

• *Lipids in Baking . . .*

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in the higher melting crystal forms do not provide proper aeration of cake batters, although in other applications they may perform better than the lower melting forms.

As we gain more knowledge about the performance of specific crystal forms in the different kinds of bakery products, we can design specific fat systems with the desired characteristics by deliberately manipulating the molecular composition of the fat by proper choice of raw material and manner of chemical processing.

C. W. HOERR

Studies on the Lipid System of Flour and Dough

The baking industry is vitally interested in fats for many reasons. For the purpose of this paper, two areas of interest, related to breadmaking, are singled out: the lipids of wheat flour, and the commercial fats that comprise one of the ingredients of bread dough.

Wheat flour lipids have been studied for at least a century, but their role in flour quality remains obscure. The earlier literature on lipid research has been confusing and contradictory; hopefully, with the improved methodology available today and the current interest in lipids by a number of laboratories both here and abroad, both the complete identification and functionality of the flour lipids will be determined. By reference to a thin-layer chromatogram showing a typical class separation of flour lipids, the distribution of lipids as presently known is briefly summarized and discussed. Comparison of the distribution of lipids from a number of commercial flours shows little differences; attempts to show relationships between lipid quantity and flourbaking quality in the literature have generally been fruitless.

In the author's laboratory, recent attention has been directed to specific associations between lipid and protein in wheat flour; surprisingly, little previous work has been done in this area. Wheat flour gluten was fractionated into three components by each of two routes; the fractions were freeze-dried, then analyzed for lipid distribution by quantitative thin-layer chromatography. Differences in lipid distribution were observed; some of the implications of these findings are discussed.

Another phase of research has been concerned with the notable bread-improving effects that result when very small amounts of certain aliphatic hydrocarbons are added to dough. Data are shown indicating a specific relationship between solvent carbon-chain-length and functionality in dough. Added fat is an essential requirement for the improving effects; without the fats, the solvents cause dough deterioration. "Binding" of lipid, phosphorus, and protein in dough, when solvents are present, suggest alterations in lipoprotein structure.

Studies on fat requirements for continuous-breadmaking indicate that a number of fats are satisfactory, provided that a certain level of hard fats, either hydrogenated cottonseed oil or tallow flakes, are present. Dilatometric studies show that lard has essentially no solids at 110F, a temperature often attained in proof boxes of continuous breadmaking plants, which may explain poor results when lard alone is used as a shortening; evidently a requirement exists for crystalline fats to prevent leakage of gas through cell walls of dough. Fat systems that promote formation of beta prime crystals appear to be desirable. Data are presented on the lipid binding of continuous-mix dough and bread in comparison to that of conventional dough and bread.

Continued study of flour lipids and added fat systems, as well as interactions between them and other dough components is indicated.

J. G. PONTE, JR.

• *New Members*

Active

- Marshall J. Chick, Chemist, Best Foods Division, Corn Products, Bayonne, N. J.
Gene M. Coxwell, President, Southern Technical Services, Inc., Clinton, Miss.
Chester A. Davis, Research Chemist, Toni Division, Gillette, Chicago, Ill.
William Patrick Donahoo, Technical Marketing Manager, The Griffith Laboratories, Chicago, Ill.
Rudolf Kohn, Research Chemist, US Army Natick Laboratories, Natick, Mass.
Glen Peter Krawiec, Quality Controller, Corn Products, Alameda, Calif.
Arthur Edward Krisinski, Chemist, Corn Products, Bayonne, N. J.
Holger Larsen, Chief Chemist, Corn Products, Alameda, Calif.
Bernard Lesieur, V. P. Engineering, Georges Lesieur et Ses Fils, Paris, France.
John E. Lowden, Head of Quality Control Laboratory, Capital City Products, Division of Stokely-Van Camp, Inc., Columbus, Ohio.
Daniel Joseph Meshnick, Assistant Production Manager, Industrial Division, Drew Chemical Corp., Boonton, N. J.
Patrick L. Parker, Assistant Professor of Chemistry, University of Texas, Port Aransas, Texas.
Jack Patt, Technical Director, Stan Sax Corp., Detroit, Mich.
Kunihiko Saito, Associate Professor, Department of Medical Chemistry, Kansai Medical School, Osaka, Japan.
Grace Y. Sun, Research Associate, Cleveland Psychiatric Institute, Cleveland, Ohio.
Thomas Edward Vickers, Assistant to the Quality Supervisor, Anderson, Clayton & Co., Foods Division, Durant, Okla.
Donald T. Warner, Research Associate (Biochemistry), The Upjohn Co., Kalamazoo, Mich.

Corporation Associate

- Cincinnati Milling Machine Co., Donald W. Smith, Research Chemist, Cimcool Laboratory, Cincinnati, Ohio.

Active Junior

- Ian Andrew de la Roche, Graduate Research Assistant, Department of Agronomy, University of Illinois, Champaign, Ill.

• *Names in the News*

A. C. ZETTMAYER (1948), research director and chemistry professor at Lehigh University, Bethlehem, Pa., has assumed the new position of first Vice-President for Research. Currently the Lehigh Institute coordinates more than 160 research projects at the University for US Government agencies, industries, foundations, and societies.

FRANCIS SCOFIELD (1937) is responsible for the overall technical activities and long range planning of the National Paint, Varnish and Lacquer Association in his new position as Vice-President—Technical Affairs. His work will include air and water pollution control programs. Scofield's former duties as Director of the Technical Division of NPVLA are being performed by R. A. BROWN, who joined NPVLA after five years as plant manager and technical director of the Stanley Chemical Division of The Stanley Works, East Berlin, Connecticut.

N. M. MOLNAR (1964), founder and president of Fine Organics, Inc., at Lodi, N. J., has received a special citation for outstanding professional achievement from the Cooper Union for the Advancement of Science and Art in New York City.