Activity Time!

What comes from a cow?

1. Circle the foods made from milk or that include ingredients made from milk.

2. Tell a friend which ingredients in the pictures are made from milk.

Cow Calculations

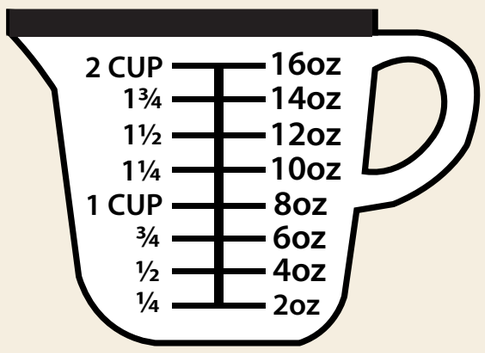
1) Imagine that so far today you've eaten: ½ cup of milk in a bowl of cereal for breakfast, A mini-pizza for lunch that contained 1/4 cup of shredded mozzarella cheese, and a 1/2 cup sized container of yogurt for a snack.

3) How much of the recommended DV of milk did you get from these foods?

How much more should you have today?

What foods can you eat before bedtime to get your DV?

2) Using the measuring cup, determine the total amount of dairy you've had by coloring and labeling each ingredient's measurements.



Think Your Drink

Activity from USDA/ChooseMyPlate.

Find these drinks at home or the grocery store. Look at the nutrition label on each item to answer these questions:

1. Rank the drinks from lowest to highest sugar levels.
   1) _____ 4) _____
   2) _____ 5) _____
   3) _____ 6) _____
2. What is the relationship between added sugar and carbohydrate levels?
3. Which drink has the highest amount of calcium? Which one has the lowest?
4. What other products can you eat/drink that help you to get your daily requirement of calcium?
5. Which drink do you think is the healthiest? Why?

How Much is Enough?

Recommended Daily Value (DV) = 3 cups of calcium-rich, low-or non-fat dairy foods.

Vocabulary

Amino Acids
Amino acids are special organic molecules used by living organisms to make proteins. The main elements in amino acids are carbon, hydrogen, oxygen, and nitrogen. There are twenty different kinds of amino acids that combine to make proteins in our bodies. Our bodies can actually make some amino acids, but the rest we must get from our food.

Casein
A protein found in milk solids; it is a major component of cheese.

Curds
The thick, solid part that is produced when the whey and water are removed from milk. Cheese is made from milk curds.

Daily Value
Nutrition specialists know how much of each food group kids and adults should get every day to have a healthy diet. The daily value (DV) tells you how much of this food you should eat to meet these daily goals.

Dairy
Dairy products are foods made from milk, such as cheese and yogurt.

Enzymes
Breaks down your food so it can get into your cells (the basic unit of life).

Fluid Milk
Is milk in its liquid form and hasn't been turned into a dairy product.

Homogenize
To treat milk so that the fat is mixed throughout instead of floating on top. Processing plants do this, and it is where fat is removed in order to produce reduced-fat, low-fat, and skim milk.

Lactose
A sugar found in milk and some milk products. If someone is "lactose intolerant," it means that his or her body is unable to digest this sugar.

Nutrient
A substance that plants, animals, and people need to live and grow.

Pasteurize
To heat milk to a high enough temperature (at least 145 degrees for milk) for a long enough period of time (half an hour) so that you kill certain bacteria, which is important for food safety.

Protein
Proteins are long chains of amino acids. Protein is needed to build, repair and maintain the body.

Udder
The mammary gland of cows; it resembles a bag, and the large nipples, or teats, are squeezed to release milk.

Whey
The liquid remaining after milk has been separated. It is a protein, and contains about half of milk's nutrients.

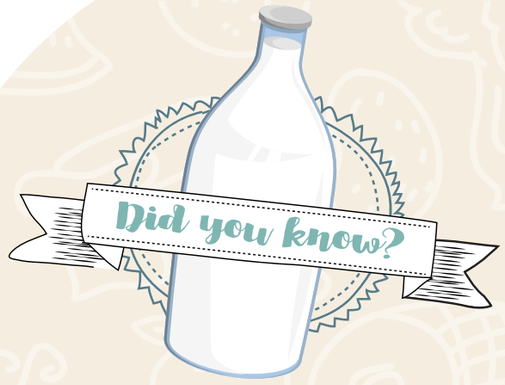
NEVADA'S COW POWER

There are approximately 28 dairies in Nevada raising 45,000 cows. Most of these dairies are in the northwestern part of Nevada, near Reno, but the largest dairies are in southern Nevada.

Nevada dairy cows produce nearly 666 million pounds of milk per year. There are 5 major breeds or types of dairy cows: Holstein, Jersey, Ayrshire, Guernsey, and Brown Swiss. **Holsteins**, (the black-and-white cows) are the most common type of cow found in Nevada and produce the most milk. **Jersey cows**, which are smaller than Holsteins, are very light brown in color. Jersey cows are prized for their milk's high butterfat content.

In northern Nevada, milk produced on dairy farms either goes to milk processing plants, such as Model Dairy, to be turned into drinkable milk, or it goes to the Dairy Farmers of America (DFA) dry milk processing plant in Fallon, where it is turned into milk powder or condensed milk. Milk produced by southern Nevada dairy farms is largely used in Las Vegas or shipped to California, where it is processed to become drinking milk or cheese.

(Source: Libby Lovig, RDN, LD and The Dairy Council of UT/NV)



Each day, dairy cows eat 90 pounds of alfalfa hay, silage (fermented corn, wheat, or hay with stalks and leaves), corn, and grain. Also, they drink 25-50 gallons of water—that's about a bathtub full of water!

Each dairy cow in Nevada produces an average of 22,143 pounds of milk per year, and 10 gallons per day!

THAT'S A-MOO-ZING!

THE MAKEUP OF MILK

Milk is 85 percent water. The rest is comprised of fat, protein, and other solids, including ash, calcium, and other minerals. The solids are used to make cheese.

NATURE'S SPORTS DRINK

After your next soccer game or bike ride, reach for a nice tall glass of chocolate milk. Researchers have discovered that chocolate milk is the best beverage you can drink after exercising. This is because it is an affordable, easy-to-digest combination of proteins and carbohydrates that help to repair muscles, replace lost nutrients, and refuel energy. In fact, for refueling after exercise, **non-fat chocolate milk** is preferred over regular milk! So stir in some chocolate and drink up!

(Source: Illinois Department of Agriculture and The Dairy Council of UT/NV)

CALCIUM AND THE BONE BANK

Your bones are like calcium banks. As you grow, your body absorbs calcium and stores it in your bones, depositing it in your "bone bank." That's why you need to eat lots of calcium when you're still growing. It's important to "fill up the bank" as much as possible, because when you are older, your bones lose the ability to absorb calcium. If your bones have too many holes, they become weak. This is a condition called osteoporosis. As you get older, your body will withdraw from this calcium bank to keep your bones strong during adulthood.

FOOD SAFETY

Why is pasteurization important?

Pasteurization is a process that kills harmful bacteria by heating milk to a specific temperature for a set period of time. First developed by Louis Pasteur in 1864, pasteurization kills harmful organisms responsible for such diseases as listeriosis, typhoid fever, tuberculosis, diphtheria, and brucellosis.

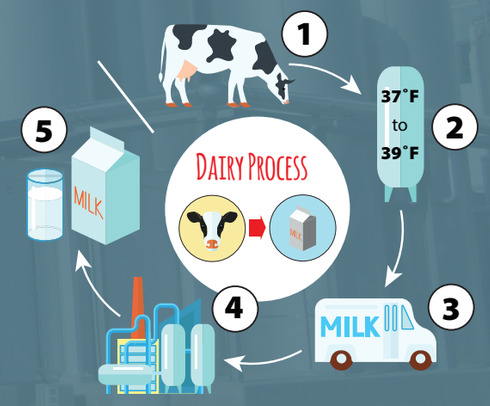
Research shows no meaningful difference in the nutritional values of pasteurized and unpasteurized milk. Pasteurized milk contains low levels of the type of nonpathogenic bacteria that can cause food spoilage, so storing pasteurized milk in the refrigerator is still important.

(SOURCE: U.S. Food & Drug Administration)

NEVADA CONNECTION: ANDERSON DAIRY

Anderson Dairy enjoys a rich tradition and heritage that dates to 1907, when Harry Anderson first began his dairy operation in Las Vegas. That tradition continues today.

For more than 100 years Anderson Dairy has been dedicated to doing one thing the best: produce fresh, great tasting milk and other dairy products. Anderson Dairy serves its milk to many Nevada schools and has been a principle dairy supplier for southern Nevada -- it's the way Harry Anderson would have wanted it to be.



1) Cow gets milked at an automated milking parlor.
2) Milk gets stored in a temperature controlled tank between 37˚ F - 39˚ F
3) Milk gets transported to the milk plant in an insulated truck.
4) Milk gets pasteurized, homogenized and bottled at a processing plant.
5) Milk gets delivered to grocery stores, schools and customers.

CAREER CORNER

ISIDRO ALVES, OWNER AND DAIRY FARMER AT SAND HILL DAIRY

Q Describe Sand Hill Dairy and your job there.

A We're a dairy farm in Fallon. We milk about 500 cows every day, twice a day. We sell to the dry milk plant here in Fallon, and we sell bottled milk around Reno and Carson City. A few years ago, we started making cheese, too. We make queso fresco, which is known here as farmer's cheese; it has a fresh, crumbled texture. The Spanish eat it all the time crumbled on tacos and salads. We also make some fresh mozzarella.

My job is to manage the employees, all aspects of that, as well as make sure that the cows are fed on time, care for any sick cows, oversee the processing of all milk and cheese, and ensure that sanitation policies are followed. We have seven employees: five on the dairy farm and two in processing. I also do milk and cheese deliveries to stores, mostly in Reno, two or three times a week.

Q How did you get into this line of work?

A My parents emigrated here from the Azores Islands off the coast of Portugal. Their first jobs were on dairy farms. I was very involved in that with them, and when I went to college I was interested in agriculture. I went into sales after college, working for an agricultural company in central California. I had always wanted to run a dairy farm, and my wife, Heather, a teacher, is my partner.

Q What is a typical day like for you?

A I wake at about 2:00 a.m., and the first thing I do is go to the dairy. The cows are milked, and I transfer the milk to a vat for pasteurization. Then I do a series of tests and lab work on the milk to be sure the product is safe for the market. That takes me until about 5:00 a.m. At 5, my cheese makers come in, and I go to the dairy site, away from processing room, and I feed the cows, doctor them, and make sure they're milked with the milking machines. We have about 11,000 cows. That's the rest of the day, basically. I do deliveries a few days, too. The rest of the time is spent managing employees. My workday runs until about 6 or 7:00 p.m. Cows are a 24/7 kind of job. They don't know when it's a holiday, they still have to eat!

Q What's your favorite part of your job?

A Being on the dairy, caring for cows. It's enjoyable, and it's the reason I got into this business in the first place. It's peaceful. All the processing is great, but it takes me away from the farm, which is what I like best.

Q What kind of preparation, training, or skills does it take to do this kind of work?

A I majored in dairy science when I was in college at California Polytechnic Institute. There's a lot of business and technical information you need to learn in order to run a dairy farm. But a lot is learned on the job, just working hands on with the cows. And it's not easy, so you have to really love it.

WES CLARK, FACILITY MANAGER, DAIRY FARMERS OF AMERICA (DFA) FALLON DRY MILK PROCESSING PLANT

Q Describe your job.

A My responsibilities are managing plant operations at the DFA plant in Fallon, dealing with production, shipping and receiving, maintenance, and sanitation. I oversee the production of powdered milk, fortified powders, evaporated milk, and skim milk powder. My job is to ensure we have enough milk volume daily, and to manage the people who test the food safety and quality of our products.

Q What are dried and evaporated milk, and how do you make them?

A Evaporated milk is milk that has had large portions of water removed. The milk is pumped through a heated vessel under a low level of vacuum. This pressure causes the liquid to evaporate at a lower temperature than normal. As the water is being removed, the milk solids increase. Then we can fortify the milk with certain nutrients to meet the needs of customers' various recipes.

Dry milk is made simply by removing more water. We pump the milk into a drying chamber at 425 degrees F, and remove 97 percent of the water remaining in the overall solids. Dry milk can be stored up to two years before being used, while a gallon of raw milk may go bad very quickly.

Q How do you prepare for this career?

A I've been working in the dairy industry since 1985, and I've gained experience while on the job. While experience is great, it is important to look for the school that fits your career needs. Direct training for dairy manufacturing jobs is difficult to find, however some universities do offer it. Check out food science or microbiology programs, or if you are interested in maintenance, you might want to look at computer science.

People look at the dairy industry and think we're all just milking cows. But this is a technical world, and we run the plant with about 45 people, and 2 million pounds of milk run through it. We live in a technological world where computers run the equipment, but the people have to know what the computers are doing. You also need to understand milk chemistry. An interest in, and understanding of science is important too.

Q What's your favorite part of your job?

A There are so many that it's hard to list just one! I would start with working in a brand-new facility, working with a great staff, and working with state-of-the-art technology. Also, it's being proud of what we've done here as a team, from the operators on the floor to the dairy farmers who ship the milk to the plant.