AnimalSmart.org

Jr. Animal Scientist

AUGUST 2019

Canines, Colostrum, and Cows, Oh My!

ISSN print: 2324-8262 ISSN online: 2324-8238

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Here's what you need to know!

- **Antibodies** – molecules that help protect the body from germs
- **Calf** – a baby cow
- **Colostrum** – a mother's first milk she makes after birth
- **Calving** – the process of a cow giving birth
- **Creep Feeding** – the process of feeding easily digestible food to an animal that is still nursing on its mother's milk.
- **Puppy** – a baby dog
- **Ruminant** – an animal that has a stomach with four compartments
- **Non-ruminant (monogastric)** – an animal with one working stomach
- **Rumen Fermentation** – a process that converts an animal's feed into an energy source
- **Small Intestine** – the part of the digestive system. This is where digestion is completed and nutrients are absorbed
- **Weaning** – the process of switching from the mother's milk to solid feed
- **Whelping** – the process of a dog giving birth

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Same for Now...

What do dogs and cows have in common?

A baby cow is called a calf, and the process of a cow giving birth is called calving. A baby dog is called a puppy, and the process of a dog giving birth is called whelping. Puppies and dogs have a stomach with one compartment, so they are considered non-ruminant (monogastric). When calves are born, they are considered ruminant, however, functionally their digestive tracts work as non-ruminant until the rumen is fully developed.

As newborn babies, both puppies and calves require colostrum. Colostrum is the first milk that they will drink from their mother and they need it within the first 12 hours of birth. Colostrum is rich in **antibodies**, which help protect newborns from disease.

Fun Facts:

- The average number of puppies in a litter is 6!*
- Cows usually only have 1 calf!*

*https://www.sciencedirect.com/science/article/pii/S0093691X10005625?via%3Dihub

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What is Colostrum?

Antibodies are molecules that help protect the body from germs.

A kind of milk called colostrum is very important for keeping calves and puppies healthy! Colostrum has antibodies from the mother, and these antibodies are what keep them safe from germs. The majority of antibodies in colostrum will be absorbed during the first 12 hours of life. This is why it is so important for babies to drink their mom's milk right after they are born!

Puppies and calves grow very quickly! Just one day after they are born, these babies go through a process called gut closure. Gut closure refers to the closing of the cells lining the small intestine in a newborn animal. Once the cell lining closes, colostral antibodies are no longer able to cross the intestinal barrier. This happens because the antibodies are too big to go through the lininh of the small intestine.

Sources:
Dr. Kimberly Ange-van Heugten, Teacher Assistant Professor at North Carolina State University
Dr. Jacquelyn Boerman, Assistant Professor of Animal Sciences at Purdue University

Fun Facts:

- Colostrum is thicker, sticker, and more yellow than regular milk![1]
- Puppies are born deaf and blind![2]

[1]www.sciencedaily.com/terms/colostrum.htm

[2]http://mentalfloss.com/article/536413/facts-about-puppies

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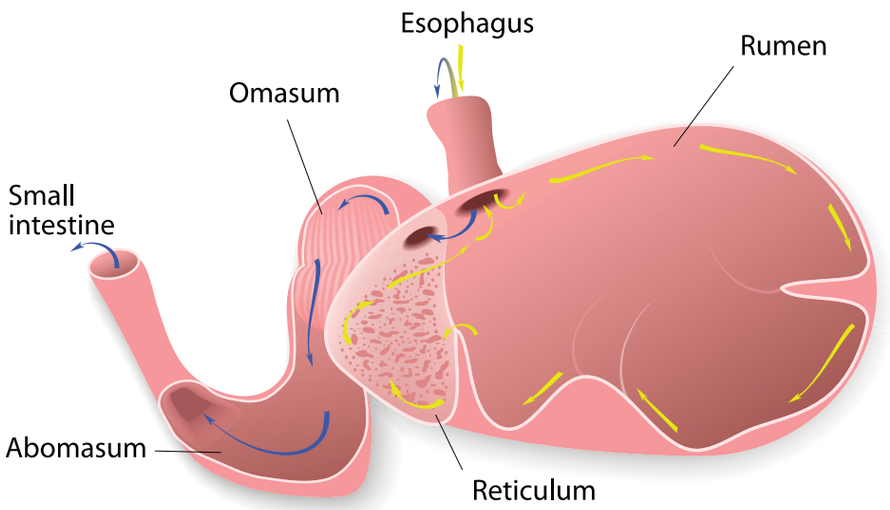
Differences are Good!

There is a big difference when it comes to calf and puppy stomaches!
A calf's stomach changes as it grows up, but a puppy's stomach stays the same.

As it gets older, a calf will start using all four parts of its stomach.
Each of the four parts of ruminant stomachs have different jobs to help the calf digest its food.

The 4 Parts of a Ruminant Stomach

- **Rumen:** breaks down and changes feed using microorganisms that inhabit the rumen
- **Reticulum:** sorts feed into large and small particles
- **Omasum:** absorbs water and salts
- **Abomasum:** is known as the "true stomach." It secretes acid and enzymes that help break down food



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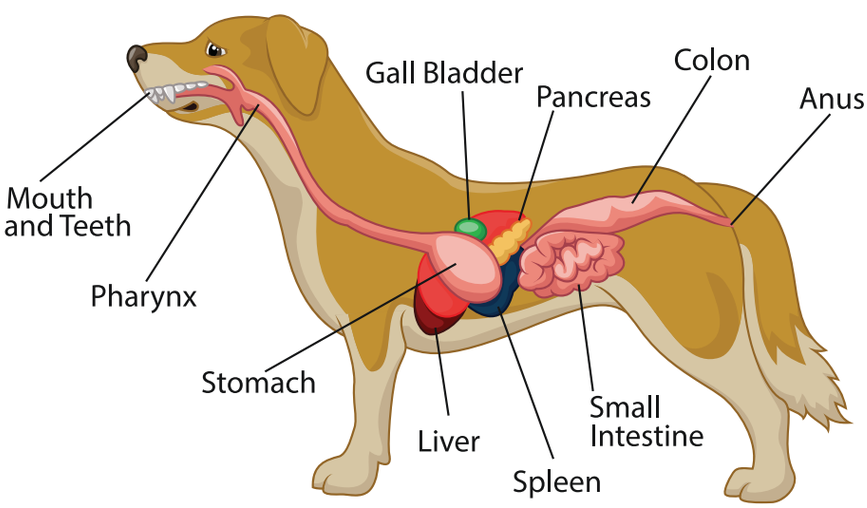

Fun Facts:

- The abomasum is most similar to your stomach!
- Cattle regurgitate and chew their feed for further break down. This is called " chewing their cud."

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Bye-Bye Milk!

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Weaning

Like a calf, a puppy's digestive system is not fully developed when it is born. For the first 7 weeks of life, puppies need easily digestible foods, such as their mother's milk! To help wean a puppy from its mother, puppies are often given creep feed. Creep feeding is when you offer solid but highly digestible feed to animals while they are still drinking some mother's milk. To begin creep feeding, puppies are fed a mix of ground up puppy chow and water. Water is added to help the puppies chew and digest the puppy chow. This feed will be fed to puppies 3 times a day until they are fully weaned.[1]

Weaning in a calf can happen at different ages. Dairy calves are weaned earlier because their mother's milk is needed for humans. Dairy calves are then raised on what is called "milk replacer." Following their first meal of colostrum, dairy calves will be supplemented with milk replacer. They too will be creep fed. The earlier a calf is on solid feed, the earlier their rumen will begin to develop.

Fun Fact:

- A female dog carries her puppies for about 60 days before they are born!*

*https://dogtime.com/puppies/19540-20-dog-facts-to-share-with-kids

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A beef calf spends 6 to 8 months with its mother. Beef calves will also be creep fed to aid in the development of their rumen. Grain helps introduce a calf's rumen to good germs. These good germs, or microorganisms, will help the calf ferment its feed.[2]

Sources:
[1]https://www.sciencedirect.com/science/article/pii/S0167587712001109

[2]https://www.lsuagcenter.com/topics/livestock/dairy/calf%20and%20heifer/when-can-calves-be-weaned

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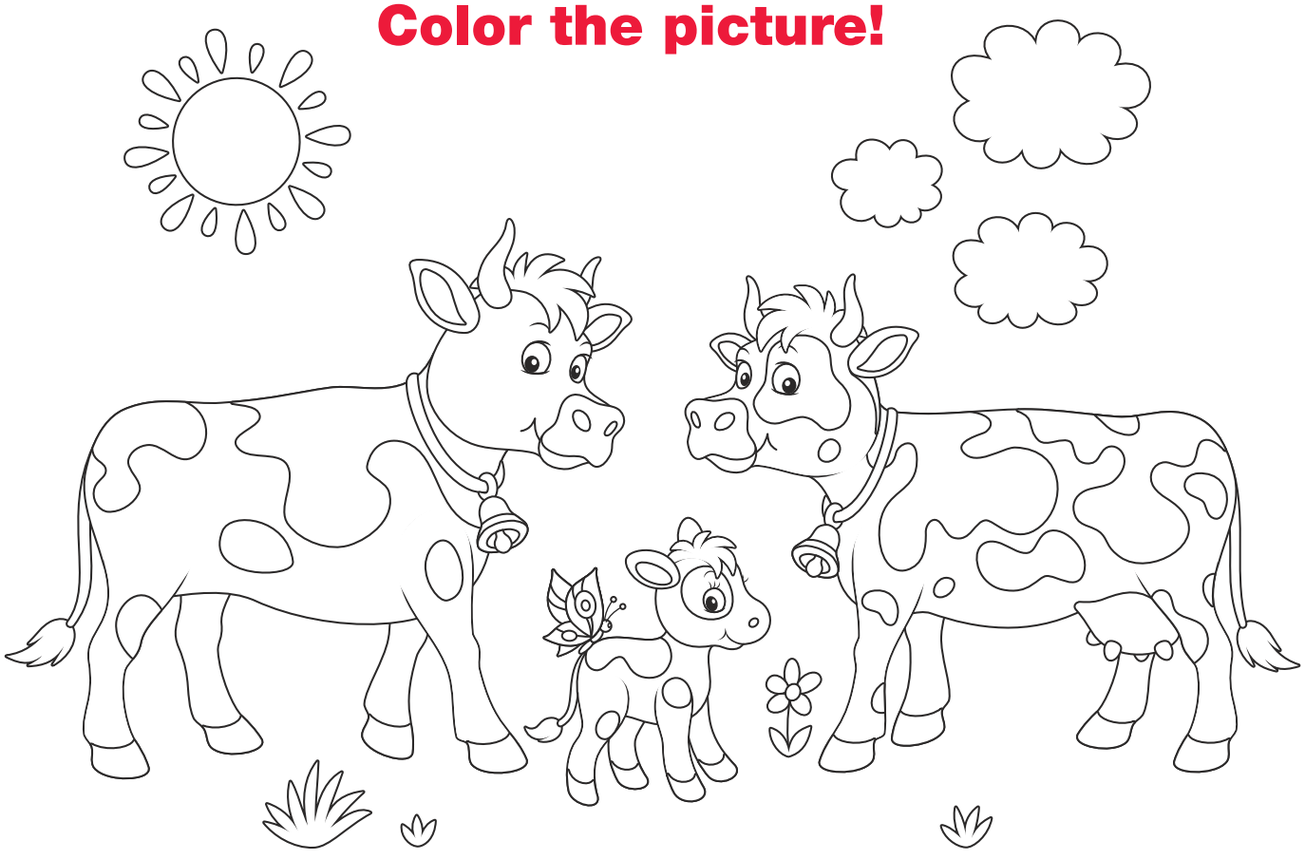

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