



SC Farm Bureau
Ag in the Classroom
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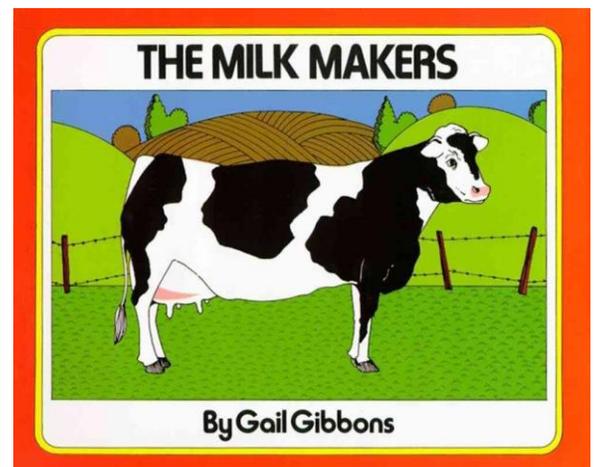
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January 2019 Book of the Month

The Milk Makers

By: Gail Gibbons

You probably drink milk at almost every meal. But have you ever wondered where it comes from? Cows eat special feed to make good milk. But after the cow is milked, there are still many steps the milk must go through before it reaches you. This book describes them all. And you'll be surprised to find how many other things you eat and drink come from milk, too. ¹



Did You Know? (Ag Facts)

- One dairy cow's daily milk production (about 70 pounds) can produce 8 gallons of milk, 3.3 pounds of butter, 7 pounds of cheese.
- A Holstein's spots are like a snowflake or human fingerprint; no two cows have exactly the same patterns of spots.
- With today's technology, some dairy farms have robots that operate their milking machines.

Discussion Questions

- Where does milk come from?
- What do cows eat and drink? Do people and cows need the same things?
- What can be made from milk?

Lesson Plans Available Online at
agclassroom.org/sc

Purpose: Students will understand that all organisms need energy to live and grow. In this lesson, we will explore the transfer of energy in the milk making process.

Vocabulary:

- Cattle
- Milking parlor
- Energy

Background Agricultural Connections ²

In the United States, **cattle** are typically raised to produce beef and milk for our food supply. The term *cattle* can refer to any breed or gender of the bovine species. All breeds of cattle produce meat and all female cattle produce milk after they give birth. However, within the cattle industry, specific breeds of cattle are classified as either "beef" or "dairy" cattle due to their efficiency in producing either meat or milk.

Female cattle, or *cows*, produce milk. They begin producing milk after giving birth to their first baby, which is called a *calf*. Cows that are able to produce large quantities of milk are called **dairy cows**. Such breeds of dairy cows raised in the United States include the Holstein, Ayrshire, Brown Swiss, Guernsey, Jersey, and the Milking Shorthorn. Can any breed or type of male cow be used for milk production? No, male cows do not produce milk.

Cattle breeds that are more muscular are raised as **beef cattle**. There are many different breeds of *beef cattle* raised in the United States such as Angus, the most popular, along with other common breeds such as Hereford, Shorthorn, Charolais, Simmental, and Limousin. Female beef cows do produce milk after giving birth, but in much smaller quantities than a typical dairy cow. Female beef cows produce enough milk to raise their own calf.

The cow that produced 1,500 quarts of milk per year a hundred years ago can produce 7,812 quarts per year today. One first grade student would have to drink 85 plus cartons of milk a day for an entire year to equal this amount. The dairy cows are normally milked twice a day, depending on the farm, in a building called a **milking parlor**. Automatic milking machines are used today and help the dairy farmer keep accurate records regarding milk production from each cow.

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Cows Give Us Milk AND Energy!

Materials:

- Engagement Chart (printed or recreated on chart paper)
- Post-it notes
- Crash Kids Video (<https://tinyurl.com/hjja5fm>)
- Energy from the Sun (<https://tinyurl.com/y7zhnd2b>)
- Energy Cycle – Cows
- Scissors
- Glue
- Construction Paper

Procedures:

1. Print Engagement Chart, or recreate on chart paper. This chart will be posted throughout this lesson so that students can return to their understandings.
2. Ask students, “What is energy?” Have them record their answers on post-it notes and stick in the “What I Think I Know” column of Engagement Chart. You could also ask, “Where do we get energy?”
3. Show [Crash Course Kids](#) video to explain why we eat, and how we get energy from our food. {Stop at 1:15 seconds into video.}
4. Read [Energy from the Sun](#) {Rookie Read-About Science}, or listen via hyperlink. Discuss wonderings that students may have from video. Explain that the book described energy as a cycle. Discuss with students what “cycle” means – the process of energy keeps going, just like the tire on a bicycle goes around and around. How could the energy cycle relate to cows? Show students the book, *The Milk Makers*, and discuss how it possibly fits with energy. Do cows need energy? What do we get from cows that gives us energy? Show students the Energy Cycle – Cows sheet. You could display this on a SmartBoard to complete as a class, or print for students to complete individually.
5. Students can complete Energy Cycle – Cows sheet individually by cutting and pasting in the right order, or you may complete as a class together. If students complete individually, they can paste their “cycle” on a piece of construction paper in the form of a circle – signifying the continuation of a cycle.
6. After students have completed their work, come together as a group to discuss the Engagement Chart. If students’ understandings have changed, they may write a new post-it to add to the chart under the column, “What I Learned”.

Dairy, Dairy, Dairy!

Materials:

- *The Milk Makers* by Gail Gibbons
- Fun Facts About Dairy infographic
- Various magazines
- Construction paper
- Scissors
- Glue

Procedures:

1. Gather students on carpet. Ask students, “Where do we get milk?” Discuss the different animals that make milk (goats, cows, sheep, etc.), highlighting that we mostly drink cow’s milk. Explain that we will be exploring what all types of things we get from cows, how they produce milk, and how that milk gets to our tables.
2. Read *The Milk Makers*, pausing periodically to answer questions and foster discussion for students.
3. Show students the infographic – Fun Facts about Dairy. Brainstorm with students the different products that can come from dairy cows. Display this list for students to refer back to as they complete the activity.
4. Explain to students they are going on a scavenger hunt in magazines to find as many dairy products as they can find. Pass out scissors, glue, magazines, and construction paper.
5. As students finish, bring them back together and have them share with a partner all of the products they found.

Enriching Activities

**Making Butter*

Materials: 1 pint of heaving whipping cream (warmed to room temperature), salt to taste, marbles, 2-3 small plastic airtight containers with lids, napkins, saltine crackers, plastic knives

Procedures:

1. Be sure the plastic container and marbles are washed and clean.
2. Pour cream into containers, filling each container about two-thirds full.
3. Add about 3 dashes of salt to each container.
4. Seal containers with lids.
5. Pass containers around to students, having each student shake the container for approximately 30-45 seconds before passing to the next student. Be sure to tell students to keep the lid side up as they shake to prevent possible spills.

6. As they shake, the marbles help the cream separate from the water. The cream solidifies into butter and the water separates into “buttermilk.”
7. After shaking 10-15 minutes, carefully open containers and pour off the buttermilk.
8. Have students use the knives to spread butter on crackers to sample fresh butter!
9. Leftover butter should be refrigerated and used within one week.

**Label the Dairy Cow*

Materials: 1 *Label the Dairy Cow* worksheet per student

Procedures:

1. Review the ways that dairy cows can give us energy. Explain to students that dairy cows have special body parts that help them produce the milk they do.
2. Together as a class, or individually, label the different parts of the dairy cow.

Suggested Companion Resources

- [Clarabelle](#) (book)
- [Has A Cow Saved Your Life?](#) (book)
- [The Cow in Patrick O’Shanahan’s Kitchen](#) (book)
- [From Moo to You!](#) (multimedia)
- [Discover Dairy](#) (website)
- [Real Ag – Dairy Products](#) (multimedia)

Sources/Credits

1. Gibbons, Gail. New York: Aladdin Paperbacks, 1985. Print.
2. [North Carolina Farm Bureau Ag in the Classroom](#)
3. [California Foundation for Ag in the Classroom](#)
4. [Discover Dairy](#)
5. [Crash Course Kids](#)

Lesson Plans Available Online at

agclassroom.org/sc

Suggested SC Standards Met:

English/Language Arts -

- K.RI.5.1 With guidance and support, ask and answer who, what, when, where, why, and how questions about a text; refer to key details to make inferences and draw conclusions in texts heard or read.
- K.RI.5.2 With guidance and support, ask and answer questions to make predictions using prior knowledge, pictures, illustrations, title, and information about author and illustrator.
- K.RI.6.1 With guidance and support, retell the central idea and identify key details to summarize a text heard, read, or viewed.
- 1.RI.5.1 Ask and answer who, what, when, where, why, and how questions to demonstrate understanding of a text; use key details to make inferences and draw conclusions in texts heard or read.
- 1.RI.5.2 Make predictions using prior knowledge, pictures, illustrations, title, and information about author and illustrator.
- 1.RI.6.1 Retell the central idea and key details to summarize a text heard, read, or viewed.
- 2.RI.5.1 Ask and answer literal and inferential questions to demonstrate understanding of a text; use specific details to make inferences and draw conclusions in texts heard or read.
- 2.RI.5.2 Make predictions before and during reading; confirm or modify thinking.
- 2.RI.6.1 Retell the central idea and key details from multi-paragraph texts; summarize the text by stating the topic of each paragraph heard, read, or viewed.
- 2.RI.7.1 Compare and contrast topics, ideas, or concepts across texts in a thematic, author, or genre study heard, read, or viewed.
- 3.RI.5.1 Ask and answer literal and inferential questions to determine meaning; refer explicitly to the text to support inferences and conclusions.
- 3.RI.6.1 Summarize multi-paragraph texts using key details to support the central idea.
- 3.RI.7.1 Compare and contrast diverse texts on the same topic, idea, or concept.

Science –

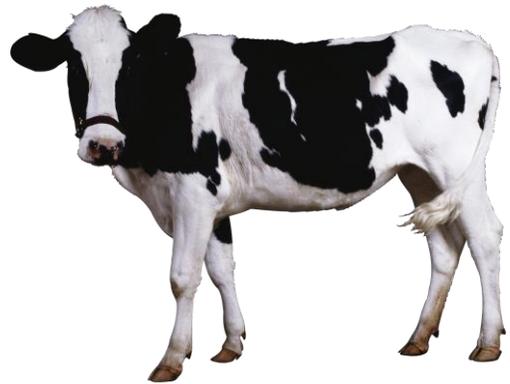
- K.L.2 The student will demonstrate an understanding of organisms found in the environment and how these organisms depend on the environment to meet those needs.
- 1.L.5B Plants have basic needs that provide energy in order to grow and be healthy. Each plant has a specific environment where it can thrive. There are distinct environments in the world that support different types of plants. These environments can change slowly or quickly. Plants respond to these changes in different ways.
- 2.L.5B Animals (including humans) require air, water, food, and shelter to survive in environments where these needs can be met. There are distinct environments in the world that support different types of animals. Environments can change slowly or quickly. Animals respond to these changes in different ways.
- 3.L.5A The characteristics of an environment (including physical characteristics, temperature, availability of resources, or the kinds and numbers of organisms present) influence the diversity of organisms that live there. Organisms can survive only in environments where their basic needs are met. All organisms need energy to live and grow. This energy is obtained from food. The role an organism serves in an ecosystem can be described by the way in which it gets its energy.

What I Think I Know

Questions I Have

What I Learned

Energy Cycle – Cows



FUN FACTS

ABOUT DAIRY

Butter is made from the cream of milk.



It takes **12 POUNDS** of whole milk to make one gallon of ice cream.

Each person in America eats an average of **46 SLICES** of pizza a year.



There are approximately **2,000** varieties of cheeses.



The average American consumes almost **25 GALLONS** of milk a year.



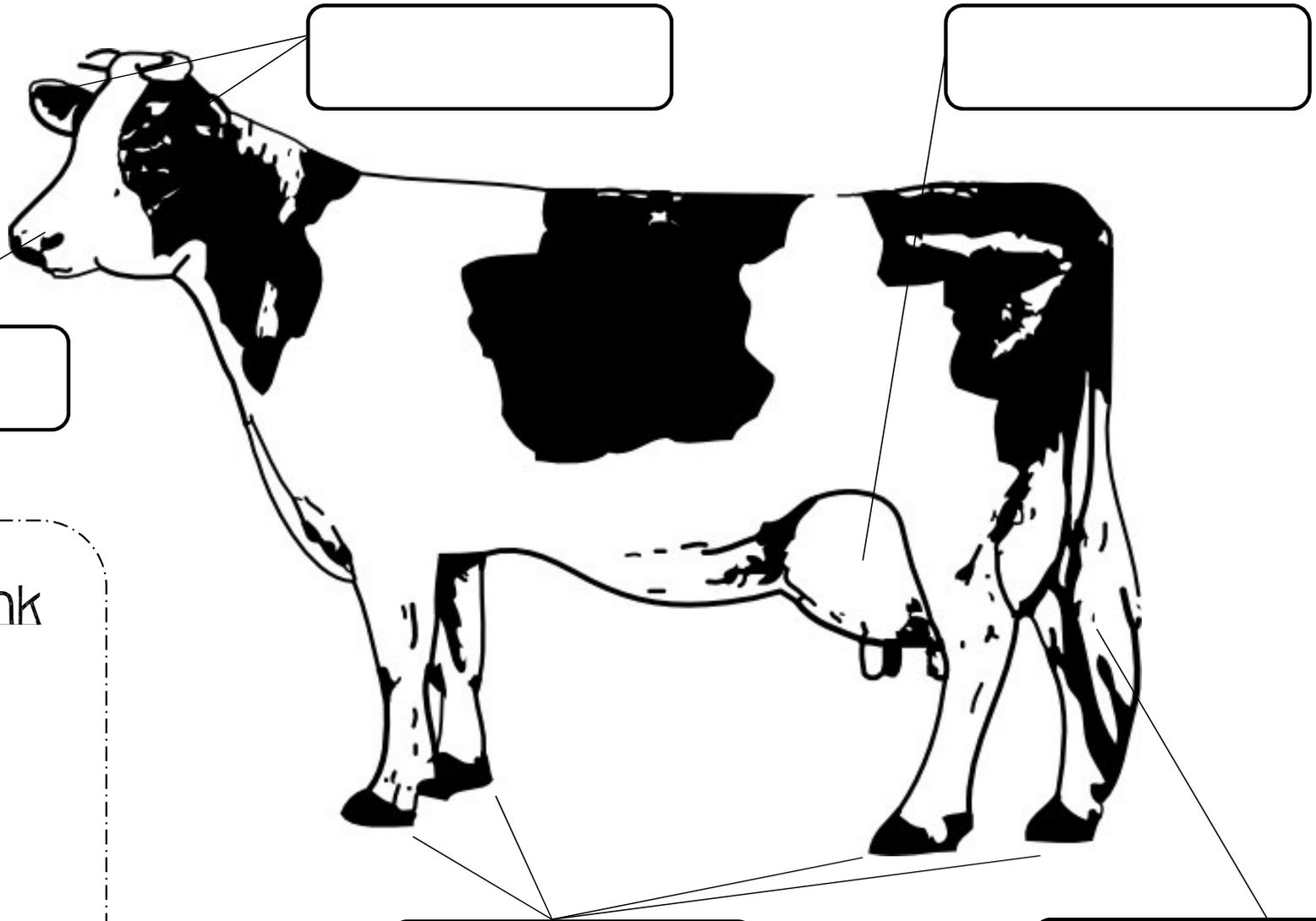
discoverdairy.com



Labeling A Dairy Cow

Name:

Date:



Word Bank

udder

ears

hooves

tail

nose