

Difference Between Ruminant and Non-Ruminant Animals

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Key Difference - Ruminant vs Non-Ruminant Animals

Animals can be characterized based on different physiological and morphological properties for the ease of grouping animals. Based on the property of the process of digestion, animals are broadly classified as ruminants and nonruminants. Ruminant animals are animals which have a complex stomach structure which facilitates four main processes namely, regurgitation, remastication, resalivation, and reswallowing. Nonruminants have a simple stomach structure with a single compartment which facilitates the normal digestion process where the ingested food is digested in a single process. The **key difference** between the ruminants and the nonruminants is in their structure of the stomach. **Ruminants possess a complex stomach structure with four different compartments whereas the nonruminants possess a simple stomach structure with a single compartment.**

What are Ruminant Animals?

Ruminant animals are mostly herbivorous and display for main properties in terms of their digestive process. They are as follows,

1. Regurgitation – The process in which expulsion of the contents in the stomach takes place. The contents are partially digested and partially chewed. The initiation of regurgitation takes place with reticulum contraction. This allows the stomach contents containing the undigested food to enter the esophagus. This is carried to the mouth by reverse peristalsis. In ruminants, this is re-swallowed after some time.
2. Re mastication – The contents that are released from the regurgitation process into the mouth are re-masticated to complete the chewing process. This completes the mechanical digestion process in the mouth.
3. Re salivation – The secretion of saliva takes place in order to chemically digest the re-masticated content to form the food bolus.
4. Re swallowing – The formed bolus after re salivation is swallowed again. This content then undergoes complete digestion.

In order to facilitate the above four processes in ruminants, their stomach is modified to a complex structure containing different compartments. The ruminant stomach has four main compartments such as rumen, reticulum, omasum, and abomasums. The rumen is the largest portion of the ruminant stomach and it acts as the store for the stomach contents. It can hold up to 25 gallons of material and its surface area is increased by tiny projections. The rumen is also rich in fermentative bacteria. The bacteria together with the absorbed acids can undergo fermentation at high rates.

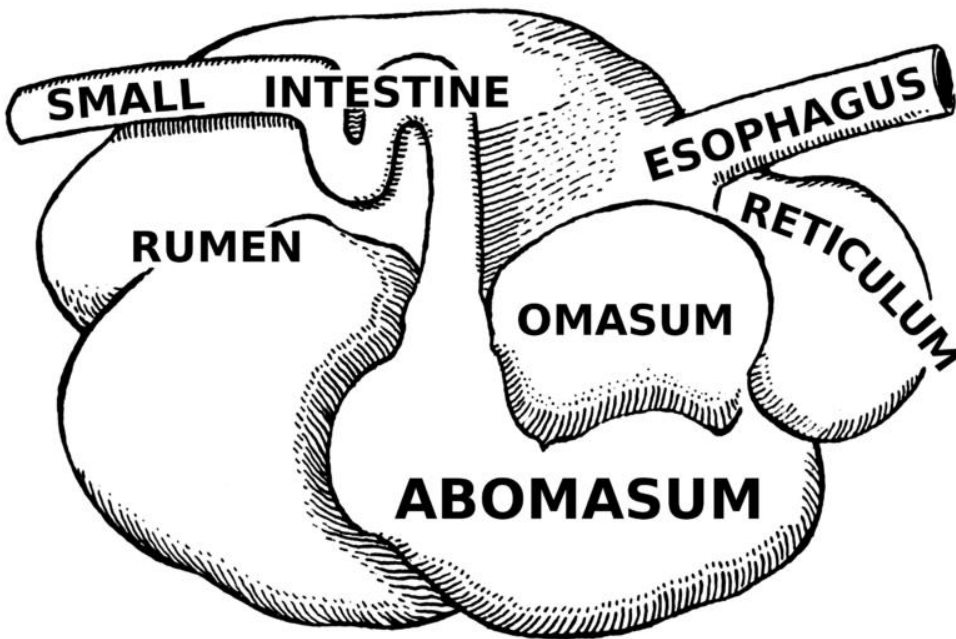


Figure 01: Ruminant Stomach Structure

Reticulum is a pouch-like structure which is involved in shuttling the stomach contents back to the esophagus for the process of regurgitation. Omasum is a globe like structure which is involved in absorbing water. This helps to moisten the contents of the ruminant stomach. The abomasum is a compartment with glandular cell lining. Abomasum secretes Hydrochloric acid and gastric juice which aids in digestion. The examples of ruminant animals include goat, sheep, cattle etc.

What are Non-Ruminant Animals?

Nonruminants include most of the [carnivores](#), [omnivores](#), and some herbivores which contain a simple stomach structure and they do not undergo regurgitation process as in ruminants.

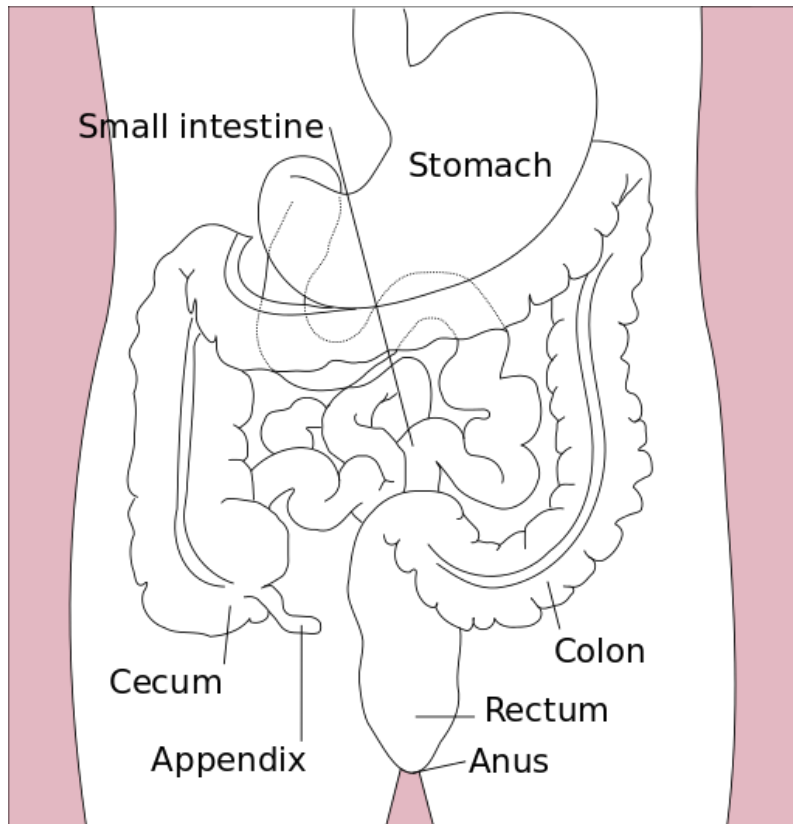


Figure 02: Nonruminant Digestive System

Humans are also considered as nonruminants since they are not capable of reverse peristalsis in order to exclude the stomach contents into the esophagus and to the mouth. Nonruminants have a simple stomach structure and do not have four compartmentalization.

What are the Similarities Between Ruminant and Non-Ruminant Animals?

- Both contain a complete digestive tract.
- Both consume food in the solid form.

What is the Difference Between Ruminant and Non-Ruminant Animals?

Ruminant vs Non-Ruminant Animals	
Ruminant animals are animals that have a complex stomach structure which facilitates four main processes; regurgitation, remastication, re	Nonruminants have a simple stomach structure which facilitates the normal digestion process where the ingested food is

salivation and re-swallowing.	digested in a single process.
Structure of the Stomach	
Ruminant animals' stomach contains four compartments namely Rumen, Reticulum, omasum, and abomasums.	Nonruminant animals' stomach contains only one apartment.
Reverse Peristalsis	
Reverse peristalsis can be observed in ruminants.	Reverse peristalsis cannot be observed in nonruminants.
Type of Nutrition	
Type of nutrition of Ruminants is mostly herbivorous.	Nonruminants can be herbivorous, omnivorous or carnivorous.
Examples	
Cattle, goat are examples of ruminants.	Humans, dogs, are examples of nonruminants.

Summary - Ruminant vs Non-Ruminant Animals

Ruminants and Nonruminants are two categories of animals classified based on their type of digestive process. Ruminants are capable of regurgitation in which the partially chewed food entering into the stomach can undergo remastication, re salivation and re-swallowing. Nonruminants follow a simple digestive process. Cattle, goats, and sheep are categorized as ruminants whereas humans and other carnivores and omnivores are categorized as nonruminants. Ruminants have a complex stomach structure while nonruminants have a simple stomach structure. This is the difference between ruminants and nonruminants.

Reference:

1. "Feeding the dairy herd." Ruminant anatomy and physiology : Dairy Extension : University of Minnesota Extension. [Available here](#)
2. Powley, J.S. "Non-Ruminant Digestion Nutrition", Palau Livestock Management Academy. [Available here](#)

Image Courtesy:

- 1.'Abomasum (PSF)'By Pearson Scott Foresman (Public Domain) via [Commons Wikimedia](#)
- 2.'Stomach colon rectum diagram-en'By Indolences, William Crohot - US PD picture., (Public Domain) via [Commons Wikimedia](#)

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