

Animal Digestion and Nutrition

Competency: Analyze the parts and functions of the digestive system of farm animals



Ruminants

- ★ Objective: Describe the function and major parts of the digestive system of ruminants.

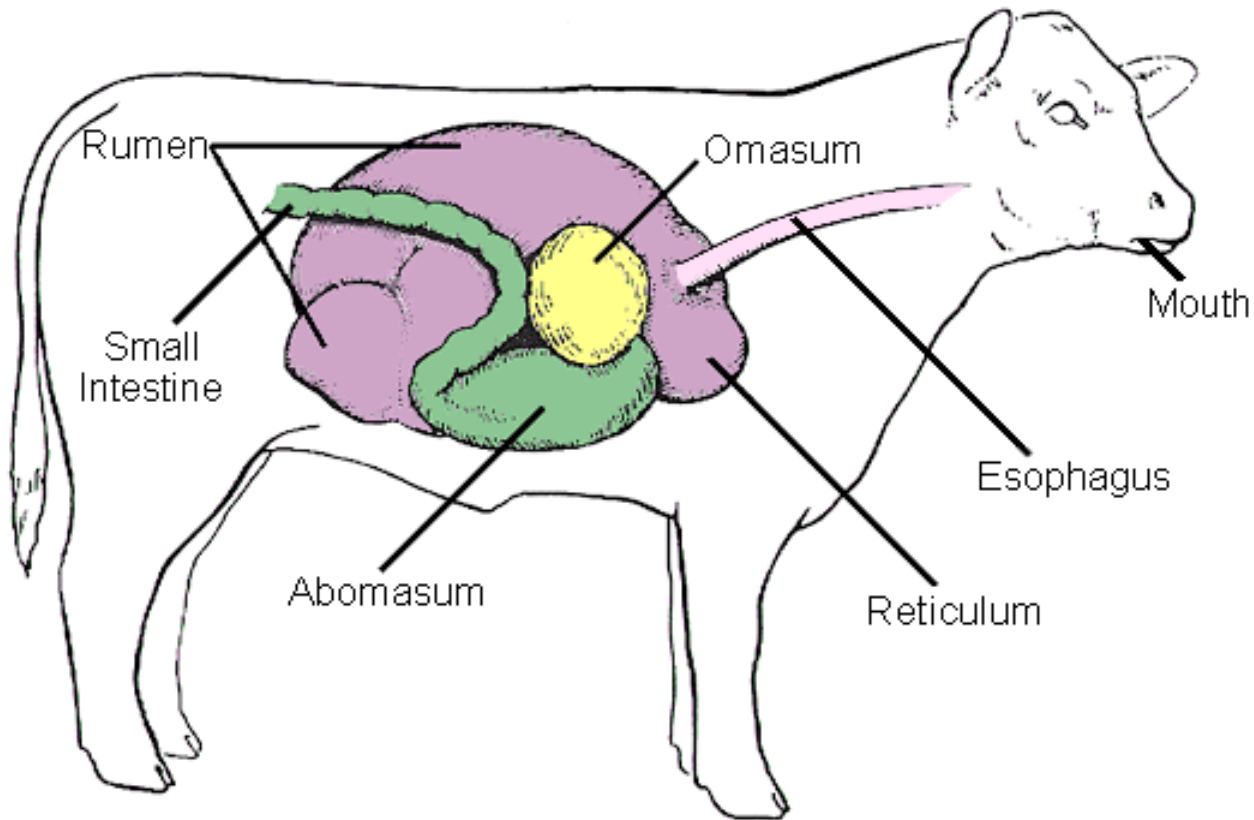


Ruminant Animals

- ★ Animals with complex digestive systems
- ★ Capable of digesting material with a high fiber concentration
- ★ Uses microbial fermentation
 - Cattle
 - Sheep
 - Goats
 - Deer



Ruminants



Ruminant Digestive System



Parts and Functions

- ★ Mouth
 - Bites and chews
- ★ Esophagus
 - Connection
- ★ Four Compartment Stomach
 - Rumen
 - Reticulum
 - Omasum
 - Abomasum



85% of the capacity

The diagram shows two overlapping compartments, the rumen and reticulum, with a callout box pointing to them. The callout box is yellow and contains the text '85% of the capacity'.



Parts and Functions

* Ruman

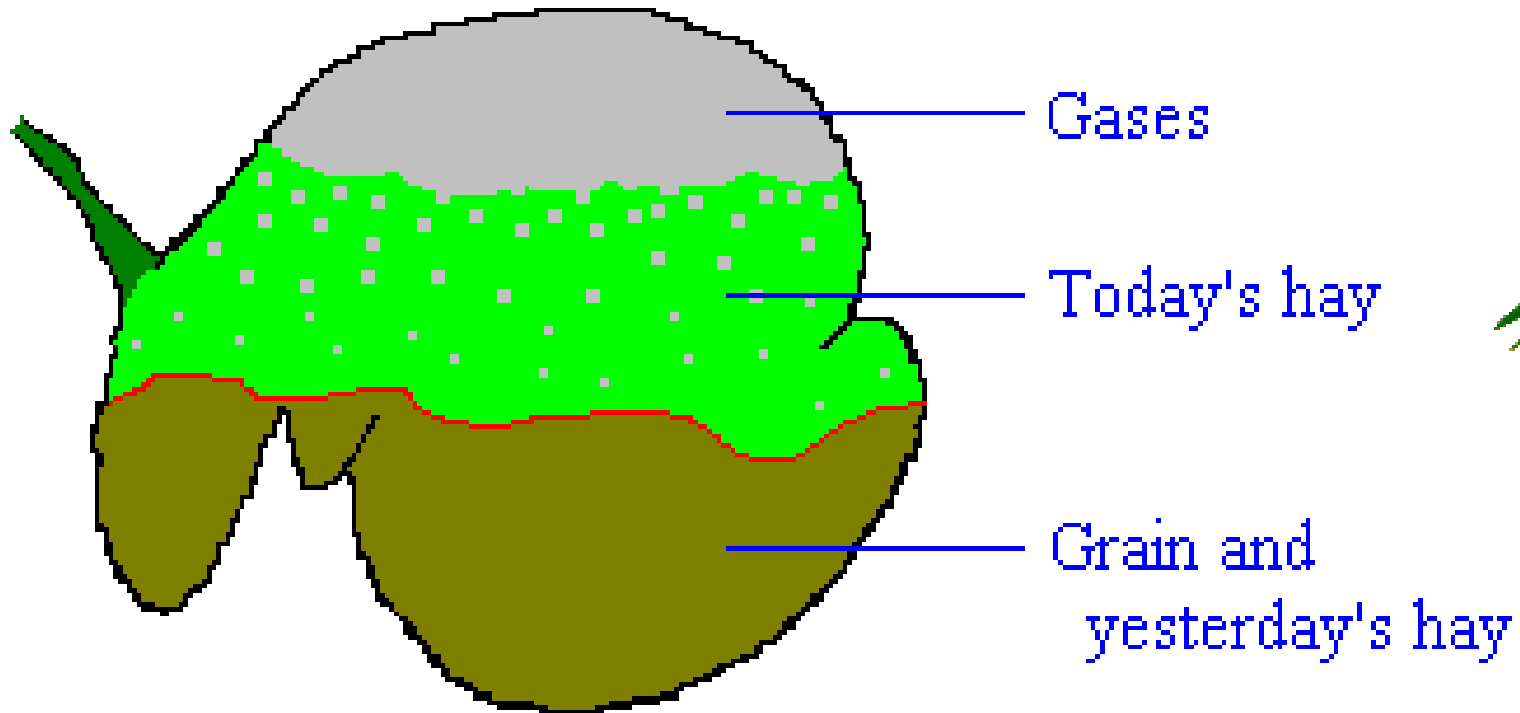
- Largest of the four parts “room-in-it”
- Filled with bacteria
- Converts large amounts of roughage to amino acids

Fact!!!!

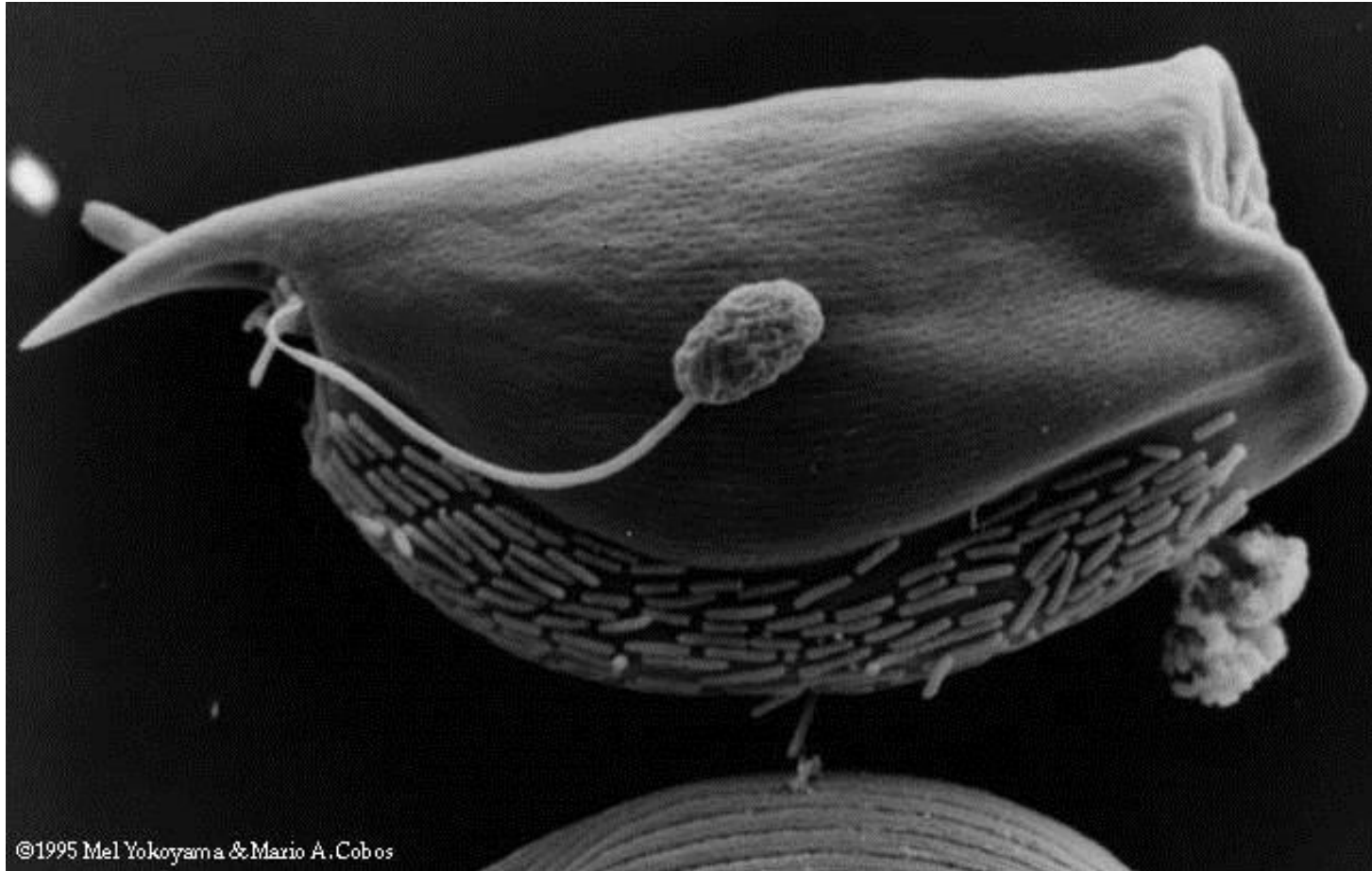
- * The average cow rumen can hold over 160 liters (40 gallons)



Ruman



Ruman Microbe



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Ruman Microbe

- ★ The large microbe is a type of protist
- ★ The creature that looks like a tadpole attached to the side of the protist is a fungal spore
- ★ The smaller, rod-shaped organism lining the underside of the protist are bacteria.



Parts and Functions

★ Reticulum

- Compartment where liquid goes
- Honeycomb in structure

★ Omasum

- Grinds and squeezes
- Removes some liquid

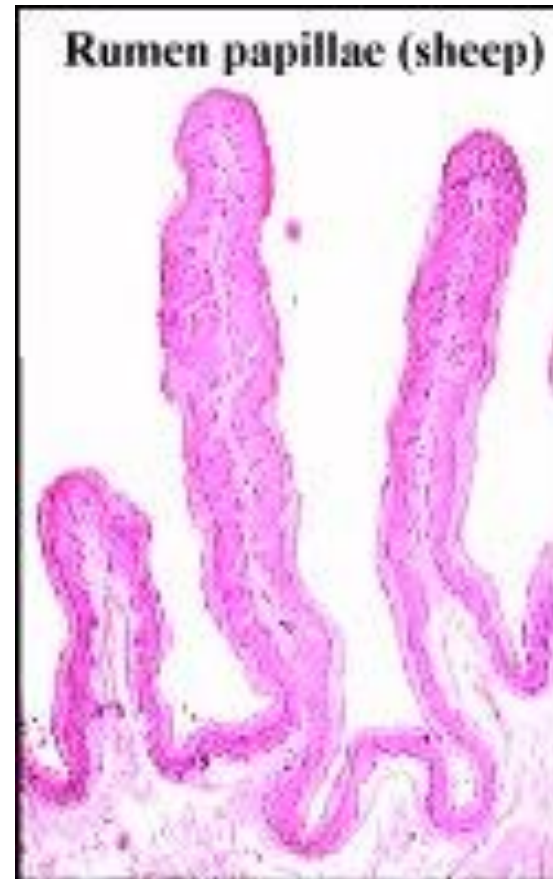
★ Abomasum

- True stomach
- Enzymes and acids



Parts and Functions

- ★ Small Intestine
 - Partially digested feed is mixed
 - ★ Bile
 - ★ Pancreatic juice
 - ★ Intestinal juice
 - Most of the food nutrient is absorbed
 - ★ Villi or Papillae



Parts and Functions

- ★ Large intestine
 - Main function is to absorb water
 - Add mucus to undigested feed
 - ★ Feces



Non-Ruminant

- ★ Objective: Describe the function and major parts of the digestive system of non-ruminants.



Non-Ruminant

- ★ Simple digestive system
 - (Monogastric)
 - Feed must be highly quality concentrates
 - Cannot digest large amounts of fiber
 - ★ Human
 - ★ Dogs
 - ★ Cats
 - ★ Rabbits
 - ★ Pigs
 - ★ Horses????



Non-Ruminant Parts & Functions

- ★ Mouth
- ★ Esophagus
- ★ Stomach
 - Enzymes acts on feed
 - Churns and mixes
- ★ Small intestine
- ★ Large intestine

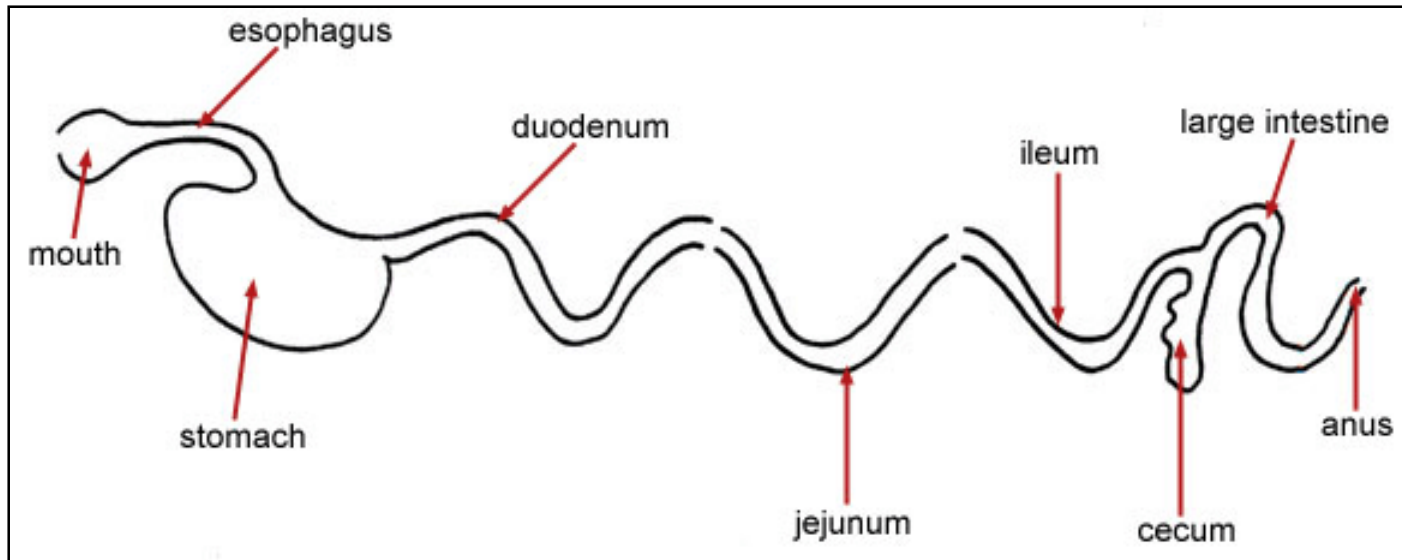


Non-Ruminant Parts & Functions

- ★ Accessory system
 - Liver
 - ★ Produces bile that acts on fat
 - Pancreas
 - ★ Produces insulin
- ★ Anus
 - End of the digestive tract



Monogastric



Simple Digestive System



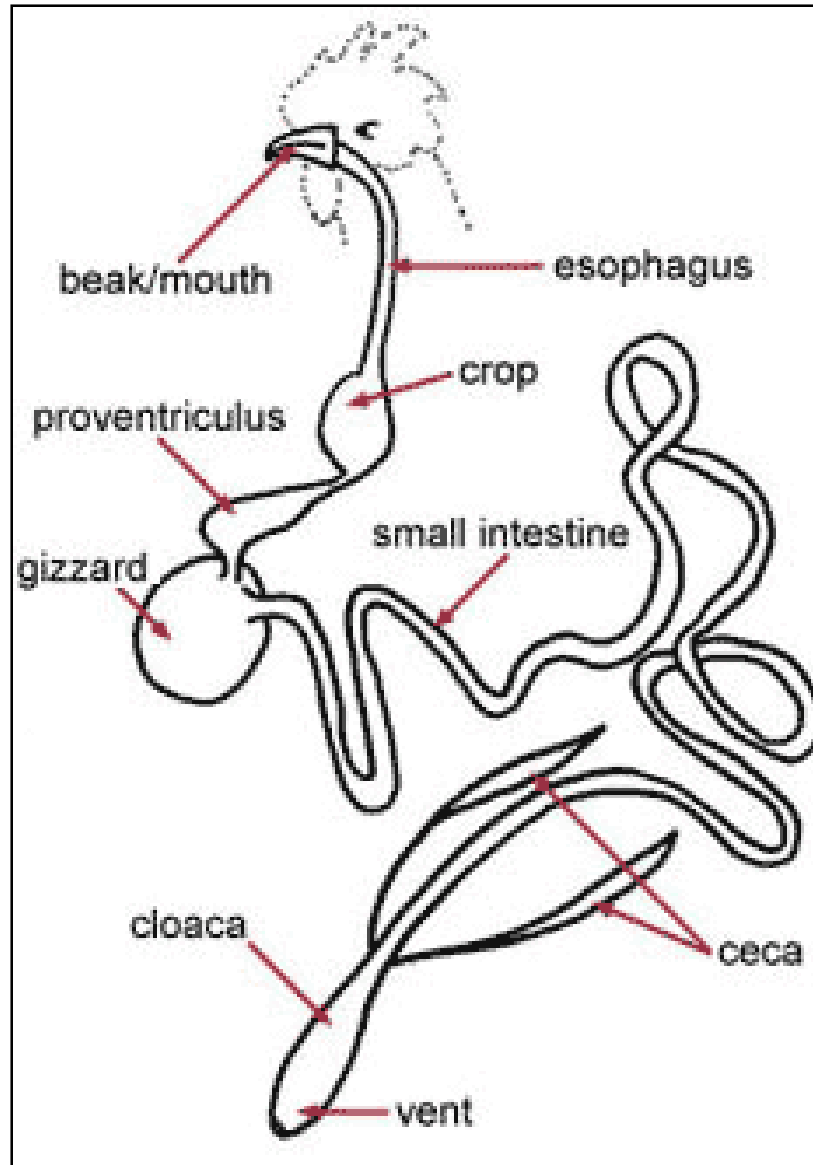
Poultry Digestive Systems

- ★ Objective: Describe the function and major parts of the digestive system of non-ruminants.



Poultry

- ★ Chickens
- ★ Turkeys
- ★ Ducks
- ★ Geese



Poultry Digestive Systems

- ★ Mouth or beak
 - Can not chew food
- ★ Esophagus
 - Connects mouth to crop
- ★ Crop
 - Stores feed



Poultry Digestive Systems

- ★ Gizzard
 - Crushes feed
 - ★ Contains grit and gravel
 - Mixes feed with digestive juices
- ★ Liver
- ★ Small and Large Intestine
- ★ Vent
 - Removes solid and liquid waste



Inspecting Animal Digestive Systems

- ★ Esophagus
 - Tube like structure
- ★ Stomach
 - Pouch with undigested feed
- ★ Liver
 - Large brown organ beneath the stomach or crop



Inspecting Animal Digestive Systems

- ★ Small intestine
 - Long tube
 - Gray colored partially digested feed
- ★ Large intestine
 - Large relatively short compartment
 - Contains fecal material



Nutrients

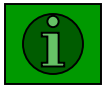
Competency: Distinguish the functions and sources of feed nutrients for farm animals



Groups of Nutrients

- ★ Objective: Identify the six major groups of nutrients





Carbohydrates

- ★ Composed of sugar, starches, cellulose and lignin
- ★ Provide energy and heat
- ★ Make up the largest quantity of livestock feed
 - Carbon
 - Hydrogen
 - Oxygen



Fats and Oils

- ★ 2.25 times the energy value of carbohydrates
- ★ At body temperature fat are solids and oils are liquid
 - Example: cooking lard
- ★ Extra carbohydrates are stored as fats
 - Carbon, hydrogen, oxygen
- ★ Carriers fat-soluble vitamins





Proteins

- ★ Major component of muscles and tissues
- ★ Made up of amino acids
- ★ Continuously needed to replace dying body cells
- ★ Young animals need large amounts for growth

Organic



Vitamins

- ★ Needed in small quantities
- ★ Helps regulate body functions
- ★ Designated by letters
 - A,B,C,D,E,K
- ★ Sources:
 - Naturally found in feed
 - Feed additives made from animal by-products
 - Made by the body itself

Organic



Minerals

- ★ Needed in small amounts
 - Calcium, phosphorus, sodium, etc.
- ★ Regulates body functions
- ★ Provide growth for:
 - Bone
 - Teeth
 - Tissue
 - ★ Example: calcium is needed in poultry for eggshell development



Water

- ✦ Makes up 40% to 60% of the animals body
- ✦ Dissolves other nutrients and helps carry them to parts of the body



Sources of Nutrients

- ★ Carbohydrates
 - Cereal grains
 - ★ corn
 - ★ wheat
 - ★ oats
 - ★ rye
 - ★ barley
 - ★ sorghum



Sources of Nutrients

★ Proteins

– Plant sources

- ★ Soybean meal
- ★ Cottonseed meal
- ★ Alfalfa meal

– Animal sources

- ★ Meat meal
- ★ Fishmeal
- ★ Dried milk
- ★ Synthetic nitrogen source called urea



Sources of Nutrients

- ★ Fats and Oils
 - Grains and protein concentrates
- ★ Vitamins and Minerals
 - Most feed ingredients
 - Supplements
 - ★ Pre-mixes
 - ★ Mineral blocks



Sources of Nutrients

- ★ Other sources and exceptions:
 - Alfalfa (roughage) can be used to provide energy and fiber
 - Molasses
 - ★ Improve taste (palatability)
 - ★ Reduce feed dust



Concentrates

- ★ High in Nutrient Value
- ★ Grains
 - Corn
 - Barley
 - Wheat



Roughages

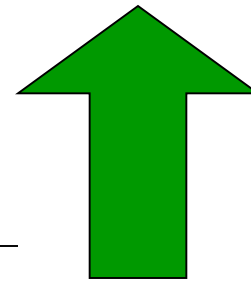
- ★ High in Fiber
- ★ Forage Crops
 - Silage
 - Hay
 - Pasture Grass



Nutritional Value

- * Total Digestible Nutrients

Concentrates are high in TDN



Roughages are low in TDN

