week 7-1

Palm Oil

16:0 doymuş yağ oranı → %40 → Bu miktar başka yerde bu kadar çok yok
18:1 doymamış yağ (zeytindeki olesic) → %41

- High in saturated fats
- Semi solid at room temp

Palm fruit $\xrightarrow{\text{oil extraction}}$ Virgin oil $\xrightarrow{\text{deodorization}}$ esters → refined oil → infant formula

Is Nutella Safe

3MCPD } → bu maddeler çoğu vegetable'da var. ama palmoil'de yüksek miktarda var.
2MCPD

- → not found in raw oils
- → present in heated oils (such as palm oil) (when processing)
- → repeated exposure → ↑ tumor in rats
  - → harmful to children
- → bad to male reproductive sys.

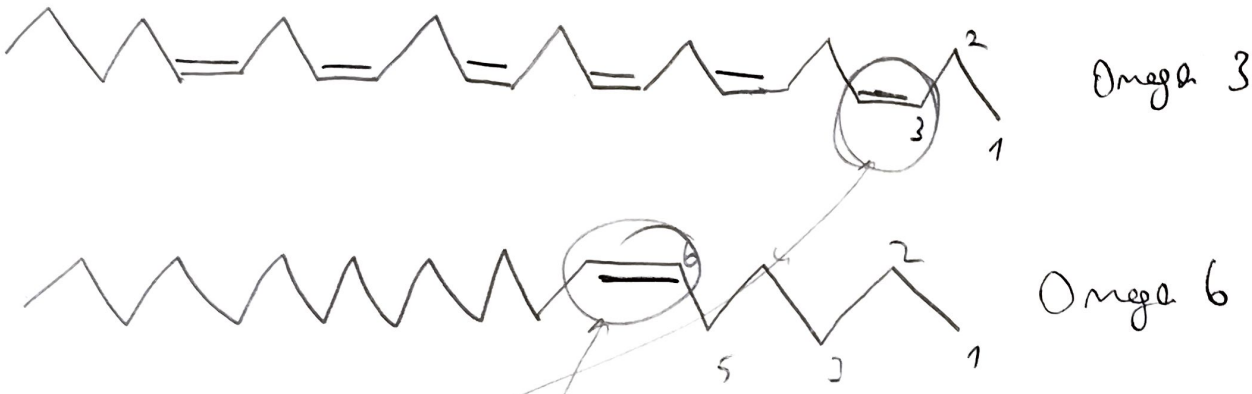
Ferrara says they maintain temp below 200°C. → minimize contaminants

Coconut Oil

- Medium chain (12-18 oranı çok)
- Slightly low calorie
- Saturated fats

Omega 3

- Fight depression
- Prevent cancer
- Improve bone health
- " eye health



Bizim vücudumuz 3 ve 6. sıradaki çift bağları (C=C) yapamıyor.
essential fatty acids

Omega 3'ün türleri var. Kendi aresinde dönüşebiliyor vücutta
(ALA, EPA, DHA)

Omega 6 → Genelde yeterli miktarda alıyoruz. İyi
Omega 3 → Yeterli miktarda almalıyız. İyi
↳ DHA → important for brain & visual

Omega 3 → fish, flaxseed
ALA → essential (your body cannot produce), mainly plants
ALA → EPA ⇄ DHA → small amount
↓
therefore get EPA / DHA (fish)

Omega 3 also provides energy.

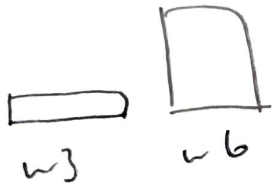
- Son 100 yıldır sanayi devrimyle proceed seed ve vegetable oil yiyoruz → Omega 6 intake ↑
- Daha sneden bu kadar almadığımız için w6 yeterli.

high w6
low w3 → iltihap ↑ (inflammation)

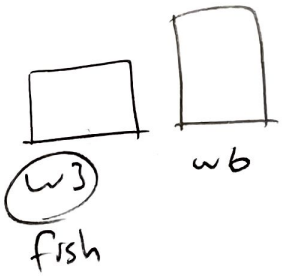
balanced w6 - w3 → iltihap ↓

Western diet (w6 ↑)

What we actually eat



What we suppose to eat

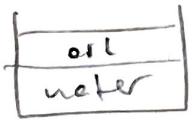


Emulsion

- Mayoneisse
  - immiscible liquid in another liquid. (Oil in water)
    (karismaz)

oil → non poler → hydrophobic

w.o. phase seperation



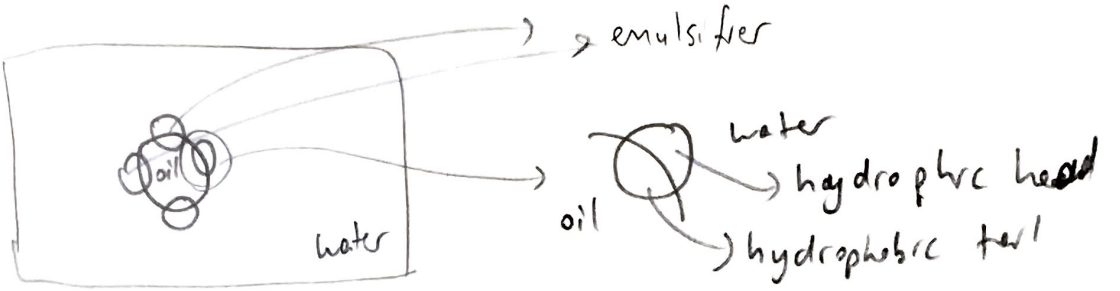
→ add emulsifier

Emulsifier are amphiphilic (dual character)

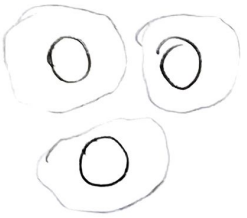
oil → phobi
vinegar → phili

- 1 part dissolves in water but not in oil. (head)
- tail → dissolve in oil, not in water.

Food emulsifier → Lecithin (found in egg yolk and soy)



oil in water emulsion



water in oil

margarine

Cholesterol

- Fatty like substance (body handles like fat)
- Not broken down to yield energy.
- Cell membrane, sex hormone, vitamin D, hormones
- Has vital roles but not essential.
  - → body can make it (enough)
  - → in the liver (1000-1500 mg)

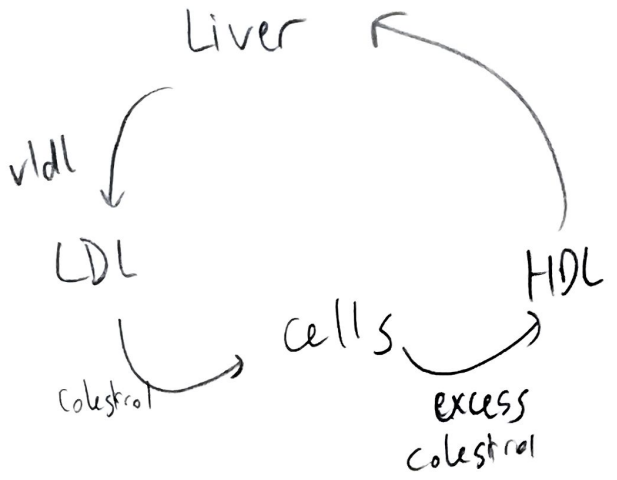
- 2/3 of cholesterol produced by liver
- Rest diet

In body, fats are transported via lipoproteins.

VLDL → Very Low Density Lipoprotein → triglyceride to cells
LDL → cholestrol to cells
HDL → cholestrol to headquarters

LDL can oxidize due to poor diet/smoking. Yolu (arteri) kapatıyor

heart disease (heart attack)



HDL iyi , LDL kötü

Saturated fats

- Not cholestrol but impacts on cholesterol levels.
- High sat. fats , LDL↑ , heart disease↑

Trans fats → LDL↑ , HDL↓

avoid trans fat, minimize saturated fats

Monounsaturated fats

- Olive oil
- lower cholestrol levels
- LDL↓
- neutral to HDL

Polyunsaturated fats

- sunflower, corn oil ...
- lower cholestrol levels
- ↓LDL
- HDL↓ (bad)

MILK

week 7-2

- First 6 months of an infant.
  - ↳ bioactive components → chemical mediators
    - → vitamins
    - → enzyms
    - → blood cells (colostrum)

  } ↑ immune system of baby

- It evolves during growth and maturation

Types of Breast Milks

1-Colostrum

- ~ several days after birth
- yellowish
- high in protein, especially antibodies
- vitamin, fat, mineral

2-Transitional

~ 2 weeks
→ helps the baby gain any weight lost after birth.
- more fat

3-Mature milk

- final
- 90% water. → warm terms hydration of infant
  10% carbohydrate, protein, fat

- Foremilk → front
  - ↳ produced at the beginning of each feeding
  - ↳ water, vitamin, protein

- Hind milk → later
  - ↳ richer in lipids and CHO.

Human milk	- cow milk
higher water, lactose	
	certain vitamins and minerals
	not suitable for infants ↳ some proteins may trigger allergic reactions

if no human milk, use supplement for babies

Mother's milk → nutritional
- → immunological components against infections
- → good temp by mother
- → sterile
- → cannot be adulturated
- → ↓ risk of breast cancer
- → psychological effects

%86,5 → water

%12.5 → solids
- → %3.43 → fat → fat solubble vitamins
- → %8.57 → non fat
  - → %3.25 protein
    - → %2.67 casein
    - → %0.58 whey protein
  - → %4.63 lactose
  - → mineral and other

Milk pH → 6.5 - 6.7 → slightly acidic.
↳ but close to 7, can be said neutral

Milk is emulsion.

Why white → hundreds types of proten
↳ main is casein
↳ scatters light.

proteins form micelle → molekül kümes

Casein micelles + fat

- lactose sugar var.

Different types of Milks

	energy	fat	proten	CHO
human	70	~4	1	6.8
cow	61	3	3	4
sheep	108	~7	~6	~5

Goat milk is easier to digest than cow or buffalo
↳ fat globules in goat milk are smaller
↳ more homogenized

Goat milk → cheese making in Akdeniz

Sheep milk has higher proten
↳ yoghurt & cheese
high fat → butter making
more proten → more acidic

Drinking raw Milk

- Not recommended
- Boiling might not be sufficient.
- Süt üretildiği yerde temiz ama hanallarda veya meme ucunda mikrop kapabilir

Pasterized (Daily Milk)

63°C, 30 minutes → Low temp long time (LTLT)
72°C, 15 sec → High temp short time (HTST)

zararlı m.o'lar ölüyor fakat laktik asit fermentasyonu yapan bakteriler yaşıyor. O yüzden max 1 haftada süt ekşiyor.

UHT

Ultra-heat-treatment

- 135-150°C, 3-5 sec
- kills <u>all</u> m.o.

→ shelf life 3 months

UHT packaging → multilayer
↳ %85 paper
↳ polyethlene + allimnium

→ Tetrapak → the company
hard to recycle due to polyethlene + alymmum.

- UHT süresi artarsa (3-5 sn değil de daha uzun) süt kahverengi olabilir. Contains less lactose and protein
↳ color + <u>flavor</u> is affected.

when the milk is heated too much due to protein unfolding (denaturation) sulfhydryl become free → flavor is affected

Pasteurized vs UHT

- Nutrition loss is 10%.
- For vitamins <u>temp</u> is <u>not</u> important, <u>time</u> is <u>important</u>.
- vitamin A-B uneffected
  C loss due to oxidation

- Past. milk is considered more healthy
  - ↳ probiotic bacterra → good for intestine
    - ↳ anti fungal
    - ↳ anti viral
    - ↳ anti bacterial

Antibiotics in Milk

- To treat animals → is used
- Could mix to the milk.
- this milk should not be consumed
  - ↳ cause problems in immune sys.
  - ↳ antibiotic allergy
- Cannot use ~~too~~ produce cheese or yeghurt
  - ↳ fermentation cannot take a place

No additives to UHT.

If you prefer to boil street milk → boiling degrades vitamins significantly if not controlled.

Problem about Milkman's milk

- Dont have certification about M.O. per mL.
- No analysis
- could have antibiodic residues
- boiling could kill mo but toxins and antibiodics remain.
  - ↳ B vitamin is affected.
- could have carbonate, soda, peroxide, starch

Homogenization

raw milk after 1 hour

- homogenization
  - → mechanical treatment
  - → pressure
  - → reduced tendency for creaming of fat globules

does not affect nutritional val

possitive " on digest

If you boil milk at home → creaming

Because milk is emulsifier

Proteins

- 20 standard aminoacids
- 11 can be synthesed
- 9 are essential, must be consumed.

Protein Unfolding – Denaturation

- Temp
- PH
- Salts

→ Decreased solubility
→ water bind capacity changes
→ ↓ biological activity
→ destruction of toxins
→ improved digestability
→ increased viscosity
→ inability to crystallize

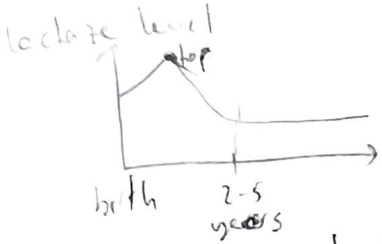
Lactose

Glucose + Galactose

- Half of calories in human milk
  ↳ %40 in cow milk

- sweet taste

- lactase → enzyme that hydrolize lactose.



→ sebebi bebeklikten sonra genelde süt ile karşılaşılmıyor. İşe yaramayan enzimi üretmeye gerek yok.

Eğer yetişkinde çok fazla lactose enzimi yoksa, lactose kalın bağırsağa geçebiliyor ve bakteriler metabolize ederek CO_2, H_2O, metane çıkartıyor. Sugar also draws water from intestinal walls and this cause ~~bloated~~ diarrhea.

- Lactose tolerant → 98 % scandinavian
  90 % French
  40 % North africa
  30 % America

- lactose-less adults can consume ~250ml milk.

- Cheese contain little or no lactose.

Milk Proteins

- Curds and whey

curd → casein → clump together in acid.
↳ coagulate.

→ thickened milk products cheese and yoghurt

whey → remain suspended.
↳ minor role
↳ texture of casein curds

casein → 4 → %80
whey → 1 → %20

coagulate → pihtilaşmak

- casein and whey tolerant of heat
- Kazein ve whey pihtilaşmadığı için süte kaymakta çok az bir kısmı krema / kaymak olugar. (?)

Caseins

Together → miscelles
- 10% of volume of milk
- calcium → glue of holding the protein

One portion calcium → 15-25 casein clusters
another portion → hundreds of clusters to a miscelles
→ water avoiding hydrophobic portions

Are Proteins Disrupted By Heating

- 3D shape of protein is affected.
- Nutrients are in aminoacids.
- Aa not affected.
- Change in structure → denaturation → digestibility ↑
- breaking peptide bonds between aa occur through proteases enzym
  ↳ not harm aa
- nutritional loss occurs only when aa are depleted
  ↳ such as. Maillard Browning

Yoghurt

~10000 BC

Milking ~8500 BC → closely related to domestication of animals

Yoghurt → accidental result of storing milk in primitive methods (warm climates)

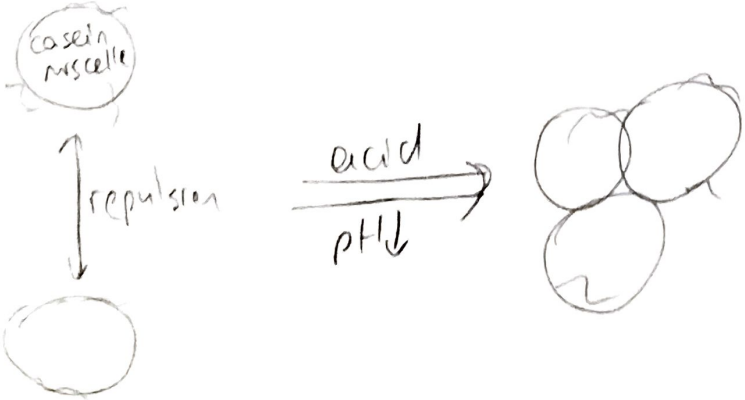
~2000 BC → skin cleaner

950 → yogurmak

- many benefits

How yoghurt is obtained

- Lactic acid bacteria.
- utilize lactose → ↑lactic acid → pH↓
  - ↳ fermentation
- when pH = 4.6 → casein becomes neutral → bonds between
- gel is created
- once yogurt is formed bacteria continues its activity
  - ↳ gets sourer if kept longer.
- Shelf life 2 weeks
- to concentrate → evaporation
  - ↳ if no ev → shelf life ↓
- shel life ↑ if whey is added



Probiotic Yoghurt

↳ for life → good, friendly bacteria

- yoghurt is <u>not always</u> probiotic food.
- many yoghurt contains live and active cultures but not all cultures are probiotic.

Kefir

- probiotic bacteria
- contains beneficial yeast
- bacteria + yeast → kefir
- superior health benefits when consumed regularly.
- minerals & vitamins
- easily digestible complete proteins
- kefirdeki maya provides lactose → consumes lactose after culturing
- lactose intolerant ✓
- can be made from any ~~yog~~ type of milk.
- <u>grain</u> denen madde eklenyor → bugday tanesinden fındık boyutuna kadar
  - → bacteria / yeast mix
  - → casein
  - → sugars
- kefir olusunca süzülüyor. Farklı sütte tekrar kullanılıyor

Home Made Yoghurt or Industrial

- Both are safe.
- <u>Milk powder</u> is added for thickening. O.w. yogurt will be a weak gel and synaresis (sıvılaşma) occurs.
  - ↳ dry milk, not a synthetic agent

Missing Points of Home Made Yoghurt

- time / temp combination 85°C 20-30 min

↳ whey + casein → gel network

→ overboiling → denature intensively, ↓ gel network (weak yoghurt)

↳ proteins in pan, ↓ nutritional

- we use pre-made yogurt as culture.

↳ not only yogurt bacteria

↳ contaminant bacteria → yeasts

- Yeast are tolerant to acid, can grow at low temp.

- Gas expansion by yeast.

Recipe

Heat milk 40-50°C → add milk powder 1-2 spoon → heat 80-85°C 20-30 min

↓

cool 42°C

↓

add culture

↓

incubate 42°C 3-4 hours

Ayran

Milk, salt, culture, homogenization

yogurt + cold water + salt.