Ruminant Digestion

Steps for digestion
Ruminants

- Cattle, Sheep, Goats, Deer, Elk
  - Primarily Herbivores

- 60-75% of food fermented by microbes before exposed to gastric juices!!
Step 1: Chewing! (Mouth)

- Consists of Tongue, Teeth, Saliva

- Primary purpose is to breakdown ingesta
  - Teeth breakdown into smaller pieces
  - Saliva uses a high pH to breakdown

- Mouth is source of chewing and rechewing food

- 40,000 to 60,000 jaw movements a day!!
Step 2: Esophagus

- 2 ½ to 3 feet long!
- Uses muscle contractions to move food
- Food should pass through 2 times before fully digested.
- Opens into Reticulum and Rumen.
4 Stomachs or Compartments?

- 4 Compartments
  - Rumen
  - Reticulum
  - Omasum
  - Abomasum.

Figure 1. Ruminant Stomach Flow of Digesta
Step 3: Rumen

- 40-50 Gallons capacity, Largest Component
- Digestion helped by 500,000 bacteria and 50 protozoa
  - Primarily Anaerobic
- Muscle contractions keep feed mixed
- Uses “finger like” projections for absorption.
Step 4: Reticulum

- Located next to heart
- Honeycomb in appearance
- Pathway to:
  - Esophagus
  - Rumen
  - Omasum
- Helps move feed back up for rechewing
Stop 5: Omasum

- Called “Many piles” due to unique look
  - Looks like pages in an open book
- May contain up to 100 leaves
- Uses papillae on leaves for absorption
- Also reduces particle size
Step 6: Abomasum

- “True Stomach”
- Functions similarly to our stomach
- Folds increase surface area
- Acidic environment
- Uses PEPSIN for breakdown
  - Pepsin:
Step 7: Small Intestine

- 130 ft. long 2 in wide
- Basic environment (pH of 7-8)
- Uses enzymes/hormones from pancreas
- Contractions aid movement

Hint: Think of a pile of ropes!
Step 8: Large Intestine

- Cecum, Colon, Rectum
  - Same as humans

- Purpose:
  - Absorb water from digesta
  - Make digesta solid
Ruminant Rap!
Ruminant Rap Directions:

- Create lyrics showing the stages of RUMINANT digestion.
- Lyrics MUST be in correct order!
- You need to write the lyrics down on a poster for the class to follow.
- Select a beat to have in the background
  - MUST be approved by Ms. G!!
  - Red Karaoke website works well for music
“Dance Like No One is Watching and Sing Like Your Tone Deaf!!”

http://www.redkaraoke.com/karaoke.php?id=24704