Toxic oil answers elude researchers

In May 1981, an 8-year-old Spanish boy died in a Madrid hospital from acute pulmonary failure; his was the first reported death attributed to toxic oil syndrome (TOS) which, by the end of 1981, affected 20,000 people. To date the syndrome has killed hundreds of people.

The World Health Organization (WHO) and the Fondo de Investigaciones Sanitarias (FIS) of Spain met in April to discuss the work undertaken so far, as well as work still to be carried out, and to determine the exact cause of the disaster. According to S. Tarkowski of WHO, only within the past two years has there been coordinated research to investigate the etiology of the syndrome.

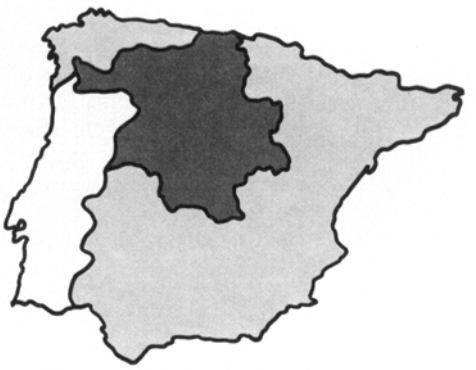
The report said 97% of persons affected could be documented as having ingested tainted oil, sold door-to-door by itinerant salesmen and in local markets as pure olive oil. In fact, the oil was mostly rapeseed oil which had been adulterated with aniline dye which would make it suitable for inedible use only, and therefore eligible to enter Spain at reduced import duties. Once inside Spain, the oil was processed in an attempt to remove the aniline and then blended with animal and vegetable oils and fats. In May 1989, 12 persons were ruled guilty on public health, negligence and fraud charges in connection with the case (see "Toxic oil verdict angers victims," *JAOCS*, 66(7):885, 1989).

Barry Rossell, of the Leatherhead Food Research Association, stated that he believes that the aniline reacted with the oil during transport, storage and/or processing to form unknown toxic compounds, according to a report on the subject in *Chemistry and Industry* issue of Sept. 4, 1989. As the oil was crude, it would have contained free fatty acids with which aniline might have reacted to form anilides. Such compounds themselves may have undergone further reaction during storage or processing.

Anilides have been implicated in the interference of the prostaglandin pathway. This might lead to increased levels of arachidonic acids and an overproduction of free radicals. Norman Aldridge, of the Robens Institute at Surrey University, suggested that it is possible that linoleyl anilide could undergo oxidation with the production of hydroperoxides, the generation of which has been implicated in the etiology of TOS.

Mike Jordan, of the Leatherhead Food Research Association, believes that glucosinolates and their decomposition products, isocyanates, present in rapeseed oil, could have undergone reactions with aniline to form thiourea derivatives and, following a cyclization reaction, imidazolidinethione. Such reactions might have occurred in the oil, but could also take place in the acidic environment of the stomach.

According to Aldridge, the cause of the disease is unknown because "TOS is unique, the pathogenesis is unclear, the attack rate is not known, there is conflicting evidence in immunological involvement and there have been considerable difficulties in obtaining authentic case-related oils. It is still not clear whether the syndrome was due to one or more toxins; furthermore, the oils have been poorly stored since the epidemic, and this may have led to the breakdown of unstable components of interest, hindering present-day evaluation and analysis," the *Chemistry and Industry* article said.



Darker area indicates area in Spain where toxic oil cases occurred.

An international research program continues, funded by grants from the Spanish government, with the main research focusing on the causative chemical compounds, improved animal toxicity experiments, the biochemical effects and abnormalities induced during and following the disease, short-term *in vitro* clinical testing and long-term clinical epidemiology.

Maine imposes ban on aseptic packaging

Maine governor John McKernan has signed a bill to forbid the sale of all aseptic beverage packs, or brick-packs, and of any other non-dairy beverage container which cannot be recycled. Soymilk is available only in brick-packs in Maine.

The new law, scheduled to take effect Sept. 1, 1990, is aimed at attaining through economic incentives recycling of 50% of the solid waste produced in Maine by 1994. The ban on aseptic packaging, which combines aluminum, paper and plastic, joins an existing deposit law on bottled and canned soft drinks and beer. Milk and dairy-derived products have been exempted from this legislation; containers for these products need not be recyclable or carry a deposit.

Leslie Harlow, executive administrator of the

Soyfoods Association of America, said most Maine health food stores report that soymilk is one of their top ten most popular products. "It would be great if soymilk were readily available in other packages," says Harlow, "but at this point in time, it's not. Aseptic packaging has been the greatest thing to happen to soymilk since scientists figured out how to rid it of its 'beany' flavor, and until manufacturers start to package it aseptically in recyclable glass or cans, these brick-packs are all we have."

At Harlow's request, state representative Virginia Constantine will try to amend the bill to exclude soymilk products from the ban. Tetra-Pak, the world's largest seller of aseptic packaging machinery and supplies, is looking for a legislator to sponsor an amendment that would exempt all aseptic beverage packs from the ban.

180 attend conference on industrial crops

Approximately 180 people from 12 nations attended the first annual Association for the Advancement of Industrial Crops conference in Peoria, Illinois, on Oct. 2-6, 1989.

Conference chairman G.E. Hamerstrand said he was pleased with the attendance and the enthusiasm of the conference registrants. The AAIC was formed last year when the Guayule Rubber Society joined forces with people involved in the development of other industrial crops. "The conference provided a much-needed forum for those involved in the industrial crops area," said Hamerstrand. "There are really an amazing number of people working on industrial crops, and the AAIC provides them with a unified voice."

Conference sessions focused on the agronomy, development, or industrial applications of several oilseed products. *Vernonia galamensis,* a crop native to semiarid African lands, was the subject of several presentations. The seed of *V. galamensis* is about 40% oil, 80% of which is vernolic acid, a naturally epoxidized fatty acid. This makes it an attractive raw material for large volume industrial applications in coatings and epoxy resins.

Jojoba growers discussed improving growing and harvesting methods of the seed. Currently a high-priced oil sold to the cosmetic industry, jojoba could also be used as a high-temperature, high-pressure lubricant if the seed supply is increased and, therefore, the price is lowered.

Other oilseed presentations focused on cuphea, castor, lesquerella, meadowfoam oil, salicornica, crambe, soybeans and genetic engineering of plant fatty acid synthesis.

Speakers also addressed policy issues in new crop development, and covered other non-oilseed crop products, such as guayule rubber, kenaf paper, and agriculturally-derived plastics.

Persons interested in learning more about the AAIC and future conferences may contact G.E. Hamerstrand at the Northern Regional Research Center, 1815 N. University St., Peoria, IL 61604. Telephone (309) 685-4011. The next conference is scheduled for October 1990 in Riverside, California.

Some fluorochemical products flourishing

Despite the adverse publicity given to chlorofluorocarbons, other fluorochemicals, including fluorinated oils and fluids, are doing very well. These are the results of a new study, by Philip Townsend Associates Inc., of Mount Olive, New Jersey.

The study reports that world consumption of fluorine-containing organic chemicals (excluding polymers and elastomers) is about $3.5 billion. Most sales involve the troubled chlorofluorocarbons, but about $500 million worth represents sales of specialty organic fluorochemicals, including oils and inert fluids. These products are used, for example, as lubricants for pump bearings in hostile environments (for instance, for

handling liquid oxygen) and as fluids for high-performance vacuum pumps.

Townsend noted that specialty fluorochemicals are truly global, with producers shipping throughout the world. World consumption is growing at a higher rate, about 7%, than that of all specialty chemicals, Townsend said. Although little information of profitability is public, specialty fluorochemicals are thought to be very profitable. Many sell for $10 a pound or more, and some for hundreds of dollars a liter.

Calgene, Rhone-Poulenc sign license agreement

Calgene Inc. and Rhone-Poulenc Agrochemie have signed agreements to expand their program for commercializing herbicide tolerant crops. Calgene has granted to Rhone-Poulenc the exclusive, worldwide license to the use of its patented "Glyphotol," a glyphosate resistance gene, in most major field crops, including soybeans and sunflower. Calgene has retained the exclusive rights to glyphosphate tolerance in its core crops of cotton, rapeseed, alfalfa, tomato and potato.

Patent sought for new bioherbicide technology

Crop Genetics International has filed a patent application on a new bioherbicide technology. One application could be in the post-emergent crop market, including soybeans and cotton. The invention consists of mixing a small amount of chemical herbicide with opportunistic bacteria, such as certain *Pseudomonas* species. The mixture destroys the weeds in a synergistic manner: the chemical herbicide stresses the weeds so that they are vulnerable to subsequent bacterial infection. Peter Carlson, chief scientific officer at Crop Genetics, predicts that the technology will permit farmers to use 75% to 90% less chemical herbicide.

Mexico imposes tariff, to restructure 'ejidos'

On Sept. 27, 1989, the Mexican government imposed an import tariff on soybean meal to ensure the purchase of the domestically produced October soybean harvest. Although the government has not announced a method of payment, the subsidy most likely will be paid to the soybean producers through the prices they receive from the oilseed crushers. Favorable rainfall and adequate irrigation water during this crop cycle have provided Mexico with a good soybean crop this year. Mexico had dropped all soymeal tariffs in July 1989 to encourage adequate supplies of poultry feed. The import tariff probably will remain in place for at least six months, or until the entire domestic crop has been sold to the crushers.

A competing feedstuff for poultry in Mexico is canola. Canadian canola generally sells for about 15% less than domestically produced sunflower and as much as 20% less than domestically produced soybeans per metric ton. Canola does not compete well in the Mexican retail cooking market against sunflower seed or soybean oils; it is primarily used as an ingredient in poultry feed.

In a more far-ranging attempt to bolster Mexican agriculture, President Salinas' administration has announced plans to discontinue support of the inefficient "ejido," or rural collective system of farming, the Mexican press announced. The report said 70% of the land in Mexico is in the hands of the ejidatarios (members of the rural collectives who work the land without ownership), with 30% of Mexican farmland belonging to the private sector. However, 70% of the agricultural products come from the private sector, and only 30% from the ejidos. The ejidatario cannot be removed from that piece of land regardless of how well or poorly the plot is administered. Should Salinas carry out the rural reform policy, each ejidatario will be given his or her own piece of land. The change will enable the ejidatario to obtain a loan, using the land parcel as collateral.

Ferruzzi trading unit loses $100 million

The trading activities of the Ferruzzi Group have acknowledged it may show a $100 million loss by the end of 1989 because of "extraordinary events" in international trading operations, according to a report in the Sept. 25 issue of *The Wall Street Journal.*

Ferruzzi made the statement after an Italian publication had estimated 1989 losses at $200 million. Ferruzzi also said financial actions had been taken to offset the loss.

Ferruzzi was the center of a mid-summer order by the Chicago Board of Trade for liquidation of July soybean futures contracts. Later three top traders in Ferruzzi's Paris office resigned. The Paris office is headquarters for Ferruzzi's international trading activities.

Argentina to reduce ag export tariffs

As a means of encouraging agricultural exports, Argentine President Carlos Menem reduced the export tariffs on a number of major farm products. The export tax reductions for soybeans, soybean oil and soybean meal will take effect April 1, 1990. Similarly,

export taxes will be reduced for sunflowerseed, sunflowerseed oil, and sunflowerseed meal, effective December 15, 1989.

Pakistan modifies rules on use of soybean oil

Pakistan has announced changes in palm oil import tariffs, the distribution of soybean oil, and the retail price of vegetable ghee. The changes were made in an attempt to control the country's burgeoning vegetable oil processing capacity resulting from the abolition of the Pakistani government's approval requirement for building vegetable oil plants. While soybean oil purchases by ghee processors are limited to 35% of the plants' production capacity, cooking oil processors are now allowed 100% of their needs. The regulatory duty on palm oil imports was increased from $171 to $226 per metric ton, in order to keep the landed price of palm oil on par with soybean oil. As a slight compensation to ghee processors for the increase in palm oil duties, the retail price of vegetable ghee was increased by 3.6%.

Lam Soon to expand China oil mill stake

According to a report in the *Hong Kong Standard* on Oct. 2, 1989, Lam Soon (Hong Kong) Ltd., a major local edible oil and food canning company, will invest about U.S. $40 million (H.K. $311 million) in China to expand its edible oil milling business. Negotiations are under way to devote a large part of that amount, H.K. $30 million, to establish an edible oil milling and oil refinery in Guangdong. Another $H.K. 23.37 million will be used to set up a small plant in Shandong.

Group Managing Director Raymond Chien told the *Hong Kong Standard* that the agreement for the plant in Guangdong will be signed at the end of this year. The group was negotiating with Chinese authorities to lease the 250,000 square foot site for 30 years. The soybean oil and peanut oil milling plant in Shandong would be a 60-40 joint venture between Lam Soon and the China authorities.

Lam Soon markets eight different brands of peanut, corn and blended oil in the Hong Kong edible oil market, and claims to have a 60% share of the total consumer edible oil market.

Peru's exports up due to fish catch

Peruvian fish oil and meal exports during 1989 were expected to reach the highest levels since the early 1970s due to an exceptionally good fish catch. Peru-

vian fish catch was projected to total 6.5 million metric tons (MT) during 1989, compared with 5.4 million MT caught during 1988, according to a U.S. Department of Agriculture (USDA) Foreign Agricultural Service report filed from Lima, Peru.

As a result of the good fish catch, Peruvian fish meal and fish oil production was expected to increase sharply for 1989. Production totaled 842,700 (MT) of fish meal and 250,800 MT of fish oil during January-July 1989, compared with 619,200 MT of fish meal and 75,600 MT of fish oil during the same period in 1988. Exports during January-July 1989 included 659,100 MT of fish meal and 171,500 MT of fish oil.

According to the Peruvian National Fishing Society, a total catch of 4,487,000 MT was reported for January-July 1989, with 74% composed of anchovy and the remaining of other species. A ban on the fishing of anchovy and sardines in the main Peruvian fishing zones was in effect July 25, 1989, through Sept. 11, 1989, to help preserve biomass and maintain a high level of catch for 1990.

The USDA report also said Peruvian consumption of soybean oil is expected to drop during 1989 and 1990 due to the lack of foreign currency to import vegetable oil. The demand for cooking oil is expected to be met with domestic fish oil, palm oil and cottonseed oil. Canada has donated 6,500 MT of canola oil to Peru.

Canola acreage increasing in U.S.

U.S. plantings of winter canola for 1989-90 are projected to total approximately 80,000 to 100,000 acres, according to preliminary estimates from Ameri-Can Pedigreed Seed Co. officials.

Although industry officials initially projected plantings might reach 120,000 acres, rains throughout Kentucky, Southern Illinois and Missouri hampered some plantings.

Andrew Baum, president of Ameri-Can Pedigreed Seed Co., noted that U.S. planting occurs between mid-August and mid-October, depending on the location. Winter canola is now grown in Michigan, Ohio, Indiana, Illlinois, Kentucky, Missouri, Kansas, Tennessee, Arkansas, Georgia, Alabama and Mississippi.

Approximately 65,000 acres were planted to winter canola in the U.S. during the 1988-89 season, Baum said.

Kraft testing new fat-free ice cream

Kraft General Foods is testing a fat-free ice cream, called Sealtest Free Nonfat Ice Cream, without the 10% butterfat required under the ice cream standard.

The firm said the new fat- and cholesterol-free product, with 100 calories a serving, has the taste, texture and appearance of ice cream and is nutritionally equivalent. Cellulose gel is the bulking agent in the product. Kraft is expected to ask for an amendment of the standard.

Kraft is also introducing a fat- and cholesterol-free salad dressing using cellulose gel as the bulking agent in selected markets.

U.S. peanut crop largest ever

The largest planted acreage since the 1950s and the highest yields since 1985 were expected to produce a record U.S. peanut crop of 4.44 billion pounds in 1989.

Generally favorable growing conditions in the major production regions were expected to raise yields to 2,688 pounds per acre, 10% higher than during 1988.

Domestic food use of peanuts during the marketing year which ended July 31, 1989, was up 8% over the previous year, to a record 2.24 billion pounds.

Peanuts protected by kernel moisture

Peanut kernels that stay moist before harvest have been found by U.S. Department of Agriculture (USDA) scientists to reject aflatoxin.

Kernel moisture is linked to a peanut's ability to produce natural chemicals, called phytoalexins, that prevent fungi from making aflatoxin, according to Joe W. Dorner, a microbiologist with USDA's Agricultural Research Service's National Peanut Research Laboratory in Dawson, Georgia.

According to Dorner, aflatoxin-producing fungi are able to tolerate stress created by high temperatures and low moisture. Once a peanut kernel's moisture level drops to 20-25%, the fungi can make aflatoxin and face no natural resistance. Studies at Dawson, however, have shown that irrigated peanuts maintain their natural defense system.

Dorner and colleagues at Dawson are planning to examine different peanut varieties for ways to make peanuts produce phytoalexins in drought situations. Researchers are trying to find peanut varieties that retain enough moisture for phytoalexin production.

Four firms promoting 'canola belt' in U.S.

Four North American agricultural companies are joining forces to develop a canola growing belt in Geor-

gia, Alabama and South Carolina.

It will be the first introduction of canola on a commercial scale in the coastal plains region. Farmers in the Southeast will be asked to plant a canola variety called Delta, developed by Allelix Crop Technologies. The seeds will be marketed by Atlanta-based Agratech Seed Inc., which has signed an exclusive sales agreement with Allelix, and will be sold through the Gold Kist Inc. distribution network.

Gold Kist Inc., Agratech Seed Inc.'s parent company, also will provide chemical and fertilizer recommendations. The fourth member of the partnership is Archer Daniels Midland Company, which will crush the regional canola crop at its Augusta, Georgia, plant.

As a first step in introducing canola into the Southeast, grower meetings are being held to explain the benefits of canola to farmers. Jeremy Gawan, President of Allelix Crop Technologies, anticipates that the first commercial canola crops in the area will be harvested in 1990.

Japanese crush down, oil production rises

Japan's oilseed crush declined slightly to 6,363,000 metric tons in 1988 compared to 6,438,000 tons during 1987, according to newly released statistics from Japan's Ministry of Agriculture, Forestry and Fisheries. Oil production rose, however, to 2,097,000 tons from 2,055,000 tons (Table 1).

TABLE 1

Japan Oils and Fats Statistics for 1988 and 1987[a]

	1988	1987
Oilseed crush (total)	6,363	6,438
Soybean	3,687	3,812
Rapeseed	1,663	1,619
Vegetable oil production	2,097	2,055
Vegetable oil imports	390	360
Edible oil disappearance		
Vegetable	1,847	1,784
Animal	325	321
Non-edible oil disappearance		
Vegetable	248	220
Animal	238	355
Total oil exports	367	190
Total oil disappearance	3,025	2,869
Total oil meal production	4,472	4,506
Soybean meal	2,875	2,961
Rapeseed meal	956	916

[a]000 Metric tons.

Borden to sell some facilities

Borden Inc. has announced it will establish an after-tax reserve of approximately $404 million to streamline and consolidate production in its rapidly growing

businesses, with the goal of making the company a lowest-cost producer in all of its operations by 1992.

Under the plan, the company will close or sell about 65 of its 265 plants worldwide over a two- to three-year period. About 20 of the closings will involve dairy plants and branches in non-growth market areas. The restructuring will reduce the company's worldwide employment by approximately 7,000 from the current 46,000 persons employed.

The company said it will identify the initial plants to be affected only after employees and customers are notified.

FDA's Layloff to head AOAC for 1989-90

The Association of Official Analytical Chemists has installed Thomas P. Layloff of the U.S. Food and Drug Administration as its president for 1989-90.

Odette L. Shotwell of the U.S. Department of Agriculture's Northern Regional Research Center is the immediate past president. H. Michael Wehr of the Oregon Department of Agriculture is president-elect. Edgar R. Elkins of the National Food Processors Association will be secretary-treasurer.

Directors elected include Albert W. Tiedemann of the Virginia Division of Consolidated Labs, Arvid Munson of Hazleton Laboratories Corp., Nicole Hardin of the U.S. Food and Drug Administration, Harry B.S. Conacher of Health and Welfare Canada, and Alex Williams of the Laboratory of the Government Chemist, United Kingdom.

FGIS okays Neogen aflatoxin test kit

The USDA Federal Grain Inspection Service has added the Neogen Corporation's Agri-Screen test kit to its list of commercial test kits approved for determining aflatoxin in corn.

Kits previously approved were the Ex-Screen, Aflatest, Afla-20 Cup, Oxoid and Sam-A.

News briefs

The **Soviet Union** has purchased its first order of corn gluten feed from the U.S., according to *Oil World.* Trade sources indicated Russia in late September bought 60,000 metric tons for delivery during October 1989/March 1990.

Korean soybean crushers are reportedly upset about **Cargill's** attempt to build a crushing facility in the country. The Ministry of Agriculture has promised to block the proposed plant, although they admit there is no legal basis to keep it out.

The Kuala Lumpur Commodity Exchange (KLCE) has postponed the start of trading in refined, bleached and deodorized (RBD) palm olein futures contracts until March 1990. KLCE said that such issues as the terms of clearinghouse guarantees of contracts and arbitration procedures still must be resolved.

Peter M. Scott of the Health Protection Branch, Health and Welfare Canada, and **Viorica Lopez-Avila** of Acurex Corp. have received the "General Referee of the Year" awards from the **Association of Official Analytical Chemists.** Scott works in the area of mycotoxins; Lopez-Avila works in the area of organics in surface and waste water.

Monsanto's Searle drug unit has acquired **Heumann Pharma GmbH** of Nuremberg, West Germany. Heumann, with strengths in cardiovascular, anti-infective and gastrointestinal products, is considered a good bet to introduce new Searle products now in the U.S. company's discovery pipeline.

Fuji Oil Company of Japan plans to begin construction on a confectionery fat refining plant in the U.S. by the end of this year. The company will refine raw fractionated fats imported from Malaysia and Singapore, and plans to enter the U.S. confectionery market using a cocoa butter equivalent and cocoa butter substitute.

Wilsey Foods Inc. in the United States has been acquired by **Mitsui & Co.** of Japan. Mitsui intends to market to-line Japanese original foods in the U.S. through Wilsey. Estimated net sales for the first year is 200 million yen.

Procter & Gamble Co. has named as its chairman and chief executive officer **Edwin L. Artzt,** architect of the consumer products giant's turnaround in the international market. The announcement marks an earlier-than-expected departure for P&G's current chairman and chief executive, John G. Smale, who is credited with strengthening the company through $4 billion acquisitions that opened new markets, such as health care. Artzt will assume the posts in January. He is expected to concentrate heavily on health care and developing new foods that have more medical benefits, both considered growth opportunities; and on stimulating growth overseas.

Soviet leader **Mikhail Gorbachev** didn't bite when **Mrs. Nelson Rockefeller,** a board member of the **Archer Daniels Midland Co.,** offered him a soy burger, *The Wall Street Journal* reported. Gorbachev opened a major U.S. trade exhibition in Moscow in mid-October and spent two hours touring some of the 150 stalls representing blue-chip companies, including ADM. You'd have thought he would have been hungry after two hours in the exhibit hall.