

Milk Made for You

Activity Synopsis

This activity outlines how milk is transported, processed and distributed. Students learn about the various processes that milk undergoes at the dairy processing plant as well as the different occupations people have within the dairy industry. Finally, students participate in a hands-on demonstration of how one dairy product, butter, is made.

Activity Outcomes

Students will be able to:

- Describe three processes that milk undergoes at the dairy processing plant, including pasteurization and homogenization.
- Identify three professional occupations people have that contribute to the processing and transportation of milk.
- Identify three dairy foods and/or beverages.

Cross-curricular Outcomes

Students will be able to:

- Explain the journey of milk from the dairy farm to the consumer. (Environment and Ecology)
- Define, and correctly use, terms related to dairy processing and transportation. (Language Arts)
- Follow verbal instructions appropriately. (Language Arts)

Activity Length

Part One: 30-40 minutes

Part Two: 30-40 minutes

Materials

- An empty 1/2-gallon milk container with the label intact
- **Rock-and-Roll Butter** handout
- Large plastic jar (approximately 1-quart size)
- A bowl and a wooden spoon
- 8-ounces whipping cream
- 1 cup cold water
- Salt (optional)
- Butter knife
- Crackers
- Napkins
- One kind of cheese (*Swiss, American, Edam, Sharp Cheddar, Mozzarella, etc.*), one piece per student. (Going Further optional activity)
- Cheese slicer or heavy plastic knife for teacher's use (Going Further optional activity)
- **From Moo to You** worksheet (Going Further optional activity)

Advance Preparation

- Preview the suggested instructional strategy.
- Obtain an empty container of milk.
- Duplicate the **Rock-and-Roll Butter** handout, one per student.
- Cut cheese into individual pieces, one per student (Going Further optional activity)
- Duplicate the **From Moo to You** worksheet, one per student. (Going Further optional activity)

After you've completed this lesson

go to www.dairyspot.com and

- Complete our **User Survey** with your thoughts on this lesson and the entire program.
- **Enter your school librarian or media specialist** into our drawing for a chance to win a book bag, filled with dairy and nutrition-related books, for your school library!

MILK:
It Does a
Student
Body Good!

Part One: From Cow to Bottle

1. Begin by reviewing that dairy cows produce milk for people to drink.

- Dairy cows live on dairy farms where **dairy farmers** milk them everyday.
- Milk from the farm is called **raw milk**.

Continue by explaining to the students that today they will learn about how milk gets from the dairy farm to the store or school for us to drink and enjoy.

Ask students:

- *How does milk get from the farm to the dairy plant?*

A tank-truck driver picks up the milk from the farm.

- The **tank-truck driver** pumps the milk into a refrigerated tank truck. The tank truck is like a thermos bottle on wheels. It keeps the milk cold.
- The tank-truck driver also takes samples of the milk.
- The milk samples are tested at a laboratory by **lab technicians** to make sure the milk is safe and fresh for us to drink.
- The tank truck driver takes the milk to the **dairy processing plant**.

Ask students:

- *Does anyone know about a dairy processing plant near your home?*

Write the word “**processing**” on the board.

Ask students:

- *What does the word “processing” mean?* **Accept all reasonable responses.**

Explain that:

- When raw milk arrives at the dairy processing plant, it moves through a series of special pipes to different machines.
- As the raw milk moves through the plant, the milk undergoes some changes before machines put it into bottles and cartons for us to drink.
- These changes are called **pasteurization** and **homogenization**.
- These changes process the milk from the cow for you.

2. Explain that many things happen to milk at the dairy processing plant.

Write the word “**pasteurized**” on the board.

Ask students:

- *Has anyone ever heard or seen the word “pasteurized” before? Where?* **Accept all reasonable responses.**

- Point to the word “pasteurized” on the milk label.

Explain that:

- Milk undergoes **pasteurization**.
- During this process or step, milk is heated to kill any germs that would make the milk unsafe to drink or cause it to spoil.
- After the milk is heated, it is cooled very quickly.
- When this is done, the milk is called **pasteurized** milk.

Ask students:

- *Has anyone ever heard or seen the word “homogenized” before? Where?* **Accept all reasonable responses.**

Point to the word “**homogenized**” on the milk label.

Explain that:

- Milk undergoes **homogenization**.
- This process mixes up the butterfat or cream in the milk. It gives milk a smooth taste. When this is done, milk is **homogenized**.
- If milk were not homogenized, the cream would rise to the top. You would have to shake or stir the milk before drinking it. Butterfat or cream is removed to make milk with less fat. One example of this is lowfat (1%) milk.

Ask students:

- *Can you get lowfat (1%) milk in the cafeteria?*
- *Can you name other kinds of milk that have some or all of the butterfat removed?* **Reduced (2%) fat milk and nonfat (fat free) milk**

Sometimes flavors are added to make flavored milk.

Ask students:

- *What are your favorite flavors of milk?* **Accept all reasonable responses.**
- *Can you buy flavored milk at school? What flavors are sold in the cafeteria?*

Tell students:

- After the milk is changed in different ways, special machines are used to package the milk. These special machines:
 - Put milk into bottles and cartons.
 - Seal the bottles and cartons.
 - Load the bottles and cartons into milk crates.

- Milk is stored in a large refrigerated room until it leaves the dairy processing plant.

- Trucks deliver the milk to schools and stores.

Explain that while some of the milk is packaged for us to drink, some milk is used to make other dairy products.

Ask students:

■ *What dairy products are made from milk?* **Cheese, yogurt, cottage cheese, ice cream, and butter**

3. Ask the students to raise their right hand if they know someone who works at a dairy processing plant. Tell students there are several people who help to process milk. There are different types of jobs that people have at dairy processing plants. Ask students what jobs they think need to be done in order to get milk to school or the store.

■ The **dairy plant manager** controls the machines that process the milk.

■ The **lab technicians** test the milk samples.

■ The **dairy plant worker** keeps the machines running. The machines process the milk and put it into containers.

■ The **dairy truck driver** delivers the milk to schools and stores.

4. Ask students to think back to how cows are milked on the dairy farm and to what happens to milk at the dairy processing plant.

Ask the students:

■ *Do human hands ever touch the milk?* **No**

■ *Are machines used to milk the cow and to move the milk through the dairy processing plant?* **Yes**

Point out that:

■ Milk is one of the safest foods you can eat.

■ Human hands never touch the milk.

■ The milk is tested to make sure it is fresh and clean.

■ Milk is always kept cold as it travels from the cow to dairy processing plant and finally to the store or school.

■ These steps are important to make sure that milk is always safe and fresh for us to drink.

Suggested Instructional Strategy

Part Two: Rock-and-Roll Butter

Follow the instructions below to show students how butter is made. Use the **Rock-and-Roll Butter** handout for reference.

■ Pour the whipping cream into a clean plastic jar. Screw on the lid. Have students take turns shaking the jar vigorously. You may want to turn on some lively music for inspiration.

■ When the whipping cream thickens into whipped cream, stop and allow the students to see how the cream has changed. Spoon out a scoop of the whipping cream and demonstrate its thickness by holding the spoon upside down, horizontally, over the jar. The whipped cream will not fall from the spoon. Ask students to describe the changes that have occurred.

■ Replace the lid and have students continue taking turns shaking the jar. After about ten minutes, yellow clumps will form as the butterfat particles stick together.

Ask students:

■ *What is the pale yellow clump?* **Butter**

■ *What is the remaining liquid?* **Nonfat (fat free) milk**

■ Pour off the milk and wash the butter by mixing it with cold water. Pour off the water. Use the wooden spoon to press the butter against the side of the bowl to remove any excess milk. Continue working the butter until the milk is gone.

■ Add a little salt, if you like, and serve the butter on crackers for each student to try.

Explain that:

■ Milk is made of water, protein, butterfat, and other nutrients. Through this activity, students can see that butterfat is removed from cream to make butter. The remaining liquid is nonfat (fat free) milk.

■ Distribute the **Rock-and-Roll Butter** handout for students to take home.

Going Further:

Class Visit to the Cafeteria Arrange a class visit to the cafeteria to meet with the foodservice director or manager. Have students generate a list of questions. Examples:

- *How often is milk delivered to the school?*
- *How much milk is delivered to the school?*
- *Is there more white, chocolate, strawberry or vanilla milk delivered each day? (Include the flavors that are offered at your school.)*
- *What types of milk (fat levels) are delivered to the school: nonfat or fat free, lowfat (1%), reduced fat (2%), whole?*
- *Where is the milk stored?*
- *How cold should the milk be? How do you know if the milk is cold enough?*

Exploring Cheese Direct students as they explore the characteristics of one dairy product, cheese, using each of their five senses. Distribute a plate and napkin to each student along with a pre-cut piece of cheese. Tell the students not to eat the cheese as you are going to “explore” the cheese first. Pose the following questions, addressing the sensory characteristics of the cheese:

Sight

- *What does the cheese look like?*
- *What color is the cheese?*
- *Are there any holes in the cheese?
Are the holes all the same size?*

Smell

- *How does the cheese smell?*

- *Does it smell like milk?
Like another food you know?*
- *Do you like the smell of the cheese?*

Touch

- *What does the cheese feel like?*
- *Is it more wet than dry?
Is it more soft than hard?*
- *Will it bend? Will it break?*

Sound

- *Does it make a noise when you break a piece in half?*
- *Can you eat it without making a noise?*

Taste

- *What does the cheese taste like?*
- *Is it salty? Is it sweet? Does it taste like milk?*
- *Does it taste good?*
- *How does the cheese feel in your mouth? Does it feel smooth? Does it feel hard? Is it hard to chew?*

Conclude the activity by allowing the students to eat any remaining cheese. Encourage them to eat slowly and pay attention to how the cheese looks, smells, feels, sounds and tastes. Encourage students to “explore” at home with different kinds of cheeses.

From Moo to You Distribute copies of the **From Moo to You** worksheet. Review the instructions with the students. Let students start by coloring in any dairy foods they’ve eaten today. Suggest that they explain the handout to their parents and then post it on the refrigerator or in some easy-to-see spot at home.