

# Jean Inman Food Science Practice Exam (Sample)

## Study Guide



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**SAMPLE**

## **Questions**

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- 1. What is the nutritive value of a standard egg?**
  - A. 90 kcals, 6 g protein, 7 g fat**
  - B. 80 kcals, 6 g protein, 5 g fat**
  - C. 75 kcals, 5 g protein, 4 g fat**
  - D. 85 kcals, 6 g protein, 6 g fat**
- 2. What impact does freezing have on enzyme activity in food?**
  - A. It accelerates enzyme activity**
  - B. It completely stops enzyme activity**
  - C. It slows down enzyme activity**
  - D. It has no impact on enzyme activity**
- 3. What is a pH meter used for in food science?**
  - A. Measuring temperature**
  - B. Measuring acidity or alkalinity**
  - C. Analyzing nutritional content**
  - D. Testing food safety**
- 4. What is the mixture of melted half fat and half flour known as?**
  - A. Sauce**
  - B. Coulis**
  - C. Paste**
  - D. Roux**
- 5. What is the function of phytochemicals in human nutrition?**
  - A. They act as preservatives for food**
  - B. They provide essential amino acids**
  - C. They are bioactive compounds with health benefits**
  - D. They serve as a primary source of energy**

- 6. Which of the following best describes the role of proteins in food products?**
- A. They provide only energy to the food**
  - B. They solely contribute to flavor**
  - C. They are responsible for structure, texture, and flavor**
  - D. They prevent spoilage of food**
- 7. What method of cooking is least likely to be used for tender cuts of meat?**
- A. Broiling**
  - B. Stewing**
  - C. Roasting**
  - D. Baking**
- 8. Which sensory attribute significantly influences consumer preferences?**
- A. Cost and convenience**
  - B. Packaging and labeling**
  - C. Taste, aroma, and texture**
  - D. Brand reputation**
- 9. Which pigment would likely remain stable in varying pH levels?**
- A. Pheophytin**
  - B. Anthocyanins**
  - C. Carotenoids**
  - D. Flavonoids**
- 10. What is the fat content of both butter and margarine?**
- A. 75%**
  - B. 80%**
  - C. 85%**
  - D. 90%**

## **Answers**

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- 1. B**
- 2. C**
- 3. B**
- 4. D**
- 5. C**
- 6. C**
- 7. B**
- 8. C**
- 9. C**
- 10. B**

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## **Explanations**

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**1. What is the nutritive value of a standard egg?**

- A. 90 kcals, 6 g protein, 7 g fat
- B. 80 kcals, 6 g protein, 5 g fat**
- C. 75 kcals, 5 g protein, 4 g fat
- D. 85 kcals, 6 g protein, 6 g fat

A standard large egg typically contains approximately 80 calories, 6 grams of protein, and 5 grams of fat. This profile makes it a valuable source of high-quality protein, as the protein in eggs contains all the essential amino acids necessary for human nutrition. Additionally, eggs are rich in vitamins and minerals, including vitamin D, B vitamins, and selenium, contributing to their overall nutritional value. The protein content is particularly notable, as it helps with muscle development and repair and supports overall bodily functions. The fat content is primarily found in the yolk, which also contains important nutrients, including healthy fats and lipophilic vitamins. When considering the options provided, the choice that accurately reflects the standard nutritional composition of an egg aligns perfectly with the established values, making it the correct answer.

**2. What impact does freezing have on enzyme activity in food?**

- A. It accelerates enzyme activity
- B. It completely stops enzyme activity
- C. It slows down enzyme activity**
- D. It has no impact on enzyme activity

Freezing slows down enzyme activity in food primarily due to the low temperatures involved. Enzymes are proteins that facilitate biochemical reactions, and their activity is heavily influenced by temperature. At freezing temperatures, molecular movement decreases significantly, which leads to a reduction in the rate of these chemical reactions, including those facilitated by enzymes. This reduction does not completely halt enzymatic activity, but it dramatically slows it down, which can help preserve the quality of the food by limiting the degradation of nutrients and the development of undesirable flavors. It's important to note that while freezing extends the shelf life of foods by slowing enzymatic and microbial activity, some enzymes can gradually re-activate when the food is thawed, which is why blanched vegetables are often recommended before freezing to further inhibit enzyme action. Understanding this mechanism is crucial for food preservation strategies.

### 3. What is a pH meter used for in food science?

- A. Measuring temperature
- B. Measuring acidity or alkalinity**
- C. Analyzing nutritional content
- D. Testing food safety

A pH meter is specifically designed to measure the acidity or alkalinity of a solution, which is a critical aspect in food science. The pH level can significantly affect the taste, texture, and preservation of food products. For instance, certain foods are best preserved at specific pH levels, and many fermentation processes require careful pH control to ensure proper development of flavors and textures. Furthermore, understanding the pH of various food items can help in optimizing recipes and improving overall product quality. In contrast, other options such as measuring temperature, analyzing nutritional content, or testing food safety involve different instruments or methods that do not specifically relate to pH measurement.

### 4. What is the mixture of melted half fat and half flour known as?

- A. Sauce
- B. Coulis
- C. Paste
- D. Roux**

The mixture of melted half fat and half flour is known as roux. Roux is a fundamental component in classical cooking, particularly in French cuisine, where it serves as a thickening agent for sauces and soups. By mixing equal parts of fat (usually butter) and flour and cooking them together, the roux develops a specific flavor and helps create a stable base for various dishes. As it cooks, the mixture changes color depending on the length of cooking time, ranging from a pale blonde to a deep brown, which impacts the flavor and thickness of the final product. Understanding the role of roux is essential in food science and culinary applications, as it demonstrates how a simple combination of ingredients can influence the texture and taste of a dish significantly. This technique is central to making sauces like béchamel or gravy, making it a crucial skill for anyone involved in cooking or food preparation.

**5. What is the function of phytochemicals in human nutrition?**

- A. They act as preservatives for food**
- B. They provide essential amino acids**
- C. They are bioactive compounds with health benefits**
- D. They serve as a primary source of energy**

Phytochemicals are naturally occurring compounds found in plants that contribute to their color, flavor, and disease resistance. In human nutrition, these bioactive compounds play a significant role in promoting health and preventing disease. Research has shown that consuming foods rich in phytochemicals can offer various health benefits, including antioxidant effects, anti-inflammatory properties, and support for a healthy immune system. They may also help reduce the risk of chronic diseases such as heart disease, diabetes, and certain types of cancer. The other choices do not accurately reflect the role of phytochemicals. While some preservatives can be derived from plant sources, their primary function is not related to the health benefits associated with phytochemicals. Essential amino acids, which are vital for protein synthesis, are typically obtained from proteins in various foods rather than from phytochemicals. Lastly, while energy is essential for the body, the primary sources of energy are carbohydrates, fats, and proteins, not phytochemicals. Thus, phytochemicals stand out for their unique contributions to human health beyond basic nutrition.

**6. Which of the following best describes the role of proteins in food products?**

- A. They provide only energy to the food**
- B. They solely contribute to flavor**
- C. They are responsible for structure, texture, and flavor**
- D. They prevent spoilage of food**

Proteins in food products play a multifaceted role that goes beyond energy provision and extends into vital aspects such as structure, texture, and flavor. When it comes to structure, proteins are essential in forming the backbone of many food matrices, particularly in baked goods, meat products, and dairy. They contribute to the desired texture by influencing viscosity, firmness, and elasticity. For example, gluten proteins in wheat flour give bread its characteristic chewiness and volume. Additionally, proteins can affect flavor development through various chemical reactions that occur during cooking and processing. They can interact with other food components, enhancing the overall sensory profile of the product. For example, the browning reaction, known as the Maillard reaction, involves proteins and leads to complex flavor compounds during cooking. While proteins provide energy, their primary roles in food products are much broader and integral to food science and culinary applications. This comprehensive role highlights why the correct answer is that proteins are responsible for structure, texture, and flavor, thereby playing an essential part in the quality and enjoyment of food.

**7. What method of cooking is least likely to be used for tender cuts of meat?**

- A. Broiling**
- B. Stewing**
- C. Roasting**
- D. Baking**

The method of cooking that is least likely to be used for tender cuts of meat is stewing. Stewing is a technique that typically involves cooking tougher cuts of meat at low temperatures for extended periods of time in liquid, which helps to break down the connective tissues and render the meat tender. This method is designed for those tougher cuts that benefit from long, moist cooking. Tender cuts of meat, such as fillets or ribeyes, are usually best prepared using dry heat methods like broiling, roasting, or baking. These methods allow for quick cooking and help preserve the natural tenderness of the meat. Broiling cooks from above with high heat, roasting cooks an item evenly from all sides in the oven, and baking generally surrounds food with hot, dry air. All these techniques enhance the flavor and texture of tender cuts without overcooking them, which could lead to a loss of quality. In summary, stewing is not typically associated with tender cuts of meat because it is better suited for tougher pieces that require slow cooking to achieve tenderness.

**8. Which sensory attribute significantly influences consumer preferences?**

- A. Cost and convenience**
- B. Packaging and labeling**
- C. Taste, aroma, and texture**
- D. Brand reputation**

Taste, aroma, and texture are fundamental sensory attributes that significantly influence consumer preferences for food products. These sensory characteristics are directly linked to the eating experience and can evoke strong emotional responses. When consumers evaluate food, they rely heavily on their sensory perceptions; for instance, a pleasing taste can lead to repeat purchases and brand loyalty. The aroma of food can also play a critical role in appetite stimulation and overall enjoyment, as it often precedes taste. Additionally, texture contributes to the overall mouthfeel and can affect how a product is perceived in terms of freshness and quality. While other factors such as cost, convenience, packaging, and brand reputation do influence consumer behavior, they often come into play after the sensory attributes have initially attracted the consumer. If a product does not satisfy the consumer's taste, aroma, and texture preferences, it is unlikely to succeed in the market, regardless of its pricing strategy or branding efforts. Therefore, the impact of these sensory attributes is paramount in shaping consumer preferences and choices in food products.

**9. Which pigment would likely remain stable in varying pH levels?**

- A. Pheophytin**
- B. Anthocyanins**
- C. Carotenoids**
- D. Flavonoids**

Carotenoids are the pigments that are known for their stability across a broad range of pH levels. These pigments are typically found in a variety of fruits and vegetables, contributing to their bright yellow, orange, and red colors. Carotenoids, because of their chemical stability, do not undergo significant structural changes or degradation in response to varying acidity or alkalinity in the environment. In contrast, other pigments can be more sensitive to pH changes. For instance, anthocyanins, which are water-soluble pigments responsible for the red, purple, and blue colors in many fruits and flowers, can change color with variations in pH, making them less stable. Pheophytin, a derivative of chlorophyll, can also be affected by changes in pH, leading to a loss of its green color. Flavonoids, while they have some stability, can similarly undergo chemical changes in response to pH fluctuations, affecting their color and solubility. Thus, carotenoids provide a robust option for stability across varying pH levels, making them the correct choice in this context.

**10. What is the fat content of both butter and margarine?**

- A. 75%**
- B. 80%**
- C. 85%**
- D. 90%**

Butter and margarine are both known for having similar fat content, which typically ranges around 80%. This is a standard figure for both products in their regular forms. The fat in these products is an essential component that contributes to their texture, flavor, and cooking properties. Margarine can vary slightly in fat content depending on the type and brand, but most commonly available margarine sticks are formulated to match the fat content of butter to allow for equivalent usage in recipes. Therefore, the choice indicating 80% accurately reflects the typical fat content found in standard butter and margarine, making it the correct answer for this question.