

National FFA Career Development Event
Food Science and Technology
2010 TEST

1. When a company replaces atmospheric air in a bag of potato chips with a pre-defined mixture of oxygen, carbon dioxide, and/or nitrogen to preserve product appearance and extend shelf life, they are using _____ technology.
 - a. electron beam packaging
 - b. aerobic packaging
 - c. retort packaging
 - d. modified-atmosphere packaging

2. The largest shell egg recall in U.S. history occurred this year due to _____ contamination, a pathogen that may be found in eggs.
 - a. *Listeria monocytogenes*
 - b. *Escherichia coli* O157:H7
 - c. *Salmonella enteritidis*
 - d. *Staphylococcus aureus*

3. The flavor enhancer _____ has no flavor of its own but is used in food products to help bring out the flavors already present in food.
 - a. calcium alginate
 - b. monosodium glutamate
 - c. acetic acid
 - d. sodium propionate

4. When rice grains are stored for long periods of time, they are less sticky after cooking than fresher grains of rice because _____ acts on amylose, breaking down the amylose chains.
 - a. heat
 - b. proteolysis
 - c. lactase
 - d. amylase

5. When glucose reacts chemically with oxygen, water and _____ are formed.
 - a. carbon dioxide
 - b. sucrose
 - c. fructose
 - d. ethyl alcohol

6. The protein molecules of collagen and elastin form rope-like fibers so they are considered to be _____ proteins.
 - a. globular
 - b. fibrous
 - c. denatured
 - d. coagulated

7. To make vinegar from apples takes several steps. In the first step, sugar from the fruit is converted to _____ in the presence of yeast.
- acetic acid
 - methyl alcohol
 - citric acid
 - ethyl alcohol
8. The pH of a food ingredient, measured on a scale from _____, influences the functionality of the ingredient in a food product.
- 0-1
 - 0-7
 - 0-14
 - 0-20
9. Food companies sometimes use potassium chloride instead of sodium chloride to lower the sodium content of a food product; however, potassium chloride can have a _____ aftertaste.
- bitter
 - sweet
 - sour
 - hot
10. Food ingredients that are GRAS, also known as _____, are considered safe for human consumption.
- generally realized as secure
 - generally recognized as safe
 - government recognized as safe
 - generally recognized as secure
11. _____ in eggs acts as a natural emulsifier.
- Phospholipids
 - Cholesterol
 - Albumin
 - Calcium
12. In a commercial bread operation, baked bread is conveyed to a depanner which uses suction cups and _____ to remove the baked loaf from the pan.
- plastic grips
 - vacuum pressure
 - metal tongs
 - a weighted device to rap against the pan
13. Liquid may form on the surface of pudding that has been stored refrigerated due to water leaking from the gel as it ages. This is also known as _____.
- viscosity
 - hydrolysis
 - syneresis
 - inversion

14. An alternating electric current in a(n) _____ coil produces an alternating magnetic field causing iron cooking utensils placed on the cooking surface to become hot while the surface itself remains cool. The hot cooking utensil then transmits heat to the food.
- radiation
 - convection
 - conduction
 - induction
15. When a thermometer is used to monitor product internal temperature, it should be _____ before it is used to ensure the readings are accurate.
- tared
 - calibrated
 - cleaned
 - adjusted
16. The protein found in the liquid that remains after fat and casein have been removed from milk is called _____.
- whey
 - lactose
 - curds
 - rennin
17. The chemical formula NaHCO_3 represents _____.
- table salt
 - sodium bicarbonate
 - caffeine
 - sodium benzoate
18. Vitamins A, D, E, and K _____.
- are water soluble vitamins
 - usually circulate freely in the blood and cell fluids
 - are fat soluble vitamins
 - are excreted in the urine when excess amounts are present in the body
19. A(n) _____ is used in the production of peanut butter to keep the peanut oil from separating out to the top of the jar.
- blanching agent
 - anti-caking agent
 - antioxidant
 - stabilizer
20. _____ is the form of carbohydrates that is found in meat.
- Glycogen
 - Glucose
 - Myosin
 - Collagen

21. The frozen food industry was born in the 1920's when _____ invented, developed, and commercialized a method for quick-freezing food products.
- a. Herb Peterson
 - b. Francis Bacon
 - c. Clarence Birdseye
 - d. Louis Pasteur
22. The functional component _____, found in tomatoes, is associated with a reduced cancer risk of the prostate, breast, digestive tract, bladder, and skin.
- a. lycopene
 - b. acticoa
 - c. banaba
 - d. spirulina
23. Sucrose is the main disaccharide in table sugar, honey, and _____.
- a. agave nectar
 - b. maple syrup
 - c. barley malt syrup
 - d. brown rice syrup
24. The length of time required at a specific temperature to destroy 90% of a pathogen is called the _____.
- a. D-value
 - b. F-value
 - c. z-value
 - d. C-value
25. Food scientists often need to know how much solute a solution contains. What would be the mass percent of sodium chloride in a solution if 15 g of sodium chloride was dissolved in 85 g of water?
- a. 17.6%
 - b. 5.7%
 - c. 6.7%
 - d. 15.0%
26. An apple that has been peeled for processing will turn brown quickly as a result of _____.
- a. carmelization
 - b. the maillard reaction
 - c. enzymatic browning
 - d. bruising
27. The meat industry is regulated by the _____.
- a. United States Food and Drug Administration
 - b. United States Department of Agriculture
 - c. United States Environmental Protection Agency
 - d. Centers for Disease Control and Prevention

28. When fruits and vegetables are dehydrated, temperatures used during drying _____.
a. are not high enough to kill bacteria
b. are high enough to kill bacteria
c. will cook the outside of the product
d. will lead to case-hardening and trap moisture inside the product
29. Based on the principles of HACCP, the presence of a walnut in vanilla ice cream is an example of a _____ hazard.
a. biological
b. physical
c. chemical
d. non-existent
30. Carbonated colas _____.
a. have an acidic pH
b. have a neutral pH
c. have a basic pH
d. have a pH similar to pure water
31. By federal law, baking powder must yield at least _____ of carbon dioxide for every 100 g of powder.
a. 12 g
b. 25 g
c. 48 g
d. 61 g
32. Chicken does not discolor in the same way as ground beef because chicken muscle has less _____.
a. nitrosohemochrome
b. lutein
c. myoglobin
d. astaxanthin
33. _____ is a pathogen that causes a food infection.
a. *Escherichia coli* O157:H7
b. *Staphylococcus aureus*
c. *Clostridium perfringens*
d. *Clostridium botulinum*
34. To evaluate product characteristics such as flavor, texture, and shape, food scientists rely on _____ who are specialized groups of people who evaluate food samples.
a. statisticians
b. biotechnologists
c. food chemists
d. sensory evaluation panelists

35. Oxidation of fat involves the loss of a _____ atom from a single-bonded carbon next to a double bond and leads to rancidity.
- oxygen
 - nitrogen
 - hydrogen
 - sulfur
36. _____ of milk is a heat treatment that destroys all pathogenic organisms but does not destroy all spoilage organisms.
- Pasteurization
 - Emulsification
 - Homogenization
 - Winterization
37. Ice at 0°C will keep food colder longer in an ice chest than water at 0°C because of _____, or the energy required to cause a phase change without a change in temperature.
- radiation
 - latent heat
 - conduction
 - surface tension
38. Papain contains three enzymes from _____ which is used as a meat tenderizer.
- pineapple
 - kiwi
 - papaya
 - mango
39. The _____ provided sweeping legislation requiring almost all foods produced in the U.S. to have labels with specific facts about nutrition labeling.
- Nutrition Labeling and Education Act of 1990
 - Food, Drug, and Cosmetic Act of 1938
 - Pure Food and Drug Act of 1906
 - Fair Packaging and Labeling Act of 1966
40. To determine when a food has been heated sufficiently during the canning process, canners check the _____ which is the last point in the food to reach the temperature considered safe for killing microorganisms in that food.
- hot point
 - center point
 - cold point
 - thermal destruction point
41. Frankfurters are an example of a _____ meat product.
- whole muscle
 - injected
 - enhanced
 - comminuted

42. Gelatin can bind _____ times its weight in water.
- a. 10
 - b. 100
 - c. 1,000
 - d. 10,000
43. To measure the sugar concentration in a beverage, food companies will measure the _____ of the solution.
- a. Brix value
 - b. water activity value
 - c. viscosity
 - d. shear stress
44. When people consume carbohydrates, digestion begins _____.
- a. in the mouth when amylase in saliva breaks down starch into simpler sugars
 - b. in the stomach when enzymes act on the starch
 - c. in the small intestine
 - d. in the esophagus when food is swallowed
45. Unripened cheese such as _____ has a high moisture content resulting in a shorter shelf life than ripened cheese.
- a. parmesan
 - b. cream cheese
 - c. cheddar
 - d. provolone
46. Food processors promote products containing omega-3 fatty acids because they _____.
- a. promote heart health
 - b. contain fewer calories than other fatty acids
 - c. promote eye health
 - d. are more economic to use as an ingredient
47. Flour with a strong _____ quality produces yeast bread with high volume and fine texture.
- a. gluten
 - b. glucose
 - c. starch
 - d. galactose
48. By _____ cacao beans, the cell walls break down, bitter-tasting compounds react with each other, and the seed temperature increases leading to biochemical changes.
- a. hydrolyzing
 - b. fermenting
 - c. dehydrating
 - d. hydrogenating

49. The spores of _____ can germinate under anaerobic conditions to produce vegetative bacteria that can grow and produce a deadly toxin if foods are not adequately heat processed during retorting.

- a. *Clostridium perfringens*
- b. *Listeria monocytogenes*
- c. *Escherichia coli* O157:H7
- d. *Clostridium botulinum*

50. The process of _____ is used to add nutrients lost in processing to food at levels that are higher than what existed before the food was processed. For example, thiamin, riboflavin, niacin, folic acid, and iron are added to flour through this process.

- a. fortification
- b. restoration
- c. enrichment
- d. nutrification