

A bold new look at milk fat *

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It's very well known that milk fat contains a number of components that have anticancer potential. For the last 15 yr, a great deal of knowledge has been accumulated on health beneficial factors of some milk fat acids and others milk chemical components, like conjugated linoleic acid, butyric acid, ether lipids, sphingomyelin, vitamins, *B*-carotene, etc, and more recently the bovine milk fat globule membrane. Milk fat in the lactation cow is secreted as a vast number of micro lipids droplets. These droplets are encircled by a special membrane composed of lipid bilayer and proteins, which has been designated as "*milk fat globule membrane*" (MFGM). The aim of this article is to describe part of a recent review on the potential nutraceutical (foods that provides health benefits) properties of MFGM.

The MFGM originates from a specific structure (plasma membrane) of the mammary gland secretory cells by extrusion of lipid droplet from the cells. Because each lipid droplet in milk has its own membrane envelope, the milk fat globules are present in the milk in a disperse form and, therefore, do not aggregate with each other. Only after destruction of the structure of MFGM through, for example, a mechanical force like churning, do the lipid droplets aggregate and subsequently form large fat clumps known as butter.

The protein fraction of MFGM is composed of a large number of protein polypeptides (amino acids chains), which can be seen in a similar number in human MFGM. The physiological role of the MFGM proteins is not completely clear despite numerous research studies. Apparently, when these peptides are absorbed in the bloodstream, and after reaching the organs or tissues, they could exert their inhibitory action on the cells undergoing carcinogenic transformations. According to the researchers, the work on inhibition of the growth of experimental tumors by some specific protein peptides given orally to animals would be important to justify the application of bovine MFGM as a food supplement for preventing breast and ovarian cancer. But, there are some contradictory observations regarding the effect of consumption of milk and dairy products on the development of coronary heart diseases. Among the known health-beneficial components of the MFGM are: cholesterol lowering factor, inhibitor or bactericidal agent of some pathogenic organisms, and possible suppressor of multiple sclerosis, Alzheimer's disease, depression and stress.

Today, it should be possible to increase some health-promoting components in milk modifying the cow's diets. In addition, novel anti-carcinogenic components could be introduced by the cow's diet for subsequent transfer to the milk. For the components already known and present in milk, such as conjugated linoleic acid or CLA, a research project on gene identification related to these fatty acids in dairy cow's milk has been undertaken at the University of California Davis, Animal Science and supported by the Cooperative Extension Service. The improvement of milk quality for human health purposes, through animal nutrition, genetic selection and genetic engineering in dairy cows, is nowadays another important challenge of the animal science. * (*Merced Sun-Star, Section C, Agribusiness, California, Monday, October 31, 2005*)