

Report from Italy: Stazione Sperimentale per le Industrie degli Oli e dei Grassi¹

The "Stazione Sperimentale per le Industrie degli Oli e dei Grassi" (SIOG) (Experiment Station for Oils and Fats), Milan, Italy, is one of a group of eight institutes formed under the Inspectorate for Industrial Research (Ministry of Industry). Each of the institutes, located in different towns, assists one specific industrial branch. The oldest is the Experiment Station for Leather in Naples, founded in 1885; the newest is the Experiment Station for Glass in Venice, founded in 1959.

Background and Organization

The SIOG, which was set up as a self-governing institute in 1919, was derived from the Oils and Fats Laboratory, Technical High School of Milan. It is headed by a director and a board composed of leaders in the economic and industrial world. The director is chosen by national competition and the board is appointed by the competent industrial branch. The president of the board is appointed by the Ministry of Industry.

Approximately 60% of the financing for the SIOG is provided by private industry with the rest supplied by the government. The National Research Council (CNR—Rome) gives a contribution as well. From 1960-1969, the CNR supported a Lipochemistry Center at the SIOG; since 1969 the CNR has continued its contribution to SIOG by research contracts.

The SIOG offices were built in 1935 and considerably enlarged in 1969. The SIOG activity concerns, principally, vegetable and animal oils and fats, soap, and detergents.

SIOG duties involve the scientific and technological research carried on either by its own initiative or by research contracts with private or public, Italian or foreign bodies. From 1960 to 1966, the SIOG had been working on five research grants for the U.S. Department of Agriculture (Public Law 408); advising industry (technical assistance for setting up a procedure, laboratory, and pilot plant tests, analysis, etc.); providing documentation; and studying and editing standard analysis methods.

To this purpose, the SIOG is divided into two main departments:

Research: Besides the traditional laboratories, the SIOG has the capacity for physical and physicochemicals analysis; this department, in addition to its own research, collaborates with the other laboratories of the SIOG for the solution of particular analytical problems.

Consulting and analysis: This department is subdivided into many laboratories: olive oil, oils and fats other than olive oil, vegetable proteins, and surfactants.

The staff of the station is composed of 55 people (graduated, technicians, clerks, and subsidiary personnel). Moreover, Italian and foreign graduates and technicians always are present due to various grants of the SIOG itself, of the CNR, and of foreign bodies. Students from the Milan University are present as well, working on their graduation theses.

The equipment of the SIOG is considerable: chromatographic and spectroscopic techniques normally are employed. The SIOG is provided with a good gas chromatographic laboratory, mass spectrometry combined with gas chromatography, atomic absorption spectrometry, UV spectrophotometry, IR, visible, etc. It can, furthermore, make use of a pilot plant for fats refining and of another plant for studying the solvent winterization. The SIOG's library, with over 4000 volumes, is likely the most specialized in Italy for the field of oils; it is open to public. The SIOG receives 180 specialized periodicals.

Since 1921 the SIOG has been publishing a periodical of its own, *La Rivista Italiana delle Sostanze Grasse* (Italian Review of Fats), with 12 issues/year and a bibliographic guide, published every three months, which collects the abstracts of main works appearing in specialized periodicals under the supervision of the SIOG's Documentation Service.

At the SIOG there is a Technical Committee, instituted in 1930, whose duty is to standardize analyses methods and their publication. These methods, even though unofficial, are authoritative in Italy. The last volumes of analytical standards published by SIOG include: the oils and fats (1957) with supplements (1961, 1965, 1968, and 1971) (altogether 208 methods) and surfactants (1965). In 1972 it collaborated with the Experiment Station for Fuels to publish *Standards on Mineral Oils*.

Research Areas

Research published by SIOG over the last few years has particularly concerned five subjects: minor components of vegetable oils, distribution of fatty acids, changes in edible oils, rapeseed sulphurated substances, and biodegradability.

The SIOG has been studying the minor components of vegetable oils for ca. 15 years; this study has led to the identification of many known or still unknown natural substances in oils, among which are the terpenic alcohols (cyclo artenol, 24-methylene-cycloartenol, butyr spermol responsible for the "Fitelson" chromatic reaction) α - β amirines and many other homologs, whose structures are still unknown, and the 4-methylsterols (publication in progress). Both terpenic alcohols and sterols seem to be characteristic components (finger prints) of the oil and important for their biological significance or, more simply,

¹This information is published as a result of the creation of the European Club of Centers for Lipid Research, January 1972, in Paris. For details regarding this new club, see *JAOCs* 49:236A (1972). Reports from five other countries have been published to date: Belgium, *JAOCs* 49:330A(1972); Germany, *JAOCs* 49:372A (1972); Spain, *JAOCs* 49:374A(1972); France, *JAOCs* 50:4A(1973); and The Netherlands, *JAOCs* 50:136A(1973).

SOUTHWESTERN

LABORATORIES

Fort Worth, Tex.

Analytical Chemists
Inspection & Testing
Engineers

Agricultural Products
Feeds—Seeds—Oils
& Related Products

817-332-5181, P.O. Box-1379, 2900 Cullen St., 76101

for the analytic characterization of the oil.

More recently, minor components have been isolated directly from the oil rather than from the unsaponifiable; this has allowed the isolation of esters of the alcohols (aliphatic or terpenic and sterols) and of the fatty acids (natural methyl and ethyl esters).

Research on the flavoring components of olive oil (important on the Italian and Mediterranean markets) has been under way for ca. two years. The research recently has been extended to minor components of olive vegetation waters. The research on minor components is discussed in over 60 foreign and Italian publications published from 1960 to date. The research led to the request to set up numerous new separation and analysis methods, most of which are on microscale. The minor components also have been extracted and studied separately in cotyledons and embryos of some seeds: soya, peanut, and avocado.

A collaboration with the Instituto de la Grasa (Sevilla) is now in progress to investigate whether, or which, olive components (oil and vegetation water) attract the oil fly (*Dacus olivae*) which periodically spoils the olive yards.

In researching the distribution of fatty acids into the glyceride and the determination of *trans* double bonds it is, above all, necessary for Italy to single out the olive oils restored by esterification. The SIOG has contributed to the acceptance, in international circles, of the analysis method by pancreatic lipase.

The SIOG has been engaged in the study of changes of the characteristics undergone by the edible oils, when treated for refining. Minor components, distribution of fatty acids in glycerides, formation of *trans* double bonds and conjugate systems, and formation of polymers have been studied. The study of products which distill by

stripping during deodorization is under way. Paralleling this subject, is the study about the use of "hydrotrope substances" as auxiliary to neutralization of acid oils (such as the husk-olive oils). The research, supported by the Italian division of Marchon Products Co. (Whitehaven, U.K.), concerns the use of alkaline sodium xylensulfonate solutions for the separation of free fatty acids from the oil. Under these conditions, the soaps do not bring about colloidal solutions; the refining coefficients improve notably. This study was carried out by the SIOG, utilizing the Alfa-Laval Marchon Halwoxon OR process.

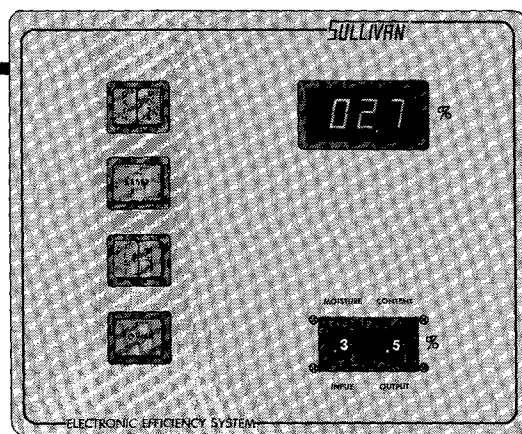
Winterization is one of the many physical treatments to refine an oil. The SIOG recently has been studying the acetone solution winterization which eliminates nearly quantitatively the oil waxes (rice-brain, husk-olive, avocado, etc.).

Among the rapeseed sulphurated substances, the vinyl-oxazolidinethione is studied closely (determination, structure changes, and fate of the compound after toasting). The research continues in collaboration with the Institute of Zootechny, Italian Catholic University, and with an Italian oil industry. The research is, at present, devoted to the study of metabolites of vinyl-oxazolidinethione in ruminants and to the possibility of eliminating these substances from cakes by industrial treatments.

Set-up of methods to evaluate the biodegradability of surfactants (ABS and LAS) also has been the subject of research by the SIOG in collaboration with the Institutes of Waters of the CNR and OCDE working groups.

Collaboration with other Organizations

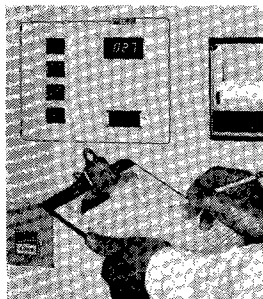
There is a great deal of collaboration between the SIOG
(Continued on page 533A)



A Dramatic Breakthrough in Oil Refining Loss Control

The Sullivan Electronic Efficiency System. Another Sullivan Innovation.

It may not look very dramatic. But it can do a lot to increase your refining profits. Inside, thousands of computerized circuits monitor your input and output, to give you an instantaneous reading of oil loss. That's new... and, with the rising cost of crude oil, very valuable. Knowing your refining loss, you can immediately make adjustments and operate at maximum yields.



Let us install our system in your plant. It could pay for itself within a month.

SULLIVAN

Innovators in the
Edible Oil Processing Industry

Headquarters: Maritime Center, P.O. Box
158, Tiburon, CA 94920 (415) 435-3855

New Books

J. F. Gerecht, Book Review Editor

Allyl Compounds and Their Polymers, Calvin E. Schidknecht (Wiley-Interscience, New York, N.Y. 1973, 736 p., \$29.95).

Allyl Compounds and Their Polymers (including Polyolefins) offers a thorough description of many classes of allylic compounds that have either been homopolymerized or copolymerized. The author has done an effective job in culling the literature and has provided a complete review of the subject. Each chapter is replete with literature references.

The scope of the book can best be defined by giving the chapter titles: Introduction to Polymerizations of Vinyl and Allyl Compounds, Polymerizations of 1-Alkenes, Allylic Diolefins, Allyl Halides and Related Allylic Alcohols, Allyl Acids and Related, Allyl Aldehydes and Ketones, Monoallyl Esters, Allylic Isopropenyl Compounds, Diallyl Carbonates, Diallyl Phthalates, Other Polyfunctional Allyl Esters, Monoallyl Alkyl Ethers and Related, Polyfunctional Allyl Ethers, Allylic Acetals and Ketals, Allyl Aryl Ethers, Allyl Phenols and Related, Allyl Sulfur Compounds, Allyl Amines and Their Salts, Allyl Amides, Allyl Urethanes, Other N-Allyl Compounds, C-Allyl Nitrogen Compounds, Triallyl Cyanurate and Related, Allyl Acrylic Monomers, Diallyl Maleate and Diallyl Fumarate, Other Allyl Vinyl Monomers, Allyl Phosphorus Compounds, Allyl Silicon Compounds, Allyl Boron Compounds, and Allyl Compounds with Metals. The book also contains an adequate index.

Of special interest to chemists working with long-chain fatty acids and related substances, the chapters dealing with allyl esters of long-chain fatty acids and of dibasic acids will be most useful, even though these represent only a small percentage of the total coverage in the book. However, the discussions of the polymerization and copolymerization of allyl ethers, N-allyl-substituted amides, and related compounds should furnish any ingenious chemist with numerous ideas for extending studies into the field of long-chain compounds. Furthermore, since the most frequently encountered unsaturated oils, fatty acids, esters, and alcohols are "allylic," information given in many chapters of this book should be of considerable interest and value to lipid chemists.

The book is relatively free of typographical errors, and it is extremely well organized. Everyone interested in polymer chemistry should have a copy of this book or see that their library purchases it.

DANIEL SWERN
Chemistry Department
Temple University
Philadelphia, Pennsylvania

Analysis of Triglycerides, Carter Litchfield (Academic Press, New York, N.Y., 1972, 355 p. \$19.50)

This book is an excellent review of triglyceride analysis at a time when, as the author states, the field has reached

• Four Corners . . .

(continued from page 524A)

relaunched their liquid sunflower oil "Salat" in a new design using plastic bottles.

The other new products were "Eldor" and "Pril." The former is a shampoo launched by G. and A. Baker in three different colors and formulations. Amber colored "olive oil," yellow colored pearly opaque "egg," and greenish-yellow transparent "lemon" are the three brands. "Pril" is a dish-wash liquid produced by Turyağ Company, İzmir. ■

• Report from Italy . . .

(Continued from page 531A)

and the Italian Oil Chemists' Society. Since 1954, 11 Congresses and some 15 meetings, even at international level, have been organized on the various scientific and technological aspects of fatty materials, oil meals, surfactants, etc. All papers have been published in *Italian Review of Fats*.

The SIOG has been collaborating for many years with some working groups of the OCDE (Paris) and the EEC (Brussels), with COI, CID, IUPAC, ISO, ISF, etc. In fact, the Experiment Station had the responsibility to organize the first ISF Congress in 1965. ■

STIRRED REACTORS

On Moveable Floor Stands

For applying heat,
pressure and agitation to
any chemical reaction

Now offered in a **new one gallon size** or in convenient one and two liter models with an adjustable speed, heavy duty stirrer, tachometer, automatic temperature control and other new features.

Ask for our new Bulletin 4500.

Telephone
(309) 762-7716

PARR INSTRUMENT COMPANY
211 Fifty-Third St.
Moline, Ill. 61265

New from **PARR®**

