FUN FACES OF WISCONSIN AGRICULTURE
CURLEY'S BEEF FAST FACTS

Production Information

Beef animals are raised on farms and ranches. There are almost 100 million beef animals and 800,000 beef cattle producers in the United States. Most of the cattle are raised on family farms.

Cow-calf operations will have a herd of breeding cows that are bred by either a bull or with artificial insemination. The gestation for beef cattle is 283 days or about 9 months. A heifer can be bred so that she has her first calf at 24 months of age. The calves produced are kept until after weaning and then sold to another type of producer until market weight. These may be stockers who keep the cattle until they are ready to go to a feedlot. Feedlots will raise the animals until market weight and then sell them to a packing plant. Cattle can reach maturity and market weight by 18-22 months or when they are between 1000 – 1250 pounds. This will vary on the breed of cattle, feeding conditions and other factors. There are over 275 recognized breeds of beef cattle.

Cattle are ruminant animals and have four compartments in their stomachs. This stomach system allows them to eat grass and roughages as they will swallow the food, cough it back up and chew it as "cud", and then swallow it again and finish digesting it. A cow may chew its cud for up to eight hours a day. Beef can eat up to 40 pounds of feed per day including corn, alfalfa, silage and by-products such as cotton seed hull and corn stalks.

Wisconsin Production

In 2006, Wisconsin had 3.4 million cattle and calves. Cattle and calves generate $877 million in economic activity in Wisconsin. The top counties in beef production were Grant, Marathon, Clark, Dane and Dodge. Cattle rank as the #2 commodity by dollar value in the state. There are 265,000 beef cows in the state. The calf crop for 2006 was 1,350,000 animals. Wisconsin ranks #9 in the nation for cattle and calves. Wisconsin is host to the World Beef Expo held in West Allis in September.

Career Information

Producers will raise the cattle and care for their dietary, housing and physical needs. Nutritionists will develop balanced rations for the cattle. Animal scientists will work with animal genetics, breeding and artificial insemination. Meat inspectors and processors will make sure that beef is properly handled, inspected and labeled for the consumer. Other jobs include animal housing (buildings and feedlots), and cattle fitting (preparing animals for shows).

Trivia

- Cattle produce about 25 billion pounds of meat each year.
- The combined value of the cattle and beef industry is $200 billion.
- The hide from one cow can make 144 baseballs, 20 footballs or 12 basketballs.
- Disneyland (CA) sells over 4 million hamburgers each year.

Other Information

Cow- adult female that has produced a calf
Bull- male animal
Steer- male animal that has been castrated and cannot breed
Heifer- young female that has not produced a calf
Veal- calves that are raised to 475-500 pounds

Over 98% of the beef animal is used when it is processed. About 45% of the animal is used for meat and the rest is used for other by-products including leather, china, glue, film, soap, pharmaceuticals, insulin, gelatins.

The meat from cattle is called beef. The average American eats about 65 pounds of beef each year.

FUN FACES OF WISCONSIN AGRICULTURE
MATH - BEEF LESSON PLAN

STUDENT'S NAME:

Answer the questions below. Show your work.

1. In 2003, there were 245,000 head of beef in Wisconsin. The record high was 350,000 in 1976. How many years was it from 1976 to 2003? What is the difference in head of beef from 1976 to 2003?

2. One cowhide can be made into 144 baseballs, 20 footballs, 18 soccer balls, 18 volleyballs or 12 basketballs. If there are 72 footballs used in the Super Bowl, how many cowhides are used?

3. One pound of hamburger can make how many "quarter pound" burgers?

4. If I eat one quarter pound burger while my brother has two eighth-pound burgers, who is eating more meat?

5. One pound of hamburger costs $1.88, and makes six burgers. What is the price for each burger?

6. If your feed costs $50 for every hundred pounds your steer weighs, how much money will you have invested to raise a 750 pound steer?

ANSWER KEY

1. In 2003, there were 245,000 head of beef in Wisconsin. The record high was 350,000 in 1976. How many years was it from 1976 to 2003? What is the difference in head of beef from 1976 to 2003?

2003-1976 = 27 years
350,000 head in 1976 – 245,000 head in 2003= 105,000 head difference

2. One cowhide can be made into either 144 baseballs, 20 footballs, 18 soccer balls, 18 volleyballs or 12 basketballs. If there are 72 footballs used in the Super Bowl, how many cowhides are used?

72 footballs / 20 in one cowhide = 3.6 cowhides to supply the Super Bowl with footballs

3. One pound of hamburger can make how many "quarter pound" burgers?

One quarter is ¼ of something, so 4 quarter pound burgers in one pound of hamburger

4. If I eat one quarter pound burger while my brother has two eighth-pound burgers, who is eating more meat?

¼ = 2/8, so we are eating the same amount of meat

5. One pound of hamburger costs $1.88, and makes six burgers. What is the price for each burger?

$1.88 / 6 burgers = $0.31 per burger

6. If your feed costs $50 for every hundred pounds your steer weighs, how much money will you have invested to raise a 750 pound steer?

750 pound steer / 100 pounds = 7.5
7.5 X $50 for feed = $375.00 in feed costs

FUN FACES OF WISCONSIN AGRICULTURE
BEEF NUTRITION LESSON PLAN

Activity Length:
Basics about Beef- 30 minutes
Future Ag Marketers- 60 minutes
Beef Math Worksheet – 30 minutes

Student Objectives:
1. Students will utilize different sources to learn about the nutrients beef provides
2. Students will learn proper serving size to get proper nutrients
3. Students will create an advertisement for beef to encourage healthy eating

Wisconsin Model Academic Standards:

English	A.4.4	B.4.1	E.4.1	E.4.2	E.4.3	E.4.4	E.4.5	F.4.1
Science	C4.2	F.4.1						
Social Studies	D4.3							

Introduction: Curley's Beef Fast Facts

Important Terms:
- Zinc- a mineral the human body needs to grow, learn, heal and keep itself healthy
- Iron- needed for the blood to carry oxygen to cells
- Protein- needed to build muscles, nerve tissue, blood, enzymes, hormones, antibodies and organs.
- Nutrients- substances necessary for the functioning of an organism

Materials for this activity:
- *This Business Called Agriculture*
- *Beef Ag Mag*
- Nutrition News Worksheet and Answer Key
- Old magazines
- Supplies to make posters or equipment to make radio ads

Lesson Outline:
Basics about Beef
Students will read from two sources to learn about healthy eating and the benefits provided by beef. Students will further discuss the correct serving sizes of Beef to gain the needed nutrients they just read about.
1. Have students read and complete the activity (page 34 Wisconsin Livestock – Beef) of the *This Business Called Agriculture* book

Answer: Iron helps build red blood cells and carries oxygen to body cells

2. Students can also read through Beefman Goes to School on page 35 of *This Business Called Agriculture*

3. Have students read the Nutrition News section on page 2 in the *Beef Ag Mag*.

4. Have students complete the Nutrition News Worksheet.

Future Ag Marketers

This activity will give students the opportunity to share the information they learned from the perspective of selling their product to others.

1. Look through old magazines. Discuss with students the advertisements they see on TV, in magazines, and hear on the radio. What makes those commercials memorable? What do they tell you about the product? Is there a logo that makes them stand out? How do they get the information to you? Write down their responses.

2. Visit several beef websites:

   Beef- It's What's for Dinner (http://www.beefitswhatsfordinner.com/)
   Zip4Tweens (http://www.beefitswhatsfordinner.com/)
   Wisconsin Beef Council (http://www.beeftips.com/index.html) to get ideas of how to promote beef.

3. Assign students the responsibility of designing an advertisement or commercial for beef. Using the information discussed in the two previous activities, require that they use at least two facts that they learned and create an advertisement that meets the criteria that they gave for their memorable advertisements and commercials.

4. If possible, utilize the school's intercom system during announcements to give their brief commercials on the nutritional benefits of beef. If the students design a print advertisement, hang the advertisements in the cafeteria or classroom.

Beef Math Worksheet

Distribute math worksheet for classroom exercise or for homework

Suggested Reading Materials:

- *Amazing Grazing.* By Cris Peterson, Boyds Mill Press, 2002.

Additional Worksheets:

- Careers Guide related to beef
- Ag Statistics Lesson Plan related to beef

Related activities:

- Build a Hamburger- have students analyze a hamburger and identify where all the parts of the hamburger are grown or raised.
- Have the students visit MyPyramid (http://teamnutrition.usda.gov/kids-pyramid.html)to determine how they can incorporate beef into their diet.

FUN FACES OF WISCONSIN AGRICULTURE
NUTRITION NEWS WORKSHEET

STUDENT'S NAME:

ZIP stands for what? What does each of these letters stand for and provide us with?

Z-

I-

P-

Fat is important in our diets because it is needed for what?

A serving of beef is ___ ounces (or the size of a deck of playing cards). __ egg(s),

___tablespoon(s) of peanut butter or ____ cup(s) of beans are also one serving.

When cooking with raw meat, it is important to do what four things?

1. Wash your _____ before cooking and eating
2. Cook burgers, meatballs and meatloaf to _____°F and steaks to at least ____°F inside
3. _____leftovers right away
4. Keep raw meat and poultry _____ from other foods and use _____plates for raw and cooked food.

Steaks have (more) or (less) fat in each serving than peanut butter? (underline the correct one)

Bonus What is the difference between a cow and a heifer?

FUN FACES OF WISCONSIN AGRICULTURE
NUTRITION NEWS WORKSHEET - ANSWERS

ZIP stands for what? What does each of these letters stand for and provide us with?

> **Z**-*Zinc helps the body grow, learn, heal and stay healthy. It also helps attention, short-term memory, and problem solving.*
>
> **I**-*Iron helps the blood carry oxygen to cells. Not enough iron makes us tired, weak and grouchy.*
>
> **P**-*Protein builds muscles, nerve tissue, blood, antibodies and organs.*

Fat is important in our diets because it is needed for what?

> *It protects organs and is needed to absorb certain vitamins*

A serving of beef is *3* ounces (or the size of a deck of playing cards). *1* egg, *2* tablespoon(s) of peanut butter or *1/2* cup(s) of beans are also one serving.

When cooking with raw meat, it is important to do what four things?

1. Wash your *hands* before cooking and eating
2. Cook burgers, meatballs and meatloaf to *165*°F and steaks to at least *145*°F inside
3. *Refrigerate* leftovers right away
4. Keep raw meat and poultry *separate* from other foods and use *different* plates for raw and cooked food.

Steaks have more or *less* fat in each serving than peanut butter?

Bonus What is the difference between a cow and a heifer?

> *A cow has had a calf and a heifer is a female that has not had a calf*

FUN FACES OF WISCONSIN AGRICULTURE
BEEF PRODUCTION LESSON PLAN

Activity Length:
World of Beef – 30 minutes
Do beef eat what we eat? – 45 minutes
Where does it go? – 45 minutes
Beef Math Worksheet – 30 minutes

Student Objectives:
1. Students will use a world map to decide the origination of certain beef breeds
2. Students will compare balanced human meals to balanced beef animal meals
3. Students will explore the digestion process of a ruminant

Wisconsin Model Academic Standards:

English	A.4.1	A.4.2	A.4.4	C.4.3	E.4.3	F.4.1	
Math	A.4.1	A.4.3	B.4.4	B.4.5	D.4.1	D.4.2	D.4.4
Science	A.4.3	C.4.2	C.4.3	F.4.1	F.4.4		
Social Studies	A.4.7						

Introduction: Curley's Beef Fast Facts

Important Terms:
- Ruminant- an animal that has a four-chambered stomach
- Ration- amount of feed fed in one day
- Forage – crop plants grown for their vegetative growth and fed to animals
- Climate- the weather conditions of a specific region
- Breed – a group of animals having similar physical characteristics that are passed along to their offspring
- Cow – female of the cattle family that has given birth
- Calf – young member of the cattle family
- Steer – castrated male member of the cattle family
- Bull – male of the cattle family

Materials for this activity:
- World of Beef worksheet
- Ingredients for ration
    - Chow mien noodles to represent forage in a cow's diet
    - Marshmallows to represent protein in a cow's diet (or use soy nuts)
    - Candy corn to represent corn in a cow's diet (or use corn nuts)
    - Sprinkles to represent the vitamins and minerals a cow needs
- Beef Digestion worksheet

Lesson Outline:

World of Beef

Students will use deductive reasoning skills to combine what they are given about climate and countries to determine the origin of major beef breeds. Another source for this lesson could be Everyday Math-Reference Book under the World Tour section.

1. Individually, or in groups, distribute the World of Beef worksheet

2. Using a map, help students to find the five countries or locations listed on the worksheet.

3. Have students complete the rest of the worksheet by reading the descriptions of the locations and matching them to the qualities of the beef animals listed in the other column.

4. Complete the questions at the end of the worksheet and then go through as a class.

5. Access (http://www.ansi.okstate.edu/breeds/cattle/) and have color pictures of each of the breeds listed on the worksheet so students can visualize the descriptions as well.

Do beef eat what we eat?

Students will explore their own nutrient needs and the balanced human diet as well as comparing to what beef consume daily.

1. As follow-up, or as part of a discussion on proper human nutrition, review the important needs of a balanced diet.

2. Compare the elements of a human diet to the needs of a beef cow:

   Fiber: forage for cows – certain vegetables for humans
   Protein: soybeans for cows – meat and nuts for humans
   Carbohydrates: corn for cows – pasta and rice for humans
   Water: water for cows – water for humans

3. Discuss the importance of each of the elements in the cow's diet listed on Beef Animal's Diet.

4. Using chow mien noodles to represent forages, candy corn to represent corn grain as an energy source, marshmallows to represent protein, and colored sprinkles, mix up the following trail mix. Everything is given in proportions, depending on class size, mix accordingly. If your school's Wellness Policy prohibits the use of candy, substitute soy nuts for the marshmallows and corn nuts for the candy corn.

   Chow mien noodles= ¼ of the mix
   Candy Corn = ½ of the mix
   Marshmallows = ¼ of the mix
   Sprinkles = a 'pinch' sprinkled on top

5. This mixture represents the proportions of these feed items that are fed to beef animals. Sometimes feed is all mixed together and sometimes feed items are fed separately (grains mixed together and hay given separately). As you distribute the mix to students, notice the ones that are picking one food over another and draw attention to the fact that some items are better liked than others. Cows do this same thing, and it is referred to as "sorting". If they are given too much feed, they have the option to only eat what they like and not get the needed nutrients from what is left.

6. What would happen if we were given the choice to eat only what we liked? Who would choose to eat only the certain foods that they wanted too? Even if they knew healthy choices? Properly mixing and feeding feeds like this is important for the farmers to make sure their animals stay healthy. Farmers need to carefully monitor what their cows eat to make sure that they are given what they need to stay healthy.

Where does it go?

This activity will explore the journey of food from the mouth of the cow through the digestive system.

1. Using the Beef Digestion worksheet, have students complete the digestive process of the beef cow from start to finish.

2. Discuss the differences in the human digestive system. (one stomach vs. four compartments)

3. What do humans need food for? What do cows use their food to produce?

4. Why do cows chew cud? What is in each of their stomach compartments?

Beef Math Worksheet

1. Distribute math worksheet for classroom exercise or for homework

Suggested Reading Materials:

- *Amazing Grazing.* By Cris Peterson, Boyds Mill Press, 2002.
- *Learn More about Veal.* Available from the Wisconsin Beef Council (www.beeftips.com)
- *Beef in Brief – How America's Cattle Serve the World*- available from the National Cattleman's Association (www.beef.org)
- *Life on a Cattle Farm.* By Judy Wolfman, Carolrhoda Books, Inc

Additional Worksheets:

- Careers Guide related to beef
- Ag Statistics Lesson Plan related to beef

Related activities:

- *Beef Ag Mag*
- Develop a mixture for human diets that you can compare to the animal ration mix.

FUN FACES OF WISCONSIN AGRICULTURE
WORLD OF BEEF

STUDENT'S NAME:

Using a world map, locate on the map these locations:

- France
- India
- England
- Northeastern Scotland
- Highlands of Scotland

Match the locations from column A to the breeds of beef animal in column B that are the best fit for that location. Pay attention to the climate, type of land, and needs for a beef animal to find the best fit. (hint: some beef breeds are named after the location they originated from).

Column A

France: *has a temperate climate, had a need for a large, powerful animal that was able to grow fast to meet the needs they had for a draft animal to haul products*

Scottish Highlands: *cold, snowy weather with poor land for grazing. There was a need for an animal that could withstand cold temperatures and survive without having the best quality grass to eat*

India: *Tropical climate with hot weather and lots of disease carrying insects, little water is available for animals to drink regularly and food sources are not easy to find*

Herfordshire, England: *temperate climate, lots of quality grass. There was a need for an animal that could easily convert grass into a quality meat product while reaching maturity fast and having lots of babies*

Northeastern Scotland (Angus County): *temperate climate, easy to grow grain crops and good pastures*

Column B

Brahman: *short, thick white hair with a thick black skin to keep out intense sun rays and prevent insect bites, lots of loose skin and a hump on their neck with more sweat glands to let them sweat more in hot temperature*

Herford: *reddish color with white markings, able to convert the least grass into the most meat, reach maturity early in their life, and give birth to hearty, healthy calves*

Charolais: (pronounced Char-lay): *Large framed, powerful animal with white hair. This breed grows fast and is able to haul heavy loads and work hard because of their coarse bones and heavy muscles*

Highland: *Smaller animal with long, thick hair to withstand extreme cold temperatures. They are "browsers" meaning that they can eat brush as well as quality grass*

Black Angus: *Black animal that is easily adapted to changing temperatures and different types of feeds*

1. These are just a few examples of beef breeds. Why is there a need for so many different breeds in the world?

2. What is the climate like in Wisconsin?

3. What locations in column A have similarities to the Wisconsin climate?

4. Which of the breeds in column B would not be able to survive at all in Wisconsin's climate? (only one)

5. Where in the United States would you find the breed from question #4?

FUN FACES OF WISCONSIN AGRICULTURE
WORLD OF BEEF- ANSWER KEY

Match the locations from column A to the breeds of beef animal in column B that are the best fit for that location. Pay attention to the climate, type of land, and needs for a beef animal to find the best fit. (hint: some beef breeds are named after the location they originated from).

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1. These are just a few examples of beef breeds. Why is there a need for so many different breeds in the world?

   Different locations require animals that have different strengths and weaknesses such as tolerance to heat, dry conditions, terrain or feed available.

   Different breeds will differ in areas such as body strength, growth rate, rate of gain,, and different quality of meat.

2. What is the climate like in Wisconsin?

   Wisconsin has a temperate climate it can get cold in the winter, and hot in the summer

3. What locations in column A have similarities to the Wisconsin climate?

   France, Scotland (both locations), and England

4. Which of the breeds in column B would not be able to survive at all in Wisconsin's climate? (only one)

   Brahman

5. Besides India, where would you find the breed from the previous question?

   Tropical places like Mexico, Puerto Rico, and Central America

FUN FACES OF WISCONSIN AGRICULTURE
BEEF ANIMAL'S DIET

Beef animals need to have five important nutrients in their diet: carbohydrates, protein, fiber, vitamins and minerals, and water.

- **Carbohydrates** provide the needed energy for the animal's body to maintain itself and to grow. What do humans need energy for? When animals have babies, some of this energy goes into feeding and growing the baby calf as well. If cows don't get enough carbohydrates, they will not grow as fast as they could and don't grow as strong. In a cow's diet, carbohydrates are often provided by grain such as wheat or corn. Where can we get carbohydrates for a human? Do they provide the same things for us?

- Cattle also require **protein** in their diet to produce muscle (which is what the meat we eat is) and to produce milk (which is a human food that is a good source of protein). What do humans need protein for? When does a person eat more protein than usual? If we don't feed them enough protein, their body needs to take it from other places inside the body and they can get sick and not grow as well. In a cow's diet, protein comes from crops like soybeans and the seed of cotton plants.

- **Fiber** is important in the diet of a cow because it helps to make their stomach work. Fiber 'tickles' the cow's stomach to get it to stay active and digest food. The four stomach compartments in a cow are triggered by the touching of this stiff part of their diet. If a cow eats too much of this fiber, they will get full before they eat the grain that provides their energy and protein.

  What could happen if a cow doesn't get grain? Review the points made about protein and carbohydrates

  If cows don't get enough fiber, they will need to eat too much grain to make themselves full. Too much grain can also make them sick. Like us eating all of just one type of food. If we ate just carrots all the time we would still be missing many of our needed nutrients. Cows can get fiber from crops like dry hay or haylage (which is hay that is stored in a silo) which are called forage.

  Different types of fiber may also provide some protein or energy for the cow as well. The farmer needs to be careful to provide just the right amount of each of the nutrients for the animals.

  If the farmer feeds a different type of forage, the whole feed ration needs to be changed to make sure the cow is getting everything she needs.

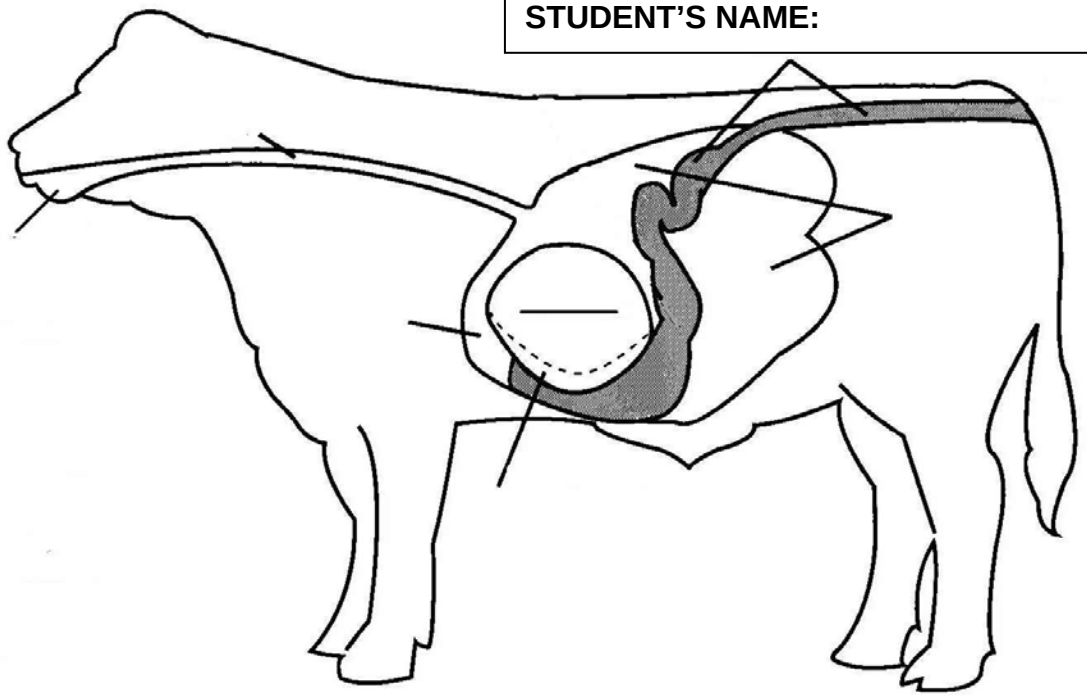
- **Vitamins and Minerals** are important to a cow's diet because they help the cows use the nutrients provided by the carbohydrates, protein and fiber. A cow needs vitamins and minerals just like we do.

- **Water** is important to a cow just like it is important to humans. A cow needs water to keep from getting dehydrated and sick. A cow is only able to eat as much feed as it can drink water. If a cow doesn't get enough water, it won't eat as much feed and will not get the needed nutrients.

For more information about beef production, have the students visit Beef- From Pasture to Plate (http://www.beeffrompasturetoplate.org/stagesinbeefproductionprocess.aspx)

BEEF DIGESTION

STUDENT'S NAME:



Cattle are ruminants. A ruminant is an animal that has a four-chambered stomach.

Label the digestive system parts by writing the names on the lines.

Reticulum-Food travels from the rumen to the reticulum where further digestion occurs. Large food items are returned to the mouth for further chewing. This food is called cud.

Esophagus-After the food is swallowed, it travels down the esophagus to the rumen

Large and Small Intestine-From the abomasums, food moves through the large and small intestines where nutrients are absorbed into the blood stream and used by the animal

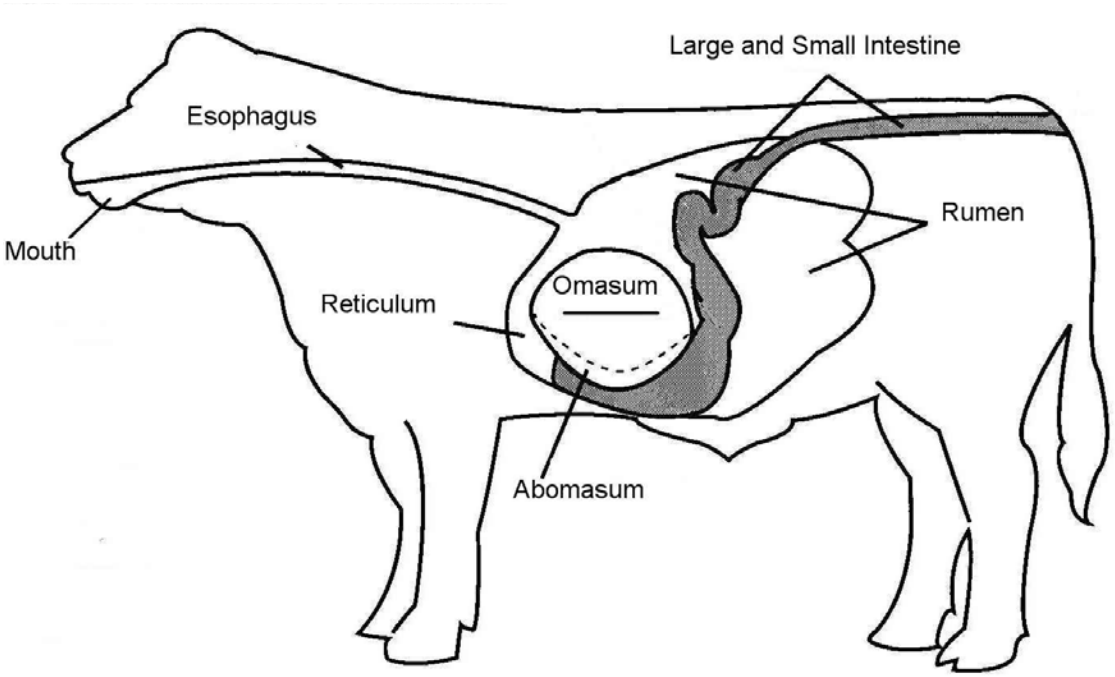
Mouth-This is where the cattle obtain their food and bring it into their body

Omasum-When food particles are small enough, they pass through the omasum where water is removed

Rumen-The largest chamber of the stomach where food mixes and softens with the aid of microorganisms

Abomasum-The food travels to another stomach chamber where stomach juices continue to digest the food

BEEF DIGESTION ANSWER KEY



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Omasum-When food particles are small enough, they pass through the omasum where water is removed

Rumen-The largest chamber of the stomach where food mixes and softens with the aid of micro-organisms

Abomasum-The food travels to another stomach chamber where stomach juices continue to digest the food