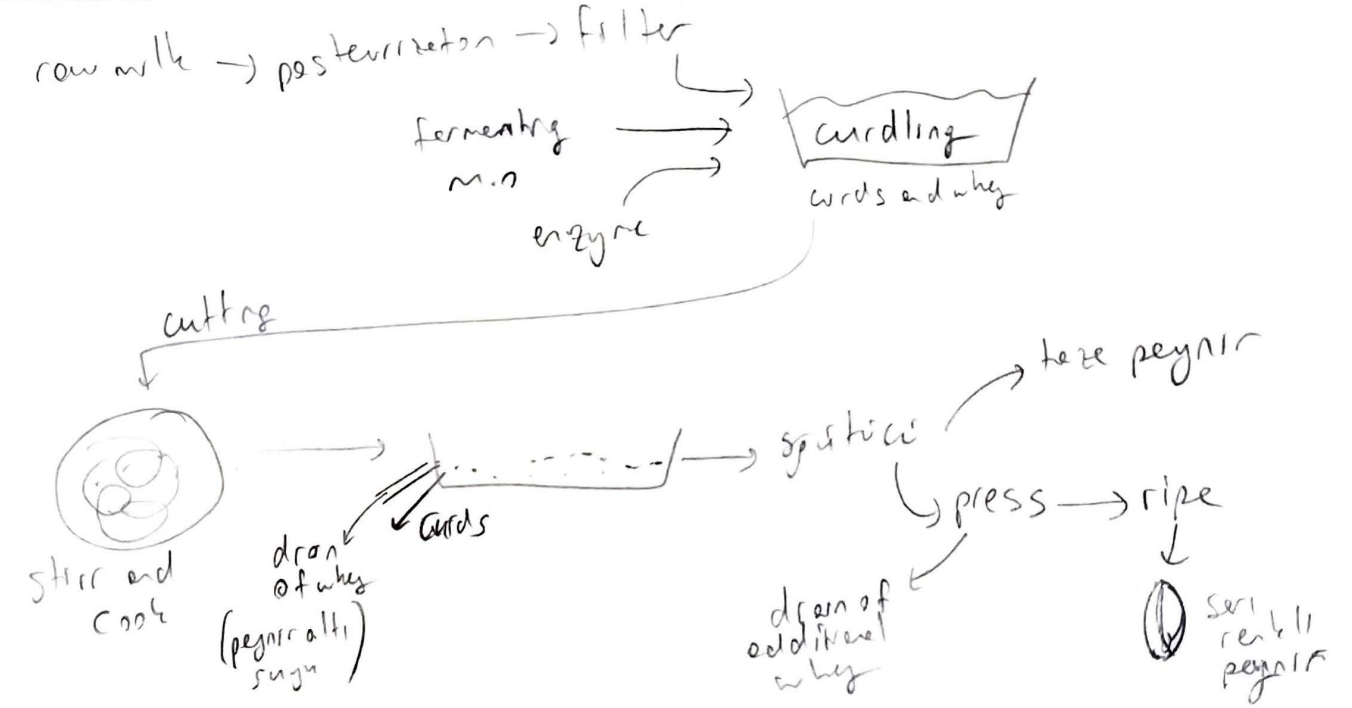
Cheese

week 8

- Milk + sun ⟶ sour
- when sour milk was drained and salted → less perishable (→ longer shelf life) than yogurt

- curdling is better when it occurs in animals stomach.

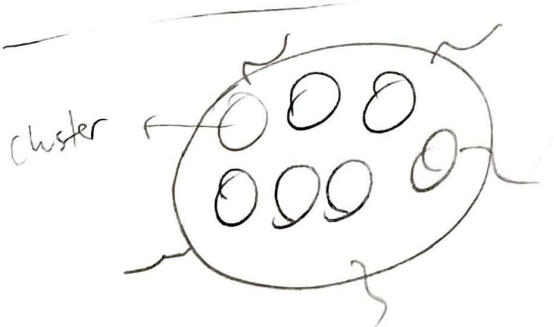
Production



Curding → denaturation of proteins

Draining & pressing → remove water, lactose → sets protein-fat structure

Aging & ripening → chemical change with O_2 + reaction by enzymes

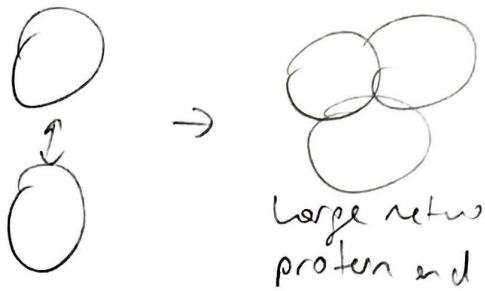


→ carboxil group that repels micelles
k-Casein

Acid Mediated Curd Formation

- Disrupt casein micelles to form milk curd
  - ↳ change pH ↓ (lemon juice or lactic acid by bacteria fermentation)

- pH, micelle repulsion ↓



Large networks of protein and fat.

Acid set cheese do not melt

- acid dissolves calcium glue that holds casein proteins together in micelles.
- when acid curd is heated, first thing to be shaken loose is water not protein
- continue heat / water off, but w.o. calcium holding together not going to have melting action

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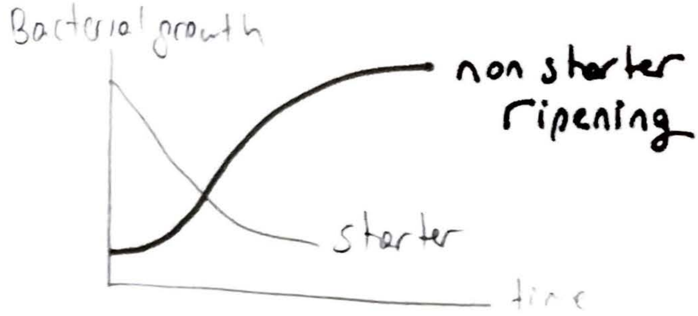
You could use bacteria fermentation (indirect acid)

- lactic acid, pH↓
- ↳ not only formation of curd
  - ↳ but also taste and aroma

2 types of bacteria
- ↳ 1 starter
- ↳ 2 ripening

- Finishing bacteria → changes depending on the type
  - ↳ common → lower pH ✓
    - ↳ high temp ✓



Enzyme mediated Curd Formation

- rennet → enzim
  - ↳ geviş getiren hayvanların midesinde var.
  - ↳ separate milk into solid curds → cheese making
    - ↳ liquid whey
- Hayvanın midesinde yapılırsa (sütten → peynir) daha hızlı oluyor

Can we make cheese / yogurt from UHT

- Milk for cheese temp 72°C ~15 s.
  - ↳ casein and whey s.
  - ↳ high temp → disrupt of whey → adsorbed (tutunmak) onto casein miscilles
    - ↳ curd formation will be prevented

→ add Ca^{+2} to reduce this effect.

UHT can be used to make yogurt

Processed Cheese

Cheese —heat→ fat + protein ⇒ terrible

we need to contain fat in protein matrix.

heat → ↓ emulsifying capability of protein

- melting salt (eritme tuzu) is used.
  ↳ not emulsifier but they restore the ability of milk proteins very effciently

Quark

- Acid coagulated
- Weak gel
- Not yoghurt, cheese.
- Not only casein but also whey → more protein

White Cheese

- Feta
- Taste, odor → plant
  → animal
  → dif. technologies
- rennet added → pressed with cloth → brined (selenure)

Ezine peyniri, edirne, urfa, konya
sheep, goat, cow — sheep+cow — sheep — goat

Hallouimi (Hellim)

- high melting point → fried or grilled
- rennet
- usually mint is added.
  → preservative + flavor
- curd is boiled in whey 30-45 min 90°C
) comes from fresh curd is heated before being shaped and placed.
- close no air holes.

Kashkaval

- Hard, yellow
- Curd left for fermentation 6 months
  then boiled at 70°C

- To know desired acidity is achieved
  - sheet enlargement → too much ferm. → torn
  - sicin cekmek — not enough ferm. → not enlarge

pH → 5 - 5.5
4.8 and below → boiling problems

curd
kesilmiş
süt

Mihalic

- Balikesir
- Stored in brine (similar to white cheese)

Cerkez

after boiling the curd, put into basket for shaping

Tulum

- ripened in goatskin casing (tulum)
- meze
- süte starter ekle. 30dk sonra curd & whey
- drain the curd, cut the curd → more whey to drain
- curd'u torbaya koyup bekle.
- tahta kaba koy, ağırlık koy → daha fazla whey to drain

Lor

- Rich in protein
- Sütü kaynat, bezе koy

Ice Cream

Sorbet → meyve ile yapılan dondurma

- milk, suger, sometimes eggs. , stabilizers (gums)
- air → %30-50
  - → prevents overly sweet flavor
  - → the better structure → time↑ for flavor to released → flavor lasts longer
- High in fat (%10)
  - → comes from milk
  - → improves density, smoothness
- Ice crystals are formed when water in icecream starts to freeze.
  - too big crystals → grainy
  - less size // → smooth
- To avoid sandy ice cream, ice crystals should be small.
- Some stabilizers absorbs water in ice cream → less ice crystals
- More solids → less free water → less ice crystals
  - too few solids → sandy ice cream

- Air, ice crystals, fat globules, liquid syrup, stabilizers (~0.2%)
  - → important, eriması dondurmayı tekrar dondurup yersen gizli olmaz.
  - → kütüyü alıp eritirsen volume↓

whipped cream → krem santi
plain cream → sade krema
sweetness
Plain cream > whipped cream
hava yok hava var
çok tatlı

Structure control the rate at which flavor molecules are released into the mouth.
Larger structure (ice cream) → larger flavor

Overrun

- The amount of air in ice cream.
- Commercial mix 50% → 50% air
  50% ice cream
- Better brands have higher density
- More air → quicker melting

- Presence of air in icecream → foam
- Taste good because of fat (from milk)
- Premium ice creams (20%) fat.
- Reduced-fat icecream does not taste good as real.

Each fat droplet is coated with milk proteins, prevents
t droplets from interacting with each other.
emulsifier.
→ good in milk. But not good in icecream, stabilize emulsion.
t droplest should merge to trap air.

Another emulsifier is added to allow fat to coalesce (kaynaşmak)

↳ replace milk proteins

↳ lecithin (egg yolk)

↳ Fat globullerin birlikte durmasını sağlıyor. → air is trapped

Stabilizers

- Make texture creamy.
- Prevent large crystels → small ice crystels

melts slowly because fats surrounds small crystals

- Proteins (gelen) and egg whites.
- w.o. stabilizers ice cream will look like milkshake.

Ice cream doesnot freeze at 0°C.

- for every mole of solute per 1 kg water → -1.86°C.

i.e. 1 mole of sugar in 1kg water → -1.86°C freeze temp

How is ice-cream made

Mix

- Milk, cream, suger are heated until sugar dissolved.

cooled

- flavorings are added.

Freezing

Liquid goes to the machine,

stirred until thick/softly cream

↳ air is added → volume ↑

inflated volume = overrun

Hardening

- Difficult to fully freeze while churning (call element) because paddle needs to keep moving.
- 1/3 of water is not frozen.
  ↳ not enough to scoop / stay in ice cream cone.
- Semi-frozen ice cream is packed into containers
  ↓
  hardening → in freezers

Creamy texture

- rapid chill + churning → water to minuscle crystals.
- constant churning → prevents water to attrach each other.
  ↳ creamy mouth feel.

When ice cream melts → small ices melt
↳ freeze again → larger crystals.

arım yenmiş dondurmada nem dondurmanın içinden çıkıp donabilir.
e crystals ↑

→ Thus, ice cream stores in small conteiners with little to o space.
↓
allows take out only the amount of icecream you need.

Salep

- Bir bitkinin kökü.
- Salep flour.

Ice cream

10% milk fat (at least)

Frozen yogurt

Gelato

- less cream, more milk
- lower fat then ice cream.

Soft serve

- Less milk fat
- more air.
- fluffy
- McDonalds dondurması

Frozen Custard

- Thicker
- At least 1.4% egg yolk

Sherbet

- Flavored with fruit
- Milk fat 1-2%
- sweeter then ice cream

Sorbet

(non dairy)

- frozen juices