

Name: _____

Date: _____

The Hidden Chemist in Your Kitchen: 8th Grade Nutrition Challenge

Evaluate 10 complex scenarios regarding bioavailability, glycemic loads, and metabolic pathways to determine how food fuels cellular performance.

1. An athlete consumes a meal of white rice and honey two hours before a race. Analyze the likely physiological response regarding her blood glucose and insulin levels.

- A. Stable glucose levels due to the high fiber content of simple sugars.
- B. A rapid glucose spike followed by an insulin surge, potentially causing a 'crash'.
- C. Delayed gastric emptying due to the complex carbohydrate structure.
- D. Increased fat oxidation as the primary energy source for the workout.

2. Bioavailability refers to the proportion of a nutrient that is digested, absorbed, and utilized through metabolic pathways rather than just the total amount present in the food.

- A. True
- B. False

3. To increase the absorption of non-heme iron found in plant sources like lentils, one should consume them alongside foods high in ____.

- A. Calcium
- B. Vitamin D
- C. Vitamin C
- D. Vitamin K

4. Consider the role of 'Essential Fatty Acids' (EFAs) like Omega-3. Why does the human body require these specifically from dietary sources?

- A. They provide 12 calories per gram compared to the 9 in other fats.
- B. The body lacks the enzymes to synthesize them with double bonds at specific positions.
- C. They are the only fats that can be converted directly into glucose.
- D. They prevent the body from absorbing any saturated fats during digestion.

5. The metabolic process of breaking down large molecules like glycogen into glucose to release energy is known as ____.

- A. Anabolism
- B. Catabolism
- C. Photosynthesis
- D. Hydrogenation

6. A 'Complete Protein' source must contain all nine essential amino acids in proportions that match human requirements.

- A. True

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B. False

7. Based on the thermic effect of food (TEF), which macronutrient requires the most energy for the body to process and digest?

- A. Saturated Fats
- B. Simple Carbohydrates
- C. Protein
- D. Water

8. While searching for a healthy snack, you find a product with 0g 'Trans Fats' but 'Partially Hydrogenated Oil' in the ingredients. This is a result of ____.

- A. Regulatory loopholes allowing <0.5g per serving to be rounded down
- B. The oil becoming healthy once it is partially hydrogenated
- C. The removal of all cholesterol from the vegetable oil
- D. Natural fermentation processes in processed snacks

9. Which of the following is a symptom of 'Micro-nutrient Malnutrition' often seen in populations with high-calorie but low-nutrient diets?

- A. Excess storage of fat-soluble vitamins
- B. Hidden hunger (deficiency in essential vitamins/minerals)
- C. Superior cognitive function due to high sugar intake
- D. Increased bone density from processed sodium

10. The primary role of insoluble fiber is to provide the body with a long-term source of glucose for endurance activities.

- A. True
- B. False