Milk is an emulsion with fat particles (globules) and proteins dispersed in an aqueous (watery) environment. As an introduction to cheese science...

**Milk Basics**

**Milk** contains two main types of proteins: casein (~80%) and whey (~20%). Casein proteins will aggregate under two main conditions: acid addition and enzyme addition.

- **Casein**: Contains the major proteins in milk, caseins. Casein is responsible for the heat coagulation of milk, which is a key process in cheese making.
- **Whey**: Contains the minor proteins in milk, whey proteins. Whey proteins are globular proteins that denature when exposed to high heat.

**Milk Sugar**

Lactose is the main sugar found in milk; it's a disaccharide of galactose and glucose. Those who are lactose intolerant lack the lactase enzyme and do not break down lactose. Instead, it is fermented by colonic bacteria.

**Milk Fat**

Most of the fat in milk is saturated, and is found in globular structures. Milk fat globules are made up of a phospholipid tri-layer, in the form of a bilayer and monolayer. The membranes contain other lipids, sugars, proteins, etc.

**Milk Protein**

Milk contains two main types of proteins: casein (~80%) and whey (~20%).

### Casein

- **Casein micelle**
- **Casein sub-micelle**

Outlines of the micelle illustrate the negative charge present. The isoelectric point has been reached (pH=4.6), and micelles aggregate.

### Whey

Whey proteins are globular proteins that denature when exposed to high heat.

**Sources:**