Sanders evaluates fat’s role in heart disease

The Oils and Fats Group of the SCI held its Annual General Meeting at 6 p.m., June 11, 1998, at the SCI offices in Belgrave Square in London. This report is by Kurt Berger, a consultant based in London.

After the brief formalities of the Oils and Fats Group annual business session, the members heard a lecture by Tom Sanders of King’s College, London, under the title, “Have We Overestimated the Effects of Dietary Fat on the Risk of Cardiovascular Disease?”

Dealing first with stroke, Sanders pointed out that there appeared to be an inverse correlation with fat intake. Stroke rates are relatively high in Japan and China, which have relatively low levels of fat intake, while stroke rates have been falling in the United Kingdom during the past 50 years. In Japan, fat intake has been rising recently and stroke rates declining. Recent results from the Framingham Study (in the United States) showed that high fat intakes are associated with a low stroke rate. Low plasma-cholesterol levels are associated with hemorrhagic stroke.

In the United Kingdom, fat consumption has been decreasing during the past 50 years, but has remained constant as a proportion of energy intake at 40-42% of calories. Fat intake has fallen from 108 g daily in 1974 to 80 g daily in 1996, the saturated content has fallen from 50 grams to 25 grams, but cholesterol levels have changed little.

There is no convincing evidence that lowering fat intake reduced the risk of a first heart attack and there is no effect on the risk of a second attack. Increased fish consumption can reduce the risk of reinfarction while rapeseed oil usage lowers mortality rates.

Advice to reduce fat intake is not very effective for healthy people. Advice on modifying the fat intake is more effective.

In regards to the effect of individual fatty acids on blood cholesterol levels, stearic acid is neutral. There is some evidence that palmitic acid raises levels only when the linoleic acid intake is low. Lauric and myristic acids raise both high-density lipoprotein (HDL) and low-density lipoprotein (LDL) cholesterol, while the short- and medium-chain saturates do not raise LDL but do lower HDL cholesterol.

Low-fat diets do effect a small reduction in LDL cholesterol, but the statin drugs are much more effective.

Sanders next discussed thrombotic effects. Although atherosclerosis is a chronic disease, typically developing over 20-30 years, thrombosis is acute and can be treated by short-term intervention. For example, aspirin reduces the risk of a second heart attack by 50%.

The coagulation of blood is needed to heal wounds. It is the result of a cascade of reactions in which Factor VII plays an important role. Factor VII is a glycoprotein produced in the liver. It circulates in an inactive form which is activated by contact with damaged cells and then promotes the formation of thrombin from prothrombin. Thrombin in turn promotes the formation of fibrin from fibrinogen. Fibrin, together with aggregated blood platelets, forms a blood clot, or thrombus.

A fatty meal raises blood lipid levels for several hours after the meal, particularly in the middle-aged and elderly, and this lipemia activates Factor VII. This occurs at lower fat intakes in older individuals. Fibrinogen levels are raised in obesity, and also by smoking and by inflammations.

Sanders said that oleic, stearic, and elaidic acids and cocoa butter all cause peaks in postprandial lipemia, whereas the biggest increase in activated Factor VII occurs with oleic acid, much more so than with palmitic acid. He concluded that a reduction in total fat intake is desirable in older people because of the effect on lipemia and activated Factor VII, but that there is no case for fat reduction in the young and physically active.

The regional differences in heart disease in the United Kingdom are more likely due to differences in fruit and vegetable consumption than in fat intake. Significantly, the well-to-do Surrey town of Guildford and the Mediterranean island of Crete report similar rates of heart disease.

The lecture finished on the cheerful note that two glasses of wine daily reduced coronary heart disease risk by 50% and this was the signal to adjourn for dinner nearby.

Soy protein symposium to be held in 1999

The Third International Symposium on the Role of Soy in Preventing and Treating Chronic Disease will be held Oct. 31–Nov. 3, 1999, at the Omni Shoreham Hotel, Washington, D.C.

Mark Messina will be general chairperson for this event, as he was for the 1994 symposium in Arizona and the 1996 symposium in Belgium. The meeting is supported by the United Soybean Board.

Persons who wish to receive program, registration, and housing information should notify the Meetings and Exhibits Department, AOCS, P.O. Box 3489, Champaign, IL 61826-3489 (fax: 217-351-8091; e-mail: meetings@aocs.org).

DHA, EPA affect human hemodynamics

Researchers in Norway have found that dietary docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) influence heart rate, and that the fatty acid composition of plasma phospholipids may affect cardiac mechanics in humans.

In their study, Sameline Grimsaard and colleagues at the Institute of Community Medicine and Institute of Clinical Medicine, University of Tromso, Norway, looked at the effects of EPA and DHA on blood pressure, heart rate, and cardiac mechanics in healthy, nonsmoking men. Findings

For the study, 224 subjects were randomly assigned dietary supplementation with either 4 g per day of ethyl ester concentrates of DHA or EPA, or 4 g per day of corn oil as the control. Mean blood pressure at baseline was 122/77 mm Hg, and was positively associated with concentrations of serum phospholipid saturated fatty acids. Blood pressure did not change during the intervention.

Mean heart rate at baseline was 63.4 beats per minute; it decreased 2.2 beats per minute in the DHA group, increased 1.9 beats per minute in the EPA group, and remained practically unchanged in the control group. In a pooled analysis, changes in heart rate were independent of baseline heart rate and were associated with changes in concentrations of serum phospholipid DHA and docosapentaenoic acid (22:5n-3).

Echocardiography in a subsample of 52 men showed improved left ventricular diastolic filling in the marine oil groups compared with the corn oil group. In contrast, an increase in plasma concentrations of saturated fatty acids was associated with delayed diastolic filling.

**Positive effects seen with diet and exercise**

A new study has shown that a combination of diet and physical activity reduced low-density lipoprotein (LDL) cholesterol in men and postmenopausal women at risk for coronary heart disease due to elevated levels of LDL cholesterol and low levels of high-density lipoprotein (HDL) cholesterol.

In the study, subjects ate a diet based on American Heart Association (AHA) Step 2 guidelines to reduce intake of saturated fat to less than 7% of calories and intake of dietary cholesterol to less than 200 mg per day. Subjects also engaged in aerobic activity equivalent to walking or jogging 10 miles per week.
Diet and exercise were continued for one year.

Findings, published in the July 2, 1998, issue of The New England Journal of Medicine, showed there were no statistically significant reductions of LDL cholesterol in individuals who followed a regimen of either diet alone or exercise alone. However, a combination of dietary changes and exercise did reduce LDL levels.

“We cannot conclude from this study that diet by itself is ineffective in lowering LDL levels,” according to Ronald M. Krauss, a member of AHA’s Nutrition Committee. “Average reductions in LDL cholesterol levels with the Step 2 diet were 5–7%, which is very consistent with the changes that would be predicted on the basis of many previous studies.”

Because individuals have wide differences in their cholesterol response to diet, a study such as this, using relatively small dietary changes in small groups, may not be large enough to provide an adequate test of the diet alone or exercise alone, he said.

“Individuals should not be discouraged from trying to reduce levels of LDL cholesterol with diet, since many people can achieve a beneficial response. However, this study suggests the diet may be more effective when combined with increased physical activity,” he said.

The study also failed to confirm earlier evidence that exercise increases levels of the protective HDL cholesterol. However, the diet and exercise regimens used resulted in relatively small weight changes, with average reductions less than 5%. Previous studies have suggested that a greater weight loss, and over a sustained period, may be necessary to achieve an increase in HDL cholesterol and other metabolic changes.

Linoleic acid link to cancer unresolved

Researchers conducting a metaanalysis of epidemiological and case-control and prospective cohort studies concerning linoleic acid intake and cancer risk have concluded that it is “unlikely” that high intake of linoleic acid substantially raises the risk of contracting breast, colo-rectal, or prostate cancer in humans.

In a review published in the July 1998 issue of the American Journal of Clinical Nutrition, P.L. Zock and M.B. Katan of Wageningen Agricultural University, The Netherlands, said there has been concern that long-term consumption of large amounts of linoleic acid might increase cancer risk. As a result, they reviewed epidemiologic and experimental literature on the topic, and conducted metaanalyses of risk estimates from case-control and prospective cohort studies.

“None of the combined estimates from within-population studies indicated a significantly increased risk of cancer with high compared with low intakes of linoleic acid or polyunsaturated fat,” they wrote, adding, “Eologic comparisons of populations showed positive associations between cancer rates and per capita use of animal or saturated fat, but less so with per capita use of vegetable oil or polyunsaturated fat.”

Zock and Katan, however, did point out that animal experiments have indicated that a “minimum amount of linoleic acid is required to promote growth of artificially induced tumors in rodents, but above this threshold, linoleic acid did not appear to have a specific tumor-promoting effect.”

In an editorial accompanying the article, Kent L. Erickson of the University of California at Davis noted that “conclusions concerning linoleic acid and its potential role in tumorigenesis of the breast, colon, and prostate are tenuous. Clearly, much needs to be learned about and appropriate studies conducted concerning the influence of different fatty acids on breast, colon, and prostate cancers before specific dietary pronouncements can be made.”

Diet needs to include more fruit, vegetables

The U.S. Department of Agriculture’s (USDA’s) Healthy Eating Index, an assessment of the overall quality of Americans’ diets, shows that Americans are reducing fat in their diets and eating a wider variety of foods, but still need to eat more fruit, drink more milk, and reduce sodium intake.

The Healthy Eating Index, developed by USDA’s Center for Nutrition Policy and Promotion, uses 10 components to assess diet quality. The first five measure the degree to which a diet conforms to Food Guide Pyramid recommendations on consumption of grains, vegetables, fruits, milk products, and meat. The next five components measure fat, saturated fat, cholesterol, and sodium intake, as well as overall variety of the diet.

The index ranges from 0 to 100, with higher numbers representing healthier diets. In 1996 the index was 63.8 compared to 61.5 in 1989.

“Total fat intake” scores can range from 0 to 10, with 10 points given for intake of 30% or less energy from fat, and 0 points for intake of 45% or more energy from fat. Intakes between 30 and 45% are scored proportionately. For “saturated fat,” 10 points are given for less than 10% of energy derived from saturated fat, and 0 points for 15% or more of energy derived from saturated fat, with intermediate intakes scored proportionately.

Between 1989 and 1996, the total fat score improved from 6.3 to 6.9, and saturated fat score improved from 5.4 to 6.4.

Netlink: http://www.usda.gov/cnpp

Eisai USA starts up vitamin E plant

Eisai USA Inc., a subsidiary of Eisai Co. Ltd. of Tokyo, Japan, in June began operating a synthetic vitamin E production plant in the Bayport Industrial Complex in Pasadena, Texas.

Designed to produce 1,500 metric tons a year of synthetic vitamin E, the plant will supply Eisai’s customers in the United States and Latin America.

Eisai USA headquarters in Houston, Texas, will market the synthetic vitamin E produced.