

Dairy Production - continued

Idea: Mammals, Milk and Math – Developed by and used with permission from Susan Anderson, Education Specialist, Minnesota Agriculture in the Classroom

Activity Synopsis: Practice mathematical applications while learning about cows and milk.

Objective: The student will determine the number of half pints of milk a cow produces in a day and in a year.

Advanced Preparation: Download the Dairy Cattle commodity card at <http://www.mda.state.mn.us/maitc/commcard.htm>. Write out the number of gallons of milk in paragraph 6 on page 2 and duplicate a copy of page 2 for each student. *(Note: These cards are specific for Minnesota, most of the information is appropriate for North Dakota, too.)*

A set of empty containers – gallon, half-gallon, quart, pint, half-pint – for each group of students

Balance scales, if activity is age-appropriate, for converting to mass

Reproduce problem, which is stated at the end of this lesson, on a transparency

Blank transparency for recording responses

Liquid measuring cups

Water

Basin

Paper towels

Estimated Time: 45 minutes

Step 1:

Did you know that milk comes from cows? At milk break and in the lunchroom, you have milk every day. How many servings of milk are recommended? Why is it good to have milk every day?

What size containers are used for milk in the lunchroom? They are called half-pints.

Today in math we are going to find the solution to this problem: “About how many half-pints of milk does an average cow produce in one day and in one year?”

Refer to the problem, using the overhead transparency, to look at unknown vocabulary.

Are there any words that need to be discussed before we can begin to work on this assignment?

When the question starts with the word “about,” what does this mean?

We know what half-pints are since we see them every day, but do we know some of the equivalencies in cups, in quarts and in gallons that we might need to solve this problem?

What does “average” mean, and how would that be calculated for the amount of milk given by a cow?

Through our work, we are also going to fill in these missing pieces of data from the Dairy Cattle commodity card that is provided.

Step 2:

Divide the students into groups of four to six students. Give the following directions to the students.

In a group discussion, do the following:
(Allow 5 minutes for discussion)

Identify the information that is needed to solve the problem.

Choose someone from the group to record the information needed.

Step 3:

Bring the small groups together for reporting the information needed. Record the information needed to solve the problem on the blank transparency.

Step 4:

Read through the Dairy Cattle commodity card with the students. Indicate that the missing data on the card will be filled in when the problem is solved. We will know how

many half-pints of milk a cow can produce in a day and in a year.

Show the various containers, including gallons, half-gallons, quarts, pints and half-pints. Give each group a set of containers to use when solving the problem.

At this point, if balance scales are appropriate and/or available, they would be used to measure mass as the students convert pounds to cups or gallons.

If balance scales are not used, provide the students with the following information. One gallon of milk weighs 8.6 pounds. One gallon of water weighs 8 pounds. Why does milk weigh more?

Put the problem on the overhead projector.

Explain to the students that there is no one right way to solve the problem, but at the end of the period, they will be asked to share the process they used and what the approximate answers are for the missing pieces of data from the commodity card.

Step 5:

Students work on solving the problem.

Step 6:

Discuss the process each group used to solve the problem.

What made the problem difficult to solve?

What is your group's answer?

What steps did you use to solve the problem?

What were some interesting things that happened within your group as you worked to solve the problem?

What were some interesting facts you learned about dairy cows?

How many children can have a half-pint carton of milk at lunch thanks to one cow?

How many cows would it take to provide milk at lunch for the whole school?