

HEALTHY ENVIRONMENT



COMMITTED TO A HEALTHY ENVIRONMENT

Farmers and ranchers consider themselves the original environmentalists. Their livelihood depends on the long-term health of their land and natural resources. Identifying and using practices that preserve and use these resources responsibly is not only the right thing to do for the planet, but it is a necessity for the long-term sustainability of the beef industry. Perhaps the beef industry's simplest measurement of conservation success is the persistence of farms and ranches from one generation to the next. More than one-half of U.S. cattle farms and ranches have existed for at least three generations.



Numerous steps have helped cattle farmers and ranchers maintain a healthy environment, including:

- Conserving natural resources
- Caring for the open range
- Protecting biodiversity and wildlife
- Preserving water quality
- Managing manure
- Reducing greenhouse gas emissions

WHERE WE ARE TODAY

Using Fewer Natural Resources

Conservation principles are used at every point in the beef production chain, starting with the farmers and ranchers who run pasture-based cow-calf and stocker operations to the cattlemen and women who feed cattle at feedyards. The practices look different based on geography and type of operation, but collectively, the efforts farmers and ranchers make across the country help maintain and improve the environment. A Washington State University study found each pound of beef raised (defined as hot carcass weight) in 2007 used 20 percent less feed, 30 percent less land, 14 percent less water and 9 percent less fossil fuel energy than in 1977, while also generating 18 percent fewer carbon emissions. In addition, in 2007, 13 percent more beef was produced with 13 percent fewer animals.¹

The United States is generally recognized as the world model for raising sustainable beef because today's system is so efficient, meaning U.S. farmers and ranchers can raise more beef, more affordably and more consistently with a smaller cattle herd while using fewer natural resources. For example, U.S. cattlemen raise 20 percent of the world's beef with 7 percent of the world's cattle.²

Everyday Environmentalists

On average, each cattle farmer and rancher has 13 different practices in place to accomplish environment goals such as nurturing wildlife, preventing erosion or conserving and protecting water.



Recognizing Environmental Stewards

The growth in consumer interest and concern about environmental sustainability has spurred the beef industry to better inform the public about its best environmental practices. For example, the annual Environmental Stewardship Award Program (ESAP), managed by the National Cattlemen's Beef Association (NCBA) and the National Cattlemen's Foundation through sponsorship by Dow AgroSciences LLC and the Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture (USDA), honors the beef industry's outstanding environmentalists.

Competition for the award is strong. Every year, seven regions around the country hold a local competition for the most

outstanding environmental steward. The seven regional winners then compete for the national award. A selection committee comprised of industry, government and environmental non-governmental organization representatives review the entries. More than 140 regional awards and 20 national awards have been given out since the program began in 1991, including the 2010 award which honored Iowa cattle feeders Bill and Nancy Couser (above). These awards recognize environmental innovation and investments by cattle farmers and ranchers across the country. As Sally Shaver, former associate counselor for agriculture policy, Office of the Administrator, U.S. Environmental Protection Agency (EPA) said, "The beef industry recognizes their responsibility for the environment and is responsive. They are more engaged in these issues and will be for a long time."

Grazing and Managing Rangeland

Unmanaged grazing can negatively affect the land. Overgrazing in the early 1930s led to erosion and decreased water quality. Lessons learned from this time period have helped today's beef industry prevent negative effects, and instead positively influence a variety of environmental factors, including biodiversity, invasive species control, wildlife habitat and more.

According to USDA Economic Research Service, livestock grazing is the primary use of an estimated 587 million acres of permanent grassland, pasture and rangeland, which accounts for 26 percent of all U.S. land and one-half of all agricultural land. When cropland pasture (62 million acres) and forested grazing lands (134 million acres) are added to the permanent grassland acreage, total potentially-usable grazing land comprises about 783 million acres, or 35 percent of the total U.S. land area and two-thirds of all agricultural land.³ Much of the land cattle graze is not suitable for growing other food products. Raising cattle on it more than doubles the land area farmers and ranchers can use to raise food for the world's growing population.

“ The beef industry recognizes their responsibility for the environment and is responsive. ”

**Sally Shaver,
Formerly EPA**

The Bureau of Land Management (BLM) estimates that 300 million acres of open space, primarily in the West, has been preserved by public ownership. BLM has designated this public land for multiple activities that support national interests, including grazing beef cattle. Commonly called "public lands ranching," cattlemen lease the land from the government for grazing and, at the same time, commit to caring for the land in an effort to preserve it for the future. In the eastern United States, cattle farmers and ranchers primarily raise cattle on their own private land.

Protecting Land from Degradation and Development

Grazing cattle on public lands means cattlemen play an important role in protecting public landscapes, both by enhancing ecosystems and by keeping much of this land safe from degradation. Cattlemen also privately own some of the richest agricultural land in the West. Federal grazing permits allow cattlemen in the West to graze and raise cattle on public land and provide them with critical access to rangeland so they can continue to raise beef. Without being able to utilize and graze cattle on this public land, the private property owned by farmers and ranchers—which are interspersed with public land—would likely be lost to urban development, and the open rangeland that comprises much of the West today would be lost forever.

According to David White, chief of the NRCS, more than 21 million acres of rangeland and pastureland has turned into developed property in the last 25 years.⁴

A study by Mark W. Brunson, Ph.D., published in the journal *Rangeland Ecology Management* explained, “Saving ranches has become a focus not only of rural traditionalists and livestock producers but also of conservationists, who prefer ranching as a land use over exurban subdivisions, and who see private lands conservation as a needed alternative to underfunded and controversial public acquisition.”⁵

One of the ways NRCS has provided business incentives to help cattlemen and women maintain and manage this valuable acreage is through the Grasslands Reserve Program (GRP). GRP is a voluntary program that helps “landowners and operators restore and protect grassland, including rangeland, pastureland and



Utilizing Land

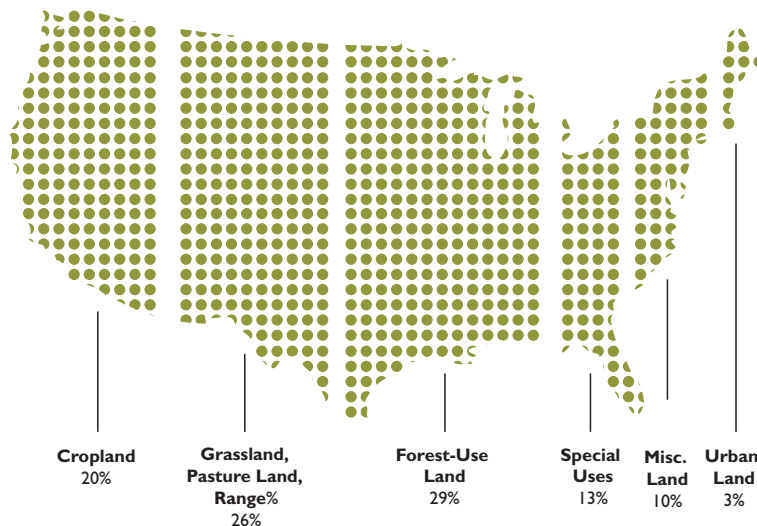
Approximately 85 percent of U.S. grazing lands are unsuitable for producing crops. Grazing cattle on this land more than doubles the area that can be used to raise food.

“ Saving ranches has become a focus not only of rural traditionalists and livestock producers but also of conservationists. ”

Dr. Mark W. Brunson,
Utah State University

U.S. Land Uses

About 587 million acres of U.S. Land—which is unsuitable for raising other food—is used for livestock grazing.



Source: U.S. Department of Agriculture, *Major Uses of Land in the United States, 2002*

certain other lands, while maintaining the areas as grazing lands.” The program emphasizes support for working grazing operations.

Terry Fankhauser, executive vice president of the Colorado Cattlemen’s Association, said that the GRP is particularly important to ranchers. “Programs like the GRP are voluntary landowner incentives that accomplish conservation objectives without hindering the business aspects of a ranching operation,” he said.



Promoting Wildlife on Ranch Lands

Wildlife depends on the habitat provided by farming and ranching. In the eastern and central United States, wildlife is almost entirely reliant on ranch, farm and other private lands for habitat. In the West, where productive, private lands are interspersed with large areas of rockier, less desirable public lands, biodiversity of species depends greatly on ranch land. According to Rick Knight, Ph.D., Colorado State University biology professor with a doctorate in wildlife, ecology, zoology and veterinary science, ranching on both public and private land “has been found to support biodiversity that is of conservation concern” because it “encompasses large amounts of land with low human

densities, and because it alters native vegetation in modest ways.” Dr. Knight also noted that other uses—such as outdoor recreation and residential use—are not as conducive to the support of threatened or endangered species.⁶

Wild birds and mammals seek out and thrive in the shelter provided by natural ranch features, like diverse plant cover and windbreaks, as opposed to row-to-row crops or bare landscapes. Many ranchers across the West are purposely implementing grazing practices to improve habitat and help prevent adding species, such as the Greater Sage-Grouse, to the Endangered Species List. According to NRCS, ranchers have already employed practices to help save between 800 and 1,000 grouse.⁷

“ Besides providing such traditional products as meat and fiber, well-managed rangelands and other private ranch lands support healthy watersheds, carbon sequestration, recreational opportunities and wildlife habitat. ”

U.S. Bureau of Land Management

Large animals such as elk also are known to thrive in areas where cattle graze. For example, the Montana Department of Fish, Wildlife & Parks reported that rotational cattle grazing on the Wall Creek Wildlife Management Area helped bring the elk population from 250 to 2,500.⁸ Similarly, a study in Texas revealed that 80 percent of deer habitat was grazed by cattle. In western South Texas, the largest bucks were 20 pounds heavier on ranches with cattle compared to ranches with no cattle.⁹ Cattle farmers and ranchers may provide supplemental food, such as hay, to help wildlife populations survive tough weather conditions, such as a cold or overly snowy winter.

The improvements farmers and ranchers make to water sources—building, maintaining and protecting reservoirs and stock ponds, for example—can also improve and, in some cases, create wildlife habitats. For example, research has shown that some threatened species, including the California tiger salamander and red-legged frog, appear to be more abundant in vernal pools near cattle grazing than those where cattle are not present. The researchers said lack of grazing should be considered as threatening to these systems as overgrazing.¹⁰

According to BLM, “Well-managed grazing can be used to manage vegetation. Intensively managed ‘targeted’ grazing can control some invasive plant species or reduce the fuels that contribute to severe wildfires. Besides providing such traditional products as meat and fiber, well-managed rangelands and other private ranch lands support healthy watersheds, carbon sequestration, recreational opportunities and wildlife habitat.”¹¹

Reducing the Risk of Range Fires

Other research suggests that cattle grazing may help prevent invasion by non-native grasses, which threaten plant biodiversity on the land. For example, cattle farmer and rancher brush control efforts help decrease the spread of cheatgrass, a highly flammable invasive weed. This is important because in areas dominated by cheatgrass, fires that historically occurred only once every 50 to 100 years are now occurring every two to five years, according to a study in the *Journal of Rangeland Management*. Study authors concluded that “from an ecological standpoint we can argue that if we remove the grazing infrastructure from public rangelands, we would see some adverse consequences. We’d see less variety and too much ground cover, for example, as well as more cheatgrass and the potential for more range fires.”¹²

Improving Water Quality and Use

Managed grazing can also provide benefits to the areas between land and water sources, while reducing soil erosion. Because proper grazing encourages the growth of healthy riparian areas by reducing the prevalence of invasive species, soil is less likely to run off the land and cause environmental problems after heavy rains.

Some examples of farmer and rancher everyday water conservation and environmental efforts include conducting water quality tests, fencing off streams to protect fish and waterways, reclaiming, filtering and reusing water whenever possible and creating man-made irrigation ponds.

Water quality is not only important for the environment, but it is also important to the health of animals. For example, at one of the larger feedyards in the Northwest, one person spends 50 percent of his time scrubbing and inspecting water tanks to ensure the cattle have constant access to clean water.

Cattle, like all other living creatures, require water, but cattlemen recognize that everyone plays a role in water conservation. Cattle farmers and ranchers reuse or recycle water by collecting rainfall or using wells in order to use less water and make sure that the environment is sustainable for future generations. Thanks to water conservation on cattle farms and ranches, each pound of beef raised today uses 14 percent less water than 30 years ago, according to a study from Washington State University.¹³



Protecting Resources

More than nine in 10 cattlemen say protecting natural resources including water supplies and quality is critical to their business.

Interactive

[Click here to view a short video about cattle farmers and ranchers caring for the environment.](#)

Managing Manure

When managed appropriately, manure provides significant benefits to society in the form of organic fertilizer, which supplies essential nutrients to grow our food, and more recently, offers a renewable energy source.

Manure also provides other benefits to local farmers and ranchers. In a feedyard, cattlemen carefully contain the manure generated at their facilities. Local farmers and ranchers then use this manure scraped from cattle pens as a natural fertilizer for their crops. In turn, the feedyard buys grains from those farmers to feed their cattle.

When manure is recycled as fertilizer, it returns nutrients to the soil and generates fewer greenhouse gas emissions than synthetic fertilizers. In fact, synthetic fertilizer accounts for about four times more nitrous oxide emissions on cropland and grassland than manure.

Manure from livestock operations also has the potential to provide energy very efficiently. According to the Texas State Energy Conservation Office, it takes 2.4 kilowatt-hours (kwh) of electricity to burn a 100-watt light bulb for a day. The electrical energy available in one cow's daily manure contribution can produce 3.0 kwh of "cow power."¹³

Using Renewable Energy

Just as many large corporations and households have in recent years decided to install solar panels or fill-up cars with ethanol-blended fuel, farmers and ranchers who raise cattle for beef are choosing to use alternative energy options. In a recent survey, 30 percent of cattlemen indicated they use biofuels on the farm and 17 percent say they use solar energy.¹⁴ For example, Agri Beef, a family-owned company involved with almost every aspect of the beef production lifecycle, is researching the use of anaerobic digestion to generate biogas. As the biogas is approximately 65 percent methane, it could be used to burn in a boiler or generator and produce electricity for use at Agri Beef, thereby reducing the company's energy needs. Agri Beef is also researching ways to convert the beef fat trimmed away during processing (called tallow) into biofuels. Amtrak is currently using a biodiesel fuel blend with 20 percent beef tallow to help run one of its trains and is expected to reduce hydrocarbons and carbon monoxide by 10 percent each, particulates by 15 percent and sulfates by 20 percent.

A Closer Look at Feedyards

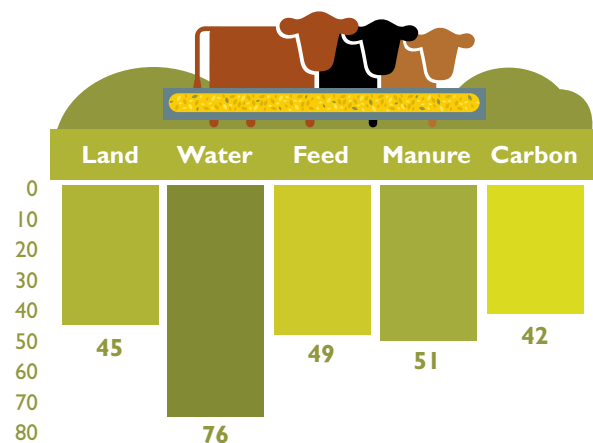
Most cattle spend the majority of their lives grazing on grasslands before moving to a feedyard where they receive a specially balanced, grain-based diet.

Protecting Water

Feedyards are regulated by several environmental laws under EPA jurisdiction. For example, the strict regulations within the Clean Water Act's Concentrated Animal Feeding Operation (CAFO) rule, which apply to feedyards with 1,000 or more cattle, include requirement that CAFOs:

- May not legally discharge any pollutant into a water of the United States, except in the most extreme circumstances.
- Must develop and implement a strict nutrient management plan (NMP) for the application to croplands of manure as fertilizer. Such plans must include a manure application rate

Grain-Finished Beef Uses Less Resources and Produces Less Manure/Carbon



Percent Less Than Grass-Fed

Source: J.L. Capper, The environmental impact of conventional, natural and grass-fed beef production systems. Greenhouse Gases in Animal Agriculture Conference, 2010.

that minimizes the chance phosphorus and nitrogen could affect surface waters.

- Must identify and implement site-specific conservation practices to control runoff from fields to waters of the United States.
- Must maintain records which document the implementation and management of the NMP.
- Violators are subject to steep fines, so feedyards make significant capital investments in their operations to adhere to these regulatory requirements.

Recycling Feed

In feedyards, cattle are able to consume the otherwise unusable byproducts from human food and ethanol production. Cattle in the Northwest, for example, may get nutrition from eating potato peelings or discarded potato products like hash browns or fries that don't meet consumer food specifications. In the Dakotas and Mountain West, cattle may graze on the tops of sugar beet plants after they're harvested and then eat the pulp from processed sugar beets in a nearby feedyard. One of the benefits of using these otherwise useless ingredients for cattle feed is that it decreases land fill waste; the 11.3 million tons of potatoes processed in the United States and Canada in 2008 resulted in an estimated 4.3 million tons of edible byproduct for cattle.¹⁵ Similarly, producing ethanol from corn creates the beneficial byproduct wet or dried distillers grains that can be used as a source of nutrition in cattle feed. The availability of this feedstuff for cattle has increased significantly in recent years due to increased ethanol production.

Grain-Finished vs. Grass-Fed (or Grass-Finished)

Although the marketing term "grass-fed" refers to beef cattle that spend their entire lives on pasture (and never live at a feedyard), the fact is all beef cattle are grass-fed, given they spend the majority of their lives grazing on pasture. This leads to a debate over whether "finishing" cattle in a feedyard or on grass is more environmentally friendly. The fact is, including feedyards in the beef lifecycle has many benefits, including increased meat quality, the use of fewer natural resources and reduced greenhouse gas emissions. Research conducted at Washington State University by Jude Capper, Ph.D., found that cattle that spend their entire lives eating grass may, in some respects, present more environmental challenges because it takes 226 more days for grass-finished cattle to reach market weight than grain-finished cattle. According to Dr. Capper, each pound of grain-finished beef requires 45 percent less land, 76 percent less water, and 49 percent less feed, while generating 51 percent less manure and 42 percent fewer carbon emissions.¹⁶

Cattle farmers and ranchers use the diverse resources available in their local areas to produce nutritious, safe and delicious beef. For consumers, that means there are a variety of beef choices.

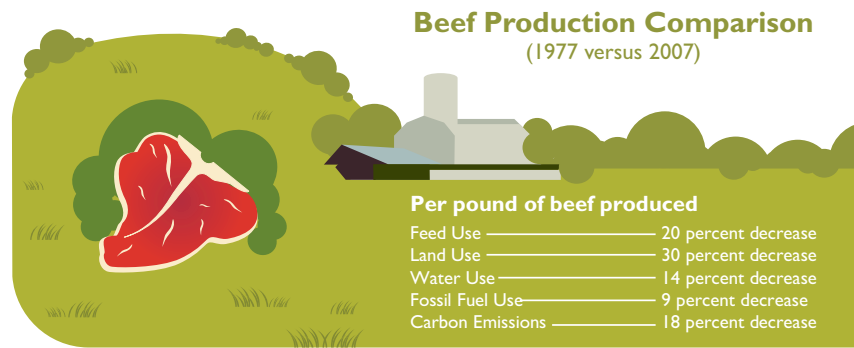
Natural Recyclers

4.3 million tons of potatoes—including French fries—inedible for human consumption were used to help feed U.S. cattle in 2008.



Reducing Greenhouse Gas Emissions

In 2006, the Food and Agriculture Organization of the United Nations released the report “Livestock’s Long Shadow – Environmental Issues and Options.” The report stated that worldwide, raising food animals like beef cattle was a more significant contributor to greenhouse gases than even transportation.



Source: J.L. Capper, *Comparing the environmental impact of the US beef industry in 1977 to 2007.*

“Developing countries should adopt more efficient, Western-style farming practices, to make more food with less greenhouse gas production.”

Dr. Frank Mitloehner,
UC Davis

However, “Clearing the Air: Livestock’s Contribution to Climate Change,” a study by Frank Mitloehner, Ph.D., associate professor at University of California, Davis, points out that raising livestock in developed countries, such as the United States, results in far fewer greenhouse gas (GHG) emissions than in developing countries. According to EPA, the U.S. transportation sector accounts for at least 26 percent of total annual anthropogenic (man-made) GHG emissions in this country, compared to less than 3 percent associated with total livestock production.¹⁷

“Developing countries should adopt more efficient, Western-style [United States] farming practices, to make more food with less greenhouse gas production, to help feed a growing population high-quality, nutritious food,” Mitloehner said, in reference to the efficiencies and advancements of modern cattle production in the United States.

Continuing to Invest in Research

Cattle farmer and rancher leaders in September 2010 committed their beef checkoff dollars to starting the first phase of a multi-year cattle lifecycle assessment (LCA) project. This LCA will help guide the industry toward discovering and using even more advanced cattle production practices that are environmentally friendly and economically achievable. Recent research, government data and environmental experts credit the U.S. beef industry’s modern, highly efficient and innovative cattle production system for improved natural resource use and management and decreased GHG emissions. Ongoing research, including the LCA, can help the beef industry continue to improve environmental practices.

VISION FOR THE FUTURE

Cattlemen have a long tradition of caring for the land and improving beef’s environmental footprint. The following goals will help the industry continue to meet growing consumer protein needs while protecting natural resources:

- Conducting a multi-phase, multi-year lifecycle assessment that details the environmental footprint of raising beef in the United States.
- Commissioning a comparative analysis of beef’s nutritional benefit per environmental input. Assessment should account for land use in raising cattle that could not easily be used for growing plants.
- Quantifying environmental outputs or benefits of various cattle farmer and rancher environmental practices (e.g., rotational grazing, providing wildlife habitat, invasive species control, etc.).
- Leveraging all of the above data to help create new environmental tools for farmers and ranchers to continue implementing the best management practices for sustainability.

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Reducing Greenhouse Gases

Beef cattle raised today emit 18 percent fewer carbon emissions compared to 30 years ago.

