

Veterinary Bioscience: Digestive System



LECTURE 5 FROM MOUTH TO STOMACH

LECTURER

PROFESSOR SIMON BAILEY

After time spent in mixed veterinary practice in the UK, Simon undertook a PhD at the Royal Veterinary College, London. He then continued in research at the RVC, working in the fields of equine laminitis and inflammation. Simon then worked as a research scientist at the Heart and Lung Research Institute at the Ohio State University Medical Center, Columbus, Ohio. He then returned to the Royal Veterinary College as a lecturer and moved to the University of Melbourne in 2007. He is currently Professor of Pre-clinical Veterinary Sciences, and conducts research on inflammatory diseases, pharmacology and endocrinology in various species including horses.



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INTENDED LEARNING OUTCOMES

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

- Utilise your knowledge of the structure and location of the salivary glands in different species, in order to relate this to differences in diet and feeding.
- Explain the process of bolus formation and swallowing, in order to relate the structural features of the tongue and pharynx to their function.
- Apply your knowledge of the structure of the oesophagus and its relationships to other anatomical structures, in order to understand the potential physical and functional mechanisms by which obstruction may occur.

KEY WORDS

Oral cavity; salivary glands; oesophagus; mediastinum; neck; smooth muscle; skeletal muscle.

LECTURE OVERVIEW

When food is introduced into the oral cavity, it is moistened with the secretions of the salivary glands. The major salivary glands in most domestic species are the parotid, mandibular and sublingual glands; the carnivores have an additional salivary gland, the zygomatic gland. Most of these glands convey their secretions to the oral cavity through a single primary duct. The secretory cells within salivary glands are

arranged in acini, and can be either mucous-secreting or serous-secreting cells. The acini release their contents into a branching duct system, which conveys the secretions to the primary duct.

In preparation for swallowing (deglutition), the moistened bolus of food is shaped by the movement of the tongue, then moved into the pharynx where it initiates a series of reflex muscle actions, causing the pharynx to move rostrally to engulf the bolus and push it into the oesophagus; here, peristaltic contractions are initiated, resulting in the bolus being conveyed to the stomach.

The oesophagus is a muscular tube that runs from the pharynx to the stomach. It is found in close proximity to the trachea within the neck, and within the mediastinum within the thorax; it penetrates the diaphragm before joining the stomach within the abdomen. The oesophagus is lined with a mucosa, which includes a muscle layer and is surrounded by the submucosa, which contains glands. An external muscle layer surrounds the submucosa; this layer is composed of skeletal muscle at the cranial end, and in most species changes to smooth muscle at the caudal end. A connective tissue layer surrounds the muscle layer.

FURTHER READING

Dyce, KM & Wensing, CJG (2010) *Textbook of Veterinary Anatomy*, 4th ed, St Louis, Saunders/Elsevier

Eurell, JA & Frappier BL (2006) *Dellmann's Textbook of Veterinary Histology*, 6th ed, Ames: Blackwell