Keepin' It Fresh

Objectives:

- Students will define pasteurization.
- Students will tell how farms are regulated to ensure safe milk products.
- Students will explain through writing or by describing pictures the processes that milk goes through from cow to consumer to ensure quality and safety.

Approximate Lesson Length: 55 Minutes

Materials Needed:

- **"Keepin' It Fresh"** worksheets for each student
- **"Keepin' It Fresh"** guided reading pamphlets (or eBook) for each student
- **"Discover Dairy . . . and Milk Safety"** video and projector
- **"Keepin' It Fresh"** overhead on Page 5
- Other materials (one for each student):
  - Scissors
  - One red and one green crayon or colored pencil
  - Pencil or pen

Lesson Components:

Component	Time	Component	Time
Video Motivator & Discussion	10 min	Classroom Lesson & Instruction	15 min.
Guided Reading & Relevant Vocabulary	15 min.	Classroom Worksheet & Writing Assessment	15 min.

Motivator:

Introduce the **"Discover Dairy . . . and Milk Safety"** video. Explain to the students that in the video, they will hear about the processes milk goes through to ensure that it is a safe, high-quality product when it gets to the grocery store. Explain that this is one example of the processes and safety steps all food products must go through to protect our wellbeing. Write the following questions on the board. Ask the students to listen for answers while watching the video, and encourage them to write down the answers as they hear them. You can also hand out **Worksheet 2.1** for students to take notes.

- **How do we know milk is safe?** Milking equipment and cows are clean, milk is tested several times before it gets to the grocery store, milk is regulated by the government
- **Where is milk tested for safety and quality?** At the farm, in the milk truck, at the plant
- **What is pasteurization?** The process of heating milk rapidly to ensure it is safe
- **What can we do to keep milk safe?** Keep it clean, covered and cold

Video:

Show the **"Discover Dairy . . . and Milk Safety"** video and then summarize it with the class. Review the questions above.

Lesson:

Ask students: How many of you have gone grocery shopping with your parents? While your shopping, how do you know the food is safe?

Answer: There are national and state organizations called regulatory agencies — like the Food and Drug Administration (FDA), for example — working to ensure that our food supply is safe and wholesome. Explain that these agencies establish tests and processes that food must go through to make sure it is safe for us to eat.

Tell the class that they will follow milk from the farm where it is produced to the grocery store where we purchase it to demonstrate how food is handled and tested to make sure it is safe. Explain that milk and dairy products undergo a number of safety, quality and sanitation procedures on the farm, in transport and at the processing plant, making them the most highly regulated and safest foods available to us. Preserving the safety and quality of milk begins at the farm and follows through to the refrigerator.

Classroom Activity:

Use **Worksheet 2.2** to guide students through the next activity. Go through the steps below and ask students to describe what is depicted in each illustration on the worksheet. As you review each step, have students write the name of the step on their copy of **Worksheet 2.2**, without numbering the steps. *The guided reading pamphlet can also be used to walk through this activity.*

Step 1: Care & Cleanliness

Barns must be clean and well kept, and cows must be clean, comfortable and well cared for in order to produce safe, high-quality milk. Healthy cows produce quality milk. When cows do get sick, they are given medicine—much like an antibiotic a doctor would prescribe for us. If a cow is given an antibiotic, her milk is thrown away until she is healthy again and no longer needs the antibiotic. The milk is tested before it is used again to make sure no antibiotics are in the milk.

Step 2: Inspections

Dairy farms are regularly inspected by a state sanitation inspector to make sure the milking equipment, housing facilities and cows are clean. Federal inspectors from the Food and Drug Administration also inspect the farms to ensure safety.

Step 3: Milking

Cows respond to regular routines and kind handling. They're milked two or three times a day. At each milking the cow's udder and teats are cleaned and sanitized to keep the milk clean. The milking machine is attached and gently squeezes the milk out of the udder. Each milking takes 4 - 5 minutes per cow.

Step 4: Cooling

The milk from the cows flows through sanitized pipelines to the large milk tank. Here the milk is cooled quickly to 40°F or lower to keep it fresh.

Step 5: Transportation

The milk is picked up by an insulated transport truck every one or two days and transported to the processing plant. Samples of the milk are taken at the farm and in the milk truck to test for safety and quality. On average the milk arriving at the processing plant is less than two days old.

Step 6: Pasteurization
Once it arrives at the processing plant, the milk is pasteurized. Pasteurization is the process of heating milk to high temperatures (at least 145°F) for a short period of time. Pasteurization ensures milk and dairy products are safe to drink and eat.

Step 7: Testing
The dairy industry works with state and federal regulators to monitor and test dairy production, processing and marketing to ensure the safety and wholesomeness of milk and dairy products. Every load of milk shipped from every dairy farm in the U.S. is tested and re-tested for safety and quality — up to 17 times throughout the process. Any milk that does not meet the federal quality and safety standards is thrown away. Think of it this way — if it is not perfect, it is pitched.

Step 8: Our Part
Dairy farmers, industry personnel and federal and state regulators go to great lengths to ensure the safety and wholesomeness of the milk we drink. However, once we get it home, it is up to us to keep it safe and pure. The three things we must do to keep milk safe are:

► **Keep It CLEAN** ► **Keep It COVERED** ► **Keep It COLD**

Mini Review Activity: Now have students cut the 8 boxes apart and have them shuffle them out of order. Then ask them to see if they can put them in the correct order from the cow to us.

Guided Reading Lesson:

Hand out the reading pamphlets to review the lesson or provide the link to the eBook.

Evaluation:

Use **Worksheets 2.3 and 2.4** that accompany this lesson to evaluate whether the students comprehended lesson material and have achieved stated objectives.

Explain that the process that ensures milk safety is just one example of how our food supply is protected to make certain that what we are eating is safe and wholesome. Milk and dairy products are among the safest, most highly regulated foods in the grocery store. Clean conditions on the farm, processes like pasteurization, and continuous testing and monitoring by state and federal regulatory agencies ensure us that all milk and dairy products available to us are safe and pure.

Review Questions:

Ask questions to review the lesson. See examples below.

- **What is the first step in producing safe, pure milk?** Clean barns & healthy cows
- **What is pasteurization?** The process of heating milk to ensure it is safe
- **Where is milk tested for safety and quality?** On the farm, in the milk truck, and at the plant
- **How can we help keep milk safe and pure?** Keep it clean, cooled and covered

For a writing assessment opportunity, encourage the students to complete the writing assignment on **Worksheet 2.5.**

Worksheet 2.1

Name: _____ Date: _____

“Discover Dairy...and Milk Safety”

Video Notes

Instructions: Answer the following questions while watching the “Discover Dairy...and Milk Safety” video.

1. **How do we know milk is safe?**

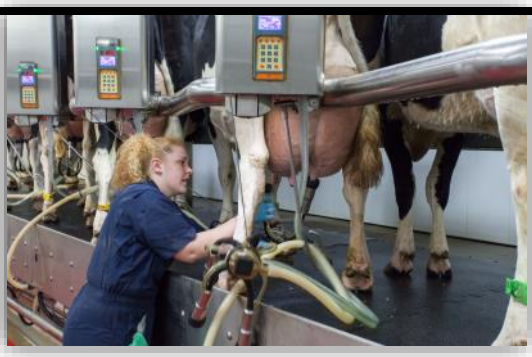
2. **Where is milk tested for safety and quality?**

3. **What is pasteurization?**

4. **What can we do to keep milk safe?**

Worksheet 2.2

8 Steps to Ensure High Quality Milk



Worksheet 2.3

Name: _____ Date: _____

Answer the questions below and complete the maze to review Lesson 1 concepts.

1. What is the first step needed to produce safe, wholesome milk?

   _____

2. What is the process of heating milk to high temperatures to ensure it is safe?

   _____

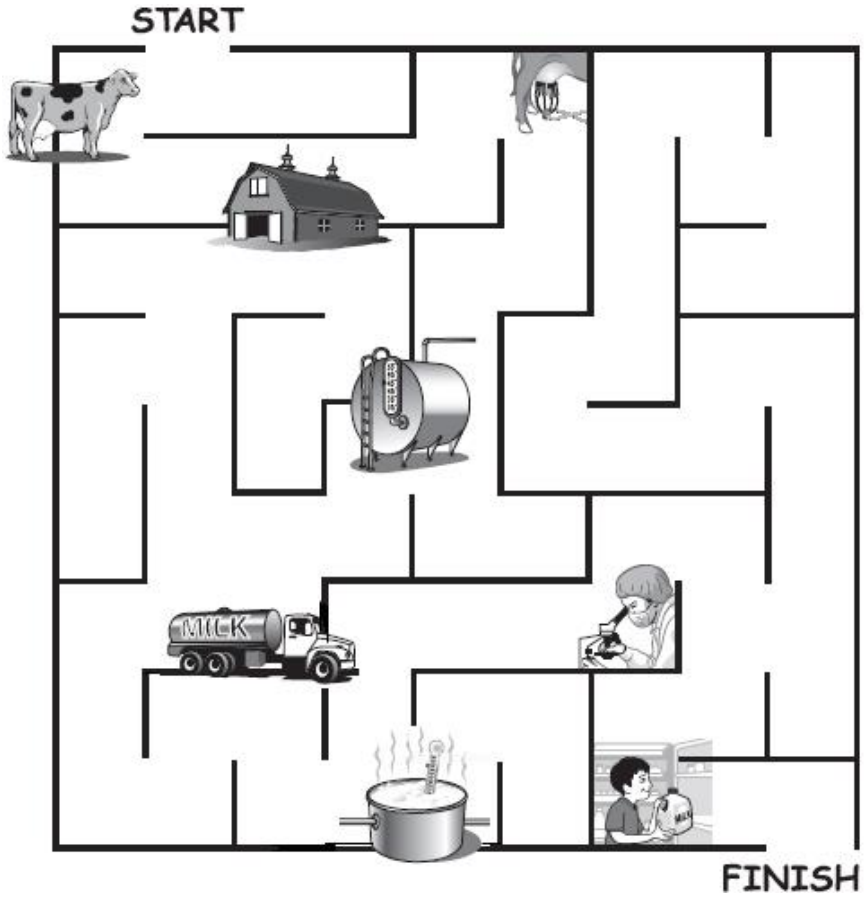
3. Name two places milk is tested for safety and quality?

   _____

4. What are the three Cs involved with our role in keeping milk safe?

   _____ _____ _____

Trace the trail of milk from the cow to our table by following each of the 8 steps in milk safety.



Worksheet 2.4

Name: _____ Date: _____

Read each of the situations below and color the light either green or red with a crayon or colored pencil. A green light indicates the milk will continue to move through the steps to get to our table. A red light indicates the milk will be discarded or thrown away.

SCENARIO	LIGHT
A state inspector comes to look at the farm. It is clean and sanitary.	RED GREEN
A cow gets the flu (or pneumonia in cow terms). She is given an antibiotic to help her feel better.	RED GREEN
The thermometer on the bulk cooling tank where the milk is stored is broken, and the milk is kept at 50˚F.	RED GREEN
A farmer cleans the cow's udder and teats off carefully and sprays them with a sanitizing solution to make sure they are clean.	RED GREEN
The milk is tested at the farm and passes all safety and quality standards. It is also tested at the dairy plant and passes all of the tests.	RED GREEN
The milk transport truck breaks down on the way from the farm to the plant, and the milk sits on the truck for several days before it is unloaded.	RED GREEN
The milk is pasteurized at the processing plant.	RED GREEN

Worksheet 2.5

Name: _____ Date: _____

Writing Enrichment

Compare and Contrast

Instructions: Write a summary paragraph describing the three things you can do at home to make sure milk remains wholesome and high-quality. Be sure to incorporate the three "C's" into your paragraph.

Worksheet 2.1

Name: _____ Date: _____

“Discover Dairy...in Our Environment”

Video Notes

Instructions: Answer the following questions while watching the “Discover Dairy...and Milk Safety” video.

1. **How do we know milk is safe?**

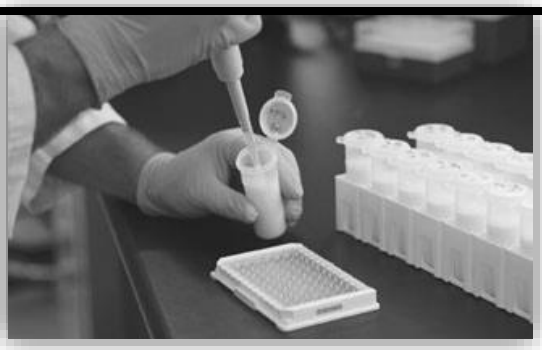
2. **Where is milk tested for safety and quality?**

3. **What is pasteurization?**

4. **What can we do to keep milk safe?**

Worksheet 2.2

8 Steps to Ensure High Quality Milk



Worksheet 2.3

Name: _____ Date: _____

Answer the questions below and complete the maze to review Lesson 1 concepts.

1. What is the first step needed to produce safe, wholesome milk?

   _____

2. What is the process of heating milk to high temperatures to ensure it is safe?

   _____

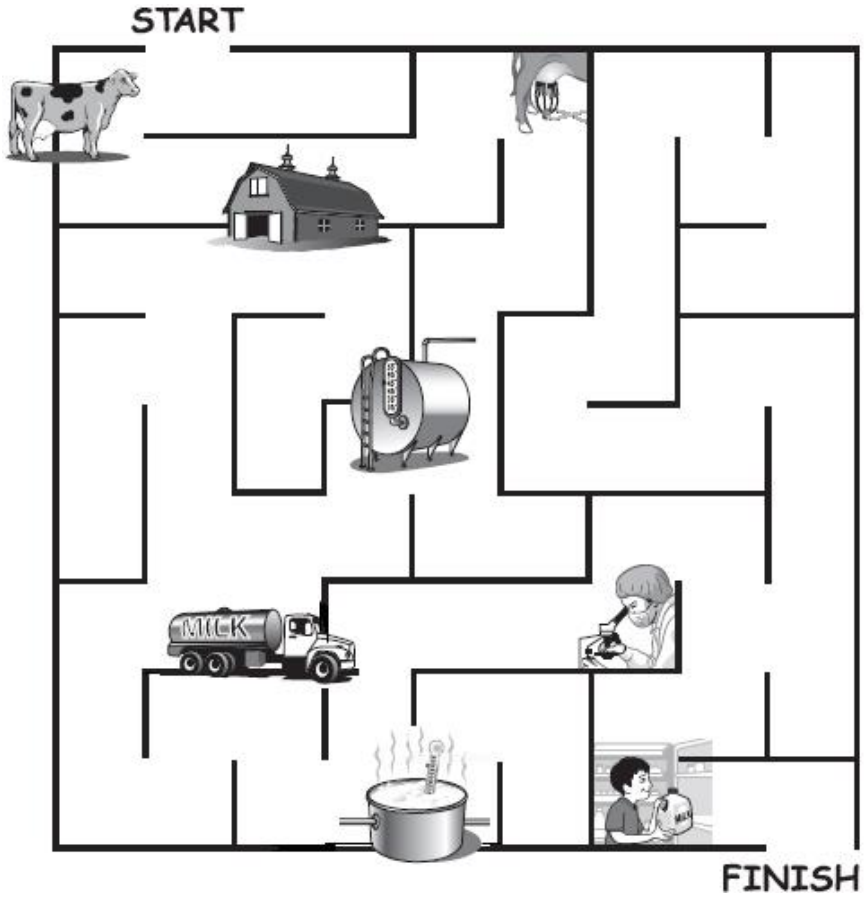
3. Name two places milk is tested for safety and quality?

   _____

4. What are the three Cs involved with our role in keeping milk safe?

   _____ _____ _____

Trace the trail of milk from the cow to our table by following each of the 8 steps in milk safety.



Worksheet 2.4

Name: _____ Date: _____

Read each of the situations below and color the light either green or red with a crayon or colored pencil. A green light indicates the milk will continue to move through the steps to get to our table. A red light indicates the milk will be discarded or thrown away.

SCENARIO	LIGHT
A state inspector comes to look at the farm. It is clean and sanitary.	RED GREEN
A cow gets the flu (or pneumonia in cow terms). She is given an antibiotic to help her feel better.	RED GREEN
The thermometer on the bulk cooling tank where the milk is stored is broken, and the milk is kept at 50˚F.	RED GREEN
A farmer cleans the cow's udder and teats off carefully and sprays them with a sanitizing solution to make sure they are clean.	RED GREEN
The milk is tested at the farm and passes all safety and quality standards. It is also tested at the dairy plant and passes all of the tests.	RED GREEN
The milk transport truck breaks down on the way from the farm to the plant, and the milk sits on the truck for several days before it is unloaded.	RED GREEN
The milk is pasteurized at the processing plant.	RED GREEN

Worksheet 2.5

Name: _____ Date: _____

Writing Enrichment

Compare and Contrast

Instructions: Write a summary paragraph describing the three things you can do at home to make sure milk remains wholesome and high-quality. Be sure to incorporate the three "C's" into your paragraph.