

**Nutrition & Ruminant Anatomy Unit Objectives:** *by the end of this unit, students will be able to...*

- Summarize the extent of the universality of nutrient requirements among living species in regards to the six kinds of nutrients.
- Identify the nutrient most important for living species and summarize the roles it plays in the bodies of animals.
- List key characteristics and identify the roles played by each of the following nutrients: *water, carbohydrates, fats, proteins, vitamins, and minerals.*
- List key characteristics and identify the roles played by each of the following fat soluble vitamins: *A, D, E, K.*
- List key characteristics and identify the roles played by each of the following water soluble vitamins: *a. B12 b. Choline c. Thiamin (B1)/Niacin (B3)*
- Explain why vitamin C is not needed in the diets of most animals.
- List key characteristics and identify the roles played by each of the following macrominerals: *a. Potassium b. Sodium/Chlorine c. Sulfur d. Calcium/Phosphorus e. Magnesium*
- List key characteristics and identify the roles played by each of the following microminerals: *a. Iron b. Copper c. Zinc d. Fluorine e. Manganese*
- Summarize the identifying characteristics of each of the following classes of digestive tracts: *a. Ruminant b. Avian c. Post-gastric fermenters d. Monogastrics*
- Explain the function and characteristics of each of the following organs: *a. Gizzard b. Cecum c. Rumen*
- Summarize the advantages of disadvantages of being a ruminant.
- Identify the function of each of the following stomach chambers: *a. Rumen b. Reticulum c. Omasum d. Abomasum.*
- Describe the path of food starting at the mouth and proceeding through each stomach chamber and type of intestine.
- Define “VFA” and summarize its importance to a ruminant.
- Identify and explain the roles of saliva in digestion for a ruminant.
- Explain the meaning and importance of each of the following for a ruminant: *a. Rumination b. Eructation c. Peristalsis d. Papillae e. Villi*
- Explain the rate at which forage is fermented in the rumen and how it changes inside the rumen during this time.
- Summarize the four key benefits provided to a ruminant by its rumen microbes.
- Explain how a calf becomes a ruminant by incorporating the role and purpose of the esophageal groove in a newborn calf and by identifying its source of the rumen microbes.
- Compare and contrast the abomasum of a ruminant to the stomach of a human.
- Summarize the processes that occur in the small and large intestine that enable digestion and other critical processes.
- Diagnose the most likely outcomes for a ruminant for each of the following scenarios:
  - *Iron Or Copper Deficiency*
  - *Manganese Deficiency*
  - *Swollen Large Intestine*
  - *Inability To Perform Eructation*
  - *Absent Or Swollen Villi*
  - *Swollen Papillae/Inability To Absorb VFAs*
  - *Reduced Saliva Production*
  - *Decrease In Rumen Microbe Populations*