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Website:

Lecture title: Digestive system in ruminant

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Summary: Ruminants stomach have four compartments, the rumen ,the reticulum, the omasum ,and the abomasum .each parts have special function for digestion of feeds, Rumen microbes ferment feed and produce volatile fatty acid and gases. Which is the cows main source of energy.

Urea in the rumen

Urea entering to the rumen from:

- ✓ Salivary secretion
- ✓ Blood (diffuse from blood to the rumen)
- ✓ Diet

- ❖ In the rumen urea is rapidly hydrolyzed to ammonia and CO_2
  By micro organism in the rumen(**urease enzyme**)

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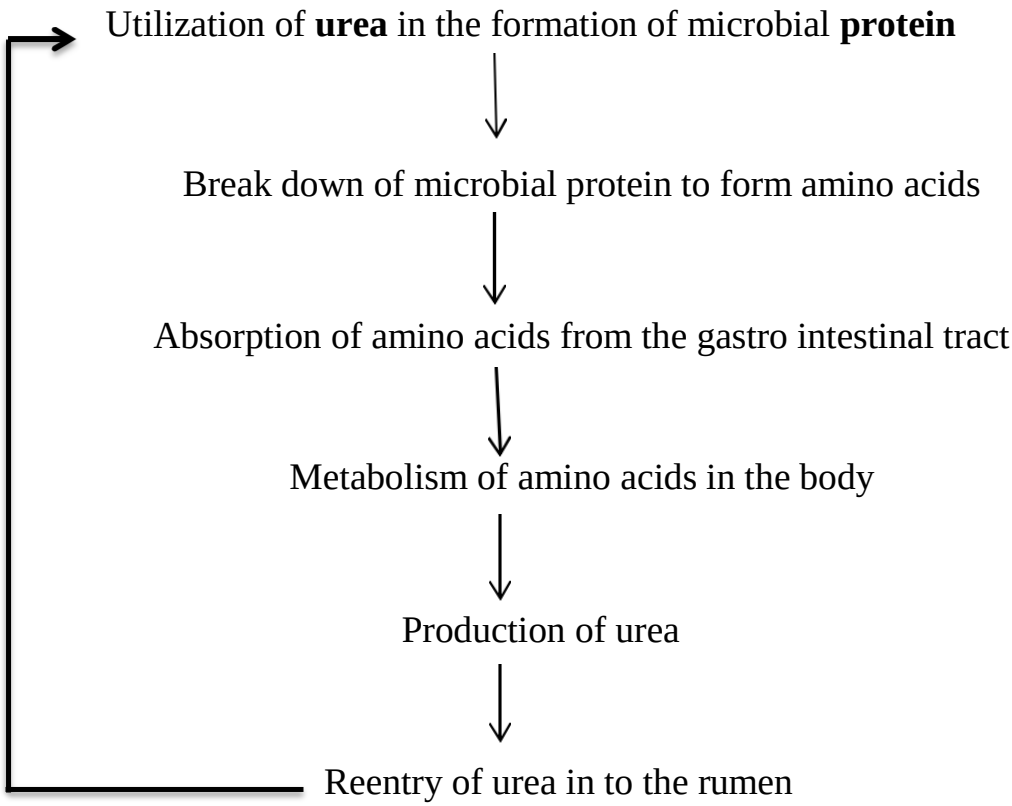
Protein regeneration cycle

Its recycling of the urea through the body of the ruminant to the rumen.



Gas production

√ The gas in the rumen contain on the average
-60% carbon dioxide
-35 % methane
-5% oxygen and other gases.

Carbon dioxide is produced from:

√ fermentation of carbohydrates

√ deamination of amino acids

√ Saliva bicarbonates as a result from neutralization of fatty acid forming fermentation

Methane is produced:

From reduction of CO_2 by methanogenic bacteria.

These gases must be eliminated from the body to maintain health and even life of ruminant.

a-Eructation(belching).
b-Respiration.

Failure to expel gas can result in **bloat** and **death**.

Gas and heat production

Gas production may amount to 600L/day. Much of the gas goes in to the trachea and lungs. This provides a muffling effect and reduces the noise level considerably.

Heat is also a major product of fermentation .part of total heat increment of the animal which is useful in winter to keep the body warm but can be detrimental in hot weather.

Small Intestine

Comprising of three main sections — the duodenum, jejunum and ileum — the small intestine carries out most of the actual digestive process. The stomach connects to the duodenum, where the animal's gallbladder and pancreas secrete substances to help digest the food matter. The jejunum is lined with villi, finger-like struct

ures that increase intestinal surface area and helps to further absorb nutrients.

the ileum functions to absorb vitamin B12, bile salts, and any nutrients that passed through the jejunum. A valve located at the end of the ileum prevents materials from flowing back.

Cecum

Sitting between the small and large intestines is a three-foot-long pouch called the cecum. It provides storage and serves as a transition point between the small and large intestines.

Large Intestine

The large intestine is shorter in length but larger in diameter than the small intestine and is the last step in the digestive process. It carries out the function of absorbing remaining water and making use of bacteria and microbes to finish digestion and produce vitamins for the animal's growth and health. Finally, the large intestine eliminates undigested and unabsorbed food in the form of waste.

Absorption

- -The sits of absorption are the stomach, small intestine and large intestine.
- -VFA are absorbed from rumen, reticulum and omasum. but mainly in rumen because their concentration in rumen is high .
- -Ammonia ,electrolytes and number of drugs are absorbed from rumen .
- -water can move freely in either direction across the rumen epithelium and this move freely in either direction across the rumen epithelium and this movement depends on the osmolarity of the solution .
- -CO2 absorption from the rumen.
- -Methan is not absorbed but must be eructated through the GIT.