

ENZYMES IN CHEESE PRODUCTION



Cheese is a dairy product that is made from the curdled or coagulated milk of various animals, most commonly cows, goats, or sheep.

- Enzymes are essential to the production of cheese, influencing coagulation, proteolysis, lipolysis, and other biochemical processes that shape the final characteristics of different cheese varieties flavor, texture etc.
- The specific enzymes involved and their actions depend on the type of cheese being produced, the desired flavors and textures, and the aging process used.

Enzymes used in cheese production



1. Rennet (Chymosin)

- It contains chymosin, an enzyme that plays a central role in coagulating milk proteins, primarily casein.
- Chymosin cleaves a specific bond in the casein molecule, causing it to aggregate and form curds.

Chymosin can be sourced from animal rennet (typically from the stomachs of young calves) or produced using microbial fermentation techniques (microbial rennet), which is more common for vegetarian-friendly cheeses.

2. Pepsin

- Found in **animal stomachs** and is used for coagulating milk proteins.
- Works similarly to chymosin by breaking down casein proteins.

3. Proteases

- Enzymes responsible for breaking down proteins into smaller peptides and amino acids.
- Often naturally present in milk or **introduced through starter cultures.**

4. Lipases

- Lipases break down fats (lipids) into fatty acids and glycerol by lipolysis.

5. Lactase

- Lactase is an enzyme that breaks down lactose, the sugar found in milk.
- Used in some cheese production processes to reduce lactose content, which is beneficial for individuals with lactose intolerance.



6. Starter Cultures

- Cultures contain specific strains of bacteria that ferment lactose into lactic acid, reducing the pH of the milk. This lower pH aids in protein coagulation and curd formation.

7. Secondary Enzymes

- Various secondary enzymes present in milk and introduced during the cheese-making process. These enzymes can have subtle yet important effects on the cheese's characteristics.