

Veterinary Bioscience: Digestive System



PRACTICAL 4 SHEEP HEAD DISSECTION

TEACHING STAFF

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LOCATION

- WEBS (Building 125) Dissection Laboratory (Room B104)

INTENDED LEARNING OUTCOMES

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

- Identify the positions of the major salivary glands of the sheep.
- Recognise the major anatomical structures of the mouth and oropharynx.
- Identify the major gross features of the tongue of different species.

CLASS PREPARATION

- A video tutorial is available on the LMS. Students should review this **prior** to attending class.

1. SHEEP HEAD DISSECTION

Your table has been provided with one sheep head that has been sectioned along the median plane. Work in two groups, with half a head each. You may find some structures are easier to identify in one section or the other, as a perfect midline cut is difficult to achieve.

You will be expected to know the structures that are highlighted in **bold** type.

Dissection: Incise the skin around the nostril and lips, around the eye following the bony orbit and around the base of the ear. Using rat-toothed forceps and a scalpel, carefully remove the skin from the entire head, just leaving behind the skin surrounding the nostril, lips, eye and ear. You should start from one of the cut edges of the head, trying to leave as much subcutaneous tissue intact as you can. Then remove the thin layer of subcutaneous muscle and the layer of fat overlying the deeper tissues (it is difficult to do this cleanly).

Begin your identification of structures on the lateral surface of the head.

The **parotid salivary gland** lies mainly caudal to the masseter muscle, extending from the base of the ear dorsally, to the angle of the mandible ventrally. The parotid gland is likely to be incomplete in your abattoir sourced specimen. Note the **parotid duct** as it passes from the rostral margin of the parotid gland across the ventral aspect of the masseter towards the cheek.

The **mandibular salivary gland** in the sheep is larger than the parotid and lies medial to it and the ramus of the mandible. Its duct runs below the oral mucosa on the floor of the oral cavity, to open at the sublingual caruncle (see later).

Note the lymph nodes (mandibular and parotid) that lie close to these salivary glands.

The dorsal and ventral **buccal salivary glands** occupy the cheek, level with the upper and lower cheek teeth – only parts of these glands will be visible at this stage.

The **buccinator** is the muscle that acts to return food from the vestibule (space between the cheek and the teeth) to between the teeth for chewing. It covers the buccal region between the maxilla and mandible, from the angle of the lips to the ramus of the mandible.

The muscles of mastication include the **masseter**, that lies on the lateral surface of the ramus of the mandible, ventral to the zygomatic arch, and the **temporalis**, that occupies the temporal fossa and lies dorsal and medial to the zygomatic arch and rostral and medial to the pinna of the ear.

Now turn to the medial cut surface of your specimen.

Identify the following structures:

Tongue

- The **frenulum, body, root, apex** and **torus**.
- The **papillae** – which types can you find?
- The **intrinsic muscle** of the tongue (The medial aspect of some of the extrinsic muscles of the tongue may be observed, but these muscles will be more clearly shown in the dog demonstration dissection). Note the transected basihyoid bone in the muscle of the root of the tongue – this is one of the bones of the hyoid apparatus (individual bones of the hyoid will be covered in the respiratory course and need not be explored here). The extrinsic and intrinsic muscles of the tongue act to move and shape the tongue during prehension, chewing and swallowing of food.

The **sublingual caruncles** in the sheep lie on the floor of the mouth, rostral to the frenulum and caudal to the lower incisors. Which salivary gland ducts open here?

Dental pad

Buccal papillae

Hard palate and soft palate

The **pharynx** - this has three parts:

- The **oropharynx** is the space ventral to the soft palate that extends from the palatoglossal arches to the base of the epiglottis.
- The **nasopharynx** is the space dorsal to the palate that extends from the choanae (internal nostrils) to level with the caudal margin of the soft palate at the palatopharyngeal arches.
- The **laryngopharynx** extends from level with the caudal margin of the soft palate to the entrance to the **oesophagus** (the pharyngeal muscles that assist with movement of food into the oesophagus will be indicated in the demonstration dog dissection).

The larynx lies ventral to the laryngopharynx and entrance to the oesophagus. (The individual components of the larynx will be covered in your respiratory course and their identification, except for the epiglottis, is not required here).

Now turn to the ventral aspect of the head.

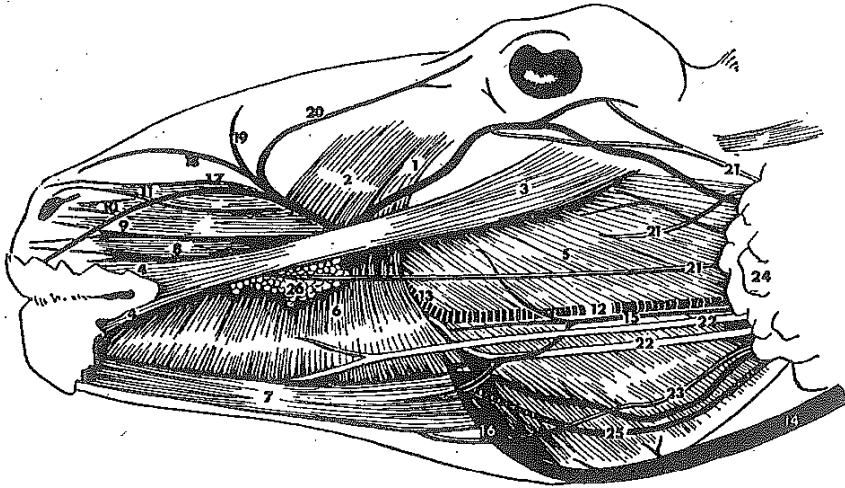
The thin **mylohyoideus** muscle is the most ventral muscle, with transverse fibres that originate on the medial aspect of the mandible. The thicker straplike muscle dorsal to it is the **geniohyoideus**. These muscles act to move the hyoid and tongue to facilitate prehension and swallowing.

Dissection: Incise the mylohyoideus along its attachment to the mandible.

This will expose the **digastricus** muscle that runs medial to the ramus to insert on the medial and ventral aspects of the body of the mandible. This muscle originates on the occipital bone of the skull and it acts to open the mouth. You will also see the ventral part of the **pterygoid** muscle attached to the medial surface of the ramus of the mandible, deep to the digastricus. The pterygoid, masseter and temporalis muscles act together to elevate and (in herbivores) rotate the jaw during mastication.

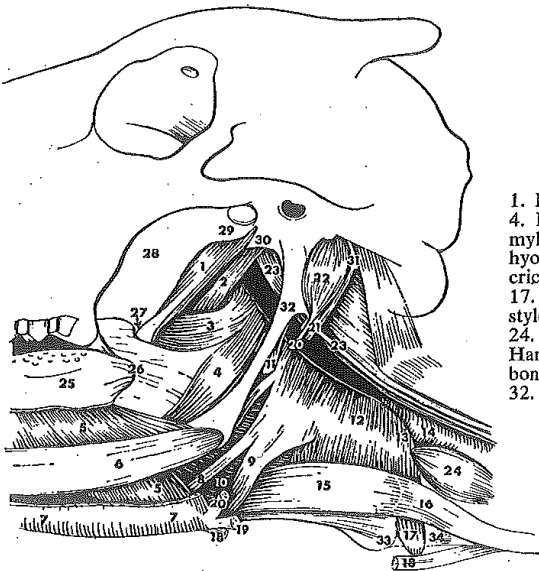
Dissection: Make a longitudinal incision through the mylohyoideus, parallel to the mandible, to expose the sublingual salivary gland.

You may notice one or more large nerves in this region that innervate the tongue.



SUPERFICIAL DISSECTION OF THE HEAD

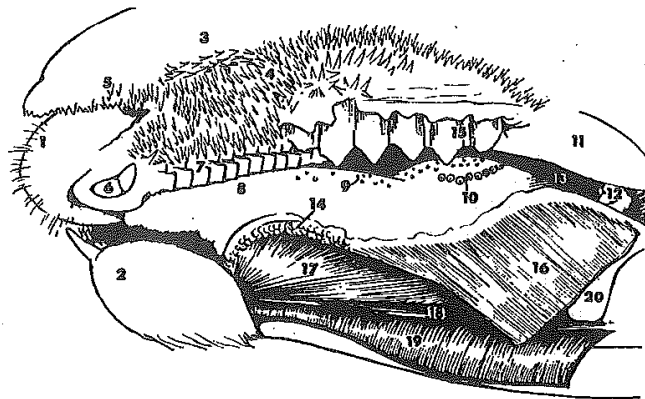
1. M. malaris (m. depressor palpebrae inferioris); 2. M. malaris (m. levator buccalis); 3. M. zygomaticus; 4. M. orbicularis oris; 5. M. masseter; 6. M. buccinator; 7. M. depressor labii inferioris; 8-9. M. depressor labii superioris; 10. M. dilatator naris lateralis; 11. M. levator labii maxillaris; 12. A. facialis transversa; 13. A. labialis maxillaris; 14. V. maxillaris externa; 15. V. facialis transversa; 16. V. facialis; 17. V. labialis superior; 18. V. lateralis naris; 19. V. dorsalis naris; 20. V. angularis oculi; 21. N. temporalis superficialis; 22. N. buccalis dorsalis; 23. N. buccalis ventralis; 24. Parotid gland; 25. Parotid duct. 26. Buccal gland.



MUSCLES OF THE PHARYNX AND LARYNX

1. M. tensor veli palatini; 2. M. levator veli palatini; 3. M. pterygopharyngeus; 4. M. stylopharyngeus (pars oralis); 5. M. hyoglossus; 6. M. styloglossus; 7. M. mylohyoideus; 8. M. keratopharyngeus; 9. M. chondropharyngeus; 10. M. keratohyoideus; 11. M. stylopharyngeus (pars aboralis); 12. M. thyreopharyngeus; 13. M. cricopharyngeus; 14. Oesophagus; 15. M. thyreohyoideus; 16. M. sternothyroideus; 17. M. cricothyroideus; 18. M. sternohyoideus; 19. M. omohyoideus; 20. M. stylohyoideus; 21. M. digastricus; 22. M. occipitohyoideus; 23. M. longus capitis; 24. Thyroid gland; 25. Tongue; 26. Cut edge of plica pterygomandibularis; 27. Hamulus of pterygoid bone; 28. Palatine bone; 29. Pterygoid process of sphenoid bone; 30. Muscular process of petrous temporal bone; 31. Paramastoid process; 32. Stylohyoid; 33. Thyroid cartilage; 34. 1st tracheal ring.

NDS May, The Anatomy of the Sheep – a dissection manual, 3rd ed, 1977, UQP, pp. 148, 188, 195



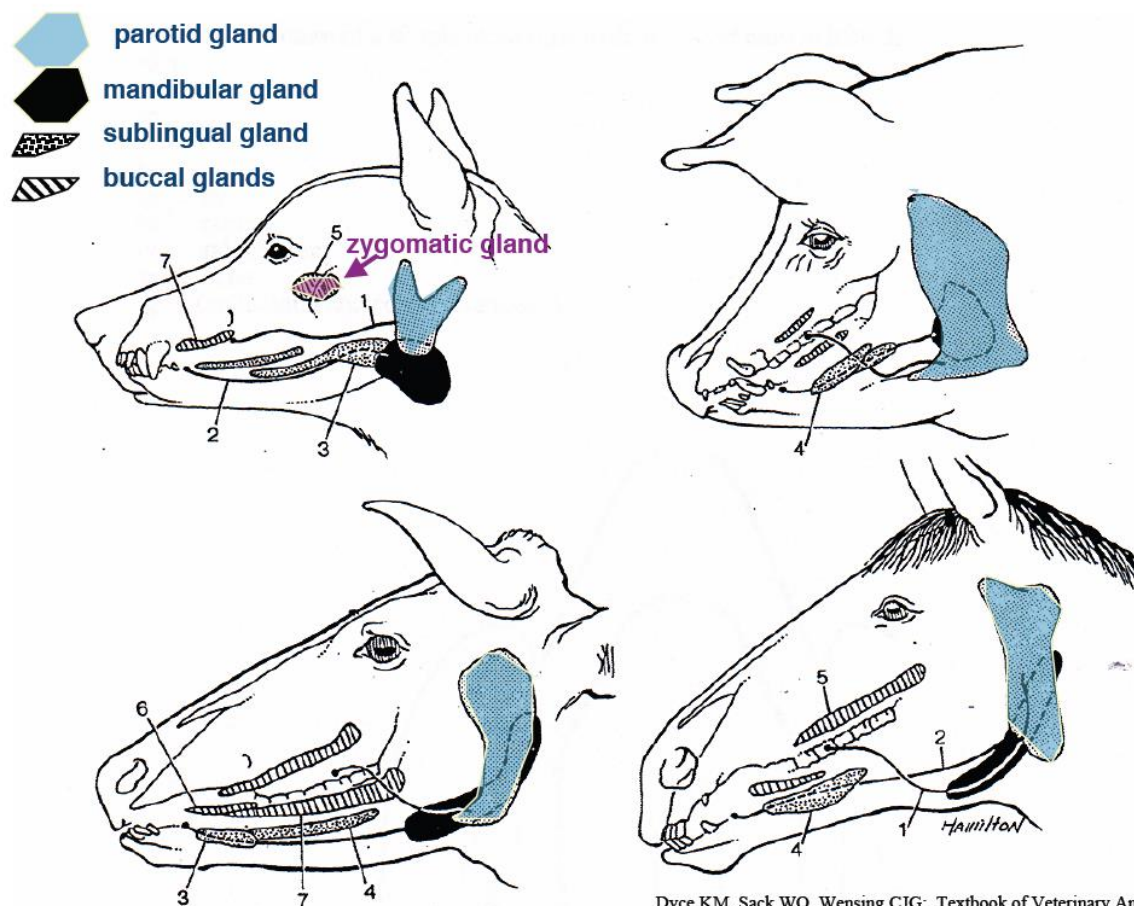
MOUTH CAVITY

1. Upper lip; 2. Lower lip; 3. Cheek; 4. Papillae of cheek; 5. Papillae of lip; 6. Papilla incisiva; 7. Ridges of hard palate; 8. Tongue; 9. Fungiform papillae; 10. Vallate papillae; 11. Soft palate; 12. Tonsil; 13. Pharynx; 14. Sublingual glands; 15. 6th cheek tooth; 16. M. hyoglossus; 17. M. genioglossus; 18. M. geniohyoideus; 19. M. mylohyoideus; 20. Hyoid bone.

2. DOG DEMONSTRATION DISSECTION

This specimen has been prepared so that you can examine an intact larynx and pharynx in situ. The salivary glands have been reflected or removed, the digastricus muscle excised, the mandibular symphysis separated and tissues attached to the medial surface of the mandible reflected. Identify the **mylohyoideus** and **geniohyoideus** muscles. The **extrinsic muscles of the tongue** that originate on the hyoid and the mandible and insert onto the tongue may be seen in this preparation (it is not necessary to name them individually here - that will be covered in a subsequent course).

At its cranial end the oesophagus lies dorsal to the trachea. The pharyngeal muscles are intact in this specimen. Insert a finger into the entrance of the oesophagus by passing your hand over the dorsal aspect of the tongue. Your fingers are now within the **pharyngeal muscles** that are rostral to the oesophageal entrance. You will also be able to feel some of the delicate bones of the **hyoid apparatus** on either side of this arch of muscles and the cartilages of the **larynx** ventrally.



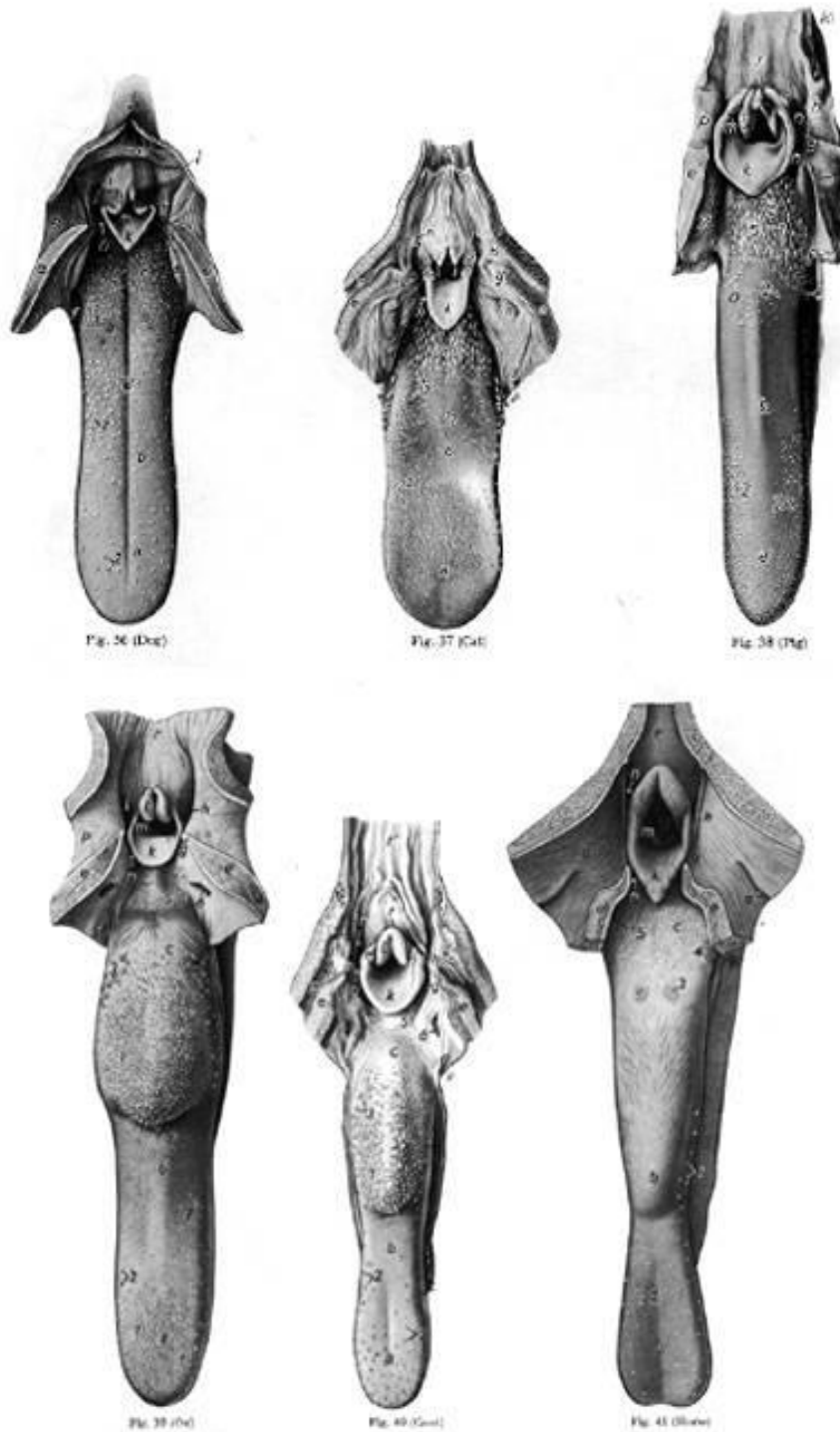
Dyce KM, Sack WO, Wensing CJG: Textbook of Veterinary Anatomy. Philadelphia, Saunders, 1987.

3. COMPARATIVE TONGUES

A number of tongues from different species will be available for examination. Determine the species from which each tongue was taken.

Identify and examine the following features: shape, dorsum, apex, body, frenulum, torus linguae and hyoid bones if present.

Identify and examine the papillae in respect to types and distribution in each species. What are their functions?



From R. Nickel, A. Schummer and E. Seiferle. *The Viscera of the Domestic Mammals*. 1973