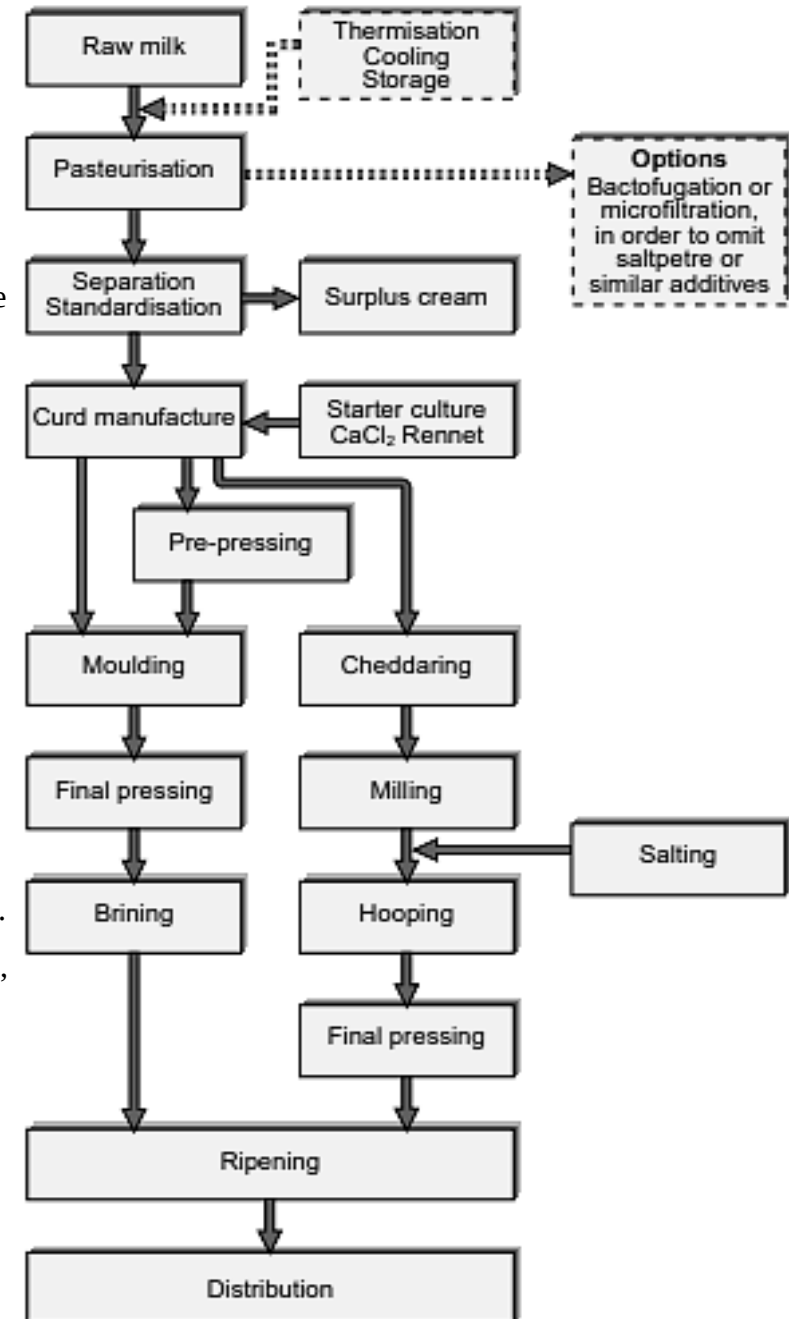


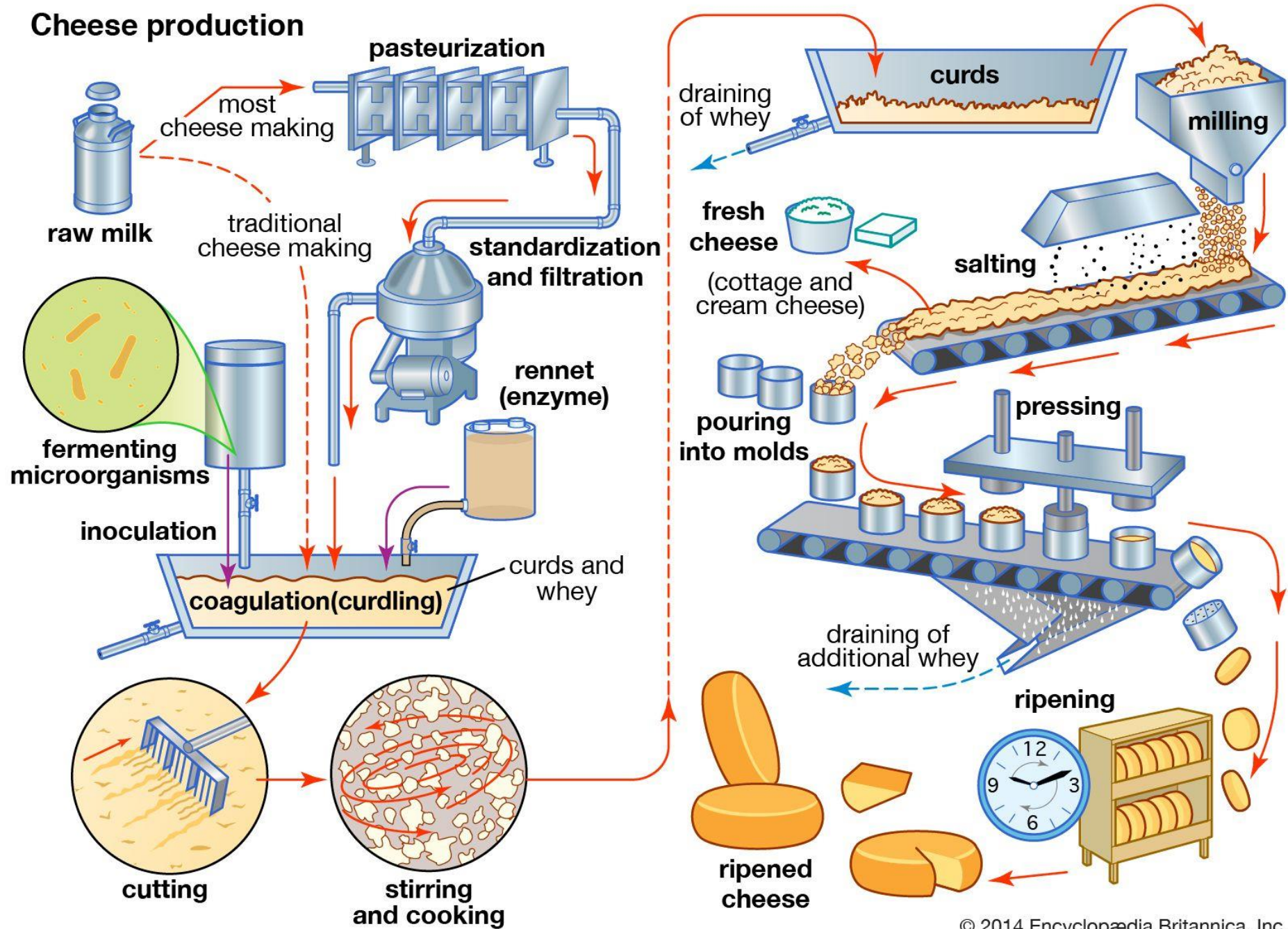
CHEESE



- **Raw milk** can undergo thermisation (mild heat treatment), cooling, and storage prior to full pasteurization. Typical parameters: 72–75°C for 15–30 s (HTST) or 63°C for 30 min (batch).
- **Separation:** Centrifugal separation removes surplus cream (fat) from the milk
- **Standardisation:** Achieves desirable casein-to-fat ratio, critical for correct curd formation
- **Curd Manufacture :** Addition of starter cultures, calcium chloride (for certain milk types), and rennet. Calcium chloride improves coagulation in some milks. Starter bacteria acidify the milk, while rennet enzymes degrade κ -casein, causing milk to gel (coagulate).
- **Pre-Pressing**
- **Moulding route:** Curd is placed in molds, light pre-press enforces initial whey expulsion and shape formation.
- **Cheddaring route:** Used for Cheddar-type and some other hard cheeses, the curd is cut, piled, turned, and “cheddared” to further acidify, stretch, and develop texture before milling (cutting into small pieces).
 - *Milling:* Ensures homogeneous salt distribution and regulates final moisture.
 - *Hooping:* Placement in molds.
 - *Final pressing:* High pressure maximizes whey expulsion and cheese firmness.
- **Salting :** Dry salting or brining: Salt can be added directly to curds or as a bath (brine) after molding.
- **Brining :** For non-dry salted cheeses: Immersion in saturated salt solution, allowing even salt uptake, rind formation, and further whey drainage.
- Ripening (Affinage): Controlled maturation in regulated conditions (temperature, humidity). Biochemical changes: Enzyme- and microbe-driven proteolysis and lipolysis create aromatic and textural properties unique to each cheese type.
- Distribution : Cheeses are cut, packed, and distributed.



Cheese production



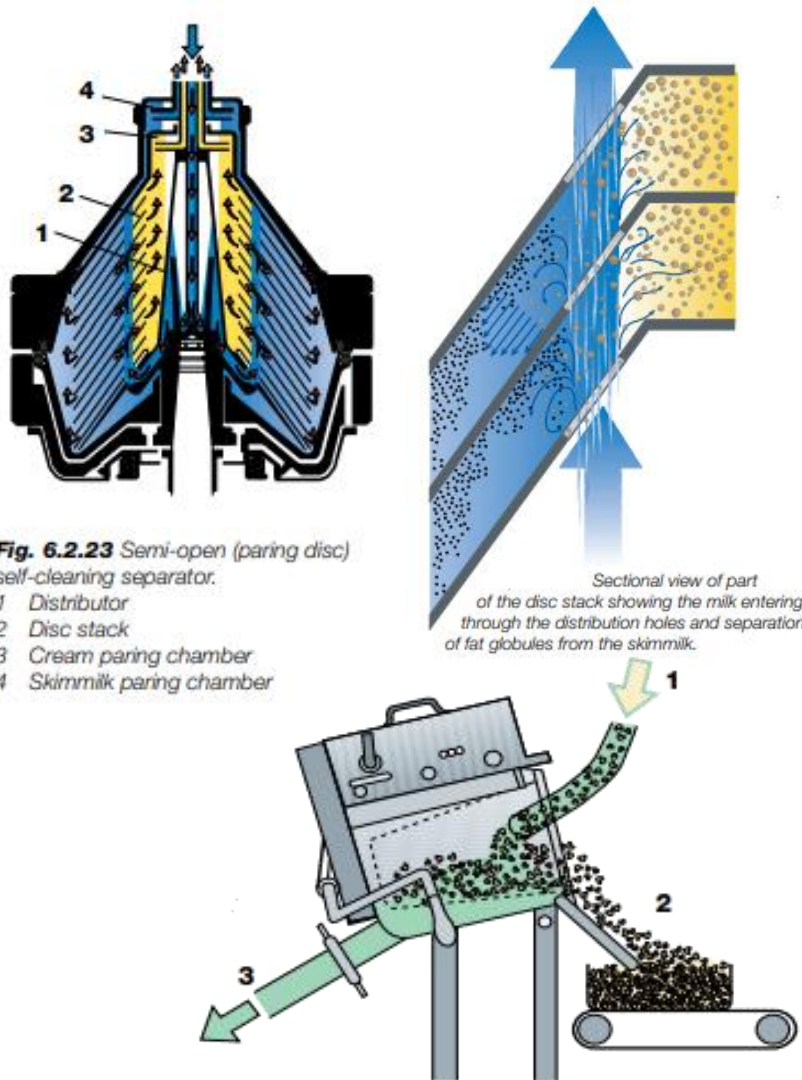


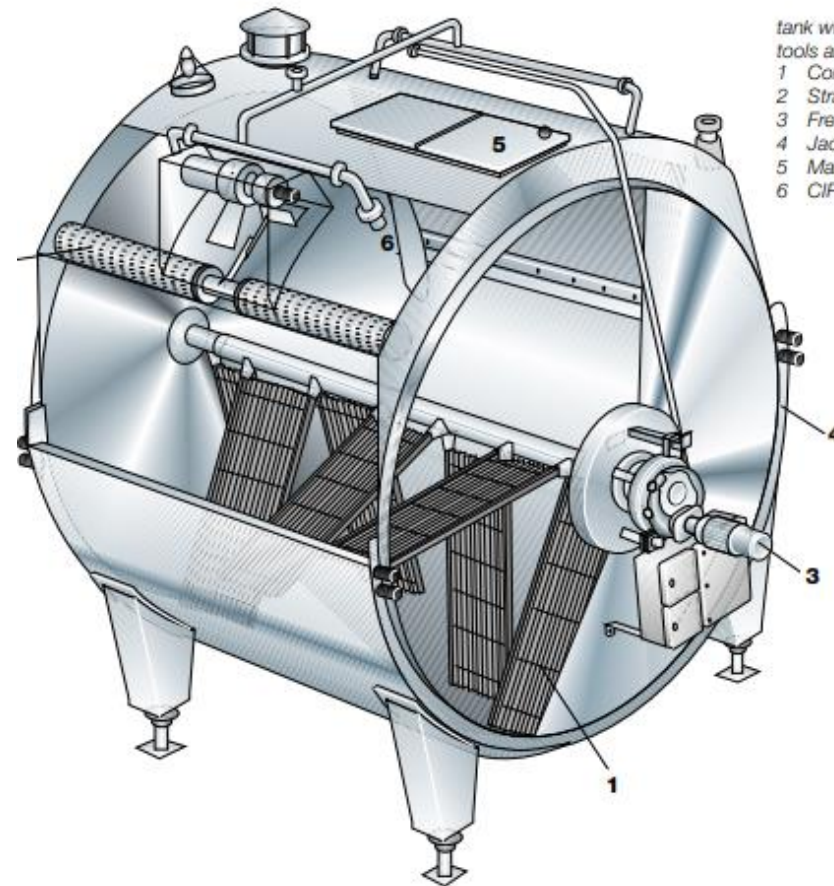
Fig. 6.2.23 Semi-open (paring disc) self-cleaning separator.

- 1 Distributor
- 2 Disc stack
- 3 Cream paring chamber
- 4 Skim milk paring chamber

Sectional view of part of the disc stack showing the milk entering through the distribution holes and separation of fat globules from the skim milk.

Curd and whey are separated in a rotating strainer.

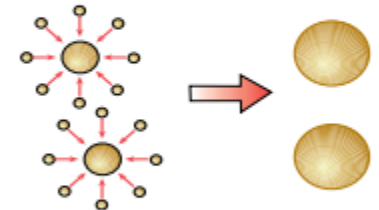
- 1 Curd/whey mixture
- 2 Drained curd
- 3 Whey outlet



Horizontal enclosed cheese tank with combined stirring and cutting tools and hoisted whey drainage system.

- 1 Combined cutting and stirring tools
- 2 Strainer for whey drainage
- 3 Frequency-controlled motor drive
- 4 Jacket for heating
- 5 Manhole
- 6 CIP nozzle

Formation of carbon dioxide (CO_2)
 Saturation of the curd with CO_2
 Diffusion of CO_2
 Eye formation



Development of gas in cheese and eye formation.
 (By courtesy of dr. H. Burling, R&D dept. SMR, Lund, Sweden.)