In all mammals, the gut is a one-way street: food is taken in at the front. As it passes through the digestive system, it is processed and nutrients are removed. What cannot be digested and absorbed is passed out at the rear as feces.

**MOUTH/TEETH**

Lips, tongue and front teeth help get the food into the mouth. Further back are teeth which begin the process of breaking down the food by masticating or chewing it. Saliva is added to the chewed food, to moisten it for swallowing. Saliva also contains one or two enzymes that begin the chemical digestion of the food.

**ESOPHAGUS**

Once food is swallowed, it is carried to the stomach in the abdomen through a long muscular tube called the esophagus. Muscles in the esophagus wall contract behind the food item to propel it along the tube.

**STOMACH**

The stomach has muscles in the wall. These muscles assist digestion by contracting to churn the contents, just like a washing machine, making sure that the digesta are well mixed with the acid and enzymes. For such a large animal, the stomach is quite small. Comparing it with a dog or a human stomach, it is relatively smaller in proportion to the animal’s size. So a horse’s stomach does not operate as large storage reservoir where much of digestion takes place: Instead it is designed to take small, frequent quantities of food, begin digesting them, and passing them along rapidly.

- Unlike most mammals, acid is constantly being secreted into the stomach (whether or not there is food present)
- Stomach has 2 distinct sections
  1. Glandular - secretes mucus to protects stomach lining from acid
  2. Non - glandular – no mucus production (site of gastric ulcers)
- Start of protein digestion
- Regulates rate at which digesta enters small intestine
Equine Anatomy & Digestion

SMALL INTESTINE (75’long)
After the stomach, the rest of the digestive system is a long tube that is coiled so it fits into the cavity of the abdomen. The first part of the tube is the small intestine. Its function is to finish digesting the digesta, and to extract as many nutrients as possible. Nutrients are carried through the lining of the intestine and directly into the blood stream, where they pass to the liver for further processing. The small intestine has three regions: the duodenum first, then the jejunum which is tightly coiled, and the ileum which passes into the large cecum and intestine. The small intestine in the horse is long, narrow and extremely coiled. It is attached to the top of the abdomen by mesentery. The mesentery to the jejunum is long and allows this mobile organ to wander anywhere in the abdomen.

- 75% of digestive tract but only 30% of total capacity
  - Duodenum – exits stomach, digestion of fats, protein and carbohydrates
  - Jejunum – longest part of the small intestine, absorption of fatty acids, amino acids, glucose, minerals, vitamins, electrolytes
  - Ileum - thick muscular wall, enters the cecum, acts like a valve (ileocecal valve)
- Enzyme mixtures in small intestine are sensitive to dietary changes and its ability to digest may be hindered, resulting in undigested carbohydrate reaching the large intestine

CECUM
The small intestine opens into a blind sac called the cecum and the large intestine or colon. In dogs and humans the cecum is small and contributes little to digestion. However, the cecum and ascending colon of the horse are greatly enlarged to form the fermentation vat where microbes ferment fibre to produce volatile fatty acids that horses uses for energy. The ascending colon is not just wide, it is also very long. To fit in the abdomen it has to be folded back on itself.

- Sac-like structure; hold 33-68L!
- House good bacteria that help breakdown plant fibre through fermentation
- Produces B vitamins and volatile fatty acids (VFA)
- Undigested carbohydrates will cause overproduction of gas and lactic acid
Equine Anatomy & Digestion

LARGE COLON
The ascending colon has many bends in it and changes in diameter as well. If the digesta are quite fluid there is no problem. But if the digesta get too dry, clumps can get stuck in the bends. The pelvic flexure is particularly susceptible because it narrows down too. Impaction - or blockage of the ascending colon - is a major cause of colic. Small frequent meals and plenty of water go a long way to prevent it.

- 11’ long and large diameter – 40% capacity of digestive tract (80L)
- Further microbial breakdown of fibre
- Absorption of fluids and VFA
- Production of gas

SMALL COLON
The small colon is about 10ft long and is smaller in diameter than the large colon. Fecal ball are formed here before they are excreted by the rectum.