

THE DIGESTIVE SYSTEM OF THE RUMINANT

This article looks at the various parts of the digestive system and explains the workings of the digestive tract in order to efficiently feed the ruminant. True ruminants include sheep, cattle and goats.

The Digestive System The digestive tract is composed of the mouth, tongue, teeth, esophagus, stomach, small and large intestines. Many people say the ruminant has four stomachs. In fact, a ruminant has only one stomach, but with four compartments. The stomach is divided into the reticulum, rumen, omasum and abomasum. A short description will be given to the more important parts of the digestive tract.

Mouth and Esophagus This is the location where food enters the system and is chewed (masticate). Salivary glands are found in the mouth. They secrete saliva which has a pH of about 8.2. Saliva helps to reduce acidity in the rumen and also aids in the transfer of food (ingesta) from the mouth to the rumen via the esophagus.

Reticulo-rumen (reticulum and rumen) Reticulum and rumen are often discussed together since each compartment is separated by a low partition. Eighty percent of the capacity of the stomach is related to the reticulo-rumen. The contents of the reticulum and rumen intermix freely. The wall of the reticulum is honeycomb in structure and is often the location where hardware will be found. Magnets are located in this area to reduce the effects of hardware disease. The rumen is the main fermentation vat where billions of microorganisms attack and break down the relatively indigestible feed components of the ruminant's diet. This segment of the digestive system is one of the most important parts when considering the feeding of beef, sheep, dairy and goats.

Omasum After fermentation in the reticulum and rumen, the feed passes to the omasum. While the function of the omasum is not entirely clear, it acts as a filter pump to sort liquid and fine food particles. Coarse fibre particles are not allowed to enter the omasum. Also, the omasum may be the site for absorption of water, minerals and nitrogen.

Abomasum The abomasum is the true stomach and the only site on the digestive tract that produces gastric juices (hydrochloric acid and the enzymes, pepsin and rennin). In the newborn calf, the abomasum makes up about 80 percent of the total stomach volume, while in the mature cow it amounts to only 10 percent. Ingesta only remains here for 1 to 2 hours.

Small Intestine The small intestine is the location where a further breakdown of the food material occurs. Secretion of enzymes, pancreatic juice and bile, aid in further digestion of the ingesta. This generally occurs in the upper portions of the intestine. The end products of the digestion process are absorbed in the lower section of the small intestine. When we refer to by-pass protein and fats, it is here that these proteins and fats have their positive nutritional effects.

Large Intestine The large intestine is where residues of the ingested feed are deposited. Feed residues do undergo some fermentation. There are absorption sites for water, minerals and nitrogen.