

Lactation

ANSC 1000
Introductory Animal Science

I. Composition of Milk and Factors Affecting Composition

- Species differences
- Breed differences

Species differences in milk composition

<u>Species</u>	<u>Fat</u> (%)	<u>Protein</u> (%)	<u>Lactose</u> (%)	<u>Solids</u> (%)
Cow	3.6	3.3	4.6	12.5
Ewe	5.4	4.8	4.6	15.7
Sow	6.8	5.1	5.5	17-18
Mare	1.3	2.2	5.9	9.8
Woman	4.5	1.1	6.8	12.6

Breed Differences

<u>Breed</u>	<u>Milk fat</u> (%)
Holstein	3.3-3.6
Ayrshire	3.9
Brown Swiss	4.0
Guernsey	4.6
Jersey	5.0

Physiological & Environmental Factors Affecting Milk Composition

Physiological & Environmental Factors

- Season
 - ▶
 - ▶
- Stage of lactation
 - ▶
 - ▶
- Time of sampling during milking
 - ▶
 - ▶
 - ▶

Physiological & Environmental Factors

- Age
 -

- Calving (colostrum)

Physiological & Environmental Factors

- Calving (colostrum)

Physiological & Environmental Factors

- Calving (colostrum)
 - Why important?
 - Newborn immunity
 - ∴

 - Intestinal absorption

 - Frozen colostrum

II. Udder Development

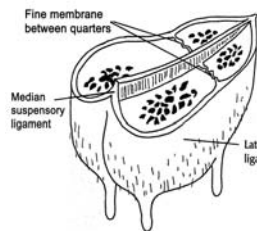
- A. Starts early in growth of fetus.
- B. At birth:
 - ▶
- C. Birth to puberty:
 - ▶
- D. At puberty:
- E. Final growth

III. Structure of the Udder

- A. Species differences
 - Cow:
 - Mare:
 - Sheep & Goat:
 - Multiparous animals

III. Structure of the Udder

B. Udder of the cow (Fig. 19.2 in text)

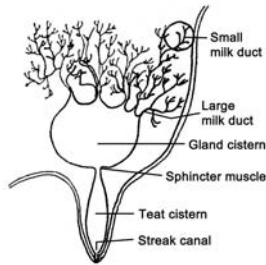


• Mature cow

- Suspension
 - ▶
 - ▶
- Four glands or quarters
 -
 -

III. Structure of the Udder

B. Udder of the cow

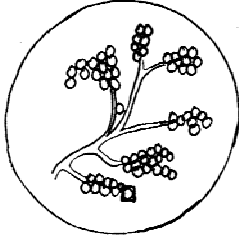


- Teats
 -
 -
 -
- Milk collecting system
 -
 -
 -
- Alveoli
 -

III. Structure of the Udder

B. Udder of the cow

Alveoli

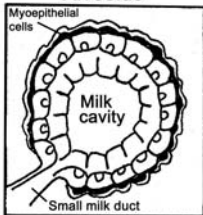


- Alveoli
 -
 -
- An individual alveolus enlarged...

III. Structure of the Udder

B. Udder of the cow

Alveolus

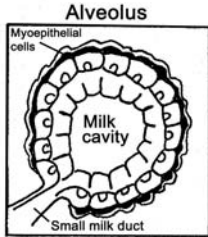


- Alveolus
 -
 -
- Milk is stored
- Myoepithelial cells –

IV. Milk Secretion

A. General information

- Milk synthesis



- Very efficient
- Blood supply
- Synthesis is continuous

› Intramammary pressure

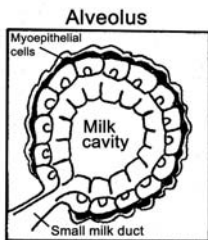
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IV. Milk Secretion

B. Milk let-down

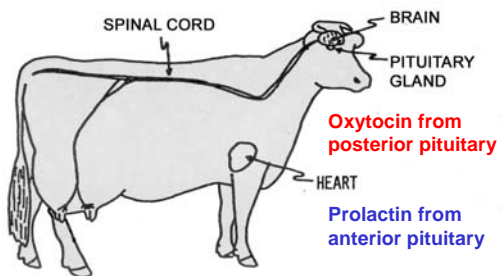
Udder stimulation

- › Impulses conducted via nerves to pituitary gland
- › Posterior pituitary
- › Anterior pituitary
- › Blood transport
- › Oxytocin causes
- › Prolactin stimulates



IV. Milk Secretion

B. Milk let-down



IV. Milk Secretion

C. Milk "hold-up"

IV. Milk Secretion

D. Lactation curve

- Peak (6-8 weeks)
- Persistency (90-92%)
- Dry period

V. Mastitis

- Inflammation of the udder
- Costly
 - ▶
 - ▶
- Usually caused by
- Three main causes
 - ▶
 - ▶
 - ▶

