Soy protein linked to reduced CHD risk

Consumption of soy protein may provide health benefits including reduced risk of coronary heart disease (CHD), according to a meta analysis published in the New England Journal of Medicine.

The meta analysis by James Anderson, professor of medicine at the University of Kentucky, included evaluation of data from nearly 30 clinical studies involving more than 700 persons. “This is the bottom line—increased intake of soy equals decreased risk of coronary heart disease,” Anderson said.

His paper, “Meta-Analysis of Effects of Soy Protein Intake on Serum Lipids in Humans,” also addresses practical ways in which people can incorporate soy products into their diet. “Too often the scientific community tells Americans what they need to eat, but doesn’t worry about how they’ll eat it. Soy can easily be a part of everyone’s diet, and this paper helps show people how,” he said.

To accompany the article, John Erdman, director of the University of Illinois’s Division of Nutritional Sciences, wrote an editorial for the same Aug. 3, 1995, issue, addressing the safety and practicality of eating soy protein.

The report noted that replacing animal protein with an average of 47 g of soy protein a day can significantly lower levels of low-density lipoprotein (LDL) cholesterol without affecting high-density lipoprotein (HDL) cholesterol. One study at the University of Illinois has shown that 25 g of soy protein a day lowered LDL in men with elevated cholesterol levels. Erdman said it is not yet known whether an even lower amount of soy protein, if combined with a high-fiber, low-fat diet, might have the same effect.

University of Illinois nutrition professor Sue Potter is conducting a study examining the effect of soy protein and isoflavones on heart disease and osteoporosis in 75 women who have gone through menopause.

Peter Gann, a professor of preventive medicine at Northwestern University Medical School, has announced there will be a clinical study undertaken this fall at Northwestern to track the hormonal effects of soy consumption in women and to examine a possible link between lowered estrogen levels and reduced risk of breast cancer, according to a report in the July 24, 1995, Food Chemical News.

In Gann’s research project, 200 women will be given randomized amounts of isoflavones in the form of powdered soybean isolate for use in muffins and other recipes. The women will be tracked for 15 months. Gann noted that much research is needed before determining whether increased soy consumption is a useful strategy for breast cancer prevention.

Obese mice lose weight when given hormone

Scientists treating obese mice with a genetically engineered hormone have found the mice lost 22–40% of their weight in just a month, according to research findings published in Science.

The hormone, named leptin, is naturally produced by the ob gene cloned last year by Jeffrey M. Friedman and colleagues at the Howard Hughes Medical Institute at Rockefeller University.

Friedman and colleagues reported in December that they had found the ob gene in mice as well as a counterpart in humans. They hypothesized that the gene produces a hormone that helps regulate the body’s storage of fat. Subsequently, mice studies at Friedman’s laboratory as well as at two other laboratories have verified that leptin helped reduce excess fat in mice.

In this latest research, scientists twice a day injected leptin into ob-defective mice, as well as into normal mice and mice with a gene defect that makes them diabetic. The ob-defective mice quickly began losing fat cells, ate less food and spent more time exercising. Most of the extremely fat mice experienced body weight reduction by about 30%. Normal mice injected with leptin lost almost all of their body fat, representing about 12% of their body weight. The diabetic mice were not affected.

Leptin is found in the blood of normal mice but not in a mouse bred to have the flawed ob gene.

Scientists said more research is needed to see if it is safe to give the human version of the hormone to humans. If no safety questions arise, experimental human trials may begin in another year. Amgen Inc., a drug company in Thousand Oaks, California, holds a license from Rockefeller University for use of the ob gene and leptin hormone. The research was described in Science’s July 28, 1995, issue.

Dietary choices affected by complex factors

Although many persons believe that dietary behaviors are based purely on personal choices and therefore are modifiable, research suggests that some dietary choices are influenced by brain chemistry and body composition, according to Adam Drewnowski, director of the Human Nutrition Program at the University of Michigan School of Public Health.

Writing on the impact of taste preferences on dietary choices and food consumption patterns in the May–June 1995 issue of Food & Nutrition News, Drewnowski pointed out that the pleasure response to fats, controlled by brain neurotransmitters or peptides, may play a prominent role in dictating food choices.

“If so, then human biochemistry, rather than behavior, may be responsible for the failure to achieve recommended fat intake goals,” he wrote.

Fat consumption may satisfy several physiological and psychological needs. “The sensory pleasure response appears to be mediated by the release of endogenous opiate peptides—plea-
sure-enhancing molecules manufactured by the human brain," he wrote. "Since opiate peptides are also involved in mediating the pleasure response to foods, it may be that fat consumption affects the mental health and well-being of the individual."

Taste preferences for sugar, as well as fat, appear to be under opiate control, according to Drewnowski.

Increased personal income, accompanied by increased availability of fats and sugars in the food supply, is one factor favoring increased fat and sugar consumption, he wrote. Interhealth, a disease prevention program of the World Health Organization, has examined changing dietary patterns and disease risks in 14 countries. "Between 1954 and 1986, the availability of dietary fats increased in each one of the 14 Interhealth countries. In every case, fat displaced complex carbohydrate as an energy source, while dietary protein remained constant," Drewnowski wrote.

### Dietary interventions subject of conference

The following report was prepared by Kenneth K. Carroll, director of the Centre for Human Nutrition at The University of Western Ontario, London, Ontario, Canada, and an associate editor of INFORM.

Concern about the efficacy of the American Heart Association (AHA) Step I and Step II diets led to a May 3–5, 1995, scientific conference on the Efficacy of Hypcholesterolemic Dietary Interventions, held in San Antonio, Texas.

The Step I and Step II diets are designed to lower serum cholesterol levels through reductions in saturated fat and cholesterol intakes. However, a recent AHA fact sheet shows that 40% of Americans in the 45–55 year age group have blood cholesterol levels of 240 μg/dL or more.

The conference, attended by approximately 100 persons, featured oral and poster presentations on various factors influencing blood cholesterol levels, including different dietary components, genetics, diseases such as diabetes, and obesity.

The conference opened with an overview of epidemiological studies on the role of diet and hypercholesterolemia in cardiovascular disease, presented by Lewis H. Kuller of the University of Pittsburgh. This was followed by a discussion of the rationale for current dietary guidelines, presented by Scott M. Grundy of the University of Texas Southwestern Medical Center at Dallas.

Results of Step I diet trials were described by Henry N. Ginsberg of Columbia University College of Physicians and Surgeons, New York City, New York; Penny Kris-Etherton of Pennsylvania State University, University Park, Pennsylvania; Alice Lichtenstein of Tufts University, Boston, Massachusetts; and Patricia J. Elmer, University of Minnesota, Minneapolis, for the DELTA Research Group. Also, D. Mark Hegsted of Harvard University in Boston and Henry C. McGill Jr. of the Southwest Foundation for Biomedical Research in San Antonio described intervention studies related to dietary fatty acid composition and dietary cholesterol.

In sessions on other dietary factors, discussions and speakers included the following: effects of dietary protein and amino acids, Kenneth K. Carroll of the Centre for Human Nutrition, University of Western Ontario; dietary fiber, Barbara Schneeman, University of California at Davis; plant sterols and structured triglycerides, David Kritchevsky, The Wistar Institute, Philadelphia, Pennsylvania; and dietary calcium, Margo A. Denke, University of Texas Southwestern Medical Center at Dallas. Also, R. James Barnard of the University of California at Los Angeles described the effects of very low-fat diets, while Michael Davidson of the Chicago Center for Clinical Research spoke on fat substitutes.

In a session on genetic–environmental interactions on lipoprotein levels, Barbara V. Howard of the Malignant Research Institute of Washington, D.C., spoke on obesity. Other talks centered on gender, by Phyllis Bowen of the University of Illinois at Chicago; genetic factors, by Ronald M. Krauss of the Lawrence Berkeley Laboratory, University of California at Berkeley; and diabetes, discussed by John D. Brunzell of the University of Washington in Seattle.

The concluding session consisted of a summary of major conclusions presented by Grundy, followed by a panel discussion.

"This symposium reaffirmed the importance of diet in the prevention of coronary heart disease (CHD) in the United States. Although great strides have been taken in the treatment of high blood cholesterol with drugs, the use of drugs will be largely limited to high-risk patients," Grundy noted, adding, "The latter will include patients with established CHD or those with subclinical atherosclerotic disease or multiple risk factors. Dietary modification, combined with avoidance of cigarette smoking and regular physical activity, affords the best opportunity for the lifetime prevention of CHD. Three dietary factors need attention for modification. These are excess dietary cholesterol, cholesterol-raising fatty acids, and excess energy intake leading to obesity. The cholesterol-raising fatty acids include palmitic acid, lauric acid, myristic acid and trans fatty acids."

Participants generally agreed that reduced intakes of dietary cholesterol, cholesterol-raising fatty acids and total energy (in overweight people) are the bases for dietary prevention of CHD. For the general public, total fat intake should be 30% or less of total energy. However, there was not complete agreement on what represents a useful "therapeutic diet" for treatment of hypercholesterolemia. Most investigators favored an intake of less than 20 mg/day of cholesterol and intake of cholesterol-raising fatty acids of less than 7% of total energy intake. Whether a "therapeutic diet" should have a total fat intake below 20–25% of total calories was a continuing point of dispute. Otherwise, there was general agreement on the overall dietary approach to prevent CHD.

AHA plans to publish a summary of the conference later this year in its

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Conference advocates more olive oil in diet

The following report from the First International Conference on Fats and Oils Consumption in Health and Disease held April 24–25, 1995, in New York, was written by Mark A. Bieber, chairperson of the AOCS Health and Nutrition Division.

The First International Conference on Fats and Oils Consumption in Health and Disease presented very little new data but did solidly place olive oil and the Mediterranean diet in a truer scientific context.

As a result, the conference, which drew about 250 attendees, supported the drive for further use of olive oil, particularly in developed countries such as the United States. Primary sponsor for the conference was the International Olive Oil Council; co-hosts were The New York Hospital, Cornell University Medical College, The Rockefeller University, Harvard Medical School, The Regional Nutrition Center at the New York Academy of Medicine, and the Strang Cancer Prevention Center.

The following are some of the highlights from the conference.

Antonia Trichopoulou of the World Health Organization pointed out that 63% of the world’s population has access to less than 60 g of fat per day, while 11% has access to over 120 g per day. In developed societies, the more educated eat less total fat and more margarine than butter. The nutritional focus has been on the polyunsaturated/saturated ratio, with only a mention of monounsaturates. The Mediterranean Pyramid, however, helps “solve” this void by including olive oil as an integral part of the diet. This pyramid is based on the historical use of olive oil in the region and the perceived good health of the people living there.

Nancy Ernst of the National Institutes of Health discussed National Health and Nutrition Examination Survey III data showing that Americans eat about 34% of calories as fat, with about 12% derived from saturated, about 13% from monounsaturates and about 7% from polyunsaturates. Males consume an average of 350 mg of cholesterol per day while females consume 230 mg. Over the 1972–1990 time period, the change in dietary fat, when “plugged into” the Keys and Hegsted equations, would result in a net change of about -11 mg/dL in blood cholesterol levels; actual measurement of population blood cholesterol levels showed a drop of 12 mg/dL. This change was only in low-density lipoprotein (LDL) cholesterol, not high-density lipoprotein (HDL) cholesterol.

Martijn Katan of the Agricultural University in Wageningen, the Netherlands, asked, “What should we replace saturated fats with: alcohol, protein, carbohydrate, or other types of fat?” His conclusion from meta-analysis is that a high-oil diet rich in monounsaturates, with fat representing about 35% of calories, is preferable to a high-carbohydrate diet since the latter results in elevated triglycerides and lower HDL cholesterol.

Acknowledging that a high-oil diet could lead to obesity faster and probably would be lower in dietary fiber than a high-carbohydrate diet, Katan said evidence concerning glucose tolerance favors the high-oil diet. Displaying fat replacement graphs showing that trans fatty acids modestly raise LDL and that polyunsaturates are slightly better than monounsaturates, Katan still recommended monounsaturates as the “nutrient fat” of choice.

Michael Oliver, professor emeritus at the National Heart and Lung Institute in London, England, reviewed diet trials to lower coronary heart disease (CHD), concluding that there was a decrease in CHD only in those who achieved a significant lowering of blood cholesterol levels. Most diet trials were unable to achieve the high degree of cholesterol lowering needed to see a change in clinical events. Of the 14 diet trials that have been conducted, six were primary trials and only two have shown true CHD lowering. Oliver stressed that a rigorous diet regimen is needed to achieve a difference in cholesterol levels. He pointed out that significant lowering of cholesterol levels, whether by diet or drugs, is needed to reduce CHD. Fish oil feeding results in a striking decrease in CHD incidence. However, this is not due to cholesterol mechanisms but rather to changes in thrombosis and protection against arrhythmias, he said.

Scott M. Grundy of the University of Texas Southwestern Medical Center at Dallas recommended that the “ideal” diet would contain less than 30% of calories as fat, with a saturate-to-monounsaturated-to-polyunsaturated ratio of 7:14:7.

Elliott Berry of the Hadassah Medical School at Hebrew University in Jerusalem, Israel, said results from the Jerusalem study with diabetics showed increased CHD risk in males with a higher intake of polyunsaturates. It is not clear why this occurred. He hypothesized that n-3 fatty acids are less likely to lead to obesity but that a high monounsaturate diet is preferred since they oxidize more slowly than other fatty acids. Low oxidation is important, especially for diabetics.

David Rose of the American Health Foundation presented the same story for cancer and relied on animal model data showing that olive oil consumption resulted in less tumors than with corn oil. Prostaglandin synthesis decreased with olive oil or fish oil intake. In nude mice, olive oil and fish oil protected against tumor progression. However, it should be pointed out that human data are inconsistent with animal data in that no relationship between polyunsaturates and cancer has been found.

Walter Willett of the Harvard School of Public Health and Sam Shapiro of Boston University debated the effects of trans fatty acids in the diet. Willett likened the presence of trans fatty acids in food to conducting uncontrolled research without informed consent. Shapiro concentrated on methodology issues, pointing out inadequate epidemiology in conducting trans studies thus far, particularly the lack of a dose/response and extremely poor statistics.
Michael Crawford of the Zoological Society of London pointed out that the human brain is mostly lipid and that 70% of fetal energy is used to lay down brain lipid. With very low birthweight infants, brain development may pose a major problem. Low birthweight infants also are unprepared to fight off the oxygen attack of birth because of insufficient antioxidants in their tissues. Arachidonic and docosahexaenoic acids are needed in the newborn, with breast milk a superior source than formula, Crawford said.

Daniel Steinberg of the University of California at San Diego, the “originator” of the antioxidant hypothesis of atherosclerosis, said consumers should obtain antioxidants from food rather than supplements. Oxidized LDL leads to fatty streaks, not plaque, Steinberg said, adding that the hypothesis is still attractive although human intervention data are not totally supportive. Thus, more research is needed. In addition, he questioned if more effective antioxidants are needed.

Enzo Fedeli of Stazione Sperimentale pointed out that there are three types of olive oil—virgin, refined and pomace—and low molecular-weight phenols are present to act as antioxidants. For flavor, floral terpenes and aliphatics are present, including some salicylic acid derivatives. Tirosolo, with strong antioxidant properties, is found in 12 different forms in various olive oils.

JoAnn Manson of Harvard Medical School discussed how obesity is a risk factor in CHD. She pointed out a body-weight paradox, where the thinnest and fattest people have higher risk of dying from coronary-related incidents than those with a middle-range weight. Cigarette smoking can account for some of the thin person’s higher risk, but not all of it. In Seventh Day Adventists, a positive relationship was observed between body mass index (BMI) and increased risk of death. In the Nurses Health study, a BMI up to 29 was associated with no increased risk.

The optimum BMI lies between 20 and 28, a much wider range than previously recommended, according to Reubin Andres of the National Institutes of Health. He attributed the higher risk in the low BMI group to smoking and illness.

Dimitrious Trichopoulos of the Harvard School of Public Health concluded that the Mediterranean diet is healthful and should be adapted in all Western societies. Not only the diet but also the more relaxed lifestyle associated with it is needed, he said.