

World Conference on **SOYA** **Processing and Utilization**

CENTRO ACAPULCO • ACAPULCO, MEXICO
November 9-14, 1980

More speakers confirmed

More than 40 additional speakers have been confirmed for the World Conference on Soya Processing and Utilization to be held Nov. 9-14, 1980, in Acapulco, Mexico.

The conference is designed to transmit state-of-the-art knowledge and technology about the processing and use of soya, particularly for nations that could improve the nutritional quality and quantity of foods in their diet through a sustained growth in the use of soya. The meeting will provide a means to establish constructive and continuing dialog between experts in soya products and processing and those professionals who can put such knowledge to practical use.

The conference subject matter has been arranged into six categories: production; processing; effects of processing; analysis, physical characteristics and nutrition; soya meal in animal feeds; soya protein for human foods: nutritional and regulatory aspects. Each category will be explored during morning plenary sessions, featuring 55 previously announced speakers, and during afternoon round table discussions. The additional speakers are announced at this time and others will be confirmed later.

Three to four concurrent round table discussions will be held each day. The discussions will provide a chance for registrants to question plenary session speakers and to comment on the plenary presentations. Each plenary speaker will attend the discussion session pertinent to his subject. The additional talks during the round table discussions will probe particular topics more deeply or will comment on the general theme. In all cases, the papers are designed to promote further discussion and understanding of the processing and use of soya.

Day-by-day round table schedule:

Monday, November 10

Processing

Storage of Soybeans under a Controlled Atmosphere, Phillipe Van Doosselaere, DeSmet, Mexico; Processing of Full Fat Soybean Products, Ing. Felipe Suberbie, Industrial De Alimentos S.A.; Soybean Processing and Near Infrared (NIR) Measurement, Ronald D. Moen, Neotec Corp., USA; Art of Soybean Meal and Hull Grinding, George R. Thomas, Prater Industries, USA; Solvent Safety, Leigh Shoemaker,

French Oil Mill Machinery Co., USA; Energy Considerations in Oil Mills and Refineries, V. De Oliveira Shurmann, CEVAL, Brazil; Low Cost Extrusion, Marcel Noyes, Buhler-Miag Inc., USA; and a panel on training of processing personnel, consisting of plenary session speakers.

Soya Protein—Nutrition

A Legislator's Consideration in Development of Regulations on New Food Sources, Thomas Grumbly, USDA Food Safety and Quality Service, USA; What Are Current Regulations of Soya Protein Costing the World in Higher Food Prices and Lost Nutrition?, Sheldon Hauck, Food Protein Council, USA.

Tuesday, November 11

Processing

Modern Aspects on Bleaching of Soybean Oil, Ernst H. Goebel, Sued-Chemie, A.G., Mexico; Effects of Catalyst Concentration on Selectivity in Soybean Oil Hydrogenation, George L. Buehler, Ray Coleman, United Catalysts, USA; Hydrogenation in Plant Practice, Ignacio Garibay, Aceitera LaGloria, Mexico; Physical Refining of Soybean Oil, Guy L. Posschelle, DeSmet USA; Chilling and Crystallization of Shortenings and Margarines, Bart Greenwell, Groen, USA; Margarine and Salad Dressing Processing, Santiago Tribaldos, Kraft, Venezuela; Processing of Industrial Chemicals from Soybean Oil, Earle Fritz, Union Camp, USA; Wastewater Treatment in Soybean Oil Mills and Refineries, Ogden A. Clemens, Dravo Corp., USA.

Soy Protein—Nutrition

Uses of Soya Proteins in Mixed Protein Systems to Improve Nutritional Qualities of Foods, Dan Hopkins, Ralston Purina, USA; Agency for International Development (AID) Requirements for Soy-Fortified Composite Flours, George Bookwalter, USDA Northern Regional Research Center, USA; Soybeans in Feeding of Children, Benjamin Torun, INCAP, Guatemala; Use of Soya Proteins for the Vegetarian Market, Oliver H. Miller, Loma Linda Foods, USA; Progress and Future Needs for Research in Soya Protein Nutrition, Walter Wolf, USDA Northern Regional Research Center, USA.

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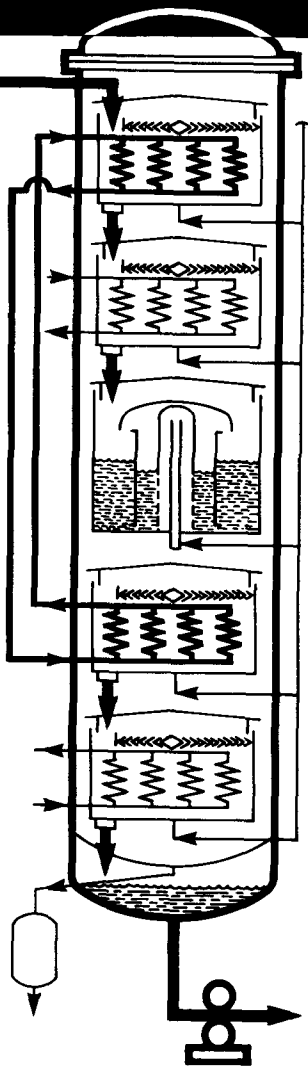
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Meetings

Wednesday, November 12

Soybean Meal in Animal Feeds

Full-fat Soybean Meal for Poultry, Park Waldroup, University of Arkansas, USA; Energy/Protein Relationships for Poultry, Manuel Cuca, University of Chapingo, Mexico; A Refined Near Infrared (NIR) Method of Measuring Protein, Moisture and Fiber in Soybean Meal; Don Webster, Neotec, USA.

Soya Protein—Nutrition

Current U.S. Regulations for Foods Containing Soya Protein, John Vanderveen, FDA Bureau of Foods, USA; Effectiveness of Methods for Evaluation of Protein Quality, C.E. Bodwell, USDA Agricultural Research, USA; Determination of Soya Protein Content in Processed Foods, A.C. Eldridge, USDA Northern Regional Research Center, USA; Requirements of Soya Protein Products Purchased by the U.S. Government for Feeding Programs, Douglas Hagg, Dawson Food Ingredients, USA.

Thursday, November 13

Soya Meal in Animal Feeds

Early Weaning on Good Pig Starters, Armando Shimada, National Institute of Animal Husbandry and Research, Mexico; New Concepts for Early Weaning of Pigs, Juan Jose Maqueda, Elanco, Mexico.

Soya Protein—Nutrition

Effect of Soy Protein on Mineral Availability, John Erdman, University of Illinois, USA; Significance of Soya Phytin in Nutrition, Werner Jaffe, National Institute of Nutrition, Venezuela; Significance of Soya Trypsin Inhibitor Activity in Nutrition, J.J. Rackis, USDA Northern Regional Research Center, USA; Lysinoalanine Production, Significance and Control in Preparation of Soya Protein Isolates, Barbara J. Struthers, Ralston Purina Co., USA; Flatulence and Its Control through Soya Processing, J.J. Rackis, USDA Northern Regional Research Center, USA; Dietary Fiber in Soya Products, John Erdman, University of Illinois, USA.

Friday, November 14

Soya Meal in Animal Feeds

Raising a Healthy Calf, George Barr, Land O'Lakes, USA; The Use of Multiblending As a Technique in Managing Ingredient Purchasing, Russ Bussman, Computone, USA.

Soya Protein—Nutrition

Review of Earlier Soya Protein-Fortified Foods to Relieve Malnutrition in Developing Countries, J.M. Aquilera, Texas A&M University, USA; Use of Whole Soybeans and Soya Flour As Protein/Energy Supplement to Maize, Luiz G. Elias, INCAP, Guatemala; Soya Fortification of Tortilla and Pinole in Chihuahua, Armando Camacho Griensen, Centro de Investigaciones y Asistencia Tecnologica del Estado de Chihuahua, Mexico.

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Golden Jubilee International Congress



on Essential Fatty Acids and Prostaglandins

The week after the ISF/AOCS World Congress, approximately 410 persons attended the Golden Jubilee International Congress on Essential Fatty Acids and Prostaglandins, held at the University of Minnesota in Minneapolis. Jubilee President Ralph T. Holman and his program coordinators provided the following summary for *JAOCS*.

In 1930 at the University of Minnesota in Minneapolis George O. Burr and M.M. Burr made the remarkable discovery that dietary linoleic acid was essential for growth, development and normal function in rats. At this time, pharmacological activity of a group of uncharacterized substances from semen and male accessory glands was also being described by workers in New York, England and Sweden. At the Karolinska Institutet in Stockholm, U.S. von Euler first extracted and characterized this material as a biologically active hydroxylated unsaturated fatty acid and named it "prostaglandin." There are now known to be several different prostaglandins of different degrees of unsaturation and different substituents.

World War II interrupted research on the "essential fatty acids" (EFA) and "prostaglandins" (PG), which in any case was then limited by inadequate technology. The 1950s saw the introduction of radioisotopes, gas liquid chromatography and mass spectrometry. During the 1950s and 1960s EFA were shown to be required by several species, including man, and linoleic acid was found to be metabolized to longer chain polyunsaturated acids by a series of desaturation and elongation steps. Furthermore, the fatty acids derived metabolically from linoleic acid were considerably more potent as essential fatty acids.

In 1965, van Dorp and colleagues of Unilever in Holland and Bergström and colleagues at the Karolinska Institute in Sweden demonstrated that PG were enzymatically derived from arachidonic acid and other polyunsaturated acids. In the past decade, several new metabolites of arachidonic acid have been described, each with potent biological activity. These include the thromboxanes and leukotrienes described by Samuelsson and colleagues and prostacyclins described by Vane and Moncada. One or more of the original discoverers of all of the above findings actively

participated in the Golden Jubilee Congress.

In spite of the evidence establishing a link between EFA and PG or other autopharmacological mediators, workers in both fields had remained separated. Pharmaceutical companies became excited by the potential of PG, their analogs and inhibitors in the fields of reproductive physiology, inflammation and thrombosis. Meanwhile, in the EFA camp, advances were made in establishing the role of EFA in cell membrane function, brain growth and the prevention of atherosclerosis and thrombosis. At the time, however, benefits of high linoleic acid diets to the cardiovascular system were largely attributed to reduction in blood cholesterol.

Two years ago an international group investigated the feasibility of a marriage between the EFA and PG fields at a Golden Jubilee Congress to mark the 50 years that would soon have passed since their discoveries in 1930 and 1935. It was ascertained that Burr and von Euler (with a combined age of 160 years) were both able and willing to attend a congress as guests of honor and give addresses on their discoveries. With this focus, a scientific conference was organized in which new and exciting findings were presented against the historical backdrop of lectures by pioneers reviewing and updating their respective areas. It was obviously not possible to cover every topic in great detail, but the sessions were designed to highlight the precursor-product relationship between EFA, PG and other biologically important EFA metabolites.

A new feature of the programming was the final session on "Hot Stuff and Torrid Topics." Some subjects had been extracted from the offerings to the main program, whereas others were submitted at the meeting itself. The main criteria for acceptance in this session were that the data were completely new and the subjects were burning or controversial. The content of this session was kept a close secret throughout the meeting, and much in the way of speculation was overheard! This format was designed to generate excitement and to allow a plenary-type presentation to *any* investigator with something important to say.

The unique formula for this meeting worked in a very special way. It was a first meeting of two branches of

Meetings

science which had been distant acquaintances for many years. The knowledge each had to offer the other fused them into one and generated infectious enthusiasm. The essence of the meeting was the synthesis and dissemination of ideas and knowledge rather than an emphasis on personalities.

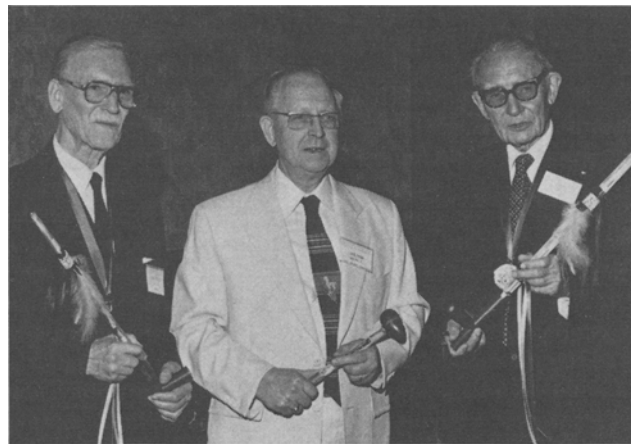
The reasons for the occurrence of polyunsaturated fatty acids in cell membrane lipids are now being elucidated. Studies of the rates of interconversion of EFA have led to the concept that nutritional management of the dietary precursors should affect biosynthesis of PG and other oxygenated products. Practical applications of this knowledge were reported at the congress. Retinopathy in human diabetics maintained for six years on a diet rich in linoleic acid has been prevented. Similarly, it now seems that in man the dietary intake of linoleic acid or of polyunsaturated acids of fish oils may reduce severity of hypertension and atherosclerosis.

Although dietary linoleic acid is converted to the PG precursors dihomo- γ -linolenic acid and arachidonic acid, individual oxidative metabolites of these EFA may have different or even opposing actions in several biological systems. Conventional descriptions of EFA deficiency as a scaly skin and an elevated triene/tetraene ratio may be inadequate because different disease states were described in which conversion of linoleic acid to the PG precursors is impaired. We now must also consider the spectrum of various PG, leukotrienes, thromboxanes and prostacyclins derived from the different polyunsaturated fatty acids ingested in different fats and oils. In this context, present recommendations for linoleic acid intake of 1-2% of dietary energy may have to be revised upwards, especially when one considers our present consumption of saturated fatty acids and arachidonic acid from animal fat.

If one considers that prostaglandins are themselves EFA, then psoriasis is one example of EFA-deficiency in which supplies of the linoleic and arachidonic acids are adequate but in which there is a block in the enzyme cyclooxygenase necessary for PG formation. In such cases replacement therapy with PG or their synthetic analogs may be indicated.

New leukotrienes were described at the congress, bringing to three the families or series of leukotrienes. A double bond at the five-position seems obligatory for an unsaturated fatty acid to serve as a leukotriene precursor. Although no leukotrienes can be produced from 8,11,14-20:3, they can be produced from 5,8,11-20:3 (Mead's acid of EFA deficiency), from arachidonic acid 5,8,11,14-20:4 and from 5,8,11,14,17-20:5. Within each series of leukotrienes there are four individual members of which two have proinflammatory and bronchoconstrictor roles suiting them as mediators of inflammation and asthma. Probably these account for the biological activity of the slow reacting substance in anaphylaxis (SRS-A). There were also reports on chemical synthesis of novel leukotrienes and of the biosynthesis of leukotriene-like substances from 18-carbon fatty acids possessing Δ -5 unsaturation.

In the prevention of thrombosis and in the immune system, there was renewed speculation that PGE₁ and/or other derivatives of 8,11,14-20:3 may play previously hidden roles. The metabolic production of this acid from dietary linoleic and γ -linolenic acids, and its accumulation



U.S. von Euler, (left), pioneer prostaglandin researcher, and George O. Burr (right), pioneer EFA researcher, pose at Golden Jubilee International Congress with conference president Ralph T. Holman. Peace pipes were presented to the two men to symbolize their contributions to knowledge.

in free fatty acid pools may be involved in the process. Changes in PG metabolism induced by the therapeutic use of lidocaine in endotoxin shock in baboons indicated that prostacyclin might be involved in protection against shock. This finding, for the first time, provided a rational link between adequate nutrition and susceptibility to stress and shock. The concept that prostacyclin is a circulating hormone came in for heavy attack from several groups who had used various assay methods to test the possibility, and there was some mention of the original findings being artifactual.

The torrid topic session produced a threat to the postulated role of thromboxane A₂ in platelet thrombus formation. Although thromboxane A₂ is more potent as a platelet aggregator than the endoperoxides (PGG₂ and PGH₂) from which it is enzymically derived, these endoperoxides may also produce aggregation in their own right. Work was described in which a specific thromboxane inhibitor was used to block thromboxane production induced by arachidonic acid, adrenaline and collagen, but aggregation was unimpaired even though an antagonist of endoperoxide-induced aggregation could inhibit aggregation induced by these agents.

Another torrid topic was columbinic acid, derived from seeds of the Columbine. Its structure is similar to linoleic acid with a *trans* double bond at the five-position. This acid was found to express many EFA functions associated with linoleic acid, but it cannot be converted to prostaglandins. The new essential fatty acids thus provided an experimental tool for separating PG-mediated functions from the structural lipid functions of essential fatty acids. For instance, in rats, columbinic acid could restore to normal the scaly skin lesions of EFA-deficient rats, but could not normalize the response to inflammation. Kidney lesions and defective platelet function also were not restored.

Recently, much publicity has been given to the view that we should protect ourselves against thrombotic disease by subsisting on an Eskimo diet, whose effects seem mainly attributable to its high content of eicosapentaenoic acid (EPA), which is a precursor for PG of the 3-series. However, from evidence presented at the congress, this view received

some setbacks. There were several reports that fish oils containing EPA could indeed prolong bleeding and inhibit platelet aggregation, but sometimes severe reductions in platelet count were encountered. Furthermore, available evidence from animal and human studies did not support the view that EPA owes its antithrombotic actions to its conversion to a prostacyclin-like PGI₃ by enzymes in the vasculature. Feeding studies with EPA-rich fish oils in both animals and a human volunteer showed evidence of reduced platelet thromboxane production, and also of reduced production of prostacyclin which has antithrombotic properties. The question arose whether diets rich in EPA cause undesirable increases in leukotriene/prostaglandin ratio. In a human volunteer who subsisted on a severe Eskimo diet for a prolonged period, some changes were seen that male members of the audience did not wish to share! Clearly additional animal studies with pure EPA, followed by closely monitored human volunteer studies, are needed.

Perhaps the most exciting of all the torrid topics was a report suggesting that arthritis may be alleviated by dietary means involving 6,9,12-18:3. This result was found in an animal model of immune-mediated arthritis and the leukocytes from such animals were not able to take part in chemotaxis. With this and the other reported examples from the immune response and cardiovascular areas, the distinct impression was given that we may be on the verge of new and exciting developments in dietary control of many disease states. This goal might be more easily realized if the suitably chosen dietary adjunct is combined with a drug which specifically redirects oxidative metabolism of EFA and other polyunsaturated fatty acid precursors. Alternatively, or in addition, a drug could be administered that blocks cyclic AMP degradation by phosphodiesterases. Such a drug should enhance desirable antithrombotic actions of PG whose formation is enhanced by dietary means. As reported at the meeting, antithrombotic properties of all PG are exerted through stimulation of cyclic AMP production in platelets. Certainly, pharmaceutical companies involved in development of drugs whose actions impinge on PG/thromboxane/leukotriene-mediated mechanisms should be aware of the importance of dietary EFA in ultimately controlling actions of these drugs. Dietary

factors should be accurately monitored in both animal tests and clinical studies.

It was part of the historical picture that G.O. Burr and U.S. von Euler should meet for the first time at this congress, and it was appropriate that the EFA and PG people should also meet for the first time with such fertile results. Dr. Ralph T. Holman, the Congress Chairman, reminded us (with dry wit) of two other people who also met in the land of 10,000 lakes—Hiawatha and Minnehaha. Because parodies of the *Song of Hiawatha* had been part of the literature of lipid researchers for two decades, the congress was opened and closed in that style.

The banquet ended with two historic speeches from two remarkable men—remarkable not only for their work but for their great insight and natural humility. As scientists we were reminded to “expect the unexpected” and to realize that original discoveries often only become important after development by others whose contributions are often forgotten.

To celebrate the occasion in a more substantive way, the congress had medals struck which bore the images of Burr and von Euler. Burr and von Euler were renamed Hiawatha, they were given their gold medals for winning the lipid Olympics and they were given Chippewa peace pipes symbolic of their wisdom and honor. Replicas were also presented to Drs. Sune Bergström, David van Dorp, Jan Boldingh, Hugh Sinclair, the program coordinators of the congress, and the Department of Biochemistry of which Burr was once head, all of whom had done so much to stimulate awareness of the importance in man of dietary essential fatty acids and prostaglandins. All attendees at the banquet received replicas in pewter.

*Then the Fellowship of Hiawatha
Left the cavern, wended homeward,
But they left with inspiration
From the council halls of learning,
From the speeches of the Four Winds,
From the Wisdom they had gathered
At the feet of Hiawatha.*

R.T. Holman, M. Crawford, J.F. Mead, A.L. Willis
Coordinating Committee

1981 in New Orleans

Jazz, seafood and its polyglot atmosphere are the top attractions drawing thousands of visitors each year to New Orleans, many of them attending meetings similar to the 72nd annual meeting of the American Oil Chemists' Society to be held May 17–21, 1981, in the city's Fairmont Hotel.

The city traces its founding to a Frenchman's claim on the area for France in 1718. The French flag, tradition says, was planted in what became a 13-square-block area along a bend of the Mississippi River. That area is now known as the French Quarter, which is one of the nation's best known areas for listening to jazz.

The Spanish architecture in New Orleans is a heritage of Spain's dominance. The modern skyscrapers and Superdome reflect New Orleans' stature as a modern American commercial city.

New Orleans' sights, sounds and foods can be sampled on walking tours of its various areas, or by motor vehicle. Riverboats provide another view of the metropolitan area including areas normally hidden by levees built to protect the city from floodwaters. □

Oil palm meeting in 1981

An international conference covering all aspects of oil palm from breeding through final product usage has been tentatively scheduled for June 17–20, 1981, in Kuala Lumpur. Sponsors will be The Palm Oil Research Institute of Malaysia and the Incorporated Society of Planters.

An initial circular on the conference is available from the Conference Secretary, c/o Incorporated Society of Planters, PO Box 262, Kuala Lumpur 01-02, Malaysia. □