

Food Science Career Development Event
2021 General Knowledge Exam

1. Humans “burn” food for energy. Which of the following can humans obtain energy from consuming?
 - a. Proteins
 - b. Carbohydrates
 - c. Lipids
 - d. All of the above
2. According to the United States Food and Drug Administration (FDA), which of the following is true regarding COVID-19 and the safety of our food supply?
 - a. COVID-19 is now recognized as a foodborne illness
 - b. There is currently no evidence that food or food packaging have been associated with COVID-19 transmission
 - c. Foodborne exposure to SARS-CoV-2 (the virus that causes COVID-19) is a route of transmission for the COVID-19 respiratory illness
 - d. The FDA has not released any information regarding COVID-19
3. Product quality and shelf life can be the result of an effective sanitation program because _____.
 - a. a reduction in the microbial population can occur.
 - b. antimicrobials are directly added to the food product.
 - c. probiotics are used to sanitize equipment.
 - d. all surfaces are irradiated during the sanitation process.
4. _____ is necessary for many enzymes to function and for proper immune system function, as well as wound healing.
 - a. Iodine
 - b. Fluoride
 - c. Iron
 - d. Zinc
5. Acids develop as fruits mature. These acids _____.
 - a. increase sugar content only
 - b. increase sugar content and improve juice quality only
 - c. increase sugar content, improve juice quality, and affect color development
 - d. increase sugar content, improve juice quality, affect color development, and always increase the pH of fruit
6. The _____ the freezing process is, the _____ the ice crystals become.
 - a. slower, smaller
 - b. slower, larger

- c. faster, smaller
 - d. faster, larger
7. Meat and poultry provide nourishment to microorganisms that lead to _____.
- a. spoilage
 - b. discoloration
 - c. foodborne illness
 - d. all of the above
8. When a food contains all the indispensable amino acids, it is called a/an _____.
- a. complete food
 - b. incomplete food
 - c. complete protein
 - d. incomplete protein
9. _____ is the reactions, both chemical and physical, that take place within cells.
- a. Digestion
 - b. Absorption
 - c. Osmosis
 - d. Metabolism
10. The human tongue can sense sour, sweet, salty, and bitter because it is covered in hundreds of _____.
- a. papillae
 - b. flavor sensors
 - c. pores
 - d. microorganisms
11. _____ is the international food standards-setting body that protects consumer health and fair food trade practices by establishing voluntary international food standards, codes of practice, and guidelines.
- a. Codex Alimentarius
 - b. United States Department of Agriculture
 - c. United States Food and Drug Administration
 - d. Hazard Analysis and Critical Control Points (HACCP)
12. Using modern molecular biology to alter genetic material by removing, adding, or rearranging genes is called _____.
- a. whole genome sequencing
 - b. genetic engineering
 - c. nanotechnology
 - d. none of these
13. The _____ in red wine are associated with a reduction in heart disease.

- a. indoles
- b. polyphenols
- c. carotenes
- d. allyl sulfides

14. GRAS is an acronym for _____.

- a. Generally Recognized As Safe
- b. Generally Recognized Antimicrobial Substance
- c. Genetic Removal of Antimicrobial Substance
- d. Genetic Removal of Amylopectin Starch

15. A food intoxication is a foodborne illness that is caused by _____.

- a. ethanol in a food product
- b. toxins from a sanitizing agent used during sanitation
- c. a toxin released from microbes
- d. none of these

16. According to the USDA, a product labeled as "Organic" means the product contains _____.

- a. 100% organic ingredients
- b. a minimum of 95% organic ingredients
- c. at least 70% organic ingredients
- d. specific organic ingredients

17. When making pastries, the role of fat is to _____.

- a. add elasticity to the dough
- b. provide shape to the final product
- c. hold water in the dough
- d. provide texture to the final product

18. GMPs is an acronym for _____.

- a. Good Manufacturing Procedures
- b. Good Manufacturing Practices
- c. Great Manufacturing Procedures
- d. Great Manufacturing Practices

19. On the new Nutrition Facts label, which of the following are included under "Added Sugars"?

- a. Naturally-occurring sugars
- b. Sugars added during processing
- c. Naturally-occurring sugars and sugars added during processing
- d. None of these

20. The _____ is the material that is being dissolved in a homogenous mixture.

- a. solute
- b. solvent
- c. solution
- d. substance

21. During refrigeration, the _____ of the air can be changed to stop respiration and extend the shelf life of a food.

- a. circulation
- b. filtration
- c. gas content
- d. pressure

22. Which of the following is the definition for food defense?

- a. Access to nutritious, safe food
- b. Protecting food products from unintentional adulteration by chemical, biological, radioactive, or physical contaminants
- c. Protecting food products from intentional adulteration by chemical, biological, radioactive, or physical contaminants
- d. All of the above

23. _____ is the fastest dehydration method.

- a. Spray drying
- b. Vacuum drying
- c. Freeze-drying
- d. Sun drying

24. The common name for saccharide is _____.

- a. protein
- b. fat
- c. sodium
- d. sugar

25. Brewing temperature is important when brewing coffee or tea. What happens when the brewing temperature is too high?

- a. Too few of flavor compounds are released.
- b. Bitter polyphenols are released.
- c. A sweet off flavor occurs because volatile fatty acids are released.
- d. None of these

26. A conventional food that has certain food components and/or essential nutrients added for a specific physiological purpose is referred to as a _____.

- a. medicinal food
- b. supplement
- c. genetically modified food

d. functional food

27. _____ is the only reliable method for determining when a food has reached an internal temperature that is adequate for killing foodborne pathogens.

- a. Product color
- b. Product texture
- c. A food thermometer
- d. Oven temperature

28. What type of claim is “Calcium builds strong bones” when used on a food label?

- a. Nutrient content claim
- b. Health claim
- c. Qualified health claim
- d. Structure/function claim

29. A finished food is a _____ food product.

- a. raw
- b. manufactured
- c. ready to eat
- d. discontinued

30. A molecule that has a polar end and a nonpolar end, and is used as a stabilizing factor to maintain dispersion of one immiscible liquid in another, is called a/an _____.

- a. emulsifier
- b. pH control agent
- c. anticaking agent
- d. desiccant

31. Which of the following is used to convert milk into cheese?

- a. Enzymes
- b. Acids
- c. Salts
- d. Sugars

32. Which of the following is true regarding acrylamides?

- a. By-product of cooking, frying, and baking
- b. Formed by combination of sugars and proteins that undergo chemical changes at high temperatures
- c. Toasted or browned foods contain the highest levels
- d. All of the above

33. Flavor is an effect caused by the combination of _____.

- a. Taste and texture
- b. Taste and aroma

- c. Texture and aroma
 - d. Taste and appearance
34. The _____ is primarily responsible for maintaining integrity of a food product from the time when it leaves the factory to when it is consumed by a consumer.
- a. pH
 - b. grocery store
 - c. food package
 - d. truck driver
35. Effective January 1, 2023, what food will be added as the 9th allergen?
- a. Soybeans
 - b. Sesame
 - c. Shellfish
 - d. Sugar
36. In people with _____, foods that contain gluten trigger an immune response that can damage the small intestine lining.
- a. Celiac disease
 - b. stomach cancer
 - c. foodborne illness
 - d. All of these
37. Food handlers can spread bacteria and cause illness through their _____.
- a. hands
 - b. breath
 - c. hair
 - d. all of these
38. Which of the following is indigestible by humans?
- a. Sucrose
 - b. Fructose
 - c. Glucose
 - d. Cellulose
39. Why does chocolate “melt in your mouth”?
- a. The proteins in the chocolate denature at body temperature.
 - b. The lipids in chocolate have a melting point that is close to body temperature.
 - c. The sugars in chocolate caramelize at body temperature.
 - d. None of these.
40. _____ holds oxygen in muscle tissue and gives meat its color.
- a. Myoglobin
 - b. Glycogen

- c. Lipids
 - d. Collagen
41. _____ is a nonnutritive sweetener that is made when chlorine atoms are added to sugar.
- a. Aspartame
 - b. Acesulfame Potassium
 - c. Neotame
 - d. Sucralose
42. When making semidry and dry sausages, _____ are added to ferment the meat.
- a. spices
 - b. salts
 - c. lactic acid bacteria
 - d. enzymes
43. In order to multiply, *Clostridium botulinum* requires an environment with _____.
- a. a pH of 4.6 or greater that is free of oxygen
 - b. a pH below 4.6 that is free of oxygen
 - c. a pH of 4.6 or greater that contains oxygen
 - d. a pH below 4.6 that contains oxygen
44. When developing a new food product, it is important for food scientists to know _____.
- a. target consumer group
 - b. the need or problem
 - c. current trends
 - d. all of these
45. What is the first principle of HACCP?
- a. Conduct a hazard analysis
 - b. Identify critical control points (CCPs)
 - c. Establish critical limits for CCPs
 - d. Establish effective record-keeping procedures
46. How is the calorie density of a food calculated?
- a. Total calories of a food divided by total weight of the food
 - b. Total calories of a food divided by total weight of a meal
 - c. Total weight of a food divided by the total calories of the food
 - d. Total weight of a food divided by total weight of a meal
47. _____ is responsible for the red color that is typical of tomatoes.

- a. Beta-carotene
- b. Lycopene
- c. Lutein
- d. Alpha-carotene

48. Prebiotics are non-digestible components of food that _____.

- a. can interfere with proper digestion
- b. support the growth of foodborne pathogens and lead to foodborne illness
- c. often lead to diarrhea and symptoms of indigestion
- d. encourage beneficial microorganism growth in the intestine

49. Gelatin is a/an _____ that is often used to thicken ice cream and other desserts.

- a. starch
- b. lipid
- c. emulsifier
- d. protein

50. Refrigerated leftovers should be used within _____.

- a. 1-2 days
- b. 3-4 days
- c. 5-7 days
- d. 7-10 days

Food Science Career Development Event
2022 General Knowledge Exam

1. Poor sanitation can cause _____, which is a common problem that can lead to _____.
 - a. food weight to increase, more expensive products
 - b. food spoilage, off-odors and flavors
 - c. employee termination, labor shortages
 - d. None of the choices properly complete the sentence
2. What is the United States Department of Agriculture (USDA) agency that is responsible for ensuring the safety of the nation's meat, poultry, and processed egg products?
 - a. Food Inspection Service
 - b. Food Safety Service
 - c. Meat, Poultry, and Egg Products Inspection Service
 - d. Food Safety Inspection Service
3. Which of the following represents the temperature "Danger Zone"?
 - a. 30°F to 130°F
 - b. 35°F to 135°F
 - c. 40°F to 140°F
 - d. 45°F to 145°F
4. The term "organic" is well-defined and regulated by _____.
 - a. USDA's National Organic Program
 - b. FDA's National Organic Program
 - c. The National Organic Food Program of the United States of America
 - d. Organic Foods of America
5. Vitamin C is also known as _____.
 - a. acetic acid
 - b. ascorbic acid
 - c. citric acid
 - d. phosphoric acid
6. In the food industry, recipes are called _____.
 - a. recipes
 - b. formulations
 - c. protocols
 - d. preparations
7. Which of the following can impact a human's ability to detect flavors?
 - a. Age
 - b. Gender

- c. Health
 - d. All of the above
8. In 2002, *savory* was officially recognized as the fifth taste by the scientific community. What is another term for *savory*?
- a. Tasty
 - b. Beefy
 - c. Umami
 - d. Astringency
9. On August 1, 2022, the USDA announced that it will be declaring *Salmonella* an adulterant in which of the following products?
- a. Raw pork products
 - b. Breaded and stuffed raw chicken products
 - c. All raw ground meat and poultry products
 - d. Raw poultry and turkey products
10. When bread is toasted, and browning occurs, this an example of which type of change?
- a. Physical change
 - b. Phase change
 - c. Physical and phase change
 - d. Chemical change
11. In terms of addressing bioterrorism in the food industry, what are the “3 Ps” of protection?
- a. Personnel, product, politics
 - b. Product, property, politics
 - c. Personnel, product, property
 - d. Personnel, property, processing
12. Which of the following refers to the stationary phase of microbial growth?
- a. Period of adjustment after contamination occurs
 - b. Period of exponential growth
 - c. Environmental factors are limiting and growth slows
 - d. Death at an exponential rate
13. The food industry uses sublimation to _____ and _____ foods at the same time.
- a. freeze, dry
 - b. freeze, liquefy
 - c. dry, liquefy
 - d. cook, irradiate
14. Structural changes in ingredients can be the indirect result of _____.

- a. heating
 - b. processing
 - c. storage
 - d. All of the above
15. What happens when gluten protein chains come into contact with water?
- a. They do not react or move
 - b. Their shape changes by breaking into smaller chains or forming longer chains
 - c. Water acts as a protease and degrades gluten proteins
 - d. None of the above
16. What is the water activity of cookies, crackers, and bread crusts?
- a. 0.50
 - b. 0.40
 - c. 0.30
 - d. 0.20
17. What is lactose intolerance?
- a. Overproduction of lactose in the small intestine
 - b. Overproduction of lactase in the small intestine
 - c. Inability to produce lactose
 - d. Inability to produce lactase
18. The flakiness and tenderness of a pastry or pie shell is dependent on _____ and _____.
- a. type of fat used, temperature at which fat is incorporated into flour
 - b. type of sugar used, temperature at which sugar is incorporated into flour
 - c. amount of air introduced, how much dissolved oxygen is present
 - d. cooking temperature, how quickly the product was cooled
19. Which of the following sweet alcohols is NOT used as a texturizer?
- a. Glycerol
 - b. Mannitol
 - c. Sorbitol
 - d. Xylitol
20. Retrogradation occurs because _____.
- a. a gel wasn't properly cooled
 - b. too much starch was added to a product
 - c. starch granules try to return to their pre-cooking structure
 - d. all of the above
21. What is a psychosomatic food illness?
- a. All foodborne illnesses

- b. Illness caused by the mind because of the sight of a foreign object or after watching another human get sick
 - c. Faking foodborne illness to avoid school or work
 - d. None of the above
22. Which pathogen caused a large outbreak in powdered infant formula in early 2022?
- a. *Salmonella* Typhimurium
 - b. *Escherichia coli* O157:H7
 - c. *Listeria monocytogenes*
 - d. *Cronobacter sakazakii*
23. When carbohydrates are not present as an energy source, the body goes into _____, which is a process of producing _____.
- a. ketosis, ketone bodies
 - b. glycolysis, glycogen
 - c. stress, cortisol
 - d. proteolysis, proteases
24. Which of the following is a lipid?
- a. Shortening
 - b. Sterols
 - c. Cholesterols
 - d. All of the above
25. Which of the following describes a foodborne intoxication?
- a. A disease-causing microorganism is ingested and causes illness
 - b. A chemical used in a food processing plant accidentally contaminates a food
 - c. A microorganism grows in a food, produces a toxin, and the toxin causes illness
 - d. The deliberate contamination of a food product with a toxic chemical
26. Which of the following is NOT an example of a globular protein?
- a. Caseins in milk
 - b. Albumin in egg white
 - c. Whey in milk
 - d. All of these are globular proteins
27. Pork is lighter in color than beef because it contains less _____.
- a. blood
 - b. myoglobin
 - c. fat
 - d. glycogen
28. A food package is important for which of the following?
- a. Protection of the product

- b. Containing the product
- c. Communicating information to the consumer
- d. All of the above

29. When making popcorn, what causes the kernels to pop?

- a. Heating degrades the proteins in the pericarp (shell) of the kernel, causing the kernel to pop
- b. Heating breaks down starches in the kernel, causing them to expand, and the kernel to pop
- c. Heating causes water and starch to combine in the kernel, causing the kernel to expand and pop
- d. Heating causes water in the kernel to boil, resulting in steam, and the pressure caused by the steam pops the kernel

30. What is rennin?

- a. Enzyme that breaks down fat during lipolysis
- b. Enzyme that breaks down proteins in milk
- c. Enzyme that breaks down lactose
- d. Enzyme that breaks down maltose

31. Enzymatic browning is a chemical reaction that results in the production of brown pigments called _____.

- a. Acrylamides
- b. Oxidases
- c. Melanins
- d. Bromelains

32. What are the fat-soluble vitamins?

- a. A, D, E, K
- b. A, C, E, K
- c. C, D, E, K
- d. A, C, D, E

33. Iodine is important for thyroxine production, which is produced by the thyroid. _____ is one of the best sources of iodine.

- a. Beef
- b. Chicken
- c. Pork
- d. Seafood

34. Why of the following are NOT high in polyphenols?

- a. White grapes
- b. Red grapes
- c. Purple grapes

d. Berries

35. Food allergies are mediated by _____ antibodies to proteins.

- a. IgA
- b. IgE
- c. IgG
- d. IgM

36. Hygiene is important for people working in the food industry. People are known to harbor which of the following?

- a. Streptococci
- b. Staphylococci
- c. Intestinal microorganisms
- d. All of the above

37. What does CIP stand for in the food industry?

- a. Cooking-in-Place
- b. Cleaning-in-Place
- c. Cooking-in-Progress
- d. Cleaning-in-Progress

38. What does the acronym CRISPR stand for?

- a. Clustered Regularly Interspaced Palindromic Repeats
- b. Clustered Routinely Interspaced Palindromic Repeats
- c. Check Regularly Inside Production Refrigerators
- d. Check Routinely Inside Production Refrigerators

39. In terms of protein content and unsaturated fatty acids, insects provide nutritional benefits that are comparable to meat. However, edible insects also provide a source of _____ and _____.

- a. Vitamin C, cellulose
- b. Vitamin K, cellulose
- c. Vitamin C, fiber
- d. Vitamin K, fiber

40. Which of the following is NOT true regarding COVID-19 and our food supply?

- a. Food packaging is an important source of SARS-CoV-2 (the virus that causes COVID-19) transmission, so all food packages should be sanitized
- b. There is no evidence that COVID-19 can be transmitted by food
- c. Coronaviruses, such as SARS-CoV-2, are easily killed using appropriate disinfectants
- d. All of these are true statements

41. Which of the following is caused by a prion?

- a. Salmonellosis
 - b. Rotavirus
 - c. Bovine spongiform encephalopathy
 - d. Hepatitis
42. Two Latin names are given to classify microbes. What is the genus and what is the species for *Escherichia coli*?
- a. Genus = *Escherichia*, species = *coli*
 - b. Genus = *coli*, species = *Escherichia*
 - c. Genus = bacteria, species = *Escherichia*
 - d. Genus = *Escherichia*, species = bacteria
43. What is the Delaney Clause?
- a. Bars the approval of any food known to cause illness in humans
 - b. Bars the approval of any food additive known to cause cancer in humans or animals
 - c. Bars the use of any sanitizer or disinfectant in the food industry if it is known to cause cancer in humans or animals
 - d. None of these describe the Delaney Clause
44. What does the term "Reduced Fat" mean when used as a food label nutrient claim?
- a. No more than 10% of the fat of the comparable food
 - b. No more than 15% of the fat of the comparable food
 - c. No more than 20% of the fat of the comparable food
 - d. No more than 25% of the fat of the comparable food
45. Why can't grapefruits and/or grapefruit juice be consumed with some medications?
- a. Some medications alter the tastebuds and make grapefruits taste like metal
 - b. The ingredients in some medications combine with the flavonoid naringin in grapefruits to make a toxic compound
 - c. The flavonoid naringin in grapefruits can decrease the effectiveness of some medications
 - d. All of these are true
46. Which of the following best describes a sanitizer?
- a. Agent that destroys/eliminates microbial life in all forms
 - b. Agent that kills vegetative bacteria and infectious fungi, but does not necessarily eliminate spores
 - c. Agent that removes soil and debris from a surface
 - d. Agent that decreases, but does not necessarily eliminate, microorganisms to a level deemed safe for public health
47. Caffeine consumption increases the excretion of _____.
- a. Calcium

- b. Calcium and magnesium
- c. Zinc
- d. Zinc and folic acid

48. What does the term aseptic mean?

- a. Free of pathogens
- b. Another term for sanitation
- c. Heating food to 165°F
- d. Another term for blanching

49. What does the term “Best If Used By” indicate on a food label?

- a. Refers to product safety and indicates products are not safe after the date
- b. Refers to product quality and safety, indicating the product will have poor quality and not be safe after the date
- c. Refers only to product quality and indicates the product may still be fine to eat after the date
- d. Tells the grocery store the last date that they can sell product before it must be destroyed

50. Which of the following types of required information must be found on the principal display panel of a food label?

- a. Ingredients
- b. Major food allergens
- c. Company name and address
- d. Name of food or statement of identity



FOOD SCIENCE CAREER DEVELOPMENT EVENT

2023 GENERAL KNOWLEDGE EXAM

1. Which of the following is NOT a function that water serves in the body?
 - a. Improving the quality of sleep
 - b. Transportation of nutrients
 - c. Reactant in metabolism
 - d. Maintaining body temperature
2. Which of the following best defines fatty acid?
 - a. Inorganic molecules that consist of a carbon chain with a carboxyl group at one end
 - b. Inorganic molecules that consist of a carbon chain with a triglyceride at one end
 - c. Organic molecules that consist of a carbon chain with a carboxyl group at one end
 - d. Organic molecules that consist of a carbon chain with a triglyceride at one end
3. Which of the following best defines margin of safety for an additive?
 - a. Zone between the concentration in which an additive is normally used and the level at which a hazard exists
 - b. Zone between no use (0% concentration) and the concentration at which an additive is normally used
 - c. The concentration at which an additive is normally used with an acceptable error of +/- 5%
 - d. None of the above
4. Microorganisms and _____ often work together to cause food spoilage.
 - a. people
 - b. animals
 - c. enzymes
 - d. All of the above
5. Why are three-digit codes used to label products during sensory evaluation?
 - a. Allows for enough unique numbers to be available when doing a sensory study with a large number of samples
 - b. Reduces bias because panelists are more likely to select 1 over 3 or A instead of B or C
 - c. This is a requirement by the Food and Drug Administration
 - d. None of the above

6. Hydroponic crops are grown with their roots suspended _____.
a. in a system that maintains moisture at a concentration of 50% soil and 50% water
b. in distilled water
c. in municipal tap water
d. in a liquid nutrient solution
7. Which of the following a technique to separate foods based upon density?
a. Centrifugal force
b. Sedimentation
c. Pressure
d. Chemicals
8. What is the **overarching goal** that MyPlate.gov, the Physical Activity Guidelines, and the Dietary Guidelines aim to achieve?
a. More physical activity
b. Fewer calories consumed per day
c. Energy balance
d. More sleep
9. If eggs are cooked too long, _____ will develop, and the result will be a green ring around the egg yolk.
a. Iron sulfide
b. Hydrogen sulfide
c. Iron disulfide
d. Hydrogen disulfide
10. Cellulose is indigestible and composed of _____.
a. beta-fructose
b. beta-sucrose
c. beta-lactose
d. beta-glucose
11. Which of the following best describes cultivated meat?
a. Laboratories are used to reproduce animal flesh in bioreactors to produce a product that is characteristic of natural meat
b. Laboratories are used to produce a product that resembles meat using ingredients that are not of an animal origin
c. Processing plants are used to produce a product that resembles meat using ingredients that are not of an animal origin
d. Processing plants are used to produce a product that resembles meat but is made entirely of vegan materials

12. Foams can be described as _____, surrounded by a _____ film.
- a. bubbles of air, lipid
 - b. bubbles of air, protein
 - c. proteins, carbohydrate
 - d. proteins, lipid
13. Which of the following is NOT a function of acids and bases?
- a. Food preservation
 - b. Cheese production
 - c. Protein source
 - d. Aid in digestion
14. High-dose irradiation can be defined as levels of radiation of _____ kgray or higher.
- a. 10
 - b. 15
 - c. 20
 - d. 25
15. A soft drink is a(n) _____ solution.
- a. oxygen-in-water
 - b. carbon dioxide-in-water
 - c. sugar with oxygen-in-water
 - d. sugar with carbon dioxide-in-water
16. Which of the following are methods used in descriptive research?
- a. Surveys
 - b. Interviews
 - c. Observations
 - d. All of the above are descriptive research methods
17. Which of the following is NOT true about molds?
- a. Almost all molds should be considered a health hazard
 - b. Bacteria and yeast are less hardy than molds
 - c. Molds spoil foods
 - d. Mold growth can occur over a wide pH range
18. Which of the following is NOT one of the 7 principles of the Hazard Analysis and Critical Control Point program?
- a. Establish critical limits
 - b. Establish corrective actions
 - c. Establish regulatory relationships
 - d. Establish record-keeping and documentation procedures

19. Which of the following is recognized as the leading body for setting international food standards with the goal of protecting consumer health ensuring fair food trade practices?
- a. United States Department of Agriculture
 - b. Food and Drug Administration
 - c. Codex Alimentarius
 - d. All of the above
20. Which pathogen is often implicated in infant formula recalls?
- a. Clostridium botulinum
 - b. Cronobacter sakazakii
 - c. Campylobacter jejuni
 - d. None of the above
21. Which of the following best describes the research term meta-analysis?
- a. A sensory study that has 1,000 or more research participants
 - b. A research study that is conducted by the USDA or FDA in conjunction with a university
 - c. A research study conducted by 5 or university researchers
 - d. Drawing overall conclusions by pooling results from several individual research studies
22. When water leaks from a gel over time, this is known as _____.
- a. Syneresis
 - b. Dehydration
 - c. Stability
 - d. Gelatinization
23. Why does a dressing that consists of vinegar and oil separate?
- a. Fat molecules in the vinegar are nonpolar and the oil molecules are polar
 - b. Fat molecules in the oil are polar and vinegar molecules are nonpolar
 - c. Fat molecules in oil are nonpolar and vinegar molecules are polar
 - d. Fat molecules in the vinegar are polar and the oil molecules are nonpolar
24. _____ is the energy required for a reaction to begin and _____ reduce the amount of energy required for a reaction to begin.
- a. Active energy, enzymes
 - b. Activation energy, enzymes
 - c. Active energy, substrate
 - d. Activation energy, substrate

25. Which of the following best defines the term bioavailability?
- a. Ability of the body to absorb a nutrient and convert it to a form that can be used by the body
 - b. Degradation of a nutrient that is not needed in the body to prevent excess accumulation of nutrients
 - c. Ability of the body to absorb and use a nutrient in the form it was consumed
 - d. None of the above
26. Why is slow freezing and the development of large ice crystals an issue in food products?
- a. Rupture cell walls of animal and plant tissues
 - b. Create a crunchy, undesirable eating experience
 - c. Large ice crystals may damage a consumer's mouth while eating
 - d. All of the above
27. Dehydrofreezing is also known as _____.
- a. lyophilization
 - b. dehydration
 - c. rehydration
 - d. concentration
28. The proportion of flour to liquid is lower in _____ than in _____.
- a. doughs, batters
 - b. batters, doughs
 - c. foams, batters
 - d. foams, doughs
29. Which of the following contribute the most kilocalories per gram of nuts?
- a. Carbohydrates
 - b. Proteins
 - c. Fats
 - d. Proteins, fats, and carbohydrates contribute equal kilocalories
30. Which of the following is NOT a phenolic acid?
- a. Ellagic acid
 - b. Vanillin
 - c. Thymol
 - d. All of the above are phenolic acids
31. Coliforms present in a food product indicate the possible presence of _____.
- a. pathogenic microorganisms
 - b. chemical contaminants
 - c. physical hazards
 - d. a & b

32. Which of the following is NOT one of the “4 Cs of Food Safety”?
- a. Change
 - b. Clean
 - c. Cook
 - d. Chill
33. Which of the following can viscosity influence in a food?
- a. Texture of a food
 - b. Desirability of a food
 - c. Effectiveness of a cooking oil
 - d. All of the above
34. What policy did the USDA implement in December of 2012 with the goal of significantly reducing consumer exposure to unsafe meat products?
- a. Chill and Test
 - b. Chill and Ship
 - c. Test and Ship
 - d. Test and Hold
35. Which of the following USDA Recall Classifications represents “high or medium risk”?
- a. Class I
 - b. Class II
 - c. Class III
 - d. Class IV
36. Which of the following is a component of the FDA’s New Era of Smarter Food Safety blueprint?
- a. Green Energy
 - b. Cultivated Meats
 - c. Tech-Enabled Traceability
 - d. Genetic Engineering
37. Which of the following is the most recent edition of the FDA Food Code?
- a. 2023 Food Code
 - b. 2022 Food Code
 - c. 2017 Food Code
 - d. 2013 Food Code
38. What is the definition of a compound?
- a. Substance that contains two or more elements that are chemically combined
 - b. Substance that contains three or more elements that are chemically combined
 - c. Pharmaceutical term that relates to the combining of ingredients to generate a pharmaceutical product
 - d. None of the above

39. Which of the following is another term for condensation?
- a. Sublimation
 - b. Vaporization
 - c. Fusion
 - d. None of the above
40. The enzyme _____ breaks lactose down into _____.
- a. Glucose, glucose and galactose
 - b. Lactase, glucose and galactose
 - c. Glucose, sucrose and galactose
 - d. Lactase, sucrose and galactose
41. Aspartame is comprised of which two amino acids?
- a. Lysine and phenylalanine
 - b. Asparagine and phenylalanine
 - c. Aspartic acid and phenylalanine
 - d. Alanine and phenylalanine
42. Which of the following is NOT true about caffeine?
- a. A moderate dose of caffeine is considered to be 300-400 mg per day
 - b. Classified as a mild stimulant
 - c. Considered Generally Recognized as Safe (GRAS)
 - d. Added to many foods and beverages
43. When anaerobic bacteria digest cow manure, _____ is produced, which can be captured and burned in generators to produce energy and decrease _____.
- a. methane, greenhouse gas emissions
 - b. methane, smell
 - c. carbon dioxide, greenhouse gas emissions
 - d. carbon dioxide, smell
44. Which of the following is considered the **main source** for the foodborne pathogen *Staphylococcus aureus*?
- a. Cattle
 - b. Pigs
 - c. Chickens
 - d. Humans
45. What gas is often reduced in modified atmosphere packaging (MAP)?
- a. Oxygen
 - b. Carbon dioxide
 - c. Nitrogen
 - d. Carbon monoxide

46. The membrane in eggs that separates the egg white from the shell is similar in structure to a(n) _____.
a. cytoplasmic membrane
b. cell wall
c. mucous membrane
d. biofilm
47. Fresh apple shelf life can be extended by suppressing their natural production of _____.
a. glucose
b. methane
c. ethylene
d. carbon dioxide
48. Which of the following is NOT associated with rancidity?
a. Unpleasant flavor for the consumer
b. Unpleasant odor for the consumer
c. Auto-oxidation of the product
d. Short-term health risks are a concern if a rancid product is consumed
49. What is collagen?
a. A protein found in muscle tissue
b. A protein found in connective tissue
c. A lipid found in muscle tissue
d. A lipid found in connective tissue
50. Which of the following is a benefit of food additives?
51. Reduced risk of foodborne illness
52. Reduced waste due to spoilage
53. Reduced amount of time required to prepare food
54. All of the above

Food Science Career Development Event
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1. Which of the following prompted the discipline of food science to emerge?
 - a. Cross-contamination in home kitchens caused foodborne illness
 - b. The USDA declared the need for food science
 - c. Food preparation transitioned from the home to a factory because of technology advancements
 - d. None of the above
2. Which of the following is required to calibrate an alcohol thermometer?
 - a. Ice water
 - b. Boiling water
 - c. 70% ethanol
 - d. A&B
3. What is/are the best food vehicle(s) for delivering Vitamin E as a fortificant?
 - a. Orange juice
 - b. Fats and oils
 - c. Milk and dairy products
 - d. Cereal
4. Why is the milk that is used for yogurt production heated?
 - a. Killing undesirable bacteria
 - b. Denatures proteins
 - c. Contributes to thick texture
 - d. All of the above
5. What is an advantage of concentrated foods?
 - a. Shipping and packaging cost savings
 - b. Customers can dilute the product to their taste preferences
 - c. Less water is required, so these products are more sustainable for the environment
 - d. These products have a more intense color, which is desirable to consumers
6. What is freezer burn?
 - a. Undesired sublimation of frozen foods
 - b. Desired sublimation of frozen foods
 - c. Undesired freezing that only occurs in a blast freezer
 - d. None of the above
7. In comparison to proteins and carbohydrates, fats provide _____ as many calories.
 - a. 2x
 - b. 3x
 - c. 4x
 - d. 5x
8. What is another name for glucose?
 - a. Fructose
 - b. Sucrose
 - c. Dextrose

- d. Aspartame
9. Which of the following is not true about water?
- a. Contains one oxygen atom
 - b. Contains two hydrogen atoms
 - c. The compound is held together by covalent bonds
 - d. All of the above are true
10. Eggs have carbon dioxide that escapes through the porous shell during storage. What happens to pH of the egg as carbon dioxide escapes?
- a. Remains the same
 - b. Increases
 - c. Decreases
 - d. This does not happen in eggs and the statement is not true
11. Excess consumption of which of the following may cause diarrhea?
- a. Glycerol
 - b. Mannitol
 - c. Sorbitol
 - d. All of the above
12. Caffeine reaches maximum effects _____ minutes after consumption.
- a. 15 to 45
 - b. 30 to 60
 - c. 60 to 90
 - d. 90 to 120
13. Which of the following are used to produce wine?
- a. Honey
 - b. Dandelions
 - c. Grapes
 - d. All of the above
14. According to Centers for Disease Control and Prevention estimates, about _____ of salmonellosis outbreaks involve eggs?
- a. 25%
 - b. 50%
 - c. 75%
 - d. 85%
15. Which of the following viruses have been associated with foodborne illness?
- a. Rotavirus
 - b. Norovirus (also known as Norwalk)
 - c. Hepatitis A
 - d. All of the above
16. Which ingredient in soft drinks is an effective meat tenderizer?
- a. Carbon dioxide
 - b. Phosphoric acid
 - c. Sodium benzoate
 - d. Sweeteners
17. Acrylamides are a by-product of _____.

- a. Baking
 - b. Cooking
 - c. Frying
 - d. All of the above
18. What causes taste bias?
- a. Negative experiences that lead a person to disliking a food
 - b. Positive food experiences
 - c. Taste preferences
 - d. All of the above
19. What can lead to systematic error?
- a. Too many variables
 - b. A poorly designed experiment
 - c. A&B
 - d. None of the above
20. Why is sodium dioxide or potassium metabisulfite added to wine?
- a. Prevent unwanted growth of organisms
 - b. Stabilize color
 - c. A&B
 - d. None of the above
21. Which of the following is a liquid-in-liquid solution?
- a. Carbon dioxide in water
 - b. Alcohol in water
 - c. Sugar in water
 - d. All of the above
22. When should a marketing campaign be prepared for a new food product?
- a. During idea conception
 - b. During initial formulation and development
 - c. Before sensory testing begins
 - d. Simultaneously with preparing to manufacture the product
23. Isoflavones are present in which of the following foods?
- a. Soy products
 - b. Chickpeas
 - c. Licorice
 - d. All of the above
24. Riboflavin is a natural coloring agent that provides a _____ color.
- a. Yellow-red
 - b. Yellow
 - c. Red-orange
 - d. Orange
25. High-dose irradiation has been recommended for _____.
- a. Spices
 - b. Leafy greens
 - c. Fresh ground beef
 - d. None of the above

26. Pure lactic acid is produced from _____.
a. Yogurt
b. Whey
c. Casein
d. Sour cream
27. In the metric system, the prefix hecto means _____.
a. One
b. Ten
c. Hundred
d. Thousand
28. On the Celsius scale (°C), which of the following would be considered room temperature?
a. 4
b. 11
c. 21
d. 30
29. Sources of modified starches most commonly include _____.
a. Wheat
b. Corn
c. Soy
d. All of the above
30. In an enzymatic reaction, what is the substrate?
a. Coenzyme necessary for the reaction to proceed
b. Location where the enzyme acts
c. Energy needed to start the reaction
d. None of the above
31. Gelatin is a _____.
a. Protein
b. Carbohydrate
c. Lipid
d. Artificial sweetener
32. What is another name for tocopherol?
a. Vitamin A
b. Vitamin B
c. Vitamin D
d. Vitamin E
33. What is the preferred water activity (a_w) for most yeasts?
a. 0.83 – 0.96
b. 0.90 – 0.91
c. 0.87 – 0.94
d. 0.70 – 0.80
34. What is the preferred pH range for most molds to grow?
a. 6.5 – 7.5
b. 4.0 – 6.5

- c. 4.0 – 6.8
 - d. 2.9 – 6.0
35. Water activity is a measure of the _____ to support chemical and biological reactions.
- a. Free water available
 - b. Bound water unavailable
 - c. Amount of water added to a food that is available
 - d. None of the above
36. What is the maximum FDA-approved irradiation dose for spices and seasonings?
- a. 30 kGy
 - b. 50 kGy
 - c. 70 kGy
 - d. 100 kGy
37. When combining vinegar and baking soda, the fizz that forms is _____.
- a. Toxic
 - b. The result of carbon dioxide physically separating from water
 - c. The result of carbon dioxide forming through a chemical reaction
 - d. A&C
38. Which of the following is the name of a saturated fatty acid?
- a. Oleic
 - b. Butyric
 - c. Linoleic
 - d. Linolenic
39. Which of the following correctly describes indispensable amino acids?
- a. Do not need to be provided by the diet because they can be sufficiently produced by the body
 - b. Must be provided by foods in a diet and are required for growth of new tissues
 - c. Considered nonessential
 - d. A&C
40. What is sucralose?
- a. Sugar substitute that is manufactured through the addition of chlorine atoms to sugar
 - b. A natural extract from a plant leaf
 - c. A sweet alcohol
 - d. The common name for aspartame
41. What is the recommended storage time (shelf life) of ice cream?
- a. 1 month
 - b. 2 months
 - c. 6 months
 - d. 9 months
42. In the United States, organic foods must meet requirements of the _____ in order to be labeled *organic*.
- a. FDA Organic Program
 - b. USDA Organic Program

- c. National Organic Program
d. United States Organic Foods Program
43. Chemical leavening agents cause an acid-base reaction that leads to the formation of _____.
- a. Carbon dioxide
 - b. Water
 - c. Salt
 - d. All of the above
44. Which of the following teas has the largest caffeine content?
- a. White
 - b. Green
 - c. Black
 - d. They all have the same caffeine content
45. During cooking, the reaction that occurs between carbohydrates and proteins that causes the food to turn brown is called _____.
- a. Acrylamide
 - b. Aldehyde
 - c. Maillard
 - d. Methionine
46. _____ are responsible for the characteristic texture of gummy bears.
- a. Carbohydrate gums
 - b. Pectins
 - c. Gelatinized starches
 - d. None of the above
47. Bottled water is regulated by the _____.
- a. Environmental Protection Agency
 - b. Food and Drug Administration
 - c. United States Department of Agriculture
 - d. Centers for Disease Control and Prevention
48. Which type of sensory panel is most used during the development of a food product?
- a. Consumer taste panelists
 - b. Robotic and electronic sensory testing
 - c. Trained taste panelists
 - d. B&C
49. Which of the following laws was passed in 1906?
- a. Pure Food and Drug Act
 - b. Food, Drug, and Cosmetic Act
 - c. Meat Inspection Act
 - d. A&C
50. What pH is needed for *Clostridium botulinum* to grow?
- a. 4.0 – 4.2
 - b. 4.2 – 4.4
 - c. 4.4 – 4.6
 - d. 4.6 or greater

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1. You can describe a chemical change using a _____.
 - a. Periodic table
 - b. Chemical equation
 - c. Photograph
 - d. None of the above
2. Which of the following is a synthetic antioxidant that is used regularly in food?
 - a. Nitrite
 - b. Benzoic acid
 - c. Propylene glycol
 - d. Butylated hydroxytoluene
3. Why is sourdough bread “sour”?
 - a. Acids are added to the dough to create this flavor
 - b. Bacteria produce acidic by-products
 - c. Yeast produces alcohol
 - d. The combination of b & c
4. What can Gram staining identify?
 - a. Gram-positive bacteria
 - b. Gram-negative bacteria
 - c. Shape of bacterial cells
 - d. All of the above
5. When canning foods, low acid foods are at risk for _____ because _____ can survive boiling temperatures.
 - a. *Clostridium botulinum*, spores
 - b. *Clostridium botulinum*, vegetative cells
 - c. *Clostridium perfringens*, spores
 - d. *Clostridium perfringens*, vegetative cells
6. Which of the following is **not** true about cellophane as a packaging film?
 - a. Over 100 types of cellophane exist
 - b. Cellophane is cellulose that has been specially processed
 - c. Some cellophane products are edible
 - d. Cellophane can vary in thickness, flexibility, and strength
7. Which of the following preservation methods is the most tested and researched of all food preservation methods?
 - a. Irradiation
 - b. Salting
 - c. Refrigeration
 - d. None of these
8. Which of the following would you use to ensure cocoa powder and sugar remain evenly suspended in cocoa butter?
 - a. Water
 - b. Sulfite

- c. Lipase
 - d. Lecithin
9. Which of the following does the food industry use to remove visible solids from a solution?
- a. Filtration
 - b. Evaporation
 - c. Distillation
 - d. All of these
10. An egg shell is largely composed of which of the following?
- a. Calcium citrate
 - b. Calcium carbonate
 - c. Calcium chloride
 - d. Sodium carbonate
11. When preparing to launch a new food product, when would the marketing and advertising campaign be prepared?
- a. At the beginning of the product development process
 - b. While preparing to manufacture the product
 - c. After the first shipment leaves the warehouse
 - d. When products reach the store shelves
12. Why are quality control personnel so important in the food industry?
- a. Quality and safety errors can put a company out of business
 - b. Many regulations must be followed every day
 - c. Extensive documentation is required every day
 - d. All of the above
13. What happens first when milk coagulates to form cheese curds?
- a. Rennin reacts with whey protein to form paracasein
 - b. Rennin reacts with casein to form paracasein
 - c. Rennin reacts with calcium to form calcium paracasein
 - d. Rennin reacts with casein to form calcium paracasein
14. The characteristic texture of gummy bears is provided by _____.
- a. Cellulose
 - b. Amylose
 - c. Starch
 - d. Carbohydrate gums
15. In sensory evaluation, what is the maximum number of samples that a taster can evaluate at one time?
- a. 1-2
 - b. 2-3
 - c. 3-4
 - d. 4-5
16. Sour foods are typically evaluated based on what?
- a. Burning sensation on the tongue
 - b. Drying sensation on the tongue
 - c. Astringency

- d. None of these
17. What is the Bronsted-Lowry theory?
- a. Acids are proton donors, and bases are proton acceptors
 - b. Bases are proton donors, and acids are proton acceptors
 - c. Acids are electron donors, and bases are electron acceptors
 - d. Bases are electron donors, and acids are electron acceptors
18. What is an essential fatty acid?
- a. Fatty acids readily produced by the body
 - b. Fatty acids that cannot be produced by the human body
 - c. Cholesterol
 - d. Lipoprotein
19. What enzyme causes enzymatic browning in fruits and vegetables?
- a. Rennin
 - b. Polyphenol oxidase
 - c. Lactase
 - d. Amylase
20. Which method will lead to the most loss of water-soluble vitamins when preparing vegetables?
- a. Eating vegetables raw
 - b. Steaming vegetables
 - c. Boiling vegetables
 - d. None of the above
21. As food colors intensify, the kinds of _____ consumed increases.
- a. Phytochemicals
 - b. Sugar
 - c. Enzymes
 - d. Proteins
22. Moderate consumption of caffeine can increase which of the following?
- a. Secretion of stress hormones
 - b. Blood pressure
 - c. Respiration rate
 - d. All of the above
23. Which contribution is attributed to Louis Pasteur?
- a. Developed the rabies vaccine
 - b. Developed pasteurization
 - c. Proved the theory of spontaneous generation was false
 - d. All of the above
24. How can the shelf life of fresh apples be extended during storage?
- a. Suppress natural ethylene production
 - b. Chilling
 - c. High levels of carbon dioxide in the air
 - d. All of the above
25. Which of the following is a phenolic acid?
- a. Lactic acid

- b. Carbonic acid
 - c. Butyric acid
 - d. None of the above
26. What do yeast need to grow?
- a. Moisture
 - b. Food supply
 - c. Warm temperatures
 - d. All of the above
27. Riboflavin is a natural coloring agent. What color does it turn a food?
- a. Yellow
 - b. Orange
 - c. Red
 - d. None of the above
28. The _____ a sugar is, the _____ the molecule structure is.
- a. Sweeter, more complex
 - b. Sweeter, simpler
 - c. Sweeter, longer
 - d. None of these
29. What is the most common solvent of substances in foods?
- a. Fat
 - b. Oil
 - c. Water
 - d. All of the above
30. What is a visual sign that a chemical change is occurring?
- a. Bubbling
 - b. Color change
 - c. Precipitate formation
 - d. All of the above
31. Amaranth is an ancient grain that was used by the Aztecs. Why is it studied as a food to combat hunger?
- a. High in calories
 - b. High Omega-3 fat content
 - c. High protein content
 - d. All of the above
32. What year was the Pure Food and Drug Act passed?
- a. 1906
 - b. 1907
 - c. 1913
 - d. 1930
33. When _____ is low enough, food will not spoil, even when stored at room temperature.
- a. pH
 - b. Oxygen
 - c. Carbon dioxide

- d. Water activity
34. _____ causes the _____ in snack (e.g., potato) chips to turn rancid.
- a. Oxygen, fat
 - b. Oxygen, proteins
 - c. Carbon dioxide, fat
 - d. Carbon dioxide, proteins
35. Acrylamide levels are the highest in which foods?
- a. Processed meats
 - b. Browned or toasted foods
 - c. Vacuum-packed foods
 - d. Shelf-stable foods
36. When conducting research, what can skew your results?
- a. Replication
 - b. Following the scientific method
 - c. Bias
 - d. Keeping detailed records
37. Which of the following is a true statement?
- a. The protein coagulation that occurs when eggs are cooked is reversible
 - b. Proteins in meat shrink during the cooking process, reducing their ability to hold water
 - c. Heat is the only method of denaturing proteins
 - d. B&C
38. What is neotame?
- a. Humectant
 - b. Sweetener
 - c. Coloring agent
 - d. Packaging film
39. What causes the holes in Swiss cheese?
- a. Propionic acid bacteria
 - b. Carbon dioxide from fermentation
 - c. A&B
 - d. None of the above
40. What is the fifth principle of HACCP?
- a. Conduct a hazard analysis
 - b. Establish critical limits
 - c. Establish corrective actions
 - d. Establish record-keeping and documentation procedures
41. Which strain of Hepatitis can be transmitted through food?
- a. A
 - b. B
 - c. C
 - d. All of the above
42. The United States Department of Agriculture defines the temperature danger zone as _____.

- a. 35°F to 135°F
 - b. 40°F to 135°F
 - c. 40°F to 140°F
 - d. None of the above
43. Which of the following is categorized as a low-acid food?
- a. Vinegar
 - b. Jams and jellies
 - c. Tomatoes
 - d. Melons
44. What is the internationally recognized symbol that signifies a food is irradiated?
- a. Biohazard
 - b. Radura
 - c. Skull and crossbones
 - d. Lightning bolt
45. What factors impact solubility?
- a. Temperature
 - b. Particle size
 - c. pH
 - d. All of the above
46. What is the fat content of whole milk?
- a. 1-2%
 - b. 2-3%
 - c. 3-4%
 - d. 4-5%
47. Rod-shaped bacteria are called _____.
- a. Bacilli
 - b. Cocci
 - c. Spirilla
 - d. Flagella
48. What is the **main** function of carbohydrates in the body?
- a. Satiety to feel full longer
 - b. Energy for bodily functions
 - c. Improve digestion
 - d. None of the above
49. Which of the following is an organic compound?
- a. Sugar
 - b. Salt
 - c. Baking soda
 - d. Baking powder
50. What is a recipe referred to as in the food industry?
- a. Recipe
 - b. Specification
 - c. Ingredient requirement
 - d. Formulation