Grades
6th to 8th

Lesson 1: Animal Health: Making Cows Smile

Lesson Introduction

Dairy farming is a way of life for over 40,000 farm families in the United States. Dairy farmers have a very important job to do. In this lesson, students will learn how dairy farmers work with others to make sure that their cows' diet is balanced and nutritious to keep the cows healthy and happy. The lesson will also highlight the career of being a nutritionist.

Lesson Objectives

- Students will read a nutrition label correctly.
- Students will create a nutritious snack balanced with specific requirements.
- Students will list the responsibilities and education of a nutritionist.

Time: 45 - 60 minutes

Standards: See the Discover Dairy website for complete listing by grade level.

Vocabulary

- Calorie, cud, dairy cow, diet, nutrient, nutrition, and total mixed ration

Materials Needed

- Computer
- Lesson PowerPoint
- Multimedia Projector and Screen
- Internet Access
- Foods for lab (baby carrots, orange juice, spinach, and string cheese) and measuring cups
- Calculator
- Pencils

Activities

- Animal Care Video Discussion Guide (fill in the blank with or without word bank)
- Nutrition Lab
- Kahoot! Game

Procedure

Introduction (10 minutes)

- Go over the essential vocabulary terms and their meanings for this lesson.
- **Activating Strategy:** Let's discover how the health and care of dairy cows are important to the farmer by watching the video, Discover Dairy and Animal Care.

Nutrition Lab (30-40 minutes)

- Do the Introduction.
- Have the food (baby carrots, orange juice, spinach, and string cheese), bowls and cups, measuring cups, and calculators ready for students.
- Pass out the Nutrition Lab Directions, Nutrition Labels for Lab Resource, and Nutrition Lab Sheet.
- Allow students class time to complete the Nutrition Lab with a partner or in a group.
- Walk around, offering help and answering questions as needed.
- Closure: We discussed what dairy farmers do every day to take care of their cows. Tell the class one way that dairy farmers are responsible for the care of their cows.

Career Spotlight: Nutritionist (5 minutes)

- Do the Introduction
- Facilitate the Career Spotlight on Nutritionist using the video and discussion of responsibilities and education.
- Closure: Dairy farmers depend on nutritionists to help them take care of their cows.
  - Tell us one way that nutritionists help dairy cows.
  - Are you interested in being a nutritionist when you grow up?

Summative Activity (5 minutes)

- Do the Introduction.
- Facilitate the Lesson 1 Kahoot! Review with students.
- **Lesson Closure:** Today you learned about what dairy farmers do every day to take care of their cows and that they work with many people to take good care of their animals, so we have milk to keep us healthy. Tell us one person farmers work with and what that person does to help the farmer and his or her cows.

Career Spotlight

Nutritionist

Summative Assessment

Students will complete the Nutrition Lab with a mastery level of 80% of higher.

Grades
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Lesson 1: Animal Health
Nutrition Lab Directions

Introduction
A healthy, well-cared-for cow will give more milk. The way farmers care for their cows and how they feed them has helped to increase the amount of milk cows give over the past 50 years.

In this lab, students will simulate how farmers use a large feeding scale and mixer to balance and weigh each feed to meet the cow's precise nutrient needs. Students will use measuring cups and nutritional labels to make a snack of a spinach salad and orange juice that meets the required nutrients listed in this lab.

Materials Needed
- Food (baby carrots, orange juice, spinach, and string cheese), measuring cups, bowls and cups, calculators, and pencils
- Nutrition Lab Sheet and Nutrition Label for Lab Resource

Procedure:
1. Assign students to lab groups or partners.
2. Have students get food items, measuring cups, bowls and cups, and calculator for themselves.
3. Pass out the Nutrition Lab Sheet and the Nutrition Label for Lab Resource.
4. Allow students class time to complete the lab using their Nutrition Lab Sheet as a guide and complete the questions in order.
5. Walk around, answering questions and offering help as needed.
6. Do closure activity.
7. Collect the Nutrition Lab Sheet.

Closure
Today you simulated how farmers balance and weigh each feed to meet the cow's precise nutrient needs by making a snack of a spinach salad and orange juice that contained the needed amounts of nutrients. How do you think adding 6 more foods to your salad would change your experiment?

Summative Assessment
Students will complete the Nutrition Lab Sheet with a mastery level of 80% or higher.

Name: _____ **Date:** _____

Discover Dairy and Animal Health
Nutrition Lab

Directions: Answer the questions below in the spaces provided.

1. Using the nutritional labels provided, record the following information in the table below for one serving size of each.

Food	Weight (g)	Calories	Protein (g)	Calcium (mg)	Iron (mg)
Spinach					
String Cheese					
Baby Carrots					
Orange Juice					

2. Create a balanced and nutritional snack using these foods. Your requirements for the snack are 250 calories, 12g of protein, 300mg of calcium, and 3mg of iron (as close as you can).

Food	# Servings	Weight (g)	Calories	Protein (g)	Calcium (mg)	Iron (mg)	Percent of Total Weight
Spinach							
String Cheese							
Baby Carrots							
Orange Juice							
Totals							

3. Using the servings in question 2, make a spinach salad (cut up the string cheese and baby carrots first). Also, pour the correct amount of orange juice into a cup or glass. Would you eat this? _____ Why or why not?

4. What nutrient is the hardest to balance? _____ Why?

5. What would happen if you tried to add another serving of string cheese?

6. How do you think adding 6 more foods to our salad would change your experiment?

Name: ANSWER KEY **Date:** _____

Discover Dairy and Animal Health
Nutrition Lab

Directions: Answer the questions below in the spaces provided.

1. Using the nutritional labels provided, record the following information in the table below for one serving size of each.

Food	Weight (g)	Calories	Protein (g)	Calcium (mg)	Iron (mg)
Spinach	30	7	0.86	29.7	0.81
String Cheese	28	80	7	150	0
Baby Carrots	15	5	0.1	4.8	0.13
Orange Juice	240	120	2	31	0

2. Create a balanced and nutritional snack using these foods. Your requirements for the snack are 250 calories, 12g of protein, 300mg of calcium, and 3mg of iron (as close as you can).

Food	# Servings	Weight (g)	Calories	Protein (g)	Calcium (mg)	Iron (mg)	Percent of Total Weight
Spinach	3	90	21	2.58	89.1	2.43	21.5311%
String Cheese	1	28	80	7	150	0	6.6982%
Baby Carrots	4	60	20	0.4	19.2	0.52	14.354%
Orange Juice	1	240	120	2	31	0	57.4162%
Totals	NA	418	241	11.98	289.3	2.95	99.9995%

3. Using the servings in question 2, make a spinach salad (cut up the string cheese and baby carrots first). Also, pour the correct amount of orange juice into a cup or glass. Would you eat this? YES OR NO Why or why not?

ANSWERS WILL VARY.

4. What nutrient is the hardest to balance? CALORIES Why?

Certain foods have a lot of calories while other foods had very little calories but affected everything else.

5. What would happen if you tried to add another serving of string cheese?

The calories and protein would be too high.

6. How do you think adding 6 more foods to our salad would change your experiment?

More food would make it harder because you have to balance even more things together.

Lesson 1: Animal Health
Nutritional Labels for Lab Resource

String Cheese

Nutrition Facts

1 serving per container

Serving size **1 piece (28g)**

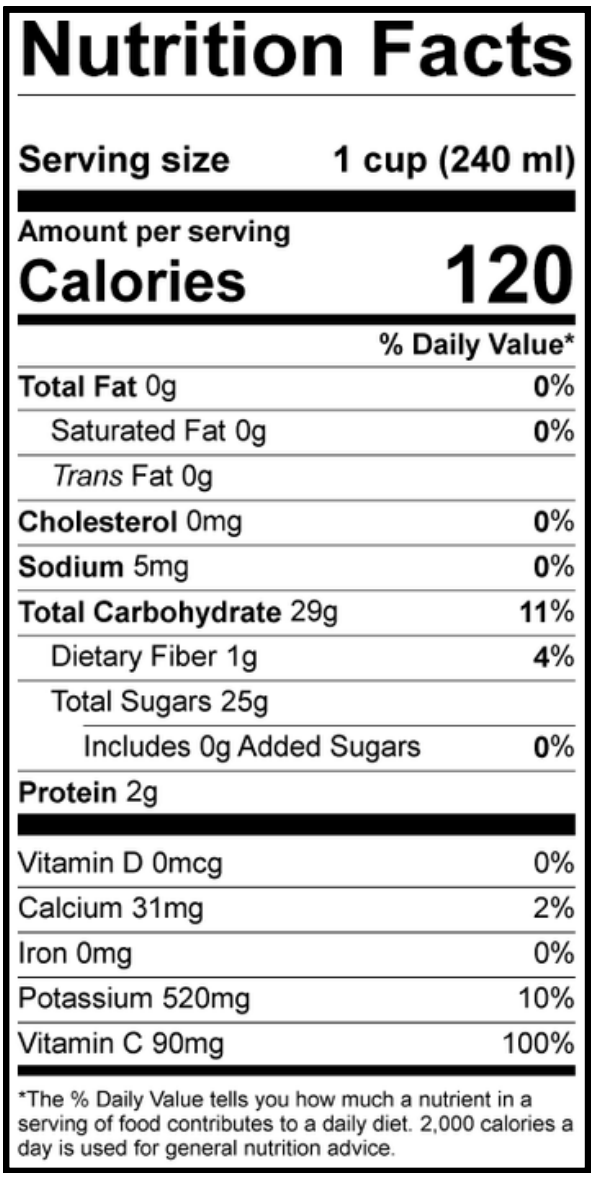
Amount per serving

Calories **80**

	% Daily Value*
Total Fat 6g	**8%**
Saturated Fat 3.5g	**18%**
Trans Fat 0g	
Cholesterol 20mg	**7%**
Sodium 190mg	**8%**
Total Carbohydrate 0g	**0%**
Dietary Fiber 0g	**0%**
Total Sugars 0g	
Includes 0g Added Sugars	**0%**
Protein 7g	
Vitamin D 0mcg	0%
Calcium 150mg	10%
Iron 0mg	0%
Potassium 0mg	0%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Orange Juice



Nutrition Facts

Serving size **1 cup (240 ml)**

Amount per serving

Calories **120**

	% Daily Value*
Total Fat 0g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 5mg	**0%**
Total Carbohydrate 29g	**11%**
Dietary Fiber 1g	**4%**
Total Sugars 25g	
Includes 0g Added Sugars	**0%**
Protein 2g	
Vitamin D 0mcg	0%
Calcium 31mg	2%
Iron 0mg	0%
Potassium 520mg	10%
Vitamin C 90mg	100%

*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Note: In liquids, 1 ml = 1 g.

String cheese label from https://www.upstatefarmsfs.com/string-cheese and orange juice label from https://smithsbrand.com/home/products/juices--teas.

Spinach

Baby Carrot

Nutrition Facts		
Serving Size: 1 cup (30g)		
Amount Per Serving		
Calories 7	Calories from Fat 1	
		% Daily Value*
Total Fat 0.12 g		**0%**
Saturated Fat 0.02 g		**0%**
Trans Fat		
Cholesterol 0 mg		**0%**
Sodium 23.7 mg		**1%**
Potassium 167.4 mg		**5%**
Total Carbohydrate 1.09 g		**0%**
Dietary Fiber 0.66 g		**3%**
Sugars 0.13 g		
Sugar Alcohols		
Protein 0.86 g		
Vitamin A 2813.1 IU		56%
Vitamin C 8.43 mg		14%
Calcium 29.7 mg		3%
Iron 0.81 mg		5%

Nutrition Facts		
Serving Size: 1 large (15g)		
Amount Per Serving		
Calories 5	Calories from Fat 0	
		% Daily Value*
Total Fat 0.02 g		**0%**
Saturated Fat 0 g		**0%**
Trans Fat		
Cholesterol 0 mg		**0%**
Sodium 11.7 mg		**0%**
Potassium 35.55 mg		**1%**
Total Carbohydrate 1.24 g		**0%**
Dietary Fiber 0.44 g		**2%**
Sugars 0.71 g		
Sugar Alcohols		
Protein 0.1 g		
Vitamin A 2068.5 IU		41%
Vitamin C 0.39 mg		1%
Calcium 4.8 mg		0%
Iron 0.13 mg		1%

The spinach label is from https://www.quitehealthy.com/nutrition-facts/spinach/114571.html and the baby carrot label is form https://www.quitehealthy.com/nutrition-facts/carrot/119601.html

Grades
6th to 8th

Lesson 1: Animal Health
Vocabulary Word Definitions

Calorie - the amount of energy in food

Cud - partially digested food that a cow chews again

Dairy Cow - a farm animal who is female, has had a baby, and produces milk for us to drink

Diet - the kinds of food that people and animals eat regularly

Nutrient - a substance that is necessary for life and growth

Nutritionist - someone who has special training in balancing a mixture of feed to keep cows healthy

Total Mixed Ration - the special mix of feed that a cow eats to meet her specific dietary needs

Grades
6th to 8th

Lesson 1: Animal Health

Career Spotlight: Nutritionist

Description

Nutritionists listen to their customers' needs and use that information to formulate a feed that maximizes the animals that consume it. They must create the best formula to keep the animals healthy while also adhering to customers' budgets. These jobs require knowledge in animal health and nutrition, good communication skills, and problem-solving skills.

Video

Animal Nutritionists

Common Responsibilities

- Communicate with existing clients
- Locate and recruit potential customers
- Ensure that the nutritional needs of their animals are satisfied
- Create feed formulas that maximize the growth of their customers' livestock

Education/Training Requirements

Bachelor's Degree in Agriculture Science, Animal Science, Animal Nutrition, or related fields (Required)

Information Sourced from agexplorer.com

Name: _____ **Date:** _____

Discover Dairy and Animal Health
Video Discussion Guide

Directions: Fill in the blanks as you watch the "Discover Dairy and Animal Care" video.

1. Every year, _____ billion pounds of milk are produced from _____ million cows which is an average of _____ gallons of milk per cow.

2. Dairy farmers have been able to produce more milk with less cows over the last 60 years through the use of _____ and _____.

3. From selective breeding and biotechnology to _____ and healthcare, all areas of cow care are supported by today's _____ technology which can handle huge amounts of information.

4. Dairy farmers are real-world people who have learned to use science and technology to meet real-world _____.

5.Dairy farmers apply the basic principles of genetics, the idea of _____ and _____ genes and the _____ of traits.

6. Dairy farmers use computer technology to keep track of a cow's health from what kinds of _____ it has eaten to the _____ it has taken to the _____ it has gotten from doctors.

7. Dairy farmers love seeing a cow chewing its _____, because it means the cow is _____.

Name: ANSWER KEY **Date:** _____

Discover Dairy and Animal Health
Video Discussion Guide

Directions: Fill in the blanks as you watch the "Discover Dairy and Animal Care" video.

1. Every year, 190 billion pounds of milk are produced from 9 million cows which is an average of 2,440 gallons of milk per cow.

2. Dairy farmers have been able to produce more milk with less cows over the last 60 years through the use of science and technology.

3. From selective breeding and biotechnology to nutrition and healthcare, all areas of cow care are supported by today's computer technology which can handle huge amounts of information.

4. Dairy farmers are real-world people who have learned to use science and technology to meet real-world challenges.

5.Dairy farmers apply the basic principles of genetics, the idea of dominant and recessive genes and the inheritance of traits.

6. Dairy farmers use computer technology to keep track of a cow's health from what kinds of food it has eaten to the medicines it has taken to the care it has gotten from doctors.

7. Dairy farmers love seeing a cow chewing its cud, because it means the cow is content.

Name: _____ **Date:** _____

Discover Dairy and Animal Health
Video Discussion Guide

Directions: Fill in the blanks as you watch the "Discover Dairy and Animal Care" video.

9	**190**	**2,440**	**Care**	**Challenges**	**Computer**
Content	**Cud**	**Dominant**	**Food**	**Inheritance**	
Medicines	**Nutrition**	**Recessive**	**Science**	**Technology**	

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Name: **ANSWER KEY** **Date:** _____

Discover Dairy and Animal Health
Video Discussion Guide

Directions: Fill in the blanks as you watch the "Discover Dairy and Animal Care" video.

9	190	2,440	Care	Challenges	Computer
Content	Cud	Dominant	Food	Inheritance	
Medicines	Nutrition	Recessive	Science	Technology	

1. Every year, **190** billion pounds of milk are produced from **9** million cows which is an average of **2,440** gallons of milk per cow.

2. Dairy farmers have been able to produce more milk with less cows over the last 60 years through the use of **science** and **technology.**

3. From selective breeding and biotechnology to **nutrition** and healthcare, all areas of cow care are supported by today's **computer** technology which can handle huge amounts of information.

4. Dairy farmers are real-world people who have learned to use science and technology to meet real-world **challenges.**

5.Dairy farmers apply the basic principles of genetics, the idea of **dominant** and **recessive** genes and the **inheritance** of traits.

6. Dairy farmers use computer technology to keep track of a cow's health from what kinds of **food** it has eaten to the **medicines** it has taken to the **care** it has gotten from doctors.

7. Dairy farmers love seeing a cow chewing its **cud**, because it means the cow is **content**.