

Comprehensive Animal Nutrition – Mock Exam

Name: _____

Date: _____

Section 1: Multiple Choice – Monogastrics (Circle the correct answer)

1. Which process describes prehension?
 - a) Absorption of nutrients in the small intestine
 - b) Grinding food mechanically in the gizzard
 - c) Getting food into the mouth
 - d) Secreting digestive enzymes

2. Which type of saliva in pigs begins chemical digestion?
 - a) Serous – watery, enzyme-rich
 - b) Mucous – lubrication only
 - c) Parietal – acid secretion
 - d) Goblet – mucus

3. The gizzard (ventriculus) in birds is primarily responsible for:
 - a) Chemical digestion of proteins
 - b) Mechanical grinding of food
 - c) Absorption of carbohydrates
 - d) Microbial fermentation

4. Which of the following is NOT a function of the small intestine?
 - a) Nutrient absorption
 - b) Secretion of digestive enzymes
 - c) Water absorption
 - d) Mechanical breakdown of large particles

5. In pigs, which organ is responsible for most microbial fermentation of fiber?
 - a) Stomach
 - b) Small intestine
 - c) Cecum
 - d) Liver

6. Parietal cells secrete:
 - a) Pepsinogen
 - b) HCl and intrinsic factor
 - c) Mucus
 - d) Lipase
 7. The pancreas secretes exocrine products that:
 - a) Include insulin and glucagon
 - b) Neutralize acidic chyme and digest macromolecules
 - c) Store bile
 - d) Grind food mechanically
 8. Which enzyme converts inactive pepsinogen into pepsin?
 - a) Lipase
 - b) Rennin
 - c) HCl
 - d) Amylase
 9. Which small intestine cell type is primarily absorptive?
 - a) Enterocyte
 - b) Goblet cell
 - c) Enteroendocrine cell
 - d) Chief cell
 10. Compared to swine, poultry have:
 - a) Longer large intestines
 - b) Slower rate of passage
 - c) Smaller large intestine capacity and faster rate of passage
 - d) More extensive microbial fermentation
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Section 2: True / False – Monogastrics (Write T or F)

1. Pigs have four types of teeth for mastication. _____
2. Swine saliva contains enzymes that begin carbohydrate digestion. _____
3. Horses and pigs both have significant microbial fermentation in the cecum. _____
4. The proventriculus in birds secretes acid and enzymes, while the gizzard provides mechanical digestion. _____
5. The ileum is the primary site for nutrient absorption in both pigs and birds. _____
6. The liver stores bile salts and aids in fat digestion and cholesterol metabolism. _____
7. Goblet cells secrete mucus to protect intestinal lining and aid in lubrication. _____
8. Enteroendocrine cells secrete hormones that regulate digestion. _____

9. Birds rely more on microbial fermentation than pigs for fiber digestion. _____
 10. The pancreas has both endocrine (insulin, glucagon) and exocrine (digestive enzymes, bicarbonate) functions. _____
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Section 3: Matching – Monogastrics

Match the digestive organ with its primary function. Write the correct letter.

Organs:

- A. Mouth / Teeth
- B. Esophagus
- C. Stomach / Proventriculus
- D. Gizzard
- E. Small intestine
- F. Cecum
- G. Colon / Large intestine
- H. Liver
- I. Gallbladder
- J. Pancreas
- K. Crop

Functions:

1. Stores and softens food (birds) _____
 2. Mechanical breakdown of food _____
 3. Chemical digestion of proteins with enzymes and acid _____
 4. Transport food from mouth to stomach _____
 5. Major site of nutrient absorption _____
 6. Microbial fermentation of fiber and vitamin synthesis _____
 7. Water absorption and feces formation _____
 8. Secretes bile and aids in fat absorption _____
 9. Stores bile (in pigs) _____
 10. Secretes bicarbonate and digestive enzymes; endocrine hormones _____
 11. Chewing and physical reduction of particle size _____
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Section 1: Multiple Choice – Ruminants

1. Which of the following is NOT a compartment of the ruminant stomach?
 - a) Rumen
 - b) Reticulum
 - c) Omasum
 - d) Cecum
 - e) Abomasum
2. Ruminant saliva is highly important because it:
 - a) Contains digestive enzymes to break down starch
 - b) Produces bicarbonate to buffer rumen pH
 - c) Is secreted in small amounts (~1 L/day in cows)
 - d) Contains hydrochloric acid
3. Hardware disease occurs when:
 - a) Sharp metal objects puncture the reticulum
 - b) Frothy gas builds up in the rumen
 - c) Acetic acid production in the rumen is too low
 - d) Microbial populations die due to low fiber intake
4. Which VFA is primarily gluconeogenic in ruminants?
 - a) Acetic acid
 - b) Propionic acid
 - c) Butyric acid
 - d) Lactic acid
5. The reticular groove allows:
 - a) Milk to bypass fermentation in the rumen and reticulum
 - b) Gas to escape from the rumen
 - c) Fibers to be digested more efficiently
 - d) VFAs to be absorbed in the abomasum
6. In horses, fiber is fermented primarily in the:
 - a) Rumen
 - b) Reticulum
 - c) Cecum and large colon
 - d) Abomasum
7. The papillae in the rumen:
 - a) Secrete digestive enzymes
 - b) Increase surface area for VFA absorption
 - c) Trap heavy metals

- d) Reduce particle size physically
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- 8. A cow on a high-grain diet may develop rumen acidosis. This occurs because:
 - a) VFA production decreases
 - b) Propionate increases relative to acetate
 - c) Rumen pH drops due to excess fermentation of starch
 - d) Saliva production increases
 - 9. Frothy bloat in ruminants is most often caused by:
 - a) Sharp metal ingestion
 - b) Rapid consumption of fresh legume pasture
 - c) High fiber roughage
 - d) Low microbial populations
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Section 2: True / False – Ruminants

- 1. True ruminants have upper incisor teeth. _____
 - 2. Rumination involves regurgitation, re-chewing, re-salivation, and re-swallowing. _____
 - 3. The omasum primarily functions to reduce particle size and absorb water. _____
 - 4. Microbial protein from rumen fermentation can be digested and absorbed in the abomasum. _____
 - 5. Hindgut fermenters like horses can utilize microbial protein efficiently. _____
 - 6. Salivary glands in ruminants are stimulated by chewing. _____
 - 7. The reticular groove in young calves allows milk to bypass the rumen. _____
 - 8. VFAs produced in the rumen provide the majority of energy for ruminants. _____
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Section 3: Matching – Ruminants

Match the term with its function or description.

Terms:

- A. Rumen
- B. Reticulum
- C. Omasum
- D. Abomasum
- E. Reticular groove
- F. Acetate
- G. Propionate

H. Butyrate
I. Bicarbonate
J. Papillae

Functions / Descriptions:

1. Primary site of microbial fermentation _____
 2. Honeycomb structure, traps heavy objects _____
 3. Reduces particle size and absorbs water _____
 4. True glandular stomach, secretes HCl and enzymes _____
 5. Directs milk past rumen in calves _____
 6. Lipogenic VFA, energy for fat synthesis _____
 7. Gluconeogenic VFA, converted to glucose _____
 8. Lipogenic VFA, stimulates rumen epithelium _____
 9. Buffers rumen pH _____
 10. Increases surface area for VFA absorption _____
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