Linoleic acid decreases platelet aggregation

U.S. Department of Agriculture (USDA) researchers in California have found that subjects fed a diet high in linoleic acid had a decreased response to aggregating agents in the blood—and thus potentially a diminished risk for arterial thrombogenesis, or stroke.

Risk of arterial thrombogenesis is thought to be caused in part by an increased response of platelets to agents causing them to aggregate in the blood, leading to clots. High intake of saturated fats is though to be linked to this effect.

Betty J. Burri and coworkers at the USDA Agriculture Research Service, Western Human Nutrition Research Center reported the results of their study in the September 1991 issue of the American Journal of Clinical Nutrition. The researchers investigated the effects of linoleic acid concentrations and low levels of antioxidants on platelet aggregation and activity of antithrombin III.

Subjects were placed on one of two study diets for 95 days; the diets were identical except that one was high in linoleic acid and low in oleic acid, whereas the other was low in linoleic acid and high in oleic acid. Over time, subjects who consumed the high linoleic acid diet had a slowed rate of platelet aggregation; the decrease only became significant after 63 days on the study diet. Activity of antithrombin III, related to platelet aggregation, was not significantly affected. Antioxidant status did not change during the study time period.

The authors concluded that increasing linoleic acid at the expense of oleic acid may decrease platelet aggregation independent of changes in total and saturated fats. "This may mean that improvements in platelet aggregation can be induced by minor modifications and substitutions in the diet," they said.

FDA plans interim rules on cholesterol definitions

The Food and Drug Administration (FDA) intends to create interim definitions for "cholesterol-free" and "low cholesterol." Fred Shank, director of the Center for Food Safety and Applied Nutrition, told directors of the Institute of Shortening and Edible Oils (ISEO) during October.


Shank reportedly told the ISEO directors that FDA also would prohibit claims of "cholesterol-free" for foods high in saturated fat and would define circumstances in which a "% fat-free" labeling would be permitted.

The interim regulation would be in place until the full package of new food label regulations takes effect in 12 to 18 months.

Study links HDL and saturated fats

A study published in the September 1991 issue of Journal of Nutrition provides "further evidence of the interrelationship of triglyceride and HDL metabolism." Denise Ney of the University of Wisconsin, Madison, and colleagues undertook the study to determine the effects of different saturated fats on descriptors of HDL-cholesterol such as size distribution, apolipoprotein composition, and chemical composition.

Diets containing saturated fats caused a difference in HDL size and chemical composition. The authors suggest that ingestion of saturated fat results in "an apparent shift in the size distribution of high density lipoprotein (HDL) toward smaller particles containing a greater proportion of apo E, free cholesterol and triglyceride, and a lower proportion of protein and apo A-L."

Adult male rats were fed diets containing 16% fat as corn oil or 2% fat as corn oil plus 14% fat as butterfat, beef tallow, palm oil, or coconut oil. The study period lasted 6 weeks.

Plasma triglyceride concentrations were found to be higher with the diet containing more saturated fat than with the corn oil diets for weeks 1-5 when data from the animals fed saturated diets were combined. After 6 weeks, plasma triglyceride levels were higher in animals on the beef tallow, palm oil and coconut oil diets than those fed corn oil; triglyceride levels were significantly higher in animals fed beef tallow than those fed butterfat. However, triglyceride levels were not significantly different between animals fed butterfat and those fed corn oil after 4 weeks.

Plasma cholesterol levels were significantly higher in the animals fed palm oil and beef tallow than those fed butterfat and coconut oil diets. These levels were not different among the groups fed palm oil, beef tallow, and corn oil. They found no difference in plasma cholesterol in rats fed saturated fats when the diets had a minimal amount of added cholesterol.

Developing brain synthesizes cholesterol

The developing brain apparently obtains all the cholesterol it needs via de novo synthesis.

Research from the University of California-Los Angeles School of Medicine shows that sterol composition of the brain is not influenced by the cholesterol concentration of milk, and that cholesterol exogenous to the brain does not cross the blood-brain barrier, even under conditions of hypercholesterolemia. The research was reported in the September 1991 issue of Journal of Nutrition.

To determine whether cholesterol in milk is necessary for normal brain development, John Edmond and co-workers fed rat pups with milk substitutes containing cholesterol at concentrations lower than, equal to, and greater than cholesterol concentrations in rat milk from day 5 to day 15 after birth.

These days represent a critical period in rat brain devel-
concentrations were not affected. Brain activity of HMG-CoA reductase also remained unaffected by the cholesterol content of the milk, unlike liver levels of this enzyme which increased in the animals fed high cholesterol milk. HMG-CoA reductase is a limiting enzyme in cholesterol synthesis. The authors concluded that "brain cholesterol production is autonomous."

Human milk, like rat milk, contains cholesterol; most infant formulas contain only minimal amounts of cholesterol. The authors suggested that similar increased cholesterol synthesis could occur in formula-fed human infants as was seen in the study rats fed low cholesterol milk.

Gene therapy to be tried on hypercholesterolemia
Researchers at the University of Michigan Medical Center in Ann Arbor have received the go-ahead from the National Institutes of Health Recombinant DNA Advisory Committee to administer genetically engineered liver cells to patients with familial hypercholesterolemia (FH). FH is a rare genetic disorder in which cells lack both of the normal two copies of the gene for the low-density lipoprotein (LDL) receptor, which is responsible for removing low density lipoproteins from the blood. These patients, whose cholesterol levels are four to five times normal, often suffer heart attacks before adulthood.

Preliminary work using this technique in a species of rabbit genetically prone to high blood cholesterol resulted in an average 30% reduction of blood cholesterol levels.

U.S. children understand nutritional principles
A Gallup survey showed that many children in the United States may know more than adults about good nutrition. The survey, sponsored by the International Food Information Council (IFIC) and the National Center for Nutrition and Dietetics, interviewed 407 children in 4th through 8th grades.

The study said that the children understood the major nutritional principles of balance, variety, and moderation, according to American Dietetics Association president Mary Abbot Hess. Among survey findings: 94% of the children understood that their food choices can affect future health; 99% understood that exercise is important in being healthy; and 99% thought that it was important to eat plenty of fruits, vegetables, and high-fiber foods.

Whereas 77% of adults were familiar with the basic food groups, and 55% could name three groups, 95% of the children in the survey were familiar with the groups and 80% could identify three.

IFIC executive director Thomas E. Stenzel was quoted in Food Chemical News (9/2/91) as saying that the results indicate that nutrition education efforts are reaching children.