

MICROPARTICULATED PROTEIN AS A FAT SUBSTITUTE

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The salubrious effect of fat reduction and health has received increasing epidemiological and experimental support. In response, the food industry is now formulating ingredients and products that can make dietary recommendation easier to obtain.

One of these products is **Simplesse®** which is the first protein-based fat substitute, made from egg whites and skim milk or whey, that provides the organoleptic qualities of fat in food systems. It is made by a microparticulation process which yields protein particles 0.1 to 0.3 microns in size. **Simplesse®** is composed of about 12% protein, 10% carbohydrates and 78% water. There is a perceptual threshold below which food particles are not perceived as individual, rather as a creamy fluid.

It allows for full fat replacement in many refrigerated and frozen food applications by using protein and water in place of fat. Three grams of **Simplesse®** contain approximately one gram of protein, thus, about four calories in three grams of **Simplesse®** as compared to three grams of fat, which contains about 27 calories. Therefore, it represents an excellent nutritional exchange.

Microparticulated proteins are found in many naturally occurring foods, e.g., casein micelles occur in all dairy foods. It also occurs with other food processing techniques, for example, processed meats such as sausage and frankfurters. The range in size of these proteins is wide, most falling between 0.005 - 80 microns. A number of tests were done to confirm that no new protein substances were found, and that the natural protein was not significantly altered. These studies include one and two dimensional gels, amino acid analysis, and protein efficiency ratio studies. Tests for antigenicity provided no evidence of altered immunological activity from **Simplesse®** as compared to egg white or bovine milk.

Since it cannot be used for cooking or frying, due to coagulation of the protein, it has a potentiality to replace about 14% of food categories that currently contribute saturated fat to the diet. Recent double-blind randomized cross-over studies show that, in contrast with 16% butterfat ice cream, **Simplesse®** frozen dessert, with less than 1% fat, results in no change from baseline in plasma lipid concentrations over a seven day period during which subjects consumed six ounces of one or the other twice a day.

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