BEEF UP YOUR EDUCATION

From Pasture to Plate

KENTUCKY BEEF® COUNCIL

THE BEEF CATTLE STORY

THE SCIENCE OF BEEF

NUTRITION

BUYING BEEF

LET'S GET COOKING

Kentucky Beef Industry by the Numbers

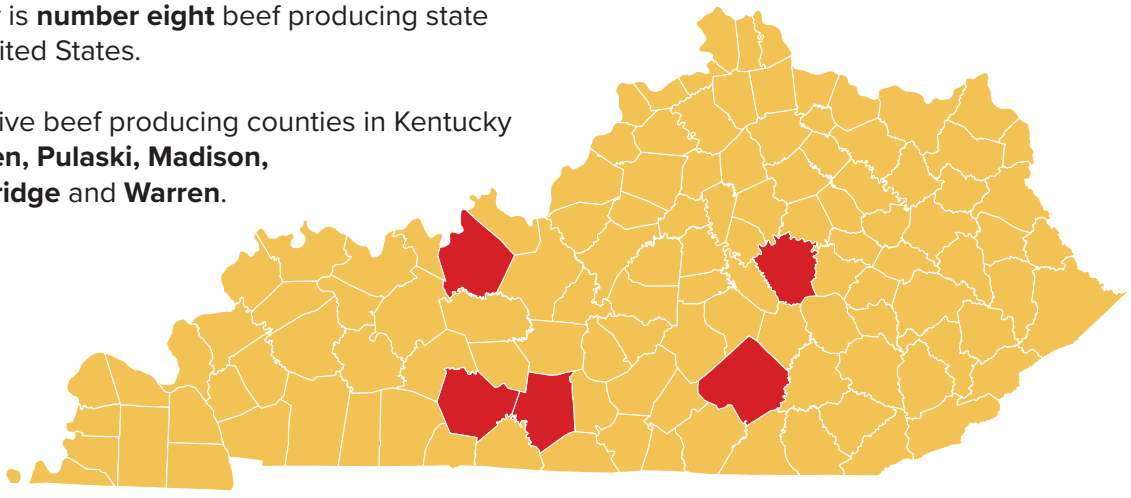
Cattle have been raised in Kentucky since 1775. Generations of Kentucky cattlemen and cattlewomen have dedicated their lives to being good stewards of the land and raising safe, nutritious beef for your table. More than 31,000 cattle farms are scattered across the Bluegrass state, the majority of which are family owned cow/calf operations with an average herd size of 32 head.

Kentucky is the **number one beef producing state** east of the Mississippi River.

Kentucky is home to **907,000 head** of cattle.

Kentucky is **number eight** beef producing state in the United States.

The top five beef producing counties in Kentucky are **Barren, Pulaski, Madison, Breckenridge** and **Warren**.



1. Cow-Calf

Hundreds of thousands of cow-calf farms and ranches, most family owned and located in all 50 states, breed cattle and raise calves. The cows nurse their calves and eventually the calves graze on grass pastures within sight of their mothers.

2. Stockers & Backgrounders

Calves transition from a diet of mostly milk, to eating a variety of grasses, hay, other plant-based feeds, and supplemental feed including vitamins and minerals.

The Beef Lifecycle

The beef lifecycle is one of the most complex of any food, taking anywhere from one and a half to three years to bring beef from pasture to plate.

It takes a community of people to care for cattle and produce beef. This includes farmers and ranchers, feedlot operators, livestock auction market owners, and packing plant workers. The beef community also includes veterinarians, animal nutritionists, pen riders and welfare specialists who ensure cattle are cared for and have a proper diet, room to roam and medical care.

Finally, restaurants, grocery stores and families like yours are a very important part of the beef community and help ensure the demand for high quality beef products.

Beef farmers and ranchers care about their animals, and the top priorities for everyone in the beef community are healthy animals and a safe, nutritious, high-quality, delicious and sustainable protein for consumers.

FACTS AT A GLANCE

All 50 states are home to cow-calf farms and ranches.

>91% of farms and ranchers across the U.S. are **family owned and operated.**

40 head is the average herd size in the U.S.

4-6 months is typically the amount of time cattle spend at a feedlot.

130 countries import US beef due to global demand.

3. Livestock Auction Markets

Cattle farmers and ranchers may work with an auction market to sell their cattle to other beef producers, feedlots or processing facilities. Advances in technology now allow auctions to be hosted through video and the internet, as well as in person.

4. Feedyard

Between 6 and 12 months of age, cattle may leave a farm or ranch and be moved to a feedyard where they spend 4-6 months or longer. Staff, including nutritionists, veterinarians and pen riders care for the animals daily. Cattle have constant access to water and eat at feed bunks containing a balanced diet that may include grains (eg: corn, wheat, soybean meal), roughage (eg: hay and grass) and local renewable byproducts (eg: distillers grains and beet pulp).

5. Packing Plant

Once cattle reach market weight at 18 to 24 months of age, they are sent to a packing plant, also called a processing facility. United States Department of Agriculture (USDA) inspectors oversee the implementation of safety, animal welfare and quality standards from the time animals enter the plant until the final beef products are shipped to grocery stores and restaurants in the U.S. and abroad.

DECODING THE LABEL

Know Your Beef Choices

Like the farmers and ranchers who choose how best to raise their cattle for beef, you have choices when it comes to the beef you buy. **Cattle are raised responsibly and beef is wholesome and nutritious.** You may see a variety of statements that reflect different production practices on beef packages in your grocery store or on a menu. The U.S. Department of Agriculture (USDA) approves these labels for beef based on specific criteria.

DID YOU KNOW

91% of US cattle farms and 80% of feedyards are **family-owned.**

Cattle eat grass for **most** of their lives.

100% of beef processed in federally inspected packing plants is overseen and inspected by the USDA.

All cattle are **commonly fed** vitamin and mineral supplements to balance their diet.

You will likely come across other beef labels. For example, USDA labels like “beef raised without antibiotics” (cattle have never received antibiotics but may receive growth-promoting hormones) and “beef raised without hormones” (cattle have never received growth-promoting hormones but may receive antibiotics). All USDA labels must be approved through a formal submission and evaluation process. You might also see other claims on labels, including references to cattle breed, where cattle were raised and cattle welfare.

Grain finished

Most beef is raised this way and likely doesn’t have a specific label.

This beef comes from cattle that...

- Spend the majority of their lives eating grass or forage
- Spend 4-6 months at a feedyard eating a balanced diet of grains, local feed ingredients, like potato hulls or sugar beets, and hay or forage
- May or may not be given U.S. Food and Drug Administration (FDA)-approved antibiotics to treat, prevent or control disease and/or growth-promoting hormones

Grass-finished or grass-fed

This beef comes from cattle that...

- Spend their whole lives eating grass or forage
- May also eat grass, forage, hay or silage at a feedyard
- May or may not be given FDA-approved antibiotics to treat, prevent or control disease and/or growth-promoting hormones

Certified organic

This beef comes from cattle that...

- Never receive any antibiotics or growth-promoting hormones
- May be either grain- or grass-finished, as long as the USDA’s Agriculture Marketing Service (AMS) certifies the feed is 100% organically grown
- May spend time at a feedyard

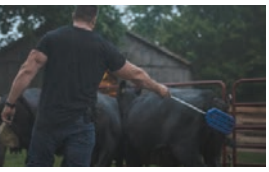
Naturally raised

This beef comes from cattle that...

- Never receive any antibiotics or growth-promoting hormones
- May be either grain- or grass-finished
- May spend time at a feedyard

What is BQA?

Beef Quality Assurance (BQA) helps beef farmers and ranchers raise better beef so consumers can feel even better about buying it. Raising quality beef requires commitment and hard work. This certification is earned, not bought. For beef farmers and ranchers, that means using modern techniques to raise cattle under optimal environmental and economic conditions. For consumers, it means knowing the beef they buy is wholesome and safe. More than 85% of U.S. beef comes from BQA-certified farmers and ranchers.



Cattle Care

Beef producers work to ensure their and the animals' well-being. This includes proper handling techniques, low-stress environments, and providing appropriate facilities so cattle are comfortable and healthy.

Herd Health

Farmers and ranchers develop and maintain herd health plans that follow good veterinary and agriculture practices based on scientific research.

Transporting Cattle

When transporting cattle, farmers and ranchers ensure they handle the cattle in ways that minimizes stress and injury.

Recordkeeping

Farmers and ranchers keep diligent records on the care and treatment given to each animal to ensure the animal's and public's health and safety is the top priority.

Cattle Nutrition

Beef farmers and ranchers make sure that cattle have access to an adequate water supply and appropriate nutrition sources.

Environmental Stewardship

Farmers and ranchers monitor key environmental control areas to manage feed and water resources while protecting or enhancing the environment.

What It Means To Be BQA Certified

BQA is a nationally coordinated state-implemented program that provides guidelines for beef cattle production. This voluntary program ensures beef producers utilize the best management practices to assure the safety, quality and wholesomeness of the beef they produce. BQA covers a range of topics including animal health, handling and environmental stewardship, aiming to meet consumer expectations for high quality beef while promoting the welfare of cattle.

Backed By Science

The BQA program is overseen by an advisory group made up of farmers, ranchers, veterinarians, cattle nutritionists, animal and meat scientists, animal welfare experts and industry stakeholders. This advisory group evaluates the program regularly and can make recommended changes or updates to the program as needed. To earn BQA certification, beef farmers can take courses online or attend in-person training taught by a network of hundreds of state BQA coordinators and trainers. They must also renew these qualifications every three years to maintain their certification. Participation is the program is an example of how the beef community is committed to raising cattle safely, humanely and sustainably.

Antibiotic Use in Cattle

Information on how beef is raised — especially when it comes to the use of antibiotics — can be confusing.

Farmers and ranchers are already putting new practices in place to limit the use of antibiotics and restrict the use for growth. These new practices meet or exceed the U.S. Food and Drug Administration's (FDA) updated guidelines (209 and 213) around administering antibiotics to cattle. Read below to get the facts about how beef is cared for and raised.

Antibiotics are just one tool to keep cattle healthy.

The Beef Quality Assurance (BQA) program has been in place since the 1980's. BQA is a nationally-coordinated, voluntary program that includes guidelines for cattle farmers and ranchers and includes 14 guidelines for use of antibiotics.

Antibiotics are just one tool that can be used by cattle farmers to ensure the health of the animals in their care. Cattlemen work with their veterinarian to develop a preventative herd health plan including routine vaccinations to promote strong immunity against common cattle diseases.

However, sometimes an animal becomes sick and not treating a sick animal would be cruel. Cattlemen work closely with veterinarians when a herd or a member of the herd becomes ill or at times when cattle are susceptible to illness, using precise doses of an antibiotic to prevent specific diseases or conditions.

So what about antibiotic free or raised without antibiotics?

Farmers, ranchers, veterinarians and the FDA are committed to ensuring no meat with a violative antibiotic residue enters the food supply. Withdrawal times, the time between when an animal receives an antibiotic and when it may be slaughtered — which are required by the FDA — ensure antibiotics are fully processed by the animal's body and out of its system before the animal is slaughtered for meat. It is also notable that science does not support claims that meat from animals raised without antibiotics is safer or healthier for you.

Most antibiotics given to cattle are rarely or never prescribed to humans.

Cattle farmers and ranchers have many tools in their toolkits to keep the animals in their care healthy, including nutrition programs, veterinary care, proper housing, management practices, vaccines and antibiotics, when necessary. However, more than 71% of the most common antibiotics used for animals are not used or rarely prescribed to humans.[2]

Also, recent guidance (209 and 213) by the FDA will create more opportunity for ranchers to incorporate veterinary consultation, as vets have oversight for use of antibiotics that are important in human medicine and have a valid use in animals.[1]

Antibiotics are only given to cattle to treat, control or prevent disease.

As part of the new FDA guidance (209 and 213), growth promotion uses of medically important antibiotics in feed and water have been eliminated; these products are only used to treat, prevent and control disease under oversight of a veterinarian.

Some cattle farmers and ranchers choose to use ionophores — a special class of antibiotics not used in human medicine that help cattle digest their feed better. This results in more efficient cattle growth while preserving resources like land, water and feed.

Antibiotics protect individual animals and the herd from illness.

Cattle may be given antibiotics during key moments of their life when they are more susceptible to illness, when they are weaned from their mother or comingled with cattle from other herds for example. This helps protect both the individual animal and the rest of the herd, and keeps a potential illness from spreading. Antibiotics are not cheap, in fact they are a significant expense for cattle farmers and ranchers. Cattlemen have no added incentive to use them except as outlined by a veterinarian as part of their animal care plan.

1 Guidance for Industry #209, Source: FDA 2012; Guidance for Industry #213, Source: FDA 2013
2 2011 SUMMARY REPORT On Antimicrobials Sold or Distributed for Use in Food-Producing Animals, Source: FDA 2011

Hormone Use in Cattle

Did you know there is no such thing as "hormone-free" beef? Hormone production is a natural part of the life cycle for all plants and animals.

What are hormones and why would beef producers use them?

Growth promotant, growth hormones, steroids and implant all mean the same thing; a small pellet placed under the skin in the animal's ear used to increase the efficiency of growth while using fewer resources.

There are several different scenarios when using an implanted hormone would be appropriate. One more common would be for steers. Early in life, male cattle (bulls) are castrated and become steers. This is often done for safety purposes. By castrating the bulls, it prevents the production of the naturally occurring male hormones that cause aggressive behavior. But these hormones are also a factor in growth and development for the bulls. Implanting with a natural or synthetic hormone like estrogen creates a comparable physiological response so the steer is able to maintain a growth weight of a bull. This allows more beef to be produced on less resources.

What is the impact on beef?

Beef, regardless of implant status, has a very low level of estrogen. See the table for comparison to other food and to naturally occurring levels in humans.

Beef may be lower in estrogen than some other food options but that doesn't imply that any of these food options should be eliminated from a diet due to a naturally occurring hormone. Additionally, research has found that hormones consumed in food break down in the stomach during digestion.

Should you be concerned?

Hormone implants are regulated by the FDA. Extensive toxicological testing is conducted prior to the approval of any new growth promotant[1,2]. Residual synthetic hormones are routinely monitored by the Food Safety Inspection Service of the USDA to ensure the safety of beef.[1,2] With safety measures in place and scientific data to back it up, you can rest assured that all beef is safe and wholesome.

1. Understanding Hormone Use in Beef Cattle Q&A By Dan Loy, Beef Specialist Iowa State University https://studylib.net/doc/8242154/understanding-hormone-use-in-beef-cattle

2. Implants and Their Use in Beef Cattle Production by Paul Beck, Ryan Reuter, David Lalman https://extension.okstate.edu/fact-sheets/implants-and-their-use-in-beef-cattle-production.html

Estrogenic activity of common foods *(ng/500g)*

FOOD	ESTROGEN ACTIVITY
SOY FLOUR DEFATTED	755,000,000
TOFU	113,500,000
PINTO BEANS	900,000
WHITE BREAD	300,000
PEANUTS	100,000
EGGS	555
BUTTER	310
MILK	32
BEEF *from implanted steer*	7
BEEF *from non-implanted steer*	5

Hoffman and Eversol (1986), Hartman et al (1998), Shore and Shemesh (2003), USDA-ARS (2002). ***Units are nanograms of estrone plus estradiol for animal products and isoflavones for plant products per 500 grams of food.***

Estrogen production in humans, and potential estrogen intake from implanted beef

	ESTROGEN AMOUNT PRODUCED DAILY
PREGNANT WOMAN	19,600,000 ng
NON-PREGNANT WOMAN	513,000 ng
ADULT MAN	136,000 ng
PRE-PUBESCENT CHILD	41,000 ng

Human's potential intake of estrogen from beef from implanted cattle is **7ng per 500g of beef.**

Beef Sustainability Facts

Family-owned for generations

More than **90% of U.S. farms and ranches** are family-owned, meaning they have a vested interest in sustainability.[1]

Provide habitat for wildlife

Cattle producers are the original conservationists, maintaining habitats for wildlife like hummingbirds, ducks, butterflies and more.[2]

Convert plants to protein

Cattle upcycle human-inedible plants into high-quality protein, which generates **more protein for the human food supply than would exist without them**.[3]

Perfect land for cattle

Approximately **one-third** of the land in the U.S. is pasture and rangeland that is **unsuitable for growing food crops**, but it's **perfect for raising cattle**. [4,5]

Store carbon in soil

Beef cattle **regenerate land** and **sequester carbon naturally**, simply by grazing. In fact, the U.S. land where cattle graze contains **up-to 30% of the world's carbon stored in soil.**[6]

Carbon negative budgets

Not only do beef cattle help **preserve land** they can create **carbon negative budgets—**meaning they are helping **store more carbon than they are emitting.**[7,8]

1. *USDA-NASS. 2017. Census of Agriculture. Farm Typology. https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Typology/typology.pdf*
2. *Barry, Sheila. 2021. Beef Cattle Grazing More Help than Harm for Endangered Plants and Animals.*
3. *Baber, J.R. et al., 2018. Estimation of human-edible protein conversion efficiency, net protein contribution, and enteric methane production from beef production in the United States. Trans. Anim. Sci. 2(4): 439-450.*
4. *USDA-ERS. 2021. Economic Research Service using data from the Major Land Use data series. Available at: https://www.ers.usda.gov/data-products/major-land-uses.aspx*
5. *Broocks, Ashley et al. 2017a. Carbon Footprint Comparison between Grass- and Grain-finished beef. OSU Extension, AFS-3292.*
6. *Silveira, et al. 2012. Carbon sequestration in grazing land ecosystems. University of Florida Extension. https://edis.ifas.ufl.edu/pdffiles/SS/SS57400.pdf*
7. *Schuman, et al. 2002. Soil Carbon dynamics and potential carbon sequestration by rangelands. Environmental Pollution 116: 391-396. https://www.onpasture.com/wp-content/uploads/2017/11/Soil-carbon-dymanics-and-potential-c-seq-by-rangelands.pdf*
8. *Barry, Sheila. 2021. Beef Cattle Grazing More Help than Harm for Endangered Plants and Animals.*

U.S. Cattle Production Sustainability Overview

Greenhouse Gas Emissions Breakdown

According to the U.S. EPA's greenhouse gas (GHG) emissions inventory, 2% of U.S. emissions come directly from beef cattle[1] (methane from cattle belches, methane and nitrous oxide from manure). Total direct emissions from all agricultural production, crops and livestock collectively, were 8.4% of U.S. emissions in 2017. Agriculture, land use, land use change, and forestry combined in the United States are a net sink of CO_2 equivalent (CO_2e) emissions, meaning they removed 172 million metric tons of CO_2e from the atmosphere in 2017.

What's the Global Situation?

Large disparities in emissions intensities, or GHG emissions per lb of beef produced, exist across regions of the world. The U.S. has one of the lowest beef GHG emissions intensities: 10 – 50 times[2] lower than other parts of the world. Most of this variation is driven by the number of cattle required to produce beef. For example, the U.S. produces around 18% of the world's beef with 6% of the world's cattle herd.[3] Fewer cattle required for a given amount of beef produced means fewer GHG emissions and fewer natural resources required to produce human nourishment. The U.S. is a leader in beef production efficiency because of scientific advancements in beef cattle genetics, nutrition, husbandry practices, and biotechnologies.

Correcting the Misinformation

A quick Google search of beef and GHG emissions will result in a wide range of statistics. Unfortunately, two types of conflation typically occur that muddy the waters. First, globally-relevant statistics are often conflated with U.S. emissions. Second, all emissions from livestock production are often ascribed to beef.

Globally, life cycle emissions from livestock production (emissions from feed production to consumer) are 14.5% of GHG emissions. Global beef life cycle emissions are 6% of the world's GHG emissions.[4] The disparity between these two percentages is due to the other forms

Item	Million Metric Tons CO_2e	Percent of US GHG emissions
Beef cattle	138.3	2%
Other animal ag	117.5	2%
Crop agriculture	286.3	4%
Agriculture total	**542.1**	**8%**
Transportation	1,800.6	28%
Electricity	1,732	27%
All other human-caused GHG emissions	2,382	37%
U.S. total GHG emissions	6,456.7	100%
Land use, land use change, forestry	-714.1	
Agriculture, land use, land use change, forestry	-172	

Table 1. 2017 U.S. Greenhouse Gas Emissions Sources and Sinks[1]

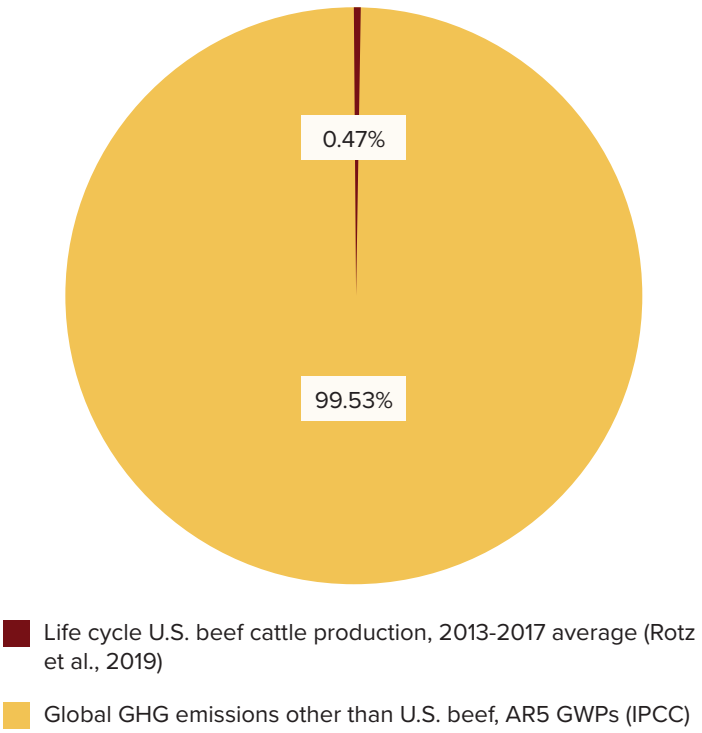


Figure 1. U.S. beef cattle production emissions in the context of total global GHG emissions

of livestock agriculture accounted for in the 14.5% figure, such as poultry, pork, and dairy production. In the United States, beef cattle production produces 3.7% of U.S. GHG emissions from a life cycle perspective[5] (adding in feed production, fuel and electricity use, etc. to the 2% estimation from the EPA inventory). The GHG emissions produced by U.S. beef cattle contribute only a fraction of the GHG emissions attributed to global beef production, as most cattle in the world are located outside U.S. borders. U.S. beef cattle emissions are less than 0.5% of the world's GHG emissions.[6]

Upcycling is the Ruminant Advantage

Cattle are ruminants. This means they have a symbiotic relationship with the microorganisms that live within their specialized stomach compartments that provides them their upcycling superpower. Upcycling is converting something of little to no value to a higher value product. Cattle upcycle every day, converting solar energy in plants that's inaccessible to humans to high-quality protein, micronutrients, and ancillary products such as leather and pharmaceuticals. The U.S. beef cattle industry provides more than two times the high-quality protein (accounting for amino acid profile and bioavailability)[7] to the U.S. food supply than cattle consume: cattle directly contribute to food security. Additionally, beef is rich in micronutrients such as Zinc, Iron, Selenium, Choline, Niacin, Riboflavin, Vitamin B12 and Vitamin B6.

Cattle Provide Far More than Beef

Cattle production results in more benefits to society than just the excellent nutrient package that is beef. Cattle are a source of fiber (leather), fertilizer, fuel, and wealth. Beef cattle operations represent over 1/3 of U.S. farms and ranches[8] – the single largest segment of U.S. agriculture. Cattle production preserves and enhances grassland ecosystems. Cattle grazing can help mitigate the risk of catastrophic wildfires.[9] Cattle grazing lands help regulate and purify the water supplies for major municipalities in the United States.[10] Conservatively, the ecosystem services of cattle ranching and farming provide $24.5 billion of societal value in the U.S.[11] In short, cattle production is a key part of the social fabric of America, from cultural contributions of cowboy Americana to provisioning of heart valves to people. Cattle are a self-replicating, solar-powered plant-based protein source with numerous unmatched co-benefits. Humanity has depended upon cattle production for the whole of civilization and will continue to do so far into the future: beef cattle production is sustainable.

Production Is Always Getting Better

Despite having a highly resilient and efficient beef production system in the USA currently, cattle producers are always looking for ways to get better. Compared to 1975, it takes 36% fewer cattle[12] to produce the same amount of beef today. This dramatic improvement in efficiency has been driven by improvements in beef cattle genetics, nutrition, biotechnologies, and husbandry practices that result in improved animal well-being. Research and extension and adoption of new knowledge is a continuous process that delivers on incremental improvements in reducing beef cattle production's resource use and environmental impacts. Advancements in grazing land management, genomically-enhanced expected progeny differences (EPDs), methane-inhibitors, integrated crop-livestock systems, water recycling technology, and manure composting are just a few of the examples of new technologies being deployed and tested that will further enhance the sustainability of U.S. beef production. Ultimately, the U.S. beef industry is resilient and well-positioned to continue to provide U.S. and international consumers a superior animal source food in a socially and environmentally responsible manner for decades to come.

1. *U.S. Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2017. Available at: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2017 accessed August 7, 2019*
2. *Herrero, M., et al., 2013. Biomass use, production, feed efficiencies, and greenhouse gas emissions from global livestock systems. Proc. Natl. Acad. Sci. 110: 20888-20893.*
3. *UN FAOSTAT database. Available at: http://www.fao.org/faostat/en/#home accessed August 7, 2019*
4. *Gerber, P.J., et al., 2013. Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities. Food and Agriculture Organization of the United Nations (FAO), Rome*
5. *Rotz. C.A. et al., 2019. Environmental footprints of beef cattle production in the United States. Ag. Syst. 169: 1-13.*
6. *IPCC, 2014: Summary for Policymakers. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.*
7. *Baber, J.R. et al., 2018. Estimation of human-edible protein conversion efficiency, net protein contribution, and enteric methane production from beef production in the United States. Trans. Anim. Sci. 2: 439-450*
8. *USDA 2017 Ag Census. Available at: https://www.nass.usda.gov/Publications/AgCensus/2017/index.php accessed August 7, 2019.*
9. *Davies, KW, et al. 2015. Winter grazing can reduce wildfire size, intensity and behaviour in a shrub-grassland. International Journal of Wildland Fire 25(2) 191-199*
10. *Steiner, J.L. et al., 2014. Knowledge and tools to enhance resilience of beef grazing systems for sustainable animal protein production. Ann. N.Y. Acad. Sci. 1328:10-17.*
11. *Maher et al. 2020. National and State Economic Values of Cattle Ranching and Farming-Based Ecosystem Services on Federal and Private Lands in the U.S. Sustainable Rangelands Roundtable 7.*
12. *USDA-NASS Quick Stats Tools. Available at: https://www.nass.usda.gov/Quick_Stats/ accessed August 7, 2019.*

The Evolution of Beef

With less land to raise cattle, beef producers have transformed the beef industry to keep up with the consumer demand for beef.

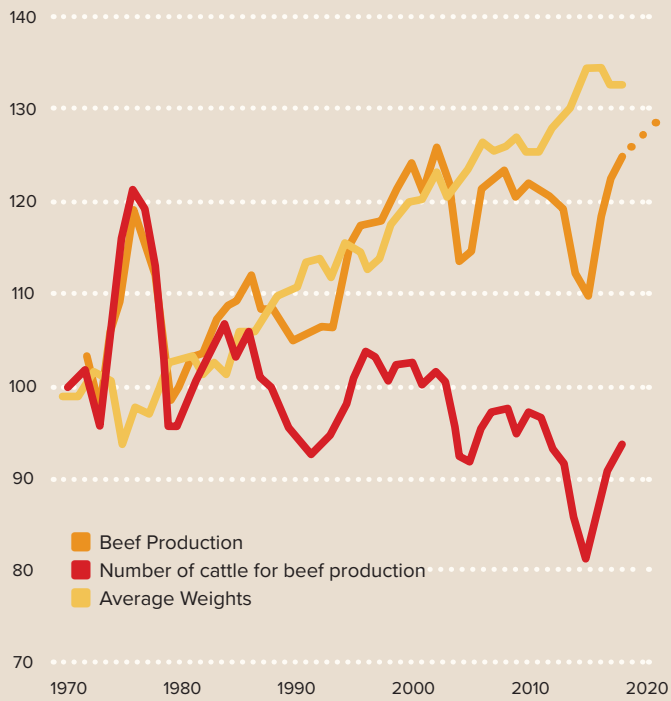
Through selective breeding and focusing on specific heritable traits, producers have been able to control the genetic improvement of beef quality traits.

- Increasing frame size and overall weight
- Higher feed conversion efficiency
- Decreasing subcutaneous fat
- Increasing intramuscular fat
- Increased ribeye area

Producers are even able to control many other traits

- Birth weight, weaning weight and yearling weight
- Natural ability to produce quality milk and raise a calf
- Calving ease (if a cow is able to give birth without assistance)
- Healthy feet and udders
- Docility

Index of commercial beef production, cattle used for beef production, and average weights



Note: Production index in 2019 and 2020 is forcasted.

Source: USDA, Economic Research Service using USDA, National Agricultural Statistics Service Quick Stats data

Understanding Beef Quality Grades

Established in 1927, the United States Department of Agriculture (USDA) meat-grading system sets standards of quality used in buying and selling of meat. Quality grading provides consumers an assurance that the product purchased conforms to expected standards of tenderness, juiciness, and flavor when cooked, generally referred to as palatability. The eight quality grades for beef are Prime, Choice, Select, Standard, Commercial, Utility, Cutter, and Canner.

When assessing quality grade, a number of factors are evaluated, including carcass maturity, firmness, texture and color of lean, and the amount and distribution of marbling within the lean. Marbling, also known as intramuscular fat, is the small flecks of white fat within beef muscle. The degree of marbling is the primary determinant of quality grade, as carcasses with a greater amount of marbling have an increased likelihood of being more tender, juicy, and flavorful. Carcass maturity also impacts quality grade as younger animals produce higher quality beef than older animals. The quality of U.S. beef has gradually increased over the last 20 years with the latest USDA report finding that 7% of the beef supply graded Prime, 68% graded Choice and 16% graded Select.

Marbling is the primary factor in determining the quality grade of a beef carcass. When determining the amount of marbling, a grader will look at the ribeye where the carcass is cut at the 12th & 13th rib juncture. Marbling helps ensure and is a strong visual predictor of beef tenderness, flavor and juiciness and improves the overall palatability of beef.

Prime beef is produced from young, well-fed cattle. It has the most marbling, is produced in smaller quantities than other grades, and is often sold in hotels and restaurants. Prime roasts and steaks are excellent for roasting, grilling or broiling.

Choice beef is high quality and produced in highest quantity, but has less marbling than Prime. Choice roast and steaks, especially from the rib and loin, will be very tender, juicy and flavorful. They are suited for roasting, grilling or broiling. Less tender cuts are perfect for slow-cooking.

Select beef is slightly leaner than Prime and Choice because it has less marbling. It can lack some tenderness, flavor and juiciness as compared to the higher grades. Select grade beef often benefits from slow-cooking or from marination prior to grilling or broiling.

Standard and Commercial grades of beef are frequently sold as ungraded **No Roll** beef. Because No Roll does not carry a grade designation, there is a risk it will not be as tender, flavorful and juicy as products graded Prime, Choice or Select.

Beef Processing in a USDA-Inspected Facility

Processing beef in a USDA-inspected facility involves several steps to ensure safety, quality and compliance with regulatory standards. Here's a step-by-step guide:

ANIMAL RECEIVING & INSPECTION

Live cattle are received at the facility and undergo initial inspection by USDA personnel to ensure they are fit for harvest. Each animal is identified with a unique tag or barcode for traceability purposes. Only approved animals at this stage will enter the food supply chain.

RESTING AND HOLDING

Cattle may be held in pens or designated areas to rest and acclimate before harvest to help reduce any stress of transport.

HARVEST

Cattle are moved through a handling facility into the harvest area where they are stunned using methods approved by the USDA to render them unconscious, typically captive bolt-stunning. After stunning, additional steps are taken to ensure they are deceased before moving on to the next stage.

DRESSING

The carcass is then hoisted and moved along a processing line where it is dressed (e.g., removing internal organs) and the hide is removed. USDA inspectors closely monitor this process to ensure sanitary conditions and compliance with food safety regulations.

CARCASS INSPECTION

Each carcass undergoes a thorough inspection by USDA inspectors to check for signs of disease, contamination or abnormalities. Carcasses that pass inspection are stamped with the USDA mark indicating they are fit for human consumption.

SPLITTING

Following inspection, the carcass is split into sides (halves) or quarters, depending on further processing needs. Trimming may occur to prepare the meat for chilling.

COOLING & AGING

Carcasses or meat cuts are chilled to specific temperatures to inhibit bacterial growth and maintain quality. Temperature monitoring is critical during this phase to ensure food safety. Aging may occur at this time.

FABRICATION

Chilled halves/quarters are fabricated into primal cuts. Depending on the preference of the customer, the primal cuts could be further fabricated into smaller sub-primal cuts, retail cuts or processed products. This process may involve portioning, trimming and packaging according to customer specifications.

PACKAGING & LABELING

Each packaged product is labeled with required information, including the USDA inspection mark, product name, weight, ingredients (if applicable), and handling instructions. Packaging materials must meet USDA-approved standards for food safety and preservation.

STORAGE & DISTRIBUTION

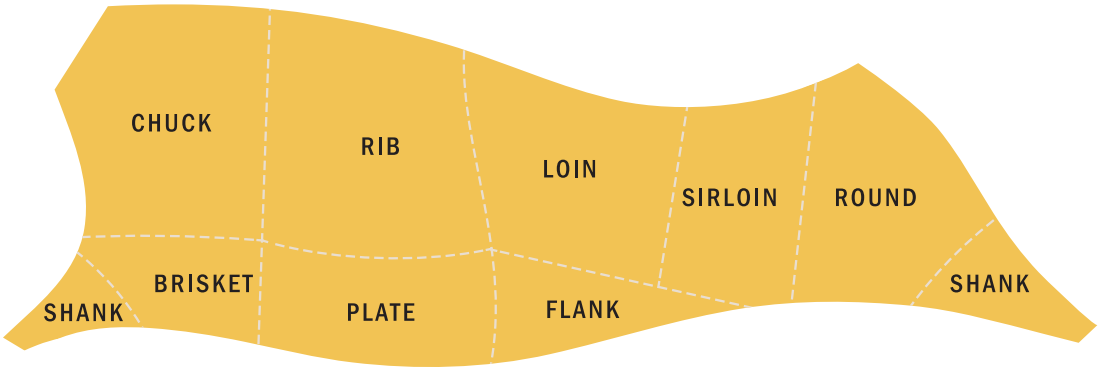
Packaged beef products are stored in refrigerated or frozen storage facilities to maintain freshness and safety. Products are distributed to retail stores, restaurants and other outlets for sale to consumers.

Cleaning and Sanitation: Throughout the entire process, facilities are cleaned and sanitized regularly to prevent cross-contamination and ensure food safety standards are met.

Quality Assurance and Compliance: USDA inspectors conduct ongoing checks and audits to verify compliance with federal regulations and ensure consistent product quality and safety.

This detailed process ensures that beef products processed in USDA-inspected facilities meet rigorous standards for safety and quality, reflecting a commitment to humane handling and food safety practices throughout the entire processing journey.

Primal Breakdown



What are Primals? Primals are the first major cuts of meat that are initially separated during processing. Each primal possesses unique eating characteristics because they are made up of different muscles with different tenderness levels, different fat content and varying flavor profiles. These variables also impact how a cut should be cooked.

25% Chuck: This cut is located in the shoulder area, this cut features robust, marbled meat with a rich flavor profile. Known to be less tender due to an abundance of connective tissue and a well-worked muscle. This cut benefits from low, slow and moist cooking methods to bring out the hearty texture and savory beefy flavor.

8% Rib: This cut is located between the chuck and loin, rib cuts have high marbling throughout that results in tender meat packed with flavor. They're versatile and can be cooked in various ways, including grilling, roasting and pan-searing.

17% Loin: This cut is located behind the rib cut. It is known for its minimal connective tissue and moderate marbling which results in natural tenderness. It's best suited for quick, high-heat cooking methods like grilling or searing to lock in juices and flavor.

10% Sirloin: This cut is located behind the loin. The loin and sirloin are often grouped together due to proximity and similarity. It has a robust flavor but tends to be slightly leaner, and is ideal for dry heat cooking methods.

22% Round: This cut is located in the hind area, like the chuck, this muscle group is worked often as well and tends to be less tender. Slow and moist cooking methods will break down the connective tissues and enhance the rich, hearty flavor.

3% Shank: This cut is located in the leg area. Tendons, well-worked muscles, and connective tissue will require a slow, wet cooking method but will result in tender, fall-off-the-bone meat. Shank is best for braising or slow-cooking in stews and soups.

3% Brisket: This cut is located in lower chest, brisket has significant marbling and a robust beefy flavor. Slow cooking methods are necessary to bring out the flavorful and tenderness of this cut.

6% Plate: This cut is located between the brisket and flank, the plate is a fatty cut full of flavor and rich collagen content. It benefits from slow, wet cooking methods. Due to its fat content, plate is not often served on its own, but it can be used to make ground beef to bring a strong beefy flavor to dishes like meatloaf and burgers.

3% Flank: This cut is located behind the plate and comes from the abdominal area and it has a visible grain running throughout the cut. Although a lean cut, it roasts a robust beefy flavor. To maximize tenderness, this cut benefits from marinating and cooking at high heat to lock in juices and flavor.

Note: Percentage values are approximate.

CHUCK

Cross Rib Chuck Roast

Arm Chuck Roast

Shoulder Roast

Arm Chuck Steak

Shoulder Steak

Blade Chuck Roast

Ranch Steak

Blade Chuck Steak

Flat Iron Steak

7-Bone Chuck Roast

Top Blade Steak

Chuck Center Roast

Shoulder Petite Tender

Denver Steak

Shoulder Petite Tender Medallions

Chuck Eye Roast

Short Ribs, Bone-In

Chuck Eye Steak

Country-Style Ribs

RIB

Ribeye Roast, Bone-In

Ribeye Steak, Bone-In

Back Ribs

Ribeye Roast, Boneless

Ribeye Steak, Boneless

Ribeye Cap Steak

Ribeye Petite Roast

Ribeye Filet

LOIN

Porterhouse Steak

T-Bone Steak

Strip Steak, Bone-In

Strip Steak, Boneless

Strip Petite Roast

Strip Filet

Tenderloin Roast

Tenderloin Steak (Filet Mignon)

SIRLOIN


Top Sirloin Steak


Top Sirloin Petite Roast


Top Sirloin Filet


Coulotte Roast


Coulotte Steak


Tri-Tip Roast


Tri-Tip Steak


Petite Sirloin Steak


Sirloin Bavette Steak

ROUND


Top Round Roast


Top Round Steak


Bottom Round Roast


Bottom Round Steak


Bottom Round Rump Roast


Eye of Round Roast


Eye of Round Steak

BRISKET


Brisket Flat


Brisket Point

PLATE & FLANK


Skirt Steak


Flank Steak


Short Ribs, Bone-In

INGREDIENT


Kabobs


Cubed Steak


Stew Meat


Ground Beef &
Ground Beef Patties


Strips


Shank Cross-Cut

KEY TO RECOMMENDED COOKING METHODS

These cuts meet the government guidelines for lean, based on cooked servings, visible fat trimmed.

Skillet-to-Oven

Roast

Braise/Pot Roast

Grill

Indirect Grilling

Pan-Broil Skillet

Marinate for best results

Stir-Fry

Beef's Big 10

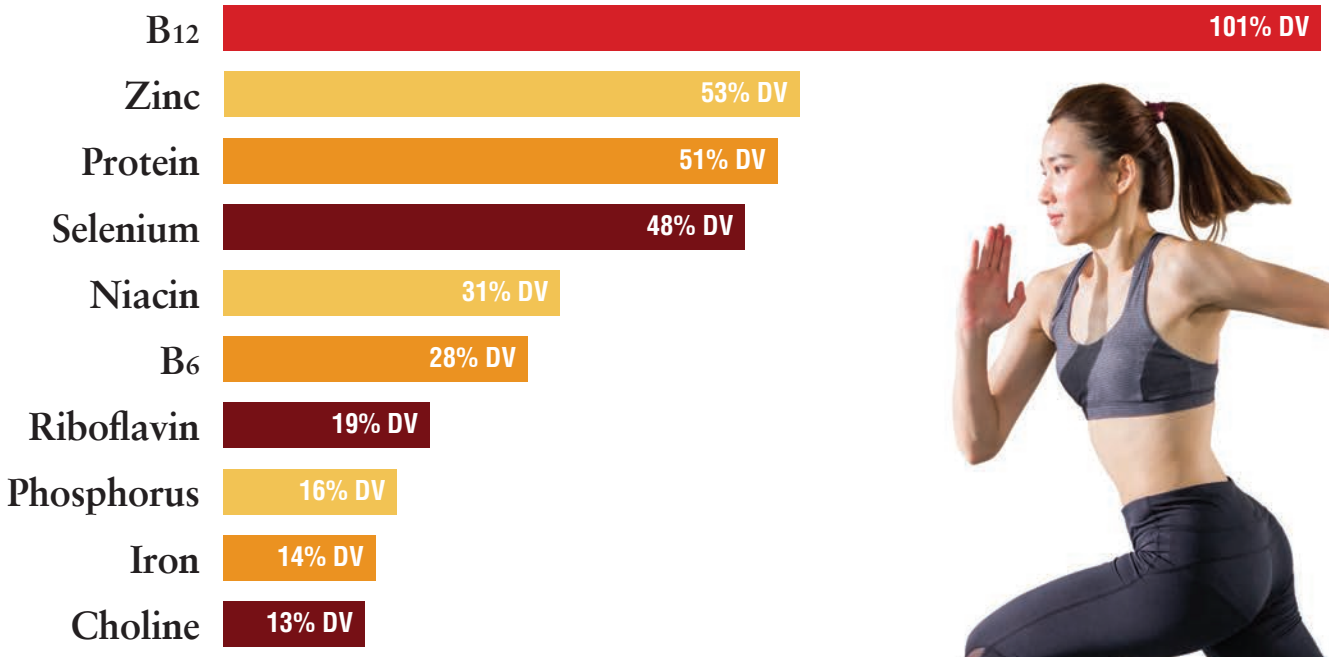
Beef gives you the nutrients your body needs and the taste you love! See how beef's 10 essential nutrients work to keep your body going.

Iron helps your body use oxygen.
Choline supports nervous system development.
Protein helps preserve and build muscle.
Vitamins B6 & B12 help maintain brain function and give you energy.
Phosphorus helps build bones and teeth.
Zinc helps maintain a healthy immune system.
Niacin supports energy production and metabolism.
Riboflavin helps convert food into fuel.
Selenium helps protect cells from damage.

Did you know?

Don't be left unsatisfied. On average a 3-oz serving of beef provides half (25 g) of the Daily Value for protein[1] which is one of the most satisfying nutrients. Get your workout in! Exercise is more effective when paired with a higher-protein diet.[2]

Beef gives your body more! On average, a **3-ounce. serving** of cooked beef provides 175 calories and:[1]



DV refers to Daily Value, the amount of a nutrient needed for a healthy adult on a 2,000-calorie diet. The %DV is the percent of a nutrient's Daily Value provided by a serving of food. For example, if a food has 50% of the DV for protein, then it provides 50% of the protein an adult needs each day. Even if your diet is higher or lower in calories, you can still use the DV as a guide to whether a food is high or low in a specific nutrient.

1 US Department of Agriculture, Agricultural Research Service, Nutrient Data Laboratory. USDA National Nutrient Database for Standard Reference, Legacy, NDB #13364. Version Current: April 2018. Internet: https://ndb.nal.usda.gov/ndb/

2 Jäger R, et al. International Society of Sports Nutrition Position Stand: protein and exercise. Int Soc Sports Nutr. 2017;14:20.

Finding Balance With Beef's High-Quality Protein

Living Well Is All About Balance

Balancing protein throughout the day supports overall health and wellness. Research shows that when coupled with physical activity, the high-quality protein in beef can help people meet nutritional recommendations, maintain a healthy weight and build lean muscle over time.[1]

It's time to find more balance in our daily diets. With today's leaner beef, it's the perfect partner for fruits, vegetables and whole grains, making a healthful plate even more delicious.

What does 25 grams of protein look like?

	AMOUNT	CALORIES	PROTEIN
QUINOA	3 cups	666	25g
PEANUT BUTTER	6 ½ tbsp	613	25g
BLACK BEANS	1 ⅔ cups	379	25g
EDAMAME	1 ⅓ cups	249	25g
BEEF	**3 ounces**	**173**	**25g**

Aim for nutrient rich, high quality protein. Animal proteins, like beef, are complete proteins, and are naturally rich in many vital nutrients. While choosing a variety of protein sources is important; calorie for calorie, beef provides more and higher-quality protein than plant foods. Beef also provides more than 10 essential nutrients, including protein, zinc, iron and more, that help the body function at its best.[2]

Take control. Balancing protein intake at meals and snacks throughout the day may be helpful for people working toward improved appetite control and body weight management. Evidence shows that people who eat a higher-protein diet (about 30% of daily calories from protein) generally feel fuller longer between meals and are less likely to overeat.[3] A 3-ounce portion of beef provides 25 to 30 grams of protein.[2]

Live a vibrant life. Protein is a powerful nutrient that plays an essential role at any age. Beef provides essential amino acids that the body needs to grow, build and preserve muscle, which supports vibrant and independent living as we age.[4] Eating enough protein-rich foods can help to protect lean body mass and prevent the loss of muscle and strength that comes with aging.[5,6]

1. Layman DK, et al. A moderate-protein diet produces sustained weight loss and long-term changes in body composition and blood lipids in obese adults. J Nutr 2009;139:514-21.
2. US Department of Agriculture, Agricultural Research Service, Nutrient Data Laboratory. USDA National Nutrient Database for Standard Reference, Release 28 (Slightly revised). Version Current: May 2016. Internet: http://www.ars.usda.gov/ba/ bhnrc/ndl. (NDD13364. Beef, composite of retail cuts, lean, 0 inch trim, all grades, cooked. Per 100g: Protein 29.9g, Total fat 8.4g, Saturated fat 3.3g and Cholesterol 90 mg).
3. Paddon-Jones D, et al. Protein, weight management, and satiety. Am J Clin Nutr 2008;87:1558S-61S.
4. Wolfe, R. The underappreciated role of muscle in health and disease. Am J Clin Nutr 2006; 84:475-82.
5. Paddon-Jones D, et al. Role of dietary protein in the sarcopenia of aging. Am J Clin Nutr 2008;87:1562S-6S.
6. Paddon-Jones D, Rasmussen BB. Dietary protein recommendations and the prevention of sarcopenia: Protein, amino acid metabolism and therapy. Curr Opin Clin Nutr Metab Care 2009;12:86–90.

Following a heart-healthy diet with lean beef is simple and flavorful with these tips

- Choose lean beef at the meat counter by looking for beef cuts with “round” or “loin” in the name (ie, Sirloin, Tenderloin, Top Round)
- Choose lean ground beef by looking for “lean”or “extra lean” – if choosing 90% lean or lower, strain after browning to further reduce fat.
- Keep portion size top of mind. A sensible and satisfying 3-ounce serving of cooked lean beef is about the size of a deck of cards.
- Prepare and cook lean beef in healthy ways – broiling, roasting, poaching or grilling. Trim away any visible fat.
- Add additional flavor to food without salt. Opt for enhancing flavor with onion, garlic, herbs, spices, citrus and vinegars. B

Indian Beef Flank Steak & Rice

Ground Beef & Pasta Skillet Primavera

Spicy Korean Beef & Cucumber

Confetti Beef Taco Salad

Scan here to visit **kybeef.com** and find these and other **American Heart Association certified heart-healthy beef recipes**.

HEART HEALTHY DIET PATTERNS

The Mediterranean Diet is one of the most popular eating patterns and is rich in fruits, vegetables, whole grains, nuts/seeds, olive oil and lean meats. Though it’s often suggested that adherents to the Mediterranean diet limit red meat consumption, it’s been shown intake of red meat in many Mediterranean countries is similar to that of the United States, and in some countries, even more.[1]

Recent research shows that a Mediterranean-style eating pattern that includes lean, unprocessed red meat can support heart health. The study demonstrates that following a Mediterranean-style eating pattern that includes up to 18 ounces of cooked, fresh lean beef and pork per week – along with poultry and fish – is just as effective at improving certain heart disease risk factors (e.g., blood pressure, total and LDL cholesterol) as the same pattern limiting red meat.[2]

The DASH (Dietary Approaches to Stop Hypertension) **Diet** is currently the gold standard heart-healthy diet recognized and recommended by health professionals to lower blood pressure and cholesterol. It is rich in fruits, vegetables, fiber and low-fat dairy. Research was recently conducted to assess the effect of including 4-5.5 ounces of lean beef, even daily, as part of a DASH-like diet and active lifestyle on heart health. Contrary to conventional wisdom, the results showed significant reductions in total and LDL “bad” cholesterol. The overall findings demonstrated improvements in heart-health risk factors are as effective as those from the DASH and other highly referenced heart-healthy diets.[3]

Heart-Check certification does not apply to information unless expressly stated.

1. Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2015. Available at https://health.gov/dietaryguidelines/2015-scientific-report/PDFs/Scientific-Report-of-the-2015-Dietary-Guidelines-Advisory-Committee.pdf

2. O’Connor LE, et al. A Mediterranean-style eating pattern with lean, unprocessed red meat has cardiometabolic benefits for adults who are overweight or obese in a randomized, crossover, controlled feeding trial. Am J Clin Nutr 2018, nqy075. https://academic.oup.com/ajcn/advance-article/doi/10.1093/ajcn/nqy075/5036105

3. Roussell MA, et al., Beef in an Optimal Lean Diet study: effects on lipids, lipoproteins, and apolipoproteins. Am J Clin Nutr 2012; 95

Misunderstood Fatty Acid Profile of Beef

Our bodies need cholesterol to build healthy cells, but high levels of cholesterol can increase our risk for heart disease. Recommendations to improve cholesterol levels include increasing activity levels, consuming adequate fiber and reducing saturated fat content. Beef is often identified as a high source of saturated fat, however 10% or less of saturated fat and total fat in the American diet comes from beef.[1] Pairing lean beef with fiber rich foods such as whole grains, fruits and vegetables and utilizing healthful cooking methods allows us to include beef in the rotation a few times per week without negatively affecting our cholesterol levels.

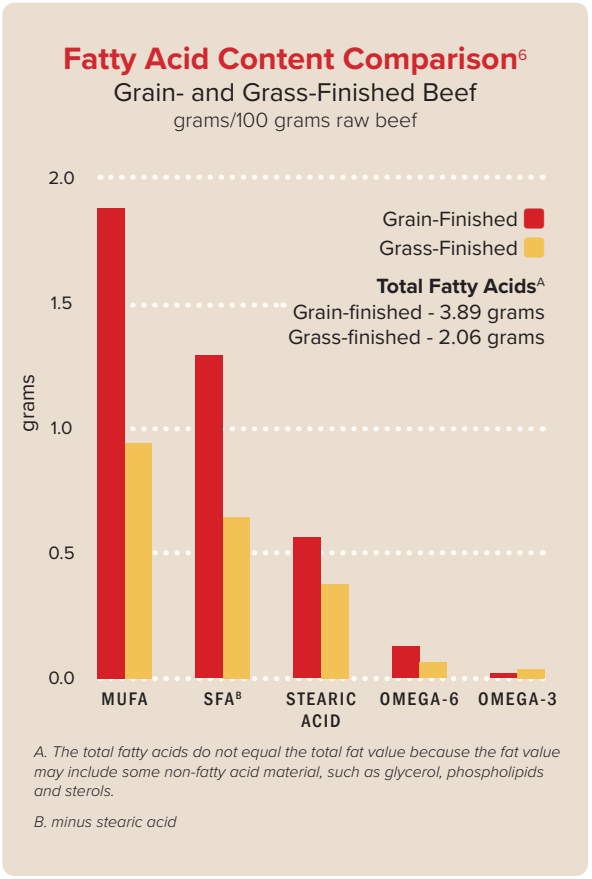
More than 36 cuts of beef are lean as defined by the USDA. To qualify as lean one, 3.5-ounce serving of beef must have less than 95 mg of cholesterol, less than 10 g of total fat and less than 4.5 g of saturated fat.

The only nutritional differences between the various beef choices relate to the fatty acid content and profile of grain-finished beef versus grass-finished beef.[2] In general, grass-finished beef tends to be leaner than grain-finished beef. However, with its higher monounsaturated fat content, the fatty acid profile of grain-finished beef may be more conducive to better health outcomes. Regardless of which option you choose, you will be getting a high-quality, nutrient rich product.

- More than half of beef's fatty acids are monounsaturated fatty acids (MUFA) – the same heart-healthy fat found in olive oil and avocado oil.
- About one-third of beef's saturated fatty acids (SFA) is steric acid which has been shown to have a neutral effect on total and LDL cholesterol levels.[3,4]

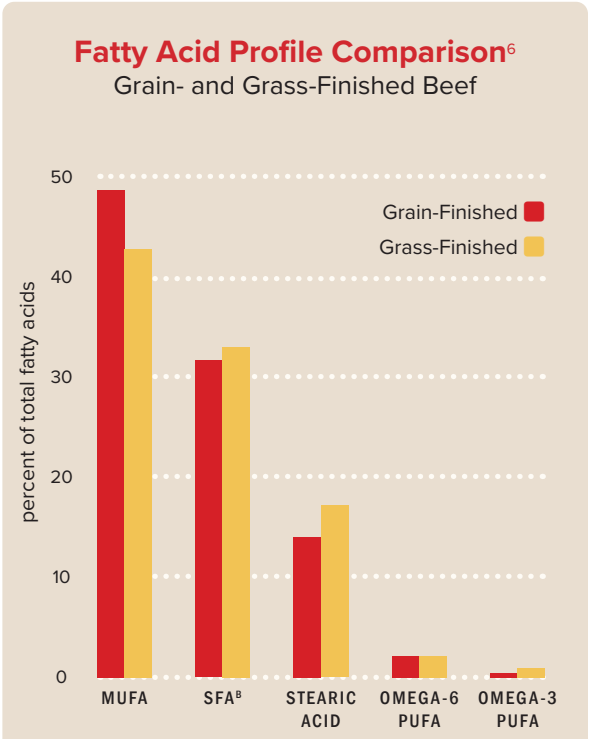
Substituting MUFA for cholesterol raising SFA has been shown to reduce LDL cholesterol and lower the risk of type 2 diabetes and cardiovascular disease.[5]

- Recent studies suggest that the higher MUFA content of grain-finished beef may be important for increasing plasma HDL cholesterol content among beef consumers.[5,6]



A. The total fatty acids do not equal the total fat value because the fat value may include some non-fatty acid material, such as glycerol, phospholipids and sterols.

B. minus stearic acid



B. minus stearic acid

1. Zanovec M, et al. Lean beef contributes significant amounts of key nutrients to the diets of US adults: National Health and Nutrition Examination Survey 1999-2004. Nutr Res 2010;30:375-81.

2. USDA National Nutrient Database for Standard Reference Legacy Release, April 2018. Available at: https://ndb.nal.usda.gov/ndb/

3. Kris-Etherton, P.M., Griel, A.E., Psota, T.L., et al. Dietary stearic acid and risk of cardiovascular disease: intake, sources, digestion, and absorption. Lipids 40: 1193-1200, 2005.

4. Mensink, R.P. Effects of stearic acid on plasma lipid and lipoproteins in humans. Lipids 40: 1201-1205, 2005.

5. Adams, T., Walzem, R., Smith, D., Tseng, S., & Smith, S. (2010). Hamburger high in total, saturated and trans-fatty acids decreases HDL cholesterol and LDL particle diameter, and increases TAG, in mildly hypercholesterolaemic men. British Journal of Nutrition, 103(1), 91-98.

6 Van Elswyk ME, McNeill SH. Impact of grass/forage feeding versus grain finishing on beef nutrients and sensory quality: the U.S.experience. Meat Sci. 2014 Jan;96(1):535-40.

Surprising Facts About Lean Beef

Many people are often surprised to learn that the bundle of nutrients in lean beef, like high-quality protein, iron, zinc and many B vitamins, comes in such a delicious package with relatively few calories. Let's bust some common myths about our favorite protein, beef.

MYTH: Beef consumption should be limited because it's bad for your heart and raises cholesterol.

FACT: Research consistently shows that a heart-healthy diet and lifestyle including lean beef, even daily, can reduce risk factors for heart disease. A randomized-controlled trial found that participants who consumed lean beef, as part of a dietary pattern that was rich in fruits and vegetables, low in saturated fat, and included low-fat dairy, experienced a 10% decrease in LDL cholesterol and a moderate decrease in blood pressure, both markers of lower heart disease risk. Another study found that subjects who followed a healthy, higher-protein, weight-loss dietary pattern, combined with physical activity, and consumed lean beef four or more times a week, saw reductions in total cholesterol, LDL cholesterol, triglycerides and systolic and diastolic blood pressure. In addition, evidence has shown that lean beef consumed in the context of an overall heart-healthy diet pattern rich in fruits, vegetables, whole grains, and low-fat dairy maintains blood lipid levels similar to other lean proteins like poultry and fish. The current body of evidence provides convincing support that eating lean beef, as part of a healthy dietary pattern and lifestyle, can support a strong heart.

MYTH: Americans consume too much red meat, especially beef.

FACT: On average, Americans consume 1.7 ounces of beef daily, well within the recommended amount of 5.5 ounces from the Protein Foods Group per day. The fact is, beef is a natural source of essential nutrients with relatively few calories, which makes it a great lean protein option that Americans can enjoy at any meal.

MYTH: Grass-finished beef is more nutritious than grain-finished beef.

FACT: The variety of beef choices available to you, including grain-finished and grass-finished, are delicious and nutritious. Most people don't realize that cattle spend the majority of their lives grazing on pasture. On average, over their lifetime, grain-finished cattle consume less than 11% of their diet as grain and close to 90% of their diet as forage (e.g., grass and hay) and other human-inedible plant leftovers (e.g., dried distillers grains). In general, all varieties of beef are equally nutritious as all are a natural source of more than 10 essential nutrients, like protein, iron, zinc and many B vitamins. While grass-finished beef tends to be a little leaner, a number of other variables contribute to leanness, including breed, age, grade and cut. B

What does "LEAN" mean?

According to USDA, a cut of cooked fresh meat is considered "lean" when it contains less than 10 grams of total fat, 4.5 grams or less of saturated fat and less than 95 mg of cholesterol per 100 grams (3½ oz) and per RACC (Reference Amount Customarily Consumed), which is 85 grams (3 oz).

NUTRIENTS	GRAIN-FINISHED	GRASS-FINISHED
PROTEIN *a powerful nutrient that helps strengthen and sustain the body*	22.2g	21.8g
ZINC *an important nutrient that helps maintain a healthy immune system*	3.8mg	3.7mg
IRON *an essential nutrient that helps your body transport and use oxygen to power through the day*	1.6mg	1.8mg
TOTAL FAT	**5.2g**	**2.9g**

	5.2g	**2.9g**
SATURATED FAT *(minus stearic acid) aim for less than 10% of total caloric intake*	1.3g	0.7g
STEARIC ACID *about 1/3 of beef's saturated fat is stearic acid, a fatty acid found in chocolate, that research shows does not raise cholesterol levels.*	0.6g	0.4g
MONOUNSATURATED FAT *the type of fat found in avocado and olive oil*	1.9g	0.9g
POLYUNSATURATED FAT	0.2g	0.1g
OMEGA-3 *found in flax seed, some nuts, salmon, and other fatty fish*	0.02g	0.05g
OMEGA-6 *found in vegetable oils and some nuts and seeds*	0.13g	0.06g

Early Nutrition with Beef

It is well-established that the first 1,000 days of life are of utmost importance for promoting short- and long-term health and developmental outcomes. The foods a child is exposed to during this critical period can shape taste preferences and food choices in addition to impacting the child's ability to grow, learn and thrive throughout life. Furthermore, there may be significant consequences to overall health and development if infants do not meet nutrient recommendations as they transition from breastmilk or formula alone to incorporating complementary first foods.

What happens in these first 1,000 days will help to set the child's "dietary pattern" – the habitual intake of a combination of foods and beverages that will work synergistically in relation to health. This is a key time for healthy habits and dietary patterns to become established to help promote a lifetime of well-being.

Beef provides a vital bundle of nutrients — Beef is a natural source of more than 10 essential nutrients including protein, zinc and iron, which children need for their development, learning, behavior and growth. Beef also provides choline, vitamin B6 and vitamin B12, all of which are critical for brain development. So much nutrition packed into a small portion size makes beef an ideal complementary food to serve to infants!

IMPORTANT TO NOTE: With an increase in mothers breast feeding for longer periods of time (which is great!) and the popularity of baby led weaning that typically excludes the use of baby cereal, research indicates that many infants are NOT meeting iron needs, since both formula and fortified baby cereal have traditionally been the main sources of iron for infants. In addition, less than 10% of infants consume meat in their first 9 months. Recommending iron-containing foods like beef and iron-fortified cereals as first foods is vital to help infants meet iron requirements.

Beef's nutrients support strong minds and bodies — According to the American Academy of Pediatrics, all nutrients are necessary for brain growth, but particular key nutrients that support proper brain development include protein; zinc; iron; choline; folate; iodine; vitamins A, D, B6, and B12; and long-chain polyunsaturated fatty acids. Failure to provide key nutrients during this critical period of brain development, especially iron, may result in lifelong deficits in brain function. The nutrients found in beef support brain health and development in little ones, including iron and zinc. Beef has also been shown to support healthy growth in infants without excess weight gain.

IMPORTANT TO NOTE: The iron in beef is highly absorbable making beef an ideal first food for 7–12-month-olds. While there are many plant sources of iron, they are not very well absorbed by our bodies, so baby would have to eat A LOT of these foods to get enough iron. Offering beef as one of baby's first foods is one of the best ways to meet iron needs.

Beef's nutrients support a healthy immune system — Parents worried about their children getting sick should know that iron- and zinc-containing foods, including beef, support the growth of healthful bacteria in an infant's gut, which enhances immune function.

Beef encourages a healthy palate — Introducing a variety of flavors and textures as first complementary foods, including meats like beef, encourages infants to accept the taste of healthy foods as they grow older.

Six Ways to Save on Beef

The Beef Checkoff, the leading authority on all things beef, shares expert tips on how to get the best deals on beef and keep your grill sizzling all year.

1: CONSIDER THE PRICE PER SERVING

To calculate the food cost per serving, divide the food cost per recipe by the number of servings. For instance, if the food cost per recipe is $5 and each recipe yields 4 servings, the food cost per serving would be $1.25.

2: BUY FAMILY SIZED PACKAGES AND BUNDLES

Look in the meat case for family packs. You will find in many cases a lower price per pound. If you can't use it all for one meal, freeze it or use leftovers for sandwiches, salads, or even stir-fry the next day.

3: GO SMALL

If you don't need a pound of beef, don't buy one! Instead, you can visit the meat case to find perfectly portioned steaks and roasts.

4: BUY LARGER CUTS AND SLICE YOUR OWN

Buying larger cuts of beef and slicing them into steaks at home can save you at least a dollar or two per pound. Freeze individually or serve when entertaining a group.

5: HUNT FOR BARGAINS

Every week, your local grocers will offer specials on beef. Watch the weekly paper for coupons and deals. Don't get the newspaper? Check out the store's website, or their social media pages. When you find a good deal on your favorite cuts, buy enough to stock your freezer.

6: ASK FOR HELP

Talk to your friendly neighborhood butcher or meat counter clerk. Their job is to recommend the most appropriate cuts and tell you how to get the most out of them. You can also pull out your phone and visit kybeef.com to research cuts, nutrition information and recipes.

Buying Local Beef

Have you considered buying local beef but don't know where to begin?

You have many options when purchasing beef. What's most important to note is all beef you purchase is safe and wholesome regardless of whether it comes from the grocery store, big box store or directly from the farmer. With 91% of U.S. cattle farms being family-owned, you can rest assured the producers behind your beef hold the health and welfare of their animals and the quality and sustainability of their beef to the highest of standards. A perk of purchasing locally, in addition to supporting your neighbor, is the ability to customize your cuts and order in bulk.

Begin Here

- Familiarize yourself with cattle production methods
- Understand labeling, grading and beef breakdown
- Find a reputable producer
- Determine quantity and specific processing options
- Understand and calculate price
- Make storage arrangements

The Local Beef Directory hosted by The Kentucky Beef Council is a resource to help connect beef buyers and sellers from all corners of the commonwealth. The directory currently represents 70 counties, 10+ processing facilities, and 160 producers.

BUY LOCAL BEEF

SELL LOCAL BEEF

Visit **https://www.kybeef.com/raising-beef/local-beef-directory**

Understanding the Label

The meat package label Identifies the kind of meat (i.e. beef), the wholesale (primal) cut and the cut name. It also includes the weight, price per pound, total price, sell-by date and safe handling instructions. It may also include a grade, nutrition and preparation information, and the country of origin.

Ground beef packages are labeled according to USDA standards. The information on the labels will be expressed as percent lean to percent fat (80% Lean/20% Fat, for example).

What to Look For

- Select beef with a bright, cherry-red color. Beef in a sealed bag typically has a darker purplish-red color. When exposed to the air, it will turn a bright red.
- Choose beef that is firm to the touch.
- Make sure the package is cold with no holes or tears.
- Choose packages without excessive liquid.
- Purchase beef on or before the sell-by date.

Understanding Beef Costs

When purchasing beef in large quantities, such as a quarter or half of a cow, several factors come into play beyond the initial price per pound. You should understand the difference between live weight, hanging weight and how that will impact the amount of meat you receive.

When you buy a bulk portion, the price is typically based on the hanging weight of the animal after it has been processed and dressed.

The live weight is the weight of the animal while alive prior to processing (also could be called weight on hoof).

The hanging weight is the weight after after all the inedible parts, the hide, and blood are removed (also could be called harvest weight).

The hanging weight is significantly less than the live weight of the animal due to the removal of inedible parts but also due to the evaporation of the water in the meat. The exact percentage of meat you receive from the hanging weight varies but generally you can expect ranges between 60% to 65%. **This means that if you purchase a quarter of a cow with a hanging weight of 200 pounds, you might receive around 110 to 130 pounds of actual meat, depending on factors like the cut selection and trimmings.**

In addition to price per pound, you may also incur costs associated with processing and butchering the meat according to your preferences. This includes cutting the meat into specific cuts, as well as packaging it for freezer storage. Processing fees can vary widely depending on the butcher and the complexity of your requests, so it's essential to discuss these details with the supplier or butcher upfront.

SAMPLE BREAKDOWN

Live Weight: 1,300 lbs - weight of the steer while alive, before processing.

Processing and Dressing: After the steer is harvested, all inedible parts are removed. You now have the **hanging weight** which is typically around about 60-65% of the live weight. If the live weight is 1,300 lbs., the hanging weight might be around 780 to 845 lbs. Let's estimate it at 806 lbs. for this example.

Chilling and Aging: The carcass is then chilled to allow the muscles to relax and for the meat to tenderize. Some moisture loss may occur during chilling. The weight loss during chilling can vary, but it's generally minimal, around 2-3%. Using the above weight of 806 lb. hanging weight and 2% loss would be 790 lbs.

Trimming: The carcass is then trimmed to remove excess fat and connective tissue. You now have the **bone-in carcass weight**. After trimming, the bone-in carcass weight might be around 70-75% of the hanging weight. Let's estimate it at 553 lbs. (70% of 790 lbs.).

Cutting and Boning Out: The carcass is then cut into various wholesale cuts (like primal cuts) and smaller retail cuts (like steaks and roasts) possibly giving you the **boneless meat yield**. Typically around 70-75% of the bone-in weight. So, from a bone-in weight of 553 lbs., you might get around 388 to 415 lbs. of boneless meat.

Packaging: Meat can be packaged further into individual cuts and portions, additional trimming could occur. This could bring you to the **final packaged weight**. The weight of packaged meat will vary based on the specific cuts and packaging methods used. For example, if you get approximately 70% yield from the boneless meat (using 70% of 553 lbs. bone-in weight), you might have around 387 lbs. of packaged boneless meat.

Remember, your processing preferences heavily influence your final figures.

Know What You Are Getting from the Butcher

When preparing to have beef processed by a butcher, filling out a cut sheet accurately ensures you get the cuts of meat you desire. Each shop will have its own cut sheet and its own method of breakdown. It is essential to meet with the processor and discuss your options before ordering. Below is a guide to help get you started when filling out a beef cut sheet.

Processing Options

- Indicate whether you want the beef processed as a whole, half or prefer specific cuts and quantities.
- Choose between standard cuts offered, or discuss other options with your butcher.
- Determine desired thickness of steaks and roasts – typically around 1 inch. If you prefer it cooked to a higher temperature, consider a thinner cut.
- Bone-in or boneless cuts – bone in can add flavor but can add additional labor.

Specialty Cuts

- If you desire specialty cuts (e.g., brisket, flank steak, ribs), specify quantities and preferences.

Offal and Miscellaneous

- Indicate if you want organs or other parts of the animal (e.g., liver, heart).
- Specify any additional processing requests (e.g., sausage making, jerky preparation).

Burger and Sausage Preference

- **Specify preferences for ground beef:**
  - Fat content (e.g., lean, regular).
  - Seasoning options (if applicable).
- **Specify preferences for sausage:**
  - Type of sausage (e.g., breakfast links, Italian).
  - Seasoning and casing preferences.

Special Instructions

- Include any other preferences or questions you have. Butchers are there to help, so don't hesitate to ask.

By following these steps and providing clear instructions on your beef cut sheet, you can ensure that your beef processing experience meets your expectations and results in high-quality cuts of meat tailored to your preferences.

ESTD 1999
BUTCHERY
— MEAT SHOP —
PREMIUM QUALITY

NAME

PHONE

EMAIL

Standard processing fee $250 for up to 500 lbs and $50 per hundred over 500 lbs. due at drop off.

LIVE WEIGHT $

Standard pricing includes all cuts, tenderize, grind, and freezer wrap.

Packaging Options $

☐ standard ☐ double freezer wrap *($4 per 100 lbs live weight)* ☐ vacuum sealed *($10 per 100 lbs live weight)*

☐ 2-3 lb roasts ☐ 3-4 lb roasts ☐ 2 steaks per pkg ☐ 4 steaks per pkg ☐ 6 steaks per pkg

☐ 1 lb ground pkg ☐ 2 lb ground pkg ☐ 1 lb cubed stew ☐ 2 lb cubed stew

Fore Quarter Cuts: write quantities or percentages and write thickness of steaks.

CHUCK ROAST	CHUCK STEAKS	ARM ROAST
FLAT IRON TRIM ☐	RIB ROAST	RIB STEAKS
BONELESS RIBEYE	BRISKET TRIM ☐	SHORT RIBS TRIM ☐

Hind Quarter Cuts: write quantities or percentages and write thickness of steaks.

SKIRT STEAK	SIRLOIN TIP ROAST	SIRLOIN TIP STEAKS
RUMP ROAST	ROUND STEAKS	CUTLETS
EYE OF ROUND ROAST	SIRLOIN STEAKS	T-BONE STEAKS
PORTERHOUSE STEAKS	NEW YORK STRIP	FILET MIGNON

Other Requests

SOUP BONES	TONGUE	LIVER
HEART	OX TAIL	SWEET BREAD

Specialty Menu: items not included in standard price and charged per lb.

Smoked Link Sausage: ____ lbs x $2.20 ☐ original seasoning ☐ German $

Cooked Salami: ____ lbs x $3.20 $

Marinated Fajita or Steaks: ____ lbs x $2.95 CUTS $

Subtotal	Deposit	Amount Due
$	$	$

www.kybeef.com

Storage Preparation & Shelf Life

When it comes to purchasing beef in bulk, proper storage preparation and understanding shelf life are essential factors that can ensure the quality and longevity of your meat supply. Knowing how to store freezer beef cannot only maximize its freshness but also optimize your investment, ensuring that every cut remains delicious and safe to enjoy well into the future.

Plan for at least 1 cubic foot of freezer space for every 35-40 lbs. of packaged meat. This range could differ based on the thickness of cuts and bone-in vs boneless cuts. Always confirm with the supplier or butcher before placing your order to ensure you have the appropriate amount of space.

Tips

- Overestimate how much freezer space you would need, especially if you plan to store any other freezer items as well.
- Utilize bins or dividers for organization.
- Practice the FIFO (First In, First Out) inventory system.
- Label each package with the date, name of beef cut, and weight and/or number of servings.
- If placing in the refrigerator, place on the lowest shelf on a plate or tray to catch any drippings.

Amount	lbs of meat	Freezer space required	Freezer space recommended
Whole	500	12-14 cubic feet	17-21 cubic feet
Half	250	6-7 cubic feet	8-10 cubic feet
Fourth	125	3-4 cubic feet	5-7 cubic feet

NOTE: Figures are approximate.

Freezer Shelf Life

Meat should be properly stored in a freezer at 0°F (-18°C) or below. Freezer storage times can vary based on factors such as the quality of the packaging, storage conditions, and initial freshness of the meat at time of freezing. Properly packaged, frozen, and maintained beef can last up to a year or more in your freezer. Here is a general guideline. [B]

FREEZER SHELF LIFE


GROUND BEEF ..... 3-4 months


STEAKS & ROASTS ..... 6-12 months


STEW MEAT ..... 6-12 months


BEEF ORGANS ..... 3-4 months


SAUSAGES AND GROUND PATTIES ..... 1-2 months


COOKED BEEF (LEFTOVERS) ..... 2-3 months

Ground Beef Thawing Recipe ready in a few easy steps!

We've all been there - it's 5:30, the kids are starving, and all you've got in the freezer is a rock hard pound of frozen ground beef. Don't panic! Follow these simple steps and you'll have a quick and delicious beef meal on the table in no time!

STEP 1

Remove your pound of frozen ground beef from packaging and place in a gallon size freezer bag.

STEP 2

Seal the storage bag, leaving a small opening for steam to escape.

STEP 3

Heat the bag in your microwave (on a microwave safe plate) for one minute on high.

STEP 4

Flip the bag over

STEP 5

Heat on high for another minute and let the beef rest for a minute.

STEP 6

Remove beef from the microwave and massage the bag for at least 10 seconds.

STEP 7

If needed, heat on high for 30 seconds longer, followed by 30 seconds rest. The leaner your beef, the less time you will need to microwave.

STEP 8

Immediately cook your ground beef to 160° F.

Grilling Frozen Beef in three simple steps

STEP 1

Prepare grill (gas or charcoal) according to manufacturer's directions for medium heat.

STEP 2

Place frozen beef cuts (directly from freezer) on cooking grid. Beef cuts should be frozen individually in a single layer.

STEP 3

Grill covered, according to the chart below, turning every five minutes or as needed. Season with herbs or spices, as desired, after first turn.

		APPROXIMATE TOTAL COOKING TIME FOR MEDIUM RARE (145°F) TO MEDIUM (160°F)	
BEEF CUT	WEIGHT/THICKNESS	FROZEN CHARCOAL GRILLING	FROZEN GAS GRILLING
Flat Iron Steak	8 oz each	19 to 24 minutes	18 to 23 minutes
Ribeye Steak, Boneless	3/4 inch 1 inch	14 to 17 minutes 19 to 22 minutes	13 to 17 minutes 20 to 24 minutes
Strip Steak, Boneless	3/4 inch 1 inch	13 to 18 minutes 19 to 24 minutes	14 to 19 minutes 20 to 25 minutes
Top Sirloin Steak, Boneless	3/4 inch (about 8 oz) 1 inch (about 9 to 10 oz)	18 to 23 minutes 23 to 29 minutes	18 to 23 minutes 26 to 32 minutes
Ground Beef Patties	1/2 inch (4 oz each)	13 to 17 minutes	13 to 17 minutes

Healthy Grilling with Beef

Grilling is a great way to enjoy fresh, flavorful foods, including beef. Whether cooking on a gas or charcoal grill, in the backyard or at a tailgate, grilling helps prepare nutrient-rich beef with maximum taste and optimal tenderness. Grilling is a method of dry heat cookery that requires little or no added fat. Here are three simple steps to help ensure a safe, delicious and healthy grilling experience with beef.

STEP 1: CHOOSE YOUR CUT

Cuts Matter. Beef contains essential nutrients like zinc, iron and protein to power healthy, active lifestyles, and many cuts of beef are perfect for delicious and nutritious grilling. Some of the best steaks for grilling include Strip Top Loin Steak, Flank and Ribeye.

STEP 2: PREPARE YOUR BEEF

Savor the Flavor. Marinades work overtime by adding extra flavor and tenderness. Marinades with little or no sugar may help protect meat from charring and have also been shown to reduce HAA formation.

> Before cooking, remove meat from the marinade and pat dry with a paper towel to promote even browning and prevent steaming.
>
> Sugary sauces and glazes can burn easily and cause charring. If using, baste during the last few minutes of grilling and avoid charring.

Don't Forget the Fruits & Veggies. Beef pairs perfectly with fruits and vegetables, especially on the grill! Grilled veggies and fruits like zucchini, corn, pineapple and plums add delicious flavor to a nutrient-rich meal with beef.

STEP 3: PREPARE YOUR BEEF

Keep it Medium. When cooking beef, use medium heat. High heat can overcook or char the outside of beef cuts while the interior remains underdone. Charring is not recommended.

Charcoal grilling: Medium heat is achieved when coals are no longer flaming and are ash-covered and spread in a single layer.

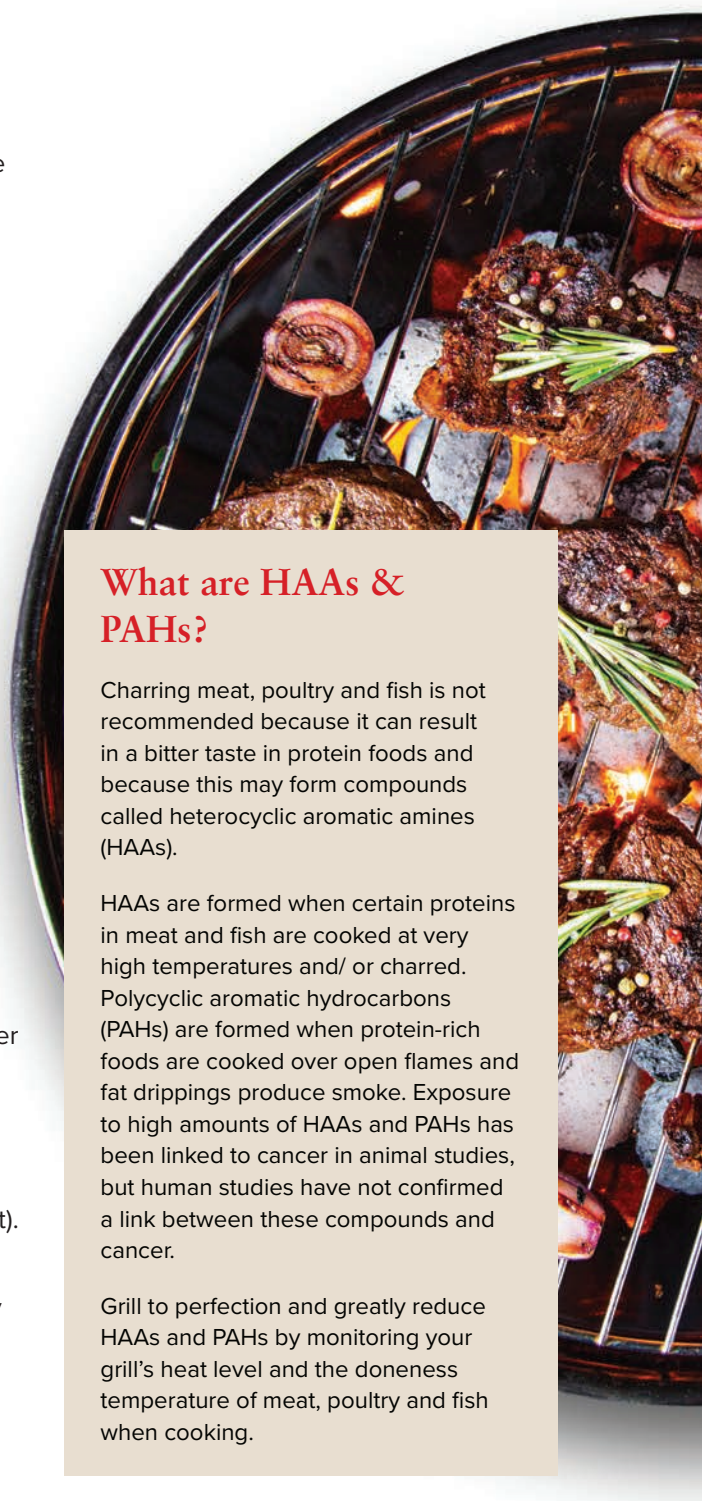
Check the cooking temperature by cautiously holding the palm of your hand above the coals at cooking height. Count the number of seconds you can hold your hand in that position before the heat forces you to pull it away (approximately 4 seconds for medium heat).

Gas grilling: Consult the owner's manual for specific information about preparing the grill for medium heat since gas grill brands vary greatly.

Patience pays off. Turn beef one to two times for even cooking and browning.

Use a spatula to turn burgers and tongs to turn steaks and kabobs.

Do not press, flatten or pierce the meat — flavorful juices will be lost.



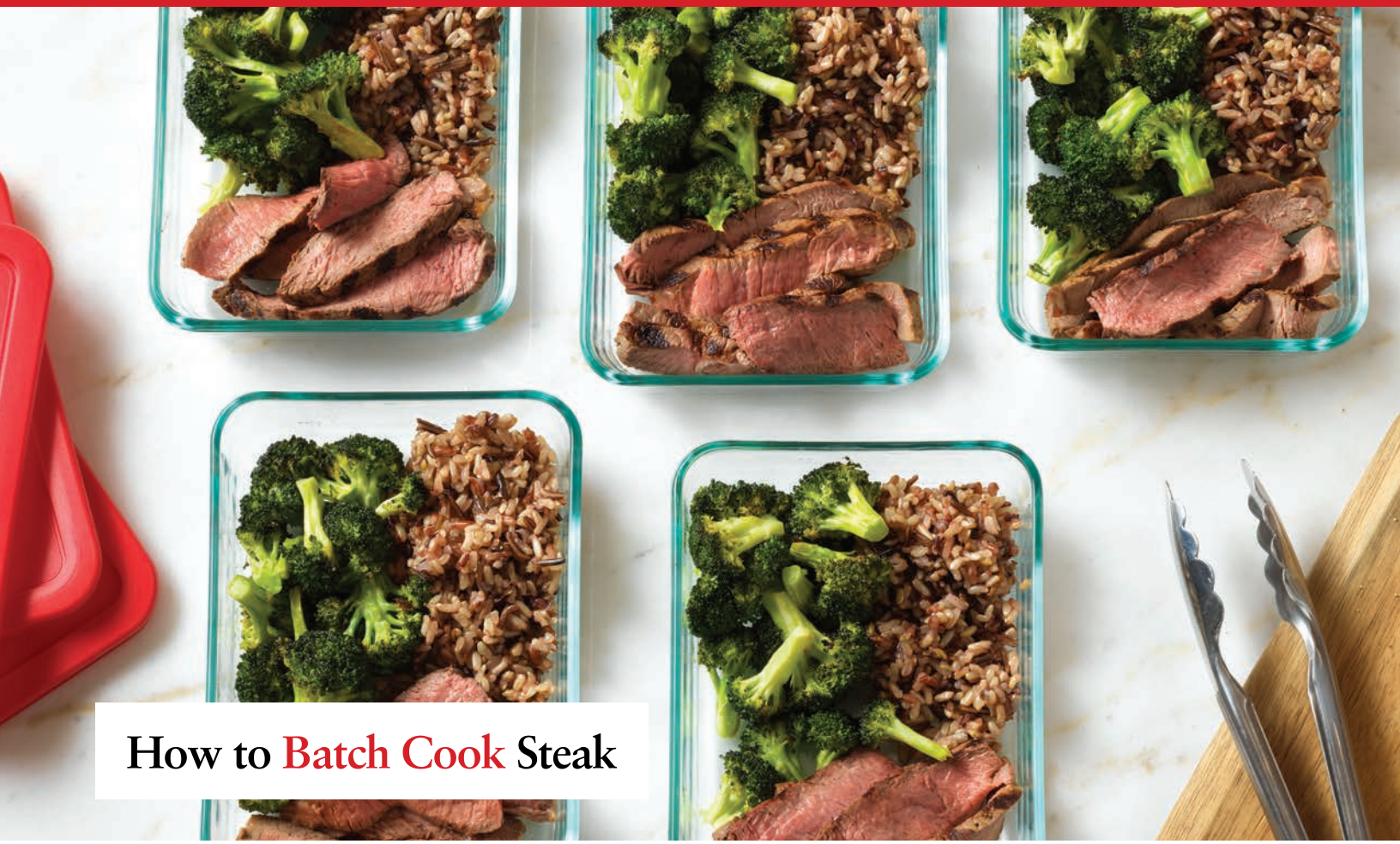
What are HAAs & PAHs?

Charring meat, poultry and fish is not recommended because it can result in a bitter taste in protein foods and because this may form compounds called heterocyclic aromatic amines (HAAs).

HAAs are formed when certain proteins in meat and fish are cooked at very high temperatures and/ or charred. Polycyclic aromatic hydrocarbons (PAHs) are formed when protein-rich foods are cooked over open flames and fat drippings produce smoke. Exposure to high amounts of HAAs and PAHs has been linked to cancer in animal studies, but human studies have not confirmed a link between these compounds and cancer.

Grill to perfection and greatly reduce HAAs and PAHs by monitoring your grill's heat level and the doneness temperature of meat, poultry and fish when cooking.

Source: Hur JH, et al. Effect of Dietary Red Meat on Colorectal Cancer Risk—A Review, Comprehensive Reviews in Food Science and Food Safety, 2019, https://doi.org/10.1111/1541-4337.12501. Accessed Oct 4, 2019.



How to Batch Cook Steak

Save time and money, while getting a nutritious, balanced meal on the table for your family, keeping them strong and focused for everyday success. Just grill up your desired amount of steak and enjoy pre-planned meals for the next few days.

STEP 1: CHOOSE YOUR CUT

Cuts Matter. Many cuts of beef are perfect for delicious and nutritious grilling. And all steak cuts contain essential nutrients like zinc, iron and protein to power healthy, active lifestyles. Some of the best cuts for grilling include top sirloin steak, strip steak, and flank steak.

STEP 2: PREPARE YOUR BEEF

Fire up the grill (gas or charcoal) to medium heat. Remove beef from refrigerator and season with herbs or seasonings of your choice. Remember to marinate less tender cuts of beef, like Flank Steak, prior to grilling, for 6 to 24 hours.

STEP 3: COOK YOUR BEEF

Place steaks on the grill and cook, covered, turning occasionally with tongs until cooked to medium rare (145°F) to medium (160°F) doneness. To determine the internal temperature, insert an instant-read thermometer horizontally into the thickest part of the steak. Once finished, let the steaks rest for five minutes before slicing to allow those tasty juices to redistribute. Season beef with salt, if desired.

STEP 4: ASSEMBLE YOUR MEALS

Once your steaks have rested, slice against the grain and portion into 3-oz. servings (a sensible 3-oz. portion, about the size of a computer mouse, has about 25 grams of protein). Transfer to reusable storage containers and add your choice of ½ cup of starchy vegetable or whole grain side dish, like sweet potato, quinoa or brown rice, and 1 cup of your favorite vegetable, such as broccoli, asparagus or green beans. Seal your containers and place in the fridge for convenient, balanced and nutritious meals on the go. Make sure to consume your batch cooked steak within 3 to 4 days. B

Simple Steak Swaps

Beef's great versatility means there are plenty of options for every taste and budget.

TENDERLOIN STEAK
(FILET MIGNON)

RIBEYE STEAK

T-BONE STEAK

STRIP STEAK

TOP SIRLOIN STEAK

STRIP STEAK (LEAN)

Tender, lean and perfect for grilling.

CHUCK EYE STEAK

A tender and savory cut. A low-cost alternative.

STRIP STEAK (LEAN)

Tender, lean and perfect for grilling.

PORTERHOUSE STEAK

Big enough for two. Simply season this sublime combination of Strip and Tenderloin to grill.

STRIP STEAK (LEAN)

Tender, lean and perfect for grilling.

RIBEYE STEAK

Rich, juicy and full-flavored with generous marbling throughout.

TOP SIRLOIN STEAK (LEAN)

Flavorful, versatile and juicy. Great as a steak or cut into kabobs.

T-BONE STEAK

Smaller than the Porterhouse, but delivers the same optimal tenderness and satisfying flavor.

STRIP STEAK (LEAN)

Tender, lean and perfect for grilling.

COULOTTE STEAK (LEAN)

With plenty of marbling, this is a juicy and savory steak.

FLAT IRON STEAK

Extremely tender, well-marbled and flavorful.

PETITE SIRLOIN STEAK

A great value steak. Grill after marinating.

RANCH STEAK (LEAN)

Affordable, lean and versatile. Good for grilling or broiling.

Determining Doneness

Safe steps in food handling, cooking, and storage are essential in preventing foodborne illness. You can't see, smell, or taste harmful bacteria that may cause illness. In every step of food preparation, **follow the four guidelines** to keep food safe:

Clean—Wash hands and surfaces often.

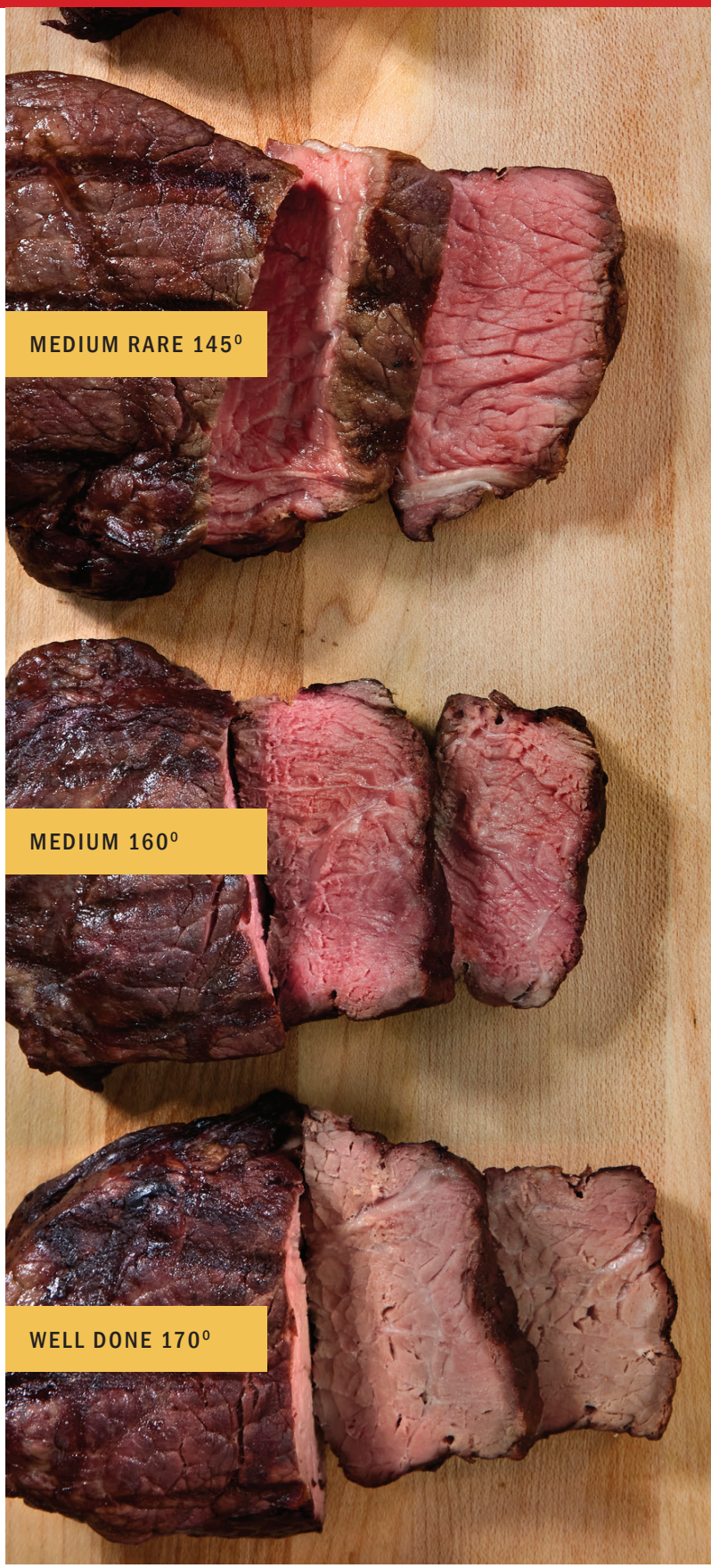
Separate—Separate raw meat from other foods.

Cook—Cook to the right temperature.

Chill—Refrigerate food promptly.

Cook all food to these minimum internal temperatures as measured with a food thermometer before removing food from the heat source. For reasons of personal preference, consumers may choose to cook food to higher temperatures.

Cook ground beef to **160°.**



For best results, insert an instant-read thermometer horizontally into the thickest part of the cut. After cooking, let steaks rest for 10 minutes before serving.

Kitchen Hacks

Countless hours can be spent in the kitchen preparing family meals or delicious party treats. Use these kitchen hacks to keep things running smoothly while creating your culinary masterpieces!

CLEAN CAST IRON WITHOUT CAUSING RUST

Clean cast iron with a coarse salt scrub to remove stuck on bits of food. Use a towel to rub the cast iron with cooking oil before storing.

PUT AN END TO SLIPPERY CUTTING BOARDS

Place a damp dishtowel or paper towel underneath a cutting board to keep if from slipping.

VACUUM SEAL WITHOUT A MACHINE

All you need is a freezer bag and a large bowl of water. Place beef in the plastic bag, and slowly lower the bag into the water. As the bag is submerged, air will escape the open bag. When you have lowered the bag as far into the water as you can without letting water into the bag, seal the bag, label it and place it in the freezer.

KEEP WOODEN CUTTING BOARDS LOOKING NEW

Scrub a wooden cutting board with coarse salt and massage half a lemon into the wood to clean away food particles and smells. To condition the board, rub with food grade mineral oil once a month.

NO GRILL BRUSH? NO PROBLEM!

Clean your grill of debris using an onion. Heat the grill, slice an onion in half, and use a fork to scrub the onion against the grill grate.

Alfalfa: perennial legume crop that is high in protein, vitamin A and vitamin D.

Animal Husbandry: animal care.

Animal and Plant Health Inspection Service (APHIS): USDA agency providing leadership in ensuring the health and care of animal and plants. APHIS is responsible for port inspection and the detection and eradication of unwanted organisms from U.S. and administers the Animal Welfare Act.

Antibiotic: a medication used judiciously in consultation with a veterinarian to treat infections caused by bacteria and other microorganisms.

Artificial insemination (AI): reproductive technology used by cattlemen and women to take advantage of the highest quality cattle genetics. It is performed by manually placing semen into the female reproductive tract.

BQA Feedyard Assessment: Audit of a feedyard pertaining to humane care and handling of cattle according to BQA protocols.

Backgrounding: raising weaned cattle for 3-9 months on pastureland where they graze on grass, forages, and/or crop residues until they are ready to go to a feedyard.

Beef: meat that comes from cattle.

The Beef Checkoff: program funded by cattle farmers and ranchers to conduct beef promotion, research and education activities. Two dollars per head of cattle is collected each time an animal is sold in Kentucky.

Beef Producer: an individual who raises cattle to produce beef.

Beef Quality Assurance (BQA): Established in 1987 by The Beef Checkoff to provide cattle producers with the tools and training necessary to assure animal health and well-being as well as provide a safe, quality product.

Beef Industry Food Safety Council (BIFSCO): Beef community group bringing together experts from all segments of the beef production chain to develop industry-wide, science-based strategies to eliminate the incidence of E.coli 0157:H7 and other foodborne pathogens in beef.

Biosecurity: a set of measures that farms and industries take to protect animals, property and people from infectious diseases or harmful organisms (pathogens). It also aims to protect neighboring farms, consumers, and the quality and safety of food products.

Bovine: A ruminant mammal belonging to the genus Bos. The biological subfamily Bovinae includes cattle, bison, water buffalo and yak.

Boxed Beef: cuts of beef packed in boxes for shipping from the packing plant to retailers.

Brand: form of identification where the hide of the animal is permanently marked with the owner's individual mark. Hot-iron or freeze.

British Breeds: originating from the British Isles. Characteristics – small size, hardiness in cold climates, early maturity, fertility, calving ease, marbled beef, meat tenderness. Examples: Angus, Hereford, Shorthorn, Devon.

Bull: an intact male bovine. Bulls are considered the sire (father) to calves.

Calf/Calves: cattle that have not reached sexual maturity. Can be male or female.

Colostrum: the first milk given by a cow following the delivery of a calf. High in antibodies that protect the calf from harmful microorganisms.

Concentrated Animal Feeding Operation (CAFO): any animal feeding operation or feedyard of more than 1,000 head of livestock.

Continental Breeds: originating from continental Europe. Characteristics – Larger size, late maturity, rapid weight gain on feed, large yield of beef, lean beef. Examples: Charolais, Limousin, Simmental, Gelbvieh, Brahman

Cow: sexually mature female that has given birth to a calf.

Cow-Calf Operation: farm or ranch that raises a breeding herd of cattle to raise calves for beef production.

Crossbreeding: mating animals from different breeds (i.e. Angus bred to a Hereford). Utilized to take advantage of hybrid vigor (heterosis).

Cud: the portion of feed that cattle regurgitate for further chewing.

Cull: to eliminate one or more animals from the breeding herd stock.

Dam: mother of a calf.

Dry (cow): Non-lactating female.

E.coli 0157:H7: A strain of bacterium Escherichia coli that produces a virulent toxin that when ingested can sometimes cause human illness.

EID: Electronic Identification– an ear tag with a unique 15-digit identification number. When an animal tagged with an EID is in range of an EID reader, an antenna in the reader transmits a radio signal to activate the radiofrequency chip inside the EID. The EID reader scans the radio frequency identification and 15-digit identification and transfers that check-in to a central software.

Ear tag: method of identification by which a numbered, lettered and or colored tag is placed in the cattle's ear.

Embryo transfer: transfer of fertilized eggs from a donor cow to one or more recipient cows.

Feed Bunk: a trough where feed is put for the cattle to eat from.

Feed Mill: where livestock feed is stored and prepared prior to feeding animals.

Feed Truck: a truck with a mixing box, that mixes, carries and unloads feed into the feed bunk.

Forage: a high fiber feed for livestock, often made up of coarsely chopped stalks and leaves of corn mixed with hay, straw and other plants.

Grain-finished beef: these cattle spend most of their lives grazing on pasture, then spend the last 4 to 6 months in a feedyard, getting finished on a balanced diet of grains, grasses and renewable feeds. May be given FDA-approved antibiotics or growth promotants.

Grass-finished beef: cattle that spend their entire lives grazing on pasture and may be judiciously given FDA approved antibiotics or growth promotants. Grass-finished beef can be difficult to produce year round in North America due to changing seasons and weather conditions.

Growth promotant: sometimes referred to as cattle growth hormones or steroids. America's cattle producers use growth promotants to safely produce more of the lean beef that consumers demand while using fewer resources, like land and feed.

Harvest: when cattle are humanely slaughtered, at a packing plant.

Heifer: A young female bovine that has not given birth to her first calf.

Herd: group of cattle (usually cows) that are in a similar management program.

Hide: the skin from a single head of cattle.

Intermuscular Fat: the fat located between muscle systems. Also called seam fat.

Intramuscular Fat: the fat located within the muscle. Also called marbling.

Livestock Auction Market (Sale Barn): a live animal market at which an auctioneer sells cattle to the highest bidder.

Naturally Raised Beef: cattle can be grain-finished or grass-finished, never received antibiotics or growth promoting hormones.

Organic Beef: Cattle can be grain-finished, as long as the feed is 100% organic, never received antibiotics or growth promoting hormones. It must be certified by the USDA and carry their official label.

Polled: Naturally hornless.

Quality Grades: grades such as Prime, Choice and Select. These grades are determined primarily by the amount of marbling the carcass contains and the age of the animal at processing.

Ration: a balanced and nutritious diet consisting of a blend of grasses, grains and renewable feed that cattle eat.

Roughage: a cattle feed that is high in fiber content, low digestible nutrients and energy. For example hay, silage or pasture.

Ruminant: animal with a stomach that has four compartments- rumen, reticulum, omasum and abomasum. Cattle, sheep and goats are ruminants. Ruminant animals all chew their cud.

Rumen: a compartment in a ruminant's stomach that is a large fermentation pouch where bacterial and protozoa break down fibrous plants eaten by the animal.

Silage: forages, corn fodder or sorghum preserved by fermentation.

Sire: male parent.

Steer: a male bovine that has been castrated prior to maturity.

Stocker: weaned cattle that are put on a high roughage diet, normally grass, for several months before going to a feedyard.

Stunning: a process used in packing plants to instantly render cattle insensible to ensure they do not feel pain at slaughter.

Tattoo: form of identification where colored numbers or letters are marked inside the ear

Vaccination: an injection of medicine which helps prevent cattle from catching specific diseases. For example, cattle are often vaccinated for Blackleg, Brucellosis, Leptospirosis, IBR=infectious bovine rhinotracheitis, BVD=bovine viral diarrhea, PI3=parainfluenza3 and BRSV = bovine respiratory syncytial virus.

Withdrawal Period: time period between when an animal is treated with an antibiotic and when it can go to a meat packing plant.

Weaning (wean): separating young cattle or calves from the cows.

Yearling: an animal that is between 1 and 2 years of age.

MASON COUNTY

The Tolle Family

The Tolle Family run a registered Angus, Maine Anjou and commercial operation based in Maysville, Kentucky. In addition, they market bred heifers and provide freezer beef.

LINCOLN COUNTY

The Coffey Family

The Coffeys operate Branch View Angus in Lincoln County, Kentucky. They host the state's largest Angus sale and offer a calf buy-back program to their customers.

MASON COUNTY

The Matheny Family

The Matheny Family have been raising Herefords since 1990 in Mays Lick, Kentucky. They market their cattle twice a year in production sales and also sell private treaty.

MEADE COUNTY

The Benham Family

The Benham Family began their adventure as first-generation farmers in Meade County, Kentucky. Their farming operation consists of soybeans, corn and cattle.

SCOTT COUNTY

The Hall Family

At **Hallstead Farms and Meats** in Georgetown, Kentucky, the Hall family raises kids, cattle, hay and grain. They sell their beef direct to consumers.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