THE FOUR CORNERS...

By EUGENE MARSHACK, Chairman,
International Relations Committee;

M. LONCIN, A. SEHER, BERTRAM HUDSON, JAMES HOLLO, K.S. KRISHNAN, EDUARDO VIOQUE, STIG FRIBERG

Corresponding Secretaries

Hungary . . . . . János Holló

A Scientific Committee of the Research Institute for the Vegetable Oil and Detergent Industry came into being in accordance with a decision made by the management of that industry. The Committee held its statutory meeting on April 14, 1971.

The main purpose of the Committee is to expand research and intensify experimental activities of the Institute. It consists of a discussion forum and an advisory organ. The president of the Committee is János Holló, member of the Hungarian Academy of Sciences and Head of the Department of Agricultural Chemical Technology of the Budapest Technological University; the secretary is Éva Kurucz, Assistant Professor at the Technological University of Budapest and Director of the Research Institute for the Vegetable Oil and Detergent Industry.

With the establishment of this committee, heads of individual plant units and chief collaborators of the Research Institute will have the opportunity to have systematic and organized consultations, discussion of problems inherent to the industry concerned requiring more extended consultations and ordinary long-range planning according to industrial purposes.

Chile . . . Enrique Amadori

Vegetable Oil Production and Consumption During 1971

This year the vegetable oil production in Chile will reach the following figures:

Crude rapeseed, 25.000 metric tons;
crude sunflower 6.800; crude soybean 300.

Considering that the total consumption will be 72.950 metric tons (6% average annual increase except during 1971 which is estimated to be 10%), the rest should be supplied, as in previous years, from foreign sources importing 39,000 metric tons of crude soybean oil and 10,000 metric tons of soybean seed. About 12% of the total vegetable oil processed in the country is used together with fish oils, coconut oil and animal fats to produce margarine and shortenings.

The annual per capita consumption of fat products in Chile, including vegetable oils, margarine, shortenings, but-

ter, animal fats and the fats present in milk, is calculated to be 12 kg. Of these about 7 kg come from vegetable oils.

Rapeseed in Chile—Present and Future

Rapeseed is at present the main oilseed crop in Chile. In the 1969–1970 period 136.086 acres were sown, compared with 38.045 acres of sunflower seed, the second major oilseed crop sown in the same period. Rapeseed production is expected to increase. At present Chile is in the tenth place among rapeseed producing countries with an average yield of 506 kg/acre. But this production is not enough to supply the internal oil consumption. For this reason Chile must import edible oil every year.

Sowing time for the winter rape is March through June, the harvest being in February. The spring or summer rape is sown in July up to November and harvested in March and April. In some central regions spring rape is sown in December as a winter crop.

Since Downey's visit to Chile in 1969, and following his instructions, COMARSA has celebrated the Annual Meeting of Rapeseed Producers. The purpose is the meeting of groups working on different aspects of rapeseed. Considerable research on rapeseed is being done in the country through several organizations.

The Third Meeting was held last May in Carillanca at INDAP, one of the Experimental Stations of the Research and Agricultural Development Institute close to Temuco City in the south of the country. The following organizations participated in this meeting: COMARSA; INDAP; University of Chile; University fo Concepción; University Austral; Catholic University; CORA; SAG; Campex von Baer. Twenty-six papers related with research and industrial processing were presented.

Industrial Aspects

Two varieties of seed "Matador" (winter rape) and "Norin 16" (spring rape) are the most important from the industrial point of view, according to seed yield, their oil content being 51.4% and 48.7% respectively (dry base), but both having high levels of erucic acid (52.3% and 51.8%). This year the seed yields were extra-ordinarily high, 726 kg/acre in the central zone and 930 kg/acre in the south. The average for the country will be 566 kg/acre.

Research

In relation to the improvement of rapeseed quality it is necessary to consider oil content, fatty acid composition, glucosinolate content, nutritive deficiencies, diseases.

Oil Content. A new strain "175 Matador" was improved in relation to agronomical characteristics, seed yield and oil content. Two new Japanese varieties "Chisaya Natane" and "Asahi Natane" showed good agronomical characteristics. Spring strains "Norin 16" with better yield in seed and oil content have been obtained.

Fatty Acid Composition. Ten spring rape varieties and 6 winter rape varieties grown in 3 different locations were analyzed. Among spring varieties "Norin 16" showed the highest erucic acid content in the three locations, the maximum being 49.8%. The lowest value for erucic acid corresponded to "Oro" variety which was practically free from erucic acid. Among winter rape varieties all presented high erucic acid values close to 50%. In this field more research is to be done in order to incorporate this erucic acid free variety with industrial crops thereby reducing the content of this acid in the oil. A breeding program is being carried on to incorporate varieties with zero erucic acid content and good agronomical performance.

Glucosinolate Content. The same varieties studied for their fatty acid composition were analyzed for their butenyl, pentenyl, isothiocyanate and VTO contents. Among spring varieties the "Bronowski" from Poland has good adaptability to the country, and the analysis practically proved an absence of glucosinolate. More research related with growth conditions will be done in the next period to incorporate this glucosinolate free rapeseed with industrial crops. Another way to get glucosinolate free rapeseed meal is through washings and subsequent drying.

Nutritive Deficiencies. Several experiments have been run in the South of the country to gather information about nutritive deficiences of the soil, specially concerning microorganisms.

Disease. Concerning plagues and diseases, it is possible to say that "Sclerotinia" does not have the economic importance assigned to it in the past. In case of a massive attack it affects not more than 10% of the yield. A systematic study related to insects and their influence on oil seeds has been started.

Canadian Mission Visits Chile

A mission from the Rapeseed Association of Canada visited Chile last January. The mission members were primarily interested in obtaining precise information about existing markets for oilseeds and oilseed products in Chile. Members of this mission were J. McAnsh, K.D. Sarsons, J.A. Stuart, K. Edie.

The Rapeseed Association of Canada, through its Executive Director J. McAnsh, has recently invited Mrs. Lilia Masson, from the Faculty of Chemistry and Pharmacy of the University of Chile, to spend a month at the Laboratories of the National Research Council of Canada, Saskatoon, Sask., Canada, to learn about new advances in rapeseed analysis there.

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Chile Starts Industrial Cultivation of Soybean

(From "Soybean and Its Cultivation in Chile" edited by José Suárez, COMARSA.)

On many occasions the introduction of this valuable plant to our agriculture has been attempted, but for various reasons these attempts did not succeed.

The "Instituto de Investigaciones Agropecuarias" carried on several studies of soybean crops by an agreement between the Instituto and COMARSA for the promotion of research on oil seeds. These studies and an experimental sowing allowed the development of the knowledge necessary for industrial expansion of this cultivation.

Important modifications of the protein market conditions took place. The expansion of poultry production, quintuplicated in the last five years, the increased swine production and the adoption of modern techniques for producing milk and livestock meat enlarged the vegetable protein market enormously. The demand created the conditions for a plant that produces protein.

Moreover the Chilean oil industry is ready to incorporate the necessary techniques and equipment for processing this seed, which is very different from the raw materials that factories normally deal with, i.e., rapeseed and sunflower seed.

Industrial Expert on Soybean and Its Derivatives

Last April COMARSA signed an agreement with the "International Executive Service Corps" (I.E.S.C.) to have the visit of an expert on soybean industrial processing. I.E.S.C. has confirmed the trip of P.G. Gottschalk as volunteer expert for Project No. 3388. Mr. Gottschalk has worked for 42 years in Allied Mills Inc., Illinois, and is a member of the American Oil Chemists' Society, American Soybean Processors Association and American Association of Cereal Chemists. Mr. Gottschalk will arrive in Chile next September and will stay in the country for a period of three months.

Czechoslovakia . . . . . Jan Pokorny

Meeting on Surface Active Agents and Detergents

The Seventh Annual Meeting on Detergents took place November 18–19, 1970, in Brno. In addition to two review papers and five committee reports, 14 original papers were presented on the following subjects: electrical phenomena in the process of

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detergency; determination of critical micellar concentration of nonionogenic detergents; measurement of the dimensions of particles in dispersion systems; detergents in sewage; adsorption of surface active agents on fabric; automatic washing machines; detergents of the polyoxyethylene and polyoxypropylene type; physical chemistry and analysis of benzalkanoin derivatives; analysis of propylene glycol monoricinoleate; potentiometric analysis of anionactive agents containing sulfonic groups.

Meeting of Czechoslovak Oil and Fat Chemists

The Tenth Annual Meeting of Czechoslovak Oil and Fat Chemists took place May 13–14, 1971, in the castle of Smolenice. Thirty-three papers were presented in the following sections: (a) Edible oils: continuous hydrogenation of oils and fatty acids; analysis of hydrogenated fats; flavor reversion of soybean oil; modern oilseed processing; quality of rapeseed; changes of vitamin A in course of production and storage of margarine; synthetic glycerol from epichlorohydrine; (b) Lipid biochemistry: physiochemical changes and biological effect of heated fats; new method of biological evaluation of fats and oils; effect of ionizing irradiation on lipids; comparison of serum inhibitor of lipoperoxidation with tocopherols and synthetic antioxidants; synthesis of unsaturated fatty acids with localized double bonds; (c) Analysis of fats and oils: determination of the structure of lipids; analysis of milk lipids; fatty acid composition of milk lipids by capillar GLC; microbial lipid production from *n*-alkanes and the determination of carboxylic acids in this material; volatile fatty acids in palm seed oils; determination of meat lipids by extraction methods; determination of chlorinated insecticides in lipids by TLC and GLC; (d) Surface active agents: raw materials for nonionogenic detergents; alkyl polyglycol ether phosphates; detergents from natural and synthetic peptides; enzymic preparations as detergents; washing of railroad tanks; (e) Analysis of surface active agents: determination of surface properties of Czechoslovak emulsifiers; stability of emulsions; separation and identification of alcohols and diols as N,N-dimethyl-*p*-aminobenzene-azobenzoates by PC and TLC; chromatography of sulfated oils, defoaming activity of silicone products with relation to the character and dimensions of particles.

Symposium on New Methods of the Production and Evaluation of Food

A symposium was held on May 26–28, 1971, in Zvikov near Prague with the following sections: General; Dairy products; Lipids; Meat. The papers of the lipid section treated mainly the interaction of lipids with protein, e.g., the effect of milk proteins on the stability of soybean oil; formation of lipoprotein complexes; reactions of lipid peroxides with protein. Other papers were presented on the evaluation of lipids in dry milk and in hydrogenated oils.

Poland . . . . . H. Niewiadomski

International Symposium at Gdansk

An International Symposium "Deterioration of Lipids," organized by the Food Technology and Chemistry Committee of the Polish Academy of Science and the Institute of Organic and Food Chemistry and Technology of the Gdansk Technical University, took place at Gdansk, Poland, from June 1–4, 1971. There were 109 participants from 15 countries.

A total of 38 papers were submitted during four Sessions. In the group of investigation of the changes of fatty acids seven papers were read. Five works were devoted to the deterioration of by-substances that appear in natural fats. The influence of antioxidants was discussed in four reports. The subject of three works was the problem connected with changes caused by heating the fats, mainly while frying. New analytical trends, useful for the investigation of deterioration of lipids, were discussed in three cases. Sixteen of the papers were devoted to the effect of storage and technological processes on the course of undesirable changes in lipids. In general the greatest number of papers was concerned with the processing and use of fats for food.

After discussing several aspects of the problem of how the processing of raw materials effects the changes both in glycerides and in their accompanying substances, the influence of heating during frying, as well as the advantage attained by the use of various antioxidants, it was possible to draw many useful conclusions for diminishing the range of unfavorable changes.

Several papers dealt with the theoretical basis of autoxidation.

Five invited plenary lectures were delivered: G. Jacini (Italy): "Minor Components of the Oils in Refining Processes"; R. Marcuse (Sweden): "Metal Catalyzed Lipid Oxidation"; H. Niewiadomski (Poland): "Deterioration of Lipids, its Influence on Technology and the Final Product"; J. Pokorny (Czechoslovakia): "Protection of Lipids Against Autoxidation"; W. Zwierzykowski (Poland): "The Kinetics and Thermodynamics of Fats Autoxidation." There was a lively discussion after every paper, which was a proof of properly selected subjects and of the high quality of the papers delivered at the Symposium.

The Symposium comprised many problems connected with all the forms of diminishing the food value of fats as well as the appearance of quantitative losses. Thus not only the phenomena connected with the so called rancidity were discussed, but also changes in chemical composition due to technological processes which may consist in removing valuable components or introducing undesirable ones for man.

The proceedings of the Symposium will be published in English most probably in 1972.

H. Niewiadomski was the Chairman of the Executive Committee and B. Drozdowski was the Scientific Secretary. Both are from the Gdansk Technical University.

France . . . . . J. P. Helme

Scientific and Technical Research on Fats in France

The French "Commissariat Général du Plan d'Equipment et de la Productivité" has just completed preparation of the "Fifth Plan" for the period 1971–1975. The report of the Sub-Committee for Fats, which is concerned with defining the economic and technical problems of the next five years, contains a general inventory of French research resources in this field.

The report also includes a synthesis of the scientific and technical research required over the next five years in the vegetable oil, margarine, soap, animal fat, fatty acid, and fats chemistry industries.

In the last ten years important progress has been made in the production methods as well as finished products. Widespread utilization of continuous processes and compact plants, the growing introduction of stainless steel equipment, and a high degree of automation have brought about reductions in overhead expenditure.

The development of modern analytical techniques which enable measurement down to ppb (parts per billion) μg/kg with a reasonable coefficient of variation, results from advances in instrumental methods, generally gas-liquid,

thin-layer, and high-pressure liquid-liquid chromatography, spectrographic methods, mass spectrometry, and the use in radio-chemistry of labelled elements.

Oil chemists are now able to fractionate, separate, isolate and characterize the secondary components of fats with greater accuracy. Latest work on the unsaponifiables in oils is a prime example.

On the technological side the volume of innovations has been so intense in the last ten years that some loss of momentum is now being experienced with the obvious exception of new process, new R and D.

With vegetable oils the essential need is for improved coordination between agronomic research, (i.e., rapeseed and sunflowerseed genetics), technological research (selective hydrogenation of linolenic acid), and nutritive research (the problem of erucic acid), for the purpose of encouraging the production of seed which meets market requirements. For various reasons the market position of the peanut has changed in the last five years and there is need for market attention to the economic and technical aspects of the problem.

In the margarine industry a study of aqueous phase crystallization of triglycerides using wide-band NMR could provide some interesting results. In this type of industry the problem of interchangeability of raw materials is fundamental.

The animal fats industry should continue its efforts in tallow collecting and should also proceed with the current study of refining methods, in particular color and odor elimination, to improve stability of product quality.

With stearin work should be done principally on new processes of olein hydrogenation and the dehydrogenation of saturated acids so as to keep pace with market trends.

The soap industry should first take practical advantage of all the research which has been done on the refining and purification of its raw materials and then possibly some work should be initiated on the molecular structure and chain composition of soaps and detergents.

In fats chemistry, of some 22 chemical reactions of triglycerides including ester function, ethylenic bond, and natural or induced hydroxyl radical, not all have industrial applications but several are already of great importance in the processing of fatty acids to produce multipurpose derivatives. For these there are numerous outlets in the coating, lubricant and plasticizer industries.

Where fats are concerned research cannot be an end in itself and no distinction between basic, applied and development research alters the contrary impression which is sometimes held. Research should above all be motivated by industrial development and improvement of quality.

The important thing is to know what you want, what you can do and where you are going. Research can be conducted either collectively or individually. Collective research tends to be more successful with new processes than with new proucts. Its principal value lies in the opportunity afforded for the concentration of various resources in various localities on subject matter likely to be beyond the means of individual companies. In any case the proportional relationship between collective research, research by individual companies and development research is constantly evolving and must therefore remain flexible, since the actual proportions depend essentially on context and economic conditions. It has frequently been the custom to initiate a program of research from general conditions, and then to seek applications for the results in industry then with individual companies. We believe that the reverse procedure is to be preferred. The point of departure should be within an individual company at the root of the problem whether economic, trading or technical, where the realities of the problem are at their most concrete stage; then is the time to examine the ways and means of encouraging and backing the research project within the company in question, then within the industry or industries as a whole.

1971–1975 Research Program Synopsis

Discipline	Field	Development aims and objectives [a]
Agronomy	Fertilizers and soils Plant physiology Improvement of strains Plant pathology Zoology Phytopharmacology	Genetic amelioration of seed quality (rapeseed, sunflower, peanut, oil palm) for improvement of oil and oil cake Perfection of methods of parasite control and improvement of techniques of cultivation Research into seed deterioration in storage
Physics and physical chemistry Technological (New process, new product)	Physical methods of study of molecular structure (Chromatographic and spectrographic techniques) Study of reactions: ester function, ethylenic bond, etc	Improved quality of oil and oil cake produced from French-grown seed Valorization of industrial by products and research aimed at increase of added value (industrial outlets)
Chemistry Analytical	Study of reactive mechanisms Study of reaction by products	Search for new and larger outlets in foods
Nutritive Science	Biophysics Biochemistry Physiology Pathology Bacteriology	Nutritive value of oil and oil cake produced from home-grown and imported seed

[a] Research on fats in France is undertaken in State run Institutes and laboratories (University, the "Centre National de la Recherche Scientifique," etc), by applied research organizations attached to industry, i.e., the "Institut des Corps Gras-ITERG" in Paris, and in the laboratories of individual companies.

• *Names in the News*

Procter & Gamble directors elected THOMAS LACO, presently manager of the company's packaged soap and detergent division, to the position of vice president-packaged soap and detergent division. Mr. Laco, joined P&G in 1954. He held various brand and advertising copy management positions before being appointed advertising manager for packaged soaps and detergents in 1967. He was named manager of the packaged soap and detergent division in April, 1970.

J.H. VOGT, former executive administrator of Lions International, has joined Dairy and Food Industries Supply Association as Executive Vice-President, taking over staff responsibilities for the 400-member organization of food equippers and suppliers at the Washington, D.C., headquarters. Mr. Vogt, who had been associated with The International Association of Lions Clubs since 1957, had complete responsibility for the business operations of the worldwide organization.

"Mr. Vogt's expertise in management and convention handling will be invaluable to DFISA," he said. "He has worked extensively with associations of all types. He is thoroughly familiar with nearly all convention cities—including Atlantic City and Dallas—where DFISA has future expositions scheduled."

Mr. Vogt and his wife Jean, former residents of Olympia Fields, a south Chicago suburb, will be house-hunting in the Washington area with their 12-year-old daughter Lisa. They also have two married children and a grandson.

Dairy and Food Industries Supply Assn. biennially sponsors Food & Dairy Expo, one of the nation's largest trade shows. The next Expo is set for Oct. 1–5, 1972, in Atlantic City Convention Hall.

RICHARD L. TRACY recently assumed the duties of Assistant Sales Manager, a newly-created position at the Jet-Vac Corporation. Tracy is a graduate Chemical Engineer, University of Alabama, with 25 years experience in his field, and is a member of the American Oil Chemists' Society.