

Nutrition focus for Asian meetings

During the period Aug. 9 through Sept. 9, 1989, three major meetings relating fats, oils and proteins to nutrition and health were held in Asia. The 14th International Congress of Nutrition was held Aug. 9-15 in Korea; an international conference on Dietary Protein as a Regulator of Lipid Metabolism was held Aug. 28-29 in Japan; and the International Palm Oil Development Conference was held Sept. 5-9 in Malaysia. Kenneth K. Carroll of the Department of Biochemistry, University of Western Ontario, London, Ontario, Canada, an associate editor for JAOCS News for Lipid Biochemistry, attended all three events and has prepared this report for JAOCS readers. The report begins with the Malaysian meeting.

International Palm Oil Development Conference

The 1989 PORIM International Palm Oil Development Conference, part of the tenth anniversary celebration of the Palm Oil Research Institute of Malaysia (PORIM), was held in Kuala Lumpur, Malaysia, Sept. 5-9, 1989. The objectives were: to provide a comprehensive discussion of the latest findings related to the nutritional and health aspects of palm oil, to review the progress in major sectors of the industry, and to project anticipated developments.

Nearly 1,000 registrants from more than 40 countries participated. In addition to the scientific program of papers and posters, the conference offered a commercial exhibit and tours to PORIM, a palm oil plantation and a refinery. The conference proceedings will be published by PORIM.

The opening ceremony featured addresses by PORIM's Director-General Augustine S.H. Ong; Lim Keng Yaik, Minister of Primary Industries of Malaysia; Basir Ismail, chairman of the Rubber Growers' Association of Malaysia, who spoke on "Malaysian Palm Oil Industry in the Year 2000"; and John Batterbee, chairman of Unilever's Oil and Fat Buying Division, Rotterdam, who spoke on "Palm Oil—The Challenge of Expanding its Edible Markets."

Basir Ismail noted that in 1960, Malaysia was a small producer of palm oil, with cultivated area totaling 55,000 hectares producing 92,700 metric tons (MT) of oil a year. By 1989, area had increased to 1.8 million hectares, with an estimated production of 5.5 million metric tons (MMT) of oil, representing 60% of the world total. He estimated that by the year 2000, Malaysia will produce 8 MMT of palm oil and 2.5 MMT of palm kernel.

Presenting data on world production of edible oils, Batterbee said soybean oil represents 27% of the total, with palm oil second at 18%. Malaysia accounts for 58% of the palm oil produced, and Indonesia represents 20%. Malaysia exports palm oil to many parts of the world, including India (22%) and the European Economic Community (17%) where it is used mainly in shortenings and for frying.

There has been a continuing increase in exports to the Middle East and a recent sharp increase in the amount exported to China. Overall, exports have more than doubled during the past decade. Price is an important factor in such markets as the U.S.S.R. From 1987 to 1989, price varied from a 30% premium to a 20% discount in relation to soybean oil, creating problems in marketing palm oil. Export pipelines also are important factors in marketing.

The fatty acid composition of palm oil is similar to that of the composite fat in the diets of Western nations. However, because of recommendations to reduce saturated fat in the diet, plant breeding programs are being used to increase the monounsaturated fatty acid content of palm oil and to reduce the saturated fatty acids.

The conference's scientific program was divided into three modules. The first two modules—Nutrition and Health Aspects of Palm Oil, and Agriculture—ran concurrently during the first two and one-half days of the conference. The third module, Chemistry, Technology and Marketing, took place during the final two days.

Thirty-one research papers and five invited lectures were given during the nutrition module. Guest lecturers presented findings concerning diet and heart disease, diet and cancer, peroxidation of membranes, and vitamin E. A new study described by K.C. Hayes of Brandeis University found dietary palmitic acid neutral with regard to serum cholesterol in three species of monkeys. Four studies in humans (from teenagers to 60 years of age) were reported in which serum cholesterol was unaffected by replacing most of the usually consumed fat with palm oil, with fat supplying between 25-40% of the energy.

Summarizing talks presented in the module, David M. Klurfeld of the Wistar Institute noted that the study of teenagers was especially relevant, particularly due to concerns that this age group consumes many snack foods with palm oil and thus might be at increased risk of elevated serum cholesterol. One study from Pakistan found significantly lower serum cholesterol with palm oil in the diet compared with consumption of ghee (butterfat). Studies also reported reductions of cholesterol in volunteers and several animal species when consuming palm oil vitamin E concentrate (tocotrienols and tocopherols). One study found no more atherosclerosis in rabbits fed palm oil than in animals fed polyunsaturated-rich oil because palm oil feeding led to the highest HDL levels.

Klurfeld noted a "wait and see" attitude from many scientists since much of the work presented was in preliminary form; publication in peer-reviewed journals will give more credibility to the research and will stimulate further independent research on the effects of palm oil, palmitic acid and minor components such as the tocotrienols and carotenoids. Al-

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though the minor components seem to have significant biological activity with hypolipidemic, antiplatelet and anticarcinogenic potential, palm oil is not viewed or promoted as a therapeutic agent or medicinal food but as a safe edible oil.

Klurfeld pointed out that adverse publicity concerning palm oil in the U.S. prompted many food processors to reformulate the fats used because of consumer perception that palm oil is harmful. An advertising campaign initiated by the American Soybean Association and newspaper ads entitled "The Poisoning of America" frightened consumers into thinking that a minor component of their diet had a major impact on heart disease. When sales of products containing palm oil dropped, manufacturers announced eliminating palm oil from many foods; thus, consumers concluded that the advertising was truthful.

Palm oil was introduced into the U.S. market in the late 1960s. Coronary heart disease in the U.S. has dropped more than 30% since then, giving no evidence of a harmful effect, Klurfeld said. Furthermore, palm oil contributes less than 2% of the saturated fat in the U.S. diet, and the latest research indicates saturated fat in palm oil does not appear to raise serum cholesterol. Normal servings of food prepared with palm oil provide only a fraction of the saturated fat that ice cream contains, yet no one has suggested eliminating ice cream from the U.S. diet, he said.

A number of scientists stressed the multifactorial etiology of cardiovascular disease, yet pointed out how prominent U.S. health organizations have reduced this message to an absurd level. Klurfeld, citing recent ads run by the American Heart Association entitled "Eat, drink and be buried," noted that this type of advertising "contains the implied promise of longer life, or even immortality, if dietary guidelines are followed. This emphasis detracts from treatment of more important risk factors such as tobacco use and hypertension and from sensible dietary practices based on current scientific knowledge." He added that the findings reported on at the meeting continue to be confirmed, "scientists will undoubtedly give palm oil a clean bill of health."

Summarizing sessions on agriculture, Abdul Halim Hassan, deputy director-general for PORIM, noted that in order to satisfy consumer demands and preferences, research has been directed at producing planting materials with high iodine values. Other work with breeding and genetics is aimed at producing superior materials with respect to yield and oil quality.

He pointed out that India and Indonesia, as well as Malaysia, are seeking to improve palm oil production. India, for instance, plans to have 2.5 million hectares devoted to oil palms by the year 2000; Indonesia, meanwhile, has announced it will have 1.6 million hectares by 1993.

Reports indicated that the observed abnormalities in clonal palm tissue culture are epigenetic. Recloning of tissue culture plantlets with terminal inflorescences resulted in normal palms. Isozyme studies

revealed no significant differences between normal and abnormal palms. Researchers noted that cytokinin has been implicated as the culprit in the abnormalities.

Future directions for genetic engineering with oil palms will include—biochemistry of fatty acid and triglyceride biosynthesis, gene characterization, isolation of mesocarp and kernel specific promoters, plant regeneration and plant transformation, according to speaker Chua Nam-Hai, who predicted such work will produce results in 10–15 years.

Efforts to improve profitability have included the use of weevils for pollination efficiency. Data presented comparing pre- and post-weevil use showed improved pollination and an increase in bunch weight within one year of weevil introduction. Appropriate harvesting machines have yet to be developed and currently harvesting poles are used; speakers suggested that further cost-saving could be achieved once harvesting equipment is available.

Other talk topics included integrating pest management, improving soil quality and fertilizer usage, and using palm by-products.

Presentations in the chemistry, technology and marketing module were summarized by Loke Kwong



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Hung of PORIM. The first session began with discussions of free radicals and their link to disease processes such as atherosclerosis and cancer, and of palm oil's oxidative properties. Other talks centered on carotenoid extraction from palm oil, the crystallization behavior of palm oil, and mesocarp oil determination by nuclear magnetic resonance spectroscopy.

In the second session, guest lecturer R.J. Hamilton of Liverpool Polytechnic described the esterification and interesterification of fats and oils by chemical methods, which have potential application in the preparation of specially tailored food products. Other papers focused on oil processing. Included were descriptions of a small-scale palm oil extraction unit in India and the Palm Oil Mill Intelligent Control System, developed by Japanese scientists and engineers and tested at a FELDA mill. Sterilization in palm oil milling as well as oil refining were discussed. A novel concept in vacuum steam stripping technology, the advantages of bleaching, and the effects of adsorbent types on oil quality also were presented.

Other papers dealt with the influence of refining systems on the deacidification and color of degummed palm oil, palm fatty acid distillation, and the effects of refining and fractionation on vitamin E.

The use of phytic acid to remove iron from palm oil also was reported.

One talk stressed the importance of applying internationally standardized analytical procedures for refined palm oil to benefit both suppliers and users of the oil. Speakers also discussed palm oil processing for new food products, the use of enzymes in processing palm and other edible oils to produce *trans*-free polyunsaturated fatty acid (PUFA) vanaspati and other value-added products, and the possibility of enzyme-catalyzed modification of dietary oils.

The last session included a talk on the current status of the oleochemical industry in Malaysia and planned developments under Malaysia's industrial master plan. The enhanced recovery of oleic acid, the manufacturing of *alpha*-sulphomethyl ester and its application to detergent production, and the use of aldehydes in the perfume industry were discussed. Other speakers mentioned additional nonfood uses of palm, including its use as a lubricant and a base fluid in oil well drilling.

Concerning food uses, researchers from Krupp Maschinentechnik GmbH of West Germany reported on the development of a dry fractionation process for edible fats and oils and the manufacture of cocoa butter replacers from such fractions.

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Dietary Protein as a Regulator of Lipid Metabolism

A seminar—Dietary Protein as a Regulator of Lipid Metabolism—was held Aug. 28–29, 1989, in Fukuoka, Japan. The meeting was sponsored by the Yabuta Foundation, Agricultural Chemical Society of Japan. The organizing committee, chaired by Michihiro Sugano of Kyushu University, included Anton C. Beynen of the University of Utrecht, David Kritchevsky of the Wistar Institute, and Katsumi Imaizumi and Ikuo Ikeda, both of Kyushu University.

The program featured 20 speakers from Australia, Canada, Denmark, Israel, Japan, The Netherlands, the U.S. and West Germany. Most presentations dealt with the effects of dietary proteins on lipid metabolism in rats or rabbits, with particular emphasis on cholesterol metabolism.

There was general agreement that dietary casein results in higher blood cholesterol levels than does soy protein in both rats and rabbits; however, the response to other dietary proteins is not always the same in both species. In rabbits, dietary animal proteins generally give higher levels than plant proteins; this distinction does not appear to apply for rats.

Dietary peptides and amino acids have been shown to affect blood cholesterol levels and other aspects of cholesterol metabolism. However, it is uncertain to what extent the effects of dietary proteins can be explained by their amino acid composition. The mechanisms by which dietary proteins and amino acids affect blood cholesterol levels are not well understood, although interesting data were presented indicating that the effects may be mediated by thyroid hormones.

Effects on steroid absorption and excretion, on serum lipoprotein composition and turnover, on fatty acid composition of tissue phospholipids and on activity of various enzymes were described, as were the effects of the interaction of protein with other dietary constituents.

A study on pigs fed casein or soy protein showed that the amino acid concentrations in venous plasma tended to reflect the amino acid composition of the dietary proteins during the early postprandial period. Another study on normocholesterolemic human subjects given formula diets containing casein or soy protein showed significantly higher LDL-cholesterol and significantly lower HDL-cholesterol on the casein diet when the formulas provided approximately 500 mg/day of cholesterol but not when they provided less than 100 mg/day.

The proceedings of the seminar will be published as a supplement of the *Journal of Nutritional Sciences and Vitaminology*.

14th International Congress of Nutrition

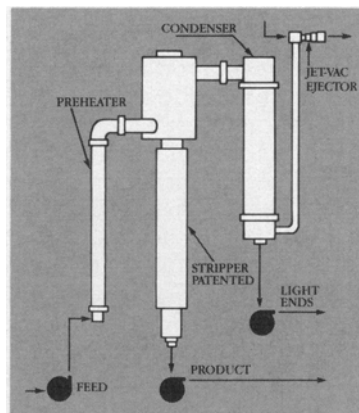
The 14th International Congress of Nutrition was held Aug. 20–25, 1989, in Seoul, Korea. The program covered a wide range of topics, presented in six plenary lectures, 50 symposia, 42 workshops and 1,146 communications. Approximately one-third of the com-

munications were given as oral presentations; the remainder were posters. The congress attracted more than 2,800 registrants representing 46 nutrition societies from 98 countries.

Among the topics of interest to members of the American Oil Chemists' Society were those related to specific dietary components such as essential fatty acids and eicosanoids, fat-soluble vitamins, trace elements, fiber, proteins and amino acids. A symposium on soybeans and human nutrition was held. Other themes dealt with nutrition in relation to specific diseases, including cardiovascular disease, cancer, diabetes and AIDS. Topics such as the regulation of foods and food safety, recommended dietary allowances, and new technologies to improve food quality were among other symposia subjects.

The proceedings will be published as a special issue of the *Korean Journal of Nutrition*. The congress was organized by the International Union of Nutritional Sciences (IUNS), which holds such meetings every four years. The 15th congress will be held in Adelaide, Australia, in September 1993. At the Seoul congress, the council of IUNS accepted an invitation from the Canadian Society of Nutritional Sciences to host the 1997 congress in Montreal.

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