Diacylglycerol oil products closer to the U.S. market

Commercial-scale production of diacylglycerol (DAG) oil was expected to begin by the end of April at a pilot plant in Decatur, Illinois, according to Larry Cunningham, vice president of corporate affairs for Archers Daniels Midland (ADM). The plant is part of a joint venture to produce the oil by ADM and Kao Corp. of Japan.

The oil, which will be marketed in the United States under the name Enova, was introduced in Japan in February 1999 as a cooking oil under the brand name Econa. Kao says the product can reduce fat deposits and lower serum triglyceride and cholesterol levels (inform 12:487, 2001).

Sales of Enova in Japan are expected to increase to more than $150 million in 2002, or roughly 22% of the total edible oil market, according to the Yomiuri Shimbun daily newspaper.

Several U.S. food manufacturers are very interested in ADM’s tests, Cunningham said, adding that the first products should appear by the beginning of 2004. DAG has the potential to go beyond being marketed as a premium cooking oil or spread, he said, and could be used in snack and baked foods as well.

Wow! under scrutiny

PepsiCo’s Frito-Lay Inc. is testing whether consumers would miss its Wow! fat-free potato chips by pulling the product off grocers’ shelves in part of Massachusetts to see if shoppers object.

Wow! chips are made with olestra, the fat substitute developed by Procter & Gamble Co. (P&G). Sales of the chips were $277 million in 1998, dropping to around $136 million in 2001, according to Information Resources Inc. of Chicago, Illinois.

P&G recently sold its olestra manufacturing plant in Cincinnati, Ohio, to Twin Rivers Technologies Inc., of Quincy, Massachusetts, while retaining ownership of its brand name, Olean (inform 13:279, 2002). Frito-Lay did not respond to requests for comment.

Fish oil may protect against fatal second heart attack

A decade-long nutrition study in Italy has produced additional evidence that n-3 fatty acids in fish oil may reduce the risk of heart attack death by persons who have experienced a previous heart attack.

The study tracked 11,323 patients who had previously had a heart attack, all of whom were advised to eat plenty of fish and olives and half of whom also took a one-gram capsule of n-3 fatty acid daily.

About 1.1% of the patients receiving the n-3 capsule died within three months of their initial heart attack, compared to 1.6% of those who followed the recommended diet, but did not receive capsules, according to the report. The new data showed that after 3.5 years, about 8.4% of those taking the supplements had died, compared with 9.8% of those who had not.

The study reportedly attributed half the reduction to a reduction in sudden cardiac death.

Approximately one-fourth of the patients also received a daily one-gram capsule of n-3 fatty acid; another fourth received 300 mg of vitamin E daily; another four took both the n-3 capsule and the additional vitamin E, and one fourth received a placebo.

The study was published in Circulation, a publication of the American Heart Association. The study leader was Roberto Marchioli from Consorzio Mario Negri Sud, a research institute in Santa Maria Imbaro, Italy.

In an editorial in Circulation, Alexander Leaf, a professor of clinical medicine at Harvard Medical School in Boston, Massachusetts, said it appeared that n-3 fatty acids stabilize heart cells so that they are “very resistant,” to arrhythmias, potentially fatal irregular heartbeats. Leaf and his colleagues have done research indicating fatty acids may have a significant role in regulating electrical activity of heart muscle cells.

The latest publication involves analysis of data from the long-term GISSI-Prevenzione trial.

Marchioli is planning a five-year study to investigate whether persons who have not had a heart attack might receive a protective benefit by taking fish oil supplements.

U.S. studies support protective role for fish diet

Two long-term U.S. studies published during early April support arguments that eating fish as a regular part of the diet may reduce the risk of fatal heart attacks and, in women, perhaps the risk of nonfatal heart attacks. Such beneficial effects often are attributed to the n-3 fatty acids in fish oil.

The study analyzed data from the Brigham nurses’ study, a study using information from 85,000 female nurses in the Boston, Massachusetts, area.

The new publication analyzed dietary recall data collected during 1980–1994. According to the researchers, the data show that the more frequently fish was eaten, the less likely the person was to suffer a heart attack or die of cardiac arrest. The study, “Fish and Omega-3 Fatty Acid Intake and Risk of Coronary Heart Disease in Women,” by F.B. Mu, L. Bronner, W.C. Willett, M.J. Stampfer, K.M. Rexroad, C.M. Albert, D. Hunter, and J.E. Manson, was published in the

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The other study, published in the New England Journal of Medicine, reviewed n-3 serum concentrations in males. When the serum concentration data was divided into quarters based on such concentrations, the researchers concluded that those persons in the top quarter had only a fifth of the risk of sudden death as those in the bottom quarter.

This report was based on data collected as part of the Physicians Health Study in 1982, which collected data from 22,000 male doctors. All were free of heart disease when the study began, and blood samples were obtained from 15,000 of the participants. During the next 17 years, according to a report in the Washington Post on April 10, 2000, 94 of the blood sample donors who had not been diagnosed with heart disease died unexpectedly. When researchers compared serum n-3 levels of those 94 with 180 surviving members, they found those who died had lower levels of serum n-3 fatty acids. The researchers then examined the data on all the blood samples and found the correlation between serum n-3 levels and sudden death risk.

Martek buys OmegaTech; DHA aids postpartum depression?

Martek Biosciences Corp., the U.S. firm that uses microalgae to produce nutritional fatty acids, will purchase privately held OmegaTech of Boulder, Colorado, according to Pete Buzy, Martek’s chief financial officer. The final purchase price may run as high as $90 million if various monetary goals, as well as regulatory and labeling approvals, are generated within the next two years.

When the purchase is final, Martek says it will be the only U.S. supplier of commercial-scale plant-sourced DHA.

Martek and OmegaTech use similar technology to produce docosahexaenoic acid (DHA), a long-chain polyunsaturated
acid (LCPUFA) both companies sell for use as a functional ingredient. But where Martek has focused on use in infant formulas, OmegaTech has researched its use in a range of foods, beverages, and adult and infant supplements and formulas. The global market for DHA in the food and beverage industry has been estimated at $1 billion.

Martek also produces arachidonic acid-enriched single-cell oil, and is the firm that first petitioned the U.S. Food and Drug Administration (FDA) to recognize its LCPUFA as Generally Recognized as Safe (GRAS) for use in infant formulas (inform 12:836–837, 1064–1074, 2001). The first DHA-containing infant formula was introduced in early 2002; the first DHA-containing baby food debuted in March.

In Europe, Chemical Market Reporter (CMR) said that Celanese Ventures GmbH is ready to enter the vegetable-based DHA market, having signed an agreement with an Italian fermentation company to manufacture ingredients for Celanese’s DHA. According to CMR, Celanese is eyeing the supplement, functional food, and beverage markets, and expects to enter the U.S. market as soon as it receives authorization from the FDA.

David Kyle, director of the Mother and Child Foundation in Columbia, Maryland, and former senior vice president for research and development at Martek, recently urged that more attention be paid to the role that DHA may play in reducing the incidence of postpartum depression.

Speaking at the 223rd national meeting of the American Chemical Society in early April, Kyle reviewed a number of independent clinical studies that suggest a possible inverse correlation between the intake levels of DHA and incidence of clinical depression, noting that the level of DHA in mother’s milk typically is 40–50 mg in U.S. women, compared to around 200 mg for European women and about 600 mg for Japanese women.

Virgin olive oil protects against LDL oxidation

Research workers in Barcelona, Spain at the University of Barcelona and at the Municipal Institute of Medical Research have found that daily ingestion of virgin olive oil may provide protection for low-density lipoprotein (LDL) from oxidation. A report of their findings has appeared in the European Journal of Clinical Nutrition (56:114–120, 2002).

Sixteen healthy volunteers aged 25–65 years ingested virgin olive oil daily over a period of one week. Few changes were observed in the postprandial phase of the study, but at the end of the feeding trial there were significant increases in blood contents of oleic acid, vitamin E, and phenolic compounds, all of which are olive oil components. Significant decreases in the quantity of dienoic acids and in the oxidation rate of LDL were also found. The basis for the observed effects was not determined.

**Calcium supplementation of benefit to serum lipids in postmenopausal women**

Dietary supplementation with calcium citrate has been found to have a beneficial effect on serum lipids in normal older women.

The study, conducted at the University of Auckland in New Zealand; has been reported in the American Journal of Medicine (112:343–347, 2002).

As part of a study of the effects of calcium supplementation on fractures, a group of 223 postmenopausal women who were not receiving therapy for hyperlipidemia or osteoporosis were given calcium (1 g/day) or a placebo over a period of one year. Blood samples were taken at baseline, and at 2, 6, and 12 months.

The results showed that after 12 months serum high-density lipoprotein (HDL) cholesterol levels and the HDL to LDL cholesterol ratio had increased more in the calcium group than in the control. The primary effect was due to a 7% increase in HDL cholesterol levels in the calcium group, with a nonsignificant 6% decline in LDL cholesterol levels. The triglyceride level remained relatively unaffected.

Lead researcher Ian Reid, along with his colleagues, said “These data provide reason to encourage the more widespread use of calcium supplementation in postmenopausal women, to explore its effects on lipids in other populations such as men, and to undertake larger studies to assess the effects of calcium supplementation on the risk of cardiovascular events.”

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**Scientia Gras**

*A Select History of Fat Science and Technology*

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