The adult equine digestive system is composed of over 100 feet of tube from the mouth to the rectum. It is a complicated labyrinth of twists and turns that when functioning properly is able to digest the food a horse eats and turn it into valuable nutrients and energy. The horse evolved as a grazing animal being able to roam across the countryside selecting forages that were easy to digest. Nowadays, we find horses with high performance demands that are confined to stalls for long periods of time that are being fed large meals once or twice a day using high energy feeds that the complex equine digestive system is not designed to process. The equine gastrointestinal tract (GIT) can be separated into two categories: the foregut & the hindgut. The foregut is composed of the esophagus, stomach and small intestines (duodenum, jejunum, ileum). The hindgut is composed of the cecum, large colon, small colon and the rectum. This month, we will focus on the hindgut.

The horse is unique in that most of the digestion of their feed occurs in the hindgut through the process of fermentation with the help of billions of naturally occurring bacteria and protozoa (together known as microbes). The cecum and large colon are similar to the rumen and reticulum of the cow and sheep. The fermentation process requires a large amount of water to keep the process running smoothly. On average, the large colon must absorb 20-30% of the horse’s body weight in water per day, roughly 25-35 gallons in the 1000 pound horse. The water is supplied by drinking and the ability of the GIT to pull fluid from the bloodstream in a continuous fashion. During the last phase of digestion the water is able to be recycled in the colon.

Undigested food (hay and grass) from the small intestine enters into the cecum. The cecum (known as the fermentation vat) is on average about four feet long and can hold eight to ten gallons of food and water. The walls of the cecum have sac-like pouches (sacculations) with many small ridges that are designed to slow the passage of food. Food remains in the cecum for up to seven hours, ensuring the microbes have adequate time to digest the feed material. Energy producing volatile fatty acids, amino acids, and B vitamins are a result of this fermentation process that are then reabsorbed in the cecum. The microbial population in the cecum becomes specific for the type of food that the horse normally consumes. Therefore, it is recommended that any feed changes be made gradually to decrease the overpopulation of microbes and an increase in fermentation process leading to an excessive build up of gas and as a result, colic.

From the cecum, microbial digestion continues into the large colon. The large colon is on average about 12 feet long and holds approximately 15 to 20 gallons of feed material and water. Like the cecum, the walls of the colon are also sacculated to allow the microbes adequate time to breakdown the feed material. The large colon is designed to be able to efficiently process a large volume of fibrous material however, the sacculations (pouches) can become twisted and fill with gas during the fermentation process. The result can be a serious case of colic that may require surgical intervention to resolve. Functions of the colon include absorption of water, electrolytes and short chain fatty acids. The fatty acids are the main source of energy in the horse.

From the large colon, feed material takes a short passage through the transverse colon and into the small colon. The small colon is on average nine to ten feet long and can hold about four
gallons of feed and water. By the time feed makes it to the small colon almost all of the nutrients have been digested. The main function of the small colon is to remove any excess water and return it to the body. The material that remains is not digestible by the horse and is formed into fecal balls that are passed into the rectum. On average, the process of ingesting food, the digestion of it, and the passage of waste material can take 36 to 72 hours.

A horse owner that can understand how the complex equine digestive system functions can better manage their horse’s feeding program to ensure that they are getting the best nutrients with the least complications. Always strive to make dietary changes slowly to allow the microbes time to adapt to the new diet. Complications that can arise in the hindgut of the horse are often the result of hastened feed changes, stress, and/or over zealous use of antibiotic and nonsteroidal medications to list a few. The large amount of naturally occurring bacteria and protozoa may experience an overgrowth during stressful times and a case of infectious diarrhea due to *Salmonella* or *Clostridium* may be the result. Due to the complexity of the equine gastrointestinal tract, small disturbances can quickly progress to life threatening emergencies.

There are many supplements available to help keep the hindgut healthy and functional should an intestinal disturbance occur. Below are several high quality options that are available at the Hagyard Pharmacy. Please note it is important to consult with your veterinarian prior to the use of any supplement.

**Assure ®:** A daily feed supplement formulated to support optimal digestive health including stabilization of the hindgut environment.

**Succeed ®:** A Digestive Conditioning Program ® that is scientifically formulated to support the health of the entire equine digestive tract, especially during the daily challenges of active training, competition, breeding, and foaling.

**Hagyard Anti-Diarrhea Paste:** Ultra purified bentonite clay that has been shown to adsorb viral and bacterial toxins.

**Saccharomyces boulardii:** A live yeast probiotic that has been shown to be effective in the prevention and treatment of colitis.