

From Last Time:

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Fall 2012 - Bodwin

Acids and Bases

Acids = increase concentration of hydrogen ion (H⁺) when dissolved in water

Bases = decrease concentration of hydrogen ion (H⁺) when dissolved in water (increase OH⁻ concentration)

H⁺(aq) + OH⁻(aq) → H₂O(l)

“Neutralization”

pH scale

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Acids and Bases

Acids taste sour

Bases are slippery to the skin

- Muscle acid – lactic acid
- Vinegar – acetic acid
- Fruit acid – citric acid

Oxalic acid – used in candy with citric acid

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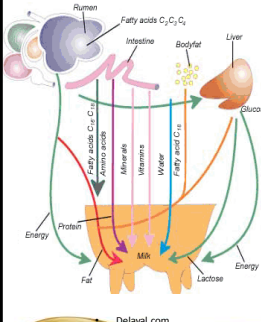
Milk Fat

Globules of fat in a phospholipid and protein shell (Emulsifiers)
 Homogenization
 Heat-stable globules
 Cold breaks fat globules – ice, ice, baby
 Fat soluble vitamins – A, D, E, K

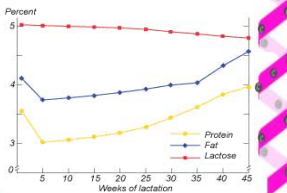


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Variations in Milk



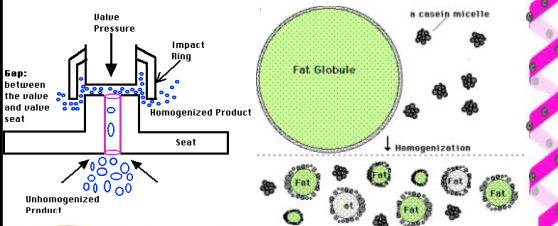
Breed	Fat %	Casein %	Whey %	Lactose %
Brown Swiss	3.8	2.63	0.55	0.72
Holstein	3.56	2.49	0.53	0.73
Jersey	4.97	3.02	0.69	0.77



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Homogenization

Increase surface area
 Casein proteins coat – Negative



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Sphere Math

Volume = $\frac{4}{3} \pi r^3$

Surface area = $4 \pi r^2$

1 sphere, 2cm radius

Volume = $\frac{4}{3} \pi (2\text{cm})^3 = 34\text{cm}^3$

Surface = $4 \pi (2\text{cm})^2 = 50.\text{cm}^2$

Break into 2 spheres:

Volume of each = $17\text{cm}^3 = \frac{4}{3} \pi (x)^3 \rightarrow x = 1.6\text{cm}$

Surface of each = $4 \pi (1.6\text{cm})^2 = 32\text{cm}^2$

Total surface = $64\text{cm}^2 \rightarrow$ too much!

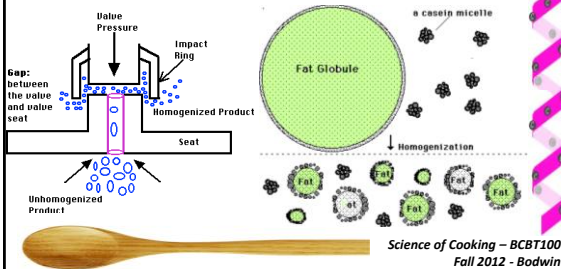


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Increase surface area

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Pasteurization

Hot enough to sterilize, not cook

“Regular” = 145°F, 30 minutes

HTST = 162°F, 15 seconds

UHT = 265°F, 1-3 seconds

Cooked flavor due to sulfur cmpds



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