

PRACTICE QUESTIONS FOR THE MIDTERM

1. Which of the following is an example of an anabolic pathway?
 - a. Proteins are broken down into amino acids.
 - b. Palmitic acid is oxidized, ending in the production of acetyl CoA.
 - c. Glucose is incorporated into glycogen stores.
 - d. The conversion of pyruvic acid to lactic acid.

2. Which of the following statements about the proximate analysis is incorrect?
 - a. Determining the water content of a food is important, as this helps to understand the shelf-life of a food product.
 - b. Short-chain fatty acids are only extracted from a food product during the ether extraction step.
 - c. The proximate analysis does not enable the distinction of saturated, monounsaturated, and polyunsaturated fatty acids.
 - d. The Kjeldahl analysis assumes that all protein has 16% nitrogen; however, certain foods deviate with regards to this assumed % content of nitrogen.

A food sample initially weighing 30g is dried down and analyzed for its various components. Moisture content is 40%, crude fat is 5%, crude protein is 20%, ash is 4%, and crude fibre is 25%.

3. What is the weight, in grams, of the digestible carbohydrate in this food sample?
 - a. 1.8
 - b. 2.5
 - c. 3.0
 - d. 3.8

4. The proximate analysis is recognized to be an important first step for the analysis of food composition. Other methods are used to provide more detailed information about specific fractions. Which of the following statements is the most correct?
 - a. The Van Soest method is used to obtain precise information about insoluble fibres.
 - b. The Southgate method provides information about the carbohydrate fraction that is subsequently used for the labelling of human foods.
 - c. Gas chromatography can be used to determine the levels of saturated and *trans* fats present in a food sample.
 - d. A, B, and C are all correct.
 - e. A, B, and C are all incorrect.

5. The complete oxidation of one molecule of pyruvate generates the equivalent of how many ATP?
 - a. 12 ATP
 - b. 15 ATP
 - c. 24 ATP
 - d. 38 ATP

6. The digestive systems of birds are highly adapted to their lifestyles. Which of the following statements is incorrect?
- The crop serves as short-term storage centre, allowing birds to quickly evade possible predators.
 - Birds have a two-chamber stomach composed of the gizzard and the proventriculus.
 - Because the large intestine of birds is very short, the majority of bacterial fermentation takes place in the gizzard.
 - The cloaca is where the digestive, urinary, and reproductive systems meet.

The following data table (given in grams) can be used to answer the **next 2 questions**.

FRACTION	INTAKE (g)	EXCRETION (g)
Dry matter	500	60
Protein	90	5
Fat	90	10
Carbohydrate	250	25
Fibre	65	15
Chromic oxide	5	5

7. Farmer Jane was curious to test a new feed in his cows. She incorporated a marker into the feed in order to calculate the apparent digestibility of protein. What is the apparent digestibility of protein in this new feed?
- 88.8%
 - 53.8%
 - 94.4%
 - 95.8%
 - Can not be calculated.
8. When discussing the energy content of foods, which of the following statements is correct?
- A Calorie is defined as the energy required to raise the temperature of 1 litre of water by 1°C.
 - One chemistry calorie provides more energy than one food Calorie.
 - A bomb calorimeter measures the amount of oxygen produced to obtain information about the energy potential of a sample.
 - Carbohydrates and protein have an equivalent gross energy.
 - None of the above are correct.
9. If Marge Simpson rides a stationary bike for 2 hours and consumes 80.0 L of oxygen and expires 71.2 L of carbon dioxide, what is the percentage of non-protein energy provided by fat? Use the non-protein RQ table in the class notes to answer this question.
- 35.8
 - 64.2
 - 71.6
 - None of the above.

10. The carbohydrate fraction typically consists of digestible and non-digestible components. Of the following statements, which is the most correct?
- Starch is the most common digestible carbohydrate in plants.
 - Amylopectin is a highly branched structure.
 - Lignin is poorly fermented by gut bacteria in the human digestive tract.
 - A, B, and C are all correct.
 - A, B, and C are all incorrect.
11. Of the following statements regarding cellular energy production, which is incorrect?
- The breakdown of glucose into two molecules of pyruvate yields a net production of 2 ATP and 2 NADH.
 - In anaerobic conditions the conversion of one pyruvate to one lactate yields 1 ATP.
 - The conversion of one pyruvate molecule into one acetyl CoA molecule generates 1 NADH.
 - The majority of energy released from foods is generated in the Krebs's cycle (also referred to as the citric acid cycle).
12. Which of the following statements regarding gluconeogenesis is incorrect?
- The enzymes required to bypass the irreversible steps in glycolysis are expressed in the liver, muscle, and adipose tissue.
 - The Cori Cycle describes a process through which lactate is transferred to the liver and used to regenerate glucose.
 - Glucose-6-phosphatase is the last enzyme required to complete the conversion of pyruvate to glucose.
 - Pyruvate must be converted to malate so that it can leave the mitochondria.
13. The conversion of linoleic acid to arachidonic acid involves:
- One desaturation step and two elongation steps.
 - Two desaturation steps and one elongation step.
 - Two desaturation steps only.
 - One elongation step only.
14. The proteins present in circulating lipoproteins play important roles. Which of the following proteins is not present in very-low density lipoproteins (VLDL)?
- Apolipoprotein B-48
 - Apolipoprotein E
 - Apolipoprotein B-100
 - Apolipoprotein C

15. I think it's fair to say that Homer Simpson doesn't have a particularly healthy lifestyle. In particular, he doesn't pay any attention to how much fat he has in his diet. However his children are very concerned! If Homer has an energy intake of 10920 kJ/d and fat provides 40% of his daily calories, how many grams of fat does he consume on a daily basis?
- Who cares...he's funny.
 - Between 100-125g.
 - Between 250-275g.
 - Between 475-500g.