Acid Adventure

Did you know that cheese is made when acid is added to milk?

The production of cheese begins with the curdling of milk, which is the making of **curds** and **whey**. There are several ways to begin this process. Two ways include the heating of milk at high temperatures and adding an acid and enzyme to the milk. For example, when the enzyme rennin is added to milk after the acid, it will speed up the curdling process. These methods will be investigated in *Food Explorations* of this chapter.

According to the Law of Conservation of Mass, matter can change from one form to another, but the total mass must stay the same. In other words, the products of a reaction, in this case curds and whey, must have a total mass equal to the total mass of the reactants, milk and acid (if used).

Curds are formed by the **coagulation** of the milk**. Casein** is a protein that makes up about 80% of milk. When the casein and fat in the milk clump together, the soft, gel-like curds are formed. The remaining liquid is mostly water with other proteins, lactose, and minerals dissolved in it. This liquid is the whey. Heat is applied to the curds to speed up the separation of whey. Once the curds are separated from the whey, they are drained, stretched, salted, and pressed to form a more concentrated cheese.

To give each cheese its own unique properties, it is then ***cured*** or ***ripened*** to complete the process. Cheese that needs to be cured is not ready for consumption after being prepared. Depending on the desired characteristics, the cheese is held for a certain amount of time, temperature, and under certain conditions. Most cheeses are considered ripened, unless they are fresh. Ripening is considered as the changes that occur between the formation of curd and the development of the desired characteristics, such as aroma (smell), flavor, texture, and composition.

Making cheese is a very complex process that varies depending on the desired product. One small change in the type of milk or enzyme, length of time, or temperature may produce an entirely different cheese. It's time to make cheese and discover the differences for yourself!

Think About It

Food Explorations Lab III

1. What forms when milk curdles? _____curds_____ and _____whey_____.

2. Curds are made up of _____protein (casein)_____ and _____fat_____.

3. The main component of whey is _____water_____.

Cheese Production Flowchart

Acid or Enzyme Added to Milk

CURDS **WHEY**

Curds are Drained, Stretched, Salted and Pressed

Cured
TIME, TEMPERATURE, CONDITIONS

Produces hard cheese like Parmesan

Ripened
MONTHS TO YEARS

Produces soft cheese like Brie

Mold added to produce cheeses like Bleu Cheese