# Ground Beef: Which Do I Buy?

**Suggested Grade Level:** 9-12

**Time:** three 50-minute class periods

**Subject:** Science, Properties of Matter, Engineering, FACS, Food Production and Services, Food Science/Dietetics/Nutrition, Nutrition and Wellness, Agriculture, Beef, Food Safety, Inspection and Regulations, Language Arts, Informational Reading, Research

**Overview:** This lesson prepares students to purchase ground beef with the correct lean-to-fat ratio for a specific cooking method.

**Objectives:**

1. Identify the lean-to-fat ratios displayed on various ground beef packages.
2. Interpret ground beef nutrition labels to determine nutrient and fat content.
3. Apply proper health and safety procedures when handling and cooking ground beef.
4. Analyze the results of frying ground beef to determine its lean-to-fat composition.
5. Evaluate which lean-to-fat ratio of ground beef is most appropriate for a specific cooking method.

**Background Information:**

Ground beef is made from trimmings from larger cuts, such as steaks and roasts. Labels often specify the source of those trimmings—for example, “ground chuck” comes from the chuck section, “ground round” from the round, and “ground sirloin” from the sirloin. The lean-to-fat ratio on packaging shows the percentage of lean meat compared to fat. For instance, 80/20 means 80 percent lean and 20 percent fat; 85/15 means 85 percent lean and 15 percent fat; and 90/10 means 90 percent lean and 10 percent fat. By law, ground beef cannot contain more than 30 percent fat (Food Ground).

Companies cannot simply add labels to their products without oversight. The Food Safety and Inspection Service (FSIS)—the USDA agency responsible for meat labeling—requires that all labels be truthful, not misleading, and supported by documentation. Producers must submit evidence to FSIS before using certain claims, such as “Grass-Fed” or “Certified Organic.” To sell “Grass-Fed” beef, producers must provide documentation showing that cattle were fed only forage after weaning and were

not fed grain or grain by-products. Any deviation must be recorded. If cattle were fed less than 100 percent forage, the product must be labeled "Partially Grass-Fed" or "Grass-Finished." (Food FSIS, p.13) Organic certification is managed by the National Organic Program (NOP). Producers, processors, and facilities—including slaughterhouses and packing plants—must all be certified. This certification covers claims such as "Certified Organic," "Raised Without Antibiotics," "No Added Hormones," and "Fed Non-GMO Feed." (Food FSIS, p.24) These labeling standards help consumers make informed decisions and avoid manipulative marketing.

**Kansas Industry Information:**
Kansas has around 45 million acres of farmland, but 15.5 million of these acres are not suitable for growing crops. This land, called pastureland, can be used to raise cattle. Cattle can turn grass and native plants into high-quality protein and nutrients that we can eat. Without cattle, most of this land would go unused. Cattle are also vital to the Kansas economy. As of January 2026, Kansas ranked third nationally with 5.85 million cattle on ranches and feedyards – more than twice the state's human population. Kansas also ranked second in the nation in commercial cattle processing, with 5.9 million head processed in 2025. In 2024, cattle generated $14.8 billion in cash receipts, representing 61% of our total agricultural income (Industry).

The Kansas Beef Council uses check-off dollars, collected from cattle sales, to fund beef promotion, consumer education, and research programs that strengthen the industry. Visit here: https://www.kansasbeef.org/about-us

During the COVID-19 pandemic, Shop Kansas Farms was launched to connect consumers directly with Kansas producers. The initiative continues to promote locally raised beef and other Kansas-made products, supporting farm families and rural economies. Visit here: https://shopkansasfarms.com/about

**Materials**
*Day 1: Beef Labels*
- Ground Beef–1 lb of each: 97/3 lean to fat, 90/10 lean to fat, 85/15 lean to fat, 80/20 lean to fat, 73/27 lean to fat. Place a paper under the meat and record the price paid for each type of ground beef
- Ground Beef Label Chart (provided)

*Day 2: Beef Experiment*
- Ground Beef Experiment Worksheet (provided)
- Ground Beef Comparison Chart Worksheet (provided)
- Ground Beef
- Glass beaker or jar
- Paper plate
- Electric frying pan or hot plate with skillet
- Scale
- Pot Holders

- Paper towels
- Wooden spoon
- Slotted spoon
- Plastic gloves

*Day 3: Tasting*

- Ground Beef Comparison Chart
- Cooked beef and rendered fat from Day 2
- Optional: Grill, extra ground beef

**Day 1: Beef Labels**

**Instructional Format:**

1. Review Background Information and Kansas Connections
2. Conduct engagement exercise
3. Complete the activity

**Engagement:** Prepare for this lesson by setting out each type of ground beef on the table. Avoid setting them out too early to prevent spoilage. Alternatively, use images of each type of ground beef instead of real packages.

**Procedures:**

1. Hold up one pound of ground beef. Say, “Pretend you have one pound of ground beef, and you need to make something for dinner. What would you make?” Record answers on a whiteboard or blackboard.
2. Ask students to state a cooking method that might be used to prepare the ground beef, and put that label next to the meal idea. Examples:
    - Hamburgers–fry, grill
    - Tacos–fry
    - Meatballs–fry, bake
    - Etc.

    The seven basic cooking methods are steam, sear, braise, poach, roast, and grill. Not all of these are necessary.
3. Now, reveal the other ground beef packages. Ask students to come forward, read the labels, and look at the marbling in the meat.
4. Put the ground beef back into a freezer, fridge, or cooler.
5. Tell students that they will learn which ground beef is most nutritious, the fattest, the leanest, the most flavorful, and the most inexpensive.
6. Have students complete the Ground Beef Label Chart worksheet.

**Day 2: Cooking the Beef**

**Instructional Format:**

1. Conduct engagement exercise

2. Complete the activity

**Engagement:** Write ‘Today We Cook’ on the board before students walk in.

**Procedures**

1. Before beginning this lesson, set out the cooking supplies listed in Materials. There should be 5 stations for each group.
2. Group students into five groups. Pass out the Ground Beef Experiment Worksheet and the Ground Beef Comparison Chart to each student.
3. Pass out each ground beef package listed in the Materials.
4. Tell students they will determine the percent of lean and fat in their assigned ground beef sample by cooking it into crumbles—similar to what’s used in tacos or spaghetti. Before handling the meat, review proper procedures for weighing, frying, and making crumbles. Then, have students examine the *Ground Beef Comparison Chart* completed by each group member.
5. Have students weigh their raw ground beef and record the measurement on their worksheet. Once recorded, have students proceed with the *Ground Beef Experiment* according to the provided directions.
6. Make sure the cooked beef is properly stored so that it is safe to consume tomorrow.

**Day 3: Tasting**

**Instructional Format**

1. Conduct engagement exercise
2. Complete the activity
3. Review vocabulary
4. Conduct assessment exercise

**Engagement:** Say or write on a whiteboard/chalkboard: “Finally, we get to eat!’” or “Time to eat!”

**Procedures:**

1. Before beginning this review, set up the beef samples and rendered fat from yesterday’s activity, along with their labels. Include the prices of each type of ground beef.
2. When students arrive, instruct them to do a “gallery walk,” observing and comparing the differences between the samples.
3. Optional: Grill the remaining beef outdoors. Offer burger buns and fixings, then cut each burger into fourths so students can taste the different lean-to-fat ratios. Discuss.
4. Have students complete the “What I Learned” section of the Beef Comparison Form.

5. Ask students to consider all the information they've learned and decide which lean-to-fat ratio of ground beef they would use for each dish:
    - Spaghetti
    - Meatballs
    - Hamburgers
    - Hot dish
    - Tacos

**Vocabulary:**

- **Grain-Fed**: beef raised either primarily on grain or finished on grain. Most cattle are finished on grain, so they can be more tender, juicier, and have more marbling.
- **Grass-Fed:** the beef has been raised on grass for its entire life. It is usually leaner, so it is less fatty and healthier. This also means it might be tougher with less marbling.
- **Marbling**: a mixture of fat and lean through the meat that is created by the nutrition and genetics of the animal. Marbling makes the meat more tender, juicy, and flavorful
- **Primal cuts**: a section of beef cut from the main carcass
- **Retail cuts**: beef cut from the primal sections and sold directly to the consumer
- **Quality Grade**: a combination of factors used to assess the flavor, tenderness, and juiciness of beef. The beef quality grades are Prime, Choice, Select, Standard, Commercial, Cutter & Canner. Prime has the most quality as well as the most fat.
- **Yield Grade**: Created by an estimate of lean meat versus fat from the primal cuts, the yield grades are 1-5, with 1 being the leanest meat and 5 being the fattiest, and age.

**Career Information:** Meat Inspector
Meat inspectors examine products such as beef, pork, seafood, and poultry before packaging. They ensure that it meets safe processing guidelines and is of good quality. They examine animals before and after harvesting. They check for disease or health issues that might be a concern. Meat inspectors also check specific cuts of meat before packaging. They make sure that anything that is not healthy or remains from harvest is destroyed properly.

**Assessment:** This activity can be assessed with a civil discourse, survey, Quizlet, or other interactive format to encourage discussion and reinforce learning.

**Kansas Standards:**
***Next Generation Science***
9th-12th Grade
Structure and Properties of Matter
HS-PS2-6. Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.

Engineering Design
HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

***LEAD FCS***
8.0 Food Production and Services
8.1 Analyze career paths within the food production and food services industries.
8.1.6 Analyze the role of professional organizations in food production and services.
8.3 Demonstrate industry standards in selecting, using, and maintaining food production and food service equipment.
8.3.6 Identify a variety of types of equipment for food processing, cooking, holding, storing, and serving.
8.5 Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.
8.5.4 Apply the fundamentals of time, temperature, and cooking methods to cooking, cooling, reheating, and holding of a variety of foods.
8.5.5 Prepare various meats, seafood, and poultry using safe handling and professional preparation techniques.
9.0 Food Science, Dietetics, and Nutrition
9.7 Demonstrate principles of food biology and chemistry.
9.7.1 Explain the properties of elements, compounds, and mixtures in foods and food products.
9.7.2 Analyze the effects of thermodynamics on chemical reactions in foods and food products.
9.7.7 Analyze the impact of food presentation methods and techniques on nutrient value, safety, and sanitation, and consumer appeal of food and products.
14.0 Nutrition and Wellness
14.3.4 Evaluate policies and practices that impact food security, sustainability, food integrity, and nutrition and wellness of individuals and families.
14.4 Evaluate factors that affect food safety from production through consumption.
14.4.3 Analyze how changes in national and international food production and distribution systems influence the food supply, including sustainability, organic food production, and the impact of genetically modified foods.
14.4.4 Investigate federal, state, and local inspection and labeling systems that protect the health of individuals and the public.
14.5 Evaluate the influence of science and technology on food, nutrition, and wellness.
14.5.1 Investigate how scientific and technical advances influence the nutrient content, availability, and safety of foods.

***Language Arts***
9th-10th Grade
Writing
Research to Build and Present Knowledge
W.9-10.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.
Speaking and Listening
Comprehension and Collaboration

SL.9-10.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9-10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

11th-12th Grade
Informational Reading
Integration of Knowledge and Ideas
RI.11-12.7 Integrate and evaluate multiple sources of information presented in media or formats as well as in words in order to address a question or solve a problem.
Writing
Research to Build and Present Knowledge
W.11-12.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.
SL.11-12.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.

**National Agricultural Literacy Standards:**

***Plants and Animals for Food, Fiber, and Energy***

- (T2.9-12 c.) Discuss reasons for government's involvement in agricultural production, processing, and distribution
- (T2.9-12 e.) Identify inspection processes associated with food safety regulations

***Food, Health, and Lifestyle***

- (T3.9-12 a.) Accurately read labels on processed food to determine nutrition content
- (T3.9-12 c.) Describe the nutritional value that can be added by processing foods
- (T3.9-12 e.) Explain food labeling terminology related to marketing and how it affects consumer choices (e.g., natural, free-range, certified organic, conventional, cage-free, zero trans-fat, sugar-free, reduced calorie)
- (T3.9-12 f.) Explain how food production systems are influenced by consumer choices

***Science, Technology, Engineering, and Mathematics***

- (T4.9-12 g.) Provide examples of how processing adds value to agricultural goods and fosters economic growth both locally and globally

***Culture, Society, Economy, and Geography***

- (T5.9-12 d.) Describe essential agricultural careers related to production, consumption, and regulation
- (T5.9-12 i.) Explain the role of government in the production, distribution, and consumption of food
- (T5.9-12 j.) Provide examples of how changes in cultural preferences influence production, processing, marketing, and trade of agricultural products

## Supporting Resources:

Beef Life Cycle Poster https://ksagclassroom.org/supporting-resources/beef/

Cattle Fun Facts Poster https://ksagclassroom.org/supporting-resources/cattle-fun/

Food Safety 101 Poster https://ksagclassroom.org/supporting-resources/foodsafety/

“How Lean Is Your Dollar?” Lesson by University of Nebraska Lincoln
https://alec.tennessee.edu/alec/wp-content/uploads/sites/40/2020/01/How-Lean-is-your-dollar-lesson-plan.pdf

Jacob Alava: How to Make Ground Beef Low Fat
https://www.youtube.com/watch?v=S-CrxWb4p7s

The Raw Truth About Beef Website https://rawtruthaboutbeef.com/

WCCO - CBS Minnesota: How Is Fat In Ground Beef Measured?
https://www.youtube.com/watch?v=HntT391-gIQ

WTHR: Understanding meat labels | What’s the Deal?
https://www.youtube.com/watch?v=ElNdnL1jJ94

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**References:**


Food Safety and Inspection Service. (2024). *FSIS guideline on substantiating animal-raising or environment-related labeling claims* (FSIS-GD-2024-0006, pp. 13, 24). U.S. Department of Agriculture. https://www.usda.gov/sites/default/files/guidance-documents/FSIS.%20FSIS%20Guideline%20on%20Substantiating%20Animal-Raising%20or%20Environment-Related%20Labeling%20Claims.pdf

Food Safety and Inspection Service. *Ground Beef and Food Safety.* (n.d.). Retrieved June 23, 2026, from https://www.fsis.usda.gov/food-safety/safe-food-handling-and-preparation/meat/ground-beef-and-food-safety

*Industry economics*. Kansas Livestock Association. (n.d.). Retrieved June 23rd, 2026, from https://www.kla.org/resources/industry-economics

Name: _____

# Ground Beef Labels

Read the label on the ground beef assigned to your group and complete the empty spaces behind the correct % lean.

| % Lean | % Fat | Total Fat | Saturated Fat | Trans Fat | Calories | Cholest-erol | Sodium | Carbo-hydrates | Protein | Calcium | Iron |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 73% | | | | | | | | | | | |
| 80% | | | | | | | | | | | |
| 85% | | | | | | | | | | | |
| 90% | | | | | | | | | | | |
| 93% | | | | | | | | | | | |

Gather information from other groups' posted chart and complete the rest of the rows above. What did you notice about each of the following?

1. Fat?

_____

2. Calories?

_____

# Ground Beef Labels

3. Cholesterol?

_____

4. Sodium?

_____

5. Carbohydrates?

_____

6. Protein?

_____

5. Calcium?

_____

6. Iron?

_____

5. What information did not seem to follow the general rule of the other parts of the chart?

_____

6. Hypothesis: Just looking at this information, what percent lean ground beef would you buy? Why?

_____

_____

_____

Name: _____

# Ground Beef Comparison Chart

The types of ground beef that will be used in this experiment are 93/7, 90/10, 85/15, 80/20, and 73/27. Use these options to complete the first row of the graph below. The answers can be used more than once. The second row will be blank until the end of the cooking.

| | Most Nutritious | Fattest | Leanest | Most Flavorful | Least Expensive |
|---|---|---|---|---|---|
| **Hypothesis:** | | | | | |
| **What I Learned:** | | | | | |

## Meat Safety Tips

**Clean:** Wash hands and surfaces often.
**Separate:** Don't cross-contaminate.
**Cook:** Cook to proper temperatures, checking with a food thermometer.
**Chill:** Refrigerate promptly.

Name: _____ Date: _____

# Ground Beef Experiment Instructions

## How Much Fat is Really Found in Ground Beef?

Read the % lean from the ground beef label assigned to your group. Observe the meat and list whether it seems to have tons, some, or little fat with the meat. Place the % fat and tons, some, or little, on the rows behind the amount of lean meat from your group. Divide the beef into four mostly equal parts. Use the scale to weigh one part. Then complete the following rows for your group. While cooking, answer the questions below.

| % Lean | % Fat | Fat observations | Ounces before cooking | Ounces after cooking | Amount of fat from cooking | % Lean from cooking |
|---|---|---|---|---|---|---|
| 73% | | | | | | |
| 80% | | | | | | |
| 85% | | | | | | |
| 90% | | | | | | |
| 93% | | | | | | |

Hypothesize:

1. What do you think the ground beef will weigh after cooking?

   _____

2. What do you think the fat will weigh after cooking?

   _____

3. Will other groups get more or less fat from their experiment? Why or why not?

   _____

# Ground Beef Experiment Instructions

**Follow the directions below to find out how much fat is truly in the ground beef from your group.**

**For this experiment, you will need:**

- Ground beef
- Glass beaker or jar
- Paper plate
- Electric frying pan or hot plate with skillet
- Scale
- Pot holders
- Paper towels
- Wooden spoon
- Slotted spoon
- Plastic gloves

**Directions:**

1. Heat the pan on medium high.
2. Put on gloves. Add the pre-weighted ground beef to the pan. Use a wooden spoon to break the meat apart.
3. Continue cooking the beef, breaking it into smaller pieces as it browns and bubbles.
4. When fully browned, remove the pan from the heat.
5. Prepare to measure fat: Place paper towels on the scale and record their weight. Paper towel weight: _____
6. Using a slotted sppoon, transfer the cooked ground beef from the pan onto the paper towels.
7. Weigh the beaker or jar that you will use for the fat. Beaker/jar weight: _____
8. Pour the melted fat from the pan into the beaker/jar.
9. Record the weight of the beaker/jar with the fat. Beaker + fat weight: _____
10. Weigh a paper plate. If the scale registers a weight, tare it or record it here: _____
11. Using the slotted spoon, move the cooked meat from the paper towels to the paper plate. Try to collect all small pieces.

# Ground Beef Experiment Instructions

12. Weigh the plate with the cooked meat. Record the cooked meat weight on the chart.
13. Weigh the greasy paper towels and record the fat absorbed. Greasy paper towel weight: _____
14. Calculate total fat: Add the fat from the beaker/jar to the fat on the paper towels. Record the total on your chart.
15. Label the beaker/jar with:
    - The % fat the ground beef was supposed to have
    - The actual fat weight (in ounces) that you measured
16. Weigh the cooked meat. Compare the weight of the raw meat with that of the cooked meat. What is the difference in weight between the two? _____

| Meat lean to fat? _____ | Fat | Ground Beef |
|---|---|---|
| % on label | | |
| Actual weight | | |

17. Finally, find the weight of a ¼ pound burger, divided by 25. _____