



Where Your Milk Comes from...Dairy Production Systems

Middle School Food and Agricultural Literacy Curriculum

Precepts

- G. Physical Growth
 - G1. Practice healthy eating habits.

National Standards

- AS.01.01.01.a Identify the origin, significance, distribution, and domestication of animal species.
- AS.07.01.02.c. Select equipment and implement animal handling procedures and improvements to enhance production efficiency.
- CS.02.01.01.c. Practice healthy eating habits.
- NL-ENG.K-12.3 – Evaluation Strategies
- NL-ENG.K-12.5 – Communication Strategies
- NL-ENG.K-12.12 – Applying Language Skills
- NM-Conn.PK-12.3 – Recognize and Apply Mathematics in Contexts Outside of Mathematics
- NS.5-8.3 – Life Science

Student Learning Objectives

- As a result of this **unit** the students will...
 - Recognize common production systems in the United States.
- As a result of this **lesson** the students will...
 - Discuss common production practices utilized by the dairy industry.

Content Outline

- I. **Dairy production systems**
 - A. **Hutch** – An individual housing unit designed for young calves.
 - 1. Young calves are given colostrum, nutrient rich milk, immediately after birth.
 - B. Freestall barn – A facility to house dairy cows that provides the animals with a clean, dry, comfortable resting area and easy access to food and water. The cows are not restrained and are free to enter, lie down, rise, and leave the barn whenever they desire.

Time

Instruction time for this lesson: 45 minutes.

Resources

"Faqs." www.moomilk.com. Retrieved August 28, 2009, from <http://www.moomilk.com/faq.htm>
"Frequently Asked Questions." www.dairyfarmingtoday.org. Retrieved August 28, 2009, from <http://www.dairyfarmingtoday.org/DairyFarmingToday/Learn-More/FAQ/>

Tools, Equipment, and Supplies

Single serve ice cream or ice cream sandwiches – one serving per student
Seven sheets of large paper
Creative supplies: markers, colored pencils, or crayons
MS.AS.2.8.AS.A-B – one per teacher
MS.AS.2.8.AS.C – one per student
MS.AS.2.8.AS.ESS.A – one per student

Key Terms

The following terms are presented in this lesson and appear in **bold italics**:

- Hutch***
- Freestall Barn***
- Milking Parlor***
- Processing Plant***
- Colostrum***
- Pasteurized***
- Homogenized***

- 1. Cows consume approximately 100 pounds of feed and 50 pounds of water each day.
- C. Milking parlor – A specialized area on the dairy farm where the milking process is performed. Cows are brought into the parlor two or three times a day.
 - 1. On average a cow gives 6.5 gallons of milk each day.
 - 2. It takes approximately 500 pounds of circulated blood to produce the milk.
- D. Processing plant
 - 1. The milk is homogenized, reducing the size of fat globules to make the milk smooth.
 - 2. The milk is pasteurized, a heat treatment used to remove pathogens from the milk.



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Interest Approach

At least one week prior to conducting this lesson send a note home to parents informing them that you will be sharing a dairy product with your class. Explain to them that you would like the form returned containing any concerns such as food allergies or lactose intolerance that their child may have. Capture the student's attention on today's lesson by serving a dairy product, such as ice cream. Discuss the role of dairy products in their diets. Using the *Descartes e-Moment*® to identify the facts that students know, think they know, and want to know about milk. Pose the following questions on large posters around the room to spark discussion over today's topic. What do you know about milk? What do you think you know about milk? What do you want to know about milk?

Greetings! Today we are going to take a closer look at a product each of you probably consumes. Whether it is in its original form as milk or a more processed form such as cheese or ice cream, milk plays an important role in your diet.

Healthy eating habits are important to growing bodies; let's see if we can name the six areas of the food pyramid.

Solicit answers looking for: grains, vegetables, fruits, oils, meat/beans, and milk!

In fact, milk is so important it has its own section on the food pyramid. Drinking low-fat and non-fat milk every day supplies calcium that aids in bone development and health.

How many of you had at least three servings of milk products yesterday?

Solicit answers.

The USDA food pyramid says that three servings of milk or milk products each day is important to a healthy diet. In fact, dairy products play such an important role in a healthy diet that we are going to make sure you have at least one serving of dairy for the day. We will serve ice cream while you work on your next activity!

Distribute the ice cream or another dairy product to the class to enjoy.

To get started, I need some information from you. What do you know about milk? What do you think you know about milk? And what would you like to know about milk? Collect your thoughts on these questions and provide at least one comment on each of the posters located around the room.

You will have three minutes to complete this task. What questions are there? GO!

Who will share something they would like to learn about milk?

Solicit answers.

Excellent, let's get started. Some of your questions involved where milk comes from and that is where we are heading next.

Summary of Content and Teaching Strategies

Objective 1. Discuss common production practices utilized by the dairy industry.

Students will each become experts in an area of dairy production. The class will be divided into four groups; each group will receive a portion of the information from today's lesson from **MS.AS.2.8.AS.A-B**. With that information each group will create a poster and share the information with the class. Students will complete guided notes on **MS.AS.2.8.AS.C** for each presentation.

Today you will each become an expert in a different area of milk production. Each group will receive a piece of information vital to milk production. Use these guidelines to create a poster that includes the following information:

1. A picture representing your topic
2. Terms and definitions of vocabulary
3. Describe the importance of this stage in dairy production
4. Prepare a presentation for the class

When you hear the word MILK, quickly line up in the front of the room by your birthday. MILK!

Group the students into four separate groups and provide them their chunks of information.



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When you receive your group and a chunk of information, send one person to gather a poster board, enough copies of "Dairy Production Facts" for each person in your group, and creative supplies to prepare for your presentation. You will have ten minutes to create your presentation.

Monitor student progress and adjust time if needed.

Great job. It looks like you are ready to share your new knowledge!

Record the information on **MS.AS.2.8.AS.B** as each group presents.

Group A, come forward and show us what you know.

Group A presents.

Thank you! Who has questions for this group?

Allow students to ask questions concerning the materials covered.

How will we thank them for sharing?

Encourage students to come up with creative ways to thank each other for sharing, use "a round of applause," "snaps," etc. Repeat this same process for groups B-D.

You have covered lots of new information on milk production today. Let's take some time to simplify it.

Review/Summary

Using the *Einstein e-Moment*® students will review their notes over milk production and create a formula that represents the products that are put into the cow and the products that are derived from the cow in the process of milking. For example, an equation may look like this:

1 Cow +100 pounds of feed +50 pounds of water+500 pounds of circulated blood=6.5 gallons of milk per day

You have a good understanding of the milk production process, but let's simplify some of the information we have gone over using a formula.

For example a formula for lemonade might look like this:

1 pitcher+4 cups of water+1 cup of sugar+1 cup lemon juice = 6 cups lemonade

While using the notes below walk students through the development of their equation while also discussing the importance of each segment to the dairy industry.

Using our notes, let's work together to create a formula that represents the inputs and products of milk production. This should be in the form of a mathematical equation. As we think through the different segments of the industry let's also focus on why these segments are an important component to the industry.

Calf hutches permit proper growth and health until weaning. During this time calves are fed milk with a bottle or bucket, along with grains and forages to continue proper growth. This is an important segment of the dairy industry because it allows us to use the cow's milk for food products such as milk, yogurt, cheese, butter, and ice cream.

Producing cattle in freestall barns provides them with access to food and water, and provides a clean, comfortable resting place between milkings. This type of care keeps animals safe from environmental factors and can help prevent infections and diseases since the area is kept clean and dry. Healthy cows are able to produce more milk for our growing population.

There are many types of milking parlors, but all parlors in which milk for human consumption comes from are thoroughly inspected for cleanliness. Milking parlors allow the dairy producers to milk their cattle in a clean, safe environment where they can be closely monitored.

Milk is collected from the farm and taken to the processing plant where it is pasteurized and homogenized for our safety. Additionally, all milk collected is tested to be safe for human consumption prior to being made into any food or drink products for humans.

Excellent. This formula will help you remember the inputs and products of milk production.



Lesson Number: MS.AS.2.8

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Application

Extended classroom activity:

Have students visit the following website: <http://www.dairyfarmingtoday.org/DairyFarmingToday/Learn-More/Myths-vs-Facts/> and research the myths and facts found on the site.

FFA activity:

Create an infomercial promoting dairy products that can be shared throughout the school and/or community.

SAE activity:

Play the game "Life on the Farm" and have students track the progress of the game by entering items into the record book for practice.

Evaluation

MS.AS.2.8.ASSESS.A

Answers to Evaluation

1. D
2. C
3. B
4. E
5. A
6. Answers may vary, but should include something along the lines of proper nutrition and protection from disease.



Group Presentation Topics & Guidelines

Group A

Guidelines: As a group, create a poster that includes the following information and describes the importance of this stage in dairy production:

1. **A picture representing your topic**
2. **Terms and definitions of vocabulary**
3. **Prepare a presentation for the class**

Facts:

Hutch – An individual housing unit designed for young calves.

Young calves are given colostrum, nutrient rich milk given immediately after birth to help boost their immune systems. Shortly after birth, dairy calves will be separated from their mothers and placed into hutches that permit proper growth and health until weaning. During this time calves are fed milk with a bottle or bucket, along with grains and forages to continue proper growth.

The mothers' milk is used to provide dairy products for human consumption, such as milk, cheese, yogurt, butter, and ice cream.

Group B

Guidelines: As a group, create a poster that includes the following information and describes the importance of this stage in dairy production:

1. **A picture representing your topic**
2. **Terms and definitions of vocabulary**
3. **Prepare a presentation for the class**

Facts:

Freestall barn – A facility to house dairy cows that provides the animals with a clean, dry, comfortable resting area and easy access to food and water. The cows are not restrained and are free to enter, lie down, rise, and leave the barn whenever they desire.

Cows consume approximately 100 pounds of feed and 50 pounds of water each day. The feed consists of proper grains and forages that provide the proper nutrients and vitamins for growth and milk production.



Group Presentation Topics & Guidelines

Group C

Guidelines: As a group, create a poster that includes the following information and describes the importance of this stage in dairy production:

1. **A picture representing your topic**
2. **Terms and definitions of vocabulary**
3. **Prepare a presentation for the class**

Facts:

Milking parlor – A specialized area on the dairy farm where the milking process is performed. Cows are brought into the parlor two or three times a day, and typically 8 to 12 cows can be milked at one time.

On average a cow give 6.5 gallons of milk each day.

It takes approximately 500 pounds of circulated blood to produce the milk

Group D

Guidelines: As a group, create a poster that includes the following information and describes the importance of this stage in dairy production:

1. **A picture representing your topic**
2. **Terms and definitions of vocabulary**
3. **Prepare a presentation for the class**

Facts:

Processing plant – Is where the milk goes after being picked up from the farm.

At the processing plant the milk is homogenized, reducing the size of fat globules to make the milk smooth.

The milk is also pasteurized, a heat treatment used to remove pathogens from the milk.



Dairy Production Facts

- A. _____ - An individual housing unit designed for young calves.
- Young calves are given _____, nutrient rich milk immediately after birth.
- B. _____ - A facility to house dairy cows that provides the animals with a clean, dry, comfortable resting area and easy access to food and water. The cows are not restrained and are free to enter, lie down, rise, and leave the barn whenever they desire.
- Cows consume approximately _____ pounds of feed and 50 pounds of water each day
- C. _____ - A specialized area on the dairy farm where the milking process is performed. Cows are brought into the parlor two or three times a day.
- On average a cow gives _____ gallons of milk each day
 - It takes approximately _____ pounds of circulated blood to produce the milk
- D. _____
- The milk is homogenized, reducing the size of fat globules to make the milk smooth
 - The milk is _____, a heat treatment used to remove pathogens from the milk



Name _____

Directions: Read each statement and write the letter of the correct answer in the blank.

___ 1.	The number of gallons of blood it takes to circulate through the cow's system to make milk.	A. Colostrum
___ 2.	The amount of feed a cow consumes in a day.	B. Hutch
___ 3.	An individual housing unit designed for young calves.	C. 100 pounds
___ 4.	A heat treatment used to remove pathogens from the milk.	D. 500
___ 5.	Nutrient rich milk.	E. Pasteurization

6. Why is a hutch a proper housing unit for a young dairy calf?
