Crazy About Cattle

Summary: Students discover common characteristics, as well as the many products and by-products of cattle.

Objectives:

The students will:

- Identify cattle as a common animal on Pennsylvania farms.
- List at least three products or by-products of cattle.
- Describe the differences between dairy and beef cattle.
- Identify at least three characteristics of cattle.

Materials:

Activity #1:

- several cattle products (edible and non-edible)/see ideas in background information
- several non-cattle products

Activity #2:

- bulletin board or wall space, materials to make a display
- scale
- camera

Activity #3:

- book How Now, Brown Cow? By Alice Schertle (or other poems/stories about cattle)
- pictures of cattle
- paper and pencils

Getting Started:

Activity #1:

- Gather cattle and non-cattle products ahead of time.

Activity #2:

- Prepare some bulletin board or wall space ahead of time to place your findings.

Activity #3:

- Locate the recommended book or other poems and stories about cattle.
- Find several pictures of cattle.

Background:

Cattle are known for being sturdy yet gentle, and extremely social animals. There are more than 270 breeds of cattle overall and over 180 of them are dairy cows. Not all cattle are cows. People often refer to all members of the species as cows, but, in fact, only mature females who have given birth to a calf are cows. Females who have not calved are called heifers. A bullock is a young, uncastrated male, a steer is a castrated male, and a bull is a mature, uncastrated male.

Cattle are a type of animal called ruminants, which are herbivores who swallow vegetation whole, then later bring it back up to chew when it is partially digested. This is referred to as chewing their "cud."

Grade Level: K-6

Topic: Common animals on Pennsylvania farms

PA Environment & Ecology Standards Addressed:

Agriculture and Society:
4.4.4.B: Identify the role of the sciences in Pennsylvania agriculture.

- Identify common animals found on Pennsylvania farms.

4.4.4.C: Know that food and fiber originate from plants and animals.

- Identify agricultural products that are local and regional.

Teaching Methods:

- Lecture/Discussion
- Prediction/Investigation
- Guided Imagery

Multiple Intelligences Utilized:

- Naturalistic
- Interpersonal
- Logical/Mathematical
- Verbal/Linguistic
- Visual/Spatial
- Bodily/Kinesthetic

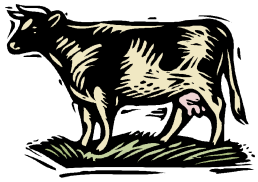
Cattle have four specialized digestive compartments (not four stomachs) called the rumen, reticulum, omasum, and the abomasum. The rumen blends and churns the food in order to begin the digestive process. Necessary bacteria are also present to help break down the food. The reticulum further mixes the partially digested food, and if any is too big to move on, it is passed back in the form of cud. The omasum acts like a funnel and only allows in food that is small enough to fit through its small opening. Once inside, it is further mixed and then absorbed into the bloodstream. The abomasum is often called the true stomach because it most resembles our stomachs. Special enzymes and acids break down the food into nutrients and then they are absorbed into the bloodstream. After this process, the completely digested food goes through the small intestine, where it can then be delivered to the udder to produce milk, or to the large intestine to produce waste.

Though water buffalo, camels, goats, sheep, and reindeer can also be milked, cows provide most of the milk that people drink in this part of the world. Around 9.2 million cows are being milked on 110,000 farms in the United States, and 99% of those dairy farms are family owned and operated. A cow must have a calf in order to produce milk, and feeds her calf until it is eight to nine weeks old. Cows are then milked for about three to four years on average. The most common breed of dairy cow in the United States is the Holstein, by far. Others include Jersey, Brown Swiss, Guernsey, and Ayrshire. The most productive cows produce over twenty-five gallons of milk each day. That equals 400 glasses of milk. Cows in the United States produce an average of 2,000 gallons of milk a year, which equals over 30,000 glasses of milk.

Besides milk, what are some of the other products that cattle can provide us? Meat is another main product of cattle. But, there are many other secondary products that are not as obvious, called by-products. It is often difficult to make the connection between the product and its origin since the manufacturing process greatly changes its form. About half of the animal is used for meat products and the other half is used for by-products. There are two main types of by-products: edible and inedible by people. Here are some examples of edible cattle by-products: Gelatin from bones used in: jello, yogurt, jelly, marshmallows, "gummy-type" candies, soft-shell capsules; Plasma protein from blood used in: cake mixes, deep-fry batters, pasta, imitation seafood; Fatty acid-base from fats used in: chewing gum, oleo margarine, oleo shortening. Here are some examples of inedible cattle by-products: Intestines used in: tennis racquet strings, instrument strings; Fats and fatty acids used in: cosmetics, detergent, cellophane, floor wax, deodorants, pet foods, livestock feeds, candles, insecticides, crayons, soap, shaving cream, perfumes, lubricant fluids, plastics, tires; Gelatin made from bones used in: photographic film, film binder, crispness for bank notes, paper and cardboard glues, emery boards, glues, hemostatic sponges, biological adhesives; Hooves and horns used in: imitation tortoise shell, combs, imitation ivory, piano keys, pet chews, decorative items (horns); Hide used as: leather or suede in upholstery, luggage, clothing, gloves, wallets, purses, boots, shoes, athletic shoes (shiny white); Hair used in: expensive artists' paint brushes, felt for weather stripping; Blood factors used for: treatment of hemophilia; Research uses: bioactive peptides, immuno-chemicals, tissue culture medium; Organs: pancreas (insulin for some diabetics), adrenal glands (epinephrine [adrenaline] to treat allergic shock, allergies), pituitary (ACTH--or the adrenocorticotropic hormone to treat allergic diseases).

Activity #1: To Moo Or Not To Moo

- Play a guessing game with your students as to whether or not an object is a cattle product.
- Gather several edible and non-edible cattle products, as well as, several non-cattle products. Hide them in a box or container away from sight.
- If the class is large, break them into groups.
- Hold up the objects one at a time. If the student/group believes that the object is a cattle product, they must "Moo" out loud. If they are correct, they get a point. If incorrect, they lose a point. The team with the most points wins.
- You may use this game before you present the material on cattle products to measure the students' prior knowledge on the subject and then use it afterwards to measure what they have learned. Or, just use it after presenting the initial material.



Activity #2: Weighing In

- Help students to get a feel for how much a typical dairy cow weighs with this comparison activity.
- Tell students that an average dairy cow weighs about 1200 pounds.
- Ask the students to predict how many students it would take to equal that amount.
- Weigh each child and determine the total weight combined of the students in the class. (If the total is less than 1200 pounds, you may need to borrow some students from another class.)
- Once you have figured out how many students it takes to equal the weight of a dairy cow, photograph the group of students.
- Draw a balance scale on a bulletin board or wall display and attach a picture of a dairy cow on one side of the scale and then the photograph of the students on the other. This will illustrate that they both equal about the same weight.
- Students can count the number of students in the photograph to find out how accurate their predictions were at the beginning of the activity.

Activity #3:
That's Moo-sic To My Ears

- Incorporate poetry and creative writing with the many facts you've learned about cattle and see what happens.
- A good book to inspire the class is How Now, Brown Cow? By Alice Schertle. Her work does a great job of describing the characteristics of cattle. Included are a few poems from the book. Can you find any other poems or unique stories about our bovine friends?
- Show the students plenty of pictures of cattle for inspiration and see what they can create.
- Use guided imagery to encourage the creative process.

"The Cow" by Alice Schertle
(from How Now, Brown Cow?)

You come across her standing there
as common as a box. As square.
Her lower jaw revolves the cud;
her hooves stand foursquare in the mud.
Come closer. View with mild surprise
the gentle softness of her eyes.

"The Cow's Complaint" by Alice Schertle
(from How Now, Brown Cow?)

How unkind to keep me here
When, over there, the grass is greener.
Tender blades--so far, so near--
How unkind to keep me here!
Through this fence they make me peer
At sweeter stems; what could be meaner?
How unkind to keep me here
When, over there, the grass is greener.

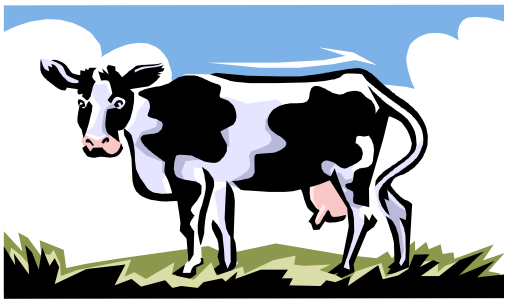
"Clever Cows" by Alice Schertle
(from How Now, Brown Cow?)

The clever cows
in single file
walk up the hill
and stop awhile.

Then, black and brindle,
red and brown,
they
make
a
line
and
walk
back
down.

Extensions/Variations:

- Ask the students to name as many dairy products as they can think of. Bring in several examples and have fun tasting them. Research how these products are made from milk.
- Measure the amount of food and water that cattle eat every day. Students will be amazed at the huge amounts since you will need to measure in pounds and gallons.
- Visit a dairy or ask a dairy farmer to visit the classroom. Discover the daily process of milking and caring for the cows.



Evaluation:

Rubric: Crazy About Cattle

3	**2**	**1**	**0**	The student can identify cattle as a common Pennsylvania farm animal.
3	**2**	**1**	**0**	The student can list at least three products or by-products of cattle.
3	**2**	**1**	**0**	The student can describe the differences between dairy and beef cattle.
3	**2**	**1**	**0**	The student can identify at least three characteristics of cattle.
12	**8**	**4**	**0**	**Total Score: /12**

Resources:

Gibbons, G. (1985). The milk makers. Simon & Schuster: NY.

Kalman, B. (1998). Hooray for dairy farming! Crabtree Publishing Company: NY.

Project food, land & people. (1998). Project Food, Land & People: Chandler, AZ.

http://www.aipl.arsusda.gov/kc/cowfacts.html