Digestive System Mid-Semester Test 2023

Practice questions

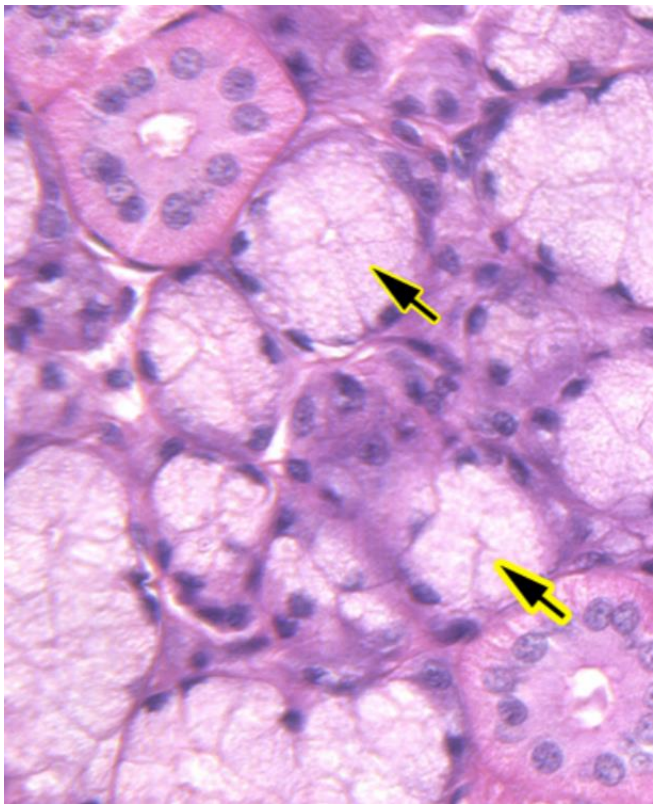
Section A – Multiple Choice Questions (12 questions / 12 marks)

Question 1. (Lecture 1; Practical 6)

Which of the following muscles form the ventral boundary of the abdominal cavity?

A. Transverse abdominal
B. Internal abdominal oblique
C. External abdominal oblique
D. Rectus abdominis
E. Serratus ventralis

Question 2. (Lecture 5; Practical 5)

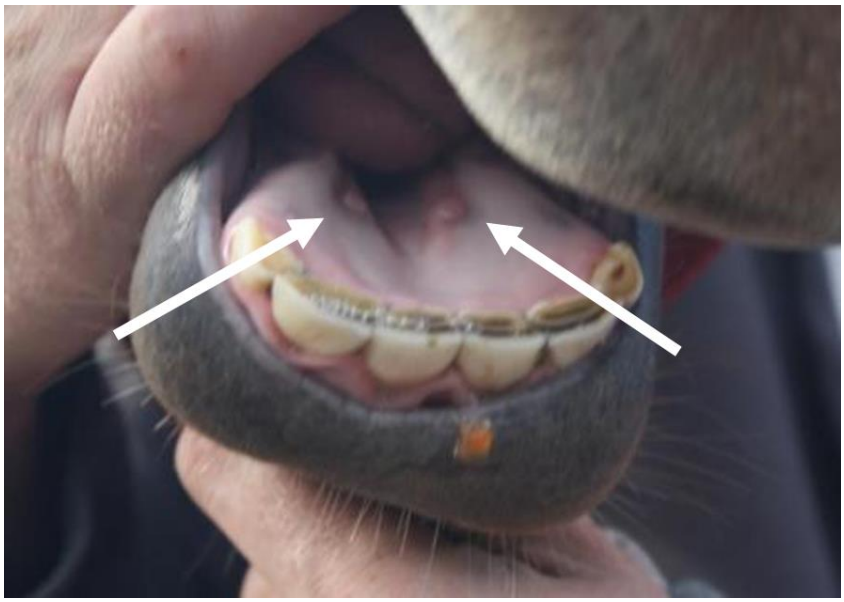


The main function of the cells indicated by the arrows in this section is to ……..?

A. absorb nutrients from ingesta
B. store energy
C. provide enzymes to aid digestion
D. provide lubrication to ingesta

Arrows highlight pale staining mucous acinus.

Question 3. (Lecture 5, Practical 4)



Consider the structures indicated by the arrows, in the mouth of this young horse. Saliva from which two salivary glands emanates into the oral cavity from here?

A. Zygomatic and mandibular glands
B. Parotid and mandibular glands
C. Mandibular and sublingual glands
D. Parotid and submandibular glands

Question 4. (Practical 1)

Which bone of the skull is most caudal and articulates with the atlas? See diagram.

A. Occipital
B. Parietal
C. Frontal
D. Zygomatic
E. Pterygoid

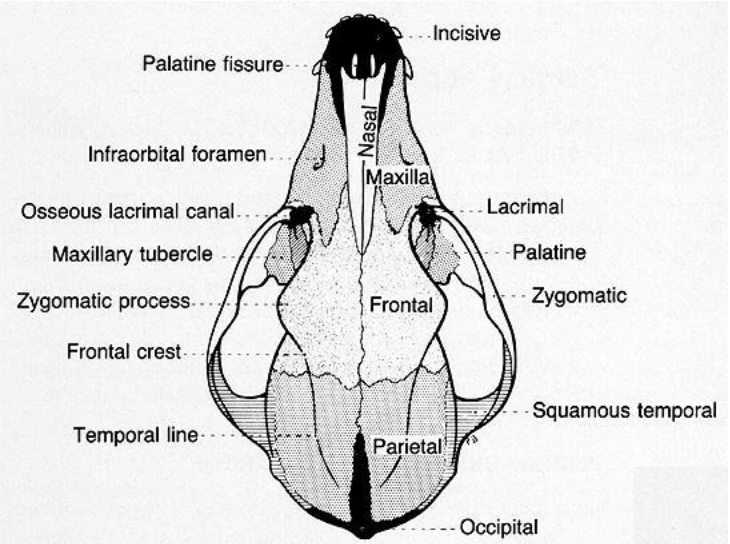


FIG. 17-3 Bones of the skull, dorsal aspect. (Evans HE, Christensen GC: Miller's Anatomy of the Dog, pp 113–161. Philadelphia, WB Saunders, 1979)

Question 5. (Lecture 3; Practical 2)

Which one of the following is correct in relation to the dentition of the horse?

A. Secondary dentine is visible on the table of the incisors of young horses, but disappears with age.
B. The incisors erupt continuously, but the molars do not.
C. There are enamel ridges on the surface of the cheek teeth, because enamel wears more slowly than dentine.
D. All four canines erupt in all horses.

Question 6. (Lecture 6)

A description of the superficial wall of the greater omentum in the cow would most likely include which one of the following phrases?

A. Covers all the small intestine on the left side of the abdomen
B. Covers the entire left side of the rumen and the small intestine
C. Separates the ventral sac of the rumen from the left abdominal wall
D. Covers only the abomasum

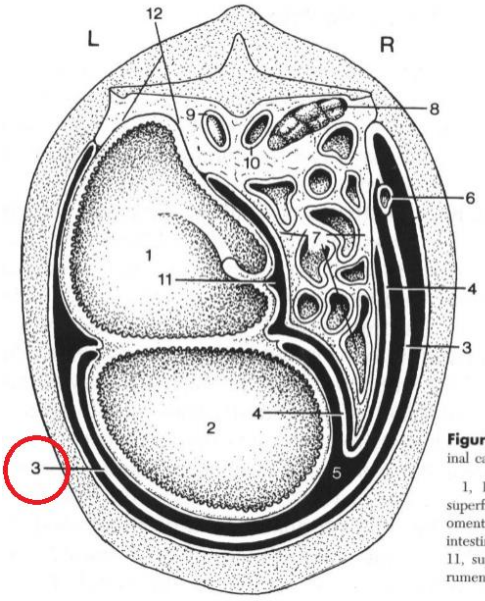


Figure 28–21. Schematic transverse section of the abdominal cavity to show the disposition of the greater omentum.

1, Dorsal sac of rumen; 2, ventral sac of rumen; 3, superficial wall of greater omentum; 4, deep wall of greater omentum; 5, omental bursa; 6, descending duodenum; 7, intestinal mass; 8, right kidney; 9, aorta; 10, caudal vena cava; 11, supraomental recess; 12, retroperitoneal attachment of rumen.

Question 7. (Lecture 12)

Which of the following is not an enterogastrone?

A. Gastrin
B. Secretin
C. Cholecystokinin
D. Acetyl choline
E. Gastric Inhibitory Peptide

Question 8. (Lecture 12)

Which of the following stimuli is likely to delay gastric emptying?

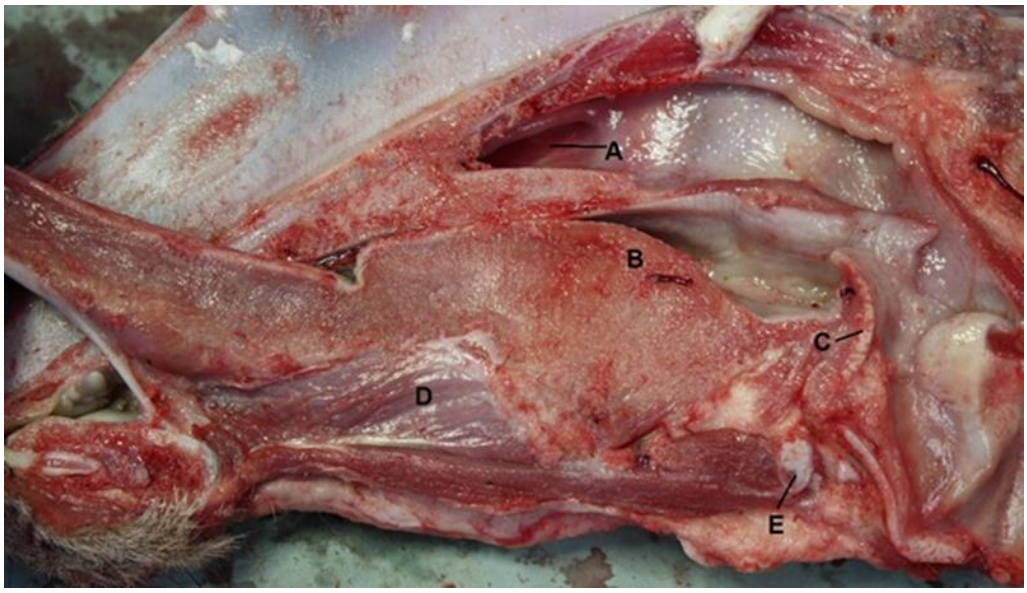
A. Stretch of the stomach
B. Presence of protein in the stomach
C. Presence of fat in the stomach
D. Stretch in the duodenum

Question 9. (Lecture 10)

A raised flat-topped solid lesion in the oral mucosa is known as a:

A. vesicle
B. papule
C. erosion
D. bulla
E. necrosis

Question 10. (Lecture 4; Practical 4)



Median section of sheep head, viewed from the median surface.

Which of the following statements is true regarding the structure labelled 'D'?

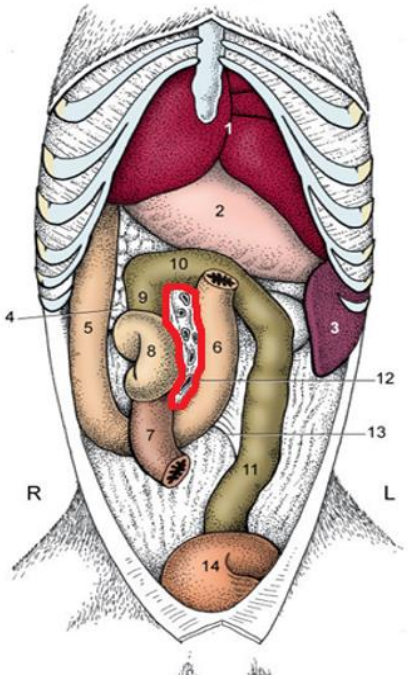
A. This is the mylohyoideus muscle.
B. This is an intrinsic muscle of the tongue.
C. This is the genioglossus muscle.
D. This muscle is responsible for closing the jaws.
E. This muscle is comprised exclusively of smooth muscle fibres.

Question 11. (Lecture 9; Case Study 2)

On a lateral abdominal radiograph, which organ/structure will be visualised adjacent to the diaphragm?

A. Left kidney
B. Spleen
C. Liver
D. Bladder
E. Caecum

Question 12. (Lecture 15; Practical 6)



Anatomic drawing of dog abdomen, deep dissection.

Which number indicates the ascending duodenum?

A. 5
B. 6
C. 7
D. 8
E. 9
F. 10
G. 11

Section B – Short Answer Questions (10 questions / 18 marks)

Question 13 (Lecture 4; Practical 4) **(1 minute)**

What is a gustatory papilla? Provide one (1) example.

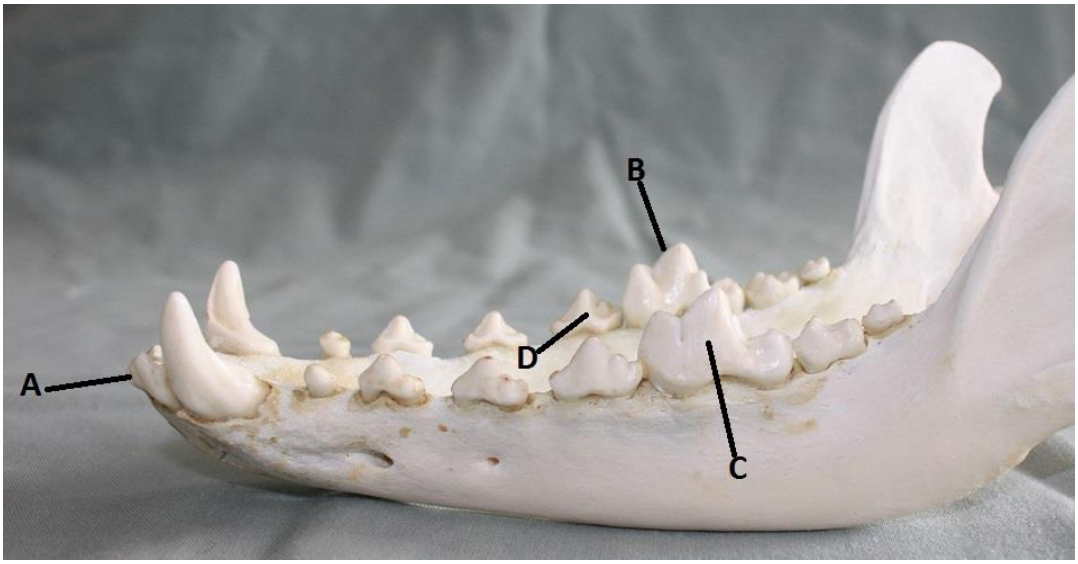
Lingual papilla that contains taste buds. Examples: fungiform, vallate/circumvallate, foliate.

Question 14 (Lecture 6) **(1 minute)**

On the internal surface of the rumen, the separations between the dorsal and ventral sacs are indicated by what anatomical features?

Longitudinal pillars (left and right)

Question 15 (Lecture 3; Practical 2) **(1 minute)**



Canine mandible and teeth

Which anatomical surface of the tooth is indicated by the letter C?

Buccal surface

Question 16 (Lecture 2; Practical 2) **(2 minutes)**

Name the two (2) mineralised tissues into which the fibres of the periodontal ligament are embedded in order to anchor the tooth. Include in your answer where these tissues are located.

Alveolar bone or lamina dura – lining the socket or alveolus.

Cement/um – on the root of the tooth.

Question 17 (Lecture 4; Practical 4) **(2 minutes)**

Name the two muscles of mastication that insert onto the medial surface of the mandible. Also note which one serves to open the jaws and which one serves to close the jaws.

Open jaws – digastricus.

Close jaws – pterygoid.

Question 18 (Lecture 7) **(1 minute)**

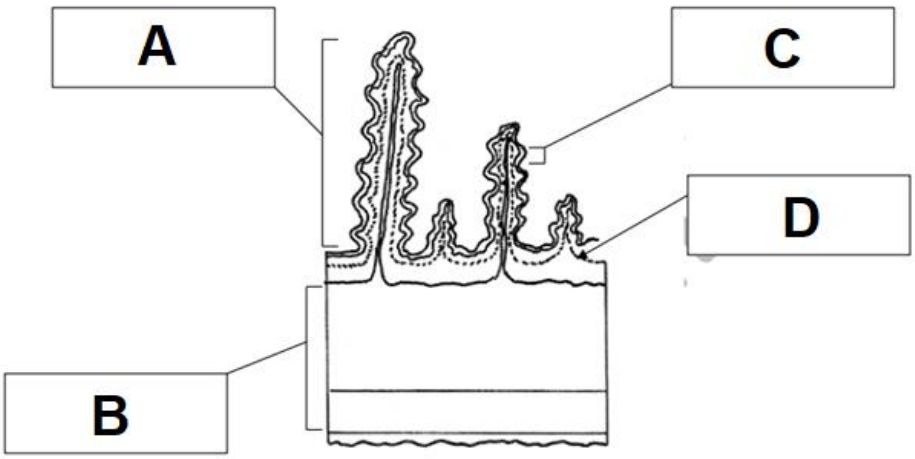
Name the two (2) main parts of the stomach of birds:

i. Proventriculus

ii. Gizzard (ventriculus)

Question 19 (Lecture 6; Practical 5) **(2 minutes)**

The diagram below if of the wall of the omasum. Which structure is indicated by each of the letters?



The possible responses include:

- Adventitia
- Laminae (or fold)
- Muscularis mucosa
- Muscularis externa
- Papilla
- Rugae
- Serosa
- Villi

A: Laminae

B: Muscularis externa

C: Papilla

D: Muscularis mucosa

Question 20 (Case Study 2) **(3 minutes)**

Briefly describe how a dog with gastric dilation volvulus can suffer from cardiovascular compromise. (Your response should require no more than 3 sentences.)

The distended stomach within the cranial abdomen places pressure on the caudal vena cava (one of the main veins returning blood to the heart). The reduction in venous return leads to a reduction in blood that is available to the heart that can then be pumped around the body. This leads to a decrease in blood (and therefore oxygen) reaching the organs and tissues of the body, eventually leading to collapse of the dog.

Question 21 (Lecture 3; Practical 2) **(2 minutes)**

Briefly describe the 'peg teeth' in rabbits.

The peg teeth of a rabbit are the two smaller incisors that sit immediately caudal to the first incisors of the upper arcade. When at rest the lower incisors occlude against the peg teeth.

Question 22 (Lecture 15; Practical 6) **(3 minutes)**

Explain the differences in the configuration of the duodenal papillae between dogs and cats. For each species, state which ducts release secretions through each duodenal papilla?

Dogs have two duodenal papillae: a major duodenal papilla and a minor duodenal papilla. The major duodenal papilla contains the openings for both the common bile duct and pancreatic duct. The minor duodenal papilla contains the opening for the accessory pancreatic duct. In contrast, cats have only a single duodenal papilla, which contains the opening for both the common bile duct and pancreatic duct.

Note that there is a Week 7 Discussion Board post related to this topic, which you should review. The anatomic variation in cats is emphasised because of its clinical relevance, but there are a minority (10-20%) of cats that will have the same configuration as dogs. You did not need to provide this information to achieve full marks – the point of emphasis needed to be the contrasting circumstance where most cats only have a single duodenal papilla.

SECTION C – Extended response questions (5 questions / 20 marks)

Clinical scenario for Questions 23-25 **(10 marks)**

Butternut, a 28-year-old Welsh pony gelding, is presented with a frothy white discharge from both nostrils, copious amounts of clear fluid dribbling from his mouth and his head lowered to the floor. His heart rate is 60 beats per minute and his respiratory rate is 20 breaths per minute. He has normal gut sounds and his faeces is of normal colour and consistency.

Question 23 (Lecture 11; Case Study 1)

What is the most likely diagnosis for Butternut's clinical signs? (1 mark)

Oesophageal obstruction. Would also award mark for 'choke' noting that this is a commonly used term in veterinary medicine. However, wherever possible, use scientific terminology in your answers.

Question 24 (Case Study 1)

Name the two (2) biggest risks of the condition to Butternut's health, if left untreated. Briefly explain the pathophysiological mechanism leading to these severe health problems. (6 marks)

If the question asks for two things plus an explanation and there are 6 marks allocated, then that means that there will be one mark for naming each risk plus two marks for explaining each mechanism.

First major risk: Dehydration.

Pathophysiological mechanism: The first mark was for explaining that water from saliva is lost and cannot get to the intestines to be recycled back into the circulation. The second mark was for the fact that the horse cannot take in water by drinking.

Second major risk: Aspiration pneumonia.

Pathophysiological mechanism: The first mark was for explaining that if the horse puts its head up, then saliva which has pooled in the laryngopharynx may enter the trachea by gravity, when the epiglottis of the larynx is opened to breath. The second mark was for mentioning that this may cause an infection/pneumonia (because the saliva is not sterile and also will be contaminated with food particles).

Note that asphyxiation is not correct. This horse is not 'choking' in the sense of having its trachea (windpipe) occluded (which is what we would usually associate with 'choking'). Instead it is the oesophagus that is obstructed. The horse has not been reported to be coughing or exhibiting difficulty breathing.

Question 25 (Case Study 1)

You tell the owner that Butternut's age may be contributing to the condition. Explain how old age can predispose horses to the condition. (3 marks)

The first mark was awarded for stating that old age leads to excessive teeth wear.

A further mark was given for explaining that if waves or steps or sharp edges develop on the cheek teeth (and cannot be managed by floating), then the horse will not be able to masticate/ grind down the grass or hay to small particles/pieces.

The third mark was awarded for explaining that the grass or hay stems, if they are not ground down sufficiently by the cheek teeth they accumulate as balls of fibre. These balls (boluses) may become stuck in the oesophagus (at one of various points along its length) and obstruct the passage of saliva.

A note about marking schemes for short-answer and extended-response questions.

We have noted above where the marks would be awarded. However, responses are considered holistically. So, if you include correct information, but then contradict yourself by including incorrect information, that response cannot receive full marks, and will be adjusted accordingly. It is important to consider how your whole answer fits together to correctly answer the question that has been asked.

Clinical scenario for Questions 26-27 **(10 marks)**

A ten-year-old cat presents with a history of vomiting over the previous 48 hours. The cat appears a little subdued, has a decreased appetite and has a body condition score of 2/5. Your physical examination of the cat reveals a mildly increased rectal temperature (39.6 °C) but no other obvious abnormalities.

In the absence of other findings, it is suspected that this may be a case of gastritis.

Question 26 (Lecture 14)

Explain the mechanism by which inflammation in the wall of the stomach may cause vomiting. (4 marks)

Gastritis is inflammation of the stomach wall. Inflammation/irritation of the gastric wall results in the activation of sensory vagal and sympathetic afferents, which transmit signals directly to the vomiting centre of the brain to initiate vomiting. Vomiting can also result from activation of the chemoreceptor trigger zone, through the action of cytokines released as part of the inflammatory process, or if toxins are absorbed into the circulation due to gastric barrier impairment. Activation of the CTZ then acts through the vomiting centre to initiate vomiting.

Question 27 (Lecture 14; Case Study 2)

As part of the symptomatic treatment to stop the vomiting, an anti-emetic drug is administered. Name two classes of anti-emetic drugs that would be appropriate to use to treat this cat, and indicate where and how they act. (6 marks)

This question is asking you to recall the classes of anti-emetics and their mechanism of action. Again, one mark for a class of drugs and two marks for the associated mechanism of action. For example, you could choose:

- Neurokinin-1 receptor antagonists (e.g. maropitant). These drugs act to prevent the binding of neurotransmitters (substance P) with NK-1 receptors, a key receptor type involved in the initiation of vomiting, that is located within both the vomiting centre and chemoreceptor trigger zone.
- Dopamine receptor antagonists (e.g. metoclopramide). These drugs prevent dopaminergic receptors activation in the chemoreceptor trigger zone. Therefore, metoclopramide will be ineffective in conditions that cause vomiting by acting directly through the vomiting centre. Metoclopramide also has prokinetic effects to increase tone of the lower oesophageal sphincter, increase gastric antral contraction, relax the pylorus and increased smooth muscle contraction in the duodenum. These effects could also help to prevent vomiting indirectly by alleviating feedback mechanisms that are related to delayed gastric emptying and stretch.
- 5HT-3 antagonists (e.g. ondansetron). These drugs have a central action by preventing 5HT-3 receptor activation within the chemoreceptor trigger zone. They also have a peripheral action by antagonising 5HT-3 receptors in the GI tract that would usually generate visceral afferent signals via the vagus nerve directly to the vomiting centre.