

# What Kind of Milk Do You Drink?

**Grade Level: 4-8**

## Lesson Overview

Ask your students where milk comes from, and they will surely reply, “cows!” But are cows the only source of milk consumed by humans? Students will learn about other animals used for milk and why dairy-providing species vary across the globe. They will then generate questions to prompt further research into dairy production.

## Student Objectives

1. Name 5 animals used for milk production around the world.
2. Describe the 3 key factors that determine which species are used to produce milk in a given country or region.
3. Formulate essential and focusing questions about a topic related to dairy farming.
4. Research a dairy-related topic in order to produce an informational product to share with others (slide presentation, video, Prezi, etc.).

## Materials

- ✓ Dairy Animals around the World information sheet
- ✓ Questions about Dairying worksheet
- ✓ Dairy Discussion worksheet
- ✓ Dairy Inquiry Project Planning worksheet

## Vocabulary

- **arid** – climate with little or no rain; too dry to support vegetation.
- **camel** – large mammal native to arid climates, with a long neck, long skinny legs, wide hooves, and either one or two humps on its back.
- **cattle** – large ruminant mammals with cloven (split) hooves, raised for meat or milk.
- **dairy** – a structure or establishment for the storage, processing, and distribution of milk and milk products; products containing or made from milk.
- **dairy products** – foods made using milk.
- **dairying** – producing, storing, and distributing milk and milk products.
- **developed country** – a country with high levels of industrial activity, economic growth, generally high levels of income, and a mature and stable economy.

- **developing country** – a country with low levels of industrial production, generally low-income levels, and reliance on agriculture as the main industry.
- **draft animal** – an animal used to pull heavy loads.
- **dung** – animal feces; manure.
- **goat** – domesticated ruminant animal similar to a sheep but with longer legs and a thin, hairy coat; raised for meat and milk.
- **herder** – person who cares for a herd of livestock in open country.
- **lactation** – the process of milk production.
- **manure** – livestock waste; feces.
- **nomad** – member of a group of people with no permanent home who travel from place to place with their livestock depending on the season.
- **ruminant** – a hooved mammal that chews cud (partially-digested food) regurgitated from its rumen.
- **sheep** – hooved ruminant mammal with a thick, wooly coat; kept in flocks and raised for meat, milk, and fiber.
- **subsistence farming** – farming that provides most or all of the products needed for a family to survive without any extra left to sell for profit.
- **tropical** – a hot, humid climate that does not freeze and where vegetation grows year-round; located in the tropics or the region of Earth surrounding the Equator.
- **water buffalo** – domesticated Asian buffalo with large, curved horns; used as a beast of burden and to produce milk.
- **yak** – large, shaggy ox used as a pack animal and for meat and milk in Tibet and nearby mountainous areas of central Asia.
- **yield** – amount of a product produced, as in milk yield or crop yields.

## Procedure

### *Day 1*

1. Open the lesson by asking students to name animals from which humans obtain milk. If needed, remind students that only mammals produce milk and that they do so to feed their offspring. Make a list on the board of the species mentioned.
2. Explain that students will read an informational page to learn more about animals used for dairy production around the world. Once they are finished, they will work with a group to discuss what they read and generate questions.

3. Distribute copies of the Dairy Animals around the World information sheet to each student. Allow time for them to read the information. (You may wish to review vocabulary terms with the class beforehand.)
4. Place students in groups of 3-4. Ask each group to designate a recorder who will write down questions. Give each recorder a copy of the Questions about Dairying worksheet. Allow groups time to generate and record their questions.

### *Day 2*

5. Give each group a Dairy Inquiry Project Framework worksheet. Explain that groups will research a dairy-related question and create a presentation in the format of their choosing. (You may want to share a source credibility guide to aid in evaluation of information found online, such as the one found at <https://lib.nmu.edu/help/resource-guides/subject-guide/evaluating-internet-sources>.)

### *Day 3*

6. Allow time for each group to share their presentation with the class.
7. After all groups have shared their projects, encourage individual student reflection through one of the following or a similar technique:
  - a. Write down the most important thing you learned about dairy production in exactly 15 words.
  - b. Create a “tweet” about what you learned about dairy production using no more than 140 characters.
  - c. Ask students to complete this sentence: “The most important thing I learned about dairy production was...”
8. Close the lesson by inviting students to share their reflections with the class.

## **Extension Activities**

1. Have students map where different species of animals are used for dairy production globally, using an online interactive world map tool like <https://mapchart.net/world.html>
2. Challenge students to research and compare the nutritional content of cow’s milk and various plant-based “milks.”

## **Additional Resources**

- Discover Dairy, <https://www.discoverdairy.com/>
- Food & Agriculture Organization: Gateway to Dairy Production and Products, <http://www.fao.org/dairy-production-products/en/>

- Illinois Agriculture in the Classroom: Dairy Ag Mag, <http://bit.ly/33S5UJ5>
- Illinois Agriculture in the Classroom Dairy Reader  
[http://www.agintheclassroom.org/TeacherResources/terra\\_nova.shtml](http://www.agintheclassroom.org/TeacherResources/terra_nova.shtml)
- Midwest Dairy, <https://www.midwestdairy.com/>
- Where Does Milk Come From? <https://bit.ly/2Tjt1fy>
- Why humans have evolved to drink milk, <https://bbc.in/3Elq29F>

## Standards

### ***Illinois Social Science Standard***

SS.IS.2.6-8. Ask essential and focusing questions that will lead to independent research.

### ***Illinois English Language Arts Standard***

W.6.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

The **M**ultidisciplinary **A**gricultural **I**ntegrated **C**urriculum (mAGic) was created in 2004 under the leadership of the Illinois State Board of Education (ISBE) and the Facilitating Coordination in Agricultural Education Project (FCAE). Funding was made available through the FCAE grant budget from the agricultural education line item of the ISBE budget. This revision, as printed, was developed in September 2021.



These mAGic lessons are designed to bring agriculture to life in your classroom. They address the Illinois Learning Standards in math, science, English language arts and social studies.

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# Dairy Animals around the World

## Overview



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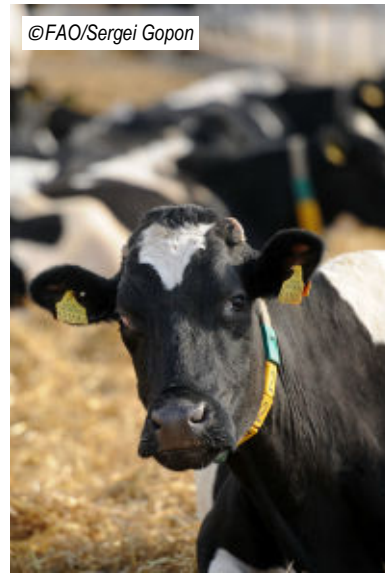
World milk production comes mostly from cattle, buffaloes, goats, sheep and camels. Other, less-common milk animals are yaks, horses, reindeer and donkeys. The presence and use of each animal varies among regions and

countries. Key factors that determine dairy species utilized are feed, water and climate. Other factors that can play a role in which animals are used for milk are market demand, dietary traditions, and the socioeconomic situation of households (for example, poorer families tend to rely more on small ruminants like goats or sheep).

Although cattle are kept in a wide range of environments, other dairy species make dairying possible in harsh environments that support few other types of agricultural production. Sheep allow milk production in semi-arid regions around the Mediterranean. Goats provide milk in regions with poor soils in Africa. Horses are used for milk in the steppes of Central Asia. Camels allow milk production in arid lands, while buffaloes are used in wet tropical regions. In high mountainous areas such as the Tibetan Plateau, yaks provide milk.

Text ©FAO, 2021, *Dairy Animals*,  
<http://www.fao.org/dairy-production-products/production/dairy-animals/en/>  
accessed 8-31-21 (text adapted for student readability)

## Cattle



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Compared with other dairy animals, cattle offer many advantages. They are easier to milk, have large udders in which to store their milk, and produce milk in abundant quantities. In fact, milk from cattle makes up the

largest share of the total world milk production. There are far more milking cows in developing than developed countries, but animals in developing countries often have lower milk yields and shorter lactations. Poor animal performance in developing countries is the result of factors like climate (high temperature, humidity), low-quality feed, use of multi-purpose animals (in addition to milk and meat these cattle are also often used as draft animals), and disease.

## Buffaloes



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The domestic water buffalo (*Bubalus bubalis*) contributes an important share of global milk production. It is the major milk-producing animal in several countries. Buffaloes are kept mostly by small-scale producers in

developing countries, who raise one or two

animals in mixed crop and livestock systems. Water buffaloes are classified into two subspecies: the river buffalo and the swamp buffalo. River buffaloes constitute approximately 70 percent of the world water buffalo population. River buffalo milk accounts for a substantial share of total milk production in India and Pakistan and is also important in the Near East. Swamp buffaloes are smaller and have lower milk yields than river buffaloes. They are present mainly in Eastern Asia and are primarily raised as draft animals.

## Sheep and Goats



In developing countries, sheep and goats are often kept in areas with scarce grazing and harsh climates. They are the dairy animals of the poor because they are less expensive to purchase and take care of. They mature quickly and have short

pregnancies so they can begin producing milk at a younger age. They supply enough milk for immediate household consumption, but not so much as to create challenges of storage or marketing. Women are generally more involved than men in small ruminant production.

Goats have a higher milk yield than sheep. They are considered the “poor man's cow” and are the major source of milk and meat for many subsistence farmers in tropical regions. Goats are common in arid and semi-arid areas and are usually kept in flocks of two to ten animals. Goat milk is widely produced in West Africa but also in the Caribbean and Central Africa. It is usually used for household consumption, but is sometimes traded within the community.

More than half of the world's sheep population is in developing countries. Sheep are more common than goats in cooler climates. Sheep can be used to produce milk, meat, skin, fiber (wool), and manure. However, most small-scale farmers in developing countries raise sheep for meat or to sell as livestock at local markets.

Most sheep milk is produced in the Mediterranean region, and most dairy sheep breeds are found in the Mediterranean region and the Near East.

## Camels



Camels are found in Africa and Asia and are kept mostly by nomads. There are two species of camels. One-humped Arabian camels or dromedaries (*Camelus dromedarius*) are the camels of the plains. Two-humped Bactrian

camels (*Camelus bactrianus*) are the camels of the mountains. Camels are raised for milk, meat, fiber (wool and hair), transport, and other work. Camel dung is used as fuel. Milk is often the most important camel product and is the staple food of nomads. When nomads move in search of pasture, they can live for up to a month in the desert on nothing but camel milk. Camels can produce more milk from poor feed than any other dairy species. In northern Kenya, for example, camels produce far more milk than cattle. There is growing recognition of the value and benefits of camels for their milk, meat and fiber. Camel dairy products could not only provide more food for people in arid and semi-arid areas but also give nomadic herders a rich source of income.

Names \_\_\_\_\_

### Questions about Dairying

After reading the Dairy Animals around the World informational page, generate as many questions as you can about dairy production. Write down each question exactly as it is stated; do not worry if it seems like a “silly” question. List the questions below. Use another sheet of paper if you run out of room.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.

Names \_\_\_\_\_

## Dairy Discussion

Review the questions on your list. To the left of each question:

1. Write an “**S**” if the question is actually a **statement**.
2. Write a “**C**” if it is a **closed question**. Closed questions are researchable and can be reported as fact.
3. Write an “**O**” if it is an **open question**. An open question requires you to choose a position and defend it with evidence. There may be more than one way to answer an open question.

Now, revisit your questions again.

1. Go back to any questions marked with an “S” and rewrite them so they are questions. Categorize them as “C” for closed or “O” for open.
2. Are there any questions you can revise so that they make more sense?
3. Can you change any of your questions from closed to open, or vice versa?
4. Choose and circle the two most interesting questions on each of your lists.

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Discuss and answer the following questions:

1. How many different species of dairy animals were listed in the article? What were they?
2. What are the factors that determine what species are used for dairy production?
3. What did you learn about raising animals for milk that surprised you?



## Dairy Discussion ANSWER KEY

Discuss and answer the following questions:

1. How many different species of dairy animals were listed in the article? What were they?  
***Nine species: cattle, buffaloes, goats, sheep, camels, yaks, horses, reindeer, and donkeys***
2. What are the factors that determine what species are used for dairy production?  
***Feed, water, climate, market demand, dietary traditions, and socioeconomic situation of households***
3. What did you learn about raising animals for milk that surprised you?  
***Answers will vary.***

Names \_\_\_\_\_

## **Dairy Inquiry Project Planning**

**Topic/Title of Project (based on one of the two most interesting questions chosen):**

**Why we chose this topic to research:**

**How we will show what we learned from our research: (Describe your project. It may be a skit, slide presentation, video, brochure, display board, Prezi, etc.)**

**5-10 questions we have about our topic:**

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

**Research notes on 5 of our questions (use additional paper if necessary):**

Research notes & source (webpage, book, article, etc.)	Strengths & limitations of source
1.	
2.	
3.	

4.	
5.	

**Vocabulary (choose 5 terms, write a definition, and use them in your presentation):**

1. \_\_\_\_\_ -

2. \_\_\_\_\_ -

3. \_\_\_\_\_ -

4. \_\_\_\_\_ -

5. \_\_\_\_\_ -