

# **Equine gastrointestinal system**

## **Lecture 1: Introduction to Equine Colic and Anatomy**

### **1. Introduction:**

#### **Definition of colic:**

Equine colic, characterized by acute abdominal pain, frequently prompts emergency situations in veterinary practice. For horse owners, this can be a distressing condition, especially given many misconceptions about its nature. Contrary to some beliefs, colic is not a distinct disease. Instead, it represents a spectrum of symptoms primarily indicative of pain, often tied to the gastrointestinal (GI) tract.

Colic pain arises from the distension of a viscus (like the stomach or intestine), reduction in blood supply to an organ, or from inflammation of the peritoneum (the lining of the abdominal cavity).

Equine colic is not solely a result of gastrointestinal issues. Many non-GI conditions, sometimes termed 'false colic,' can mimic its symptoms. Examples include uterine torsion in late-stage pregnant mares, acute exertional rhabdomyolysis causing sudden muscle breakdown, aortoiliac thrombosis leading to hind limb pain, and other diseases like bladder distension, pleuritis, liver ailments, and laminitis.

#### **Importance of understanding colic in equine practice:**

Understanding colic in equine medicine is essential due to its frequent occurrence and varied causes. Some forms, like strangulating obstructions, can be fatal without timely diagnosis and treatment. Beyond the horse's health, colic poses significant economic burdens from treatment costs, potential horse loss, and missed breeding or competition opportunities. For horse owners, colic episodes are highly stressful; they rely on veterinarians for accurate diagnosis, treatment, and prognosis guidance. Preventive advice, based on a vet's knowledge of colic causes and risk factors, can be invaluable. Given the dynamic nature of equine gastrointestinal research, continuous learning is vital for veterinary professionals.

### **2. Overview of the Equine Gastrointestinal Tract anatomy and basic functions:**

#### **◆ Mouth:**

- i. Function: The starting point of digestion where food is broken down mechanically by mastication and mixed with saliva.
- ii. Salivary Glands: Horses produce a significant amount of saliva (up to 40 liters/day) which aids in bolus formation, lubrication, and initial carbohydrate digestion.

◆ **Esophagus:**

- i. Function: Transports food from the mouth to the stomach. It's about 1-1.5 meters long in adult horses.
- ii. Muscle Composition: The esophagus transitions from striated muscle in the proximal two-thirds to smooth muscle in the distal third, aiding in coordinated food movement.
- iii. Unique Feature: Horses rarely vomit due to their lower esophageal sphincter and esophageal angle. However, extreme stomach distension may lead to rare cases of regurgitation, which is usually a critical condition requiring immediate veterinary care.

◆ **Stomach:**

- i. Function: Acts as a reservoir and initiates digestion. It mixes food with gastric juices containing hydrochloric acid and digestive enzymes.
- ii. Capacity: Relatively small (8-15 liters) compared to the horse's size. This is a reflection of their evolutionary grazing habit.

◆ **Small Intestine:**

- i. Function: Primary site for digestion and absorption of proteins, simple sugars, and fats.
- ii. Sections: Duodenum, jejunum, and ileum. The combined length is approximately 20-25 meters.
- iii. Digestive Enzymes: Produced by the pancreas and small intestinal lining. They help break down proteins, carbohydrates, and fats.

◆ **Cecum and Large Colon:**

- i. Function: Fermentation region where microbial populations break down fibrous plant materials, producing volatile fatty acids which are a significant energy source for the horse.
- ii. Cecum: Often referred to as the "hindgut," it's about 1 meter long with a capacity of 25-30 liters.
- iii. Large Colon: Comprises the right ventral colon, sternal flexure, left ventral colon, pelvic flexure, left dorsal colon, diaphragmatic flexure, right dorsal

colon and transverse colon. It's the primary site for water absorption and further fermentation.