AMSA Food Safety & Science Certification Review

Review Objectives

- Food Safety
- Food Science

Food Safety

Food Safety

- Is the scientific discipline describing the handling, preparation and storage of food in ways which prevent foodborne illness
- Is the responsibility of producers, processors and the consumer

Food Safety

- Is highly regulated and effectively executed by both producers and processors
- Can become a concern when the consumer forgets to perform proper food handling procedures

Food Industry Safety

- Is regulated by the Food Safety Inspection Service (FSIS) for domestic and imported animal products such as raw meat and poultry
- For facilities deemed high-risk, should be inspected once every three years according to FDA requirements
- Is also assured by local health departments conducting health inspections and keeping health inspection records

Foodborne Illness

- Is also referred to as food poisoning
- Is the result of ingesting pathogenic microorganisms or their toxins
- Causes one to feel sick and exhibit various symptoms
- Is a collective term for the two types of illness:
  - food infection
  - toxin-mediated infections

Vulnerable Populations

- Include:
  - senior citizens
  - pregnant women
  - young children
  - individuals with compromised immune systems such as those suffering from the following:
    - cancer
    - diabetes
    - liver disease
    - HIV
    - AIDS

Foodborne Illnesses

- Are most commonly caused by mishandling food in one or more of the following ways:
  - time-temperature abuse
  - cross-contamination
  - improper cooking or handling procedures
  - contamination after cooking

Food poisoning is a term used to describe an illness caused by the ingestion of toxins and can also be known as a foodborne intoxication.

Temperature

- Is an important component in the prevention of bacteria growth
- Should be regulated during both food storage and food preparation

Psychrophiles are microorganisms which grow best at temperatures below 68°F (20°C).

Food Storage Temperatures

- Reduce the rate of bacterial growth
- Include:
  - below 40°F (4°C) for cold products
  - above 140°F (60°C) for hot products

Anaerobic microorganisms ONLY grow in the absence of oxygen.

Temperature Danger Zone (TDZ)

- Is between 40°F (4°C) and 140°F (60°C)
- Is the range in which most foodborne pathogenic microorganisms reproduce at an exponential rate

Food held for more than four hours in the temperature danger zone should be discarded.

Temperature Danger Zone (TDZ)

- Can be avoided by:
  - properly cooking all foods
  - heating foods to the proper temperature before serving
  - keeping foods above 140°F (60°C) while serving
  - quickly cooling all food products

Cross-Contamination

- Is the transfer of pathogenic bacteria between foods due to unwashed hands, kitchen equipment or utensils
- Can occur when purchasing, storing, preparing or serving foods

Common Foodborne Intoxications

Illness	***Botulism***
Causative Agent	Toxins produced by the spore-forming bacteria C*lostridium botulinum*
Symptoms	Nausea; vomiting; fatigue; dizziness; headache; dryness of skin; constipation; impaired swallowing, speaking, respiration and coordination; dizziness; double vision **Ten percent of cases are fatal**
Time of Onset	12 to 72 hours after consumption
Food Usually Involved	Home-canned foods with a low acid content, improperly canned commercial foods, home-canned or fermented fish, herb-infused oils, baked potatoes cooled in aluminum foil, cheese sauce Children under one year of age can get botulism from eating honey. Some honeys may contain undeveloped *Clostridium botulinum* bacteria.
Preventative Measures	Properly complete home canning; do not let infants consume honey; do not purchase dented cans

Common Foodborne Infections

Illness	***Perfringens* Food Poisoning**
Causative Agent	*Clostridium perfringens,* bacteria
Symptoms	Nausea; occasional vomiting; abdominal pain; diarrhea
Time of Onset	8 to 24 hours after consumption
Food Usually Involved	Cooked meat, poultry and fish held at non refrigerated temperatures for long periods of time
Preventative Measures	Prompt refrigeration of unconsumed cooked meat, gravy and fish; maintenance of refrigeration equipment; sanitation

Common Foodborne Infections

Illness	***Salmonellosis***
Causative Agent	*Salmonella spp.,* over 1,200 species of *Salmonella* cause illness when ingested, bacteria
Symptoms	Nausea; vomiting; abdominal pain; diarrhea; fever; possible chills and headache
Time of Onset	12 to 24 hours after consumption
Food Usually Involved	Insufficiently cooked or re-heated meat, poultry and eggs; products kept unrefrigerated for long periods of time
Preventative Measures	Properly cooking food products; proper refrigeration and packaging; cleanliness of food handlers; sanitation of equipment

Common Foodborne Infections

Illness	***Listeriosis***
Causative Agent	*Listeria monocytogenes,* bacteria
Symptoms	Fever; headache; nausea; vomiting; monocytosis, meningitis; septicemia; miscarriage; localized external and internal lesions; pharyngitis
Time of Onset	Unknown, approximately four days to three weeks after consumption
Food Usually Involved	Ready-to-eat deli meats and hot dogs; refrigerated meat spreads; unpasteurized milk and dairy products; soft cheese made with unpasteurized milk; refrigerated smoked seafood
Preventative Measures	Proper hygiene practices; sanitation of equipment and workspace; rinse, scrub and dry skins of fresh produce

Common Foodborne Infections

Illness	**Hemolytic Uremic Syndrome**
Causative Agent	*E. coli* O157:H7, bacteria
Symptoms	Severe abdominal cramps; bloody diarrhea; nausea; vomiting; diarrhea; possible complications from hemolytic uremic syndrome, occurs when toxic substances produced by *E. coli* destroy red blood cells and injure the kidneys
Time of Onset	3 to 4 days after consumption
Food Usually Involved	Contaminated food and water; undercooked ground meat; unpasteurized milk and juice; soft cheeses made from unpasteurized milk; raw fruits and vegetables
Preventative Measures	Cook ground meat to 160°F (71°C); avoid unpasteurized milk, juice and dairy products; wash hands properly before preparing foods, after using the restroom and after diapering infants

"Hamburger Illness" is a common name given to this infection.

Sanitation

- Is the application of a chemical or heat to a clean surface which kills microorganisms
- Is hygienic and clean
- Protects the consumer from foodborne contaminants related to disease-producing organisms

Food Contact Surfaces

- Are surfaces which contact human food during the normal course of operations
- Should be cleaned and sanitized more often than other areas of the facility
- Include:
  - clothing
  - gloves
  - hands
  - equipment
  - utensils

Cleaning & Sanitation Programs

- Are important in preventing contamination in food production and unsanitary conditions
- Includes the following:
  - how and what you will clean and sanitize
  - where and when it will be done
  - who will be assigned to do the task

Cleaning & Sanitizing

- Should take place between each use for the following:
  - utensils
  - employee's hands
- Should take place after each shift for the following:
  - small equipment
  - buttons and switches

Cleaning & Sanitizing

- Should take place daily for the following:
  - walls and floors
  - storage shelves
  - large equipment

Sanitizers

- Include:
  - heat
    - hot water
  - chemicals
    - chlorine
    - iodophors
    - Quaternary Ammonium Compounds (Quats)
    - peracetic acid (PAA)

Sanitizing with Heat

- Is commonly used where immersing the contact surfaces is practical
  - small parts
  - utensils
- Can also be used on large equipment with a sprayer
  - cold equipment will bring the temperature of heat treatment down, causing it to be less effective

Chlorine

- Is the most commonly used sanitizer in food production facilities
- Kills most microorganisms
- Should not be mixed with other chemicals
- Should always be added to water
- Should always be used in well ventilated areas

Sanitation Standard Operating Procedures (SSOPs)

- Are written procedures a food production facility develops and implements to prevent direct contamination
- Are required in all USDA-FSIS inspected establishments

SSOPs General Rules

- Are found in 9 CFR 416.11
- State the following:
  - "Each official establishment shall develop, implement and maintain written standard operating procedures for sanitation (Sanitation SOPs) in accordance with the requirements of this part"

The Development of SSOPs

- Is found in four parts in 9 CFR 416.12
- Is to provide an understanding for the responsibility a food production facility has to developing written SSOPs which clearly describes procedures

Part A

- States the following:
  - “The SSOPs shall describe all procedures an official establishment will conduct daily, before and during operations, sufficient to prevent direct contamination or adulteration of product(s).”

Part B

- States the following:
  - "The SSOPs shall be signed and dated by the individual with overall authority on-site or a higher level official of the establishment. This signature shall signify the establishment will implement the SSOPs as specified and will maintain the SSOPs in accordance with the requirements of this part. The SSOPs shall be signed and dated upon initially implementing the SSOPs and upon any modification to the SSOPs."

Part C

- States the following:
  - "Procedures in the SSOPs which are to be conducted prior to operations shall be identified as such, and shall address, at a minimum, the cleaning of food contact surfaces of facilities, equipment and utensils."

Part D

- States the following:
  - “The SSOPs shall specify the frequency with which each procedure in the SSOPs is to be conducted and identify the establishment employee(s) responsible for the implementation and maintenance of such procedure(s).”

SSOP Verification Tasks

- Include:
  - pre-operational and operational SSOP record review
    - use record keeping to verify the procedures in SSOPs are effective in the prevention of food contaminants
  - pre-operational and operational SSOP review and observation
    - review and observe the procedures in SSOPs are effective in the prevention of food contaminants

Hazard Analysis & Critical Control Points (HACCP)

- Is a preventative measure
- Combines science and common sense for food safety
- Was originally developed with Pillsbury® and NASA for use in the space program
- Address physical, biological and chemical hazards
- Is required in meat, poultry, seafood and juice production

Hazard Analysis & Critical Control Points (HACCP)

- Has seven principles:
  1. conduct a hazard analysis
  2. identify critical control points (CCPs)
  3. establish critical limits for each critical control point
  4. establish critical control point monitoring requirements
  5. establish corrective actions
  6. establish record keeping procedures
  7. establish procedures for verifying the HACCP system is working as intended

HACCP Plans

- Require a few preliminary tasks to be completed prior to creation:
  - assembly of a HACCP team
  - creation of a description of a food
  - development of a flow diagram
- Are overseen by the HACCP Coordinator
  - it is the HACCP Coordinator's responsibility to develop, organize and manage the entire HACCP program

Hazards

- Can be:
  - biological
    - hazards such as bacteria, viruses, yeast and molds which can cause a foodborne illness
  - physical
    - any foreign material such as glass or metal which can cause injury to a consumer
  - chemical
    - hazards such as pesticide residues, antibiotic residues, allergens or sanitizers which could have adverse effects on consumers

Potential Sources of Bacterial Contamination

- Include:
  - sticking knife
  - digestive tract
  - hide
  - feathers/hair
  - hooves
  - processing environment
  - lymph nodes

Controlling Biological Hazards

- Can be accomplished by:
  - preventing the contamination
  - destroying or removing foodborne disease agents
  - preventing multiplication of foodborne disease agents

Physical Contaminants

- Include:
  - foreign materials which can cause injury
    - glass
    - metal fragments
    - rocks
- Can come from the following:
  - employees
  - equipment
  - facilities
  - raw materials

Controlling Physical Hazards

- Can be accomplished by:
  - implementing personnel Good Manufacturing Practices
    - hair restraints
    - jewelry policies
  - maintaining Good Manufacturing Practices
  - supervising and educating employees
  - maintaining and monitoring equipment and facilities

Controlling Physical Hazards

- Can be accomplished by:
  - inspecting raw materials
  - instillation of equipment to detect or remove hazards such as:
    - magnets or metal detectors
    - bone separators
    - x-rays

Chemical Contaminants

- Are chemical compounds which can cause injury or illness
- Can be:
  - naturally occurring
  - direct addition
  - incidental addition
- Examples include:
  - allergens
  - lubricants
  - cleaning and sanitizing agents
  - mycotoxins

Adulterants

- Are substances which, if found in a food product, are not fit for human consumption

E. coli is considered an adulterant in ground beef. USDA has a ZERO TOLERANCE policy for *E. coli* in ground beef.

Listeria monocytogenes is considered an adulterant in ready-to-eat foods. USDA has a ZERO TOLERANCE policy for *Listeria monocytogenes* in ready-to-eat foods.

USDA has a ZERO TOLERANCE policy for the presence of visible fecal matter or ingesta on the carcass in meat and poultry processing.

Allergens

- Are ingredients in a product which can cause an adverse reaction in individuals who are sensitive to the ingredient
- Are closely monitored
  - Food Allergen Labeling & Consumer Protection Act
    - requires food processors to prevent cross-contamination of allergens into products when they are not ingredients and to label any known allergens in the food

The acronym GRAS stands for Generally Recognized as Safe when referring to food products or ingredients.

Eight Major Food Allergens

1. Peanuts
2. Tree nuts (walnuts, pecans)
3. Eggs
4. Milk
5. Soybeans
6. Wheat
7. Fish
8. Shellfish

Conducting a Hazard Analysis

- Involves:
  - preparing a list of hazards
  - making decisions concerning which hazards to include in the HACCP plan
  - describing potential control measures
- Is the basis for determining critical control points

If a problem has occurred more than once within a food processing system, FSIS deems this problem as “reasonably likely to occur.”

A step which is not conducted within your food processing facility such as storage of your product by a grocery store can be described as a step which has “absence of control.”

Conducting a Hazard Analysis

- Should assess the risk of a hazard
  - risk is the public health impact of a hazard
- Should NOT address quality issues

Hard Analysis Tip: If the likelihood of a hazard to occur is low and the severity of hazard is low, then the hazard should NOT be addressed in the HACCP plan.

Critical Control Point (CCP)

- Is a step at which a control can be applied to prevent, eliminate or reduce a food safety hazard to an acceptable level
- Examples include:
  - time
  - temperature
  - water activity (Aw)

If a kill step such as cooking occurs later in a food process, a biological hazard may not be listed as a Critical Control Point (CCP).

Critical Limits (CL)

- Are parameters to define if a Critical Control Point (CCP) is in or out of control
- Examples of parameters which are measured:
  - temperature
  - time
  - time/temperature combinations
  - pH
  - water activity (Aw)
  - nitrite content
  - salt content

Critical Limits (CL)

- For time/temperature combinations and cooking parameters which are required for certain products to kill pathogens in food products can be found in USDA Appendix A
- For chilling parameters to reduce the growth of foodborne pathogens in food products can be found in USDA Appendix B

Critical Limits (CL)

- Can be monitored using:
  - continuous monitoring
    - tests all products
    - commonly used in batch processes
  - non-continuous monitoring/attribute sampling
    - establishes monitoring intervals
    - examples include visual observations and interval time/temperature measurements

Corrective Actions

- Are procedures which are followed when a deviation occurs
- Must be taken because a Critical Limit (CL) has been exceeded and an actual potential hazard may result
- Must be established for each Critical Control Point (CCP)

Verification

- Ensures the HACCP plan is controlling the hazards and the day-to-day activities are in compliance with the HACCP plan
- Includes:
  - verifying prerequisite programs
  - verifying Critical Control Points (CCPs)
  - verifying the HACCP plan
- Can be conducted both internally and externally

When verifying CCPs, records are reviewed, equipment is calibrated and employee audits occur.

Pre-Shipment Review

- Is a review of records associated with the production of a product before it has been shipped to ensure completeness

USDA FSIS

- Has verification regulation requirements such as:
  - reviewing records and sampling activities
  - meeting FSIS compliance checklists of regulations and standards
  - determining if the HACCP plan complies with regulations and standards

Recordkeeping

- Provides evidence of product safety
- Should be completed because of:
  - audits
  - employee training
  - problem solving

Records

- Should be retained or kept for:
  - at least one year
    - slaughter plants
    - refrigerated products
  - at least two years
    - frozen, preserved or shelf-stable products

Tips for Certification Test

- Review the diseases caused by the pathogens included in the presentation
- Understand SSOPs and their purpose
- Know the major food allergens
- Know the order of the seven principles of HACCP
- Review the vocabulary associated with the seven principles of HACCP
- Have an understanding of what occurs during each step of HACCP

Food Science

Water Activity (Aw)

- Is a measure of the amount of free water not chemically bound in a food
- Does NOT impact the rate of a chemical reaction

Fermentation

- Is the conversion of carbohydrates to alcohols and carbon dioxide or organic acids using yeasts or bacteria under anaerobic conditions

Fermentation occurs in milk spoilage when the milk enzyme lactase turns the milk protein lactose into lactic acid.

Caramelization

- Results in a nutty flavor
- Oxidizes sugar
- Causes brown color formation

Retrogradation

- Is the process in which additional bonds form in starch rigidity after cooking
- Occurs when a loaf of bread hardens over a period of time

Rate of Chemical Reactions

- Can be impacted by:
  - concentration
  - temperature
  - pressure

In a reaction between hydrochloric acid and sodium hydroxide, NaCl is formed.

In a reaction between baking soda and vinegar an acid-base reaction occurs as well as a decomposition reaction.

Carbohydrates

- Are organic compounds composed of carbon, hydrogen and oxygen

Smoke Point

- Is the temperature at which fats and oils begin to smoke, emit odors and chemical structures begin to break down

Chemical Changes

- In foods consist of the following:
  - nonenzymatic browning
  - leavening
  - fermentation

Leavening agents include: baking powder, baking soda and yeast. Baking powder and baking soda are considered chemical leaveners.

pH

- Is equal to the negative of the base-10 logarithm of the hydronium concentration

Bases have a bitter taste, a pH greater than seven and change blue litmus paper to red.

Acids are chemicals which donate a hydrogen ion, have a pH less than seven and change red litmus paper to blue.

Food Deterioration & Spoilage

- Can be impacted by:
  - pH
  - water activity (Aw)
  - temperature

Solution

- Is a mixture which has an even concentration throughout
- Is said to be supersaturated when it contains more solute than can be dissolved

Concentration is the amount of solute dissolved per the amount of the solution.

Emulsion

- Is a mixture of two or more immiscible liquids
- Examples include:
  - mayonnaise
  - Hollandaise sauce
  - vinaigrette prepared with only oil and vinegar

Enzymes

- Are proteins which act as catalysts to help complex reactions occur
  - when temperature is increased during an enzyme reaction, the reaction occurs more quickly

Bromelain: enzyme found in pineapple
Lipase: enzyme commonly used to add flavor to cheese
Pectinase: enzyme commonly used to make fruit juice clear
Ficin: enzyme found in figs

Food Irradiation

- Is a means of food preservation used to extend product shelf-life
- Is the process of exposing foods, either prepackaged or in bulk, to very high-energy, invisible light waves
- Causes changes in molecules, such as breaking chemical bonds

Food Irradiation

- Modifies properties of food such as sprouting and ripening
- Alters molecules in microorganisms so they can no longer cause spoilage or human illness

Food Irradiation

- Can be completed using three different types of energy
  - electron beams
  - X-rays
  - gamma rays

Sources of Radiation

- Electron beams
  - are produced by an electron accelerator
- X-rays
  - occur when the electron beams produced by the electron accelerator are stopped by a metal target
- Gamma rays
  - are produced by radioactive substances called radioisotopes

Food Irradiation

- Is most useful in four areas
  - preservation
  - sterilization
  - control of sprouting, ripening and insect damage
  - control of foodborne illness

Irradiated Food

- Is not radioactive
- Has the same physical appearance as non-irradiated food
- Is labeled with a green radura symbol to differentiate it from other food products and a statement indicating the food was treated with irradiation

Blanching

- Involves scalding the food in boiling water or steam for a short time
- Denatures enzymes which cause browning
- Can be used for meats, fruits and vegetables
- Methods include:
  - water blanching
  - steam blanching
  - microwave blanching

Water Blanching

- Involves briefly placing food in boiling water
- Can include salt or sugar in the boiling water to increase effectiveness
- Kills many microorganisms which are responsible for spoilage

Steam Blanching

- Involves placing a food over boiling water and heating the food with the steam
- Takes one and a half times longer than water blanching
- Can change the final texture of a dehydrated food
  - apple slices which are steamed will break easier than those which are water blanched

Microwave Blanching

- Involves adding a small amount of water to a container of food and microwaving the container
- The steam from the water blanches the food
  - best used for vegetables
- Is less effective than traditional water or steam blanching
  - some enzymes may not be inactivated
  - could result in off-flavors, loss of texture and color

Dehydration

- Is one of the oldest forms of food preservation
- Was originally completed by adding salt to the food and then drying it in the sun or on stove tops
- Reduces the moisture in foods to levels which inhibit the microbial growth which causes them to rot
  - since water is removed, mold and bacteria cannot grow

Rate of Dehydrating Food

- Is dependent upon the following:
  - water content of the food
  - sugar content of the food
  - size of the food
  - amount of air circulation when food is dried
  - level of humidity in the dehydrator
  - type of dehydrator

Food Dehydration Temperatures

- Optimum temperature for drying foods is 140°F (60°C)
  - if higher temperatures are used, food will cook instead of drying
    - case hardening can occur if too high of a temperature is used

Case Hardening: the outermost portion of a food is dried while the interior remains moist which causes the food to spoil due to microbial growth

Ingredient Chart

- Is included on food labels to disclose the basic components used in the making of a product

Modified Atmosphere Packaging (MAP)

- Is a packaging technique which injects a blend of components into the packaging to extend product shelf-life

Tips for Certification Exam

- Review food chemistry reactions and processes
- Understand common food chemical reactions and changes
- Be able to describe different food processes

Assessment

AMSA Food Safety & Science Certification Review

Assessment

1. Which of the following measures the amount of free water NOT chemically bound in a food?
    A. pH Level
    B. Water activity
    C. Osmosis
    D. Calories

2. Which of the following is the conversion of carbohydrates to alcohols and carbon dioxide or organic acids using yeasts or bacteria under anaerobic conditions?
    A. Nonenzymatic browning
    B. Leavening
    C. Fermentation
    D. Boiling

Assessment

3. In the reaction between hydrochloric acid and sodium hydroxide, which common substance is formed as the salt of the acid-base reaction?
    A. NaCO
    B. NaOH
    C. NaH
    D. NaCl

4. The reaction between baking soda and vinegar is two reactions, one is an acid-base reaction and the other is which of the following reaction types?
    A. Synthesis
    B. Decomposition
    C. Single displacement
    D. Double synthesis

Assessment

5. Which of the following is a mixture of two or more immiscible liquids?
    A. Concentration
    B. Emulsion
    C. Colloid
    D. Supersaturated solution

6. Which of the following is NOT an example of an emulsion?
    A. Mayonnaise
    B. Hollandaise sauce
    C. Vinaigrette prepared with only oil and vinegar
    D. Ketchup

Assessment

7. Which of the following are proteins which act as catalysts to help complex reactions occur?
    A. Inhibitors
    B. Substrates
    C. Enzymes
    D. Carbohydrates

8. You have made a marinade for some meat and decided to include pineapple juice to help tenderize the meat. What enzyme is found in pineapples which tenderizes meat?
    A. Ficin
    B. Papain
    C. Bromelin
    D. Pinepain

Assessment

9. Which of the following is NOT true of caramelization?
    A. Results in a nutty flavor
    B. Causes green color formation
    C. Oxidizes sugar
    D. Causes brown color formation

10. You left a loaf of bread on the counter and the loaf hardened. Which of the following processes caused this hardening?
    A. Gelatinization
    B. Syneresis
    C. Retrogradation
    D. Gelation

Assessment

11. The acronym GRAS stands for which of the following?
    A. Generally Required to be Safe
    B. Generally Recognized as Safe
    C. Genuinely Required to be Safe
    D. Genuinely Recognized as Safe

12. Which of the following terms describes an illness caused by the ingestion of toxins and is also known as a foodborne intoxication?
    A. Food infection
    B. Food poisoning
    C. Food rancidity
    D. Food spoilage

Assessment

13. Which of the following describes when the outermost portion of a food is dried while the interior remains moist?
    A. Case hardening
    B. Freezer burn
    C. Cold shortening
    D. Fat caps

14. Which of the following is a packaging technique which injects a blend of components to extend product shelf life?
    A. Vacuum Packaging
    B. Modified Atmosphere Packaging
    C. Shrink Wrapping
    D. Overwrap Packaging

Assessment

15. Which of the following causes *Salmonellosis*?
    A. *Salmonella spp.*
    B. *E. coli O157:H7*
    C. *Clostridium perfringens*
    D. *Listeria monocytogenes*

16. Which of the following causes Hemolytic Uremic Syndrome?
    A. *Salmonella spp.*
    B. *E. coli O157:H7*
    C. *Clostridium perfringens*
    D. *Listeria monocytogenes*

Assessment

17. The acronym HACCP stands for which of the following?
    - A. Hazard Analysis and Crucial Control Points
    - B. Hazard Analysis and Critical Control Parameters
    - C. Hazard Analysis and Critical Control Points
    - D. Hazard Analysis and Crucial Control Parameters

18. HACCP was originally developed for which of the following organizations to use to ensure food safety in their programs?
    - A. U.S. National Guard
    - B. Centers of Disease Control and Prevention
    - C. U.S. Navy
    - D. NASA

Assessment

19. Which of the following is a substance which, if found in a food product, is not fit for human consumption?
    A. SSOP
    B. Coliform
    C. Allergen
    D. Adulterant

20. Which of the following requires that food processors must prevent cross-contamination of allergens into products where they are NOT ingredients?
    A. Food Safety Inspection Act
    B. Environmental Protection Agency
    C. Food Allergen Labeling & Consumer Protection Act
    D. Delaney Clause

Assessment

21. During meat or poultry processing, which of the following is a ZERO TOLERANCE policy?
    - A. Presence of visible fecal matter or ingesta on the carcass
    - B. Presence of water on the carcass
    - C. Presence of lactic acid on the carcass
    - D. Presence of visible blood on the carcass

22. Which of the following is a step at which a control can be applied to prevent, eliminate or reduce a food safety hazard to an acceptable level?
    - A. Critical limit
    - B. Verification step
    - C. Critical control point
    - D. Rate-limiting step

Assessment

23. Which of the following products are NOT required to have HACCP?
    A. Meat
    B. Juice
    C. Seafood
    D. Candy

24. Which of the following is a monitoring technique which tests all product, a vat of soup for example, and is commonly used in batch processes?
    A. Continuous monitoring
    B. Attribute sampling
    C. Process sampling
    D. Verification monitoring

Assessment

25. Which of the following is a monitoring technique where the monitoring of a critical limit is measured on a sub-sample basis such as one of 1,000 sausages?
    A. Continuous monitoring
    B. Attribute sampling
    C. Process sampling
    D. Verification monitoring

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