

# Sheep Digestive Tract Student Notes - Answer Key

## Monogastric vs. Polygastric Digestive Systems

- **Monogastric:**
  - **Humans** have monogastric stomachs
  - Stomach is a **simple** structure
  - **One** compartment
  - Animals:
    - Pigs, **Horses, Dogs**, Rabbits, Fowl
- **Polygastric:**
  - Also called **Ruminant** digestive system
  - Stomach is a **complex** structure
  - Many compartments (**4**)
  - Animals: Cattle, **Sheep, Goats**, Deer

## Digestive Tract of the Sheep

The digestive tract starts in the **mouth** and ends in the **anus**.

- As food passes through, it is **broken down** into smaller and smaller parts.
- There are 3 goals of digestive system:
  - 1) Break down food for nutrients**
  - 2) Absorb food as nutrients**
  - 3) Pass non-absorbable material through the body as urine or feces**

## Upper Gastrointestinal Tract

- Parts include:
  - **mouth** (salivary glands, mucosa, teeth and tongue)
  - **pharynx**
  - **esophagus**
  - **stomach**

## Mouth

- Sheep have no **upper incisor** or **canine teeth**.
- **Chewing** is the first step in processing the food.
- Sheep make **40,000** to **60,000** jaw movements per day as it chews and re-chews regurgitated feed. As this roughage is eaten by adult sheep, it is chewed, soaked with saliva and then swallowed.
- This small rounded mass of food is called **"the cud."**

## Pharynx and Esophagus

- The pharynx is located in the **back of the mouth**.
- This is a tube-like structure that carries food from the **mouth** to the **stomach**.
- Muscle contractions push the food (cud) and gases through the **esophagus** to the **stomach**.
- **Swallowing** is the first muscle contraction that pushes food from mouth to stomach.

## Stomach

- The sheep's stomach has four chambers:

5) rumen

6) reticulum

7) omasum

8) abomasum or true stomach

## Rumen

- Largest of the 4 stomach compartments
- Capacity 5 to 10 gallons
- Fermentation breaks down fiber in feed resulting in large quantities of gas
- Sheep must belch, or bloat occurs

## Reticulum

- Also known as honeycomb or hardware stomach
- Microbial Action takes place here
- Capacity of 1.2 to 2.0 quarts
- Smallest compartment in stomach
- Functions as a pump that causes liquid to flow in and out of the rumen
- Holds heavier substances and foreign objects can become stuck here

## Omasum

- Also known as manyplies
- Consists of many folds/layers of tissue
- Capacity of 0.5 to 1.0 quarts
- Removes excess moisture and finer grinding occurs
- Absorbs more volatile fatty acids to help supply energy
- Not involved in rumination

## Abomasum

- Also known as 'true stomach'
- Capacity of 2.0 to 3.0 gallons
- Fundic glands are important for digestion
- 3 regions are fundic, body and pyloric
- The pyloric region joins the small intestine

## Lower Gastrointestinal Tract

- Parts include:
  - Small intestine
  - Large intestine
    - Cecum
    - Colon
    - Rectum
  - Anus

### Small intestine

- The small intestine has 3 parts: **Duodenum**, **Jejunum** and **Ileum**
- The small intestine is an **80** foot-long **1**-inch-wide tube with a **2.0 to 2.5**-gallon capacity.
- Lined with fingerlike projections called **villi**
- Nutrients are **absorbed** and made available
- Feed mixes with **secretions**
- Enzymes turn:
  - **Proteins** to amino acids
  - **Starch** to glucose
  - **Complex fats** to fatty acids

### Large intestine

- Three parts: 1) **cecum** 2) **colon** and 3) **rectum**
- Its primary function is to **absorb water** from the intestine's contents thus making it more solid
- Cecum is also known as **blind gut**. Feed materials are digested by **microorganisms**
- Colon is where **fecal** pellets are formed
- Rectum is the **storage** place for fecal matter
- Anus is where the **elimination** of fecal matter happens

### Accessory glands

- The **salivary glands, liver and pancreas** contribute to digestion.
- Saliva secreted by the salivary glands is important in the chewing of the **cud**.
- **Bile** produced by the liver helps emulsify fat in preparation for **digestion**.
- Pancreas secretes **enzymes** here to assist in digestion of carbohydrates, proteins and fats

### Rumination

- Defined as **regurgitation**, rechewing and **re-swallowing** of rumen contents.
- The regurgitated cud is chewed thoroughly for about **one minute** then swallowed again. Ruminant animals may spend up to **8** hours per day in rumination, depending on the type of feed.
- The ruminant digestive system of the sheep works **non-stop** in an adult sheep. The sheep must continually create **digestive juices** and **enzymes** 24 hours a day every day of its' life.