



**SOUTH DAKOTA STATE
UNIVERSITY EXTENSION**

Adopt-A-Cow: Dairy

LESSON 5: FARM TO TABLE



KEY TERMS

Contamination, Pasteurization

EDUCATION STANDARDS

English Language Arts

- SL.1, SL.2, SL.3

Educational Technology

- ET.EL.2

TIME NEEDED

Lesson and Video: 10 minutes

Milking Simulation: 15 minutes

Milk Testing: 15 minutes

Milk Timeline: 10 minutes

MATERIAL LIST

Materials for the whole class:

- Computer/Projector/TV/
Promethean board
- PowerPoint
- 2% or whole milk
- Dishwashing liquid
- Food Coloring

Materials for the individual students

- Rubber Gloves
- Cotton Swabs
- Cup
- Pie Tin



EXPECTED LEARNER OUTCOMES

OBJECTIVE 1 – Youth will simulate how a dairy farmer milks a cow.

OBJECTIVE 2 – Youth will simulate how milk is tested before it reaches their refrigerator.

OBJECTIVE 3 – Youth will be able to identify the steps milk follows from the cow to the store.

BACKGROUND

Milk has a busy but quick journey from the farm to the store. The majority of milk reaches store shelves within 48 hours of leaving the farm. After cows have been milked, the milk is quickly cooled and then transported to a milk plant with a tanker. The milk plant then puts the milk under a rigorous testing process to ensure safety and quality prior to pasteurizing it and bottling it. This product may then find its way to the store shelves or to a food processing facility where it can be made into dairy products like cheese and ice cream.

VOCABULARY

Contamination – When something is made impure by pollutants or poisons.

Pasteurization – Partial sterilization of a product to make it safe for consumption and increase its shelf life.

ACTIVITY PREPARATION

For the milking simulation:

Prepare the rubber gloves by filling them with liquid and tying the open end closed. You may choose to fill the gloves with milk; however, a water flour mixture could be used as a substitute. The flour not only provides a white color to the water, but it also thickens it to keep the water from leaking or moving too quickly through the fingertips. The ratio of flour to water will vary based on the thickness of the rubber gloves as well as the size of the holes you will be putting in the fingertips. You may want to experiment ahead of time. Wait to prick the fingertips of the gloves with a pin until youth are ready to milk their cows. To add a little bit of extra fun, you can create cow spots on the gloves using permanent markers.

When selecting gloves for this activity, look for ones that are latex free to avoid any allergy issues.

For the milk testing simulation:

To make this more experiment based, you may choose to provide each group with some whole milk and some skim milk. Have youth observe the difference between how the two different milks react with the detergent. They should see that the skim milk does not react nearly as much as the whole milk due to the lower fat content.

For the milk timeline:

Be sure to print a copy of the timeline for each youth or group. You may choose to have them draw a line between the picture and the designated number or have them cut the pictures out and glue them into the correct order.

ACTIVITY INSTRUCTIONS

I. Review Lesson 4 (Slide 2)

In Lesson 4, we talked about how the nutritional needs of dairy cows compare to ours and we made our own Total Mixed Rations.

II. Video: Milk's Journey from Farm to Store (5 min) (Slide 3)

Watch the video that follows milk from the cow to the store.

Reflect on the following items discussed in the video:

- Milk comes from a cow.
- Milk undergoes testing to ensure safety.
- Farmers and vets keep cows healthy.
- Cows can get sick and need antibiotics/medicine just like us.
- Once tested, milk goes to the grocery store or a processing facility to be made into things like cheese and ice cream.

III. Cow milking simulation (Slide 4)

As noted in the video, healthy cows are milked several times each day due to the amount of milk that they produce.

Since we are unable to go to the farm and milk a real cow, we are going to pretend to be a dairy farmer and simulate what it is like to milk a cow using rubber gloves.

Each group will have a glove filled with milk. Take turns so that one person is holding the glove, and another is 'milking the cow'. Have youth milk the glove into a cup.

IV. Milk testing simulation (Slide 5)

In the video, the milk is tested many times from the time it leaves the farm till it is sent off to the store. These tests ensure that the milk is safe and does not contain any contaminants. We are going to be a food safety scientist and simulate what a milk test might look like.



- a. Add just enough milk to cover the bottom of each pie tin
- b. Have the students add a few drops of food coloring – assist if needed. Discuss what happens.
- c. Use a cotton swab into the food coloring. Discuss what happens.
- d. Dip the cotton swab in dish detergent and touch it to the food coloring and milk. Discuss what happens.

Milk is made up of water, fat, proteins, sugars, and minerals. When the cotton swab is first introduced to the milk and food coloring not much happens. However, when dish soap is introduced, the soap interacts with the proteins and fats. The soap alters the shape of the proteins setting those molecules in motion. It also interacts with the fat (like when it lifts grease off a dirty dish) causing those molecules to move.

While this test doesn't tell us if the milk is safe, it does show us that there is protein and fats present in it.

V. Cow to Store Timeline

Have youth cut out the pictures and tape or glue them in the correct order. Or have them draw a line to the correct number.

- a. Cow
- b. Milking Parlor
- c. Truck
- d. Processing Facility
- e. Store
- f. Your Table





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Cow To Store Timeline



1



2



3



4



5

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LESSON FEEDBACK

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