Name _____ Date _____ Period _____

Lab Activity 1-1
Using Safety Data Sheets (SDS)

Learning Outcomes

After completing this lab, you will be able to

- recognize the information on a safety data sheet that is important to your job and safety.
- recall the location of protective equipment in the kitchen lab.

Introduction

A safety data sheet (SDS) is designed to provide both workers and emergency personnel with the proper procedures for handling or working with a particular substance. SDS include information such as physical data, toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill or leak procedures. SDS vary in length from one to many pages. By law, these sheets must be displayed in a visible and accessible place in the kitchen.

Lab Procedure

Find a chemical used in the school kitchen or lab and locate its SDS. Answer the following questions using the SDS.

1. What is the product name?

   _____

2. What is the recommended use for the product?

   _____

3. What does the product look like?

   _____

4. What are the potential acute health effects of this product?

   _____

   _____

5. What protective equipment is recommended when using this product?

   _____

   _____

6. Locate the protective equipment mentioned in the previous question in your kitchen lab. If the SDS does not require any protective equipment, find the following equipment: goggles or face shield, impervious gloves, synthetic apron, eyewash.

Additional Lab Notes

Name _____ Date _____ Period _____

Lab Activity 1-2
Preventing Chemical Hazards

Learning Outcome

After completing this lab, you will be able to

- apply safety precautions to prevent chemical contamination.

Introduction

Incorrect chemical storage, use, dilution, and labeling are important concerns in kitchens. Foodservice professionals are responsible for the safe handling of chemicals to protect themselves and their customers.

Preparation

1. Review the section *Chemical Hazards* in text Chapter 1.
2. Locate the SDS folder in the kitchen lab.

Lab Procedure

1. Working in small groups, locate all the chemical products in your kitchen lab. Create an inventory of all the chemicals in the kitchen. For each chemical, list the name of the chemical and answer these questions: (A) Is the container clearly labeled? (B) Is the chemical stored separately from food preparation or storage areas? (C) Is an SDS available for the chemical? If a safety precaution is not being followed, the potential for a chemical hazard exists. (D) Indicate any corrective action needed to avoid a chemical hazard.

Chemical Inventory List:

1. _____
   - A. _____
   - B. _____
   - C. _____
   - D. _____
2. _____
   - A. _____
   - B. _____
   - C. _____
   - D. _____
3. _____
   - A. _____
   - B. _____
   - C. _____
   - D. _____

4. _____

A. _____

B. _____

C. _____

D. _____

5. _____

A. _____

B. _____

C. _____

D. _____

6. _____

A. _____

B. _____

C. _____

D. _____

7. _____

A. _____

B. _____

C. _____

D. _____

8. _____

A. _____

B. _____

C. _____

D. _____

9. _____

A. _____

B. _____

C. _____

D. _____

10. _____

A. _____

B. _____

C. _____

D. _____

Name _____ Date _____ Period _____

Lab Activity 1-3
Calibrating a Thermometer

Learning Outcomes

After completing this lab, you will be able to

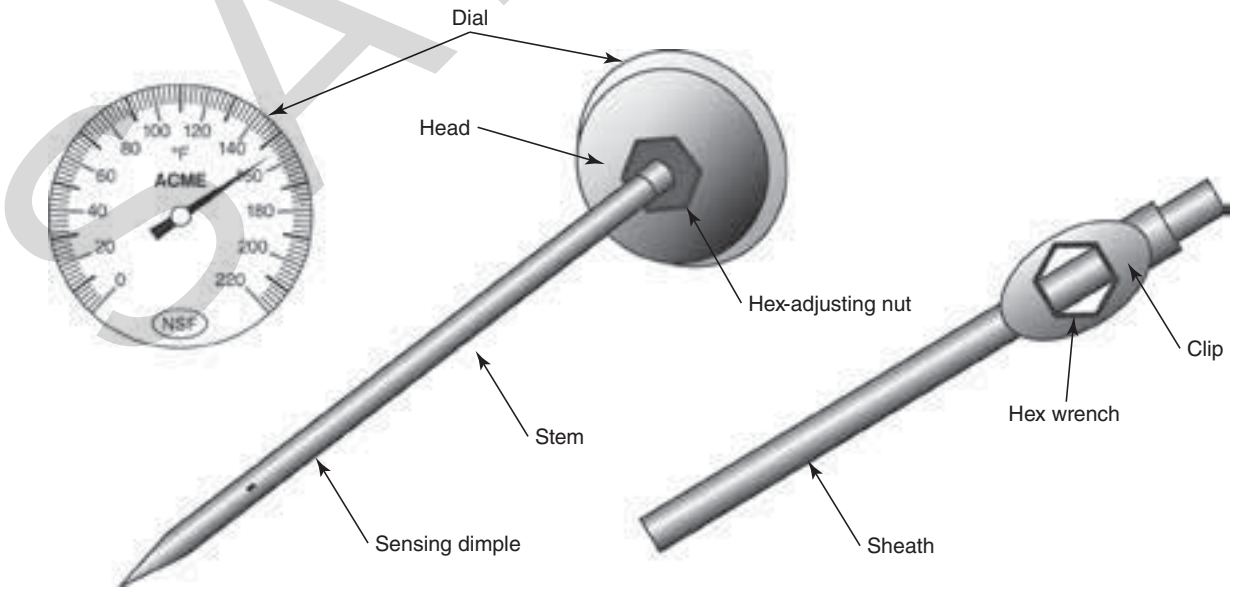
- recognize the parts of an instant-read thermometer.
- calibrate an instant-read thermometer using the ice-water method.
- calibrate an instant-read thermometer using the boiling-water method.

Introduction

The instant-read thermometer is commonly used for testing internal temperatures of hot and cold foods including raw and cooked product. The calibration, use, and understanding of the instant-read thermometer are essential for safe food handling. Two methods are commonly used for correct calibration—ice water and boiling water. Thermometers should be calibrated periodically as well as after being knocked or dropped.

Preparation

1. Read Lab Procedure and gather the following supplies:
   Instant-read thermometer with sheath
   16 oz. (or larger) container
   crushed ice
   suitable tool for adjusting hex nut on thermometer (sheath or small wrench)
   small saucepan
2. Review the section *Burns* in text Chapter 2.
3. Review the effect of altitude on boiling point in *A Serving of Science: Atmosphere Affects Moist Cooking* in text Chapter 12.
4. Review the following diagram of an instant-read thermometer.



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Lab Procedure

Part 1: Ice-Water Method

1. Fill a container with crushed ice. Add clean, cold tap water to cover ice and stir well.
2. Slide the stem of the thermometer through the clip portion of the sheath for ease and safety when handling. *Note: Often this part of the sheath has a hexagon-shaped cutout that serves double duty when calibrating a thermometer—it can be used to hold as well as adjust the thermometer.*
3. Immerse the thermometer stem a minimum of two inches (sensing dimple should be immersed) into the mixture. Make sure it is not touching the sides or bottom of the container.

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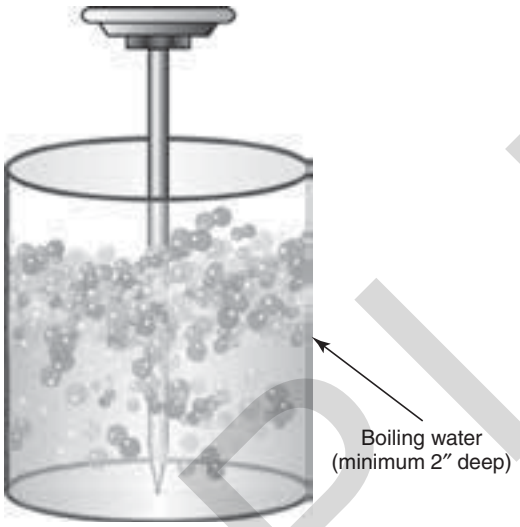
4. Hold the thermometer in the water for one minute before adjusting.
5. While continuing to hold the thermometer in the ice water, read the temperature on the dial. If the reading is 32°F (0°C), the thermometer is calibrated. If the reading is different, adjust the hex nut located under the dial until it reads 32°F (0°C). *Note: 32°F (0°C) is freezing temperature.*
6. Remove the thermometer from the water and repeat steps 1 through 5 to confirm thermometer is calibrated.

Name _____

Part 2: Boiling-Water Method

1. Bring a saucepan of clean tap water to a rolling boil.
2. Slide the stem of the thermometer through the clip portion of the sheath for ease and safety when handling. *Note: Often this part of the sheath has a hexagon-shaped cutout that serves double duty when calibrating a thermometer—it can be used to hold as well as adjust the thermometer.*
3. Immerse the thermometer stem a minimum of two inches (sensing dimple should be immersed) into the boiling water. Make sure it is not touching the sides or bottom of the container.



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4. Carefully hold the thermometer in the water for a minimum of 30 seconds before adjusting.
5. While continuing to hold the thermometer in the boiling water, read the temperature on the dial. If the reading is 212°F (100°C), the thermometer is calibrated. If the reading is different, adjust the hex nut located under the dial until it reads 212°F (100°C). *Note: This temperature may vary due to differences in atmospheric pressure at altitudes above sea level.*
6. Remove the thermometer from the water and repeat steps 1 through 5 to confirm thermometer is calibrated.

Additional Lab Notes

Name _____ Date _____ Period _____

Lab Activity 1-4
Avoiding Cross-Contamination

Learning Outcomes

After completing this lab, you will be able to

- explain how employees' hands and food-contact surfaces contribute to cross-contamination.
- apply effective handwashing procedure.
- recognize the need for sanitizing equipment after cleaning.

Introduction

Cross-contamination of food or food-contact surfaces with biological hazards is one of the greatest causes of foodborne illness. Biological hazards cannot be seen or smelled, but they exist in many foods and in all kitchens. Understanding how to prevent the transfer of biological hazards is critical for avoiding cross-contamination and foodborne illness.

Preparation

1. Read Lab Procedure and gather the following supplies:

fluorescent cream or gel	chef's knife
fluorescent powder	two potatoes
ultraviolet light	cutting board

2. Review the section *Handwashing* in text Chapter 1.

Lab Procedure

Part 1: Simulation of Bacteria on Hands

1. Rub fluorescent cream or gel on hands until absorbed. The cream or gel is used to simulate bacteria such as *Salmonella.*
2. Turn off room lights and scan hands and fingernails with ultraviolet (UV) light. The "bacteria" will glow in the UV light. This represents contamination of your hands with "bacteria."
3. Wash hands thoroughly using the technique described in the text.
4. Turn off the room lights and scan hands and fingernails with UV light again.
5. Any "bacteria" that remains on your hands after washing will glow when examined with the UV light. This indicates that hands have not been washed correctly and are carrying a potential biological hazard. In the kitchen, unclean hands can result in cross-contamination of food or equipment and possibly foodborne illness.
6. Wash hands again, paying close attention to those areas harboring "bacteria."

Observations/Questions

1. Did you see any "bacteria" remaining on your hands after washing? If so, what areas of your hands harbored the most "bacteria"?

_____

_____

2. How could you improve your handwashing technique?

_____

_____

Part 2: Simulation of Bacteria on Equipment

1. Dust a chef's knife and potato (A) with the fluorescent powder to simulate chicken juice containing "bacteria."
2. Place potato A on a cutting board and slice it several times with the chef's knife.
3. Place the sliced potato A in a bowl.
4. Select another potato (B) and place it on the same cutting board. Use the chef's knife to slice potato B several times as well. Place the sliced potato B in a different bowl.
5. Use the UV light to examine potato A, potato B, your hands, the knife, and the cutting board. Record your observations in the space provided that follows.
6. Wash the chef's knife and cutting board. Wash your hands.
7. Turn off the room lights and pass the UV light over the chef's knife, cutting board, and your hands again. Observe if any traces of "bacteria" from the simulated chicken juice are still present. Record your observations in the space provided that follows.

Observations

1. Potato A: Step 5

_____

2. Potato A: Step 7

_____

3. Potato B: Step 5

_____

4. Potato B: Step 7

_____

5. Knife: Step 5

_____

6. Knife: Step 7

_____

7. Your hands: Step 5

_____

8. Your hands: Step 7

_____

9. Cutting board: Step 5

_____

10. Cutting board: Step 7

_____

Name _____

Questions

1. Did the chef's knife and cutting board look clean after you washed them?

   _____

2. Based on the UV light inspection of the washed chef's knife and cutting board, would you consider them sanitary? Explain.

   _____

   _____

3. According to the text, what should be the next step to rid the food-contact surfaces (chef's knife and cutting board) of the "pathogens" still present after cleaning?

   _____

Additional Lab Notes

Name _____ Date _____ Period _____

Lab Activity 1-5
Preparing Sanitizing Solutions

Learning Outcomes

After completing this lab, you will be able to

- produce a proper sanitizing solution for food-contact surfaces.
- identify factors that impact the effectiveness of a sanitizing solution.

Introduction

Chlorine and quaternary ammonium compounds (quats) are the two most commonly used sanitizers in commercial kitchens. Each has its advantages and disadvantages. Whichever sanitizer you use, it is most important that you use it properly.

Preparation

1. Read Lab Procedure and gather the following supplies:

volume measuring equipment	test strip appropriate for sanitizer being used
thermometer	detergent
sanitizer	wiping cloths
three buckets for sanitizing solution	

2. Read and follow manufacturers' directions for chemicals when preparing sanitizing solutions.
3. Wear any protective equipment recommended in manufacturers' directions.
4. Locate and read the SDS sheet for the sanitizing product.

Lab Procedure

Part 1: Preparing and Using Solution

1. Measure one gallon of tap water. Read manufacturers' directions to learn the optimal water temperature for their product. Use a thermometer to measure the water temperature. Many sanitizers require water temperatures between 75°F (24°C) and 100°F (37.8°C). *Note: Some sanitizers lose effectiveness in temperatures outside this range.*
2. Add enough sanitizer to the water to create a sanitizing solution for food-contact surfaces. Check manufacturers' directions for the recommended amount to add.
3. Mix sanitizing solution and check concentration with test strip. (Be sure you are using the correct test strip for the sanitizer you are using.) Test strips should be used to recheck the concentration periodically. *Note: Some sanitizers dissipate over time and lose effectiveness.*
4. Adjust dilution if needed. If test strip indicates concentration is low, add sanitizer. If test strip indicates concentration is high, add water. Record the amount of water or sanitizer you must add to achieve the accurate concentration. *Note: Some sanitizers lose effectiveness in hard water.*
5. Clean food-contact surface with a detergent solution to remove any food or grime before sanitizing. *Note: Some sanitizers lose effectiveness in the presence of food residue, oil, or organic material.*
6. Rinse food-contact surface with clean water to remove detergent residue. Be sure to remove any excess water from surface after rinsing is complete. *Note: Some sanitizers lose their effectiveness in the presence of detergents.*
7. Dip a clean wiping cloth in sanitizing solution. Lightly wring out excess solution. Wipe the food-contact surface with sanitizing solution and allow it to air-dry.

Observations/Questions

1. Did you need to adjust the dilution by adding any additional water or sanitizer? If so, how much did you add?

_____

_____

2. What factor(s) might cause the need to add more water or sanitizer than the manufacturers' directions recommend?

_____

_____

Part 2: What Factors Impact Effectiveness?

1. Divide the sanitizing solution you made in Part 1 into three plastic buckets.
2. Label the first bucket "A." Test this sanitizing solution with a test strip every hour over four hours at room temperature. Record any changes in concentration in the table that follows.
3. Label the second bucket "B." Add approximately 8 fluid ounces of diluted pot and pan detergent to this bucket and mix. Record any change in concentration in the table that follows.
4. Label the third bucket "C." Use a wiping cloth to clean a heavily soiled food-contact surface, pot, or pan. Rinse the soiled wiping cloth in the bucket C solution. Record any changes in concentration in the table that follows.

Observations

1. Bucket A: 1st hour

_____

2. Bucket A: 2nd hour

_____

3. Bucket A: 3rd hour

_____

4. Bucket A: 4th hour

_____

5. Bucket B

_____

6. Bucket C

_____

Questions

1. Based on your observations, are the solutions in buckets A, B, and C still effective sanitizing solutions? If not, which solution(s) is no longer effective?

_____

_____

2. What action(s) could you take to ensure that you maintain an effective sanitizing solution in your daily work?

_____

_____

_____

Name _____ Date _____ Period _____

Lab Activity 1-6
Sanitation Self-Inspection

Learning Outcomes

After completing this lab, you will be able to

- identify unsafe food-handling practices.
- plan corrective action.

Introduction

Professional chefs have a moral obligation to prepare and serve wholesome, safe food. Food safety and sanitation procedures must become second nature. Routinely performing sanitation self-inspections helps you identify areas that are not meeting standards so corrective action can be taken.

Lab Procedure

1. Carefully read self-inspection checklist before starting.
2. For each standard on the list, indicate whether it has been met.
3. Indicate a corrective action for standards that are not met.

Chef's Journal

After completing the self-inspection, reflect on your findings. Were you surprised by anything you found? What suggestions do you have to improve the checklist?

Sanitation Inspection Checklist

Indicate which of the following standards are met. For any standards that are not met, note the number and corrective action in the space provided at the end of the checklist.

Employee Dress and Hygiene

1. Uniform and apron are clean and shoes are nonskid.
2. Hair is neat and restrained.
3. Nails are short, clean, and unpolished (no artificial nails).
4. Jewelry on hands and arms is restricted to a watch and plain ring.
5. Hands are washed using proper technique at critical points.
6. Gloves are changed at critical points or when torn.
7. Open sores, cuts, and bandages on or near hands are covered.
8. Personal items such as jackets and backpacks are not stored in food preparation and storage areas.
9. An employee with a Food Service Manager's certification is on premises.

Food Purchasing and Storage

10. Food is obtained from sources that are in compliance with the law.
11. Foods are checked for appropriate temperature, spoilage, and contamination at delivery.
12. Foods are dated and rotated upon receipt to facilitate first in, first out usage.
13. Food that is removed from original packaging and held in approved containers must be clearly labeled with the common name of the food.
14. Food is not stored under exposed sewer or water lines.
15. Food must be stored at least six inches from the floor.
16. All storage surfaces and floors are clean.
17. Dry storage is well ventilated, and kept cool and dry.
18. Chemicals are stored separately from food and food-related supplies.
19. Refrigerators and freezers have working thermometers located in the warmest part of the refrigerator.
20. Refrigerator and freezer temperatures are regularly checked and recorded.
21. Raw foods are not stored above ready-to-eat foods to avoid cross-contamination.
22. Foods are appropriately wrapped, labeled, and dated.

Food Preparation

23. Foods are cooked to proper temperatures.
24. Foods are held below 41°F (5°C) or above 135°F (57°C) and temperatures are checked regularly.
25. Foods are thawed in the refrigerator or in cold, running water.
26. Work surfaces are cleaned and sanitized before and after each task.
27. Buckets of sanitizing solutions are present in food prep areas and at proper concentrations.
28. Cutting boards and utensils are cleaned and sanitized for each food preparation task.
29. Vegetables and fruits are washed prior to cutting, peeling, or cooking.
30. Employees do not eat in the food preparation area (tasting with a single-use utensil is allowed).

Name _____

Cleaning and Sanitation

31. Three-compartment sink setup includes wash, rinse, and sanitizing sinks.
32. Three-compartment sanitizing sink contains an approved sanitizing solution at appropriate concentrations (test kits are used).
33. Dishmachine water temperatures are appropriate and regularly recorded.
34. Dishes, utensils, and smallwares are allowed to air-dry.
35. Clean dishes, smallwares, and utensils are stored properly to protect them from contamination.
36. Large equipment is clean to sight and touch.
37. Handwashing sinks are stocked with soap and paper towels or other approved drying device.
38. Cleaning supplies are properly labeled and stored separately from food and other supplies.
39. Safety data sheets (SDS) are readily accessible to employees.

Facilities, Waste, and Pest Control

40. Bathrooms are stocked and clean.
41. Floors, walls, and ceilings are in good repair and clean.
42. Exhaust hood and filters are clean.
43. Garbage cans in kitchen are clean and covered.
44. Outdoor dumpsters are clean and lids are closed.
45. Screens, walls, and ceilings are in good repair to discourage entrance of pests.

Recommended Corrective Action

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Name _____ Date _____ Period _____

Lab Activity 1-7
Identifying CCPs

Learning Outcomes

After completing this lab, you will be able to

- identify critical control points in a foodservice operation.
- determine appropriate corrective action.

Introduction

Critical control points (CCP) are steps in food handling at which improper practice may result in unwholesome food. Culinary professionals must be able to identify CCPs and ensure that safe food-handling practices are applied at these critical stages.

Critical control points exist as food flows from the farm to the table. In the commercial kitchen, CCPs occur in receiving, storage, preparation, cooking, holding, service, cooling, and reheating. To limit or prevent most threats to wholesome food:

- Avoid holding food in the temperature danger zone for too long.
- Cook foods to proper temperatures.
- Protect food from cross-contamination.

Lab Procedure

For each of the following scenarios, underline any examples of food being handled at a critical control point (CCP). If the food was handled improperly, write the correct procedure for handling the food in the space that follows.

1. Receiving

One hot summer day, the receiving clerk had to leave work unexpectedly due to a family emergency. After the lunch rush was over, the kitchen manager asked the new dishwasher, Liam, to finish receiving the delivery of fresh meat and poultry that was sitting at the dock. Liam had never worked in foodservice before, but was anxious to impress the manager. Liam went back to the receiving dock, loaded the cases of meat and chicken onto a cart, and pushed it into the walk-in refrigerator.

_____

_____

2. Storage

Once in the walk-in refrigerator, Liam noticed the thermometer read 45°F (7°C), which felt good after being on the hot receiving dock. He proceeded to place the cases of meat and poultry on the open shelf space above some cases of cantaloupe. Liam returned the empty cart to the receiving area and went back to washing dishes.

_____

_____

3. Preparation

The cold foods prep cook, Juanita, needed to prepare some cantaloupe for the next meal. Juanita rolled a cart into the walk-in refrigerator to get the case of cantaloupes. Back at the workstation, Juanita removed the melons from the case, placed them in a colander in a sanitized sink, and placed them under running water. Using a clean, sanitized cutting board and knife, Juanita proceeded to peel and cut the cantaloupe into wedges. Then, Juanita covered the cut cantaloupe, labeled it with the date, and placed it in the reach-in refrigerator in the prep area.

_____

_____

4. Cooking

The evening cook, Mattie, needed to prepare chicken for the dinner meal. Mattie retrieved a case of chicken breasts from the walk-in refrigerator and brought it back to the workstation. Mattie quickly placed the chicken breasts on a sheet pan, seasoned them, and placed them in the preheated oven. Customer orders for chicken were beginning to back up. When Mattie checked the temperature of the chicken with a thermometer, it read 158°F (70°C). Mattie quickly pulled the chicken out of the oven and began plating it.

5. Holding

After plating up the orders, Mattie covered the remaining chicken and placed it in a 150°F (66°C) warmer.

6. Service

Due to a coworker calling off sick, Tony was trying to do two jobs. Tony was working as cashier taking the customers' money and making change. In between customers, Tony would run to the service window and check the customers' orders for accuracy as the cooks finished them. Tony would then place the garnishes on the plates and let the server know their orders were ready. Tony did not have time for handwashing between each task, so he wore gloves when handling the money and placing the garnishes on the plates.

7. Cooling

As prep cook, one of Lena's jobs is to prepare two gallons of refried beans for the next day. When the refried beans are done cooking, Lena covers the stockpot of beans, labels and dates it, and places it on a cart. Lena then rolls the cart into the walk-in refrigerator to cool and moves on to the next task.

8. Reheating

Malcolm is getting ready for the lunch shift. Malcolm retrieves the chili that was prepared the day before from the refrigerator. Malcolm places the chili on the stovetop to reheat and notes the time is 10:30 a.m. While performing other tasks, Malcolm frequently stops and stirs the chili. At 11:15 a.m., Malcolm uses a thermometer to check the temperature of the chili. It is 168°F (76°C).