Gastronomic Science and Food Chemistry

Gastronomy · Practice Test · 12 Questions

1. What is the chemical process responsible for the non-enzymatic browning of food that occurs when amino acids and reducing sugars are heated together?

A) Caramelization
B) Maillard reaction
C) Saponification
D) Polymerization

2. Which protein structure is primarily responsible for the structural elasticity and extensibility of wheat-based doughs?

A) Amylose and Amylopectin
B) Glutenin and Gliadin
C) Casein and Whey
D) Collagen and Elastin

3. In molecular gastronomy, which substance is commonly used to create spheres through the process of ionotropic gelation with calcium chloride?

A) Sodium alginate
B) Xanthan gum
C) Agar-agar
D) Carrageenan

4. What is the critical temperature range for the denaturation of egg white proteins (ovalbumin), leading to coagulation?

A) 40-50°C
B) 60-65°C
C) 80-85°C
D) 95-100°C

5. Which fatty acid is the primary component of extra virgin olive oil, typically comprising 70-80% of its total fatty acid profile?

A) Linoleic acid
B) Palmitic acid
C) Oleic acid
D) Stearic acid

6. What chemical reaction causes the green color change in chlorophyll when vegetables are cooked in an acidic environment?

A) Pheophytinization
B) Chelation
C) Oxidation
D) Reduction

7. Which natural enzyme found in pineapple (Ananas comosus) acts as a potent protease, capable of hydrolyzing peptide bonds in meat proteins?

A) Papain
B) Bromelain
C) Ficin
D) Actinidin

8. What is the primary physical mechanism by which an emulsion, such as mayonnaise, remains stable over time?

A) Steric stabilization
B) Coalescence
C) Sedimentation
D) Flocculation

9. In the context of meat science, what is the 'rigor mortis' phase primarily caused by in post-mortem muscle tissue?

A) Depletion of ATP
B) Excessive hydration
C) Increase in glycogen
D) Formation of lactic acid

10. Which polysaccharide, derived from red algae, is uniquely capable of forming a thermoreversible gel that melts at 85°C but sets at 32-45°C?

A) Pectin
B) Agar-agar
C) Guar gum
D) Locust bean gum

11. What is the specific type of chemical bond responsible for the secondary structure of proteins, critical for the stability of a cooked gel?

A) Covalent bonds
B) Hydrogen bonds
C) Ionic bonds
D) Van der Waals forces

12. Which volatile organic compound is the primary contributor to the characteristic aroma of 'earthiness' in beetroot?

A) Geosmin
B) Limonene
C) Vanillin
D) Diacetyl