



Cheese Manufacturing

Agenda

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What is Cheese?

2.

Types of Cheese

3.

Principle of cheese manufacture

4.

Manufacture of Cheddar Cheese

5.

Conclusion

1. What is Cheese?

- Cheese has been made in most cultures since ancient times.
- Cheese is a coagulated dairy product.
- It is generally coagulated with rennet or acid or a combination of both.
- There are a lot of cheese varieties in the world.
- The first cheeses were "fresh," that is, not fermented.
- This was achieved by adding rennet to the milk.
- Rennet is obtained from the stomachs of young ruminants



2. Types of Cheese

There are more than 1800 varieties of cheeses around the world. And there are almost as many ways of classifying them. Some of the classification of cheeses are:

- Milk: cow, goat, sheep, or buffalo, etc.
- Country or region: Parmesan, Gouda.
- Age: Fresh cheese, aged
- Texture: soft to semi-soft, semi-firm to hard
- Flavor: mild to extra sharp.
- Preparation: unripen, mold-ripened cheese.

General Composition

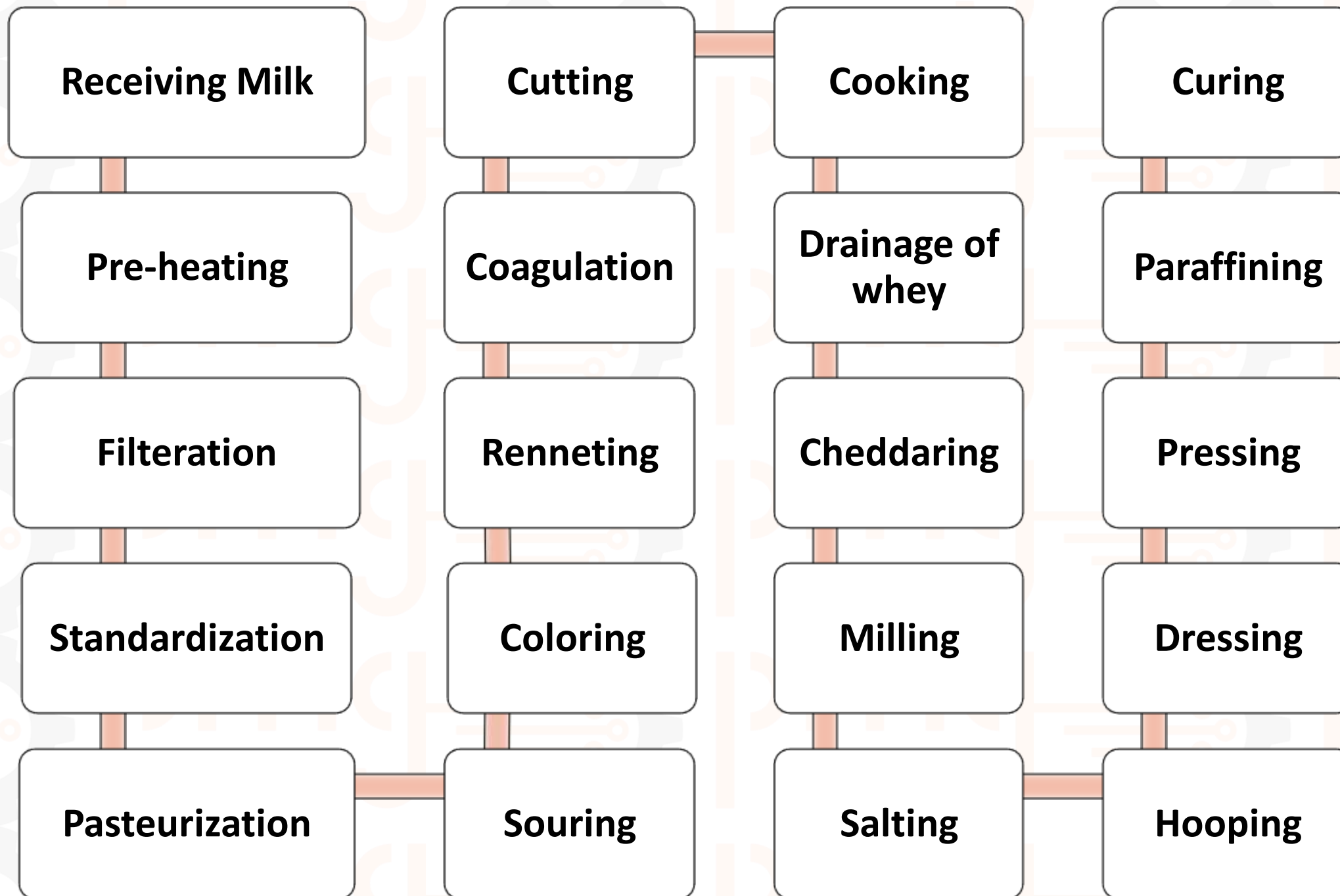
<u>Components</u>	<u>Quantity</u>
Protein(Casein)	4-40%
Carbohydrate (Lactose)	Trace/nil
Lipids:	
1. Saturated	66%
2. Mono-unsaturated	30%
3. Poly-unsaturated.	4%

3. Principle of Cheese Manufacture

- Cheeses are biologically and biochemically dynamic and consequently inherently unstable.
- All cheese have some common characteristic steps
 1. Pretreatment of milk
 2. Souring
 3. Clotting by Rennet/ similar enzymes
 4. Cutting/ breaking up coagulum (release of whey)
 1. Matting of curd
 2. Maturing



4. Manufacture Of Cheddar Cheese



4.1. Receiving

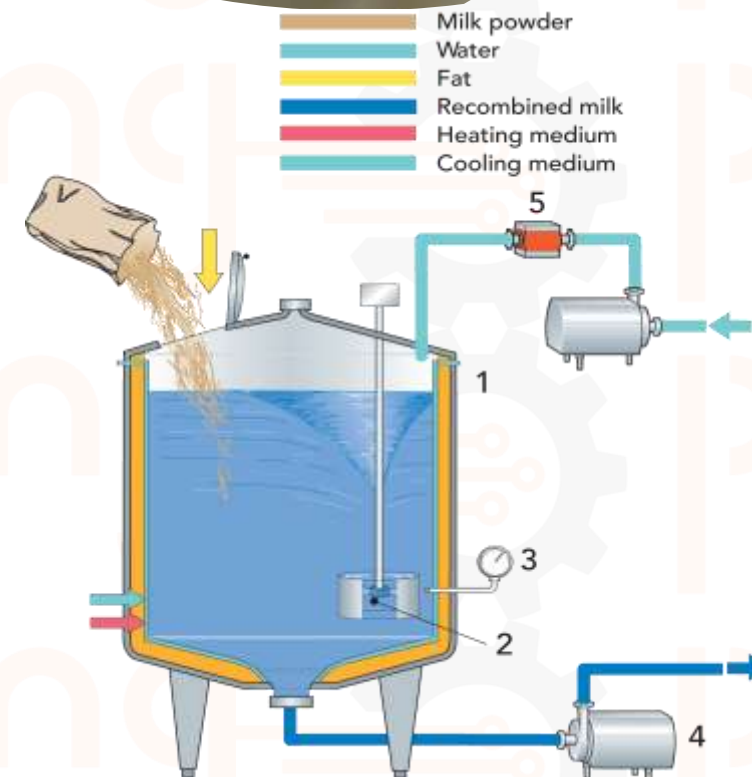
- Cheese is no better than the milk from which it is made.
- Quality checks should be done, clearly without any compromise

4.2. Filtration/Clarification

- It removes visible dirt
- Milk is preheated to 35-40°C for efficient Filtration.

4.3. Standardization

- Casein/fat ratio : 0.68-0.70
- Done to regulate fat in the dry matter of cheese.
- Produces maximum yield.



4.4. Pasteurization

- Pasteurization is not a mandatory step in cheese making
- But it is generally recommended
- HTST/ Holder pasteurization is used

4.5. Addition Of CaCl_2

- Generally, 0.01-0.03% CaCl_2 is used.
- Addition of CaCl_2 gives firmness to the curd.

4.6. Addition Of Starter

- To develop acidity
- Starter is the heart of cheese
- A good starter may make up for other defects.
- 0.5-1 % at 30-31°C.



4.7. Colouring

- Done to enhance the appearance
- 30-200 ml for 1000 kg milk
- Diluted with approx. 20 times it's volume of water.

4.8. Renneting

- Rennet was and is still mainly obtained from the abomasum of younger calves.
- Contains two enzymes:
 - Rennin : Clotting enzymes.
 - Pepsin : Proteolysis.
- 1 part of liquid rennet is used for 5000 parts of milk.
- 15-20 ml / 100 ltr of milk at 30-31°C for 25-30 minutes.
- The firm coagulum is then cut and syneresis is carried out.



4.9. Cooking

- Heating of cut curd cubes.
- Begins within 15 mins after cutting.
- Regulation of heating : reaches 32°C in 15 minutes and maximum temperature should be 37-39°C at the rate of 1°C every 4 mins.

4.10. Drainage of Whey

- Removal of whey from the curd

4.11. Cheddaring

- Combined operation of packing, turning, piling, and re-piling.
- Done for 2 hours or more.
- After cheddaring curd becomes drier, more mellow and silky



4.12. Milling

- Cutting the blocks of cheddared curd into smaller pieces with the help of a cheese mill.
- Enables quick distribution of Salt in the curd.



4.13. Salting

- It improves flavour, body and texture.
- Also improves keeping quality.
- 1-2% Salt is added in general.



4.14. Hooping, Dressing, Pressing

- The lumps of curd are initially placed inside cheese hoops or cheese molds.
- They are dressed inside muslin cloth or cheese cloths for pressing.
- The pressing is carried out using pneumatic, screw, hydraulic pressers etc. to make the curds in definite shape.

4.15. Drying

- This is done for Rind formation in Cheese.

4.16. Parafinining

- To reduce loss of moisture during curing
- To reduce mold growth.
- To avoid insect activity.

4.17. Curing

- Storage of cheese for minimum 2-3 months at a given low temperature
- Done to enhance the flavour, body, and texture of the cheese to desired level.



5. Conclusion

- There are thousands of varieties of cheese across the world.
- It is nearly impossible to detail about each one of them.
- The varieties of cheeses are still getting added up.
- The market of cheese is really growing fast as it is an essential ingredient in the fast-food industry.



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