

Challenge of the Baking Industry

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ALTHOUGH RELATIVELY FEW of us in the AOCS may consciously have thought of it as such, the baking industry has presented a continual challenge to the edible fats and oils industry through the years. Perhaps it is debatable whether the baking industry has been directly responsible for initiating work which has led to advances in our technology, or whether growth of the baking industry has been spurred by developments conceived by the fats and oils industry. At any rate, there is no denying that the bakery industry today is one of the large consumers of edible fat and oil products.

Latest Department of Commerce figures (Table I) indicate the consumption of edible fats and oils in the United States in 1961.

Although no reliable figures are available, it is estimated that the baking industry now consumes almost one-fifth of the total annual U.S. output of edible fats, distributed according to use (Table II).

With the advent of convenience food items in recent years, to the above figures must be added several million more pounds of fats and oils which are used in the wide variety of cake mixes now found on the grocers' shelves throughout the nation.

The baking industry has indeed become a multimillion-dollar business. The ten largest commercial baking companies alone reported (Chemical Week, September 8, 1962) total net sales of over 2,390 million dollars for 1961. In addition, the three largest milling companies, which produce most of the nation's prepared cake mixes, reported total net sales of almost 1,300 million dollars for that year. The combined income of the hundreds of smaller bakers cannot even be guessed.

To say the least, the commercial bakery has come a long way since the days of the cracker barrel in the local general store and the small neighborhood bakery where we bought fancy cookies and elegantly decorated cakes only for special occasions. Though few of us care to admit it, many can still remember the boxes of bulk cookies in the local grocery store. In relatively recent years, there has been a rapid transition from the small local bake shop to

TABLE I

Salad and frying oils	2,367,000,000 lb
Shortenings	2,453,000,000
Margarine Oils	1,387,000,000
Butter	1,119,000,000
Other (Confectionery fats, etc.)	417,000,000
Total Edible Fats & Oils	7,743,000,000 lb

TABLE II

Breads	350,000,000 lb
Pies	300,000,000
Cakes	250,000,000
Cookies, Wafers	200,000,000
Doughnuts	150,000,000
Crackers, Pretzels	150,000,000
	1,400,000,000 lb

the tremendous mechanized and automated plants which produced the greater part of the 10 billion loaves of bread baked last year and the seemingly limitless quantities of packaged bakery items on the supermarket shelves.

When catalytic hydrogenation of vegetable oils became a commercial reality soon after the turn of the century, the baking industry was still in its infancy and, therefore, it could scarcely have been considered a factor in this revolutionary development of the fats and oils industry. However, by the middle 1930's the interest of the baking industry in better cake shortenings must certainly have provided some incentive for the introduction of mono-glycerides as emulsifiers in shortenings for baked goods. Other emulsifiers were rapidly developed and have readily found use in baked goods. Examples are the tartaric acid esters of monoglycerides, sorbitan esters of fatty acids, polysorbates, glyceryl lactopalmitates, and stearates, etc. The needs of the prepared-mix industry for rapid-aerating shortenings promoted the development of shortenings containing the glyceryl lactopalmitates and stearates, leading to the so-called "instant mixes."

The increased demands for more and better shortenings early in the 1950's certainly spurred commercial development of rearranged lard and provided the incentive for thorough studies of the crystal properties of shortenings. As the knowledge of the crystalline properties of shortenings and their contribution to baking performance increased, further improved shortenings became available to the baking industry. Current investigations are now determining the role of emulsifying agents in shortenings and their interactions with the other ingredients of doughs and batters.

Two major trends in today's baking industry are now influencing the development of new shortenings. These are the trend toward greater automation and the trend toward highly specialized products. Both trends are thoroughly interrelated.

The pressures of increasing labor costs dictate the need

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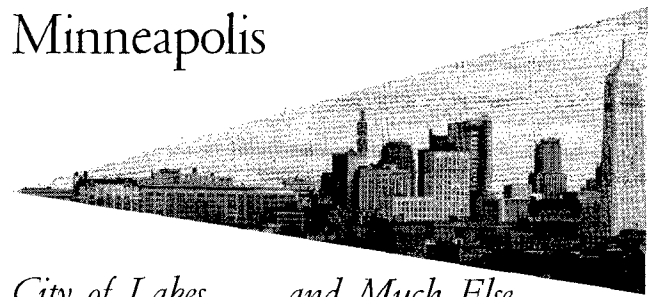
for automation in the bakery. The need is greatest in the large commercial or wholesale bakeries but is also as important to the small shop. Continuous cake and bread manufacturing machines are being installed by many. The technology of shortening crystallization and emulsifiers has contributed greatly to the development of highly specialized shortenings for highly specific uses. Fluid shortenings which can be poured or pumped have been developed to meet the requirements for shortenings that can be used in today's mechanized bakery operations. Special icing shortenings with improved eating qualities and increased aerating abilities and water-binding properties have led to more stable icings and fillings. Special shortenings for use in preparing very stable whipped toppings and pie fillings have been developed for use in the frozen pie industry. Many more examples could be cited.

The challenge of automated baking operations will undoubtedly lead to an almost complete changeover to fluid shortenings. This appears to be almost inevitable, since the physical properties of plastic shortenings and their dependence upon proper crystalline form for optimum baking performance tends to eliminate them from practical considerations in the mechanization of bakery operations.

As bakery processes are automated, new demands are placed upon the shortening systems employed. In some cases new shortenings are needed for production of currently marketed products. In other cases, new bakery products will be developed as a result of the flexibility provided by mechanized processes, and perhaps these will also, in turn, make new demands upon the shortening systems employed.

Automation and specialization are thus the current challenges of the bakery industry to the edible fats and oils industry. The next decade should see the development of stimulating new shortening and emulsifier technology.

Minneapolis



City of Lakes . . . and Much Else

The 37th Fall Meeting of the AOCS will present a Technical Program which is to draw many hundreds of members to Minneapolis, Minn. Due to the demanding schedule characteristic of these Fall Meetings, the hours for recreation and relaxation are of prime importance to the registrants. Anticipating that you may wish to consider these factors as you plan your trip, we offer a few words about the "City of Lakes" . . . and much else.

Minneapolis bills itself as the City of Lakes, and with reason. Inside the city limits are 22 lakes and 16 bathing beaches.

There also are 153 parks, encompassing 6,000 acres, 5 municipal and 11 private golf courses, 208 tennis courts, 65 playgrounds, and a 63-mile-long "Grand Round" system of parkways and boulevards sauntering through the city's more scenic areas.

For convention-bound AOCS members whose interests are less than fulfilled by streams, ponds, waterfalls, canoes, sailboats, fairways, softball and the like, Minneapolis happily offers other (but more expensive) recreational outlets.

Sports enthusiasts will find the September 30-October 2 AOCS meeting bracketed by four major football games. The Minnesota Vikings—National Football League professional team—will play the San Francisco 49'ers on September 29 and the St. Louis Cardinals on October 6. Both games will be at the Twin Cities' \$8.5 million Metropolitan Stadium.

The University of Minnesota "Golden Gophers" will play Nebraska's "Cornhuskers" on September 28 and Army on October 5 at Memorial Stadium.

Those intent on seeing the Minnesota Twins baseball team—second in 1962's American League final standings—must content themselves with watching TV September 28, or listening on radio the 29th, as the club concludes the regular season against the Yankees in New York. Should the more optimistic Twins supporters' predictions prove accurate, however, the World Series will begin in Metropolitan Stadium during AOCS convention week.

Playgoers will find it possible to see a different performance in a different theatre every night, without even sampling all that is available. Most prominent is the Tyrone Guthrie repertory theatre—opened in May this year—in which a gaggle of recognizable Broadway names are presenting four plays (Hamlet, The Miser, Death of a Salesman, and Three Sisters) of some repute. Other stage plays run nightly at the Old Log Theatre—a sumptuous summer stock emporium near Lake Minnetonka—Theatre in the Round, Edyth Bush Theatre, Moppet Players, and gridiron-like parodies are provided at Dudley Rigg's "Brave New Workshop," a coffee house.

Worthwhile art galleries include Walker Art Center (adjacent to the Guthrie theatre), Minneapolis Institute of Arts, American Swedish Institute, and the University of Minnesota art gallery. Interlarded through these are several downtown commercial galleries with offerings of varying value.

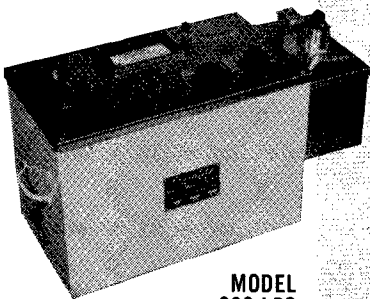
Museums? By all means. The Hennepin County Historical Society, the Minneapolis Public Library (which also offers a planetarium), and the Minnesota Museum of Natural History.

Devotees of the "down in front" schools of modern dance will find a broad offering of the twist, bossa nova, and other less refined but more basic undulations performed in

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