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Commentary

Functional Properties of Milk Proteins

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COMMENTARY

Among milk components, proteins possess the greatest potential to provide satiety signals and milk proteins are more satiating than other protein sources. Whey proteins contribute to the short-term and long-term food intake regulation by inducing satiety signals. Like all fats, milkfat provides lubrication. They impart a creamy mouth feel as opposed to a dry texture. Butter flavour is unique and is derived from low levels of short chain fatty acids. The functional properties of proteins are affected by their structure. Examples of functional properties include water absorption and retention, solubility, color, gelation, viscosity and texture, emulsification, foam formation, flavor-binding properties, curdling, and enzymatic browning.

The principal constituents of milk are water, fat, proteins, lactose (milk sugar) and minerals (salts). Milk also contains trace amounts of other substances such as pigments, enzymes, vitamins, phospholipids (substances with fatlike properties), and gases. As you can see, whole milk is high in natural proteins, fat, and calcium. Milk sold in the United States is usually fortified with vitamin A and vitamin D, as well. Other cow's milk has the same amount of carbohydrates and protein, with some or all of the fat removed.

Two of the main proteins in milk are casein and whey, making up 80 percent and 20 percent of milk proteins, respectively. Casein is considered a slow protein as it slowly empties from the stomach leading to a slow and prolonged appearance of amino acids in the blood.

REAL Egg ingredients supply foods with more than 20 functional properties, including aeration, binding, coagulation, emulsification, foaming and whipping, to name just a few. The proteins in egg products, specifically in the whites, assist with adhesion and ingredient binding. Functional materials are those which possess desirable electronic, magnetic, optical and piezoelectric properties for applications such as energy harvesting and storage, as well as memory and communication devices. They function as catalysts, they transport and store other molecules such as oxygen, they provide mechanical support and immune protection, they generate movement, they transmit nerve impulses, and they control growth and differentiation. The functional properties of starch granules include swelling power, starch solubility, gelatinization, retrogradation, syneresis, and rheological behaviour, which are generally determined by the multiple characteristics of starch structure. There is no chemical formula for milk. Milk is a mixture of different substances. Milk composition varies depending on the species (cow, goat, sheep), breed (Holstein, Jersey), the animal's feed, and the stage of lactation. 3 to 5 percent butterfat Approximately 15 to 20 fatty acids make up 90 percent of the milk fat. Milk may become contaminated with bacteria during or after milking. Some disease causing organisms can be shed through cow feces and may contaminate the outside of the udder and teats, the farm environment and the milking equipment.

Milk contains the water soluble vitamins thiamin (vitamin B1), riboflavin (vitamin B2), niacin (vitamin B3), pantothenic acid (vitamin B5), vitamin B6 (pyridoxine), vitamin B12 (cobalamin), vitamin C, and folate. Milk is a good source of thiamin, riboflavin and vitamin B12. In the food industry, both fast-releasing and slow-releasing carbohydrates are utilized to give foods a wide spectrum of functional attributes, including increased sweetness, viscosity, bulk, coating ability, solubility, consistency, texture, body, and browning capacity. Proteins for foods, in addition to providing nutrition, should also possess specific functional properties that facilitate processing and serve as the basis of product performance. Functional properties of proteins for foods connote the physicochemical properties which govern the behavior of protein in foods.

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