DISCOVERING BEEF

Overview

Beef cattle are one of the largest contributors to the world meat supply. Animals, like beef cattle supply high quality protein to the human diet as well as key nutrients. Animal caretakers are responsible stewards of the animals in their care so they can produce the best possible food for human consumption. Producers have an obligation to supply the highest quality meat because beef is such an important food source for many people.

Suggested Grade Level
3rd-5th

Time
15-30 minutes per lesson plan

Subjects
Language Arts
Life Science
Earth Science

Objectives

1. Students will learn the importance of resources to beef production.
2. Students will distinguish the differences between each stage of the beef life cycle.
3. Students will be able to identify beef animal products they use on a daily basis.

Background Information

Cattle are ruminant animals, meaning they have the ability to regurgitate food and digest it in a way that people and other animals cannot. This is an important function because it allows cattle and other ruminants to graze on grass and other plant material, converting forages to an edible meat source for humans to consume.

Beef is a high-quality protein and nutrient source for humans. In the food web, herbivores, such as beef animals, get their nutrition from producers or plants that are dependent on soil, sunlight and water. The beef digestive system, including their teeth and four stomach compartments, allows the animals to break down and obtain nutrients from high fiber food sources that would be unavailable for humans to utilize directly. This would include plants such as grass or stalks, stems and leaves from mature crop plants left in the field after harvest. This forage is called residue.

An important part of the beef production cycle is the differentiation between the stages in production such as cow/calf, stockers, feed yard, and harvesting.

Background Information Continued

During the cow/calf period, the producer is focused on the production of calves and improving their genetic breeding program. Choosing to either calve in the spring or the fall, the producer will aim to have the majority of the calf crop born in the same few weeks of the year. This helps ensure a dependable amount of weight for sale to the buyer. The producer takes the necessary steps to protect his herd and the calves that are born, this may include daily checks and veterinarian visits when needed. When the calves are at an appropriate weight and age, the producer sells them to another buyer such as a “stocker”.

Stockers are beef producers whose main goal is to increase the cattle’s poundage or weight. Calves are sent to stockers to graze on pastures and other forages to gain weight. Stockers keep calves for several months while they grow and can send calves to feed yards all months of the year, ensuring a steady supply for the feed yards.

Feed yards are the next step in the beef lifecycle. Here, the animals spend from four to six months being fed a primarily grain diet, consisting of corn, soybean meal, and other grains that are high in proteins and carbohydrates. However, there are quite a few cattle who never go to feed yards and are finished with a grass and forage diet. Either way, the beef is still full of protein and healthy nutrients such as zinc and iron.

Finally, the beef is harvested at a facility and prepared for retail. The beef is then sold to restaurants and grocery chains, and is supplied to customers for consumption.

By-products from beef cattle are important for our daily lives because we use the products all the time. From glue to make-up to wallpaper, beef by-products can be found of a wide-range in products we use all the time.

During this entire process, there are a lot of different jobs and careers that directly impact the beef industry. These careers are vastly unique and cater to different interests and talents so a large number of people with diverse backgrounds can find a job within the industry. Examples could include: nutritionist, veterinarian, range management specialist, feed production manager, feedlot manager, meat scientist, geneticist, truck driver, box and packaging manufacturer, food safety technician, meat quality grader, chef, restaurant worker and many more.

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Vocabulary

Calving: To give birth to a calf.

Colostrum: The first secretion from the mammary glands after giving birth, rich in antibodies.

Gestation Period: The length of time of a pregnancy.

Forage: Leaves, stems, and stalks that are part of plants used for animal feed which is called residue.

Instinct: Pattern of behavior in response to certain stimuli or situations.

Ruminant: An animal that has four compartments forming their stomach.

Veterinarian: Someone authorized and qualified to practice veterinary medicine.

Weaned: To detach from a source of dependence of milk or to remove from the mother so they may no longer obtain milk by nursing the cow.

Lesson 1: Beef It Up! Beef Animal Life Cycle

Materials

- Beef life cycle cutouts (provided)
- Story for instructor to read to class (provided)
- Beyond the Beef Barn Kansas Kids Connection Magazine found on the KFAC website

Procedures

1. Prepare cards by researching the different stages of the beef life cycle. The cards should have a short label describing what each stage is.
2. Read through the story with the class, while students use the cards to piece together the timeline using clues in the story.
3. Once finished, check that students put the cards in the correct order.
4. Discuss with students each step and the importance of that step in the life cycle.

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Story

When you ride down the road or highway and see cattle grazing in a pasture, you are probably witnessing a family farm or ranch in action. Most beef calves are born and raised on family-owned farms and ranches. Farmers and ranchers that own beef cattle are called beef producers. The family is involved in caring for their cattle, land, fences, and buildings every day. Their life revolves around caring for their animals.

A pregnant cow carries its calf for 9 months. Farmers and ranchers give the cows extra care when they are about to give birth (calve). If the cow has trouble giving birth, it is helped by the owner and sometimes an animal doctor (veterinarian). When a calf is born, it weighs 50 to 100 pounds. *(Note: Ask students how much they weigh right now and compare that weight to the birth weight of a calf.)*

While calves can be born year-round, most farmers and ranchers will try to avoid having calves born in the coldest part of the winter because of the possibility of having bad weather, such as a blizzard. After the calf is born, the beef producer makes sure that the calf stands and gets milk (nurses) from the cow. The first milk that a cow produces protects the calf from getting sick until its own immune system can develop, this milk contains colostrum.

When calves are young, they mainly get their nutrition from milk. Calves will begin to nibble on grass, but it will be a while before they can eat all of the foods that adult cattle enjoy. Beef calves stay with their mothers until they do not require milk anymore. At this point, the calves weigh 450 to 700 pounds and are six to 10 months of age. At all times, beef producers make sure there is plenty of fresh, clean water for the cattle to drink and enough healthy plants in the pasture to eat. If there are not enough plants in the pasture for cattle to eat, the farmer or rancher brings them extra food, such as hay bales, which is grass that is cut, dried and bundled up (baled) in the summer and stored. During the winter when grass is not growing, the cattle are fed hay. The farmers and ranchers also give cattle salt blocks and minerals to keep them healthy, much like the vitamins and minerals many children take. Just as important as caring for their animals, farmers and ranchers care for their environment where they raise their cattle. This is so important to them because it is the same environment in which they raise their own children who, one day, will take over the farm or ranch.

When the cattle are 600 to 800 pounds, most will be sold at an auction market. However, the best females may be kept and used to produce more calves. At the auction market, the buyers bid against each other until one buyer is willing to pay more than anyone else. The best cattle bring the most money, so a beef producer must strive to raise the healthiest and highest quality cattle.

After the auction market, most animals are shipped to a feedlot by a truck. At arrival, cattle are carefully watched and given a number that will be used to help manage the cattle. The people who work at the feedlot keep very good records of all the animals they care for. A veterinarian watches the cattle closely and gives medicine if cattle get sick.

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Story Continued

In a feedlot, cattle are put into pens where they eat special diets made mostly of corn and corn products along with hay, vitamins and minerals. At about 18 to 22 months, or when the animal weighs 1,200 to 1,400 pounds, they are considered finished and can be sent to the market. Some of the cattle may be raised for grass-fed beef, meaning they will continue to eat grass until they are fully grown and ready for market.

Cattle are trucked to a processing plant and processed into meat. Inspectors from the United States Department of Agriculture (USDA) check to make sure safety practices are upheld and that the meat produced is safe to eat.

Discussion Questions

1. What part of the life cycle is the most important? Least important?

2. Where in the life cycle does beef cattle vary quite differently from a pet's life cycle? Where is it similar?

3. What are the producer's roles in each stage of the beef life cycle?

4. How do each of the stages impact each other?

5. How do beef animals help humans?

6. How do humans help beef animals?

Lesson 2: Beef It Up! Animal Care Support Web

Materials

- Spool of Yarn
- Stuffed Cow Toy
- Photos of resources pasted on colored paper.
  - Food (hay, corn, etc.) on **green** paper
  - Water (tank, creek, river etc.) on **blue** paper
  - Shelter, (barn, lean-to, windbreak, etc.) on **brown** paper
  - Health Care (boluses, syringes, veterinarian, stethoscope etc.) on **purple** paper
  - Protection from harm including accidents or predators (Enclosed pens with high dense fences; dog, Mule, barns or corrals, barb wire fences, smooth wire fences) on **yellow** paper

Procedures

1. Before the activity, create resources necklaces using photos, colored paper, and yarn. On one side, write the resource (food, water, shelter, health care and protection from harm). On the other side, paste a photo of the resources. You could incorporate this step into the activity by assigning students a resource and having them do their own research online. They should print a picture of their resource.

2. Give each student a card hole punched with two holes in the top of the card and thread a two-foot length of yarn through the holes and tie so they create a “necklace”.

3. Students will form a circle with alternating colors of necklaces. There shouldn’t be two or more of the same color of card standing next to each other.

4. Have all the students pass the spool of yarn between each other. When they get the yarn, they hold on to their piece and don’t let go to preserve the “Web” and pass the yarn ball to another student across the circle who holds their piece and so on. After 3-4 students have a hold of the yarn, set the stuffed cow toy down on the web. The toy should fall through the cracks. Discuss with students why cattle need more than just a single resource to support their care and survival.

5. Pass the yarn between several more students and try with the stuffed cow toy again. It should still fall to the ground. Repeat with the other resources until each student is holding onto the yarn, forming a tight web of yarn between the circle of students. Place the stuffed toy in the center, and it should stay in the air and be supported. Discuss with students the importance of having all the resources working together to “support” the beef animal.

Discussion Questions

1. What happens if several animal care categories or roles are left out (ex: a drought or shortage of water, shortage of feed or grass, no protection from harm)? How does the beef animal survive?

2. Do you have to have each type of resource supporting the cow multiple times to make sure she is well cared for and protected?

3. What can be done to adjust for the lack of care to get things back in balance? (Take several students out of the circle, dropping their part of the yarn web, to simulate lack of care). How does this affect everyone else? How can they provide the needed support for the cow?

4. How do these basic needs of cattle compare with needs of a pet or companion animal? How are your pets needs met by the same types of resources?

5. How do these basic needs of cattle compare with humans, your friends and family? How are your basic needs met?

Lesson 3: Beef for All – There's a Cow in My House!
Student Worksheet

Materials

- Beef for All - There's a Cow in My House Student Worksheet

Recommended Reading

1. Awesome Agriculture Beef from A to Z, Susan Anderson and Joanne Buggy
2. The Cow in Patrick O'Shannahan's Kitchen, by Diana Prichard.
3. Life on a Cattle Farm by Judy Wolfman

Procedures

1. Have students circle the beef products or beef byproducts on the student worksheet.

2. Discuss with students the importance of beef and beef by-products in our every day life. Discuss how the leather is important and talk about the importance of beef as our food source.

Discussion Questions

1. What are some products that aren't typically thought of to be from a beef animal? What are some common ones?

2. What would happen if we didn't have access to these byproducts?

Student Worksheet Answers

- Football
- Leather gloves
- Hamburger
- Blush (makeup)
- Paint and paintbrush
- Crayons

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Beef for All – There's a Cow in My House!
Student Worksheet

Name:_____

Circle the six products that have been made with beef or beef byproducts!

Lesson 4: Connect the Dots

Humans benefit from and are connected to beef animals in their daily lives. Cattle generated $7.8 billion dollars of cash receipts in Kansas during 2016. That's big business! Kansas companies that produce, process, distribute and sell meat products employ as many as 19,798 people and generate an additional 50,852 jobs in supplier and connected industries in Kansas. These include jobs in companies supplying goods and services to manufacturers, distributors and retailers as well as those depending on sales to workers in the meat industry. (American Meat Institute).

Materials

- Icon cards cutouts, printed and laminated

Procedures

1. Distribute one icon card to each student from the set you have printed.

2. Students stand in a circle and when it is their turn they should share the category of connection such as sports, food, or medicine OR share one interesting fact they read on their card.

Discussion Questions

1. How would your life be different without all of these products that come from the beef animal? What would you miss the most?

Lesson 5: Careers in the Cattle Industry

This activity is focused on the relationship between cattle and the humans they support, providing examples of careers related to beef production and the beef industry.

Materials

- Paper and pencil
- Computer (optional)

Procedures

1. Have students partner up and come up with a list of potential careers within the beef industry.

2. Students should share careers with the class to create a master list.

3. Assign students a career in the beef industry for a research project.
   - Examples: Veterinarian, vet technician, extension agent, trucker, auctioneer, federal meat inspectors, animal nutritionist, feed lot worker, cow/calf producer, and stocker.

4. Have students present their chosen career to the class by using a powerpoint of the information that they found. Students should compare job descriptions, the amount of schooling required for the job and salary.

Discussion Questions

1. If you were a creative, artistic person, are there any careers in the beef cattle industry that would cater to those skills? How?

2. Are there any careers directly related to STEM (Science, Technology, Engineering and Math)? Why is this important in production agriculture?

3. What careers require a lot of education? Hands-on training? Is one more important than the other?

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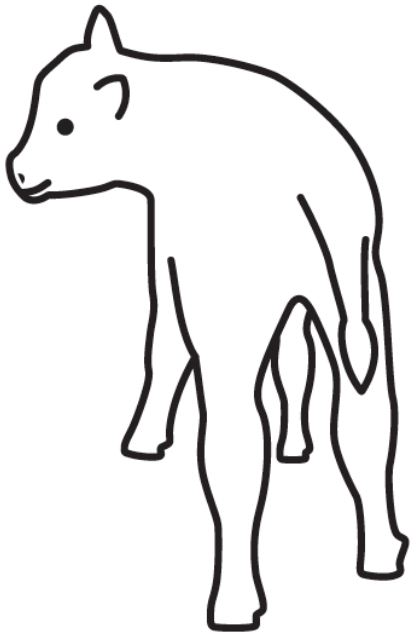
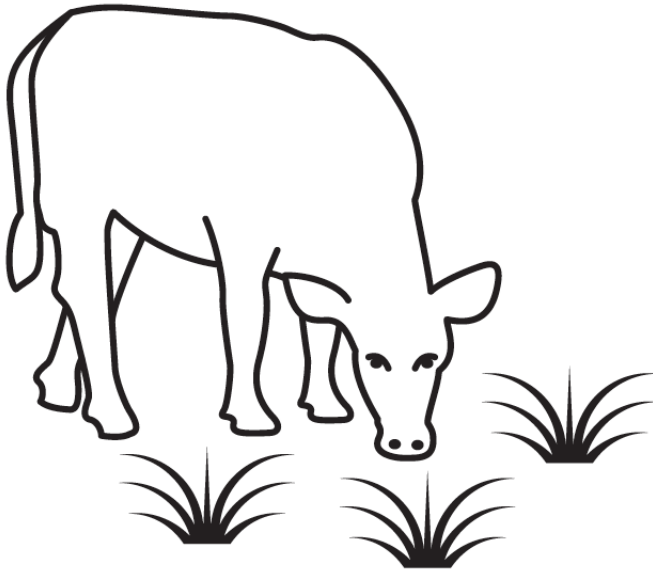
Lesson 1: Beef It Up! Beef Animal Life Cycle - Cutouts

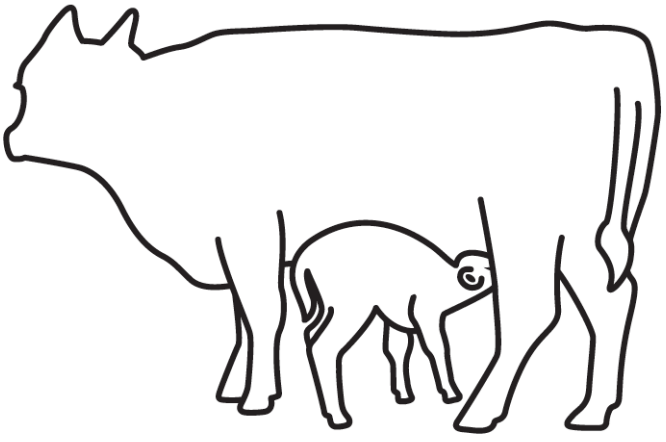


Baby calf

Boy eating a hamburger



Grazing Cow



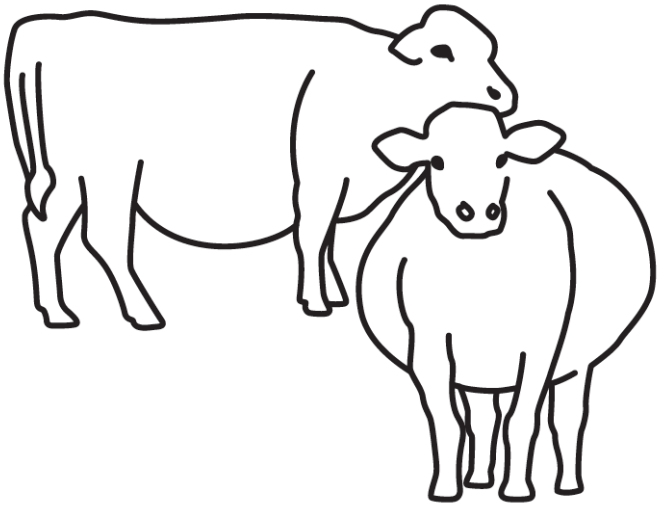
Cow/Calf

Source: National Cattlemen's Beef Association

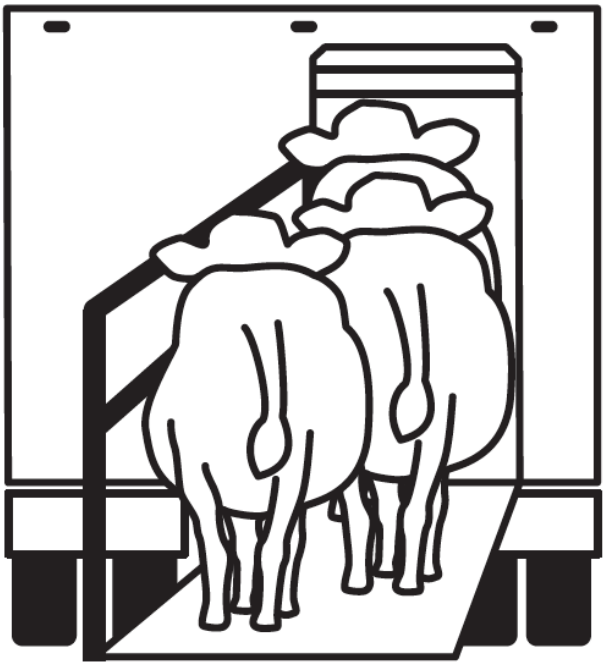
DISCOVERING BEEF

Lesson 1: Beef It Up! Beef Animal Life Cycle - Cutouts

Feed yard



Pregnant cow



Trailers

Veterinarian with cow

Source: National Cattlemen's Beef Association

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Lesson 4: Connect the Dots

Clothing

Clothing

- Leather shoes are made from cowhides.
- Belts are made with leather from cowhides.
- Purses are made with leather from cowhides.
- Wallets are made with leather from a number of animal hides.
- Boots are made with leather from a number of animal hides.
- Gloves are made with leather from animal products.

Source: National Cattlemen's Beef Association

DISCOVERING BEEF

Lesson 4: Connect the Dots

Cosmetics and Personal Care

Cosmetics and Personal Care

- Cosmetics contain plant and animal fats and oils.
- Detergents contain products from farm animals.
- Deodorants contain products from farm animals.
- Shaving cream contains products from farm animals.
- Soaps contain products from farm animals.

Source: National Cattlemen's Beef Association

DISCOVERING BEEF

Lesson 4: Connect the Dots

Environment

Environment

- Cattle are used to graze areas where keeping grass, shrubs and trees short is important and mowing too costly or too difficult – powerlines, forest fire breaks, canal banks, city parks, etc.

- Cattle graze on land that cannot grow plant crops for human food. They can turn grass from land low in nutrients into nutritious food for people.

- Cattle recycle food by processing by-products such as sugar beet pulp. almond hulls, citrus pulp, etc. and this saves landfill space.

- The hooves of cattle aerate the soil. This allows more air to enter and is better for plant root systems.

- Grazing keeps noxious weeds under control.

- Cattle are important in grass-fire prevention. Their grazing keeps the grass short, reducing fuel for fire.

- Animal manures are used to produce methane, a renewable energy source.

Source: National Cattlemen's Beef Association

Lesson 4: Connect the Dots

Housing and Construction

Housing and Construction

- Paints and wood stains contain emulsifiers and stabilizers from plant and animal products.
- High-grade steel is made with bone charcoal (special charcoal made from burning bones) from cattle and sheep.
- Plywood is held together using adhesives made from cattle and other livestock.
- Insulation has animal products and paper (made from trees) in it.
- Cement contains ingredients from farm animals.
- Putty contains products from farm animals.
- Linoleum flooring contains products from farm animals.
- Components in wall paper contain products from farm animals.
- Plastics of any type are manufactured using animal products. This would be the plastic components of video games, pool flotation devices, balls. etc.

Source: National Cattlemen's Beef Association

DISCOVERING BEEF

Lesson 4: Connect the Dots

Music and Art

Music and Art

- Crayons contain animal products
- Chalk is held together with adhesives made from farm animal products.
- Paste contains adhesives that are made from animal products.
- Lubricating oils for metal instruments include animal products.

Source: National Cattlemen's Beef Association

DISCOVERING BEEF

Lesson 4: Connect the Dots

Sports

Source: National Cattlemen's Beef Association

Sports

- All foods at sporting events comes from agriculture (hot dogs, hamburgers, potato chips, etc.).
- Most athletic shoes are made from leather that comes from cowhides and glue that come from cattle bones.

Baseball
- The ball's inner lining is made with cattle fat.
- Baseball gloves of any type are made from leather from cowhides.
- The outer hide of the baseball is made from cattle leather.

Soccer
- Soccer balls are made with leather from cowhides.

Football
- Footballs are made with leather from cowhides.

Volleyball
- Volleyballs are made with leather from cowhides.

Basketball
- Basketballs are made with leather from cowhides.

Weightlifting
- Weightlifting gloves are made with leather from cowhides.

Racecar Drivers
- Gloves are made with leather from cowhides.

Hockey
- Goalie and player's glovers, shin guards, elbow pads and goalie pads are made from leather cowhides.

Lacrosse
- Lacrosse sticks are made of wood and strung with rawhide from cattle.

KFAC

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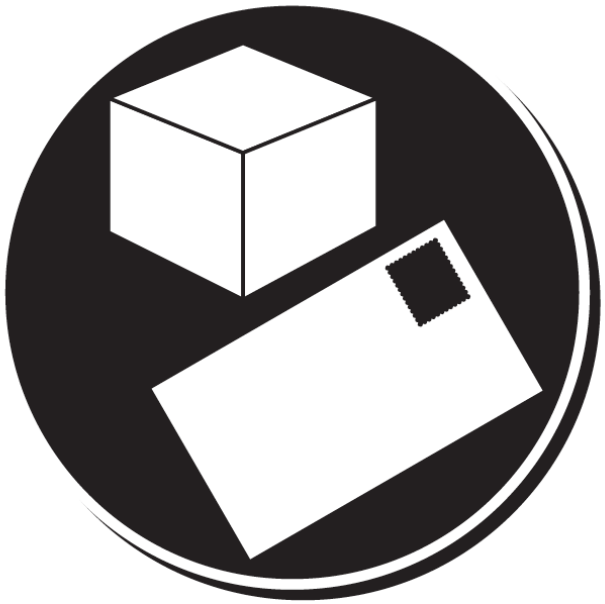
Lesson 4: Connect the Dots



Communication/ Shipping

Communication/Shipping

- Glue is made from animal products.

- Leather and cotton for high quality book binding comes from plant and animal sources.

Source: National Cattlemen's Beef Association

DISCOVERING BEEF

Lesson 4: Connect the Dots

Dining and Housewares

Dining and Housewares

- Dishes made of bone china use the bone of beef animals.
- Glass is made using animal products.
- Water filters are made using animal products.
- Cellophane contains products form farm animals.
- Floor waxes contain fat from farm animals.
- Ceramics contain products from farm animals.

Source: National Cattlemen's Beef Association

DISCOVERING BEEF

Lesson 4: Connect the Dots

Food

Food

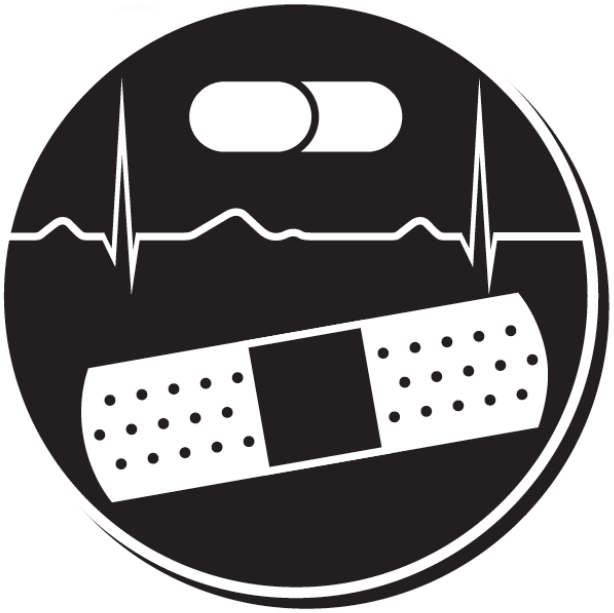
Almost all foods are produced on farms or ranches.

- T-Bone Steak
- Chuck Roast
- Beef Stew Meat
- Skirt Steak or Flank Steak - Fajitas
- Ground Beef – Hamburger, pizza, taco meat
- Ribs
- Cubed Steak
- Round
- Brisket
- Flat Iron Steak
- Shoulder Roast
- Cubes for Kabobs
- Rib Eye Roast

Source: National Cattlemen's Beef Association

DISCOVERING BEEF

Lesson 4: Connect the Dots



Health and Medicine

Medicine and Health

- Adhesive tape is made with glue from cattle bones, horns, hooves, skin and cartilage.
- Natural minerals come from animal sources such as calcium from dairy products.
- Gelatin from beef cattle is used to make soft-shell capsules (gel caps).
- Insulin to treat diabetics comes from the adrenal glands of cattle.
- Ingredients for anti-rejection drugs and for killing viruses come from cattle.
- Bone and collagen from beef are used in plastic surgery.

Source: National Cattlemen's Beef Association

Lesson 4: Connect the Dots

Recreation, Pets and Gardening

Recreation, Pets and Gardening

- Meats from all farm animals are used to make pet food.
- Pet chews are made from animal hides.
- Manure from cattle is used as fertilizer for both organic and conventional agriculture.
- Games that contain paper or cardboard are printed with natural inks or use some type of plastic made from animal products.

Source: National Cattlemen's Beef Association

DISCOVERING BEEF

Lesson 4: Connect the Dots

Transportation

Transportation

- Leather upholstery is made from cow hides.
- Biodiesel is made from animals fats and used fats and oils from the restaurant business.
- Beef fat is used to make rubber tires; and it helps tires hold their shape.
- Asphalt contains a binding agent from beef that holds it together.
- Leather shoes are made from cowhides.
- Antifreeze contains a chemical called glycol from cattle that prevents the fluids from freezing.
- Jet fuel is made using beef fats and proteins.
- Outboard engines for boats use oil that contains animal fats and proteins.
- Automobile bodies use glue made from bones, horns, hooves and cartilage of farm animals.

Source: National Cattlemen's Beef Association