**An Najah National University**

**Faculty of Veterinary Medicine**

**Animal Nutrition**

**Exam 2**

**April 13, 2010**

**Instructor: Professor J. ABO OMAR**

**Name:**

***Multiple choice: 1 point each***

1. What is beriberi?
   1. niacin deficiency
   2. thiamin deficiency
   3. folate deficiency
   4. iron deficiency
2. What is the major cation of extracellular fluid?
   1. calcium
   2. sodium
   3. phosphorous
   4. potassium
3. What metabolite is used to synthesize vitamin D3 when human skin is exposed to ultraviolet light?
   1. serotonin
   2. thiamin
   3. cholesterol
   4. phenylalanine
4. Which of the following nutrients act to prevent oxidation and free radical damage?
   1. carotenoids, vitamin E
   2. vitamins A and D
   3. niacin, vitamin K
   4. vitamins D and E
5. What is the most biologically active form of vitamin E called?
   1. β-menaquinone
   2. fibrinogen
   3. α-tocopherol
   4. phylloquinone
6. Which vitamin is needed to make NAD+ and NADP+?
   1. thiamin
   2. riboflavin
   3. niacin
   4. biotin
7. Phylloquinone and menaquinone are forms of \_\_\_\_\_.
   1. vitamin A
   2. vitamin D
   3. vitamin E
   4. vitamin K
8. What results when vitamin K is in short supply?
   1. There is little or no clotting of blood.
   2. There is insufficient absorption of calcium from intestines.
   3. There is little or no conversion of *cis*-retinal to *trans*-retinal.
   4. There is little or no synthesis of cholesterol.
9. What is the coenzyme form of pantothenic acid?
   1. FAD
   2. coenzyme A
   3. NAD
   4. coenzyme Q
10. Which vitamins are required for the production of methionine from homocysteine?
    1. thiamin and vitamin B12
    2. niacin and vitamin B6
    3. folate and vitamin B12
    4. vitamin B6 and vitamin B12
11. Maternal supplementation of this vitamin may decrease the risk of neural tube defects in babies:
    1. riboflavin.
    2. vitamin B12.
    3. vitamin B6.
    4. folate.
12. The most common nutrient deficiency in the world is with
    1. energy.
    2. calcium.
    3. iron.
    4. glucose.
13. The inability to produce intrinsic factor protein can result in a severe \_\_\_\_\_ deficiency.
    1. vitamin C
    2. vitamin B12
    3. vitamin B6
    4. folate
14. Vitamin C functions as a(n):
    1. coenzyme.
    2. antioxidant.
    3. intrinsic factor.
    4. agent to bind biotin.
15. What cation is the major one in ruminant sweat and typically high in forages?
    1. calcium
    2. sodium
    3. phosphorous
    4. potassium
16. What compound is broken apart by bacterial cellulases?
    1. starch
    2. cellulose
    3. protein
    4. lactose
17. What compounds are eructated by ruminant?
    1. oxygen
    2. methane (CH4)
    3. carbon dioxide (CO2)
    4. methane (CH4) and carbon dioxide (CO2)
    5. Hydrogen sulfide
    6. methane (CH4), carbon dioxide (CO2) and hydrogen sulfide
18. Rhodopsin is made of the protein opsin and a \_\_\_\_\_ form of vitamin A.
    1. retinol
    2. retinal
    3. retinoic acid
    4. carotenoid
19. Lipolysis is catalyzed by the enzyme hormone-sensitive:
    1. insulin.
    2. glucagon.
    3. lipase.
    4. Lipogen
20. What vitamin name is now given to a series of compounds call *retinoids*?
    1. A
    2. D
    3. K
    4. E
21. What does a deficiency of vitamin A cause?
    1. night blindness
    2. rickets
    3. hemolytic anemia
    4. bleeding

***True or False: 1 point each***

1. \_\_\_\_\_\_\_\_ Microbes protect the ruminant animal from various toxic compounds.
2. \_\_\_\_\_\_\_\_ Selenomethionine is less bioavailable than sodium selenite.
3. \_\_\_\_\_\_\_\_ Phytates and oxalates enhance absorption of many minerals.
4. \_\_\_\_\_\_\_\_ The ruminant animal ruminates for 5 to 6 hours/day to reduce particle size of the feed.
5. \_\_\_\_\_\_\_\_ Vitamin E protects cell membranes by donating electrons, thereby reducing free radicals that damage the fatty acids in phospholipid bilayers.
6. \_\_\_\_\_\_\_\_ Beta-carotene is a major provitamin A carotenoid.
7. \_\_\_\_\_\_\_\_ Vitamin C is important for the “recharging” of enzymes
8. \_\_\_\_\_\_\_\_ Although exceptions do exist, generally, water-soluble vitamins are very toxic when consumed in large amounts.
9. \_\_\_\_\_\_\_\_ ATP has two phosphate groups as part of its structure.
10. \_\_\_\_\_\_\_\_ Coenzymes are often derived from vitamins.

Provide the vitamin or mineral (there could be multiple answers) associated with the following terms. **10 points**

xerophthalmia\_\_\_\_\_\_\_\_\_\_\_\_\_\_ glutathione peroxidase \_\_\_\_\_\_\_\_\_

avidin \_\_\_\_\_\_\_\_\_\_\_\_\_\_ scurvy \_\_\_\_\_\_\_\_\_\_\_\_\_\_

sweet clover disease \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ grass tetany \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

rickets \_\_\_\_\_\_\_\_\_\_\_\_\_

goiter \_\_\_\_\_\_\_\_\_\_\_\_\_\_ pellagra \_\_\_\_\_\_\_\_\_\_\_\_

white muscle disease \_\_\_\_\_\_\_\_\_\_\_\_\_

What are lutein and lycopenes? **4 points**

What vitamin can be synthesized from tryptophan? **3 points**

What is a good range for pH in the rumen? **2 points**

Where is the great majority of calcium found in the animal body? **2 points**

What are the 3 main volatile fatty acids produced during fermentation? **3 points**

Identify the specific portion of the ruminant stomach associated with each of the following. **6points**

Formation of bolus for rumination \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Digestion and fermentation vat \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

pH changes from 6.0 to 2.5 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_