

# Beef is Good for You

## Objective

Students will use food labels to solve everyday math problems.

## Background

The beef industry generates more income than any other agricultural enterprise in our state. In 2015, Oklahoma's beef cattle inventory was 1.95 million. At that time Oklahoma ranked number two in the nation in the production of beef cattle.

Beef is an important part of a healthy diet. About 50 separate nutrients are essential to good health. No single food contains all of these nutrients. For this reason, dietitians and health providers recommend consuming a wide variety of foods daily from several different food categories.

One of the nutrients you need, Vitamin B12, can be found only in animal foods, such as beef. Beef also provides significant amounts of other important nutrients—protein, riboflavin, niacin, iron and zinc.

Proteins are made up of amino acids. We need 22 amino acids, but only eight must come from food. The body can produce the others. The amino acids the body cannot make are called “essential amino acids.” Proteins which contain all of the eight essential amino acids in proportions most useful to the body are called “complete” or “high quality” proteins. Plant proteins, when eaten alone, do not contain all of the essential amino acids in sufficient quantity and therefore are incomplete. To make them complete, they must be combined with other foods containing the amino acids that are missing. For instance, beans and rice, eaten separately, do not contain all the essential amino acids, but eaten in combination, they do.

Complete proteins, such as those in beef, help to build, maintain and repair body tissues, form body hormones and enzymes and increase resistance to infection and disease. One 3-ounce cooked serving of 80 percent lean ground beef will supply 21 grams of protein, about 45 percent of the daily amount recommended for children ages 9-13.

Beef also contains significant amounts of several B-vitamins. Riboflavin (vitamin B2) helps the body use energy and promotes healthy skin and good vision in bright light. Niacin (another B-vitamin) promotes healthy skin and nerves, aids digestion and fosters normal appetite. Vitamin B12 is

## Oklahoma Academic Standards

### GRADE 6

Speaking and Listening: R.1,2,3. Reading and Writing Process: R.1,3  
Number & Operations: 1.3,4; 3.1,2,3,4; 4.4.

### GRADE 7

Speaking and Listening: R.1,2,3. Reading and Writing Process: R.1,3. Number & Operations: 2.3

## Ag Career: Dietitian

**JOB DESCRIPTION:** Dietitians work in community health programs, hospitals, schools, and other public facilities. Some work as private nutritional consultants. A dietitian at a community health program or hospital is responsible for the facilities health programs and works with patients to help them develop healthier diets. Dietitians may also offer classes to the public in such subjects as weight control and healthy cooking techniques.

**SKILLS:** A dietitian must enjoy working with people and have some knowledge of human nutrition.

**PREPARATION:** College degree in food science and nutrition.

## Vocabulary

**amino acid**—any of numerous acids that include some which are the building blocks of proteins and are made by living cells from simpler compounds or are obtained in the diet

**dietitian**—a person who studies nutrition as it relates to health.

**enzyme**—any of various complex proteins produced by living cells that bring about or speed up reactions (as in the digestion of food) without being permanently altered

**hormone**—any of various similar substances found in plants and insects that regulate development

**iron**— a metallic element essential to healthy blood and available to humans through consumption of such foods as red meat, spinach, beets, whole wheat and raisins

**niacin**—a vitamin B complex occurring in living cells as an essential substance for growth

**nutrients**—substances necessary for life and growth

**protein**—any of a group of complex organic macromolecules that contain carbon, hydrogen, oxygen, nitrogen, and usually sulfur and are composed of one or more chains of amino acids. Proteins are fundamental components of all living cells and include many substances, such as enzymes, hormones, and antibodies, which are necessary for the proper functioning of an organism. They are essential in the diet of animals for the growth and repair of tissue and can be obtained from foods such as meat, fish, eggs, milk, and legumes.

**riboflavin**—a crystalline orange-yellow pigment, the principal growth-promoting factor in the vitamin B complex, found in milk, leafy vegetables, fresh meat and egg yolks

**tissue**—an aggregation of morphologically similar cells and associated intercellular matter acting together to perform one or more specific functions in the body

**US DRI (Dietary Reference Intake)**—the daily amount of each nutrient recommended for most people

**Vitamin B6**—a vitamin essential to the utilization of protein, the formation of red blood cells and proper nerve function. It is found in meat, poultry, fish, whole-grain cereals, sweet and white potatoes, green vegetables, bananas and prunes.

**Vitamin B12**—a vitamin necessary for the normal development of red blood cells and the functioning of all cells, particularly in the bone marrow, nervous system and intestines. Sources include organ meats, lean meats, fish, milk, eggs and shellfish.

**zinc**—a mineral found in beef, liver, eggs, poultry and whole wheat bread, which maintains taste and smell acuity, normal growth and sexual development and is important for fetal growth and wound healing.

needed for normal functioning of body cells and of the nervous system. The only natural source of Vitamin B12 is animal foods.

One of the most important nutrients in beef is iron. Iron helps red blood cells carry oxygen to and away from the body cells. Beef is one of the best sources of iron, the nutrient most often lacking in the diets of adult women, young children and athletes. Zinc is a mineral the body needs to form enzymes and insulin. Like iron, zinc is especially difficult to obtain when meat is not included in the diet.

## Procedures

1. Read and discuss background and vocabulary.
2. Hand out the Reading Page.  
—As a class, discuss unfamiliar vocabulary.  
—Lead a discussion about the importance of a varied diet based on the comprehension questions included on the Reading Page.
3. Students will bring assorted food packaging to school.  
—Students will take turns reading the information in groups.  
—Point students to the “Nutrition Facts” found on most packaging.  
—Discuss the meaning of the chart.
4. Hand out Student Worksheet A.  
—Students will use the information at the top of the page and the information provided in the questions to write equations and fill in the blanks with their solutions.
5. Provide copies of Student Worksheet B.  
—Students will use Student Worksheet B to graph the information found on Student Worksheet A.

## Extra Reading

Macaulay, David, *The Way We Work*, Houghton Mifflin, 2008.

Powell, Jillian, *Fats for a Healthy Body (Body Needs)*, Heinemann, 2009.

Royston, Angela, *Proteins for a Healthy Body (Body Needs)*, San Val, 2003.

Wolfman, Judy, and David Lorenz Winston, *Life on a Cattle Farm*, Lerner, 2002.

# Beef is Good for You

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The beef industry generates more income than any other agricultural enterprise in our state. In 2013, Oklahoma's beef cattle inventory was over 1.75 million. At that time Oklahoma ranked number three in the nation in the production of beef cattle.

Beef is an important part of a healthy diet. About 50 separate nutrients are essential to good health. No single food contains all of these nutrients. For this reason, dietitians and health providers recommend consuming a wide variety of foods daily from several different food categories.

One of the nutrients you need, Vitamin B12, can be found only in animal foods, such as beef. Beef also provides significant amounts of other important nutrients—protein, riboflavin, niacin, iron and zinc.

Proteins are made up of amino acids. We need 22 amino acids, but only eight must come from food. The body can produce the others. The amino acids the body cannot make are called “essential amino acids.” Proteins, which contain all of the eight essential amino acids in proportions most useful to the body, are called “complete” or “high quality” proteins. Plant proteins, when eaten alone, do not contain all of the essential amino acids in sufficient quantity and therefore are incomplete. To make them complete, they must be combined with other foods containing the amino acids that are missing. For instance, beans and rice, eaten separately, do not contain all the essential amino acids, but eaten in combination, they do.

Complete proteins, such as those in beef, help to build, maintain and repair body tissues, form body hormones and enzymes and increase resistance to infection and disease. One 3-ounce cooked serving of 80 percent lean ground beef will supply 21 grams of protein, about 45 percent of the daily amount recommended for children ages 9-13.

Beef also contains significant amounts of several B-vitamins. Riboflavin (vitamin B2) helps the body use energy and promotes healthy skin and good vision in bright light. Niacin (another B-vitamin) promotes healthy skin and nerves, aids digestion and fosters normal appetite. Vitamin B12 is needed for normal functioning of body cells and of the nervous system. The only natural source of Vitamin B12 is animal foods.

One of the most important nutrients in beef is iron. Iron helps red blood cells carry oxygen to and away from the body cells. Beef is one of the best sources of iron, the nutrient most often lacking in the diets of adult women, young children and athletes. Zinc is a mineral the body needs to form enzymes and insulin. Like iron, zinc is especially difficult to obtain when meat is not included in the diet.

## Comprehension Questions

What is the main idea of this passage? List three supporting facts?

What is the author's purpose?

List three of the nutrients found in beef.

In your own words, explain “essential amino acids.”

What are complete proteins? What foods contain complete proteins?

Which of the nutrients in beef help repair body tissue?

Which of the nutrients in beef helps promote healthy skin?

Which of the nutrients in beef helps red blood cells carry oxygen to and away from the body cells?

Which of the nutrients in beef helps the body produce insulin?

# Beef is Good for You

A

A serving of lean cooked beef is about the size of a deck of playing cards, weighs 3 ounces and has 228 calories.

A 3-ounce cooked lean ground beef patty provides:

- 46 percent of the US Daily Recommended Intake (DRI) of protein
- 12 percent of the US DRI of riboflavin
- 26 percent of the US DRI of niacin
- 33 percent of the US DRI of vitamin B12
- 10 percent of the US DRI of iron
- 31 percent of the US DRI of zinc.

## US DRI for the Key Nutrients in Beef

Protein	45 grams
Riboflavin	1.5 milligrams
Niacin	17 milligrams
Vitamin B12	6 micrograms
Iron	15 milligrams
Zinc	15 milligrams

Write equations to solve the problems below, using the information provided above.

A 3-ounce cooked lean ground beef patty provides \_\_\_\_ percent of the US DRI of protein. The US DRI of protein is 45 grams. A 3-ounce cooked lean ground beef patty provides 20.7 grams of protein.

A 3-ounce cooked lean ground beef patty provides \_\_\_\_\_ percent of the US DRI of **riboflavin**. The US DRI of riboflavin is \_\_\_\_\_ milligrams. A 3-ounce cooked lean ground beef patty provides \_\_\_\_\_ milligrams of riboflavin.

A 3-ounce cooked lean ground beef patty provides \_\_\_\_\_ percent of the US DRI of **niacin**. The US DRI of niacin is \_\_\_\_\_ milligrams. A 3-ounce cooked lean ground beef patty provides \_\_\_\_\_ milligrams of niacin.

A 3-ounce cooked lean ground beef patty provides \_\_\_\_\_ percent of the US DRI of **Vitamin B12**. The US DRI of Vitamin B12 is \_\_\_\_\_ micrograms. A 3-ounce cooked lean ground beef patty provides \_\_\_\_\_ micrograms of Vitamin B12.

A 3-ounce cooked lean ground beef patty provides \_\_\_\_\_ percent of the US DRI of **iron**. The US DRI of iron is \_\_\_\_\_ milligrams. A 3-ounce cooked lean ground beef patty provides \_\_\_\_\_ milligrams of iron.

A 3-ounce cooked lean ground beef patty provides \_\_\_\_\_ percent of the US DRI of **zinc**. The US DRI of zinc is \_\_\_\_\_ milligrams. A 3-ounce cooked lean ground beef patty provides \_\_\_\_\_ milligrams of zinc.

Oklahoma Ag in the Classroom is a program of the Oklahoma Cooperative Extension Service, the Oklahoma Department of Agriculture, Food and Forestry and the Oklahoma State Department of Education.

# Beef is Good for You (answers) A

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A 3-ounce cooked lean ground beef patty provides 12 percent of the US DRI of **riboflavin**. The US DRI of riboflavin is 1.5 milligrams. A 3-ounce cooked lean ground beef patty provides .18 milligrams of riboflavin.

A 3-ounce cooked lean ground beef patty provides 26 percent of the US DRI of **niacin**. The US DRI of niacin is 17 milligrams. A 3-ounce cooked lean ground beef patty provides 4.4 milligrams of niacin.

A 3-ounce cooked lean ground beef patty provides 33 percent of the US DRI of **Vitamin B12**. The US DRI of Vitamin B12 is 6 micrograms. A 3-ounce cooked lean ground beef patty provides 1.98 micrograms of Vitamin B12.

A 3-ounce cooked lean ground beef patty provides 10 percent of the US DRI of **iron**. The US DRI of iron is 15 milligrams. A 3-ounce cooked lean ground beef patty provides 1.5 milligrams of iron.

A 3-ounce cooked lean ground beef patty provides 31 percent of the US DRI of **zinc**. The US DRI of zinc is 4.65 milligrams. A 3-ounce cooked lean ground beef patty provides 1.4415 milligrams of zinc.

Name \_\_\_\_\_

# Beef is Good for You

# B

Use the information on Worksheet A to graph the key nutrients found in a 3-ounce cooked lean ground beef patty.

