Research links soy to beneficial effects

Research concerning possible health benefits from consuming soy products was the focus of the First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease, held Feb. 20–23, 1994, in Mesa, Arizona.

The conference featured more than 40 speakers and attracted approximately 290 attendees from 13 countries. Attendees included representatives from industry, various state soybean boards and the United Soybean Board, as well as dietitians, physicians, scientists and researchers.

Enthusiasm over soy’s potential links to preventing heart disease and cancer prompted organizers and speakers to anticipate a second international symposium, although it is uncertain how soon that will happen. Several speakers and attendees noted that waiting several years for more data might be the most productive.

Topics at this first symposium included an overview of soybean processing and products, soy intake and cholesterol reduction, the potential public health impact of incorporating soy protein in the diet, soy intake and cancer risk, and studies looking at specific soy components for possible anticarcinogenic effects.

Main goals of the meeting were to provide a forum to discuss collaborative efforts and to increase the awareness of the health community concerning the benefits of consuming soy products. The latter, meeting organizers explained, includes plans to publish the proceedings later this year in the Journal of Nutrition.

“It is hoped that the publication of the proceedings will encourage the research community to investigate the various roles that soy may have in preventing and/or treating chronic disease, and encourage nutritionists and dietitians to recommend that soyfoods be incorporated into the American diet,” according to Mark Messina, who organized the program.

Funding for the symposium was provided by the Nebraska, Iowa and Indiana state soybean boards as well as the United Soybean Board. Protein Technologies International sponsored the Monday dinner.

Processing and products

Speaking on the agricultural importance of soybeans, David Asbridge of the American Soybean Association pointed out that just over one half of one percent of soybean meal is consumed directly by humans in foods in the United States.

Other statistics showed annual per capita soyfood consumption totals only to be three pounds in the United States, compared with approximately 27 pounds in Japan.

Noting that $60 million in soybean producer checkoff money has been invested in research efforts over the past three years, David Thomas of the United Soybean Board said his challenge to soy producers would be to seek to increase the amount of soybean meal used directly in human foods to 3% during the next 18 months.

The most popular soyfoods in the United States are tofu, soymilk, soy sauce, tempeh and miso, according to Peter Golbitz of Soyatech Inc. The U.S. soy industry, he said, has produced “Americanized” soyfoods to try to win over consumers: a soy variation of hot dogs, a frozen dessert using tofu and a bacon alternative using tempeh. There also are soy yogurts and soy-based “cheese” available in health food stores.

U.S. soyfood sales have grown substantially since 1980, Golbitz said, predicting that sales will reach $1 billion a year by the turn of the century.

Ed Lusas of the Food Protein Research and Development Center at Texas A&M University noted that soy proteins are used widely as ingredients in formulated foods but seldom are visible to the public. White-flake defatted products are made by dehulling, flaking and defatting soybeans by hexane extraction. Further processing can result in soy flours containing 50–52% protein, concentrates containing 70% or more protein and isolates containing 90% or more protein. There also are full-fat products, dried soyfoods products and mixtures of soy and animal protein products.

His presentation prompted several researchers to urge that processors not remove certain components, such as saponins and isoflavones. Such materials, traditionally viewed as having no nutritional value, now are being scrutinized as offering potential health benefits, they pointed out. In fact, other sessions at the symposium focused on findings indicating these materials may help prevent, and perhaps help treat, some chronic diseases.

Reporting on processing effects on soy composition, Robert Anderson, a research chemist at the U.S. Department of Agriculture’s (USDA)
National Center for Agricultural Utilization Research, said most processed soy products tested contain very little trypsin inhibitor—another component believed to be detrimental but now being examined for beneficial effects. Heating, he said, is used to intentionally inactivate trypsin inhibitors.

Soybean processing also changes the content of other minor constituents such as isoflavones and saponins, Anderson said. “Because they are concentrated in the cotyledon and are generally hydrophilic, dehulling and defatting increase the concentration of these compounds relative to whole soybeans,” he said.

**Cholesterol reduction**

Three speakers introduced as the pioneers in the field discussed soy protein’s link to lowering serum cholesterol.

David Kritchevsky of the Wistar Institute noted that Ignatowski in 1908 carried out the first nutritional investigation concerning atherosclerosis. Later studies by other researchers indicated that casein, an animal protein, was more atherogenic than soy protein. What finally prompted researchers to further pursue this topic was work by Kenneth Carroll and co-workers at the University of Western Ontario showing that most proteins of animal origin were more cholesterolemic in animal models than were vegetable proteins.

“As a result, we started looking at the arginine/lysine ratio as a factor affecting cholesterolemia and atherosclerosis,” Kritchevsky said. A study he conducted found that adding arginine to casein reduced atherogenesis and produced a lipoprotein pattern in rabbits similar to that seen when they were fed soy protein, while adding lysine to soy protein had the opposite effect.

Other animal studies have shown that cholesterol is not cleared as fast from the blood when casein is fed versus soy protein. Some researchers have questioned whether various carbohydrates or fibers affect serum cholesterol as well. “We have to look at the total diet and how everything interacts. The first thing researchers do is look at a single component, but we have to remember no one eats just a single component,” Kritchevsky said.

Reviewing animal and human studies concerning soy consumption and cholesterol reduction, Carroll said his studies showed that replacing casein with soy protein could prevent cholesterolemia and atherosclerosis, particularly in rabbits but also in guinea pigs and pigs.

A casein–amino acid mixture produced hypercholesterolemia similar to that of casein, possibly due mainly to lysine and methionine, Carroll said. Soy protein, meanwhile, produced lower serum cholesterol than a soy protein–amino acid mixture, suggesting that something in soy protein counteracts the effects of hypercholesterolemic amino acids.

Low-density lipoprotein (LDL) receptors are depressed in high amino acid diets as well as in the casein diets, as compared with the soy protein diet, according to Carroll. “More needs to be done to study the mechanism. We aren’t really sure what the amino acids are doing,” he added.

Reviewing clinical studies, Cesare R. Sirtori of the University of Milan said that adding cholesterol to a soy protein diet did not raise serum cholesterol levels. Other studies with hypercholesterolemic children and renal patients have shown about a 20% reduction in serum cholesterol levels on a high soy protein diet.

“My studies have shown that a soy diet can stop the progression of renal disease,” Sirtori said. Although all the mechanisms are not known at this point, rat studies indicate that LDL receptor activity goes down on a casein diet, and increases on a soy diet. “There definitely is something in soy protein that does affect LDL receptors,” he said.

William Wong of USDA/Agricultural Research Service’s Children’s Nutrition Research Center at Baylor College of Medicine currently is studying the effect of soy protein on cholesterol absorption, excretion and synthesis using stable isotope methodologies. His randomized two-part, cross-over study is examining the effect of soy or animal protein diets in both hypercholesterolemic and normocholesterolemic men. In the diets, 75% of total protein is derived either from isolated soy protein or from animal protein.

Thus far, results are available for four subjects. “We’ve seen a dramatic decrease (20%) in serum cholesterol in hypercholesterolemic subjects on the soy protein diet,” Wong said, predicting he will have data on many more subjects by the time a follow-up symposium is held.

Also looking at possible mechanisms, William Forsythe of the University of Southern Mississippi focused on soy protein interaction with thyroid function and cholesterol regulation. “There is consistent data showing that soy protein elevates plasma thyroxine levels in animal studies,” Forsythe told attendees. He noted that in a time study, plasma thy-
Changes are the same, but they just cholesterol as well as in animals with it may be responsible for the effect.

**Other aspects of atherosclerosis**

In addition, three speakers looked at other aspects of atherosclerosis.

Elaine Raines of the University of Washington described plaque formation as a normal response to injury. Studies have shown diet-induced hypercholesterolemia results in formation of atherosclerotic lesions both in animals with very high levels of cholesterol as well as in animals with lower plasma cholesterol levels. “The changes are the same, but they just take longer at the lower levels,” Raines said.

There is some evidence that genistein, a soy isoflavone, may affect an early stage of these cellular changes, thus inhibiting cell proliferation leading to lesion formation, she said. “The challenge for the future is to take the data concerning cellular changes and ask what effect genistein in soy has on these processes.”

Josiah Wilcox of the Emory University Department of Medicine agreed that soy consumption may modify atherosclerotic development by reducing cholesterol levels and increasing plasma levels of genistein. Genistein, he said, appears to act as a tyrosine kinase inhibitor, thromboxane receptor antagonist and thrombin antagonist, although research is needed to confirm these findings in vivo.

Meanwhile, Takemichi Kanazawa of Hirosaki University School of Medicine cited studies showing that soy protein inhibits the peroxidation of LDL.

**Public health impact**

Goals of the U.S. Public Health Department’s Healthy People 2000 Agenda are to cut incidence of coronary heart disease from 135 to 100 per 100,000 persons, strokes from 30.3 to 20 per 100,000 persons and end-stage renal disease from 13.9 to 13 per 100,000 persons by the year 2000, Johanna Dwyer of the New England Medical Center Hospitals pointed out.

The National Cholesterol Education Program, American Heart Association and the American Diabetes Association also have made dietary recommendations for preventing chronic degenerative disease. Current interest in reducing heart disease risks by dietary changes has included attention to fat intake, cholesterol, soluble fiber, sodium, alcohol and other dietary constituents. “The problem is we get into trouble when we focus on only one form of therapy,” Dwyer said. A healthy diet, weight control and exercise combined can be positive interactive interventions.

The problem with guidelines is people often don’t follow them. “Ever since the Garden of Eden, we’ve been having trouble following any kind of advice,” Dwyer quipped.

While there are some recommendations concerning fat intake, not all mechanisms are understood. Also, soy products’ role is still unclear. “Experimental studies are beginning to clarify effects,” she said, noting, however, that animal evidence is difficult to correlate to humans.

Anne Goldberg of Washington University School of Medicine pointed out that incorporating soy protein into low-fat diets of humans can reduce total and LDL cholesterol levels. “The main deterrents to greater use of soy protein in the therapy of hyperlipidemia include lack of knowledge by physicians and patients of its effects and lack of availability of easily used products,” Goldberg said.

Although such soy products as tofu and soymilk are available in many stores, most consumers may be unaware of them or their use. “Without the publication of articles in mainstream medical journals on the cholesterol-lowering effects of soy protein, it is unlikely that many physicians will know of possible uses,” she added. Also needed are readily available packaged products, recipes and cookbooks before soy protein will be incorporated into the American diet.

**Diet and cancer**

Pointing out that fruits and vegetables have been associated with lower cancer risk, John Potter of the University of Minnesota said phytochemicals found in soy “are a very nice subset of those found in vegetables.”

Although there is a lot of epidemiological and animal data concerning anticarcinogenic effects from plant foods, “we still lack significant link to human data,” he said. Areas that need to be examined further are whether these compounds prevent or inhibit carcinoma formation, induce detoxifying enzymes, alter membrane structure, act as antioxidants, suppress DNA/protein synthesis, produce anticarcinogenic substances endogenous-
much larger trial, would last at least a year, while Phase III trials are large randomized, multi-year controlled studies that provide long-term toxicity evaluation.

"The challenge is to develop a dietary treatment that is nontoxic and noninvasive," he said.

In a discussion period, both Potter and Alberts pointed out that, unfortunately, many individuals would rather "pop a pill" than make lifestyle changes. "People are much more interested in 'magic bullets' than in lifestyle changes," Potter said.

Stephen Barnes of the University of Alabama at Birmingham said that once a compound is proven to have a health effect, someone must devise a way to incorporate it into foods people will regularly consume.

Alberts explained it is essential to get the food industry involved in this research: "That's the direction we need to look at a combined-agent approach.

Describing work with cancer chemopreventive agents to stop the development and progression of precancerous cells, David Alberts of the Arizona Cancer Center predicted such agents probably won't have much effect on the initiation stage of cancer because it lasts a short time. However, other opportunities may be offered in the promotion stage, which takes ten or more years, or in the stage between preneoplastic cell and neoplastic cell formation, which lasts from one to five years.

"The role of chemoprevention appears to lie in reversing the premalignant process rather than suppressing malignant growth," he said, noting that different components will have varying effects on different cancers.

Currently, the Chemopreventive Branch of the National Cancer Institute is sponsoring Phase III trials of several promising agents including retinol, several retinoids, β-carotene and tamoxifen. Genistein, meanwhile, is currently in Phase I trials to determine the highest daily dose without toxicity. This phase of study, which includes 20 to 25 subjects, will take several months. Phase II, which is a much larger trial, would last at least a year, while Phase III trials are large randomized, multi-year controlled studies that provide long-term toxicity evaluation.

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have taken. We have hooked up with a food company in our research."

Soy intake and cancer risk
Speakers during a session on soy intake and cancer risk described animal and epidemiological studies.

For instance, E.J. Hawrylewicz of Mercy Hospital and Medical Center noted that in animal studies in his laboratory he has observed a soy protein isolate diet given during the tumor-promotional phase significantly reduced the incidence of carcinogen-induced mammary tumors compared with a casein diet. In addition, giving the soy protein diet after removing the primary tumor increased the interval that the animals were disease-free and decreased the number of additional tumors.

"These results indicate that isoflavones or protease inhibitors aren't the only factors inhibiting tumors in rats," he said.

However, when methionine was added to the soy protein diet, tumor incidence rose, although it was less than with the casein diet. Concluding that "several components in soybeans inhibit the growth of tumors in animal studies," Hawrylewicz added, "A deficiency of methionine in soy isolate may have a selective role in retarding tumors."

Barnes, however, pointed out that the isoflavone genistein, if administered during the neonatal stage in rats, can help inhibit tumor growth. "We must look at the interaction and integration of all these components," Barnes cautioned.

Speaking on epidemiological studies, Victoria Persky of the University of Illinois School of Public Health noted protective effects have been seen more often with nonfermented soy product consumption, with no consistent pattern evident with fermented soy product consumption.

"There is not yet adequate epidemiological data to conclude that soy products are anticarcinogenic," she said, suggesting that future investigations include both trials and observational studies targeting intake of spe-

Challenge: getting people to eat soyfoods

Although evidence shows soyfoods may be a healthy component in the diet, convincing U.S. consumers to eat them may continue to be a challenge for the industry and nutritionists.

Part of the dilemma may be summed up by a limerick written by David Kritchovsky of the Wistar Institute during sessions at the international symposium held in Mesa, Arizona, in February:

There was a young man named McCoy
Who attended a meeting on soy.
He declaimed by the hour
On the joys of soy flour.
Still, when offered a steak, yelled, "Oh boy!"

Attendees at the conference were given a selection of soyfoods, particularly at the Sunday evening opening reception. Yet two samples of soymilks as well as Italian LeanLinks (a hot dog alternative), Meatless Chik Patties, Meatless Garden Vege-Patties and tortellini were met with less-than-total acceptance by some attendees.

Seemingly more appealing were edamame ("fruit-of-the-stem") — the beans from cooked green soybean pods — and a creamy chocolate pie made using Moru-Nu lite silken tofu.

Attendees noted that winning over U.S. consumers will depend a lot on providing foods that are appealing. Even soybean officials noted this poses a challenge. Speaking in the opening session of the symposium, David Asbridge, American Soybean Association's (ASA) director of industry information, noted, "This stuff (soyfood) is edible and tastes good — if the right sauce is used."

Part of the problem with soy's acceptance in the United States is one of image, Kritchovsky said. Perhaps if soy protein were promoted as a caviar extender rather than a meat extender, it might gain more appeal, he quipped.

"The solution isn't to produce products containing all soy or no soy, but something in-between in order to satisfy preferences in the Western diet," according to Joseph G. Endres of Central Soya Co. Inc., who said the industry already offers products containing some levels of soy protein that are very acceptable to Western consumers.

Meanwhile, researchers at the University of Illinois have been developing soy-based foods that are appealing to consumers, according to Barbara Klein, a professor at the university's Division of Foods and Nutrition. She...
cific soy products in populations with a variation in dietary soy as well as cancer risk.

**Soy-based anticarcinogens**

Vernon Steele of the National Cancer Institute (NCI) outlined efforts to identify and evaluate potential chemopreventive agents that inhibit, reduce or retard cancer. "Approximately 1.2 million persons in the United States will be diagnosed with cancer, and 538,000 persons will die from cancer, during 1994. Thus, even a 1% reduction in cancer risk, among the various materials under study at NCI."

Meanwhile, A. Vendet Rao of the University of Toronto is evaluating the value of saponins as anticarcinogens. Although saponins generally are considered antinutritive components of soy, recent evidence indicates they may be hypcholesterolemic, immune stimulatory and anticarcinogenic. This area, he said, needs further research.

Meanwhile, inositol hexaphosphate (InsP6), known as phytic acid, has demonstrated anticarcinogenic properties, according to Abulkalam Sham-suddin of the University of Maryland, who cited results in both human and animal tissues. "While further studies are needed to elucidate the mechanism of this novel action, inclusion of InsP6 in our strategies for cancer prevention and therapy is not only overdue, but also promising," he said.

Other work is focusing on protease inhibitors as possible anticarcinogens. Ann Kennedy of the University of Pennsylvania School of Medicine said protease inhibitors have been shown to be potent anticarcinogens in both in vitro and in vivo carcinogenesis assay systems. "Much of our work has focused on the ability of the soybean-derived Bowman-Birk inhibitor to suppress carcinogenesis," Kennedy said. Although the work has been conducted in animals, human trials are just beginning. Kennedy said Central Soya Co. Inc. has produced materials for use in these studies. "Our studies have shown that mix-

noted that study subjects historically have found it difficult to comply with long-term diets using soy flours or isolates because of distinctive flavors and textures. "However, new processing methods have created a generation of soy protein isolates with mild flavors and aromas, as well as improved functionality, which can be incorporated into a variety of food products at levels high enough to have an impact on health."

One hurdle is that U.S. consumers historically have viewed soy as an animal feed. The biggest challenge is to provide soy products with acceptable sensory characteristics, Klein said. The beans themselves have a typical beany flavor and slightly crunchy texture. Flours, which are a creamy color, have a beany or nutty flavor and often leave an astringent, chalky mouthfeel. Isolated soy proteins, however, provide a bland flavor.

Over the past two years, University of Illinois researchers have developed product and recipe formations that can be satisfactorily incorporated into typical diets. "We have developed a baking mixture that can be added to items that people find acceptable," Klein said. The mixture, which includes 5–10 grams of isolated soy protein, can be added to quick breads, tortillas, yeast breads, cookies, puddings, beverages and fruit bars.

"There really is a market for high soy products, particularly if touted to consumers as healthy foods," Klein said, predicting market potential for soy-based baking mixes, protein mixes, candy-like bars, cereals and dessert mixes.

In developing countries, meanwhile, there has been some success in incorporating soyfoods in local diets. Luncheon speaker Chuck Haren, program director of Plenty International, explained how Plenty International has assisted communities in Africa, Sri Lanka, the Caribbean and Central America to integrate soyfood use within their culture. "We have seen steady growth in the number of micro and small businesses marketing soybean products for human consumption," he said. In these efforts, soy products have been combined with traditional foods to enhance nutritional content without cutting down their appeal. This also has resulted in an economic benefit for such communities.

"We believe that interest in the use of soyfoods will continue in developing countries as more people become aware of the economic, nutritional and therapeutic properties of soybeans," Haren said.

H.F. Frank Cheng of the University of Iowa Medical Center chooses a piece of chocolate tofu pie.

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During the conference, Elizabeth Jeffery of the University of Illinois and Gayle Nixon of the Medical University of South Carolina discuss the potential effects of soy products on health.

Elizabeth Jeffery and Gayle Nixon discussing soy milk.
low cancer incidence. Also, vegetarians have higher values than omnivores, and the lowest values were found in postmenopausal breast cancer patients living in Boston,” he said.

It is necessary to evaluate potential benefits and risks of consuming plant estrogens by looking at their potency and sites of action, according to Patricia Whitten of Emory University. Her investigations, for example, have examined the range of natural dietary concentrations of the plant isoflavonoid coumestrol in a rat model and a variety of estrogen-dependent tissues and endpoints. Results showed that coumestrol in rats had the potential to masculinize females, feminize males, alter sexual behavior and lead to infertility. Effects in humans, however, have not been studied. As a result, Whitten cautioned that each phytoestrogen should be fully characterized in terms of sites of action, balance of agonistic and antagonistic properties, natural potency, and short- and long-term effects.

The chemopreventive effects of genistein have been studied in both in vitro and in vivo models of cancer, according to Barnes. Results of some animal studies, however, have been confounded because the diet given to the animals before acquisition by researchers has contained high levels of soy protein.

Barnes said studies conducted in vitro using purified genistein did inhibit the proliferation of human tumor cell lines. In the future, he added, “Greater emphasis is needed on biochemical and cell biology events that occur prior to the appearance of cancer to understand where genistein works. This can be applied to other components of soy as well.”

Although genistein seems promising for helping to inhibit or stop the progression of cancer, “I don’t think genistein can cure cancer once you have it,” Barnes told attendees. In short-term models, genistein is a good inhibitor on recognized biomarkers in cells, he said. Commercial processing changes the genistein composition in products, and different forms of soy products may result in different bioavailability and metabolism.

The target of genistein action in tumor cells is not yet known, according to Greg Peterson, a graduate student at the University of Alabama at Birmingham. He recommended that future studies use primary nontransformed human cells from target organs.

Theodore Fotsis of the Children’s University Hospital in Heidelberg, Germany, reported on work to examine the urine fractions of healthy humans consuming a plant-based diet for their abilities to inhibit the proliferation of vascular endothelial cells. One of the most potent fractions, he said, contained several isoflavonoids. “Of all synthetic compounds, the isoflavonoid genistein was the most potent, and inhibited endothelial cell proliferation and in vitro antiogenesis,” he reported, defining antiogenesis as the formation of new capillaries from existing ones.

“The high excretion of genistein in urine of vegetarians and our present results suggest that genistein may contribute to the preventive effect of plant-based diets on chronic disease, including solid tumors, by inhibiting neovascularization,” he said.

Conference participants expressed the hope that work with individual components of soy will result in increasing the dietary use of soyfoods in general. Summing up this sentiment, Barnes noted that while speakers had focused on individual components of soy, “We really need to look at the interactive effects. We want to deliver these beneficial effects, and, ultimately, we will do it in the form of soy.”

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Obesity, age see rise in cholesterol levels

Obesity is associated with higher cholesterol levels in women, according to researchers at The University of Texas Southwestern Medical Center at Dallas.

However, in postmenopausal women, cholesterol levels increase dramatically with age even in lean women, they wrote in the Feb. 28, 1994, issue of the Archives of Internal Medicine.

Their study compared blood lipid and lipoprotein levels in women for six different body-mass groups and three age groups: premenopausal (20–44 years old), perimenopausal (45–59 years old) and postmenopausal (60–74 years old). The study was a companion to one, published in the May 10, 1993, issue of the Archives of Internal Medicine, which examined the effects of obesity on cholesterol levels in men.

“What we found in the women is that young women behaved very much like young men: As body weight increased, total and low-density lipoprotein (LDL) cholesterol levels increased. But in the older women, there was such a dramatic rise in the cholesterol levels, even in the lean women, that it overwhelmed the effects of body weight in influencing LDL levels,” according to Margo A. Denke, lead author of the study.

In the premenopausal group, obese women who were approximately 30% or more above their ideal weight had 18 milligrams per deciliter (mg/dL) higher total cholesterol levels and 17 mg/dL higher LDL cholesterol levels than lean women who were within 10% of their ideal weight. For postmenopausal obese women, the differences were smaller. Despite the variable effects on total and LDL cholesterol levels, rising body weight was associated consistently with higher triglyceride levels and lower high-density lipoprotein (HDL) cholesterol levels.

“Obese postmenopausal women have the highest ratio of total cholesterol to HDL and, therefore, the highest risk for heart disease,” Denke said. This study also showed that older overweight women had even higher cholesterol levels than older overweight men.

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Study confirms stearic acid effects

A Danish study has verified findings from earlier studies showing fat intake high in stearic acid does not raise serum cholesterol although diets high in myristic and lauric acid or palmitic acid do.
The study, reported in the February 1994 issue of the American Journal of Clinical Nutrition, looked at young, healthy individuals in a randomized, controlled metabolic study. “Our trial included volunteers who were young and healthy, and diets that were strictly controlled and prepared from ordinary food and natural fats. Therefore, our results may be more easily extrapolated to the general population than most earlier observations,” Tine Tholstrup and colleagues wrote.

The study examined the effects of fats high in stearic, palmitic, and myristic and lauric acids on lipoproteins, blood coagulation factor VII and fibrinolytic variables. Three experimental diets were used: shea butter (42% stearic acid), palm oil (43% palmitic acid) and a kernel oil–high-oleic sunflower oil combination (10% myristic acid, 30% lauric acid). Ninety percent of the total fat in the experimental diets was derived from the test fat, and 10% was from other food items.

The researchers observed that the shea butter diet had a beneficial effect on total cholesterol, LDL cholesterol and factor VIIc, “which we suggest is mainly due to its stearic acid high content.” Meanwhile, the high myristic and lauric acid diet was more cholesterolemic than the high palmitic acid diet. The authors postulated that this may be due to a higher content of saturated fatty acids and lower polyunsaturated fatty acid content in the high myristic and lauric acid diet.

Researchers conducting the study were from the Research Department of Human Nutrition, The Royal Veterinary and Agricultural University, Copenhagen, and the Section for Thrombosis Research, South Jutland University Centre, Esbjerg, Denmark.

Lipoprotein(a) linked to higher stroke risk
Lipoprotein(a) [Lp(a)] cholesterol appears to be the most powerful link to strokes, according to researchers at Karl Franzens University in Austria.

Reporting these results at an American Heart Association meeting, Janet H. Ransom of the research team said their study of 265 stroke patients and 289 healthy men and women showed that those with Lp(a) blood levels of 18 milligrams per deciliter or higher were 21 times more likely to suffer strokes than those with lower levels.

Those who suffered strokes also had higher total cholesterol than did the comparison group, as well as larger amounts of low-density lipoprotein, according to an AP wire service report of the meeting. However, Lp(a) was the most striking difference between the two groups.

An individual’s Lp(a) levels are controlled primarily by one’s genes, and not by diet. Several pharmaceutical firms are seeking possible medicines that will lower Lp(a) levels. Currently, Lp(a) levels are not measured when individuals undergo routine cholesterol testing.

Most strokes occur when arteries in the brain become blocked. Experts believe Lp(a) contributes to dangerous buildup of plaque, which can cause this blockage.

Japanese present oxidation seminar
Approximately 130 persons attended a January seminar on preventing oxidation presented in Tokyo by the Japan Oil Chemists’ Society.

Topics included legal regulations concerning antioxidants, methods for evaluating the activity of antioxidants, the analysis of natural antioxidants and determining their chemical structures, efforts to seek new antioxidants, radical-removing activity of antioxidants in the body, and prevention of lipid oxidation in the body.

Speakers were Takao Matsunaga of Anan Information Service Co.; Junji Terao of the National Food Research Institute, Ministry of Agriculture, Forestry and Fisheries; Toshihiko Ohsawa of Nagoya University; and Etsuo Niki of Tokyo University.