

Agriculture assignment

Farm Animals Digestive System



March 21, 2016

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11C

36 (Roll No)

1, Define the following terms:

A, Ruminants B, Pseudo Ruminant C, Monogastric Animals

2, Give at least 4 examples of the above animals

3, Write each of the function of the stomach parts of the group:

A, Ruminants B, Pseudo Ruminant

Answer

1, A) Ruminants

Ruminants are a group of mammals that have a unique digestive system that allows them to efficiently break down and extract nutrients from plant-based food. This group includes animals such as cattle, sheep, goats, deer, and giraffes. The key characteristic of ruminants is their four-chambered stomach, which allows them to digest fibrous plant material that other animals cannot.

The first chamber of a ruminant's stomach is called the rumen, which is where the initial fermentation and breakdown of food occurs. Microbes in the rumen help break down cellulose and other complex carbohydrates into simpler compounds that the animal can absorb. After the food is partially digested in the rumen, it is regurgitated and re-chewed before being swallowed again. This process is called rumination, which gives ruminants their name.

The partially digested food then moves to the reticulum, omasum, and finally the abomasum, where further digestion and absorption of nutrients take place. This complex digestive system allows ruminants to derive energy and nutrients from tough, fibrous plants that other animals cannot digest.

Ruminants are important to humans for their meat, milk, and other products. They are also valuable for their ability to convert plant materials into high-quality protein for human consumption. However, their digestive system also makes them susceptible to certain health issues such as bloat and acidosis if they are not managed properly.

B) Pseudo Ruminants

Pseudo ruminants are a group of animals that have a digestive system similar to ruminants but with some key differences. This group includes animals such as camels, llamas, alpacas, and hippopotamuses. Like ruminants, pseudo ruminants have a multi-chambered stomach that allows them to efficiently digest fibrous plant material.

However, the main difference between pseudo ruminants and true ruminants is that pseudo ruminants have three stomach compartments instead of four. This means that their digestive process is not as complex as that of true ruminants, but still allows them to extract nutrients from plant material more efficiently than monogastric animals.

Pseudo ruminants also engage in a form of regurgitation and re-chewing called "chewing the cud," similar to ruminants. This process allows them to break down tough plant fibers and extract more nutrients from their food.

Pseudo ruminants are important to humans for their use as pack animals, for their fiber (such as wool from llamas and alpacas), and for their meat and milk in some cultures. Their ability to thrive on rough forage and withstand harsh environmental conditions makes them valuable in many parts of the world.

C) Monogastric Animals

Monogastric animals are those with a simple, single-chambered stomach that resembles the human stomach. This group includes animals such as pigs, dogs, cats, horses, and humans. The digestive system of monogastric animals is not as efficient at breaking down fibrous plant material as that of ruminants or pseudo ruminants.

Instead, monogastric animals rely on enzymes produced in their stomach and small intestine to break down food into simpler compounds that can be absorbed into the bloodstream. This means that they require a diet that is higher in easily digestible carbohydrates and proteins compared to ruminants.

Monogastric animals are important to humans for their meat, eggs (in the case of chickens), milk (in the case of cows and goats), and companionship (in the case of dogs and cats). Their simple digestive system makes them more adaptable to a wide range of diets compared to ruminants, but also means that they may be more susceptible to certain digestive issues if not fed an appropriate diet.

Overall, understanding the differences between ruminants, pseudo ruminants, and monogastric animals is important for proper management and care of these animals, as well as for maximizing their value to humans for food production and companionship.

2,

***Ruminants*:**

1. Cow

2. Sheep

3. Goat

4. Deer

5. Bison

6. Antelope

7. Giraffe

8. Moose

9. Elk

10. Yak

***Pseudo ruminants:***

1. Llama

2. Alpaca

3. Vicuña

4. Guanaco

5. Camel

6. Dromedary

7. Bactrian camel

8. Tibetan yak

9. Tibetan antelope

10. Tibetan gazelle

***Monogastric animals:***

1. Dog

2. Cat

3. Pig

4. Horse

5. Rabbit

6. Guinea pig

7. Rat

8. Mouse

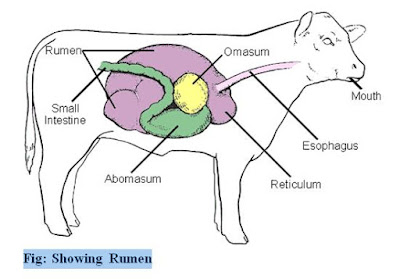
9. Ferret

10. Parrot

3,

***A, Functions and components of the Ruminant Stomach Parts:***

While the ruminant digestive tract operates differently from the monogastric system, it is composed of the same six basic components:



**1. Mouth**

The mouth is where the process begins. Cattle will graze by wrapping their tongues around plants and tearing, pulling them into their mouth for mastication. They chew first with the lower jaw incisors, working against a hard dental pad on the front part upper palate, then second with the molars, grinding plant material down further. Chewing stimulates saliva production and the saliva mixes with plant matter before the animal swallows. Saliva contains enzymes capable of breaking down fats and starches and helps to buffer the pH levels in the reticulum and rumen segments of the stomach. Mature cattle will swallow from 50 to 80 quarts daily to aid in digestion, but the amount varies based on how much time they spend chewing

**2. Esophagus**

When the cattle swallows the plant material and saliva mix, it will travel down the esophagus to the rumen. The esophagus performs the swallowing action through waves of muscle contractions, moving the feed down. It has a bidirectional function, meaning it can move feed from the mouth to the stomach or from the stomach to the mouth. Cattle need the latter to regurgitate “cud,” or the under-chewed plant matter and grain, back up to the mouth for further grinding. Once the cow is finished chewing the cud, it again swallows the matter back down to the stomach.

**3. Stomach**

Generally, the stomach functions to further break down plant matter and grain. More specifically, there are four sections of the stomach — rumen, reticulum, omasum and abomasum —each with a particular job to do. These sections store chewed plant material and grain, absorb nutrients and vitamins, break down proteins, aid in beginning digestion and dissolve material into processable pieces. The next section will focus more closely on the responsibilities and functions of each stomach compartment.

**4. Small Intestine**

The small intestine has three main sections — the duodenum, jejunum and ileum — that work together to complete most of the actual digestive process. In the duodenum, the section connected to the stomach, secretions from the gallbladder and pancreas mix with the partially digested matter. This process balances the pH in the intestine, ensuring the digestive enzymes work correctly. The jejunum section is lined with small, finger-like projections known as villi, which increase the intestinal surface area and absorb nutrients. The ileum absorbs vitamin B12, bile salts and any nutrients that passed through the jejunum. At the end of the ileum is a valve, preventing any backward flow of materials. Throughout the small intestine, muscular contractions move the matter forward. In a fully mature cow, the entire organ may be up to 150 feet long and has a 20-gallon capacity.

**5. Cecum**

Sitting between the small and large intestines is a three-foot-long pouch called the cecum. It has little function besides providing storage and a transition between the two intestines, but it does aid in the continual breaking down of material. The cecum has about a two-gallon holding capacity.

**6. Large Intestine**

Smaller in length but larger in diameter than the small intestine, the large intestine is the final step of the digestive process. It absorbs remaining water and contains bacteria microbes that finish digestion and produce vitamins the animal needs to grow and remain healthy. Its last job is to eliminate any undigested and unabsorbed food from the system in the form of waste.

When the cow is properly handled and fed, this process continually occurs, keeping the animal healthy and at the right weight. The entire digestion process should take anywhere from one to three days.

A diagram of a goat

Description automatically generated**B, *Functions and components of the Pseudo Ruminant Stomach Parts:***

***1. Rumen:*** The largest chamber of the stomach, the rumen is where ingested food is fermented by bacteria and protozoa. These microorganisms break down complex carbohydrates into simpler compounds that can be absorbed by the animal. The rumen also acts as a storage reservoir for food.

***2. Reticulum:*** The reticulum is responsible for filtering out large particles of food that are not fully digested in the rumen. These particles are either regurgitated and re-chewed or passed on to the next chamber of the stomach.

***3. Omasum:*** The omasum is sometimes called the "manyplies" because of its numerous folds and ridges. It functions as a filter, removing excess water and absorbing nutrients from the partially digested food.

***4. Abomasum:*** The abomasum is similar to the stomach of a monogastric animal (e.g. humans). It secretes digestive enzymes and acids that break down proteins, fats, and carbohydrates into smaller molecules that can be absorbed by the body. The abomasum is sometimes called the "true stomach" because it is the only chamber of the pseudo ruminant's stomach that is similar in function to a monogastric stomach.