

Esophagus:

Peristalsis, wavelike contractions of both circular and longitudinal muscles, pushes feed down the esophagus (throat) into the stomach.

Stomach

The interior surface of the lower portion of the stomach contains gastric glands, which produce different secretions that aid in protection and digestion:

Mucous cells secrete mucous to protect and lubricate the stomach lining

Parietal cells secrete hydrochloric acid needed for digestion. Acid is produced steadily, whether feed is present or not.

Chief cells secrete pepsinogen, which is converted by acid to the enzyme pepsin, used to digest protein

The combination of enzymes and acid in the stomach works to further break down feed before it moved into the small intestine.

Small Intestine

This is where most of the enzymatic breakdown and absorption of feed occurs. Here, a variety of enzymes are added to feed being digested. Starch, sugar, fat, vitamins, minerals, and protein are absorbed as the feed moves through the approximately 70 feet of small intestine.

Cecum:

Because horses do not produce the enzymes necessary to digest and release the energy held in fiber, they rely on the millions of various microbes in the cecum to break down cellulose (plant fiber) by fermentation into simple carbohydrates. These are then converted to Volatile Fatty Acids (VFAs) an essential source of energy for endurance and stamina.

Colon:

After fermentation, feed enters the colon for further digestion and absorption into the body. In addition to fiber digestion, the colon is the primary site of digestion and absorption of phosphorus, an essential mineral needed for skeletal growth, muscle contraction and energy utilization. The other main function of the equine hindgut is to serve as a reservoir of electrolytes and water which are vital to sustain exercise performance.

Digestive Tract Function

Mouth & Esophagus

The digestive process begins in the mouth, where teeth break feed into small pieces and crush stems and seeds. When feed is chewed, its surface area is increased so that it can more readily be broken down by enzymes, acid and bile salts.

Salivary glands in the mouth add a slippery lubricant called glycoprotein and buffers to neutralize acid.

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- Mucus cells secrete mucus to protect and lubricate the stomach lining.
- Parietal cells secrete hydrochloric acid needed for digestion. Acid is produced steadily, whether feed is present or not.
- Chief cells secrete pepsinogen, which is converted by acid to the enzyme pepsin, and used to digest protein.

The combination of enzymes and acid in the stomach work to further break down feed before it moves into the small intestine.

Small Intestine

The small intestine is where most of the enzymatic breakdown and absorption of feed occurs. Here, a variety of enzymes are added to feed being digested. Starch, sugar, fat, vitamins, minerals and protein are absorbed from feed as it moves along the approximately 70 feet of small intestine.

Large Intestine (Hindgut)

The large intestine includes the cecum and the colon. Millions of various microbes in the cecum break down cellulose (plant fiber) by fermentation into simple carbohydrates, which are then converted to Volatile Fatty Acids (VFAs). These VFAs are an essential source of energy for endurance and stamina. After fermentation, feed enters the colon for further digestion and absorption.