

Trans Fat Alternatives Nutritional, Functional and Economic Challenges

Trans fat is principally formed when vegetable oils are processed to make them more solid or more stable. This process is called hydrogenation and is performed to increase the quality of many foods. Partially hydrogenated vegetable oils protect against rancidity thus preserving freshness and extending the shelf life of foods containing them. Hydrogenation is also used to convert liquid oil into solid form providing the attributes of texture and eating quality desired by consumers in fried, baked or processed foods.

Partially hydrogenated oils became popular during the 1960's and 70's as substitutes for animal fats because they were able to contribute the same desirable characteristics in foods but without providing dietary cholesterol and relatively high levels of saturated fat. Later partially hydrogenated oils were also used to replace certain highly saturated vegetable oils.

The main source of trans fats in the diet comes from partially hydrogenated vegetable oils, however, up to 20% of the trans fat in the U.S. diet is consumed as products of ruminant animals (i.e., beef, dairy and lamb products). Trans fats are present in the U.S. diet at only 2-4% of total calories whereas saturated fats are present at 12-14% of total calories. Thus a reduction in fat intake to meet the 30% total dietary fat goal recommended by health professionals will address the greater need to reduce saturated fats while also reducing trans fat in the diet. It is important to recognize that saturated fat should not be increased to reduce trans fat.

Recent research has indicated that trans fats may behave similarly to saturated fats. Some studies suggest that trans fat may raise LDL and total cholesterol similar to saturates. Other studies indicate trans fats have lesser effects on blood cholesterol levels compared to saturates. Some studies feeding trans fats as added nutrients indicate a slight decrease in HDL, however, this is controversial since other experiments using partially hydrogenated oils as foods show no change in HDL.

Although it would be beneficial to resolve this issue by conducting more research to determine more clearly the health effects of trans fatty acids in the diet, the U.S. Food and Drug Administration (FDA) proposed trans fat labeling regulations in November, 1999 based on current data.

Due to emerging scientific evidence on trans fat and the anticipated announcement of trans fat labeling regulations by FDA, alternatives to hydrogenated fats have been sought within the food processing industry. While some products containing no or low levels of trans fat have already been introduced into the marketplace, their application has been relatively limited due to functional, technical, availability and economic reasons and the lack of scientific consensus about trans fat as well as their functional alternatives.

There are several factors which have limited the introduction of low or no trans fat alternatives into the marketplace:

1. Functionality.

Replacements for trans fat must be able to provide at least the same functional characteristics of the materials they replace (texture of baked goods, pie crust flakiness, etc.) Many of these highly desirable food characteristics are best achieved through the use of saturated fats (or trans fats). Because saturates are often associated with increased blood cholesterol levels, it is not in the best interests of consumers or the food industry to increase saturates as a means to replace trans fats.

2. Technology.

The most commonly used advancements in technology to provide reduced or "no" trans fat alternatives include (1) blending fully hydrogenated hard fats having no trans fat with unhydrogenated oils, (2) interesterification (molecular rearrangement) of unhydrogenated oils with high saturated fat base oils, (3) the use of more stable vegetable oils derived through traditional plant breeding or biotechnological methods, (4) the use of jelling or texture building agents, (5) an increased use of antioxidants to increase oil stability, (6) blending of more stable vegetable oils with partially hydrogenated fats to lower trans fat while keeping saturates low, and (7) a combination of some or all of the above.

3. Availability.

The introduction of trans fat alternatives into major consumer markets such as the fast food sector requires their availability in relatively large amounts. To develop such a supply in the short term would be virtually impossible. Newly developed source oils (e.g., soybean, sunflower, canola) having greater stabilities are not yet commercially available on a significant scale. A commitment by the food industry to use these oils would require at least 2-4 more years before adequate acreage of such oilseed crops could be available.

4. Economics.

The higher costs of developing and producing trans fat alternatives will ultimately be passed on to consumers.

5. Strength of Scientific Evidence

The scientific evidence regarding the health effects of trans fats continues to evolve as studies and analytical capabilities improve. Additional scientific studies are currently underway. Meanwhile, it is questionable whether the available scientific evidence merits the potential decrease in performance and increased cost to consumers by switching to alternatives based on reduced trans fat content.

In summary, the food industry has substituted partially hydrogenated vegetable oils for animal fats and certain vegetable oils to reduce the amount of saturated fats and cholesterol in the diet. Partially hydrogenated fats have also played a significant role in providing many food attributes

desired by consumers previously provided by saturates. The edible oils industry will continue to satisfy consumer needs by providing a variety of foods and food ingredients which are safe and nutritious.

This information has been supplied by the Institute of Shortening and Edible Oils (ISEO), a trade association whose members process approximately 90-95% of the edible fats and oils consumed in the U.S. ISEO members are the leading authorities on the processing of edible fats and oils.