

National FFA Career Development Event
Food Science and Technology
2011 TEST

1. Oxymyoglobin is responsible for the bright cherry red color of _____.
 - a. apples
 - b. tomatoes
 - c. ground beef**
 - d. red velvet cake

2. Which of the following statements is true?
 - a. Before coagulation occurs, denaturation of proteins is sometimes reversible**
 - b. Protein coagulation is reversible
 - c. Protein denaturation is never reversible
 - d. Protein denaturation is only caused by heating

3. Food science is _____.
 - a. using the tools of modern genetics to improve plants, animals, and microorganisms for food production
 - b. the study of how food is digested and absorbed in the gastrointestinal tract and used in intermediary metabolism
 - c. the study of mapping and sequencing all the genes of an organism
 - d. the study of producing, processing, preparing, evaluating, and using food**

4. Tartaric acid is used _____.
 - a. as a stabilizer for ice creams and soups
 - b. as an anticaking agent in powdered sugar
 - c. to control the pH in soft drinks**
 - d. to inhibit mold growth in bread

5. The characteristic flavor of sourdough bread is from the microorganism called _____.
 - a. *Aspergillus*
 - b. *Rhizopus*
 - c. *Corynebacterium*
 - d. *Lactobacillus***

6. When food is irradiated, the amount of radiation the food is exposed to during processing is commonly measured in _____.
 - a. kilograys**
 - b. kilograms
 - c. angstroms
 - d. joules

7. Fatty acids that have a long carbon chain in which every carbon atom carries a maximum number of hydrogen atoms is called a(n) _____ fatty acid.
 - a. unsaturated
 - b. saturated**
 - c. monounsaturated
 - d. polyunsaturated

8. When acids dissolve in water, their molecules break apart and release _____ into the solution to make the solution acidic.
- a. hydroxide ions
 - b. chloride ions
 - c. sodium ions
 - d. hydrogen ions**
9. During the cleaning and sanitizing process following food production, a company will use a _____ which is a chemical compound designed to emulsify fat and solubilize food residue.
- a. detergent**
 - b. sanitizer
 - c. bacteriocide
 - d. a chlorine based solution
10. A meat scientist cut open a cured ham and observed a brown spot the size of a penny near the center of the ham and deduced that this was due to the ham being frozen in the center when the cure was injected into the fresh ham. This ability to detect and solve problems is called _____.
- a. brainstorming
 - b. supervised experience
 - c. troubleshooting**
 - d. applied statistics
11. While milk is in a holding or storage tank and after it has been adjusted for butterfat content, it is fortified with vitamin _____.
- a. A
 - b. D**
 - c. E
 - d. K
12. When animals are harvested at a meat processing facility, mandatory antemortem and postmortem inspection is conducted by the _____.
- a. United States Food and Drug Administration
 - b. United States Environmental Protection Agency
 - c. United States Department of Agriculture**
 - d. Centers for Disease Control and Prevention
13. Hard wheat flour will yield flour that has a _____ ratio than that of flour from soft wheat.
- a. higher starch-to-water
 - b. higher protein-to-starch**
 - c. lower protein-to-starch
 - d. lower starch-to-water
14. _____ is a method of heat transfer where heat is transferred by circulatory movement in a liquid or gas.
- a. radiation
 - b. convection**
 - c. conduction
 - d. induction

15. A food scientist was calibrating a thermometer prior to measuring the internal temperature of a product coming out of an impingement oven. To calibrate their thermometer, they placed the thermometer in boiling water and the thermometer reading stated that the temperature was 102°C. Since the food scientist only had this thermometer to use and they could not physically adjust the thermometer for calibration, they _____ when they take the temperature of the product.

- a. need to subtract 2 degrees from their temperature reading
- b. should use the thermometer temperature reading with no adjustment
- c. need to add 2 degrees to their temperature reading**
- d. need to recalibrate the thermometer in an ice bath to find the adjustment value

16. _____ is a common term for the osmotic process that causes some water-soluble components in vegetable to leave the vegetable for the surrounding medium during the canning process.

- a. Leaching**
- b. Turgor
- c. Stasis
- d. Miscibility

17. A compound that is found in many soft drinks has the chemical formula $C_8H_{10}N_4O_2$ and is called _____.

- a. table salt
- b. sodium bicarbonate
- c. caffeine**
- d. Aspartame

18. The term “Daily Value” that is found on a nutrition facts label means _____.

- a. the number of servings in a container
- b. the amount of food in a serving
- c. you can determine if the product contains none or an insignificant amount of a nutrient
- d. you can determine how the nutrients in a food serving fit with what you can or should have for the day.**

19. When food is prepared in a food service establishment, hot foods should be maintained at _____.

- a. $\leq 120^\circ F$
- b. $\geq 120^\circ F$
- c. $\leq 145^\circ F$
- d. $\geq 145^\circ F$**

20. When the fat in walnuts begins to oxidize, the flavor of the walnut changes and becomes _____.

- a. rancid**
- b. sweet
- c. bitter
- d. sour

21. A manufacturer that produces baked beans might have challenges with their process if they use _____ because the beans will take longer than normal to cook, changing their overall processing time
- a. salt in the formulation
 - b. hard water**
 - c. soft water
 - d. brown sugar in the formulation
22. During the sensory analysis of chicken soup, _____ respond to odors in the form of steam rising from the container of hot chicken soup.
- a. taste buds
 - b. olfactory organs**
 - c. auditory organs
 - d. vision receptors
23. _____ caramelizes at 110°C.
- a. Sucrose
 - b. Glucose
 - c. Fructose**
 - d. Galactose
24. Processing a food product so that it receives a 5 D treatment means that _____ percent of the microorganisms will be destroyed.
- a. 99.0
 - b. 99.9
 - c. 99.99
 - d. 99.999**
25. Food scientists often need to know how much solute a solution contains. What would be the mass percent of sucrose in a solution if 23 g of sucrose was dissolved in 77 g of water?
- a. 29.9%
 - b. 23%**
 - c. 3.3%
 - d. 17.7%
26. The enzyme maltase in yeast cells helps in baking yeast bread because it acts as a catalyst for the breakdown of maltose to simple sugars that are then metabolized to produce _____ which causes the dough to rise.
- a. carbon dioxide**
 - b. sodium bicarbonate
 - c. water
 - d. hydrogen ions
27. Freezing an ice cream mixture _____ will create very small ice crystals.
- a. slowly
 - b. quickly**
 - c. slowly or quickly
 - d. in an aerobic environment

28. Food scientists continually conduct experiments to test processing conditions. In an experiment for a cookie company, a scientist tested spread of a cookie using butter or shortening to determine which was best for minimizing the spread of a cookie. For this experiment, the spread of the cookie would be considered a _____.
- a. inductive variable
 - b. dependent variable**
 - c. independent variable
 - d. deductive variable
29. Based on the principles of HACCP, broccoli that is contaminated with a pesticide residue is an example of a _____.
- a. biological hazard
 - b. physical hazard
 - c. chemical hazard**
 - d. filth
30. A mole of water, salt, and sugar cubes are _____ and the masses of each of these products are _____.
- a. the same, different**
 - b. different, the same
 - c. the same, the same
 - d. different, different
31. You are creating a new chocolate product and are using 57 pounds of cocoa powder in the formulation. Your supervisor has asked that you convert the formulation from English units to metric units. How much would the cocoa powder weigh in kilograms?
- a. 125.66 kg
 - b. 2.59 kg
 - c. 12.57 kg
 - d. 25.85 kg**
32. Whenever a chemical is used in a food processing lab, a(n) _____ must be available in case of an accident.
- a. autoclave
 - b. material safety data sheet**
 - c. material specifications direction sheet
 - d. chemical sink
33. A chemist, _____, discovered that the sweetness of sugar beets and of cane sugar was the result of the same chemical, sucrose.
- a. Olivier de Serres
 - b. Andreas Sigismund Marggraf**
 - c. Thomas Malthus
 - d. Harvey Washington Wiley
34. Glycogen is the form of _____ that is found in meat.
- a. protein
 - b. fat
 - c. fatty acids
 - d. carbohydrates**

35. _____ is sometimes used as an indicator microorganism which means it can provide an index of the sanitary quality of the product and may serve as an indicator of potential for the presence of pathogenic species.
- a. **Escherichia coli**
 - b. *Staphylococcus aureus*
 - c. *Clostridium perfringens*
 - d. *Clostridium botulinum*
36. During the process of _____, fat particles break down and are surrounded by an emulsifier that keeps the tiny particles permanently separated.
- a. pasteurization
 - b. emulsification
 - c. **homogenization**
 - d. winterization
37. The development of Gatorade® G Series Fit to be sold alongside of other Gatorade® products would be considered a _____.
- a. product rollout
 - b. market channel
 - c. **product line extension**
 - d. regional promotion
38. Margarine is a plant oil that was _____ to a semi-solid form to resemble an animal fat product.
- a. crystallized
 - b. lipidized
 - c. solidicated
 - d. **hydrogenated**
39. The label on Red Bull Energy beverages must meet the requirements of the _____ for labeling.
- a. **United States Food and Drug Administration**
 - b. United States Environmental Protection Agency
 - c. United States Department of Agriculture
 - d. Centers for Disease Control and Prevention
40. *Listeria monocytogenes* is considered a _____ since it can thrive and grow under refrigeration temperatures.
- a. mesophile
 - b. durophile
 - c. **psychrophile**
 - d. thermophile
41. _____ is an economic term for the transformation that occurs in a product from raw material to finished product.
- a. Free market
 - b. **Value-added**
 - c. Feasibility
 - d. Marketing

42. Which of the following products would contain the lowest water content?
- a. eggs
 - b. peanuts**
 - c. cucumbers
 - d. beef steak
43. The use of biochemical techniques to alter the genetic makeup of a plant to enhance characteristics for food production is called _____.
- a. biophysics
 - b. biophysiology
 - c. biotechnology**
 - d. biogenetics
44. Processed food products such as cereals and juice may be supplemented with _____ to enhance their nutritional content.
- a. stabilizers
 - b. chelators
 - c. antioxidants
 - d. vitamins and minerals**
45. Oil and water separate when mixed together in some salad dressings due to the _____ portions of fatty acids in oil.
- a. hydrophobic**
 - b. hydroscopic
 - c. hydrophilic
 - d. hydraulic
46. Juice packaged in a foil pouch is kept safe without refrigeration due to _____.
- a. aseptic processing**
 - b. retort canning
 - c. irradiation
 - d. fermentation
47. _____ is the use of a process to allow a substance or food to keep its useful properties for a longer than normal period.
- a. Bioavailability
 - b. Deterioration
 - c. Bioinformatics
 - d. Preservation**
48. A reaction that occurs _____ is called anaerobic.
- a. in the presence of oxygen
 - b. in the absence of oxygen**
 - c. in the presence or absence of oxygen
 - d. under an acidic pH

49. _____ causes a food intoxication and the toxin is not destroyed by heating a food.

- a. **Staphylococcus aureus**
- b. *Listeria monocytogenes*
- c. *Escherichia coli* O157:H7
- d. *Salmonella enteritidis*

50. Carotenoids in pumpkins are considered _____ because they have antioxidant properties and may reduce cancer risk.

- a. a form of fortification
- b. isoflavones
- c. **a type of phytochemical**
- d. phytosterols