Veterinary Bioscience: Digestive System

LECTURE 23
COMPARATIVE INTESTINES

LECTURER

DR NICHOLAS BAMFORD

n.bamford@unimelb.edu.au

INTENDED LEARNING OUTCOMES

At the end of this lecture, you should be able to:

- Describe the comparative gross anatomy of the small and large intestines of the horse, cow, sheep, pig and bird, including their course and position within the abdominal cavity and relationships to other organs.
- Describe the comparative gross anatomy of the pancreas and duodenal papillae in the horse, cow, sheep, pig and bird.
- Apply an understanding of intestinal anatomy of the horse, cow, sheep, pig and bird to explain how these species utilise different diets.

KEY WORDS

Digestion; duodenum; pancreatic ducts; bile duct; jejunum; ileum; ileocaecal orifice; caecum; ascending colon; taeniae; haustra; pelvic flexure; transverse colon; descending colon; rectum.

LECTURE OVERVIEW

This lecture will detail the comparative gross anatomy of the intestinal tracts of selected herbivore and omnivore species: horses, ruminants, pigs and birds. The intestinal tracts of these species are highly specialised, reflecting the different ways in which different species utilise different diets. Of particular interest is the way in which the hindgut of these species is adapted to facilitating microbial fermentation otherwise indigestible carbohydrates. The course and position of the different segments of the small and large intestines will be described, as well as comparative anatomy of the pancreas in these species and configuration of the duodenal papillae.

The small intestine

As in the dog and cat, the small intestines in the other domestic species consist of the duodenum, jejunum and ileum. Apart from the great length of the small intestine in the horse, ruminants and pig, there are some

differences in the ducts opening on the major and minor duodenal papillae (either one or two pancreatic ducts).

The large Intestine

While in the dog, the large intestine is short and unspecialised (a simple tube only slightly larger in diameter than the small intestine), in the ruminants, horse and pig it is greatly enlarged and coiled. This reflects the contribution of bacterial digestion in the hindgut and the absorption of nutrients in the form of volatile fatty acids.

FURTHER READING

Singh: *Dyce, Sack & Wensing's Textbook of Veterinary Anatomy*, 5th Ed. Elsevier, 2018.

Getty: *Sisson and Grossman's The Anatomy of the Domestic Animals*, Volumes I and II, 5th edition, 1975.

Smallwood: *A Guided Tour of Veterinary Anatomy*, Saunders, 1992.

Ashdown and Done: *Color Atlas of Veterinary Anatomy* The Ruminants, 1984.

Ashdown and Done: *Color Atlas of Veterinary Anatomy* The Horse, 1984.

Fails: *Anatomy and physiology of farm animals*, Wiley, 2018.