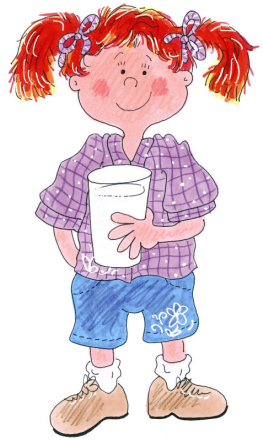
Many kinds of Milk Comes From A Cow



A lesson based on the book, Milk Comes From A Cow? by Dan Yunk.

America's food supply is safe, affordable and abundant but misunderstood by the public. Kansas Farm Bureau seeks to improve consumer knowledge of the importance of farming and ranching through the *Kailey's Ag Adventure Series*, of which this book is a part.

BACKGROUND INFORMATION:

Ask the students, "Where does milk come from?" *Anticipated responses: the refrigerator, the grocery store, a cow …* Listen to *Milk Comes From A Cow?* to find out. *Read aloud to the class.*

You followed Kailey in *Milk Comes From a Cow?* as she traveled to a dairy farm to learn that milk does come from a cow but is just sold at the grocery store. But, how does milk get from the farm to our cereal bowl?

The Milk Process:

After the cows are milked, the raw milk is pumped into refrigerated storage tanks, where it is cooled to 38°F. A truck comes to the dairy farm each day to haul the milk to the processing plant. Before the truck leaves the dairy farm, the milk is tested for safety and regulation purposes. Milk trucks have shiny metal tanks designed to keep the milk cold. The milk then arrives at a processing plant, where it goes through ***pasteurization*** and ***homogenization***.

Pasteurization is heating the milk up to 162°F for 16 seconds to kill any bacteria, germs, or yeast in the milk. It is then cooled immediately back to 38°F.

Homogenization is the process in which the butter fat, also known as the cream, is broken up and blended in with the rest of the milk.

The milk is then bottled and shipped to grocery stores, schools, and restaurants. Dates are printed on the milk jugs to show how long the milk will stay fresh. On average, it only takes 2 days for milk to go from the cow to the grocery store shelves.

LEVEL: Grade 2 – 3

SUBJECTS/STANDARDS:
Science K – 2
Engineering Design
K-2-ETS1.3
Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Standards may be adjusted to fit other grade levels.

STUDENT LEARNING OUTCOMES:
The students will:

- Compare and contrast the caloric content and percentage of calcium in the three different kinds of milk.
- Describe differences and similarities in the taste, smell and/or appearance of each milk.
- Know healthy ways to include low-fat or fat-free milk and milk products in their diets.

ESTIMATED TEACHING TIME:
60 minutes

The Different Types of Milk:
Milk is classified in different ways. If you have ever been in the dairy aisle at the supermarket, you see many different types of milk. Many times the different types of milk have different colored labels. Why are there different types of milk and which type is the best for me? Let's investigate these different types of milk to discover which one is best for me!

Refer to Worksheet 1 and Handout 1.

Milk is Good for our Health:
Each kind of milk is a good source of calcium, but also has calories. ***Calcium*** helps build strong bones and teeth. Generally, it is suggested that children 5-8 need 2 cups of milk a day. The United States Department of Agriculture, or U.S.D.A., states:

"All fluid milk products and many foods made from milk are considered part of this food group. Foods made from milk that retain their calcium content are part of the group, while foods made from milk that have little to no calcium, such as cream cheese, cream, and butter, are not. Most milk group choices should be fat-free or low-fat."

Discuss healthy dairy choices for children to get enough calcium for their growing bodies. Refer to mypyramid.gov for more smart choices from the USDA.

A ***calorie*** is a unit used to measure the energy in our food. We need energy to do all the things we do in a day. But, eating too many calories is not healthy for our bodies. We need to keep the number of calories we eat each day at a healthy level for our individual bodies. Children ages 5-8 need between 1400 and 1600 calories each day. This value is different for each person, depending on whether you are a boy or girl, your age, level of physical activity, rate of growth, and other factors.

Alternative activity: Visit www.MyPyramid.gov to have students find their own MyPyramid Plan to see how many calories are in their individual plans.

ACTIVITIES:
Nutrition Label Exercise:
How do we know, though, how many calories and the amount of calcium is in the different kinds of milk? The Food and Drug Administration (FDA) requires all food to have a nutrition facts label. Use the nutrition labels found on these three kinds of milk, whole, skim, and chocolate, to find and record the number of calories and the percentage of calcium in each kind of milk on the graph on the worksheet.

Pass out worksheet 1.

MATERIALS NEEDED:
- *Milk Comes From A Cow?* by Dan Yunk ISBN 978-0-9797653-0-8
- Copies of Worksheet 1
- Copies of Handout 1
- Transparencies of each of the milks' nutrition labels or lunch milk cartons

EQUIPMENT:
4 small disposable cups (such as Dixie cups) for each student

INGREDIENTS:
½ Gallon (or more for larger classes) of each of the suggested milks:
- Whole milk
- Skim Milk
- Chocolate Milk

PREPARE AHEAD:

If you have a large class, you can pre-pour the milk into the small cups before the activity. Be sure to keep the milk cold while teaching the background information prior to the taste testing activity.

Depending on the students' ability, project the labels using an overhead projector or PowerPoint, in addition to handing out a paper copy to each student, to locate the caloric value and percentage of calcium together as a class. For more advanced learners, use the milk cartons from lunch to find the values on the cartons. Have the students keep their milk cartons from lunch. Divide students into groups of three based on their milk choices. Each one of the milk types should be represented in each of the groups. Students find the values together using the three different milk cartons.

Taste Test

****Before doing the tasting part of the lesson, be aware if your students have milk allergies or are lactose intolerant. Make modifications accordingly.****

Students record data about the color, smell, and taste of each of the three milks on the worksheet after tasting each sample. Pass only one sample out at a time to reduce confusion. Any three different milks can be used in this activity, but using whole, skim, and chocolate highlight the differences in taste and caloric value. Have students complete the worksheet.

Facilitate discussion regarding the students' findings. Students should conclude that all milks have 30% calcium, but the caloric contents differ. Take a vote to see what kind of milk is preferred by the class. Pass out handout 1 to demonstrate other differences in milk.

WHY:

The percent of milkfat distinguishes one type of milk over another, which is why the whole milk has more calories than the skim.
Today, most manufacturers remove the milkfat and then add some back based on what type of milk is being made. This ensures one gallon of whole milk will be consistent in taste and in nutritional value as the next gallon. Or one gallon of skim milk will be consistent in taste and in nutritional value as the next. After our activities, we discovered firsthand that different people have different nutritional needs and different preferences in the tastes of milks. Thank goodness many different kinds of milk comes from a cow! There is a kind for everyone!

ADDITIONAL ACTIVITIES:

Discuss alternative ways to get calcium with farm byproducts by using soymilk in the activities!

Which kind of milk is the favorite of the class? Students figure percentages to construct bar or pie graphs to see which milk won!

Do you get enough calcium each day? Students keep a log of their eating habits for a week to decide!

ADDITIONAL RESOURCES & LITERATURE:

The Milk Makers
by Gail Gibbons
ISBN 0-02-736640-5

Dairy Ag Mag
Contact Kansas Farm Bureau or your county office for copies.

USDA My Pyramid
www.Mypyramid.gov
Discover your personal eating plan

Moo Milk
www.moomilk.com
An interactive adventure into the dairy industry

Virginia Cooperative Extension
www.ext.vt.edu/resources/4h/virtualfarm/
Visit a virtual dairy farm

USDA Animal Improvement Programs Laboratory
http://aipl.arsusda.gov/kc/kcindex.html
Facts and games about the dairy industry for children

Best Food Nation
www.bestfoodnation.com/dairy.asp
Facts about the dairy industry

Many kinds of Milk Comes From A Cow

Name_____

1. Which type of milk do you predict has the most calories?

Whole Milk Skim Milk Chocolate Milk

2. Which type of milk do you predict has the most calcium?

Whole Milk Skim Milk Chocolate Milk

3. Complete the graph.

Type of Milk	Number (#) of Calories	Percentage (%) of Calcium	What color is it? Does it have a distinct smell? What does it taste like?
Whole Milk			
Skim Milk			
Chocolate Milk			

4. Based on the information in the graph, which type of milk has the….

…Most calories?_____…Least calories?_____

…Most calcium?_____…Least calcium?_____

5. Which type of milk was your favorite?_____

6. How many cups of milk are needed for healthy 5-8 year-olds? _____

7. What will you drink or eat today to get the calcium your body needs? _____

KANSAS FARM BUREAU®
The Voice of Agriculture®

Worksheet 1

Many kinds of Milk Comes From A Cow

Name Answer Key

1. Which type of milk do you predict has the most calories?

Based on prediction Whole Milk Skim Milk Chocolate Milk

2. Which type of milk do you predict has the most calcium?

Based on prediction Whole Milk Skim Milk Chocolate Milk

3. Complete the graph.

Type of Milk	Number (#) of Calories	Percentage (%) of Calcium	What color is it? Does it have a distinct smell? What does it taste like?
Whole Milk	152	29	White...observations by students
Skim Milk	90	29	White...observations by students
Chocolate Milk	Depends on % used	29	Brown...observations by students

4. Based on the information in the graph, which type of milk has the….

…Most calories? Whole …Least calories? Skim

…Most calcium? All equal …Least calcium? All equal

5. Which type of milk was your favorite? Student Opinion

6. How many cups of milk are needed for healthy 5-8 year-olds? 2 cups

7. What will you drink or eat today to get the calcium your body needs? Answers will vary. Milk, cheese, yogurt, cottage cheese…

KANSAS FARM BUREAU®
The Voice of Agriculture®

Worksheet 1

What are the differences between different milks?

Quick definitions of the different types of milk we drink!

The percent of milkfat distinguishes one type of milk over another. Today, most manufacturers remove the milkfat and then add some back based on what type of milk is desired. This ensures one gallon of whole milk will be consistent in taste and in nutritional value as the next gallon.

Whole Milk

has 3.5% milkfat, which gives this milk its rich, creamy texture. It is recommended for children to drink whole milk up to at least two years old. The fatty acids in whole milk are important to brain development and the nervous system. It is not fortified with Vitamin A, like the other low-fat or nonfat milks.

2% Reduced-Fat Milk

has 2% milkfat, as the name implies, but still has a taste similar to whole milk. It is fortified with vitamins A and D, since these vitamins are lost when removing the milkfat.

1% Low-Fat Milk

has even less milkfat, only 1%. It, too, is fortified with vitamins A and D. It is a popular choice among women or those on diets.

Skim Milk

has as much milkfat as possible removed, hence why it is also known as nonfat milk. It only has ½ gram of fat per serving and 45% less calories than whole milk. Despite popular belief, a glass of skim milk provides all the same nutrients as a glass of whole milk, just with less fat and calories.

Chocolate Milk

is typically made with reduced-fat, low-fat, or skim milk with the addition of cocoa and other sweeteners. The chocolate only adds extra calories, approximately 60 per serving, and a little caffeine, but does not add any fat to milk. Other flavored milks, like strawberry or banana, are similar.

Buttermilk

as referred to on the dairy farm, is the liquid that remains after the butter has been separated from the whole milk. However, commercially, it is made by adding lactic acid to low-fat or skim milk. Buttermilk is commonly known as 'sour milk' and is used heavily in cooking, for example buttermilk biscuits or pancakes.

Acidophilus Milk

(pronounced as-i-**dof**-uh-luhs) is low-fat or skim milk that has a live bacterial culture, lactobacillus acidophilus, added to make the milk more digestible for some people.

Soy Milk

is not a product of a dairy cow, but is a healthy non-dairy alternative for those unable to drink a cow's milk. Soy milk is made from soybean proteins. People that are *lactose intolerant,* which means their bodies cannot digest the enzyme lactase, the sugar found in milk, can use soy milk as a substitute for milk and its healthy benefits.