



A Case of Food Poisoning

Teacher Information

..... just add students™

Summary

What is causing an outbreak of foodborne illness in a community? Students conduct simulated tests to determine the pathogen causing the illness and the source of food contamination.

Core Concepts

- Some types of pathogens can contaminate food and cause foodborne illness.
- Individual consumers and food suppliers can take actions to reduce the risk of foodborne illness.

Time Required

Two 40-minute class periods

Kit contains

- **What You Should Know About Foodborne Illness** brochure
- Simulated Diarrhea sample
- Dropper for simulated diarrhea sample
- Pathogen Testing Solution
- Dropper for pathogen testing solution
- Well strip for pathogen testing
- 4 simulated samples of potentially contaminated foods
- 4 strips of simulated *E. coli* 0157:H7 Test Paper
- **Pathogens that could cause foodborne Illness** testing diagram
- 6 toothpicks

Teacher Provides

- Safety goggles
- Paper towels for clean up
- If students are working in teams, consider providing additional copies of the **What You Should Know About Foodborne Illness** brochure

Warning: Choking Hazard

This Science Take-Out kit contains small parts. Do not allow children under the age of seven to have access to any kit components.

Reusing *A Case of Food Poisoning* kits

Kits may be refilled and reused. Allow approximately 15–30 minutes for refilling 10 student kits. Teachers will need to instruct students on how to handle clean-up and return of the reusable kit materials. For example, teachers might provide the following information for students:

Discard	Return to kit
<ul style="list-style-type: none">• Used well strips• Used strips of simulated <i>E. coli</i> 0157:H7 Test Paper• Used toothpicks	<ul style="list-style-type: none">• All labeled tubes and droppers• What You Should Know About Foodborne Illness brochure• Pathogens that could cause foodborne illness testing diagram

Refills for kits are available at www.sciencetakeout.com. The **10 Kit Refill Pack** includes the following materials:

- Instructions and Quick Guide for refilling kits
- 10 well strips for pathogen testing
- 15 mL simulated “Diarrhea”
- 15 mL “Pathogen Testing Solution”
- 15 mL “Blueberries”
- 15 mL “Green peppers”
- 15 mL “Lettuce”
- 15 mL “Bean sprouts”
- 40 strips of simulated *E. coli* 0157:H7 Test Paper
- 60 toothpicks
- 6 graduated transfer pipets (for refilling the microtubes)

Optional

The questions provided on the next three pages may be used for a quiz or homework assignment.

Foodborne Illness

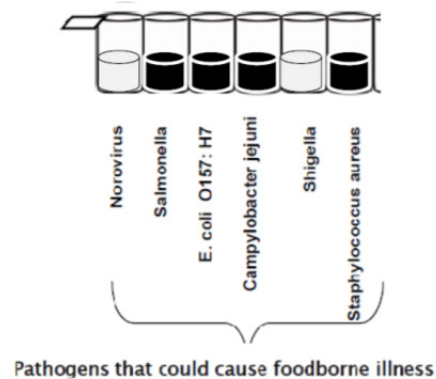
1. Which type of pathogen is responsible for causing the greatest number of foodborne illnesses?
 - A. Bacteria
 - B. Viruses
 - C. Fungi
 - D. Protozoa
2. The majority of foodborne illnesses are a result of improper handling of foods by
 - A. Consumers
 - B. Restaurants
 - C. Grocery stores
 - D. Farmers
3. The most common symptom of foodborne illness is
 - A. Kidney failure
 - B. Skin rash
 - C. Diarrhea
 - D. Headache
4. Perishable foods, such as milk, meat, and eggs, should not be allowed to stand at room temperature for more than
 - A. 2 hours
 - B. 4 hours
 - C. 8 hours
 - D. 16 hours
5. Which of the following is a good food safety practice?
 - A. Tasting and smelling food to see if it is still good.
 - B. Freezing food to kill pathogens that may be present.
 - C. Cooking eggs, meat, and fish thoroughly.
 - D. Thawing frozen foods on the counter for at least two hours.
6. If you have a foodborne illness, the best way to treat this illness is to
 - A. Take aspirin to reduce the fever and headache.
 - B. Exercise to burn out the pathogens.
 - C. Drink plenty of fluids to prevent dehydration.
 - D. Eat high protein foods to settle the stomach.
7. A person with foodborne illness should contact a physician
 - A. At the first sign of vomiting or diarrhea.
 - B. When diarrhea lasts more than a few hours.
 - C. When symptoms include a fever and headache.
 - D. If prolonged vomiting prevents keeping liquids down.

8. All of the following are important clues in determining the cause of foodborne illness except
 - A. Similar symptoms in family members or friends
 - B. Foods eaten by people with symptoms of foodborne illness
 - C. Identification of pathogens present in diarrhea samples
 - D. Treatments with antibiotics and antidiarrheal medicines

9. Which of the following statements is true of *E. coli* bacteria?
 - A. Some strains of *E. coli* bacteria found in our intestine help the body make vitamins
 - B. All strains of *E. coli* are harmful.
 - C. *E. coli* bacteria remove wastes from the intestine.
 - D. Freezing temperatures kill all strains of *E. coli* bacteria.

10. Which foods are most likely to cause foodborne illness?
 - A. Raw or undercooked eggs, meat, fish, and poultry
 - B. Pasteurized milk or milk products
 - C. Fruits and vegetables that are not organic
 - D. Foods purchased at a restaurant

11. A laboratory technician placed samples of juice into wells that each contained specific antibodies that combine with specific pathogens. A light gray color indicates that pathogens in the juice attached to the antibodies. The results of this testing is shown below.



- Based on the information in the diagram, which pathogens are present in the juice sample?
- A. Norovirus and Shigella
 - B. Salmonella, *E. coli* 0157: H7, Campylobacter, Staphylococcus
 - C. *E. coli* 0157: H7 and Shigella
 - D. *E. coli* 0157: H7 only

12. People who eat a vegetarian diet
- A. Can avoid food borne illness by eating only organic vegetables.
 - B. Can't get a foodborne illness like people who eat meat.
 - C. Need to handle and store foods properly to reduce their risk of getting a foodborne illness.
 - D. Try to avoid eating plant-based meals.
13. The X's in the chart below indicate foods that family members consumed the day before they came down with the symptoms of a foodborne illness.


Person	Lettuce	Chicken	Eggs	Milk
A	X	X	X	X
B	X		X	X
C		X	X	X
D	X	X		X

Which food most likely caused the foodborne illness?

- A. Milk
 - B. Chicken
 - C. Lettuce
 - D. Eggs
14. You like to eat hamburgers rare, but you know they could be a food safety risk. The best way to kill harmful bacteria and reduce your risk of foodborne illness is
- A. Put the raw hamburger meat in the freezer until solid. Bacteria can't survive being frozen.
 - B. Grind your own meat at home to reduce the risk of foodborne illness.
 - C. Cook the hamburger to a proper internal temperature (160°F).
 - D. Sear the burger quickly on both sides and cover the pan for two minutes.
15. To prevent food poisoning, leftovers should be
- A. Cooled for three hours at room temperature and then put in the refrigerator.
 - B. Put in the refrigerator immediately after the food is served.
 - C. Left at room temperature overnight.
 - D. Discarded because leftovers are never safe to use.

Kit Contents Quick Guide

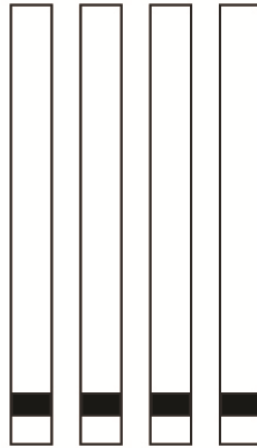
What You Should Know About Foodborne Illness



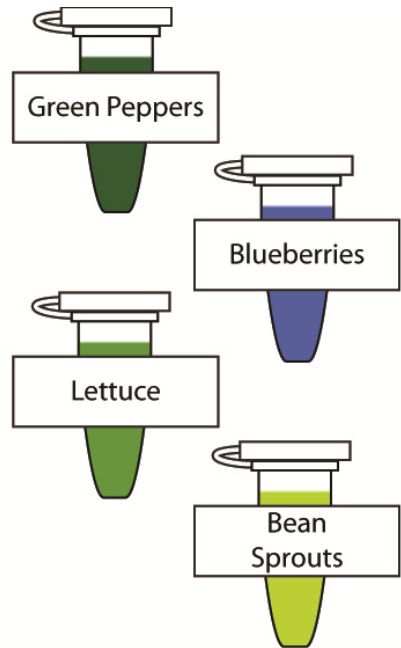
What is foodborne illness?
A foodborne illness (sometimes called food poisoning) is a disease transmitted to humans through the food that they ate a few hours or several days before becoming sick. Symptoms of foodborne illnesses may include; diarrhea, vomiting, an upset stomach, fever, cramps, or more serious symptoms. These symptoms may be caused by bacteria, viruses, or other microbes that contaminate food.

Which foods are most hazardous?
Foods associated with foodborne illness typically include moist, high-protein, and/or low acid foods. The following foods can support the rapid growth of microbes.

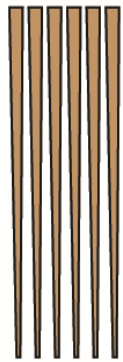
- Raw or undercooked meat, fish, and poultry
- Raw or undercooked eggs
- Unpasteurized milk or milk products
- Unwashed fruits and vegetables



E. Coli 0157:H7 Fast Test Strips



6 Well Strip



Toothpicks



Pathogens that could cause foodborne illness

Read these instructions before using Science Take-Out kits

Parental or Adult Supervision Required

This kit should be used only under the supervision of an adult who is committed to ensuring that the safety precautions below, and in the specific laboratory activity, are followed.

Safety Goggles and Gloves Strongly Recommended

We encourage students to adopt safe lab practices and to wear safety goggles and gloves when performing laboratory activities involving chemicals. Safety goggles and gloves are not provided in Science Take-Out kits. They may be purchased from a local hardware store or pharmacy.

Warning: Choking and Chemical Hazard

Science Take-Out kits contain small parts that could pose a choking hazard and chemicals that could be hazardous if ingested. Do not allow children under the age of seven to have access to any kit components. Material Safety Data Sheets (MSDS) provide specific safety information regarding the chemical contents of the kits. MSDS information for each kit is provided in the accompanying teacher instructions.

Chemicals Used in Science Take-Out Kits

Every effort has been made to reduce the use of hazardous chemicals in Science Take-Out kits. Most kits contain common household chemicals or chemicals that pose little or no risk.

General Safety Precautions

1. Work in a clean, uncluttered area. Cover the work area to protect the work surface.
2. Read and follow all instructions carefully.
3. Pay particular attention to following the specific safety precautions included in the kit activity instructions.
4. Goggles and gloves should be worn while performing experiments using chemicals.
5. Do not use the contents of this kit for any other purpose beyond those described in the kit instructions.
6. Do not leave experiment parts or kits where they could be used inappropriately by others.
7. Never taste or ingest any chemicals provided in the kit – they may be toxic.
8. Do not eat, drink, apply make-up or contact lenses while performing experiments.
9. Wash your hands before and after performing experiments.
10. Chemicals used in Science Take-Out experiments may stain or damage skin, clothing or work surfaces. If spills occur, wash the area immediately and thoroughly.
11. At the end of the experiment, return ALL kit components to the kit plastic bag. Dispose of the plastic bag and contents in your regular household trash.

No blood or body fluids from humans or animals are used in Science Take-Out kits. Chemical mixtures are substituted as simulations of these substances.

A Case of Food Poisoning - *Teacher Answer Key*

Part 1: What food might be causing the foodborne illness?

The Hill family reunion was fantastic! The weather was warm and sunny. Grandma Hill kept the picnic table loaded with food all afternoon.

One day later, a number of family members experienced vomiting and diarrhea. Some of the family members were so sick that they needed to go to the emergency room at the local hospital. Three of the family members required hospitalization for severe dehydration. Family members suspected that they had food poisoning.

Uncle Bill wondered what they ate that made them so sick. He called some of the people who attended the reunion and asked them what they ate at the reunion.

The chart that Uncle Bill made (**What People at the Reunion Said They Ate**) is on the next page.

1. Based on the information in Uncle Bill's chart, what food (or foods) might be the source of the illness? Explain why you chose this food or foods.

The mixed green salad. Most of the people who ate the salad became sick. Most people who did not eat the salad did not become sick.

What People at the Reunion Said They Ate

	People at reunion	Chicken	Hot Dogs	Mixed Green Salad	Macaroni and Cheese	Corn	Blueberries
Got Sick	Fred	yes	no	yes	yes	yes	yes
	Emma	yes	no	yes	yes	yes	yes
	Monique	no	yes	yes	yes	no	yes
	Diana	yes	no	yes	yes	yes	no
	Matt	no	yes	yes	no	yes	yes
	Jeremy	yes	yes	no	yes	yes	no
	Jenny	yes	no	yes	yes	no	no
	Ralph	yes	no	yes	yes	yes	yes
	Gina	yes	yes	yes	no	no	yes
	Jacob	no	yes	yes	yes	no	yes
Karen	yes	no	yes	no	yes	yes	
Did NOT Get Sick	Joe	yes	no	no	no	yes	no
	Sarah	yes	yes	no	yes	yes	no
	Claire	yes	no	no	yes	yes	yes
	Anna	no	yes	no	yes	no	yes
	Mike	yes	yes	yes	no	no	yes
	Erin	yes	no	no	yes	yes	yes
	Doug	no	no	no	no	yes	no

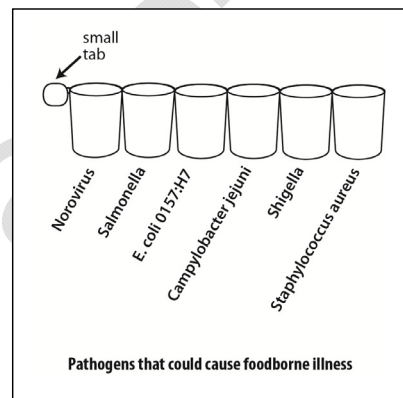
Part 2: What pathogen might be causing the foodborne illness?

Emergency room physicians reported that they were seeing a large number of people from the local area who appeared to have symptoms of foodborne illness, also known as food poisoning. Over the past few days, they had seen more than 100 people who had serious vomiting and diarrhea. The physicians contacted the State Health Department to report a possible outbreak of foodborne illness. They also sent samples of diarrhea from several patients to the State Health Department laboratory so that the samples could be tested for common pathogens that cause foodborne illness.

Your lab kit contains a simulated sample of diarrhea collected from one of the patients. Use the materials in the “For Part 2” bag and the instructions below to determine which pathogen might be causing the foodborne illness.

1. Each well on the well strip is already coated with a different kind of antibody that can only attach to one specific type of pathogen. **Set the well strip on the diagram in the Pathogen Testing kit.**

Be careful to arrange the well strip so that the small tab is on the left.



2. Put 3 drops of the simulated Patient Diarrhea Sample into each of the wells.
3. Put 3 drops of Pathogen Testing Solution into each of the wells. Use a different toothpick to stir the mixtures in each of the wells.
4. Observe the color of the contents of each of the wells.
 - A yellow color indicates the antibodies in the well have attached to a specific pathogen that is present in the diarrhea sample.
 - A blue or green color indicates the pathogens that are not present in the diarrhea sample.
5. Based on the results the diarrhea sample testing, what pathogen is most likely to be causing the foodborne illness. Support your answer with information from the tests that you conducted.

Part 3: Which food is contaminated?

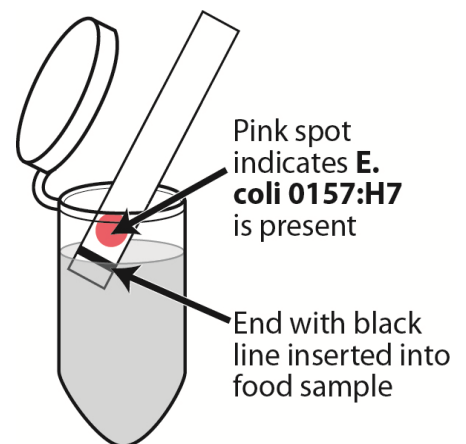
The physicians and Health Department officials began interviewing patients to determine which food was contaminated by the pathogen. They discovered that all of the patients had shopped at *Village Grocery Mart*, the town's only supermarket. The patients had all purchased and eaten the following foods:

- Blueberries
- Green peppers
- Lettuce
- Bean Sprouts

The Health Department sent a laboratory technician to collect samples of these foods from *Village Grocery Mart*. The laboratory technician mashed up small quantities of each of the four kinds of food and then mixed the mashed food with water. He filtered the samples and collected the fluid from each of the foods.

1. Use the materials in the "For Part 3" bag that contains simulated samples of the fluid from each of the four foods and a bag of *E. coli 0157:H7 Fast-Test Strips*.
2. Follow the instructions below to test the four foods for the presence of *E. coli 0157:H7* bacteria:

- Dip the end of the *E. coli 0157:H7 Fast-Test Strip* with the black line into the simulated food samples as shown on the right. **Important: Be sure that at least half of the strip is inserted into the food samples.**
- If a pink area appears on test strip, it indicates that *E. coli 0157:H7* bacteria are present in the food.



3. Which food (or foods) contains *E. coli 0157: H7* bacteria?

Part 4: Where did the contaminated food come from?

William Hurst, the manager of *Village Grocery Mart* looked at the store records and reported that they purchased the contaminated food from *Organic Produce Supply Company*, a wholesale distributor of many different kinds of produce (fruits and vegetables).

This *Organic Produce Supply Company* purchases dried bean seeds from a seed supplier. The company then moistens the bean seeds and allows them to germinate (begin to grow) in containers for several days. They package the germinated bean sprouts and ship them to grocery stores.

Health department technicians tested the bean sprouts from *Organic Produce Supply Company*. None of the bean sprouts currently in their facility tested positive for *E. coli* 0157:H7. However, several of the employees of the *Organic Produce Supply Company* revealed that the company's refrigeration system had been broken for a few days. The company had also recently changed from prewashing the sprouts to labeling the sprouts "Wash thoroughly before use."

1. Do you think that bean sprouts became contaminated at the produce company, the grocery store, or after they had been purchased for use in salad served at the family reunion? Support your answer from information in the scenarios and from the tests that you conducted.

Not all *E. coli* cause foodborne illness

Escherichia coli (*E. coli*) bacteria commonly live in the intestines of all people and animals. There are hundreds of strains of *E. coli*. Most strains of *E. coli* are normal, are and harmless inhabitants of the small intestine and colon, and do not cause disease. In fact, some strains of *E. coli* are beneficial because they produce vitamin K and some B vitamins. Some *E. coli* strains, particularly the *E.coli* 0157:H7 strain, cause "food poisoning" or diarrhea by producing toxins (poisons) that cause intestinal inflammation.

Use the information in the brochure entitled **What You Should Know About Foodborne Illness** to answer the following questions.

2. List at least three types of foods that are likely to cause foodborne illness.

3. Which type of pathogen is responsible for causing the greatest number of foodborne illnesses—bacteria, viruses, fungi, or protozoa?

4. Which is responsible for the majority of cases of foodborne illness—consumer handling of food after purchase, handling of food by restaurants or grocery stores, or contamination at farms and food processing facilities?

5. What two things should people do to help them recover from foodborne illness?

6. List at least three symptoms of food poisoning that indicate it would be best to contact a physician.

7. For each “Food Safety Mistake” on the left, write the letter of the appropriate “Why and Solution” on the line.

Food Safety Mistake	Why and Solution
<p>___ Tasting food to see if it’s still good</p>	<p>A. Why: Washing raw meat or poultry can spread bacteria to your sink, countertops, and other surfaces in your kitchen. Solution: Don’t wash meat, poultry, or eggs.</p>
<p>___ Eating undercooked or raw meat, poultry, seafood, or eggs</p>	<p>B. Why: Harmful germs can multiply extremely rapidly at room temperature. Solution: Thaw food safely in the refrigerator, in cold water, or in the microwave.</p>
<p>___ Thawing food on the counter</p>	<p>C. Why: Cooked food is safe only after it’s been cooked to a high enough temperature to kill harmful bacteria. Solution: Use the recommended cooking temperatures and a food thermometer.</p>
<p>___ Not washing your hands and cooking equipment</p>	<p>D. Why: You can’t taste (or smell or see) the bacteria that cause food poisoning. Tasting only a tiny amount can cause serious illness. Solution: Throw food out before harmful bacteria grows.</p>
	<p>E. Why: Germs on your hands or food preparation equipment can contaminate the food that you or others eat. Solution: Wash hands or cooking equipment the right way—for 20 seconds with soap and running water.</p>

8. There are many things that people can do to prevent contamination of food with the potentially harmful pathogens that cause foodborne illness. Read the brochure entitled **What You Should Know About Foodborne Illness**. As you read:

- Make a list of 3 things that you already do to prevent food poisoning.

- Make a list of 3 additional things that you should remember to do to prevent food poisoning.

Science Take-Out

MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name (as printed on the label): "Bean Sprouts"

Product identity: Buffer solution pH 10

Distributor: ScholAR Chemistry; 5100 W. Henrietta Rd, Rochester, NY 14586; (866)260-0501; www.Scholarchemistry.com

Telephone number for information: (718)338-3618 Medical emergency phone number (Chemtrec): (800) 424-9300

Date of this MSDS: 2/7/14

2. COMPOSITION/INFORMATION ON INGREDIENTS

Product	Ingredients	CAS Numbers	% Weight/Volume (balance is water)
pH 10 buffer	Sodium carbonate	497-19-8	0.25%
	Sodium bicarbonate	144-55-8	0.15%

For all the ingredients

OSHA PEL: TWA – none estab. STEL – none estab.
ACGIH TLV: TWA – none estab. STEL – none estab.
NIOSH REL: TWA – none estab. STEL – none estab.
NIOSH ILDH: none estab.

3. HAZARDS IDENTIFICATION

Potential Health Effects

EYES: May cause irritation. SKIN: May cause irritation. INHALATION: n/a
INGESTION: May cause gastrointestinal discomfort and mouth burns.

4. FIRST AID MEASURES

EYES - Flush with water for at least 15 minutes, raising and lowering eyelids occasionally. Get medical attention if irritation persists.

SKIN - Thoroughly wash exposed area for at least 15 minutes. Remove contaminated clothing. Launder contaminated clothing before reuse. Get medical attention if irritation persists.

INGESTION - Do not induce vomiting. If swallowed, if conscious, give plenty of water immediately and call a physician or poison control center. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

NFPA Rating: Health: 1 Fire: 0 Reactivity: 0

Extinguisher Media: Any means suitable for extinguishing surrounding fire

Special Firefighting Procedures: Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: No data available

6. SPILL OR LEAK PROCEDURES

Ventilate area of spill. Clean-up personnel should wear proper protective equipment and clothing. Absorb material with suitable absorbent and containerize for disposal.

7. HANDLING AND STORAGE

Store in a cool dry place. This Material is not considered hazardous. Handle using safe laboratory practices.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory Protection: n/a

Ventilation: Local Exhaust: Preferred Mechanical(General): Acceptable Special: No Other: No

Protective Gloves: Natural rubber, Neoprene, PVC or equivalent.

Eye Protection: Splash proof chemical safety goggles should be worn.

Other Protective Clothing or Equipment: Lab coat, apron, eye wash, safety shower.

9. PHYSICAL AND CHEMICAL PROPERTIES

Melting Point: ~0°C

Boiling Point: ~100°C

Vapor Pressure: information not available

Vapor Density: information not available

Specific Gravity (H₂O=1): ~1

Percent Volatile by Volume: >99

Evaporation Rate: information not available

Solubility in Water: soluble

Appearance and Odor: Green odorless liquid

10. STABILITY AND REACTIVITY

Stability: Stable

Materials to Avoid: strong acids and bases

Hazardous Decomposition Products: none known

Hazardous Polymerization: will not occur

11. TOXICOLOGICAL INFORMATION

Ingredient	Toxicity (oral-rat) LD ₅₀
Sodium carbonate	4090 mg/kg
Sodium bicarbonate	4220 mg.kg

Effects of Overexposure (for all pH buffers):

Acute: Essentially non-hazardous. Possible irritation of eyes/skin/stomach

Chronic: None known.

Conditions aggravated/Target organs: none known

Target Organs: Eyes, skin, and gastrointestinal tract.

Primary Route(s) of Entry: Ingestion or skin contact.

12. ECOLOGICAL INFORMATION

No ecological data available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Dispose in accordance with all applicable Federal, State and Local regulations.

Always contact a permitted waste disposer (TSD) to assure compliance.

14. TRANSPORTATION INFORMATION

D.O.T. SHIPPING NAME: Not regulated

15. REGULATORY INFORMATION

EPA regulations: RCRA Hazardous waste number (40 CFR 261.33) – not listed

RCRS Hazardous waste classification (40 CFR 261) – not classified

SARA Toxic Chemical (40 CFR 372.65) – not listed

SARA EHS (Extremely Hazardous Substance (40 CFR 355) – not listed

OSHA regulations: Air Contaminant (29 CFR 1910.1000) – not listed

16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents data from the manufacturer and/or vendor and is accurate to the best of our knowledge. By providing this information, Science Take-Out LLC makes no guarantee or warranty, expressed or implied, concerning the safe use, storage, handling, precautions, and/or disposal of the products covered or the accuracy of the information contained in this fact sheet. It is the responsibility of the user to comply with local, state, and federal laws and regulations concerning the safe use, storage, handling, precautions, and/or disposal of products covered in this fact sheet.

MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name (as printed on the label):
"Blueberries", "Green Peppers", "Lettuce"

Product identity: Food coloring = < 0.1%
Water = >99%%

Manufacturer: Science Take-Out, LLC
P.O. Box 205
Pittsford, NY 14534

Telephone number for information: (585)764-5400
Preparation date of this MSDS: 2/7/14
Medical emergency phone number (Chemtrec): (800) 424-9300

2. COMPOSITION/INFORMATION ON INGREDIENTS

This product contains no hazardous materials as defined by the OSHA Hazards Communications Standard
Chemical Ingredients: Red food coloring (1%) Chemical Name: N/A
CAS Number: N/A Formula: N/A Synonyms: N/A
Principle Hazardous Components: No Data
TLV and PEL units: No Data OSHA-PEL 10ppm (TWA): No Data

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW Avoid skin and eye contact.
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Potential Health Effects EYES: May cause irritation. SKIN: May cause irritation.

4. FIRST AID MEASURES

EYES - Flush with water for at least 15 minutes, raising and lowering eyelids occasionally. Get medical attention if irritation persists.
SKIN - Thoroughly wash exposed area.

5. FIRE FIGHTING MEASURES

 No data available

6. SPILL OR LEAK PROCEDURES

Wear proper eye and skin protection. Mop/wipe spill area. Rinse with water.

7. HANDLING AND STORAGE

 Avoid eye and skin contact

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory Protection: N/A Ventilation: N/A
Protective Gloves: Natural rubber, Neoprene, PVC or equivalent.
Eye Protection: Splash proof chemical safety goggles should be worn.
Other Protective Clothing or Equipment: None

9. PHYSICAL AND CHEMICAL PROPERTIES

Molecular Weight: No data	Melting Point: N/A
Boiling Point: No data	Vapor Pressure: No data
Vapor Density (Air=1): No data	Specific Gravity (H ₂ O=1): No data
Percent Volatile by Volume: No data	Evaporation Rate (BuAc=1): No data
Solubility in Water: Soluble	
Appearance and Odor: "Green Peppers" and "Lettuce" = green odorless liquid "Blueberries" = blue odorless liquid	

10. STABILITY AND REACTIVITY

Stability: Stable	Conditions to Avoid: No data
Incompatibility (Materials to Avoid): None	Hazardous Decomposition Products: No Data
Hazardous Polymerization: Will not occur	

11. TOXICOLOGICAL INFORMATION

Toxicity Data: No data	Effects of Overexposure: See section 3
Target Organs: Eyes and skin	Primary Route(s) of Entry: Eye or skin contact.

12. ECOLOGICAL INFORMATION No data

13. DISPOSAL CONSIDERATIONS Can be disposed of in trash or down the sink.

14. TRANSPORTATION INFORMATION D.O.T. SHIPPING NAME: N/A

15. REGULATORY INFORMATION N/A

16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents data from the manufacturer and/or vendor and is accurate to the best of our knowledge. By providing this information, Science Take-Out LLC makes no guarantee or warranty, expressed or implied, concerning the safe use, storage, handling, precautions, and/or disposal of the products covered or the accuracy of the information contained in this fact sheet. It is the responsibility of the user to comply with local, state, and federal laws and regulations concerning the safe use, storage, handling, precautions, and/or disposal of products covered in this fact sheet.

MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name (as printed on the label): "Pathogen Testing Solution"

Product identity: 0.05% bromothymol blue solution

Distributor: ScholAR Chemistry; 5100 W. Henrietta Rd, Rochester, NY 14586; (866)260-0501; www.Scholarchemistry.com

Telephone number for information: (718)338-3618 Medical emergency phone number (Chemtrec): (800) 424-9300

Date of this MSDS: 2/7/14

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	CAS Numbers	% Weight/Volume	TLV Units
Bromothymol blue sodium salt	34722-90-2	0.05%	None established
Water	7732-18-5	99.95%	None established

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Do not ingest. Avoid skin and eye contact. Avoid exposure to vapor or mists.

Potential Health Effects EYES: May cause irritation. SKIN: May cause slight irritation. INHALATION: n/a
INGESTION: May cause gastrointestinal discomfort

4. FIRST AID MEASURES

EYES - Flush with water for at least 15 minutes, raising and lowering eyelids occasionally. Get medical attention if irritation persists.

SKIN - Thoroughly wash exposed area for at least 15 minutes. Remove contaminated clothing. Launder contaminated clothing before reuse. Get medical attention if irritation persists.

INGESTION - Do not induce vomiting. If swallowed, if conscious, give plenty of water immediately and call a physician or poison control center. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

NFPA Rating: Health: 1 (slight) Fire: 0 Reactivity: 0

Extinguisher Media: Any means suitable for extinguishing surrounding fire

Firefighting Procedures: Firefighters should wear full protective equipment and NIOSH approved self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: None

6. SPILL OR LEAK PROCEDURES

Ventilate area of spill. Clean-up personnel should wear proper protective equipment and clothing. Mop up, or absorb material with suitable absorbent and containerize for disposal.

7. HANDLING AND STORAGE

Store in a cool dry place. Handle using safe laboratory practices.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory Protection: None required
Ventilation: Local Exhaust: Preferred
Protective Gloves: Natural rubber, Neoprene, PVC or equivalent.
Eye Protection: Splash proof chemical safety goggles should be worn.
Other Protective Clothing or Equipment: Lab coat, apron, eye wash, safety shower.

9. PHYSICAL AND CHEMICAL PROPERTIES

Melting Point: <2°C	Boiling Point: >98°C
Vapor Pressure: Ca 50 @ 20°C	Vapor Density: ~ same as water
Specific Gravity (H ₂ O=1): ~1	Percent Volatile by Volume: information not available
Evaporation Rate: ~ same as water	Solubility in Water: soluble
Appearance and Odor: Blue odorless liquid	

10. STABILITY AND REACTIVITY

Stability: Stable
Materials to Avoid: none known
Hazardous Decomposition Products: none
Reactive under what conditions: none known

11. TOXICOLOGICAL INFORMATION

Toxicity (rat) LD ₅₀
Acute oral toxicity = information not available
Acute toxicity from vapor = information not available

Effects of Overexposure:
Acute: Irritation of eyes/skin
Chronic: Irritation of eyes/skin
Target Organs: Eyes, skin.
Primary Route(s) of Entry: Ingestion

12. ECOLOGICAL INFORMATION

 No data available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Dispose in accordance with all applicable Federal, State and Local regulations.
Always contact a permitted waste disposer (TSD) to assure compliance.

14. TRANSPORTATION INFORMATION

 No data available

15. REGULATORY INFORMATION

 No data available

16. ADDITIONAL INFORMATION

The information provided in this Material Safety Data Sheet represents data from the manufacturer and/or vendor and is accurate to the best of our knowledge. By providing this information, Science Take-Out LLC makes no guarantee or warranty, expressed or implied, concerning the safe use, storage, handling, precautions, and/or disposal of the products covered or the accuracy of the information contained in this fact sheet. It is the responsibility of the user to comply with local, state, and federal laws and regulations concerning the safe use, storage, handling, precautions, and/or disposal of products covered in this fact sheet.