

Update: Reduced-fat margarines and dressings

The following article examining the trend toward reduced-fat margarines and dressings was written by Frank T. Orthoefer of Nabisco Brands Inc., East Hanover, New Jersey. Orthoefer serves as Associate Editor for JAOCs News for Food Technology.

The markets for margarines, sauces and dressings are experiencing a rapid evolution. According to statistics from the National Association of Margarine Manufacturers (NAMM), margarine sales have been growing at about the same rate as population growth, or about 1.5% annually. Meanwhile, sauces and dressings have shown 5% growth annually since 1975, according to the Association for Dressings and Sauces. Oil usage in these products, however, has not kept up with market growth.

From 1981 to 1986, although total oil use in edible products increased about 3% annually (for a total increase of 1.6 billion pounds over the five-year period), fats and oils used in margarines showed an average annual increase of only 1.1%, U.S. Department of Agriculture figures show. Oil used in sauces and dressings increased by 2.2% a year, still below that of the industry average. The major increase, of 5% annually, was in baking and frying applications.

The new margarine and dressing products filling market demand for alternatives to the traditional versions feature reduced fat. These lower-fat versions account for the difference between overall market growth of both margarines and dressings and static consumption of fats and oils. The reduced-fat versions have experienced above-average growth compared with their traditional counterparts.

The market

More consumers are calorie/weight-conscious than before, according to consumer surveys cited by *Food Engineering* in its June 1987 issue. There is a trend toward less consumption of meats and increased consumption of vegetables as well, *Newsweek* reported in its

May 19, 1986, issue.

The change in dietary consciousness has affected the type of food consumers select at the supermarket and in restaurants. In 1986, after experiencing significant growth, dry grocery diet and low-calorie section supermarket sales were flat, the July 1987 issue of *Progressive Grocer* reported. Sales have leveled off because many processors of non-diet product lines entered the market with low-calorie and low-salt versions of their traditional products, according to *Progressive Grocer*. These drew consumers' attention away from the diet section as the major brands usually are sold on the shelf with regular brand items. Examples include "light" versions of Kraft's Miracle Whip, Best Food's Hellman's Mayonnaise, and various light dressings. New products are being introduced in both low-calorie and regular versions such as Lipton's creamy Dijon and Dijon vinaigrette under the Wish Bone label. Smaller producers also are introducing low-calorie versions.

Through positioning of the low-calorie/reduced-fat products with the regular, standard products, producers improved the image of the new, non-traditional, modified products, according to *Progressive Grocer*. The low-calorie/reduced-fat products are recognized not as diet products but as nutritious, lower-calorie, good-tasting counterparts. This has instilled broader appeal than if they were positioned in a diet section of a supermarket. Additionally, new products that are as exciting, easy to prepare and satisfying to the taste as the regular product yet are lower in fat are being introduced. The reduced-fat sauces, dressings and margarines have been a major part of low-calorie product introductions.

Sauces and dressings

In 1985, the reduced-fat or reduced-calorie sauces and dressings grew faster than the total market, according to the June 1987 issue of *Food Engineering*. For 1986, the category was growing at an annual rate of 6% but the reduced-calorie products showed 23% growth with an 11% tonnage gain over 1985. The driving forces were the increased interest in nutritious foods, a shift to dietary roughage, less consumption of cholesterol, and a marked increase in "grazing." The consumption of salads, for instance, satisfies the consumer's desire for eating "healthier" foods.

The popularity of salads is expected to continue, the October 1987 issue of *Restaurant Management* reported. Fresh vegetable consumption is projected to increase 35% by the year 2000 and fresh fruit consumption by 23%. Salads are on almost every menu with 55% of the dressings being sold in food service including white tablecloth as well as fast food outlets. Salad bars are popular with 60% of restaurant patrons, *Food Engineering* reported. Main-dish salads, with 31% more patrons ordering in 1984 than 1982, were found by the National Restaurant Association to be the sixth fastest-growing menu item.

The 1986 sales of salad dressing were 15.8 pints per capita compared with 14.9 pints in 1985 and only 10.1 pints in 1975. Overall, growth through 1992 is projected at 4.3%. Sales in the salad dressing category are flattening with product proliferation occurring. Some 180 new items were introduced in 1986. Many smaller producers are meeting regional flavor preferences throughout the country.

Diet margarines and spreads

Margarine-like products having less than 80% fat, referred to as spreads, were introduced in the early 1970s, according to *Bailey's Industrial Oil and Fat Products*,

Vol. 3. Production has increased markedly from about 5% of the market in 1972 to 13.5% in 1983, NAMM reported. In the first half of 1987, spreads made up about 22% of the total margarine/spread market in retail, food service and industrial categories. Diet products, below 52% fat for reduced-calorie classification, made up 1.2% of the market. This change likely is a reflection of the diet-conscious consumer similar to the one purchasing sauces and dressings. The reasons for growth in this market are likely due to availability in convenient sizes and lower calories combined with improvements in flavor and functionality compared with the diet margarines. These products also offer lower production costs to the processor because of lower oil content, although consumers may not always see a cost savings when comparing items on the grocery shelf.

Less fragmentation has occurred in the spreads markets compared with sauces and dressings. The major producers, Kraft, Lever Brothers and RJR Nabisco, account for 70% of the market, according to the 1987 report, *Selling Areas—Marketing Incorporated*. Products include quarters, solids and soft products. Soft spreads account for more than 80% of the spreads market.

Formulation and processing

Spreads include all margarine-like products having less than 80% fat, according to *Bailey's Industrial Oil and Fat Products*. Reduced-calorie products, having one-third fewer calories than margarine, are limited to 52% maximum fat. Diet margarines are 40% fat. The spread designation seems to denote a better low-calorie product to the consumer, although this designation also is confusing.

Typical margarine oil blends of hydrogenated and fully refined oils generally are used in spreads. The blend used depends on whether stick or soft product form is being produced. Oils are distinguished by source, with soybean oil being the most widely used according to NAMM. Others include corn, cottonseed, sunflower and safflower oils.

The reduction of oil in the formula is accompanied by an increase in water content. Emulsifiers consisting of monoglycerides and lecithin may be increased slightly to improve the physical characteristics of the emulsion and its stability. Gelatin or gums have been added to improve the body of these margarine-like products.

According to *Bailey's Industrial Oil and Fat Products*, process conditions for spreads are similar to those for margarines, although conditions are more critical. Reduced-fat emulsions are more viscous because of the higher content of dispersed phase requiring higher fill temperatures for leveling in the container. Control of the rate of crystallization occurs by using less hard fats in the oil blends. The final products are water-in-oil emulsions. Multiple emulsions have been tried such as oil in water in oil. Phase inversions are required, however. The lower-fat level products may be oil-in-water emulsions, thereby lacking some of the characteristics of margarine.

Recent patents have shown the development of low *trans* fatty acid fats, high polyunsaturated fatty acid-containing fats and interesterified-oil product combinations for spreads. Noncaloric sucrose polyester-based products also have been described. In addition, potential may exist for fish oil products containing omega-3 fatty acids to be used in specialized spreads to capitalize on current public interest in these oils, according to *Restaurant Management*.

Reduced-fat dressings and sauces require processing similar to traditional products, according to the Association for Dressings and Sauces. The role of oils in sauces/dressings may not be as critical as for spreads. Gums, particularly xanthum and alginates, are used to stabilize the formula, with water replacing the fat removed. The reduced-calorie products require a one-third reduction in oil content. The oils used are the same as for the full-fat products. Most generally, soybean salad oil is used. The "one calorie" dressings rely totally on the hydrocolloids for viscosity and mouthfeel characteristics.

A number of companies are developing ingredients that they hope can be incorporated in products to replace or lower the fat content. One is Simplese, a physically modified combination of dairy or egg proteins developed by the NutraSweet Co. According to NutraSweet, Simplese possesses fat-like characteristics while providing significantly lower calories than fat for such items as sauce formulations. The Procter & Gamble Co., meanwhile, has petitioned the U.S. Food and Drug Administration (FDA) for approval to incorporate olestra, a sucrose polyester, into foods. Both substances will need to undergo FDA review and gain FDA approval before they can be used.

Future

Current political and economic issues continue to be closely watched by margarine processors and spread producers. For instance, butter giveaways by the U.S. government, a result of dairy surpluses, reduces the market potential for margarine much to the dismay of margarine producers. In addition, should more stringent nutritional labeling be adopted, processors may find it more difficult to substitute within the various oil types. Additionally, current labeling can be confusing for consumers, who are not always sure what "light," "low-calorie" and "reduced-calorie" really mean. Standardization of these terms is being contemplated by FDA.

Continued growth in the area of reduced-fat margarines, sauces and dressings is anticipated. The aging population of the U.S., combined with increased nutritional awareness, will create a market pull for modified products. Additionally, nutritional programs such as the National Institutes of Health-National Cholesterol Education Program will maintain consumer awareness of the benefits of dietary fat reduction and reduced cholesterol consumption. It also can be anticipated that further erosion of the traditional markets for fats and oils will occur.

However, opportunities will continue to develop for specialty oil-based products. Among these will

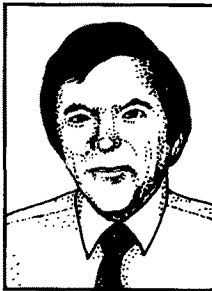
be fish oil or omega-3 fatty acid-containing fats, the high oleic oils and perhaps the genetically manipulated oils. Noncaloric fat substitutes may find ready applications;

however, regulatory review and approval could be complicated and time-consuming. Other ingredients that can provide calorie reduction, improved flavor or texture, or func-

tional characteristic may find a market in reduced-fat margarines or sauces and dressings. Certainly, consumer interest in such products already exists.

Methodology

Methods development update



Physical methods committee

Arthur Walkling at Best Foods, Union, New Jersey, has offered to organize an AOCS technical committee on physical methods. The purpose of the proposed committee would be to develop and adopt methodology for measuring the physical properties of fats, oils and fat-based food products.

Walkling has defined the scope of the committee as follows: "To propose, evaluate and formalize methods for measuring the thermal, rheological and textural properties of fats, oils and fat-based products." The AOCS methods book, *Official Methods and Recommended Practices of the American Oil Chemists' Society*, currently doesn't contain any methods for evaluating the physical properties of fats, oils and related food products.

Walkling currently is attempting to assess the interest in having such a committee and is seeking committee members. Anyone interested in actively participating on this committee is asked to contact

him at Best Foods, 1120 Commerce Ave., Union, NJ 07083, telephone 201-688-9000.

TSOMSA meeting

At the Tri-State Oil Mill Superintendents Association (TSOMSA) regional meeting Dec. 5, 1987, in Memphis, Tennessee, W. Kirk Miller, administrator for U.S. Department of Agriculture's (USDA) Federal Grain Inspection Service (FGIS) in Washington, delivered the keynote address on "Current Issues That Will Impact Oilseeds Industry." The talk is published in detail in the February 1988 issue of the *Oil Mill Gazetteer*.

In his talk, Miller discussed such items as the oilseed supply and demand outlook, the proposed European Economic Community tax on fats and oils, labeling of tropical fats and recent FGIS initiatives. Of particular interest to those involved in methods development activities is Miller's reference to contract studies with the Agricultural Research Service and other institutions. These activities include evaluating new devices for separating foreign material from grain; measuring protein, oil and moisture online using nuclear magnetic resonance (NMR); measuring single kernel moisture; and detecting odors in grain using objective methodologies. In-house FGIS projects center around the use of near-infrared reflectance (NIR) technology.

Polyethylene in fats and oils

Concerns have been expressed about the current AOCS method (Recommended Practice Ca 16-75 [87]) for the determination of polyethylene and other plastic polymers in fats and oils. As noted by recent inquiries, this method is of considerable importance to the fats and oils trade.

The method, as written before 1987, did not call for the precipitation of polyethylene and other chloroform insoluble matter from an acid solution; therefore, it was possible that the precipitate obtained was contaminated with fatty acid soaps. As one laboratory reported, this kind of contamination could impart a pink color to the precipitate. Washing the precipitate with dilute hydrochloric acid was suggested to remove the soaps. Lacking a collaborative study and more definitive data, AOCS incorporated this suggestion into "Notes" of the method for the *1987 Additions and Revisions*.

The possibility of adopting the BSI/ISO standard method, which requires the precipitation from an acid solution, will be explored by the Uniform Methods Committee during 1988. Any suggestions regarding the change in the method or adopting the BSI/ISO standard method would be appreciated.

Dave Berner
AOCS Technical Director