



## What is colic?

Colic is responsible for 1 in 3 emergency equine veterinary call-outs and is a major cause of death or euthanasia in horses.

In this article, we talk about what colic is and how the horse's digestive system works. Understanding the structure and function of this system is useful in understanding how to prevent colic.

### ***What is colic?***

The word 'colic' simply means 'pain in the abdomen (belly)'. So although we tend to think of colic as a single condition, there are actually lots of different types of colic.



Figure 1. The dotted line marks the outer margins of the abdomen

The horse's abdomen – which is where colic occurs – is the area enclosed by the blue dotted line in Figure 1. The abdomen contains almost all the organs associated with digestion (stomach, intestines, etc.) as well as a number of others. Disease of any of the organs in the abdomen can lead to colic. However, generally, colic is caused by pain in some part of the digestive system and this series of articles concentrates solely on colic associated with this system.

### Structure and function of the equine digestive system

The major function of any animal's digestive system is to extract nutrients from the food that is eaten. Horses have evolved to eat grass and have developed a highly specialised digestive system that allows them to break down plant material and use the products for energy. Figures 2, 3 and 4 show the parts of the equine digestive system that are in the abdomen.

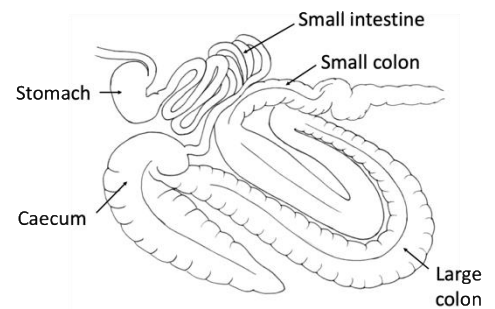


Figure 2. The equine digestive system

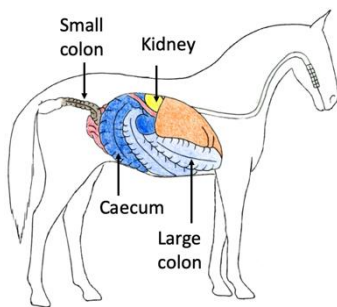


Figure 3. The equine digestive system in position

Once food has been swallowed, it travels down the oesophagus to the stomach. The food then moves to the small intestine before entering the parts of the intestine that are specialised for digestion of plants: the caecum and large colon. Once digestion has been completed, what is left of the food is expelled via the small colon, rectum and anus.

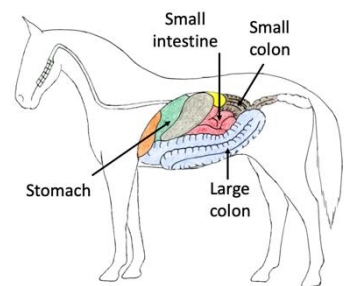


Figure 4. The equine digestive system in position

The tables below give information about each part of the digestive system, along with some colic-related facts.

<b>Stomach</b>	<b>Colic-related facts</b>
<ul style="list-style-type: none"> <li>• Starts digestion of non-fibrous food</li> </ul>	
<ul style="list-style-type: none"> <li>• Relatively small (8–15 litres/1.8–3.3 gallons*)</li> </ul>	<ul style="list-style-type: none"> <li>• Cannot hold large amounts of food</li> </ul>
<ul style="list-style-type: none"> <li>• Unable to vomit</li> </ul>	<ul style="list-style-type: none"> <li>• May rupture if contents swell (e.g., unsoaked sugar beet) or if small intestine is blocked because it has twisted or moved into an abnormal position (displacement) causing fluid to back up into stomach</li> </ul>
<ul style="list-style-type: none"> <li>• Secretes acid continuously</li> </ul>	<ul style="list-style-type: none"> <li>• Susceptible to ulcers</li> </ul>

<b>Small intestine</b>	
<ul style="list-style-type: none"> <li>• Completes digestion of non-fibrous food, including starch and sugars (unless starch/sugar content of diet is excessive)</li> </ul>	<ul style="list-style-type: none"> <li>• Excessive starch/sugar may pass to the caecum and large colon without being digested</li> </ul>
<ul style="list-style-type: none"> <li>• ~22 metres (72 feet) long*</li> </ul>	
<ul style="list-style-type: none"> <li>• Long tube that hangs off the bottom of a sheet of membrane, a bit like a large, mobile Cumberland sausage hanging off the bottom of a net curtain that is bunched together at the top</li> </ul>	<ul style="list-style-type: none"> <li>• Can move within the abdomen</li> <li>• May twist or move (displace) to an abnormal position</li> </ul>
<ul style="list-style-type: none"> <li>• Secretes ~100 litres (22 gallons) of fluid per day (most of which is reabsorbed)</li> </ul>	<ul style="list-style-type: none"> <li>• Requires constant, plentiful supply of fluid – hence horse needs constant access to fresh water</li> </ul>
<ul style="list-style-type: none"> <li>• Feed material moves fairly rapidly (~5 hours for stomach and small intestine combined)</li> </ul>	<ul style="list-style-type: none"> <li>• Blockage or obstruction of the small intestine can rapidly lead to problems</li> </ul>

<b>Caecum</b>	
<ul style="list-style-type: none"> <li>• Filled with bacteria and protozoa (microbes) that digest plant material</li> </ul>	<ul style="list-style-type: none"> <li>• Rapid changes in diet or inappropriate feeds can disrupt the population of microbes</li> </ul>
<ul style="list-style-type: none"> <li>• ~1.2 metres (4 feet) long*</li> </ul>	
<ul style="list-style-type: none"> <li>• Blind-ended sac (entry and exit points are close together at top of caecum)</li> </ul>	<ul style="list-style-type: none"> <li>• Can develop impactions/blockages of food</li> </ul>
<ul style="list-style-type: none"> <li>• Not suited for digestion of starch and sugar</li> </ul>	<ul style="list-style-type: none"> <li>• If too much starch/sugar is fed, some will pass through the stomach and small intestine undigested and enter the caecum; this may lead to production of lactic acid and acidosis (low pH), disruption of the normal population of microbes, and damage to the intestinal wall; in severe cases, death of microbes and absorption of toxins into the bloodstream may occur, leading to problems such as laminitis</li> </ul>

<b>Large colon</b>	
<ul style="list-style-type: none"> <li>• Filled with bacteria and protozoa (microbes) that digest plant material</li> </ul>	<ul style="list-style-type: none"> <li>• Rapid changes in diet or inappropriate feeds can disrupt the population of microbes</li> </ul>
<ul style="list-style-type: none"> <li>• ~3.5 metres (11 feet) long*</li> </ul>	
<ul style="list-style-type: none"> <li>• Incorporates three 180° turns and one substantial decrease in diameter</li> </ul>	<ul style="list-style-type: none"> <li>• Changes in direction and size create areas that are at risk of impaction (blockage)</li> </ul>
<ul style="list-style-type: none"> <li>• Arranged as a double-U, with one 'U' stacked on top of the other; attached to the body wall at one point only (adjacent to top of caecum)</li> </ul>	<ul style="list-style-type: none"> <li>• Colon can become displaced (move into an abnormal position)</li> </ul>
<ul style="list-style-type: none"> <li>• Not suited for digestion of starch and sugar</li> </ul>	<ul style="list-style-type: none"> <li>• If too much starch/sugar is fed, some will pass through the stomach and small intestine undigested and enter the colon; this may lead to production of lactic acid and acidosis (low pH), disruption of the normal population of microbes, and damage to the intestinal wall; in severe cases, death of microbes and absorption of toxins into the bloodstream may occur, leading to problems such as laminitis</li> </ul>

\* volumes and lengths relate to an adult horse