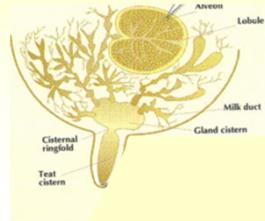




MilkTech International



## The Cow Introduction Udder Anatomy



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## Objectives

• This lesson will introduce you to the main structures of the bovine mammary gland (the udder).



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## The mammary gland

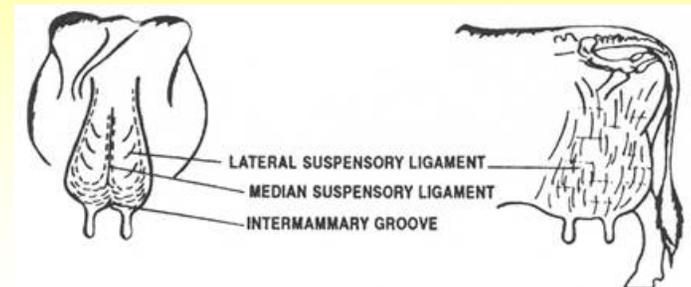


- The mammary gland is an organ that all mammalian species have to nourish their new born young.
- The mammary gland of cows is called "udder."

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## Supporting structures of the udder

• Because of its weight, the udder has to be very well attached to the skeleton and muscles.

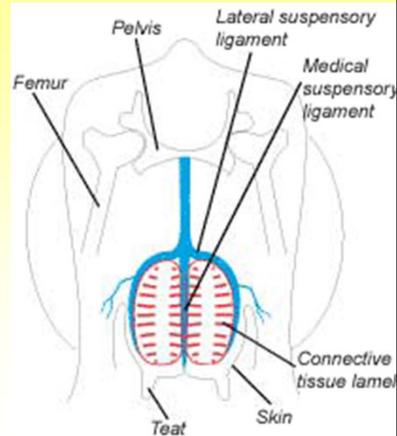


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## Supporting structures of the udder

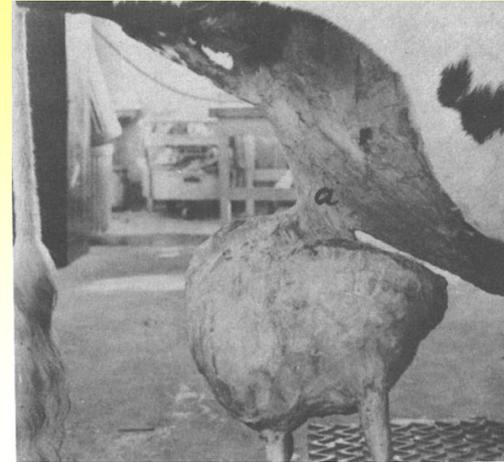
The udder is held by two main ligaments:

- Medial suspensory ligament
  - ✓ Elastic fibrous tissue
- Lateral suspensory ligament
  - ✓ Connective tissue with less elasticity



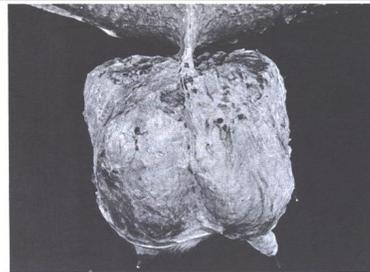
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## Medial Suspensory Ligament



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## Udder Anatomy



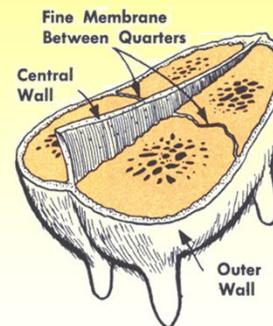
Outer Skin Removed

Side View



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## Structure of the udder



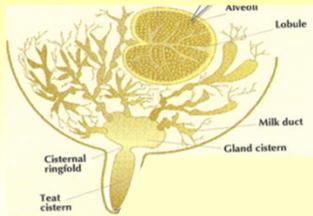
The bovine udder consists of 4 separate glands located in the inguinal region of the ventral side of the cow.

- We call each gland a quarter:
  - ✓ Right fore,
  - ✓ Right rear,
  - ✓ Left fore,
  - ✓ Left rear.

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## Tissues of the mammary gland

The mammary gland consists of secretory tissue and connective tissue.

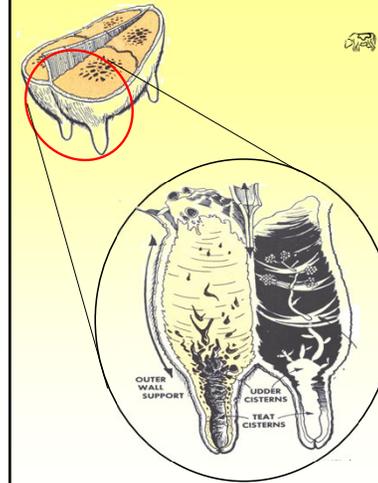


Each gland has secretory and connective tissue, which connects the teat, the cistern and the milk ducts to the alveoli.

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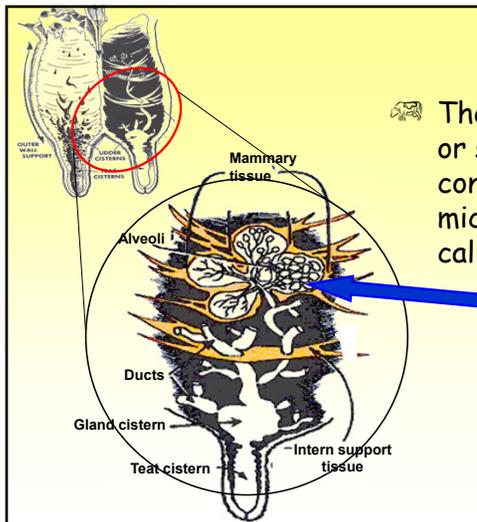
The interior of each quarter is composed of:

- Glandular tissue,
- Milk ducts,
- Gland cistern, and
- Teat cistern.



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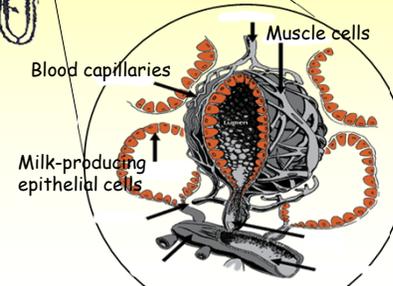
The glandular tissue or secretory portion contains millions of microscopic sacs called alveoli.



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Each alveolus is:

- Lined with milk-producing epithelial cells.
- Surrounded by blood capillaries.
- Surrounded by muscle cells.

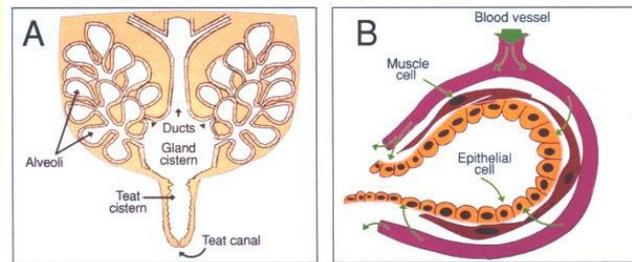


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## Alveoli

Alveoli are cage-like structures wherein milk is synthesized and secreted.

• An alveolus is the discrete milk producing unit.

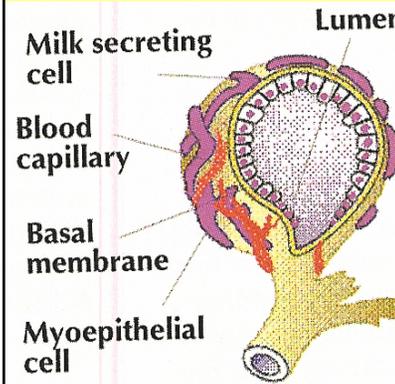


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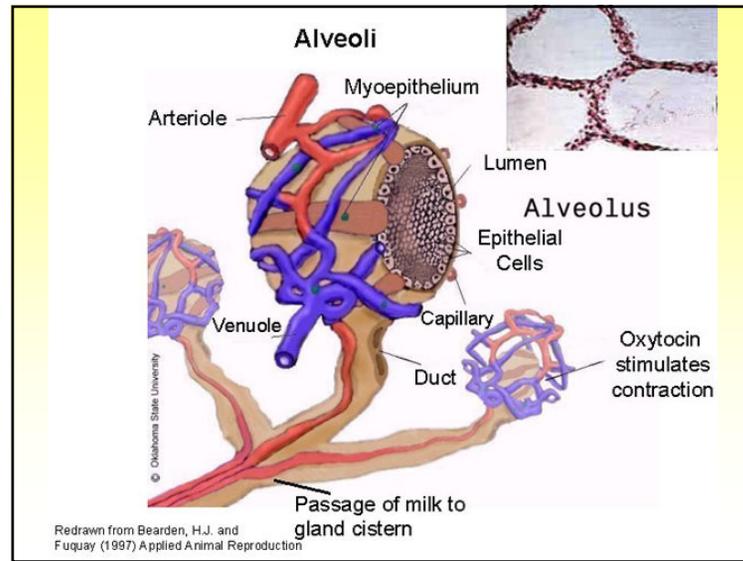
## The alveolus

A single layer of secretory epithelial cells lines the lumen of each alveolus.

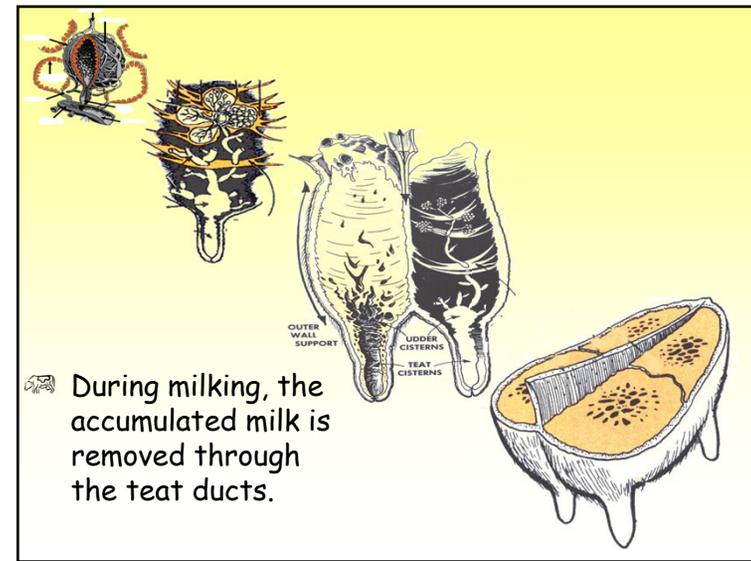
• Contractile myoepithelial cells and blood capillary surround the epithelial lining.



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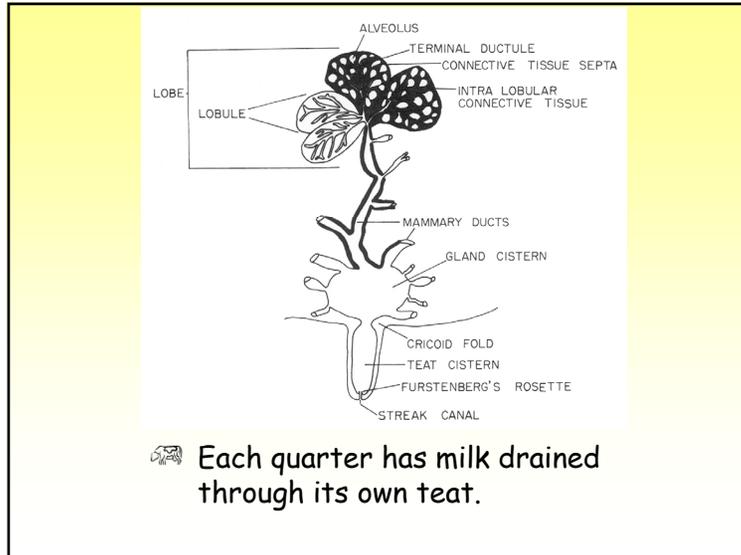


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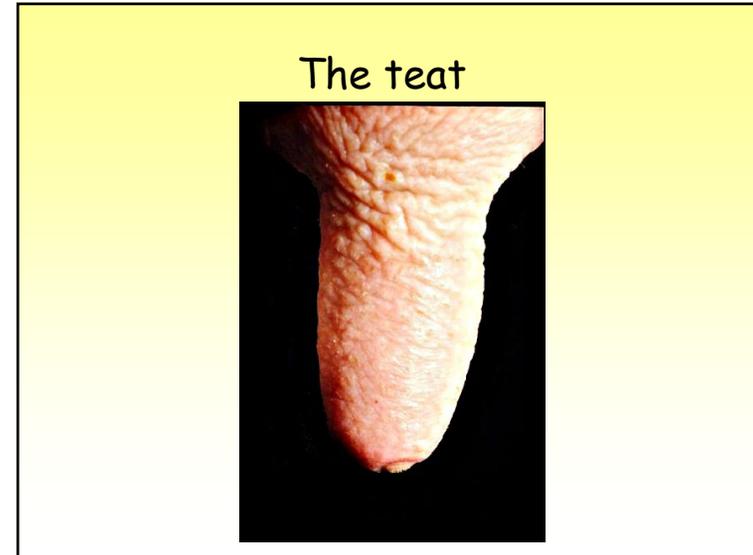


During milking, the accumulated milk is removed through the teat ducts.

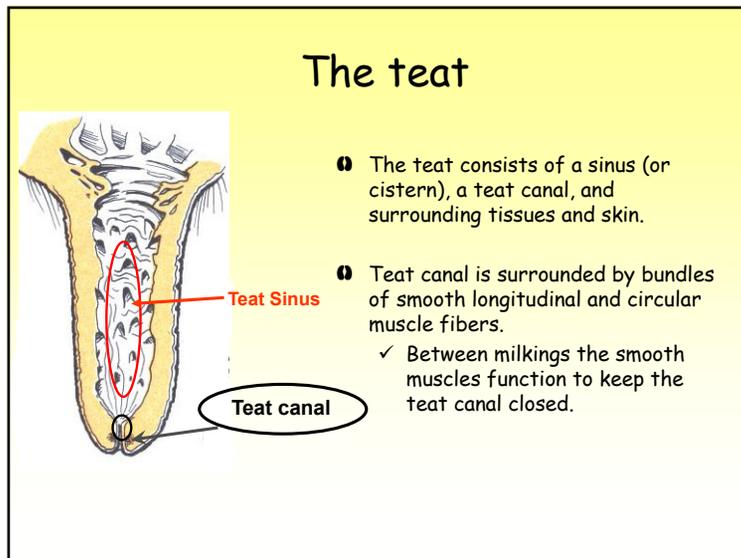
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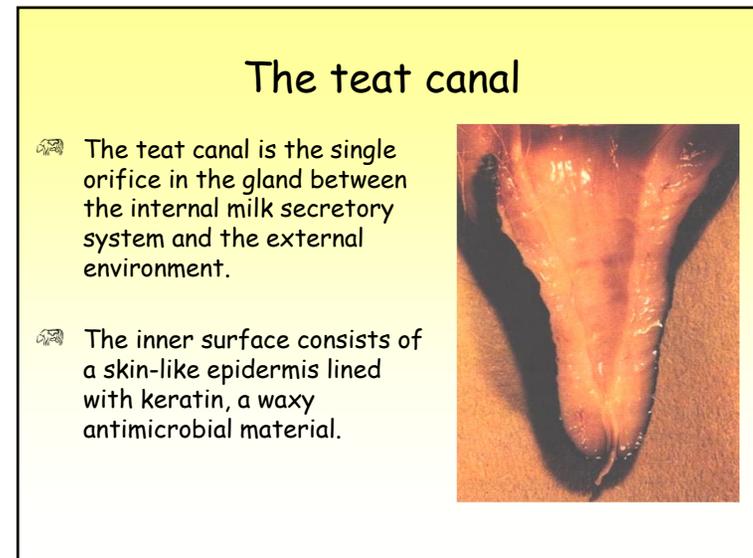
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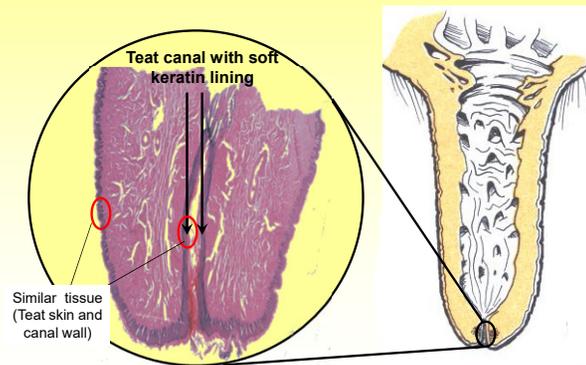


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## Keratin in the teat canal



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## Teat Sensitivity

- ☞ The mammary gland is densely innervated, especially in the teat.
- ☞ The skin of the teat has sensory nerves that are sensitive to the calf's suckling, massaging by milker and machine milking.

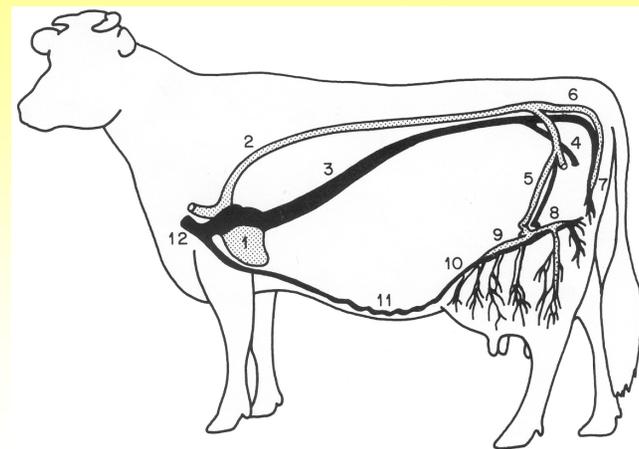
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## Udder vascular system

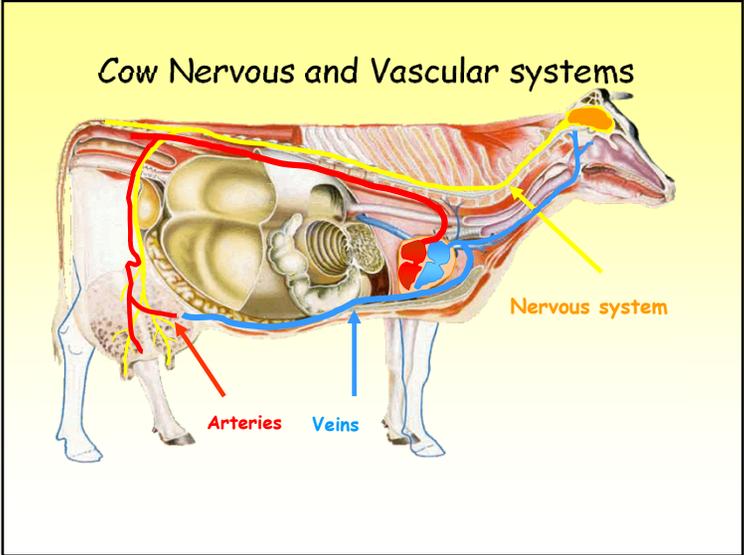
- ☞ The mammary gland is very well supported with blood vessels, arteries and veins.
- ☞ Each udder half is almost completely independent and has its own vascular system, nerve supply, and suspensory apparatus.
- ☞ Right and left udder halves have separate arterial supply, although there are some small arterial connections that pass from one half to the other.

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## Blood Supply



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