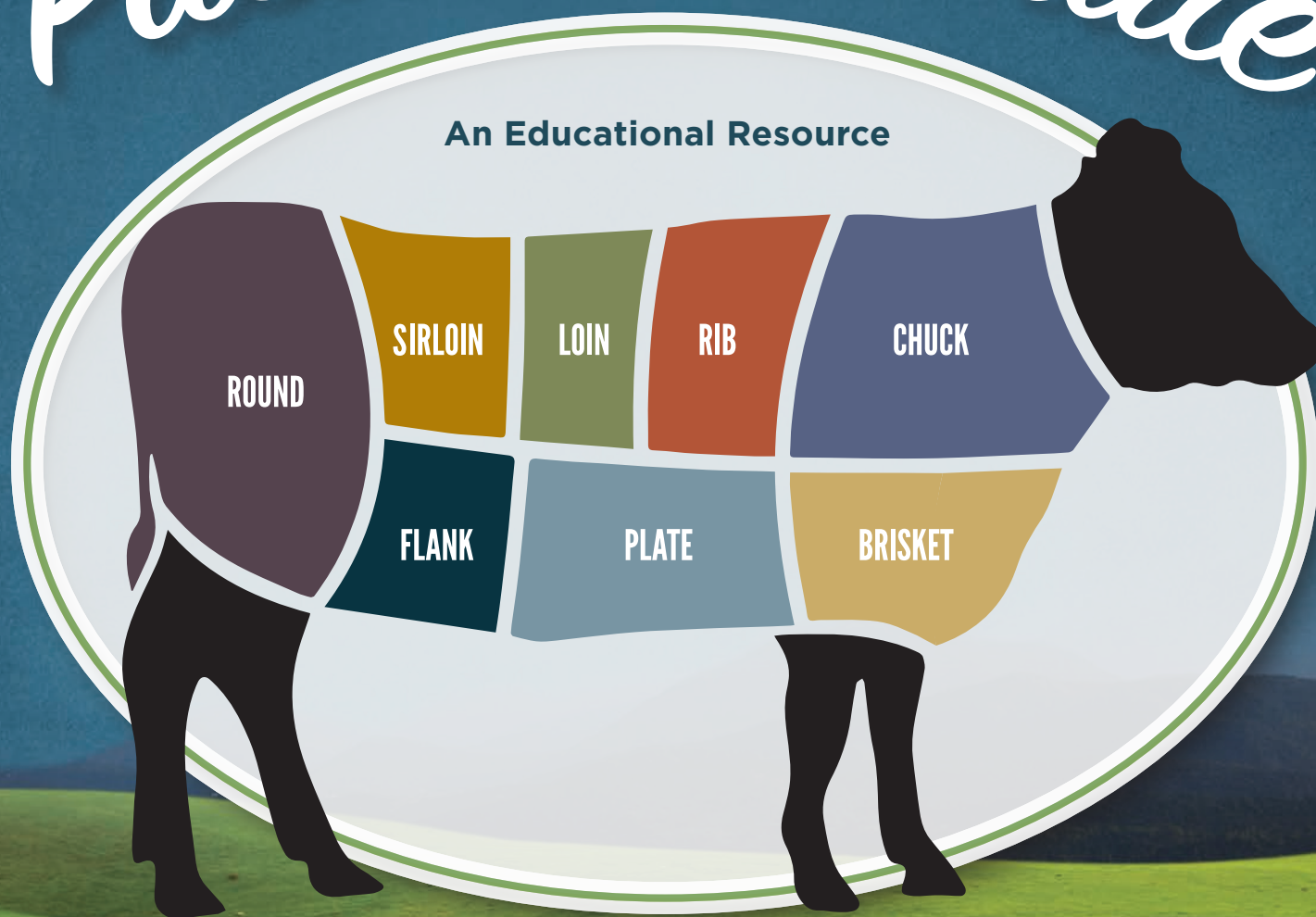


TRUE BEEF:

Pasture to Plate

An Educational Resource



AMERICAN FARM BUREAU
FOUNDATION FOR AGRICULTURE



Funded by the Beef Checkoff.

Brought to you by the American Farm Bureau Foundation for Agriculture® (a contractor to the Beef Checkoff)
www.agfoundation.org in partnership with the Texas Beef Council www.beef.org.

Welcome to the educator's guide for "True Beef: From Pasture to Plate!" We are glad you are here. Before you jump in, take a moment to familiarize yourself with the resources available.



HOW DO I GET THE VIDEO?

The lesson plans in this guide support learning with David Barrow's and Pflugerville ISD's documentary "True Beef: From Pasture to Plate." There are two ways to get the documentary:

- Purchase and download on Vimeo at vimeo.com/ondemand/truebeef.
- Order a DVD copy in the Foundation store at <https://www.dmsfulfillment.com/FarmBureau>.



WHO IS THE TARGET AUDIENCE?

These lessons were designed with high school culinary arts educators in mind. However, STEM connections have been included for all lessons making it easy for educators across the curriculum to adapt learning to various classrooms.



HOW LONG WILL THIS TAKE?

Each lesson is designed for a 45–90 minute class period, however activities can be extended to fill a longer class period. In a culinary class, each lesson is intended to introduce a unit of instruction. You will find that these lessons provide the pasture to plate context for a variety of culinary techniques. The specific cooking techniques, however, are not covered in these lessons. This gives you the flexibility to teach the specific culinary techniques you want to teach in your program. Check out the suggested planning guide on page 1 for a quick reference guide.

LOOKING FOR MORE RESOURCES?

Be sure to check out www.beef.org, www.beefitswhatsfordinner.com/ and www.beeffoodservice.com for resources on food preparation, recipes, nutrition, and safety.

BROUGHT TO YOU BY:



Funded by the Beef Checkoff.

A CONTRACTOR TO THE BEEF CHECKOFF

The Beef Checkoff Program funded development of this educator guide. The Beef Checkoff Program, MyBeefCheckoff.com, was established as part of the 1985 farm bill. The checkoff assesses \$1 per head on the sale of live domestic and imported cattle, in addition to a comparable assessment on imported beef and beef products. In states with qualified beef councils, states may retain up to 50 cents of the dollar and forward the other 50 cents per head to the Cattlemen's Beef Promotion and Research Board, which administers the national checkoff program, subject to USDA approval.

TRUE BEEF: SUGGESTED PLANNING GUIDE

TRUE BEEF DOCUMENTARY CHAPTERS	LESSON	LESSON OBJECTIVES	SUGGESTED TOPICS TO ADDRESS IN SUBSEQUENT CLASS PERIODS
CHAPTER 1: TRUE BEEF	Agriculture in America	- Students will be able to describe the economic impact of American agriculture, specifically the beef industry. - Students will identify careers related to the agriculture industry and culinary arts.	- Invite a guest speaker from the agriculture industry. - Connect with a meat buyer from a local restaurant or grocery store.
CHAPTER 2: OVERVIEW OF BEEF PRODUCTION	From Pasture to Plate	- Students will be able to describe the key steps in the beef lifecycle. - Students will be able to articulate key nutrition information related to beef food products.	Plan a field trip to a local cattle ranch or beef-processing facility.
CHAPTER 3: FFA AND AG IN THE CLASSROOM	On the Ranch	- Students will define sustainability by its three dimensions (i.e., environmental, economic, and social). - Students will categorize specific production practices by the dimensions of sustainability.	- Connect with a local 4-H (4-h.org) or FFA (ffa.org) agriculture program. - Invite a guest speaker to talk to your class. Find one at the Natural Resources Conservation Services at nrcs.usda.gov.
CHAPTER 4: TOURING THE RANCH			
CHAPTER 5: THE ART OF BUTCHERY	The Art of Butchery	- Students will identify primal, sub-primal, and fabricated beef cuts. - Students will explore the tenderness ranking and flavor attributes and describe why certain cuts of beef have certain attributes.	- Introduce students to common butchery tools. - Introduce students to common butchery equipment / machinery. - Have students demonstrate safe protocols when handling butchery equipment.
CHAPTER 5: THE ART OF BUTCHERY	Basic Cookery and Safety	- Students can categorize cooking methods into dry heat and moist heat. - Students identify the three steps for each cooking method. - Students create descriptions of beef dishes that include nutritional information, safe cooking temperature, and a description of the cooking method.	- Facilitate applied labs using dry and moist heat techniques. - Utilize recipes that demonstrate dry and moist heat cooking methods

(continued)

TRUE BEEF: SUGGESTED PLANNING GUIDE

TRUE BEEF DOCUMENTARY CHAPTERS	LESSON	LESSON OBJECTIVES	SUGGESTED TOPICS TO ADDRESS IN SUBSEQUENT CLASS PERIODS
CHAPTER 6: SAUSAGE MAKING	Ground to Perfection	- Students will be able to identify the steps in the sausage production process. - Students will be able to identify safety procedures specific to handling ground beef.	- Facilitate labs allowing students to demonstrate safe handling of ground meat - Facilitate an applied sausage making lab.
CHAPTER 7: BURGER CHALLENGE	Burger Challenge	- Students will differentiate between the types of ground beef. - Students will explain how to safely handle ground beef. - Students will create a recipe for their perfect burger.	- Demonstrate safe handling of ground meat. - Facilitate additional burger-making applied labs. - Complete a “burger challenge”.
CHAPTER 8: THE ART OF BBQ	The Art of BBQ	Students will be able to demonstrate strategies for analyzing marbling / fat content.	- Facilitate an applied lab using BBQ equipment. - Have students demonstrate preparation of steaks and briskets.
CHAPTER 9: TEXAS PRO START		To conclude the True Beef experience, watch Chapters 9–11 and consider hosting your own True Beef cooking challenge with your class. For information on the beef industry in your area, visit the Federation of State Beef Council at beefusa.org/qualifiedstatebeefcouncils.	
CHAPTER 10: TRUE BEEF COOKING CHALLENGE			
CHAPTER 11: TRUE BEEF			
FINAL REVIEW			



AGRICULTURE IN AMERICA

Understanding the Food Production System

Lesson Length: 45 minutes

Texas Essential Knowledge and Skills (TEKS):

- 130.226.5. Student examines jobs available in the food service industry and accesses career opportunities
- 130.226.5D. Establish personal short-term and long-term goals
- 130.226.2A. Create formal and informal presentations

FACS National Standards:

- 8.1.1 Explain the roles, duties, and functions of individuals engaged in food production and service careers.
- 8.1.4 Analyze the effects of food production and services occupations on local, state, national, and global economies.

Learning Objectives:

- Students will be able to describe the economic impact of American agriculture, specifically the beef industry.
- Students will identify careers related to the agriculture industry and culinary arts.

Materials and Equipment Needed:

- TV or projector to play Chapter 1 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Note: If playing the downloaded version of the documentary, the time count for this chapter is 00:00–09:13.
- Lesson 1 Handout – Attached (one per student)
- Whiteboard
- Index Cards (six)
- Flip Chart or Tear Sheet

Cross-Curricular Connections

Use these suggested adaptations to make learning across the curriculum easy!

Science	Technology
Read and report on beef research found at beefresearch.org .	Create a timeline of technological changes that have advanced agricultural production in the U.S. using the information found at agclassroom.org/gan/timeline .
Engineering	Mathematics
Research how Dr. Temple Grandin's work on animal behavior has affected the engineering design of livestock facilities using the information found at grandin.com .	Evaluate agriculture statistics for your state using usda.gov/data-products/state-fact-sheets .

Teacher Preparation:



Preview Chapter 1 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate."

- Make one copy per student of the Lesson 1 Handout.

Introduction (*Set Context for Activity*):

- **Step 1:** Break students into teams of three to five and ask them to imagine they have just entered a chocolate contest. The goal is to develop the best chocolate dessert. Ask teams to brainstorm how they would start. This should be a quick activity. Give students approximately one minute to brainstorm.

(continued)



AGRICULTURE IN AMERICA

Understanding the Food Production System

- Ask student teams to share their ideas. Listen for students to identify strategies for sourcing the best chocolate.
 - **Transition:** *Great thinking! Let's pay attention to how you focused on sourcing the best chocolate for your recipe. We often think of this important step with specialty foods, but what about the food items we use every day? Understanding where our food ingredients come from, how they are produced, and who produced them is important. We live in a nation abundant with food production, but what do we know about how it is produced?*
 - **Preview:** *We are about to embark on a journey of discovery into the beef industry using Pflugerville ISD's (2016) student-led documentary, "True Beef: From Pasture to Plate." In this lesson, we will explore the agriculture industry so that you can confidently buy, prepare, and consume food while understanding where it came from.*
- Body (Main Content):**
- **Step 2:** Play Chapter 1 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." As the documentary plays, ask student teams to listen for key words that stand out. Ask teams to share after the segment has finished.
 - **Transition:** *The agriculture industry is built around a team concept. We each work to do our part to provide a product or service that contributes to the greater good. Farmers, ranchers, processors, transporters, and chefs all take pride in the work they do.*
 - **Step 3:** Give each student a copy of the Lesson 1 Handout. Direct students' attention to the top half of the handout titled, "Agriculture in America." Divide students into two teams. Inform teams that you will display a series of numbers on the whiteboard. The goal is for teams to race to place the numbers in the correct blanks on their handouts. The first team to successfully complete the task wins.
 - Ask for clarifying questions.
 - Give teams one minute to preview the handout.
 - Display the following numbers:
 - 1,000,000
 - 168
 - 97
 - 10
 - 2
 - Compare teams' work to the following answer key by the American Farm Bureau Federation (2015):
 - Farm and ranch families make up less than 2% of the U.S. population.
 - Americans spend 10% of their disposable income on food each year, while those in other countries spend much more.
 - One U.S. farm feeds 168 people.
 - Total land in farms in the U.S. has decreased 1,000,000 acres since 2007.
 - 97% of U.S. farms are family owned.
 - **Transition:** *The agriculture industry is all around us and is a major contributor to our economy. In this unit, we will be focusing specifically on the beef industry, so let's take a closer look at that industry sector.*
 - **Step 4:** To introduce this content to students, play a fast-paced game of High-Low.
 - Give each team three index cards. Ask teams to write the following in large print, one on each card: +, -, =
 - Explain the rules. You will read / display a fact about the beef industry. Teams will quickly come to a consensus if the numerical fact presented is too high (+), too low (-), or correct (=). Teams will hold up the corresponding card to indicate their choice.
 - One point will be scored for each correct response. There will be 10 facts reviewed.
 - **Transition:** *As we jump into the final challenge of our day, keep these statistics in mind. The beef industry is a prominent part of our society and food system. Now let's shift to thinking about the careers that are connected to the beef industry.*

(continued)



AGRICULTURE IN AMERICA

Understanding the Food Production System

READ THESE STATEMENTS FROM THE NATIONAL CATTLEMAN'S BEEF ASSOCIATION (2017).	CORRECT STUDENT RESPONSE	ACTUAL ANSWER
1. There are 915,000 cattle and calf operations in the US.	=	SAME
2. The average herd size in the U.S. is 100 .	+	40
3. The average age of beef cattle ranchers is 40 years old.	-	58.3
4. The number of cattle and calves in the US as of Jan 1, 2016 was 92 million .	=	SAME
5. Texas is the number one producing cattle state.	=	SAME
6. The total U.S. beef consumed in 2015 was 10 billion pounds.	-	24.8 billion
7. Mexico is the number one export market for US Beef.	+	Mexico is number two, Japan is number one
8. The economic impact of the beef industry in the U.S. is \$50 billion .	-	\$88.25 billion
9. The average price of beef in 2015 was \$10/pound .	+	\$6.29/ pound
10. The number of beef animals processed for meat in 2015 was 2 million .	-	28.74 million

- **Step 5:** Refer students to the bottom half of the lesson handout titled, "Careers in Beef Production from Pasture to Plate." Inform students that, for the duration of the True Beef experience, they will imagine a rancher has donated an entire beef animal for their use. The animal is currently on a feedlot eating a nutritious ration to finish the animal perfectly to provide delicious meat.
 - On this sheet of paper, create a mind map around the animal brainstorming as many careers as you can think of that have gone into raising the animal to this point.
 - Share responses and have students add to their maps.
 - Save this handout and continue to add careers throughout the unit.

Wrap-Up (Review, Assess, Challenge):

- **Step 6:** Bring students back together as a whole class. Ask students to individually identify one piece of information that surprised them and one question they still have. Have students share. Collect questions on a flip chart or tear sheet. Hang this in the

classroom. Use these questions to guide discussion in subsequent lessons.

- **Step 7:** Have students think back on the chocolate challenge scenario posed at the start of class. Challenge students to keep an open mind and have an investigative spirit as they seek to understand the American food production system.

Internal links within this document are funded and maintained by the Beef Checkoff. All other outgoing links are to websites maintained by third parties.

References:

American Farm Bureau Federation. (2015). *Food and farm facts*. Washington, DC: AgEducate.

National Cattleman's Beef Association. (2017). *Beef industry statistics*. Retrieved from <http://www.beefusa.org/beefindustrystatistics.aspx>

Pflugerville ISD (Producer), & Barrow, D. (Director). (2016). *True beef: From pasture to plate* [DVD]. Available from <https://vimeo.com/ondemand/truebeef>

Agriculture in America Handout

Agriculture in America

Farm and ranch families make up less than _____ of the U.S. population.

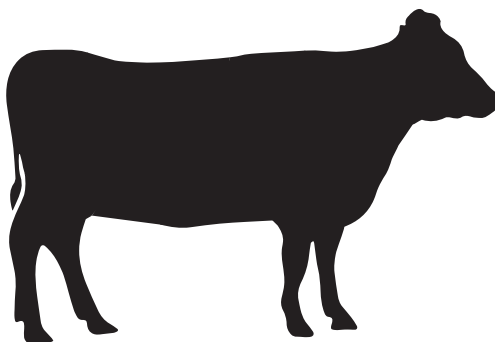
Americans spend _____ of their disposable income on food each year,
while those in other countries spend much more.

One U.S. farm feeds _____ people.

Total land in farms in the U.S. has decreased _____ acres since 2007.

_____ of U.S. farms are family owned.

Careers in Beef Production: From Pasture to Plate





FROM PASTURE TO PLATE

Understanding the Beef Lifecycle and Key Nutrients

Lesson Length: 45 minutes

Texas Essential Knowledge and Skills (TEKS):

- 130.226.1D. Understand scientific principles used in culinary arts
- 130.226.11A. Understand the basics of nutrition
- 130.226.2A. Create formal and informal presentations

FACS National Standards:

- 9.3.2 Analyze nutritional data.
- 9.3.6 Critique the selection of foods to promote a healthy lifestyle.

Learning Objectives:

- Students will be able to describe the key steps in the beef lifecycle.
- Students will be able to articulate key nutrition information related to beef food products.

Materials and Equipment Needed:

- TV or projector to play Chapter 2 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Note: If playing the downloaded version of the documentary, the time count for this chapter is 09:14–14:00.
- Whiteboard
- Straws
- Dental Floss
- Paper Clips
- Ear Tag Cards – Attached
- Money Cards – Attached
- Lifecycle Cards – Attached (one set per group)
- "The Beef Lifecycle" Poster (print or project) – Teacher Preparation Section (one per student/class)

Cross-Curricular Connections

Use these suggested adaptations to make learning across the curriculum easy!

Science	Technology
Create a healthy meal plan using beef. Check out choosemyplate.gov to discover your nutrition needs. Next, visit beefretail.org for more nutrition information.	Research common vaccines used in beef cattle production, their purpose, and requirements.
Engineering	Mathematics
Design a prototype farm set up to safely raise and move cattle.	Research and document local cattle market prices using cattle.com/markets .

Teacher Preparation:



Preview Chapter 2 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate."

- Print Ear Tag Cards and punch a hole in each. Print Money Cards and Lifecycle Cards. Group by team.
- Prepare straw hooks (one per student) as follows: Tie/tape a 4–6" piece of dental floss to the end of each straw. Hang one open paper clip (resembling a hook) to the end of the floss. You may wish to engage students in a previous class period to prepare these hooks.
- Make one copy per student or prepare to project Facts About Beef's (2014) "The Beef Lifecycle" poster found at factsaboutbeef.com.

(continued)



FROM PASTURE TO PLATE

Understanding the Beef Lifecycle and Key Nutrients

Introduction (*Set Context for Activity*):

- **Step 1:** Ask students how beef gets from pasture to plate. Have students consider and then share what they know out loud. Capture notes on the whiteboard.
 - **Preview:** *Today we will discover the key steps in the beef lifecycle so that we can more confidently purchase, prepare, and deliver quality beef products to others. We'll also dig into the nutritional qualities of beef so that we can easily communicate this with others.*

Body (*Main Content*):

- **Step 2:** Play Chapter 2 of the documentary, "True Beef: From Pasture to Plate." As students watch this chapter, have them look for information that validates what they thought about the beef production process and information that corrects misconceptions.
 - After viewing this chapter, ask students to share their observations. Add to the list on the whiteboard and make corrections to previous ideas as necessary.
- **Step 3:** Use Facts About Beef's (2014) "The Beef Lifecycle" poster to quickly review the key steps in beef production.
 - **Cow-Calf:** Cows are bred and calves are born and raised every year on cow-calf farms and ranches. They spend time grazing on grass pastures within sight of their mothers.
 - **Weaning:** Beef calves are weaned away from their mothers between six and eight months of age.
 - **Livestock Auction Markets:** Many calves leave the farm or ranch where they were born and are sold at livestock auction markets to stockers and backgrounders between six and twelve months of age.
 - **Stockers and Backgrounders:** Between six and twelve months of age, cattle spend time at stocker and backgrounder farms and ranches where they graze on a variety of pastures. Here they gain weight and convert forage and grass into lean protein.
- **Feedyard:** Cattle spend four to six months at a feedyard being fed a scientifically-balanced diet and receiving daily care. Some spend the rest of their lives on a pasture being grass finished.
- **Packing Plant:** Cattle are sent to a packer/processing facility to be slaughtered and processed. Then the beef is distributed to supermarket retailers and restaurants.
- **Supermarkets and Restaurants:** Retailers and foodservice operators sell beef in supermarkets and restaurants.
- **Step 4:** Inform students that they will have a chance to familiarize themselves with the process through a team competition that will follow one beef animal through the beef lifecycle.
 - Break students into teams of six. If need be, pair students up for each role.
 - Give each team a stack of Beef Lifecycle Cards. Each person on the team should take one card. Each Beef Lifecycle Card contains the description of the stage of production as well as a key beef nutrition fact. Give students time to preview their assigned card and ask any clarifying questions.
 - Give each team five Money Cards. Each team member, except the Cow-Calf operator, should hold one Money Card.
 - Give each team member a straw-paper clip hook.
 - Station team members across the room, by team, in order of the Beef Lifecycle stages.
 - Place an Ear Tag Card on a table or counter next to each Cow-Calf operator.
 - Clarify the challenge: Each team will race to carefully move their beef animal (represented by the Ear Tag Card) from the Cow-Calf operation through the Beef Lifecycle. Students will move the ear tag by placing the straw in his or her mouth

(continued)



FROM PASTURE TO PLATE

Understanding the Beef Lifecycle and Key Nutrients

and hooking the ear tag through the hole. At each point in the process, the student will hand off the Ear Tag Card to the next student using only the straw hooks. The person receiving the animal will hand one Money Card to the person delivering the animal. Ask for clarifying questions.

- Begin the challenge and continue until all teams have completed.
- **Step 5:** Process the activity. *What did you observe? What was challenging? How did money play a role? How do you think this is like the actual beef lifecycle? How is it different?* Listen for students to reflect on the various points where money was exchanged as well as the safety and care necessary when transporting animals.

Internal links within this document are funded and maintained by the Beef Checkoff. All other outgoing links are to websites maintained by third parties.

References:

Facts About Beef. (2014). *The beef lifecycle: From farm to fork*. Retrieved from <https://factsaboutbeef.com/2014/08/27/the-beef-lifecycle-from-farm-to-fork/>

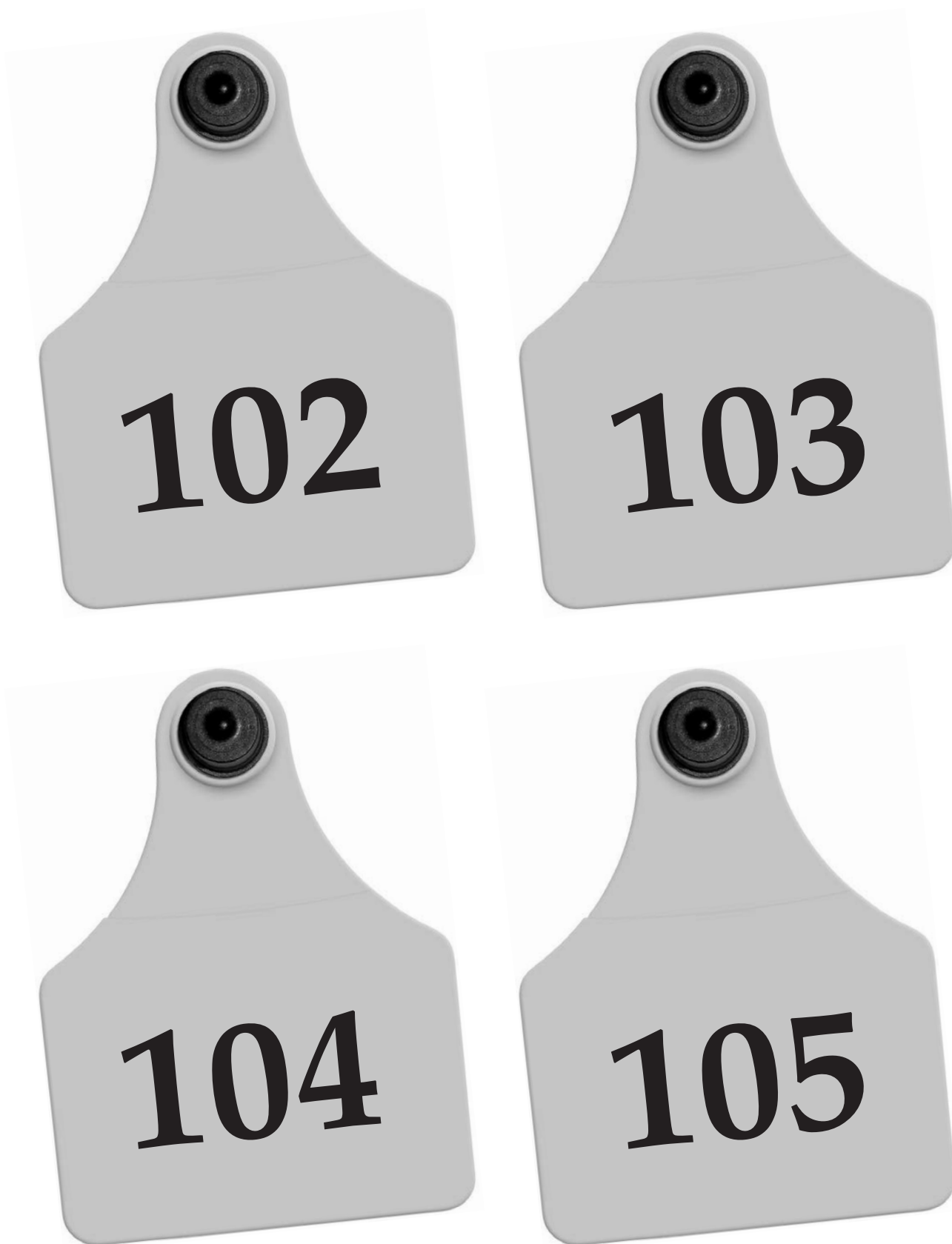
Pflugerville ISD (Producer), & Barrow, D. (Director). (2016). *True beef: From pasture to plate* [DVD]. Available from <https://vimeo.com/ondemand/truebeef>

Wrap-Up (Review, Assess, Challenge):

- **Step 6:** Have student teams regroup and review the key nutrition facts found on each of their Lifecycle Cards. Ask students to imagine that they are a chef in a restaurant famous for preparing beef. A customer asks to speak to the chef and is curious about the nutritional qualities of beef. Prepare a 30-second soundbite explaining some of the key nutritional information about beef.
 - Have teams select one representative to share.
- **Step 7:** Refer to the notes on the whiteboard from the start of the class. Challenge students to continue investigating and learning about the unique processes food items go through from pasture to plate.

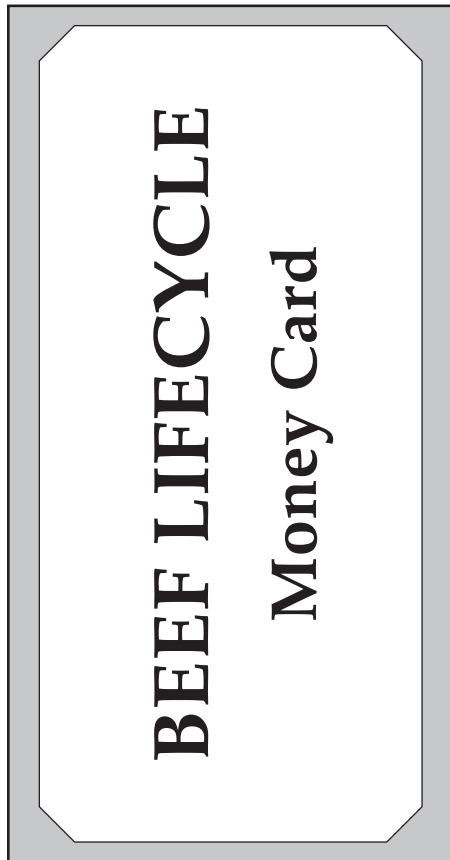
From Pasture to Plate Handout

Ear Tag Cards (1 per team)



From Pasture to Plate Handout

Money Cards (5 Per Team)



From Pasture to Plate Handout

Beef Lifecycle Cards¹

Cow-Calf: Cows are bred and calves are born and raised every year on cow-calf farms and ranches. They spend time grazing on grass pastures within sight of their mothers.

- **Weaning:** Beef calves are weaned away from their mothers between six and eight months of age.

Nutrition Bite: Beef is a powerful protein and an excellent or good source of 10 essential nutrients.

Livestock Auction Markets: Many calves leave the farm or ranch where they were born and are sold at livestock auction markets to stockers and backgrounders between six and twelve months of age.

Nutrition Bite: Many of Americans' favorite cuts, such as T-bone, sirloin steak, and 93% lean ground beef meet government guidelines for lean.

Stockers and Backgrounders: Between six and twelve months of age, cattle spend time at stocker and backgrounder farms and ranches where they graze on a variety of pastures. Here they gain weight and convert forage and grass into lean protein.

Nutrition Bite: A 3-ounce serving of lean beef is only about 155 calories.

Feedyard: Cattle spend four to six months at a feedyard being fed a scientifically-balanced diet and receiving daily care. Some spend the rest of their lives on a pasture being grass finished.

Nutrition Bite: A 3-ounce serving of beef supplies more than 10% of the recommended daily value for protein, B12, zinc, niacin, B6, phosphorus, choline, and riboflavin.

Packing Plant: Cattle are sent to a packer/processing facility to be slaughtered and processed. Then the beef is distributed to supermarket retailers and restaurants.

Nutrition Bite: To choose lean cuts of beef, look for "loin" or "round" in the name.

Supermarkets and Restaurants: Retailers and foodservice operators sell beef in supermarkets and restaurants.

Nutrition Bite: Some cuts of beef are as lean as a 3-ounce skinless chicken thigh!

¹Facts About Beef. (2014). *The beef lifecycle: From farm to fork*. Retrieved from <https://factsaboutbeef.com/2014/08/27/the-beef-lifecycle-from-farm-to-fork/>



ON THE RANCH

Families, Land, Water, and Animals — The Sustainability of Ranching

Lesson Length: 45 minutes

Texas Essential Knowledge and Skills (TEKS):

- 130.226.1D. Understand scientific principles used in culinary arts
- 130.226.2A. Create formal and informal presentations

FACS National Standards:

- 2.2.1 Analyze individual and family responsibility in relation to the environmental trends and issues.
- 2.2.2 Summarize environmental trends and issues affecting families and future generations.
- 2.2.3 Demonstrate behaviors that conserve, reuse, and recycle resources to maintain the environment.

Learning Objectives:

- Students will define sustainability by its three dimensions (i.e., environmental, economic, and social).
- Students will categorize specific production practices by the dimensions of sustainability.

Materials and Equipment Needed:

- TV or projector to play Chapters 3 and 4 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Note: If playing the downloaded version of the documentary, the time count for these chapters is 14:01–27:33.
- Poster Board (one per three to four students)
- Markers (one per student)
- Post-it Notes (ten or more per student)

Cross-Curricular Connections

Use these suggested adaptations to make learning across the curriculum easy!

Science	Technology
Create an infographic that shows the ways the beef industry interacts with the environment. Use Cattleman's Beef Board and National Cattleman's Beef Association's (2014) "Sustainability Executive Summary" found at issuu.com/beefcheckoff as a reference.	Research precision agriculture technology that farmers and ranchers use to improve their efficiency and sustainability.
Engineering	Mathematics
Design a composting system that could help eliminate food waste for your school.	Interpret the graphs and data from Cattleman's Beef Board and National Cattleman's Beef Association's (2014) "Sustainability Executive Summary" found at issuu.com/beefcheckoff .

Teacher Preparation:



Preview Chapters 3 and 4 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate."

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ON THE RANCH

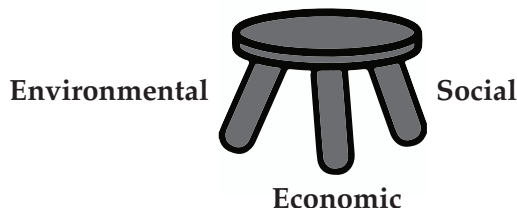
Families, Land, Water and Animals — the Sustainability of Ranching

Introduction (*Set Context for Activity*):

- **Step 1:** Ask students to think of a possession that they own that they really value. Have them capture their example on a piece of paper. Next, ask them to think of specifically what they do to take care of that possession. For example, if they value their vehicle, they might mention that they wash it weekly, take it to get serviced, and keep it full of fuel. Lastly, ask students to think about why they take care of that item and capture their thoughts down. Have students share their responses with a partner. Elicit a few responses from students to share with the entire class.
 - **Transition:** *When we care for something, we take good care of it so it will last a long time. Farmers and ranchers care for their land and animals to make sure that they will continue to hold their value for a long time. Making sure our food supply is sustainable is one of society's greatest challenges. According to Cattleman's Beef Board and National Cattleman's Beef Association (2014) by 2050 70 percent more food will be required to feed the ever-increasing population. To be able to meet this need, farmers and ranchers care for their land, their animals, and the environment.*
 - **Preview:** *Today we will dig deeper into farmers' and ranchers' commitment to sustainability and how that impacts our work in the culinary arts.*
- Agriculture represents more than 9.5 percent of Texas' gross state product.
- Everyone is a farmer; ranchers are growing grass. Everyone is producing something and being a steward of the land.
- Cattle can consume native grass and turn it into animal protein for human consumption.
- Farming is a family tradition, 98 percent of farms in Texas are family- owned and operated.
- Farmers are committed to conservation and improvement of land and improvement of grazing.
- Ranchers do educational tours to share what they do to educate consumers about why they do what they do.
- A feedyard using renewable wind energy.
- Ration that feedyards feed animals can be spent grains (by-products of other industries). Feedyards are some of the biggest recyclers of other industries' by-products.
- **Step 3:** Introduce the definition of sustainability using its three-dimensions.
 - A sustainable food supply includes balancing efficient agricultural production with environmental, economic, and social attributes.
 - The three dimensions of sustainability according to the National Resource Council (2010) are as follows:
 - **Environmental:** Enhance environmental quality and the resource base.
 - **Economic:** Sustain the economic viability of agriculture.
 - **Social:** Enhance the quality of life for farmers, farm workers, and society as a whole.

Body (*Main Content*):

- **Step 2:** Play Chapters 3 and 4 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Before starting the video, instruct students to pay careful attention to the ways that farmers and ranchers care for the land, their animals, and the environment. Have them capture their ideas on Post-it notes. Instruct students to capture one idea per Post-it note.
 - Examples that are presented in the video:
 - Students taking care of their animals while showing them (e.g., keeping them calm in the show ring, washing them, feeding them, etc.).
 - Consumers are interested in where their food comes from, and agriculture is a part of everyone's lives.



(continued)



ON THE RANCH

Families, Land, Water and Animals — the Sustainability of Ranching

- **Step 4:** Break students up into groups of three or four. On a poster board, have each group recreate the three-legged stool image and label each leg with a dimension. Next, have students work together to sort their examples from the video into the appropriate dimensions by sticking the Post-it notes to the corresponding section of the poster. Have students remove duplicate examples as they work.

Wrap-Up (Review, Assess, Challenge):

- **Step 5:** Have each group present their posters to the class. Instruct groups to share one example from each of the three dimensions and justify why they categorized that example in that specific dimension. As groups present, encourage them to pick examples that haven't already been shared. After the last group presents, backfill with the remaining examples as needed.
 - *The beef industry has made substantial progress towards increasing the sustainability of their industry. The examples cited in the movie are just a start! According to Cattleman's Beef Board and National Cattleman's Beef Association (2014), here are a few more examples of how they are improving sustainability through production practices:*
 - Improvements in crop yields
 - Improved management of nutrients on their farms
 - Higher performing cattle through improved genetics and health
 - Improved manure management
 - Biogas recovery at packing house
 - Waste water recovery
 - **Transition:** *While a lot of progress has been made, there is always more that can be done! One of the greatest opportunities is a reduction of food waste. An estimated 40 percent of all food produced in the United States is wasted. According to Cattleman's Beef Board and National Cattleman's Beef Association (2014), this contributes to a loss of efficiency across the entire food*
- *chain and costs the average family \$2,500 per year. As a culinary arts student, you have a real opportunity to help reduce food waste and make our food system and the world more sustainable!*
- **Step 6:** Have students work with a partner to brainstorm a way that they could help reduce food waste as a culinary arts student or as future culinary professional. Have students capture their idea on a piece of paper using pictures and a description. Students can post signs around the room to remind them of their commitment to reduce food waste.
 - Examples:
 - Composting waste from the school cafeteria.
 - Taking expiring foods from grocery stores and donating to food pantries.
 - Only buying the amount of food you eat.
 - **Closure:** *Today we learned how farmers and ranchers care for their land and animals to ensure a sustainable food supply. Remember everyone can work toward this goal. One the biggest ways we can contribute is by committing to reducing food waste!*

Internal links within this document are funded and maintained by the Beef Checkoff. All other outgoing links are to websites maintained by third parties.

References:

- Cattleman's Beef Board and National Cattleman's Beef Association. (2014). *Sustainability executive summary*. Centennial, CO: BeefCheckoff. Retrieved from https://issuu.com/beefcheckoff/docs/sustainability_executivesummaryweb?e=8298940/6720608
- National Research Council. (2010). *Toward sustainable agricultural systems in the 21st century*. Washington, D.C.: The National Academies Press.
- Pflugerville ISD (Producer), & Barrow, D. (Director). (2016). *True beef: From pasture to plate* [DVD]. Available from <https://vimeo.com/ondemand/truebeef>



ART OF BUTCHERY

Beef Cut Identification

Lesson Length: 45 minutes

Texas Essential Knowledge and Skills (TEKS):

- 130.226.1D. Understand scientific principles used in culinary arts
- 130.226.11A. Understand the basics of nutrition

FACS National Standards:

- 9.3.2. Analyze nutritional data.

Learning Objectives:

- Students will identify primal, sub-primal, and fabricated beef cuts.
- Students will explore the tenderness ranking and flavor attributes and describe why certain cuts of beef have certain attributes.

Materials and Equipment Needed:

- TV or projector to play the first part of Chapter 5 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Note: If playing the downloaded version of True Beef, the time count for the section of this chapter to be played is 27:34-35:14.
- 8-10 printed images of beef cuts from "Beef Cuts and Recommended Cooking Methods" found at widencdn.net
- Primal Beef Cuts Puzzle Handout – Attached
- Scissors
- Glue Sticks
- Tape
- Puzzle Solution – Attached
- Beef Cut Cards – Teacher Preparation Section (one set per student)

Cross-Curricular Connections

Use these suggested adaptations to make learning across the curriculum easy!

Science	Technology
Compare the nutritional information of different cuts of beef.	Research technologies, such as irradiation, related to food safety.
Engineering	Mathematics
Research the advancements in automation that have been developed in meat processing.	Research and report on statistical trends of consumption for different cuts of beef.

Teacher Preparation:



Preview the first part of Chapter 5 (0:00-7:39) of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate."

- Choose the eight to ten beef cuts from Cattlemen's Beef Board and National Cattlemen's Beef Association's (2013) poster, "Beef Cuts and Recommended Cooking Methods" found at widencdn.net that your students will interact with the most. Print out images of the beef cuts and cut them out into cards. Collect the different Beef Cut Cards into a set. Make one set of Beef Cut Cards per student. Make one set to keep and number the cards in that set 1-8 (9 or 10).
 - Gather the nutritional, flavor attributes, and tenderness information about the cuts you've chosen from Cattlemen's Beef Board and National Cattlemen's Beef Association's (2015) website, "Interactive Butcher Counter" found at beefitswhatsfordinner.com. You may wish to print this information or have students complete this portion of the investigation.

(continued)



ART OF BUTCHERY

Beef Cut Identification

Introduction (*Set Context for Activity*):

- **Step 1:** Before starting the video, instruct students to pay careful attention to why it is important for culinary arts students to know the cuts of beef and where they come from. Play the first part of Chapter 5 (0:00 – 7:39) of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." After the video is over, have students share their ideas with a partner. Elicit a few examples from the students.
 - Examples presented in the video:
 - The cut affects how you cook the meat.
 - If butchers know the cuts well, they can add value to the meat.
 - As a future professional, if you know the cuts of beef, you'll impress the chef you're working for and be an asset in the kitchen.
- **Preview:** *Today, we'll explore the cuts of beef and their flavor attributes to prepare you to create delicious recipes out of each of them!*
- **Transition:** *A beef carcass is first divided into eight primal cuts. Before you can learn the retail cuts of beef, you need to understand the primal cuts.*
- **Transition:** *Primal cuts are cut into sub-primal cuts. Individual portions created from sub-primal cuts are called fabricated cuts.*
- **Step 3:** Pass out the Beef Cut Cards to students. Instruct students to try to match the cuts to the primal cuts they came from by placing the images on the primal cuts on their puzzle. After all the students have made their guesses, walk through the correct answers with the students. Explain to students the tenderness ranking and flavor attributes of beef cuts are dependent on which primal cuts they are from. Have students glue the cuts around their puzzle and draw lines from each cut to the primal cut it comes from. Then have them capture notes on the completed Primal Beef Cuts Puzzle Handout about the tenderness ranking, flavor attribute and nutritional information of each cut on their poster.
 - **Transition:** *Now that we have seen it on paper, let's see if we can put our new skills to the test in real life!*

Body (*Main Content*):

- **Step 2:** Pass out a Primal Beef Cuts Puzzle Handout to each student. Have students cut out the primal cuts and then try to match them where they came from on the animal by completing the puzzle. After students have finished working, show students the Puzzle Solution handout page 1, with completed puzzle diagram to ensure they placed the cuts in the right places. Then show them page 2 of the Puzzle Solution Handout and point out where the primal cuts are located on the picture of the carcass and the picture of the live animal.
- **Step 5:** Lay out the numbered Beef Cut Cards on a table. Tell students to label a piece of paper "1" through however many Beef Cut Cards you chose on the left-hand side. Let them know their task will be to walk around the table and capture the names of the cuts on their paper. They should work independently and be timed. After the time limit has expired, walk through the correct answers with students. Their answers can be collected as an assessment.
 - **Closure:** *Today we got real practice identifying cuts of meat and where they come from. This will serve you well as you determine how to cook these cuts of meat and in your future careers in the culinary arts!*

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ART OF BUTCHERY

Beef Cut Identification

References:

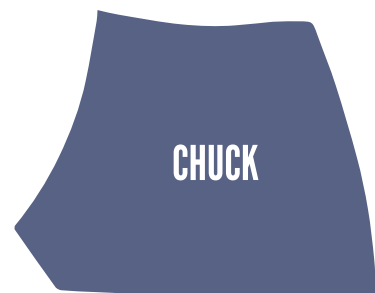
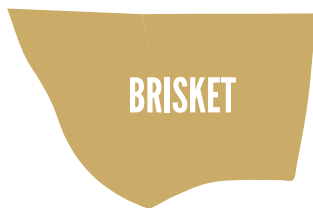
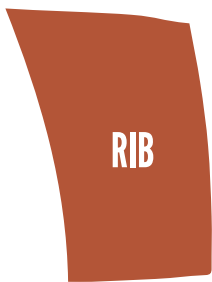
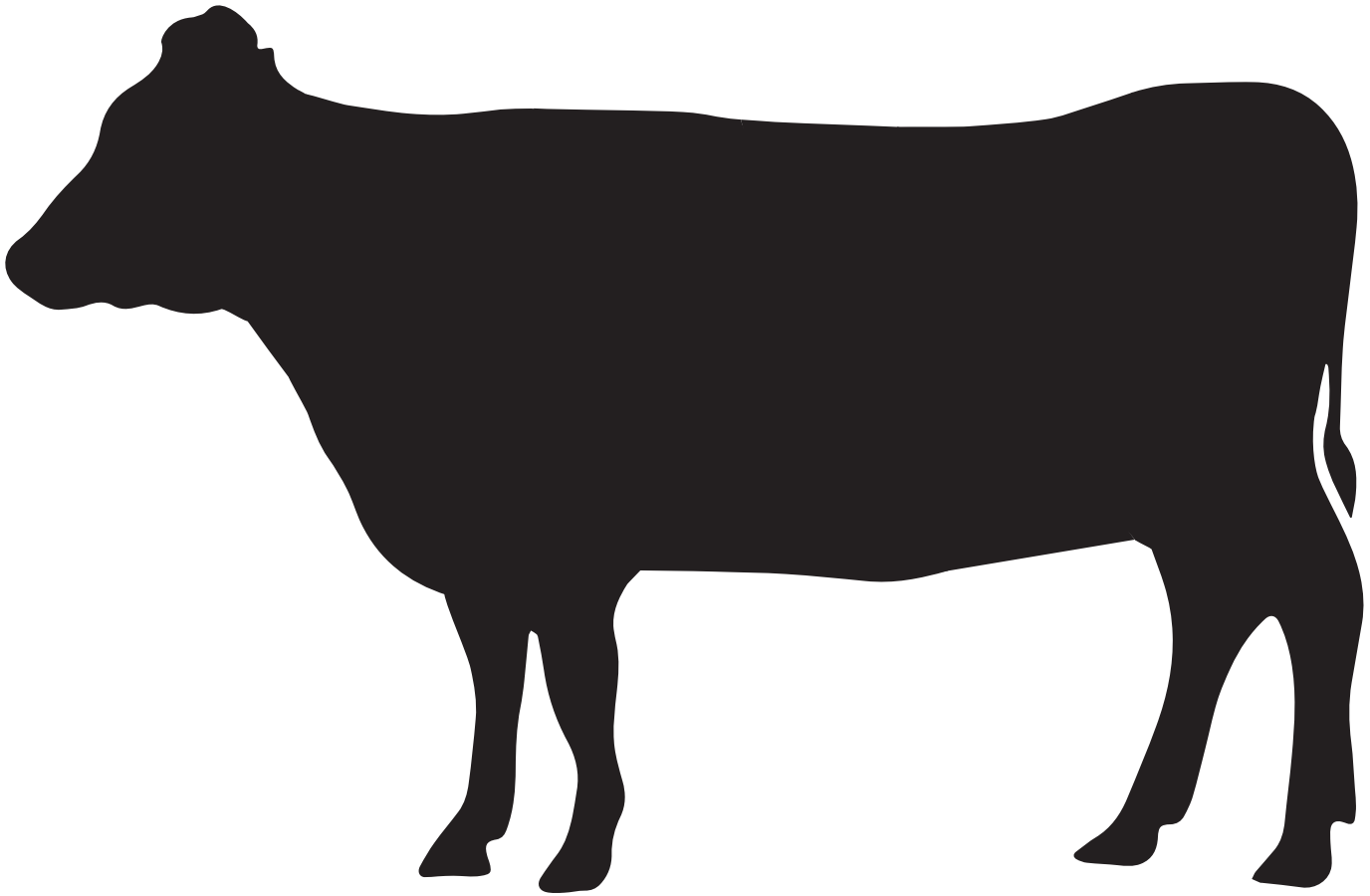
Cattlemen's Beef Board and National Cattlemen's Beef Association. (2013). *Beef cuts and recommended cooking methods*. Centennial, CO: Beef Checkoff. Retrieved from https://p.widencdn.net/fg5cim/PDF-Beef-Cut-Chart_Poster_Final

Cattlemen's Beef Board and National Cattlemen's Beef Association. (2015). *Interactive butcher counter*. Centennial, CO: Beef Checkoff. Retrieved from <http://www.beefitswhatsfordinner.com/butchercounter.aspx#start>

Pflugerville ISD (Producer), & Barrow, D. (Director). (2016). *True beef: From pasture to plate* [DVD]. Available from <https://vimeo.com/ondemand/truebeef>

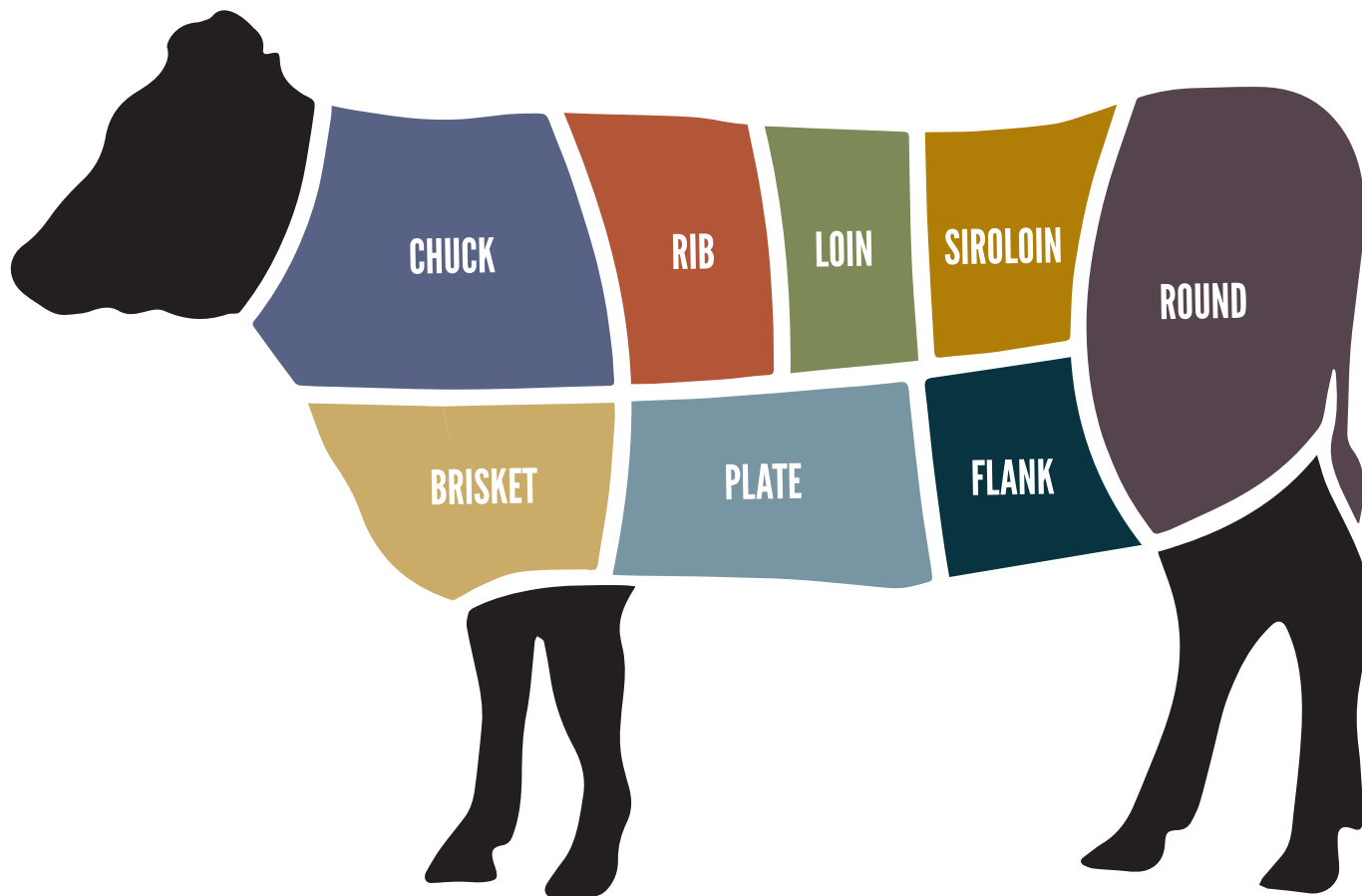
Art of Butchery Handout

Primal Beef Cuts Puzzle Handout



Art of Butchery Handout

Puzzle Solution Handout





BASIC COOKERY AND SAFETY

Matching Cut to Cooking Method

Lesson Length: 45 minutes

Texas Essential Knowledge and Skills (TEKS):

- 130.226.11A. Understand the basics of nutrition
- 130.226.6G. Demonstrate moist and dry cookery methods
- 130.226. 9A. Determine basics of safety in culinary arts

FACS National Standards:

- 8.4.2 Apply menu-planning principles to develop and modify menus.
- 8.4.3 Analyze food, equipment, and supplies needed for menus.
- 8.5.2 Demonstrate professional skill for a variety of cooking methods including roasting, broiling, smoking, grilling, sautéing, pan frying, deep frying, braising, stewing, poaching, steaming, and baking using professional equipment and current technologies.
- 9.2.1 Analyze factors that contribute to food borne illness.
- 9.6.1 Build menus to customer/ client preferences.

Learning Objectives:

- Students can categorize cooking methods into dry heat and moist heat.
- Students identify the three steps for each cooking method.
- Students create descriptions of beef dishes that include nutritional information, safe cooking temperature, and a description of the cooking method.

Materials and Equipment Needed:

- TV or projector to play the second part of Chapter 5 (7:40-12:00) of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Note: If playing the downloaded version of the documentary, the time count for the second part of this chapter is 35:14-39:45.

- Whiteboard
- Flip Chart or Tear Sheet
- Poster Board (10)
- Markers
- Internet-enabled Computers (10)

Cross-Curricular Connections

Use these suggested adaptations to make learning across the curriculum easy!

Science	Technology
Research how different cooking methods affect nutritional value.	Research new meat preparation technology such as sous-vide.
Engineering	Mathematics
Design a layout for an ideal kitchen that accommodates different meat preparation techniques and cooking methods.	Use the menus created in this lesson to make a weekly procurement list for a restaurant.

Teacher Preparation:



Preview the second part of Chapter 5 (7:40-12:00) Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate."

Introduction (*Set Context for Activity*):

- Step 1: Play the second part of Chapter 5 (7:40-12:00) Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Ask students why it is important to know the cuts of beef. Guide students to the answer that different cuts of beef are cooked differently.

(continued)



BASIC COOKERY AND SAFETY

Matching Cut to Cooking Method

- **Preview:** *Today we'll explore basic cookery methods of beef and create delicious recipes that we can prepare.*
- **Transition:** *We know that different cuts of meat are cooked differently. The cooking methods can be broken into two major categories: dry heat cooking and moist heat cooking.*

Body (Main Content):

- **Step 2:** Randomly list the 10 common preparation methods (shown below) on the whiteboard. Explain to students that, according to Certified Steak & Seafood Company (2016), dry heat cooking involves applying heat either directly by flame or indirectly by surrounding food with heated air or heated fat. Moist heat cooking is when meat is submerged directly into a hot liquid such as water, broth, wine, or a combination of all three. Have students sort preparation methods into dry heat and moist heat cooking methods by writing them down under two columns on a piece of paper. Answers as follows:
 - Dry heat cooking methods:
 - Grilling
 - Broiling
 - Stir-frying
 - Oven-roasting
 - Pan-Frying
 - Skillet cooking
 - Skillet to oven
 - In-direct grilling
 - Moist heat cooking methods:
 - Braising/Pot-roasting
 - Stewing
- **Step 3:** Review the basics of safe meat-handling procedures with students.
 - *To minimize risk of bacteria, ground beef should always be cooked to 160 degrees Fahrenheit.*
 - *To avoid cross contamination, keep raw foods and juices separate from cooked or raw foods that won't be cooked.*
- **Step 4:** Break students into 10 groups and assign each group a cooking method. Have groups access the Cattlemen's Beef Board and National Cattlemen's Beef Association's (2015) website, "Three Simple Steps" at beefitswhatsfordinner.com/3simplesteps and review their cooking method. Instruct groups to make a poster that captures the information about the three simple steps of preparing beef in the method that they were assigned. After all the groups have finished their posters, have students hang their posters around the room and do a gallery walk to review all of the groups' posters. Students should capture notes about the cooking methods.
 - **Transition:** *Now that we are familiar with the cooking methods, it is important to be able choose the appropriate cooking method for each cut of beef. Tender cuts of beef usually require a dry heat cooking method, while tougher cuts of beef use moist heat cooking.*
 - **Step 5:** Break students into groups of four. Tell them that they will work together to create a menu of four unique beef dishes using four different cuts. Each student in each group should choose a different cut and research its recommended cooking method and nutritional information on Cattlemen's Beef Board and National Cattlemen's Beef Association's (2015) website, "Interactive Butcher Counter" at beefitswhatsfordinner.com/butchercounter. Their finished product should be a written description of each dish written as a waiter would describe it to a table of customers. It should include:
 - The cut
 - A description of the preparation of the meat
 - The nutritional information
 - Safety considerations (i.e., cooking temperature)
 - Any embellishments to the cut or side dishes it is served with
 - Example: *This 8-ounce filet mignon was hand cut here at 5th Street Steakhouse from the tenderloin cut. It has been broiled to a perfectly juicy medium rare at 145 degrees Fahrenheit. This tender steak, lean yet succulent, has a fine buttery texture. It is served with garlic mashed potatoes and grilled asparagus.*

(continued)



BASIC COOKERY AND SAFETY

Matching Cut to Cooking Method

- Students should also include a description of their restaurant and make sure the meals are appropriate to be served at their restaurant (e.g., steakhouse, BBQ restaurant, food truck, etc.). You can incentivize this activity by making it a completion and choosing one menu to cook in class.

Certified Steak & Seafood Company. (2016). *Beef cooking methods*. Retrieved from <https://www.certifiedsteakandseafood.com/css-institute/beef/beef-cooking-methods>

Pflugerville ISD (Producer), & Barrow, D. (Director). (2016). *True beef: From pasture to plate* [DVD]. Available from <https://vimeo.com/ondemand/truebeef>

Wrap-Up (Review, Assess, Challenge):

- Step 6:** To review and assess learning, have each group present their menu. One student should describe their restaurant then each member of the group can read their dish's description.
 - Closure:** *Today we gained a basic understanding of moist and dry cookery methods for beef and created some delicious plans for recipes! As we explore the rest of this unit, we'll put what we learned today into practice.*

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References:

Cattlemen's Beef Board and National Cattlemen's Beef Association. (2013). *Beef cuts and recommended cooking methods*. Centennial, CO: Beef Checkoff. Retrieved from: https://p.widencdn.net/fg5cim/PDF-Beef-Cut-Chart_Poster_Final

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GROUND TO PERFECTION

Introduction to Sausage Making and Ground Beef Safety

Lesson Length: 45 minutes

Texas Essential Knowledge and Skills (TEKS):

- 130.226.1E. Read and comprehend standardized recipes
- 130.226.6F. Develop food production and presentation techniques
- 130.226.6K. Demonstrate proper cleaning of equipment and maintenance of the commercial kitchen

FACS National Standards:

- 9.5.6 Conduct sensory evaluation of food products.
- 9.6.9 Utilize Food Code Points of time, temperature, date markings, cross contamination, hand washing, and personal hygiene as criteria for safe food preparation.

Learning Objectives:

- Students will be able to identify the steps in the sausage production process.
- Students will be able to identify safety procedures specific to handling ground beef.

Materials and Equipment Needed:

- TV or projector to play Chapter 6 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Note: If playing the downloaded version of the documentary, the time count for this chapter is 39:46-45:08.
- Ground to Perfection Handout – Attached (one per student)
- Beef Link and Patty Sausage Samples – Teacher Preparation Section
- Internet-enabled Computers (one per student) or Resource Printouts (one set per student) – Teacher Preparation Section

- Food Safety Card Sets – Attached (one set per three to five students)
- Keep it Safe Handout – Attached (one per student)

Cross-Curricular Connections

Use these suggested adaptations to make learning across the curriculum easy!

Science	Technology
Compare and contrast the effect of safe thawing methods on taste and ease of beef preparation.	Review and report on Food and Agriculture Organization of the United Nation's document, "Principles of Meat Processing Technology" available at fao.org/docrep .
Engineering	Mathematics
Design and build a prototype sausage smoker.	Review the ingredients for one sausage recipe and calculate the amount needed to feed the class, school, or key event.

Teacher Preparation:



Preview Chapter 6 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate."

- Prepare copies of the Ground to Perfection handout.
- Prepare copies of the Keep It Safe! handout.
- Review the attached recipe. Determine if you will implement this in the current lesson or a subsequent lesson.
- Purchase and prepare sample beef sausages for tasting. You will need a griddle or stovetop and frying pan to prepare samples. You may wish to cook prior to class and reheat using a microwave oven.

(continued)



GROUND TO PERFECTION

Introduction to Sausage Making and Ground Beef Safety

- Print and cut out the Food Safety Cards to create a set. Create one set per three to five students.
- In Step 6, students will be researching sausage recipes. You may wish to have students briefly research these two topics on the internet, if computers are available. Alternately, you can provide print resources for students to review. Suggestions are provided below. You may wish to supplement with your own resources.
 - Suggested sausage ingredient article: Marianski's (as cited in Meats & Sausages, 2016) "Sausage Recipe Secrets" available at <http://www.meatsandsausages.com/sausage-recipes/secrets>. Look for students to identify: fat, salt, pepper, sugar
 - Suggested sausage equipment article: Let's-Make-Sausage.com's (2008) "Basic Sausage Making Equipment" available at <http://www.lets-make-sausage.com/Sausage-making-equipment.html>. Look for students to identify: meat grinder, sausage stuffer, knives, containers, measurement equipment/scales

Introduction (Set Context for Activity):

- Step 1: Ask students to work in pairs to brainstorm in their notebooks a list of ways that sausage is used in cooking (e.g., in spaghetti sauce, as a breakfast side, etc.). Challenge pairs to try to come up with the longest list. Have students share.
 - Preview: *In this lesson, we'll explore the beef sausage-making process and discover why safety is uniquely important with ground beef so that you can more confidently prepare and consume sausage.*

Body (Main Content):

- Step 2: Play Chapter 6 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Ask students to capture notes regarding the beef sausage-production process that were demonstrated. Have students share and compare notes after the film has played.
- Step 3: Provide historical background on the process of sausage making (Marchello and Garden-Robinson,

2012):

- Making sausage became an effective way to preserve and use excess meat.
- Making sausage allowed people to use all parts of the animal.
- The process of putting ground meat into casings is very similar today as it was many years ago, however technological advancements have changed the tools available.
- Today there are more than 250 varieties of sausage sold. Many varieties are unique to certain cultures or regions.
- Step 4: Distribute the Ground to Perfection handout. Have students review the six classifications of sausage (Marchello & Garden-Robinson, 2012):
 - Fresh sausage (i.e., fresh pork/beef sausage)
 - Uncooked smoked sausage (i.e., smoked, country style, kielbasa)
 - Cooked smoked sausage (i.e., frankfurter, bologna)
 - Dry sausage (i.e., Genoa salami, pepperoni)
 - Semi-dry sausage (i.e., Lebanon bologna, summer sausage)
 - Cooked meat specialties (i.e., loaves, head cheese)
- Step 5: After reviewing, introduce the two general types of fresh sausage (cased/link and ground/patty) by allowing students to taste samples of each food item. Ask students to note observations. Clarify that each type of sausage can be used in different recipes for different purposes. You may wish to offer other samples of beef sausages as well.
- Step 6: For the next activity, students will generate a basic list of sausage ingredients and equipment on the Ground to Perfection handout.
- Step 7: Finally, introduce students to specific food handling guidelines for ground beef. Place students in groups of three to five. Give each group a set of Food Safety Cards. Each set contains common food safety questions and answers from the United States Department of Agriculture, Food Safety and Inspection Service (2016). Students will race to correctly match the question with the correct response.

(continued)



GROUND TO PERFECTION

Introduction to Sausage Making and Ground Beef Safety

After students have completed the race, pass out the Keep It Safe! handout. Have students capture the correct answers on the handout.

- Correct answers are as follows:
 - Q: How do I know if ground beef is fully cooked?
 - A: To minimize risk of bacteria, ground beef should always be cooked to 160 degrees Fahrenheit.
 - Q: How long can I store fresh ground beef?
 - A: Use or freeze fresh ground beef within two days.
 - Q: Why is E. coli a special concern with ground beef?
 - A: This is a bacterium that can be found in the intestines of animals. Illnesses have been connected to consuming undercooked ground beef. Remember, cook your ground beef to 160 degrees Fahrenheit!
 - Q: What happens in a USDA-inspected beef-processing plant?
 - A: Trimmed beef for grinding is inspected for bacteria. Sanitation Standard Operating Procedures are used to make sure equipment is clean and handled properly.
 - Q: Can bacteria spread from one surface to another?
 - A: Yes. It is very important to avoid cross contamination. Keep raw foods and juices separate from cooked or raw foods that won't be cooked.
 - Q: How should I handle ground beef at the store?
 - A: Try to pick up ground beef last at the store and place in a plastic bag. Take it directly home or place it in a cooler.
 - Q: What is the best way to thaw frozen ground beef?
 - A: Defrosting ground beef in the refrigerator is the best method. Need a faster method? Use cold water or the microwave. Never leave ground beef at room temperature for more than two hours.

Wrap-Up (Review, Assess, Challenge):

- Step 8: Have students consider the type of beef sausage they would like to make and how this sausage would be paired with other foods. Allow students time to journal their responses in a notebook or share out loud.

Internal links within this document are funded and maintained by the Beef Checkoff. All other outgoing links are to websites maintained by third parties.

References:

- Cattlemen's Beef Board and National Cattlemen's Beef Association. (2015). *Basic country beef breakfast sausage*. Retrieved from <http://www.beefitswhatsfordinner.com/recipe.aspx?id=3895>
- Let's-Make-Sausage.com. *Basic sausage making equipment*. (2008). Retrieved from <http://www.lets-make-sausage.com/Sausage-making-equipment.html>
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GROUND TO PERFECTION

Introduction to Sausage Making and Ground Beef Safety

RECIPE: BEEF COUNTRY BREAKFAST SAUSAGE

FROM WWW.BEEFITSWHATSFORDINNER.COM

Ingredient List

1. 1 pound Ground Beef (96% lean)
2. 2 teaspoons chopped fresh sage or ½ teaspoon rubbed sage
3. 1 teaspoon garlic powder
4. 1 teaspoon onion powder
5. ½ teaspoon salt
6. ¼ to ½ teaspoon crushed red pepper

Steps

1. Combine Ground Beef and seasonings in large bowl, mixing lightly but thoroughly.
2. To make patties, lightly shape sausage mixture into four ½-inch thick patties. Heat large nonstick skillet over medium heat until hot. Add patties; cook 10 to 12 minutes or until instant-read thermometer inserted horizontally into center registers 160°F, turning occasionally.
3. To prepare crumbles, heat large nonstick skillet over medium heat until hot. Add sausage mixture; cook 8 to 10 minutes, breaking into ½-inch crumbles and stirring occasionally.

Test Kitchen Tips

- Cooking times are for fresh or thoroughly thawed ground beef. Ground beef should be cooked to an internal temperature of 160°F. Color is not a reliable indicator of ground beef doneness.
- 2 to 2½ cups fully cooked sausage crumbles can be frozen for 3 to 4 months. To use, heat large nonstick skillet over medium heat until hot. Add frozen crumbles and cook 6 to 9 minutes or until crumbles reach 165°F, stirring occasionally.

Ground to Perfection Handout

Ground to Perfection

Classifications of Sausage

- Fresh sausage (i.e., fresh pork /beef sausage)
- Uncooked smoked sausage (i.e., smoked, country style, kielbasa)
- Cooked smoked sausage (i.e., frankfurter, bologna)
- Dry sausage (i.e., Genoa salami, pepperoni)
- Semi-dry sausage (i.e., Lebanon bologna, summer sausage)
- Cooked meat specialties (i.e., loaves, head cheese)

WHAT ARE BASIC SAUSAGE INGREDIENTS?	WHAT BASIC EQUIPMENT IS NEEDED FOR MAKING SAUSAGE?

Ground to Perfection Handout

Keep it Safe!

Q: How do I know if ground beef is fully cooked?

A: _____

Q: How long can I store fresh ground beef?

A: _____

Q: Why is E. coli a special concern with ground beef?

A: _____

Q: What happens in a USDA-inspected beef-processing plant?

A: _____

Q: Can bacteria spread from one surface to another?

A: _____

Q: How should I handle ground beef at the store?

A: _____

Q: What is the best way to thaw frozen ground beef?

A: _____

Ground to Perfection Handout

Food Safety Cards

Q: How do I know if ground beef is fully cooked?	Q: What happens in a USDA-inspected beef-processing plant?	A: This is a bacterium that can be found in the intestines of animals. Illnesses have been connected to consuming undercooked ground beef. Remember, cook your ground beef to 160 degrees Fahrenheit!	Q: How long can I store fresh ground beef?
A: Use or freeze fresh ground beef within two days.	A: Trimmed beef for grinding is inspected for bacteria. Sanitation Standard Operating Procedures are used to make sure equipment is clean and handled properly.	A: To minimize risk of bacteria, ground beef should always be cooked to 160 degrees Fahrenheit.	Q: Can bacteria spread from one surface to another?

Ground to Perfection Handout

Food Safety Cards

Q: Why is E. coli a special concern with ground beef?	Q: How should I handle ground beef at the store?	A: Yes. It is very important to avoid cross contamination. Keep raw foods and juices separate from cooked or raw foods that won't be cooked.	A: Try to pick up ground beef last at the store and place in a plastic bag. Take it directly home or place it in a cooler.
Q: What is the best way to thaw frozen ground beef?	A: Defrosting ground beef in the refrigerator is the best method. Need a faster method? Use cold water or the microwave. Never leave ground beef at room temperature for more than two hours.		



BURGER CHALLENGE

Making the Perfect Burger

Lesson Length: 90 minutes

Texas Essential Knowledge and Skills (TEKS):

- 130.226.1D. Understand scientific principles used in culinary arts
- 130.226.11A. Understand the basics of nutrition
- 130.226.9A. Determine basics of safety in culinary arts
- 130.226.9C. Determine basics of sanitation in a professional kitchen
- 130.226.9D. Assess food hazards and determine ways to prevent food hazards
- 130.226.1E. Read and comprehend standardized recipes

FACS National Standards:

- 9.2.1 Analyze factors that contribute to food borne illness.
- 9.3.2 Analyze nutritional data.
- 9.6.4 Create standardized recipes.

Learning Objectives:

- Students will differentiate between the types of ground beef.
- Students will explain how to safely handle ground beef.
- Students will create a recipe for their perfect burger.

Materials and Equipment Needed:

- TV or projector to play Chapter 7 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Note: If playing the downloaded version of the documentary, the time count for this chapter is 45:09 – 49:41.
- Whiteboard
- Highlighters (one per student)
- Flip Chart or Tear Sheet
- Markers
- Internet-enabled Computers (one per two students)

- Burger Challenge: Crafting the Perfect Burger Handout – Attached (one per student)
- "The Burger Lab's Top 10 Tips for Making Better Burgers" Article – Teacher Preparation Section (one per student)

Cross-Curricular Connections

Use these suggested adaptations to make learning across the curriculum easy!

Science	Technology
Create and conduct an experiment to determine the amount of time it takes to get different types of ground beef to the safe internal temperature using a variety of cooking methods.	Compare different meat grinding technologies and equipment for efficiency, safety, and cost.
Engineering	Mathematics
Create a timeline of the history of the hamburger and advancements in engineering processes that drove it.	Calculate the amount the beef consumed annually in the United States in the form of hamburgers.

Teacher Preparation:



Preview Chapter 7 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate."

- Make one copy per student of J. Kenji Lopez-Alt's (2016) article, "The Burger Lab's Top 10 Tips for Making Better Burgers" found at seriouseats.com.
- Make one copy per student of the Burger Challenge: Crafting the Perfect Burger handout.

(continued)



BURGER CHALLENGE

Making the Perfect Burger

Introduction (*Set Context for Activity*):

- **Step 1:** Play Chapter 7 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Ask students what they believe makes the perfect burger.
 - **Preview:** *Today we'll dive into the different factors that go into making a perfect burger including the type of meat and cooking method you choose, how to prepare it safely, and different embellishments you can add! We'll end the day by each of you crafting your own burger recipe that you'll create in our very own burger challenge.*
 - **Transition:** *To get started, let's explore different types of burgers and innovative recipes for inspiration.*

Body (*Main Content*):

- **Step 2:** Pass out the Burger Challenge: Crafting the Perfect Burger handout. In pairs, students should use the internet to find an innovative example of an appealing burger recipe. They can start at Cattlemen's Beef Board and National Cattlemen's Beef Association's (2015) website, "Meal Solutions: Burgers" at beefitswhatsfordinner.com/burgers. They can also explore their favorite burger restaurant's menu on the internet. Instruct students to capture their thoughts on the Burger Challenge: Crafting the Perfect Burger handout. If time allows, asks groups to share their findings with the class.
 - **Transition:** *Even the most delicious burger recipe won't be perfect if it makes the customer sick! Handling ground meat safely is critical when working in a kitchen.*
- **Step 3:** With their partners, have students brainstorm everything they can remember about how to handle ground beef safely from Lesson 6: Sausage Making. Instruct students to capture their thoughts on the Burger Challenge: Crafting the Perfect Burger handout. After students have brainstormed a list, elicit responses from the class and create one master ground beef safety checklist for the class to follow. Capture the list on the whiteboard.
- **Step 4:** With their partners, have students explore the different types of ground beef using Cattlemen's Beef Board and National Cattlemen's Beef Association's

(2015) website, "Interactive Butcher Counter" at beefitswhatsfordinner.com/butchercounter. Have students capture key points on the Burger Challenge: Crafting the Perfect Burger handout. The answers are as follows:

- 70% Lean
 - **Recommended Cooking Method:** Skillet
 - **Details:** Not less than 70 percent lean (usually a 73/27 or 75/25 lean-to-fat ratio). Used for burgers and in recipes calling for browning (crumbles) and pouring off drippings, such as chili, tacos, and spaghetti sauce. When properly cooked, it is moist and juicy.
 - **Nutritional Information:** Nutrition information per 3-ounce cooked serving: 217 calories; 14 g fat (6 g saturated fat; 7 g monounsaturated fat); 21 g protein; 0.3 mg vitamin B6; 2.3 mcg vitamin B12; 2.0 mg iron.
- 80-85% Lean
 - **Recommended Cooking Method:** Skillet, Grill, or Broil
 - **Details:** Holds its shape well during cooking, therefore ideal for meatloaf, meatballs, and Salisbury steak. When properly cooked it is moist, juicy, and has a slightly firm texture.
 - **Nutritional Information:** Nutrition information per 3-ounce cooked serving: 215 calories; 13 g fat (5 g saturated fat; 6 g monounsaturated fat); 22 g protein; 0.3 mg vitamin B6; 2.3 mcg vitamin B12; 2.3 mg iron; 5.4 mg zinc.
- 95% Lean
 - **Recommended Cooking Method:** Skillet, Grill, Broil, or Oven
 - **Details:** Perfect for recipes where you can't drain off drippings such as stuffed peppers or cabbage. If used for burgers, do not over handle the beef or overcook. When properly cooked, it has a firm, dense texture. 95 percent lean ground beef also meets government guidelines for lean.

(continued)



BURGER CHALLENGE

Making the Perfect Burger

- **Nutritional Information:** Nutrition information per 3-ounce cooked serving: 149 calories; 6 g fat (3 g saturated fat; 2 g monounsaturated fat); 23 g protein; 0.3 mg vitamin B6; 2.3 mcg vitamin B12; 2.5 mg iron; 5.7 mg zinc.
- **Step 5:** Pass out and instruct students to individually review J. Kenji Lopez-Alt's (2016) article, "The Burger Lab's Top 10 Tips for Making Better Burgers." Have them underline or highlight key aspects that they think are important to include in their burger recipe. Examples of key aspects include:
 - Grind your own beef.
 - Keep everything really cold.
 - Weigh and size your patties.
 - Use a thermometer.
 - Season liberally.
 - Don't salt beef until patties are formed.
 - Flip your burgers as often as you like.
 - Don't futz with your meat.
 - Choose your bun wisely.
 - Don't let anyone tell you what to put on it.
- **Step 6:** Instruct students that their next task is to create their own recipe for their version of the perfect burger. Drawing on the inspiration from the opening activity, encourage students to be as creative as they'd like! They should include the type of ground beef and nutritional information as well as a description of the preparation method including safety tips and key points from the J. Kenji Lopez-Alt's (2016) article, "The Burger Lab's Top 10 Tips for Making Better Burgers."

Wrap-Up (Review, Assess, Challenge):

- **Step 7:** Have students come back into their original pairs and share the recipes they've created to review. Student recipes can be collected as an assessment.
 - **Closure:** *Today we laid the foundation for our Perfect Burger Challenge! Next, we'll see these recipes come to life and choose our winner when our Burger Challenge continues!*

Internal links within this document are funded and maintained by the Beef Checkoff. All other outgoing links are to websites maintained by third parties.

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Burger Challenge Handout

Food Safety Cards

	70% Lean	80–85% Lean	95% Lean
			
Recommended Cooking Method			
Details			
Nutritional Information			

Burger Challenge: Crafting the Perfect Burger!

INNOVATIVE BURGER RECIPE EXAMPLE:	GROUND BEEF SAFETY TIPS:



THE ART OF BBQ

What to Know About Picking the Right Cut and Cooking Technique

Lesson Length: 1 hour

Texas Essential Knowledge and Skills (TEKS):

- 130.226.1E. Read and comprehend standardized recipes
- 130.226.6E. Use large scale and small scale equipment in a commercial kitchen
- 130.226.6F. Develop food production and presentation techniques
- 130.226.6H. Demonstrate the preparation skills of items commonly prepared in food service operations
- 130.226.6K. Demonstrate proper cleaning of equipment and maintenance of the commercial kitchen

FACS National Standards:

- 9.5.6 Conduct sensory evaluation of food products.

Learning Objectives:

- Students will be able to demonstrate strategies for analyzing marbling/fat content.

Materials and Equipment Needed:

- TV or projector to play Chapter 8 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Note: If playing the downloaded version of the documentary, the time count for this chapter is 49:42–1:05:56.
- Whiteboard
- "What's Your Beef? A Guide to Understanding USDA's Beef Grades" (projected or printed) – Attached (one per class/student)
- Beef Marbling Photographs – Teacher Preparation Section (three to five sets)
- Labeled Beef Samples – Teacher Preparation Section (three to five)
- Post-it Notes or Tape

Cross-Curricular Connections

Use these suggested adaptations to make learning across the curriculum easy!

Science	Technology
Conduct a taste test between similar cuts with varying quality grades.	Research the technology used to predict and evaluate beef quality grades.
Engineering	Mathematics
Evaluate the design of grills and smokers to compare and contrast products.	Calculate rib-eye area using a rib-eye area plastic grid.

Teacher Preparation:



Preview Chapter 8 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate."

- Order the Beef Marbling Photographs found <https://www.dmsfulfillment.com/NCBA/>.
 - In the left menu bar, click on "Beef Retail". In the expanded menu bar, select "Marbling Photographs."
- Purchase three to five samples of packaged cuts of beef with USDA Choice and USDA Select labeling. If USDA Prime labeled meat is available, you may wish to display this as well. Cover the grade labels with Post-it notes or tape. Label samples alphabetically (i.e., A, B, C, D, etc.).
- Review the attached recipe. Determine if you will implement this in the current lesson or a subsequent lesson.

(continued)



THE ART OF BBQ

What to Know About Picking the Right Cut and Cooking Technique

Introduction (*Set Context for Activity*):

- **Step 1:** Ask students to think of adjectives that describe great BBQ. List adjectives on the whiteboard.
 - **Preview:** *Great BBQ starts long before the grill is fired up. Great BBQ starts with the right meat selection and understanding the differences between similar cuts of beef. Today, we will learn to evaluate marbling so that you can prepare BBQ items that are (insert adjectives shared by students) juicy, mouthwatering, and delicious! We'll also discover two unique techniques for BBQ — low and slow versus hot and fast — so that when the time comes, you're armed with the right information for the perfect BBQ beef.*

Body (*Main Content*):

- **Step 2:** Play Chapter 8 of Pflugerville ISD's (2016) documentary, "True Beef: From Pasture to Plate." Ask students to capture notes regarding BBQ preparation.
 - **Transition:** *Even the most delicious burger recipe won't be perfect if it makes the customer sick! Handling ground meat safely is critical when working in a kitchen.*
- **Step 3:** Introduce the concept of marbling. *Marbling is the term we use to describe the amount of intramuscular fat that is visible as white flecks within lean meat. The amount of marbling is the primary factor that affects the quality grade of meat. Quality grades give us a consistent language in the meat industry to refer to tenderness, juiciness, and flavor (USDA).*
- **Step 4:** Display or distribute copies of the USDA's "What's Your Beef? A Guide to Understanding USDA's Beef Grades." Walk students through the three USDA quality grades:
 - **Prime:** Prime beef is produced from young, well-fed beef cattle. It has abundant marbling (i.e., the amount of fat interspersed with lean meat) and is generally sold in restaurants and hotels. Prime roasts and steaks are excellent for dry-heat cooking such as broiling, roasting, or grilling.
 - **Choice:** Choice beef is high quality but has less marbling than Prime. Choice roasts and
- steaks from the loin and rib will be very tender, juicy, and flavorful and are suited for dry-heat cooking. Many of the less tender cuts can also be cooked with dry heat if not overcooked. Such cuts will be most tender if braised, roasted, or simmered with a small amount of liquid in a tightly covered pan.
- **Select:** Select beef is very uniform in quality and normally leaner than the higher grades. It is fairly tender, but, because it has less marbling, it may lack some of the juiciness and flavor of the higher grades. Only the tender cuts should be cooked with dry heat. Other cuts should be marinated before cooking or braised to obtain maximum tenderness and flavor.
- **Step 5:** Using the Beef Marbling Photographs have students evaluate each quality grade. You may wish to temporarily cover labels on cards for students to evaluate and determine grades.
- **Step 6:** Display the labeled beef samples. Give each student a chance to evaluate the meat samples and write down what they believe to be the quality grade. After all the students have recorded their guesses, reveal correct grades and discuss.
- **Step 7:** Transition students into a discussion about two unique BBQ techniques — low and slow versus hot and fast. Now that you know how to pick the right cut of beef, let's briefly discuss the two main BBQ techniques. In the beef culinary world, we look at BBQ with regard to temperature and time. According to Meathead Goldwyn (2017) the techniques are as follows:
 - **Low and Slow:** *This method is often referred to as slow smoking. The meat is cooked at a low temperature, for a long amount of time, or slowly.*
 - **Quick tip:** *When working with thicker meat, such as a brisket, use the low and slow method. Cooking thicker cuts at too high a temperature results in tough, over-cooked meat.*
 - **Hot and Fast:** *This method is what we often think of when we hear BBQ or grilling. The meat is cooked at a high temperature for a short period of time.*

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THE ART OF BBQ

What to Know About Picking the Right Cut and Cooking Technique

- *Quick tip: When working with thinner cuts, use the hot and fast method. High heat will create a dark brown sear on the thin meat without overcooking the interior.*
- *Combining the Methods: If you're working with a cut of beef that is not as thick as a brisket, such as a thick steak, you may want to use a combination of both methods.*
- **Step 8:** Have students recall these cooking methods by paraphrasing their notes out loud to a partner.

Wrap-Up (Review, Assess, Challenge):

- **Step 9:** Ask students to consider the pre-harvest factors that could impact beef quality grade. Have students capture their assumptions in a journal or notebook. Ask students to share. Clarify and guide students with the following list of pre-harvest factors which, according to Dr. Pete Anderson (cited in "Cattle Today"), can impact beef quality grade.
 - Genetics: Degree of marbling is impacted by the genetics of the animal.
 - Sex of animal: Overall, heifers grade higher than steers.
 - Age and Weight When Placed on Feed: Data shows animals placed on feed at lighter weights graded higher.
 - Season: Cattle harvested in January and February grade higher.
 - Nutrition: High levels of Vitamin A found in fresh grass inhibits marbling.
 - Health: Healthier animals grade higher.
- **Step 10:** Remind students that understanding the pre-harvest process allows them to more effectively and efficiently select and prepare quality beef.

Internal links within this document are funded and maintained by the Beef Checkoff. All other outgoing links are to websites maintained by third parties.

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THE ART OF BBQ

What to Know About Picking the Right Cut and Cooking Technique

RECIPE: TEXAS BBQ BEEF BRISKET

BY CATTLEMEN'S BEEF BOARD AND
NATIONAL CATTLEMEN'S BEEF ASSOCIATION

Ingredient List

- 1 beef Brisket Flat Half (about 2½ to 3½ pounds)
- ¾ cup barbecue sauce
- ½ cup dry red wine

Rub

- 2 tablespoons chili powder
- 1 tablespoon packed brown sugar
- 1½ teaspoons garlic powder

Steps

1. Combine rub ingredients in small bowl; press evenly onto beef brisket. Place brisket, fat side up, in stockpot.
2. Combine barbecue sauce and wine in small bowl. Pour around brisket; bring to a boil. Reduce heat; cover tightly and simmer 2¾ to 3¼ hours or until brisket is fork-tender. Remove brisket; keep warm.
3. Skim fat from cooking liquid. Bring cooking liquid to a boil. Reduce heat to medium and cook, uncovered, 8 to 10 minutes or until reduced to 1 cup sauce, stirring occasionally.
4. Trim fat from brisket. Carve diagonally across the grain into thin slices. Serve with sauce.

Test Kitchen Tips

- To cook in a slow cooker, combine rub ingredients in small bowl; press evenly onto beef brisket. Place brisket, fat side up, in 4½ to 5½ quart slow cooker. Combine barbecue sauce and wine in small bowl. Pour around brisket; Cook on HIGH 4 to 6 hours or LOW 8 to 10 hours, or until brisket is fork-tender. (No stirring is necessary during cooking.) Remove brisket; keep warm. Skim fat from cooking liquid. Bring cooking liquid to a boil in a sauce pan. Reduce heat to medium and cook, uncovered, 8 to 10 minutes or until reduced to 1 cup sauce, stirring occasionally.
- To smoke beef brisket, prepare charcoal or gas smoker according to manufacturer's directions. Combine barbecue sauce and wine in small saucepan; bring to a boil, stirring frequently. Reduce heat to medium-low; cook 7 to 8 minutes or until reduced to 1 cup, stirring frequently. Reserve ½ cup barbecue sauce for serving. Prepare rub as above; press evenly onto beef brisket. Smoke brisket according to manufacturer's instructions and cooking times or until fork-tender, brushing occasionally with remaining barbecue sauce. Carve brisket as above. Serve with reserved sauce.

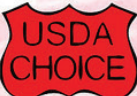
The Art of BBQ Handout

What's Your Beef?

A guide to understanding USDA's beef grades.



Prime beef is produced from young, well-fed beef cattle. It has abundant marbling, and is generally sold in hotels and restaurants. Prime roasts and steaks are excellent for broiling, roasting or grilling.



Choice beef is high quality, but has less marbling than Prime. Choice roasts and steaks from the loin and rib will be very tender, juicy, and flavorful and are suited for broiling, roasting or grilling. Less tender cuts are perfect for braising, roasting or simmering on the stovetop with a small amount of liquid.



Select beef is very uniform in quality and normally leaner than Prime or Choice. It is fairly tender, but, because it has less marbling, it may not have as much juiciness or flavor. Select beef is great for marinating or braising.



Produced by the U.S. Department of Agriculture
Agricultural Marketing Service
www.ams.usda.gov/grading

background photo courtesy KyleWiTh



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