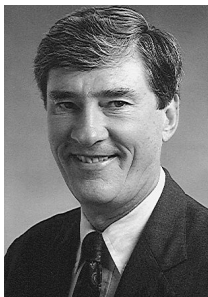


Chemistry, Testing and Application of Salatrim Low Calorie Fat

There is a consensus among health officials that the calories from fat in the diet need to be reduced. In the Surgeon General's report it was recommended that the percentage calories from fat in the American diet be reduced from 40 percent to 30 percent of calories in order to reduce the risk of cardiovascular disease and obesity.¹ Recently data have demonstrated



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that there is a continuing trend toward obesity in the United States. It has been estimated that the cost of health care related to obesity exceeds one hundred billion dollars a year.²

Recent successes of low fat products such as Con Agra's Healthy Choice line and Nabisco's Snackwells suggest that the public is responding positively to lower fat products. Aside from low fat products, there is also an enormous opportunity to produce "indulgent" products and improved products with reduced calories from fat. One approach is to incorporate a fully functional fat with a reduced caloric value in foods where fat provides a significant portion of the calories. Salatrim, a low calorie fat developed by Nabisco and marketed by Pfizer, provides functional properties in many food systems, particularly confections, and reduces the calories from fat in the product by nearly 50 percent. In this paper we will discuss the chemistry of Salatrim, review the safety testing, describe why it provides fewer calo-

ries and illustrate how Salatrim can be used to develop confections with fewer calories from fat.

CHEMISTRY OF SALATRIM

Salatrim is a family of fats composed of triglycerides that delivers fewer calories than other fats. Normal vegetable fats deliver approximately 9 kcal of energy per gram of fat. Nabisco discovered that triglycerides containing mixtures of long chain saturated fatty acids and short chain fatty acids functioned like normal fats but provided fewer calories when consumed. Salatrim is an acronym for **S**hort and **L**ong chain **a**cid **t**riacylglycerol **m**olecules. The short chain fatty acids in Salatrim are acetic acid, propionic acid, butyric acid, or mixtures including any combination of the three fatty acids. The long chain saturated fatty acids in Salatrim are provided by completely hydrogenated vegetable oils such as canola or soy. The "completely" hydrogenated fats contain predominantly stearic acid. Stearic acid is unique among long chain fatty acids because it is nonhypercholesterolemic. In addition, when fed as a component in Salatrim, stearic acid is poorly absorbed, as will be discussed later. Salatrim is prepared by the random interesterification of the hydrogenated fat with the appropriate combination of triglyceride esters of the short chain fatty acids. The basic structures of Salatrim triglycerides are illustrated in Figure 1. It can be seen that the predominant difference in the Salatrim structures is normal triglycerides that contain one or two short chain fatty acids (acetic, propionic or butyric) on each triglyceride molecule.

Typical Triglyceride Structures

All Salatrim structures include at least one long chain saturated fatty acid (typically stearic) and at least

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