 141,000 MT. About 158,000 MT will be crushed domestically, producing 25,000 MT of edible oil. About 18,000 MT will be used for domestic food products. Soybean oil amounting to 14,000 MT will be used in domestic food products.

Total oilseed production for 1984 is estimated at 780,000 MT. The forecast for 1985 is 865,000 MT, which assumes no adverse weather developments.

Venezuela

Venezuela's domestic production of vegetable oils, much of that from imported oilseeds, provides only about one-fourth the domestic needs. In 1983, edible oil imports were about 151,000 metric tons (MT) of 197,000 MT used, and in 1984 imports are estimated at 180,000 MT out of 227,000 MT used.

The Venezuelan government is seeking self-sufficiency in edible oils and oil meals by 1993 through increased production of oil palm, cotton and peanuts. Palm oil production, now about 4,000 MT annually, is targeted for 90,000 hectares producing 90,000 MT of oil annually by 1993. Cotton acreage, now about 25,000 hectares, is to be expanded to 70,000 hectares by 1993 yielding 52,000 MT of cottonseed annually. Peanut production is currently about 7,000 MT a year from 12,000 hectares. The government plan calls for production of 158,000 MT from 53,000 hectares by 1993. USDA reports some planners favor putting less effort into peanut and more into oil palm to produce a greater oil yield per hectare.

The United States is the dominant supplier of oilseeds and oil imported by Venezuela.

Ecuador

Ecuador's oilseed production is expected to rebound dramatically for the 1985 harvest after prolonged, heavy rains cut 1984 production to about a third of normal, according to a USDA report from Quito.

Ecuador's 1983 oilseed harvest totaled about 62,000 metric tons (MT), but the 1984 harvest fell to 23,000 MT. The preliminary forecast for 1985 is 79,000 MT. Soybeans are the dominant domestic oilseed crop, with harvest estimates of 35,000 MT, 6,000 MT and 55,000 MT for 1983, 1984 and 1985, respectively. Cottonseed estimates for the same years are 16,000 MT, 4,000 MT and 22,000 MT; peanut estimates are 11,000 MT, 8,000 MT and 10,000 MT, respectively.

Palm oil is becoming the dominant domestic oil, however. Total palm oil usage in 1983 is estimated at 53,000 MT, in 1984 at 61,000 MT and in 1985 at 66,000 MT. Palm oil production benefitted from the heavy rains which replenished soil moisture after a dry period, the USDA report said. Palm oil production is expected to reach 80,000 MT by 1985. Fish oil, used primarily for shortening, is the No. 3 domestic edible oil, with usage about 35% that of soy and palm oils.

Fats and oils consumption has been rising by 11% annually in Ecuador, a figure some observers feel is boosted by sales along border areas when neighboring nations have higher fats and oils prices. The real long-term domestic growth rate for vegetable oils is estimated at 7.5% annually.

Rising domestic fats and oils production is reducing reliance on imported fats and oils to meet demand. Imports totaled about 56,000 MT in 1983, but are expected to be about 45,000 MT in 1985, the report said.

Colombia

Increasing production of palm oil is largely responsible for increasing supplies of fats and oils in Colombia, with increases in cottonseed production also aiding.

Domestic palm oil production was about 87,000 metric tons (MT) in 1982, is estimated at 104,400 MT for 1983, 110,200 MT for 1984 and forecast to be 119,000 MT in 1985. The area planted to oil palm has risen from 47,000 hectares in 1982 to an expected 65,000 hectares in 1985. Studies have identified about 250,000 hectares as being suitable for oil palm, but expansion is expected to be slower than one report forecasting 120,000 hectares planted by 1990. Government tax incentives favor investments in long-term agricultural improvements and crops, such as perennial bearing oil palm.

Acreage planted to cotton has climbed from 95,000 hectares in 1982 to an anticipated 140,000 hectares in 1985. Cottonseed oil production was about 15,000 MT in 1982 and is forecast at 21,000 MT for 1985.

Soy oil remains the dominant imported oil, with about 120,000 MT expected to be imported during 1984 and the same amount in 1985.

Chile

Chile's oilseed production has been in steady decline since 1979, but is ex-

pected to take a sharp upturn in 1985 because of improved world prices for fats and oils and newly announced government oilseed price support programs.

Rapeseed and sunflower acreage was about 6,000 hectares in 1983, is estimated at 9,000 for 1984 and forecast at 35,000 for 1985. Oilseed production estimates and forecasts for those years are 8,000 metric tons (MT), 12,000 MT and 50,000 MT, respectively.

Total vegetable oil production is estimated at 3,000 MT for 1983, 5,000 MT for 1985 and 21,000 MT for 1985. Fish oil is by far the dominant Chilean oil, with production estimates for the same years at approximately 57,000 MT, 120,000 MT and 150,000 MT, respectively.

The decline of oilseed production in recent years has meant the crushing capacity has been virtually unused, with most oil facilities concentrating on refining imported crude oils. Edible oil imports were about 116,000 MT in 1983, are estimated at 85,000 MT for 1984 and forecast at 73,000 MT for 1985.

Portugal

Portugal's crushing industry has far greater capacity than needed to meet domestic needs, leading Portugal into becoming an importer of oilseeds and an exporter of oilseed products. Capacity is about 1 million metric tons (MT) of soybeans and 420,000 MT of sunflowerseed.

Total vegetable oil production for 1983 was about 223,000 MT, including 76,000 MT of olive oil, which was in an on-year in the production cycle. Soybean oil production was 127,000 MT, and sunflowerseed oil production was about 103,000 MT.

Crushing in 1984 is expected to be slightly lower, with soybean oil production about 120,000 MT, sunflowerseed oil at 89,000 MT and olive oil, in an off-year, at 14,000 MT. Better economic conditions in 1985 could require more meal production and so crushing could increase then.

Sunflowerseed is the only major commercial oilseed crop grown in Portugal, and even there production is far below import levels. For 1984 production is estimated at 20,000 MT and imports at 280,000 MT. The United States is the main supplier of soybeans and sunflowerseed. For 1984, soybean imports are estimated at 700,000 MT, which is also the import forecast for 1985.

Spain

Spain's soybean crush for 1984 is expected to be about 2.8 million metric tons (MT), or 200,000 MT less than the previous year, with a resultant drop in soy oil exports to about 390,000 MT compared to 420,000 MT the previous year and 478,000 MT two years earlier.

Spain grows relatively few soybeans, importing them to crush for livestock feed and exporting the oil. Spain limits the amount of soy oil that may be sold for edible purposes as a means of protecting markets for its domestic olive oil industry. About 360,000 MT of olive oil are expected to be used for edible purposes during 1984, with 60,000 MT exported.

Spain in recent years has ranked as the No. 3 nation in soy oil exports, but Argentina, a soybean-producing nation, should supplant Spain in 1985, if it does not do so in 1984. Spain is forecast to export about 400,000 MT of soy oil in 1985, while Argentina could have more than 500,000 MT of soy oil exports in 1984.

Negotiations have begun on Spain's entry into the Common Market. The renewed proposal to tax fats and oils consumption in the European Community is tied to the entry of Spain, which subsidizes its olive oil production.

United Kingdom

Rapeseed oil has supplanted soy oil as the dominant edible oil in the United Kingdom.

The change is a result of two primary factors. First, spurred by Euro-

pean Community financial incentives, British growers have dramatically increased rapeseed production. The 1983 harvest is estimated at 600,000 metric tons (MT); the harvest may rise to 750,000 MT by 1985. Second, soy oil from imported soybeans, or imported as oil, has become more expensive as a result of the reduced 1983 harvest in the United States.

Approximate food usage of rapeseed oil from the 1982 crop is estimated at 218,000 MT, for 1983 at 250,000 MT and for 1984 at close to 300,000 MT. Soy oil food usage from the 1982 crop was about 223,000 MT, for 1983 about 238,000 MT and for 1984 about 185,000 MT. Fish oil usage in edible products was estimated at 200,000 MT for each of the three years.

One USDA report says some trade sources expect a 1 million MT rapeseed crop in the U.K. within two or three years, subject to changes in agricultural support policies by the European Community.

While a 500,000-ton capacity soybean processing plant has closed in the past two years, a new 350,000-ton capacity oil crushing plant is to be built by Cargill on England's east coast. The plant probably will handle mainly rapeseed, but also will be able to crush soybeans and sunflowerseed. Bunge has acquired the Liverpool edible oil facilities of J. Bibby & Company.

The Netherlands

Dutch oilseed crushers were hoping for renewed vigor in soybean meal markets during the second and third quarters of 1984, perhaps through increased exports to the Soviet Union, which imported 1.1 million metric tons (MT) of soy meal from October 1982 through October 1983.

But in the first quarter of 1984, meal exports to the Soviet Union were 8,400 MT compared to almost 45,000 MT the first quarter of 1983, according to *Oil World*, the German fats and oils trade weekly.

Dutch domestic consumption of soy meal has fallen during the past year, in part because of the relatively high cost, increased use of local grains and reduced use of feeds (manioc) used with soy meal.

Vegetable oil production during 1983 is estimated at 659,900 MT, up from 602,000 MT in 1982. Sunflower oil production is estimated at 125,600 MT in 1983 compared to 61,500 MT in 1982. Soybean oil production was down slightly in 1983 at 445,000 MT compared to 448,100 MT the previous season. Soybean oil production is expected to decline again in 1984 to about 437,000 MT, while sunflower oil is projected at 132,000 MT. Rapeseed oil production, estimated at 86,800 MT in 1983, is projected at 106,000 MT in 1984. The increase in rapeseed crushing reflects a switch from soybean crushing. EC subsidies for rapeseed and promotion of rapeseed use makes such changes attractive, a USDA report said, particularly in strong currency nations such as The Netherlands.

The incentives for rapeseed are expected to be reduced, however, and crushing plants will return to soybeans, the USDA report projected. Consequently the 1985 vegetable oil production totals are forecast at 445,000 MT of soy oil, 132,000 MT of sunflowerseed oil and 86,000 MT of rapeseed oil.

Sunflowerseed oil is gaining a greater share of the domestic market in The Netherlands due to the relatively high price of soybean oil. Dutch consumption of soybean oil was about 216,000 MT in 1982, is estimated at 185,000 MT for 1983 and 170,000 MT for 1984. Sunflowerseed oil consumption for those years is estimated at 39,000 MT, 55,000 MT and 60,000 MT, respectively.

Finland

Finland's third crushing plant is expected to open this fall. The plant, owned by Hankkija, a farmer-owned organization, has been allocated 20% of Finland's rapeseed crop.

The 1983 rapeseed crop was about 101,000 metric tons (MT) and for 1984 is estimated at 88,000 MT. Producers have not expanded rapeseed acreage as rapidly as had been forecast a few years ago, possibly because of better profits in basic grains and sugar beets.

Besides its domestic rapeseed crop, Finland imports soybeans and sunflowerseeds, mainly from the U.S., to supply its oil and meal needs. Rapeseed oil production is 36,000 to 40,000 MT a year, usually permitting exports of about 10,000 MT annually. Soybean oil production is estimated about 16,000 MT a year for 1984 and 1985. Sunflowerseed is crushed for meal. Total domestic oil consumption for food is about 30,000 MT annually.

Italy

Although primarily an olive oil producing nation, Italy is continuing to increase production of sunflowerseed and soybeans.

Olive oil production for 1983, 1984 and 1985 is estimated at 430,000 metric tons (MT), 620,000 MT and 460,000 MT, respectively. Imports bring total domestic consumption to about 600,000 MT a year. Olive trees bear more heavily in alternate years.

Sunflower acreage has increased from about 51,000 hectares in 1983 to an estimated 90,000 hectares in 1985. Crops for those years are estimated at 91,000 MT and 170,000 MT, respec-

tively. Sunflower oil production was estimated at 53,000 MT in 1983; the 1985 forecast is 200,000 MT. The increase is influenced in part by pricing systems within the European Community, which also are an incentive for Italian growers to produce more soybeans. Soybean production is estimated at 61,000 MT for 1983/84 and 100,000 MT for 1984/85. Soybean oil production for 1984 is estimated at 280,000 MT and forecast for 1985 at 270,000 MT, almost all of which is consumed domestically.

Greece

Greece's primary edible oil is olive oil, with production following the usual "on-off" biennial cycle. For 1983, about 324,000 metric tons of Greece's 397,000 MT vegetable oil production was olive oil; the estimate for 1984 is for 231,000 MT production of olive oil out of a total 306,000 MT oil production.

Cottonseed is the primary domestically grown oilseed, but soybean is the major commercial oilseed because of imports. Greece produced about 46,000 MT of soybean oil in 1983, exporting 29,000 MT; 1984 production is estimated at 39,000 MT with exports of 28,000 MT, and the forecast for 1985 is for production of 49,000 MT and exports of 42,000 MT.

Export of soybean oil is mandatory in Greece currently, but in 1986 that policy is scheduled to change. Soybean oil should then join domestically produced cottonseed and sunflower oils as ingredients in shortenings, margarines and table oils. Cottonseed oil production for 1983 was about 22,000 MT. It is estimated at 26,000 MT for 1984. Sunflowerseed oil production totaled 5,000 MT in 1983, is estimated at 10,000 MT for 1984 and forecast to reach 12,000 MT in 1985.

Austria

Austria is a nation without crushing facilities. The more than 10,000 metric tons (MT) of rapeseed produced annually are sold to neighboring nations, but production costs are higher than world market prices and the government must subsidize the producers.

Some oil pumpkin is grown and crushed in relatively small amounts. Production is estimated at 1,500 MT annually.

Dietary fats and oils are provided through imports of various oils which are refined and processed into margarines and shortenings. About 135,000 metric tons of imports are estimated annually in 1983 and 1984. Sunflower, rapeseed (from Eastern Europe) and soy oils (from Western Europe) are imported in approximately equal amounts, ranging from 27,000 MT to 32,000 MT annually. In 1983, the Austrian production of margarines and edible oils was estimated at 123,000 MT. Consumption is expected to remain relatively stable.

Poland

Poland's rapeseed harvest in 1984 may be about 774,000 metric tons (MT), up from the 555,000 MT harvest of 1983 and the 433,000 MT harvest of 1982.

The increased production reflects a 25% greater acreage than for the 1982 crop and also a mild winter. While normally about 15% of the crop is killed by severe winter, the estimate this year is that there was an 8% loss.

Lack of ground moisture, however, may limit yields to about 2 MT per hectare, compared with a record 2.25 MT per hectare realized a year ago.

Foreign currency problems may limit Poland's import of soybeans with the result an expectation that total oilseed crushings may decline about 8%.

Czechoslovakia

Oilseed production in Czechoslovakia reached a record 375,000 metric tons (MT) in 1983, including a record 315,000 MT of rapeseed.

The rapeseed harvest represented a 60% increase over a poor 1982 harvest. Oilseed production in 1984 is estimated at 300,000 MT. Total oilseed crush is expected to be about 437,000 MT, with imports coming primarily from neighboring Hungary (sunflower) and from Argentina (soybeans).

Crushing capacity in Czechoslovakia is estimated at 500,000 MT annually, which means the actual crush is nearing the limit, but financial constraints appear to prevent any construction of new facilities in the near future.

Vegetable oil and fat consumption is estimated at 10.8 kilograms per capita, which is about equivalent to the 166,000 MT of vegetable oil expected to be produced in 1984. Czechoslovakia imports 20,000 to 40,000 MT of vegetable oils annually.

Hungary

Hungarian oilseed production is expected to be about 770,000 metric tons (MT), up about 8% from the drought-affected 1983 harvest. Sunflowerseed production, at 590,000 MT, represents about 77% of the total and rapeseed, at 100,000 MT, represents about 12% of the total.

Sunflowerseed oil production is estimated at 220,000 MT, with about 170,000 MT expected to be exported. Rapeseed oil production is forecast at 36,000 MT, with 20,000 MT exported.

Hungary's total crushing capacity is about 650,000 MT annually. Crush from the 1984 crop will be close to the capacity.

Fats & Oils News

Soviet Union

Soviet oilseed production has increased during the past few years, but remains about 75% of the annual goal for the five-year plan covering 1982-85.

Forecast production levels for 1984 (with the goal in parentheses) are estimated at: sunflower, 5.4 million metric tons (MT) (6.7 million MT; soybeans, 485,000 MT (1.1 million MT), and rapeseed, 125,000 MT (130,000 MT). Cottonseed, considered a byproduct from cotton fiber, is not included in the oilseed five-year plan statistics. Cottonseed production for 1984 is estimated at 5.1 million MT, about the same as in 1983. Cotton production is gradually expanding as more suitable land is irrigated.

The increased production of oilseed and cottonseed is about 1 million MT above 1982, which means the Soviet Union has been able to reduce imports of oilseeds and edible oils from the 1982 levels of 1.6 million MT of oilseeds and 866,000 MT of edible vegetable oils. Record imports of soybean meal in 1983, however, have pushed total Soviet imports of oilseeds and oilseed products to all-time high tonnages. About 2.6 million MT of soy meal are estimated to have been imported in 1983, about 1 million MT more than in 1982.

Crushing capacity in 1983 was estimated at 44,500 MT a day, up from 39,800 MT a day in 1979. Utilization is estimated at 76%. About 87% of the capacity is in solvent extraction, up from 83% in 1976. Total crushing capacity has been increasing in recent years by 2% to 3% annually.

Vegetable oil and margarine production have risen from 4.0 million MT in 1979 to 4.4 million MT in 1983. Per capita consumption of edible oils in 1983 is estimated to have been 10 kilograms.

Turkey

Turkish oilseed production for 1983/84 is estimated at 1.67 million metric tons (MT) compared to 1.5 million MT for the previous year. Cottonseed, at 835,000 MT, and sunflowerseed, at 685,000 MT, are the major oilseeds.

Total crush in 1983 was an estimated 1.5 million MT out of a total crush capacity of about 2.3 million MT.

For 1984/85, production may rise to 1.84 million MT, including 900,000 MT of cottonseed, 730,000 MT of sunflowerseed and 85,000 MT of soybeans. Soybean production is being encouraged by the government; a few years ago soybean production was less than 40,000 MT annually.

Total vegetable oil production for 1983/84 is estimated at 448,000 MT, including 40,000 MT of olive oil, in the lower phase of the production cycle. Sunflower and cottonseed oil production for 1983/84 were 228,000 MT and 275,000 MT, respectively, compared to 1982/83 totals of 107,000 MT and 117,000 MT, respectively.

The 1984/85 oil production will include an on-year for olives—about 180,000 tons of olive oil is expected. Seed oils are expected to be good, pushing total vegetable oil production to a record high of 628,000 MT.

Syria

Syria's 1983 cottonseed crop was a record 324,000 metric tons from 173,000 hectares, a harvest too large for Syria's cottonseed crushing plants to handle so some seed was exported to Turkey for processing.

Total vegetable oil consumption in 1983 was estimated at 123,900 MT, including 72,000 MT of olive oil, 34,000 MT of cottonseed oil, 800 MT of sunflower oil, 9,000 MT of imported soybean oil, 5,600 MT of sesame oil and 500 MT of corn oil. Total domestic consumption for 1984 is estimated at 130,800 MT, including 73,000 MT of olive oil and 43,000 MT of cottonseed oil, with the other oils at approximately the same volumes as in 1983.

Egypt

Egypt's primary oilseed crop is cottonseed, a byproduct of the cotton lint business, and government policies are making cotton among the least profitable crops for Egyptian producers to grow, according to a USDA report. The net result is declining supplies of cottonseed at a time of rising demand for oilseed products.

Total vegetable oil consumption was about 460,000 metric tons (MT) in 1983, is estimated at 494,000 MT in 1984 and forecast at 520,000 MT for 1985. Cottonseed oil production was 125,000 MT in 1983 and is estimated

at 107,000 MT for 1984 and forecast at 100,000 MT for 1985. Soybean oil production is rising from 40,000 MT in 1983 to an estimated 51,000 MT in 1984. Egypt still, however, imports more edible oil than it produces. For 1983, imports totaled about 260,000 MT including 120,000 MT of cottonseed oil, 61,000 MT of soybean oil, 83,000 MT of sunflower oil and 22,000 MT of palm oil. Imports for 1984 are estimated at 330,000 MT, including 75,000 MT of cottonseed oil, 50,000 MT of soybean oil, 175,000 MT of sunflower oil and 25,000 MT of palm oil.

Egypt's crushing capacity is increasing. A newly opened facility near Cairo can crush up to 60,000 MT each year, and several similar size plants are nearing completion. To speed fats and oils imports, a 40,000 MT bulk oil receiving facility has been built at Alexandria.

The increased crushing capacity may mean Egypt in future years will move to import more oilseeds and less oil and meal. Egypt is seeking to increase its poultry production, which will require protein meals.

Nigeria

Nigeria has begun an extensive program to increase palm oil and palm kernel oil that involves activating 23 palm oil processing plants by September 1984.

Fifteen of the plants were undergoing testing in mid-May. The capacity of each is about 1.5 tons per hour. The new plants are expected to yield 30% of oil compared to 15% to 17% for the hand presses currently used. The government goal is to make the country self-sufficient in oil production by the end of 1985, but 80% self-sufficiency might be a more realistic estimate. About 60,000 tons of capacity in bulk oil plants in Nigeria are being reconditioned to handle the expected increase.

Total vegetable oil production for 1984 is estimated at 160,000 to 175,000 MT, with imports of about the same quantity. Production should be up by 50,000 MT for 1985 and imports down.

Peanut acreage in recent years has declined because other crops offer better financial return and are less labor intensive or less sensitive to recurring drought. Drought also has been cited as a reason for reduced cotton acreage. Oil palm yields have been declining because new trees were not being planted at a fast enough rate to keep up with the aging of long-established palm plantings.

Zimbabwe

A dramatic decline in peanut production in Zimbabwe has prompted a government study to try to determine the reasons and what can be done to encourage more peanut acreage, according to a USDA report.

Peanut production, which was 130,000 metric tons (MT) (unshelled) in the April 1981-March 1982 period, is expected to be about 34,000 MT for the 1983/84 year, the report said. Few if any peanuts are expected to reach crushing facilities as they will be used as foodstuffs for drought relief. The rapid decline in production has occurred primarily in outlying regions.

Total oils for 1983/84 are estimated at 33,926 MT, including 12,600 MT of cottonseed oil, 15,500 MT of soybean oil, 1,326 MT of sunflower oil and 4,500 MT of corn oil. The total supply is about 10,000 MT less than what would be normal domestic demand.

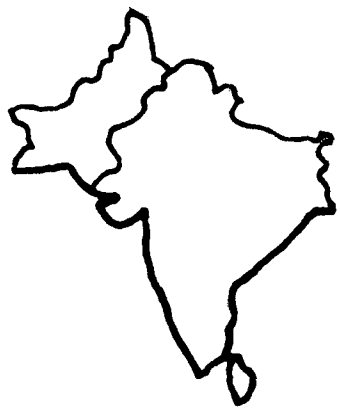
South Africa

For the second consecutive year, South Africa's oilseed production has been reduced by drought. Normal rainfall on the crops to be planted during the final quarter of 1984 could mean a 1985 harvest of more than 900,000 metric tons (MT) compared to 1983's 370,000 MT and 1984's 363,000 MT.

The reduced production has transformed South Africa from a net exporter of oilseeds and products to a net importer.

In 1983 sunflowerseed production was 202,000 MT and in 1984, 190,000 MT, with a "normal" forecast for 1985 of 525,000 MT, according to a USDA report. For peanut growers, 1984 was the worst year since 1951, with yields averaging about 0.28 ton per hectare. Total 1984 peanut production was 68,000 MT compared to the 280,000 MT expected if 1985 is normal. Cottonseed production was 73,000 MT in 1984, and soybean production was estimated at 32,000 MT.

Vegetable oil production for 1984 is estimated at 136,000 MT, with imports of 111,000 MT. The oil production forecast for 1985 is 297,000 MT. If that figure is achieved, South Africa will be exporting, rather than importing, vegetable oil.



India

India's demand for vegetable oils continues to increase faster than production, necessitating slowly rising levels of vegetable oil imports.

Consumption for 1984 is estimated at 4.5 million metric tons (MT), with production at 3.5 million MT and imports at 1.3 million MT. For 1985, the forecast is for consumption of 4.6 million MT, production of 3.5 million MT and imports of 1.4 million MT. Per capita consumption is about 6.5 kilograms annually.

India's oilseed production for 1984 is estimated at 15.42 million MT, a substantial increase from the 13.18 million ton production of 1983 when dry weather hurt crops. The forecast for 1985, assuming normal weather, is for production of 15.27 million tons. More than 80% of India's oilseed production is in peanut, rape/mustard seed, and cottonseed.

India's total oilseed crushing capacity has been estimated at 20 million tons annually, but only about half that capacity is used during a year. India does not import significant amounts of oilseeds, preferring to import vegetable oils. The government also hopes restricted oilseed imports will foster increased domestic oilseed production. India exports about a million MT annually of oilseed meal. About half of India's crushing capacity is in

300,000 seasonal crushing plants in small villages, all but 50,000 of which are animal-powered, according to one estimate. There are about 15,000 expeller plants that produce 80% of India's domestic vegetable oil and about 280 solvent extraction plants processing rice bran, cottonseed, soybean and, in some cases, removing residual oil from expeller oilcake.

India's oil imports for 1984 are estimated to include 700,000 MT of soybean oil, 350,000 of palm oil, 180,000 of rapeseed oil, 100,000 of sunflower oil and 10 million of coconut oil. Soybean oil imports were higher and palm oil imports lower than in recent years because of price differentials.

For 1985, India is expected to import 650,000 MT of soybean oil, 500,000 MT of palm oil, 150,000 of rapeseed oil, 50,000 of sunflower oil and 10,000 of coconut oil.

Pakistan

Pakistan's domestic vegetable oil consumption may rise to 958,000 metric tons (MT) for the 1984/85 marketing year, an increase of about 6% from the previous year, with about 690,000 to 700,000 MT of vegetable oil being imported to meet demand.

Most of the imported oil will be soybean oil and palm oil, with the exact proportions determined by world prices and Pakistan's financial reserves, according to a report from the U.S. Department of Agriculture's officer in Pakistan.

Pakistan's main domestic oilseed crop is cottonseed. Production in 1983/84 is estimated at a disappointing 952,000 MT, down from 1,648,000 MT the previous year. Planted acreage remained about the same, but heavy rains and insect infestation cut yields drastically, the USDA report said. For 1984/85, acreage is expected to increase slightly with production rebounding to 1.3 million MT. Virtually all cottonseed produced is used domestically, with more than 80% crushed. Domestic cottonseed oil production is estimated at 105,000 MT for 1983/84. The edible oil crushing capacity is estimated at 1.5 million MT annually (single shift basis). Less than 10% of that capacity is from solvent extraction process.

Palm oil imports declined this past season because of the relatively high price of palm oil on world markets, with subsidized soy oil imports increasing. Palm oil imports are estimated at 335,000 MT, 310,000 MT and 340,000 MT for 1983, 1984 and 1985, respectively. Soybean oil imports for those same years are estimated at 241,000 MT, 390,000 MT and 340,000 MT, respectively.

Edible oil consumption is estimated at 9.19 kilograms per capita for 1983/84.

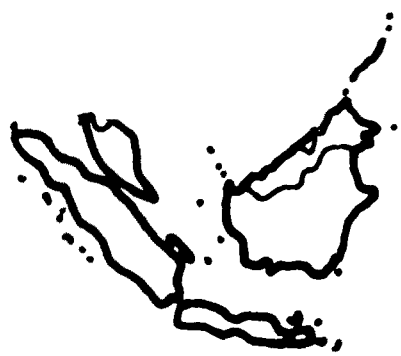
Sri Lanka

Sri Lanka is the world's No. 4 producer of coconut, but about 60% of production is consumed as fresh nuts. Poor weather in recent years has reduced the crop from 174,000 metric tons (MT) in 1982 to 131,000 MT in 1983 and an estimated 72,000 MT for 1984. Favorable rainfall in early 1984 is expected to boost 1985 production to about 130,000 MT.

Sri Lanka ranks behind The Philippines as an exporter of dessicated coconut, with about 10% of Sri Lanka's crop used for this purpose. Sri Lanka accounts for about 30% of world trade in dessicated coconut. The remaining 30% of the Sri Lanka crop is used for copra production.

There are 64 copra crushing mills, all using expellers, with an average oil recovery of 62%. For 1983, coconut oil production is estimated at 83,000 MT, and for 1984, about 44,000 MT are expected, reflecting the smaller coconut harvest. Production in 1985 is expected to climb to 79,000 MT.

Per capita consumption of coconut oil is about 3 kilograms annually, accounting for 9% of the average household's food budget. Fresh coconut consumption is relatively high, however, resulting in an estimated per capita intake of 16 kilograms of fat per year.



Malaysia

Palm oil production is expected to rebound by the third quarter of 1984 with a total annual production of 3.6 million metric tons (MT), perhaps as much as 3.8 million MT, compared to 3.0 million MT during 1983.

The 1983 decline in palm oil production was the first drop after decades of continued growth. It was a key factor in the worldwide increase in vegetable oil prices last year. USDA observers estimate palm fruit yield was 25% below the previous year and 13% below the previous low.

By 1985, production could reach a record 4.0 million MT annually. Contributing to such growth would be a return to normal yields, more acreage and more trees reaching mature status. Acreage in 1984 is 10% to 12% higher than when yields began declining in the fall of 1982.

The 1983 decline has been attributed to many factors. Often mentioned is a "stress" reaction to the spurt in palm fruit production of 1982 with release of pollinating weevils into plantations. This theory—the "tired tree" theory—maintains that trees, spurred to record output by the weevils, were worn out. Weather also may have been a factor in that there is a delayed reduction in setting of palm fruit following a dry spell. Finally, some plantations reduced fertilization programs shortly before the weevils were introduced.

One result of the decline in palm oil supplies was increased soybean oil usage in Malaysia. Soy oil was used as an extender in frying oils, a practice that may not continue, and in shortenings, which may have more long-term potential, according to a USDA ag attache report.

Oil palm acreage is expected to continue to increase, but the new land may be less productive than land previously brought into cultivation.

Malaysia's total vegetable oil production for 1984 is estimated at 4.4 million MT and for 1985 at 4.7

million MT. Palm kernel oil production is estimated at 410,000 MT and 462,000 MT for 1984 and 1985, respectively. Coconut oil production estimates for those years are 125,000 MT and 122,000 MT, respectively. Coconut oil production may increase if the experimental practice of planting hybrid coconuts as shade trees for cocoa plantations spreads.

Indonesia

Coconut oil and palm oil are the two major vegetable oils in Indonesia, with almost all locally produced and imported soybeans and peanuts being used for foodstuffs, rather than for crushing.

Oil palm acreage has increased from about 319,000 hectares in 1981 to an estimated 400,000 hectares in 1984, with harvested area about 100,000 hectares lower than the planted area each year. Crude palm oil production was about 752,000 metric tons (MT) in 1981 and is estimated at 949,000 MT for 1984. Crude palm oil exports in 1984 are estimated at 300,000 MT.

Coconut oil production is more stagnant, or even declining. Production for 1981 was estimated at 752,000 MT, while the estimate for 1984 is 641,000 MT. Harvested acreage is increasing, but yields have been reduced by a 1982 drought.

While coconut oil is traditionally preferred as a cooking oil, current usage is split about evenly between palm and coconut oils because of price and availability. Per capita consumption of cooking oil is estimated at 7.5 kilograms per year. The Indonesian economy, which surged strongly in the 1970s, has not been as strong in the 1980s because the nation's petroleum exports are affected by world demand and by the world economy in general.

A soybean processing plant might be built within two to three years, according to a USDA report, depending on both demand for livestock meal and general economic conditions.

The Philippines

Coconut production in 1984 declined due to dry conditions during key parts of the coconut growing season, but is expected to rebound for 1985.

There are approximately 415 million coconut trees planted on approximately 3.2 million hectares in the Philippines. Copra production in 1983 was above 2 million metric tons (MT), and declined to about 1.75 million MT for 1984. It could top 2 million MT again in 1985, if normal rainfall occurs.

Coconut oil production was about 1.23 million MT in 1983, is estimated at 1.06 million MT for 1984 and forecast at 1.23 million MT for 1985. Coconut oil exports were about 1 million MT in 1983, estimated at 870,000 MT for 1984 and forecast to reach 1 million MT again in 1985.

While coconut oil production declined for 1984, palm oil production rose from 21,000 MT in 1983 to an estimated 34,000 MT in 1984 and may reach 40,000 MT in 1985. The increase is the result of more trees reaching maturity and increased planting from 5,000 hectares in 1983 to 7,000 hectares in 1985. Coconut oil accounts for 96% of the Philippines' vegetable oil production and palm oil for 3%. The Philippines' limited foreign exchange is a constraint on import of other oilseeds, such as soybeans. The government is hoping to get international financing for a plan to replant older coconut plantations in higher yielding coconut palm.

Japan

Japan imported a record 4.99 million metric tons (MT) of soybeans during 1983, including 4.65 million MT from the United States, also a record.

Increased demand for feed protein spurred the record imports as soybean provides a higher ratio of protein to oil than does rapeseed, the other major oilseed imported by Japan. For 1984, soybean exports are expected to fall to about 4.7 million metric tons because 1983's record imports have provided large stocks for Japanese mills to process. Total oilseed imports for 1983 were about 6.6 million MT, for 1984 about 6.3 million MT and for 1985 are forecast at 6.3 million MT.

Meal demand is expected to slacken as millers cut the protein content of meal in an attempt to improve profit margins, a USDA report said. Rapeseed annual imports are expected to be relatively level, about 1.2 million MT for 1983 through 1985.

Total vegetable oil production for 1983 is estimated at 1.57 million MT and for 1984 at 1.59 million MT. That includes approximately 692,000 MT of soy oil in 1983 and 698,000 MT for 1984. Soy oil production for 1985 is forecast at 698,000 MT. Rapeseed oil production is estimated at 489,000 to 495,000 MT annually during the same period.

Food use of soybeans in Japan is estimated at 830,000 MT for 1983 and 840,000 MT for 1984. Those figures include approximately 480,000 MT of tofu, 180,000 MT of miso, 75,000 MT of natto, 30,000 MT of freeze-dried tofu, 10,000 MT of soy milk and more than 60,000 MT of other assorted products, including soy sauce.

Australia

Australian oilseed production has rebounded in 1984 with the end of a drought that had led to record imports the previous two years. The 1984 oilseed production estimate is 562,000 metric tons (MT), up 73% from 1983's 325,000 MT.

Even at the increased figure, Australia probably will import about 27,000 MT of oilseeds, according to a USDA report from Canberra. The oilseed crush and palm oil production will provide about 120,000 MT of vegetable oils, below anticipated domestic food consumption of 170,000 MT. Australia thus will continue to import some vegetable oils.

The primary oilseed crop in Australia is cottonseed, with 1984 production estimated at 246,000 MT compared to 160,000 MT the previous season. Sunflowerseed production for 1984 is estimated at 161,000 MT compared to 93,000 MT in 1983; soybean production for 1984 is estimated at 77,000 MT compared to 37,000 MT in 1983; peanut production is estimated at 51,000 MT for 1984 and 35,000 MT for 1983; rapeseed production is estimated at 23,000 MT for 1984 and 6,000 MT for 1983.

The initial forecast for 1985 is a further oilseed production increase to 539,000 MT and total vegetable oil production of 135,000 MT, a level that still will require vegetable oil imports.

Overview of Oilseed Products in the Feed Industry[1]

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SUMMARY

The use of oilseed meals in the US has increased at the compound annual rate of ca. 2-1/2% since 1970. Foreign use has increased at more than double the domestic rate in the same interval. The upward trend generally has been broken only in years of short supply. The world demand outlook for oilseed products is for continued expansion, but growth patterns will vary markedly in different regions. Future US domestic use should level off in relation to animal numbers and may actually decline in some cases as more is learned about the role of specific amino acids in feed rations. The same trend may be apparent in the EEC, particularly if oilseeds and meals lose their favorable duty status. Conversely, the less-developed and central-plan countries are making serious efforts to improve feed rations by raising protein content. The long-range potential for growth in these markets is enormous, but will be tempered along the way by economic realities and political decisions. On balance, world demand for oilseed products will continue to grow but perhaps at a slower rate than in the past. Soybean meal will continue as the dominant product, but increasing emphasis will be placed on the production of other oilseeds and legumes, especially in importing countries. Because cottonseed availability will be limited by the demand for cotton, sunflower and rapeseed remain as the best choices behind soybeans to satisfy future growth in demand.

The use of oilseed meals for feed in the United States, on a 44% protein equivalent basis, increased at the compound annual rate of about 2.5% between the 1970/71 and 1982/83 crop years. In the same interval, high-protein consuming animal units, while having their ups and downs, are barely more than 1% over the level of 12 years ago. The rate of feeding per animal unit has shown a compound annual growth rate of 2.35%, about double the population growth rate. If this rate were to continue, domestic usage in the year 2000 would be double the 1970 rate. Usage in the current season is below trend due to short supplies and high prices, but this will change if 1984 crops are back to normal acreage and yield.

This development has been due to a number of parallel factors, most trending in the same direction but with some offsets that are worth mentioning. The uptrend in usage has been broken only in years of short supply. The current year is a good example, where supplies of soybean, cottonseed and sunflower meals have been restricted by short crops. Protein prices rose early in the season to ration demand, which is typical of years when supply is restricted. Extreme price distortions ultimately require corrections in the opposite direction, and these are often painful short-term adjustments for market participants, but they seldom have more than a passing influence on long term growth trends. The purpose of this paper is not to discuss markets, however, but to assess the basic, long-range fundamentals of oilseed meals as animal feedstuffs.

Chief among the reasons leading to increased feeding of protein has been the development of scientific research on nutritional factors, combined with wide-scale recognition and application of the principles. Universities, feed companies and trade associations have been prominent among those publicizing the nutritional benefits of properly balanced rations, and feeders have been quick to adapt, especially in recent years. Livestock feeders cannot compete in today's environment of high costs and slim feeding margins without employing the most efficient techniques available, so new ideas and methods are quickly assimilated in our free market environment.

Another important contribution to the trend has been rapid growth of the poultry industry. Broilers in particular increasingly have gained acceptance among consumers to the point that per capita consumption of all poultry meat (including turkeys) exceeded that of pork in 1983 and will repeat the performance in 1984. Further, broiler and turkey rations contain the highest protein percentage of all feeds and there is less flexibility of substitution in least-cost rations. This important trend in poultry has led to the dominance of soybean meal, with its high lysine content,

[1]Presented at the 75th AOCS Annual Meeting, Dallas, 1984.

in the world protein market, for it is not only the U.S. that has moved in this direction but most foreign countries as well. It is debatable whether U.S. per capita consumption of poultry meat will continue to gain, but it should at least maintain its position in the future, while there is considerable potential for foreign consumption to increase further.

Better understanding of the role played by specific amino acids is contributing to a counter-trend responsible for reducing the amount of protein in certain feed rations while improving efficiency at the same time. Layer feeds are a good example. This is likely to continue, since the intensity of research into all phases of amino-acid nutrition is continuing at a rapid pace. In addition, the two most limiting amino acids, lysine and methionine, are now available as synthetics in commercial quantities. Therefore, the rate of protein feeding in the United States should level off and perhaps decline slightly in the years ahead, assuming normal conditions of price and availability. There always will be individual years when feeding will be enhanced or curtailed because of short-term supply-demand relationships but in the long-run, the per capita level of both meat consumption and protein feeding per animal should be reasonably flat. This would imply slowly increasing domestic demand for proteins at a rate roughly equal to or less than that of population growth, currently 1% per year.

On an international scale the developed countries have, by-and-large, reached maturity in animal nutrition and feeding, subject to future research and development efforts. Some central plan countries have also moved a long way toward maturity and will move even further as resources permit. A recent example is the decision of Russia to improve the quality of feeds through enhanced protein feeding as an attempt to stretch the efficiency of limited grain supplies. History has shown that once a country embarks on a program of protein feeding, it takes a severe economic pinch to slow or reverse the trend. Poland is an example of such a reversal but should gradually rebuild as her economy recovers. Yet, as in Poland, there is evidence that livestock expansion elsewhere in East Europe is slowing down, partly because imports of feedstuffs are increasingly hard to pay for. Some of these countries have plans for increasing agricultural exports to gain foreign exchange.

The developing countries have enormous potential for expansion and should compete more and more with the developed countries for available protein supplies. Growth will be very slow and will be regulated more by economic realities and political decisions than the needs of a protein deficient populace in most cases. Past attempts to develop indigenous supplies in many developing countries have met with dismal failure, linked to inept government policies coupled with mass migration to urban areas. The prospect for change in this bleak situation is not apparent. Despite seemingly well-intentioned efforts to stimulate agricultural

production, finite resources and misdirected policies have been and continue to be a major hindrance to progress toward self-sufficiency. Yet, in time this situation must be corrected if real progress is to be made in combating hunger and improving diets around the world. There is increasing evidence of the need for change. Foreign population is expanding at the rate of nearly 1.75% per year and high protein demand should expand at a somewhat higher rate, depending on economic conditions. The resulting competition for protein eventually could place a strain on supplies of natural protein and force more reliance on synthetics, and this is the reason new developments in animal nutrition are so important.

The restructuring of agricultural enterprises in many countries could have significant impact on production capability. China has done this with dramatic effect and is producing crops in quantities undreamed of a few years ago. Cotton is a good example, where production this year was 21 million bales, up 50% from just two years ago. Striking gains also have been made in oilseeds.

AgraEurope, the British trade publication, cites Russian estimates that put Soviet Union losses in harvesting, storage and processing of grain at 30% to 50% of nutrient content. Large scale investments are planned to mechanize harvesting, improve storage and recycle wastes with the objective of increasing the quantities of agricultural products reaching the consumer by 10% to 30%. India is another populous country that is moving steadily toward improved technology and more efficiency in oilseed production and processing. The possibilities are staggering but they will not be realized overnight.

Press reports have summarized a recent analysis by the USDA Economic Research Service that points to the need for technological change to increase world crop production. The study concludes that world population will increase by 40% by the year 2000, while cropland will increase by only 4% to 5%. Further, the remaining arable land is considered to be only marginally productive due to soil quality, terrain, local weather conditions, etc. Technological progress combined with the proper incentives for growers takes on new significance when viewed in the context of limited land resources and can make a big difference in the long range outlook for supplies of grains and proteins.

A significant countertrend in foreign protein usage hinges on developments in the EEC with regard to feed grain support prices and import quotas for oilseed and grain by-products. The percentage of oilseed meals in EEC feed compounds is much higher than in the U.S. because the internal price of grain is high relative to world markets. Conversely, oilseed meals enter duty free and at times are less expensive than grain. If the EEC really carries out its stated intent to reduce internal grain prices to the world level, the percentage of protein in compounds should eventually decline. This subject is highly political, however, and efforts in this direction will likely be phased-in gradually over a number of years to avoid economic dislocations. Another EEC political problem is the huge dairy surplus which, as in the United States, results in over-consumption of grains and proteins to produce milk that in turn is dried and used as feed. As the dairy surplus is reduced, as it eventually must be, the grain and protein feedstuffs so liberated will be looking for other avenues of consumption.

Research in the field of natural protein substitutes has not always been translated to commercial success because natural proteins have been too competitively priced. A notable exception is urea, which is often overlooked or downgraded in discussions of this type, partly because reliable statistics are not available. The tonnage of urea used in ruminant feeds is not known, but as a guess, the amount fed may be equivalent to about 3.0 million tons of soybean or cottonseed meal in some years. Use of this valuable synthetic can be expanded or contracted as needed, and it is a good equalizer in times of natural protein shortages. The current season is a good example of urea filling a gap in natural protein availability.

Other synthetic proteins such as those derived from petroleum feedstocks have met with less success but still may have promise for the long run. Russia is pressing ahead with plans to produce a 75% protein product from natural gas, while various biomass and other experimental projects are under way elsewhere. None of these projects will solve any world food crises, but they are small examples of imaginative things that are being tried.

In the next few years, the potential domestic supply of natural proteins appears fully adequate to satisfy U.S. requirements while servicing a subtly growing export market. In the medium to long term, however, increased reliance must be placed on more efficient use of natural proteins, supplemented by synthetics and amino acids in one form or another. The universally acceptable soybean meal is likely to continue as the leader in satisfying future world demand for natural protein. Brazil still has the potential for expanding soybean production significantly, given the proper price incentives. Argentina and Paraguay have potential as well. Soybean production in the United States is subject to many complex factors such as oilseed/grain price ratios, vegetable oil prices, crop rotation programs, etc., but acreage usually responds favorably to price incentives. Cottonseed meal availability is subject to the demand for cotton and is not likely to expand significantly from historical production levels, but will definitely improve from the poor 1983/84 crop. Rapeseed and sunflower acreages are capable of further expansion in Canada, Argentina, Europe and elsewhere. Both crops can be grown in relatively cold climates and therefore have a built-in advantage over soybeans and cotton for many countries. World rapeseed production has already increased by about 40% in the past five years, led by China, India and the EEC. Sunflower has shown moderate growth in a few countries and has been stable in the rest.

Let us not overlook corn gluten feed as a relative newcomer on the protein scene. Production has expanded rapidly in the U.S., and most of it has been exported to Western Europe. EEC net imports of corn gluten have gone from less than 700,000 tons in 1974 to 3.5 million in 1983, a 500% increase in nine years. U.S. production looks stable to slightly higher in the next few years, while the EEC seeks to impose import quotas. It is possible that increasing amounts of corn gluten feed will be available to the U.S. domestic market as time goes by.

In summary, the demand outlook is for slow growth in animal numbers, except perhaps dairy cattle, stable to declining domestic protein feeding rates and flat per-capita consumption of red meat and poultry, with the latter holding its own with beef and pork. From the supply side, potential oilseed meal production looks adequate to satisfy expected demand, given normal weather and stable economic conditions, for the next several years and probably beyond. In the next decade, new developments in technology and efficiency will take on increasing importance if world diets are to be improved or even sustained at current levels. Oilseed meals will continue in good demand for the future and ultimately the ability to produce will be the limiting factor.

Fats & Oils News

Tallow tested as fuel

Beef tallow was tested as a fuel for indirect and direct injection diesel engines in tests conducted by Texas A&M University.

The tallow, heated to 170 C, produced thermal efficient lower than diesel fuel but about the same as obtained with unmodified cottonseed oil fuels, according to the June 8, 1984, issue of Energy Notes, a newsletter from the USDA Agricultural Energy Center. The Center is at the Northern Regional Research Center in Peoria. Carbon build-up on the injector and in combustion chamber was not as severe with the tallow as with previously tested vegetable oil fuels. There were more beef tallow deposits, but they were soft and easily removed.

The preliminary tests indicate beef tallow would not cause as severe engine fouling as has been noted with vegetable oils. Researchers say the results suggest the problem with vegetable oil fuels is their unsaturation. Beef tallow is highly saturated and is partially solid at room temperature; its use as a fuel would require heating fuel tanks and lines even in summer operations, the newsletter said. The work at Texas A&M was under the direction of C. R. Englar, W. A. LePori and L. A. Johnson.

NRRC staffers honored

Gayland F. Spencer, chemist at the USDA Northern Regional Research Center in Peoria, Illinois, has received a USDA Superior Service Award, on behalf of a team of 11 scientists, for plant hormone discoveries. The award is given for "discovering a new kind of plant growth regulator that can increase crop yields and introducing it for world food production." The team discovered a substance in rapeseed pollen—which they called brassinolide—which causes a segment of the pinto bean stem to grow longer and thicker than untreated stem segments.

A USDA Superior Service Award also was given to John P. Friedrich, leader in high pressure chemistry at the Northern Regional Research Center, for introducing supercritical fluids as replacements for flammable petroleum solvents in extracting food oil from seeds. He designed high pressure equipment and demonstrated processes that use a fluid form of carbon dioxide instead of hexane to extract oil from soybeans, corn germ and other seed sources.

Three edible oil deodorizing units from Simon-Rosedown Ltd. became the heaviest cargo ever transported across the Humber Bridge as they were en route from Hull, England, to the Immingham Docks for shipment to The Netherlands. Each of the 18-meter long deodorizers weighed 50 metric tons. They were driven across the bridge at specific intervals because of their weight. The three semi-continuous Votator deodorizers, which can process a combined total of 800 metric tons of oil a day, were en route to the Unilever company Van Den Bergh en Jurgens BV, for use in the edible oil refinery. Jurgens is a major producer of margarine.

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French Oil Mill cited

The French Oil Mill Machinery Company of Piqua, Ohio, has received the Presidential E Award for substantial increase in export volume and total sales over a four-year period.

French equipment is used in 74% of the Mexican oilseed processing capacity. The firm recently was authorized by the Mexican government to be the only small business to establish two wholly owned subsidiaries. French de Mexico, S.A. de C.V. markets French products in Mexico and exports related products throughout the world. Extractora de Aceites French S.A. de C.V. was established for manufacturing and providing related services.

French is forming two export trading companies for agribusiness and for non-agribusiness related sales, service, products and consulting. French Oil Mill has sales agency agreements covering 36 countries.

The firm was founded in 1900 and had begun export sales by 1925 in Europe, Asia and Africa. The current president, Daniel P. French, is the grandson of company founder Alfred W. French.

News briefs

Jack Suriano, past president of the AOCS North Central Section, is now president of Ultimate Designs Inc., a company located in Chicago offering process design and engineering services to the fats and oils industry; he formerly was vice president for engineering with EMI Corporation of Des Plaines, Illinois. . . . **David Shaw,** also formerly with EMI Corp., has been named a project manager for Akzo Chemie America in Chicago. . . . Rutgers State University has awarded its Board of Trustees Award for Excellence in Research to **Stephen S. Chang,** head of the university's department of food science and a former president of the AOCS. The citation accompanying the award noted Dr. Chang's 31 years of research in food chemistry has resulted in more than 120 scientific publications and 16 patents. The award included a plaque and a $500 honorarium. . . . PQ Corporation has appointed **Robert A. Ruhno** as national sales manager for its microspheres group. . . . Emery Industries' Personal Care and Specialties Group has appointed **Stan Miller** as national accounts manager, **Bill Noble** as field sales manager and **Tim Long** as southeast district sales manager. . . . Bunge Edible Oil Corporation has promoted **Frank J. Stynes** as commercial manager for the southern United States and **Jim Moore** as foodservice sales manager for the eastern half of the United States.

Obituary

WILLIAM C. DEAN

AOCS has been informed of the death in March of William C. Dean, lab manager at Dothan Oil Mill Co. in Dothan, Alabama. Mr. Dean had been a member of the society since 1957.