

HEALTHY ANIMALS



COMMITTED TO RAISING HEALTHY ANIMALS

Healthy animals are critical to a healthy and safe food supply. U.S. cattlemen have long recognized this fact and through decades of research and practical experience, they have honed their skills as animal caretakers. A variety of factors influence the health of cattle, including:

- Genetics
- Quality assurance programs
- Disease management and prevention tools
- Animal handling and transportation
- Nutrition and facility conditions

Cattle farmers and ranchers live out the generations-old adage that when you take care of the land and your animals, they will take care of you. According to one survey, more than 90 percent of cattle farmers and ranchers say that protecting the health of their cattle is their number one job.¹ Traditions passed down, personal experience, training and professional judgment all help guide cattlemen in providing the best care for their animals.

Neither individual farms and ranches, nor the beef industry as a whole, could be profitable without healthy cattle. According to a Texas A&M Ranch to Rail report, healthy steers averaged almost \$124 more per head in net income than their counterparts that were sick.²

WHERE WE ARE TODAY

Maintaining a Variety of Breeds and Genetic Diversity

The United States is home to about 120 different beef cattle breeds, including those with roots tracing back to the first cattle brought to this country in the late 1400s by the Spanish.^{3,4} Cattlemen select the most appropriate breeds and genetics for different geographies and environmental conditions, as well as considering characteristics like body size, milk production, age at puberty, rate and efficiency of gain from feed, muscle expression, cutability and marbling. For example, King Ranch in Texas created the first recognized U.S. breed of cattle from Shorthorn and Brahman cattle. The resulting Santa Gertrudis breed withstands the hot, humid conditions of Texas in which other breeds might not prosper. Today, approximately 742,000 U.S. beef cattle farmers and ranchers raise more than 93 million head of beef cattle representing a variety of breeds.⁵



Cattlemen Care

More than nine out of 10 cattlemen say that the well-being of their animals is job one.



Raising Quality Beef through Quality Care

Cattlemen have a long heritage of balancing the art and science of quality animal care. The cattle industry formalized its first quality program in the late 1970s with the start of “Beef Safety Assurance,” a program designed to help cattle farmers and ranchers ensure their production practices were safe and met consumer expectations. The program educated farmers and ranchers about the proper use of cattle pharmaceuticals, including honoring government-established withdrawal times (the amount of time that must pass before treated cattle can be sent to market). The Beef Quality Assurance (BQA) program, the first of its kind in the world, soon followed. BQA was started in 1982 by cattlemen as a proactive, loose-knit, on-farm safety

program. It was officially established in 1987 to provide cattlemen with the principles, tools and education to ensure proper cattle care. BQA incorporates current Food and Drug Administration (FDA), Environmental Protection Agency (EPA), and U.S. Department of Agriculture (USDA) regulations as well as Hazard Analysis Critical Control Point (HACCP) principles. Cattle farmers and ranchers annually invest their beef checkoff dollars in funding the on-going success of the BQA program. The underlying philosophy of the program is summed-up by a quote from a BQA pioneer, Dee Griffin, DVM, associate professor, Great Plains Veterinary Education Center, University of Nebraska: “It is a process of figuring out what could go wrong, planning to avoid it—then validating and documenting what you have done.”

Establishing Cattlemen’s Codes of Care

In 1996, the BQA program developed the Producer Code for Cattle Care as an additional resource for cattlemen in their efforts to raise healthy cattle and help with their commitment to proper care and handling of livestock. The Code makes it very clear that, “Persons who willfully mistreat animals will not be tolerated.”

Producer Code of Cattle Care

Beef cattlemen take pride in their responsibility to provide proper care to cattle on their farms and ranches. The following are general recommendations for cattlemen to consider in raising and handling cattle:

- Provide adequate food, water and care to protect the health and well-being of animals.
- Provide disease prevention practices to protect herd health, including access to veterinary care.
- Provide facilities that allow safe, humane and efficient movement and/or restraint of livestock.
- Use humane methods to euthanize sick or injured livestock and dispose of them properly.
- Provide personnel with training to properly handle and care for cattle.
- Make timely observations of livestock to ensure basic needs are being met.
- Provide transportation that avoids undue stress caused by overcrowding, excess time in transit, or improper handling during loading and unloading.
- Keep updated on advancements and changes in the industry to make decisions based on sound production practices and consideration to animal well-being.
- Persons who willfully mistreat animals will not be tolerated.

In 2003, the Code was expanded to “The Cattle Industry’s Guidelines for the Care and Handling of Cattle,” which address the following areas of cattle care and handling:

- Feeding and nutrition for different types of cattle;
- Disease prevention practices and health care;
- Identification;
- Shelter and housing;
- Handling;
- Emergency procedures;
- Transportation;
- Non-ambulatory cattle, and;
- Humane euthanasia

The guidelines also include training and education for maintaining and improving cattle care and handling implementation and review programs, including a self-evaluation for cattle farmers and ranchers. The National Cattlemen’s Beef Association (NCBA) Cattle Care Working Group developed these guidelines with significant input from veterinarians, animal scientists, agricultural engineers and animal wellbeing experts. The guidelines were adopted by the NCBA Executive Committee, Cattle Health and Well-being Committee and the BQA program in 2004. They are a part of the BQA program today. The Guidelines are also endorsed by the Academy of Veterinary Consultants, the American Association of Bovine Practitioners, the Food Marketing Institute and the National Council of Chain Restaurants. More than 196,000 copies of “The Cattle Industry’s Guidelines for the Care and Handling of Cattle” booklets have been distributed.

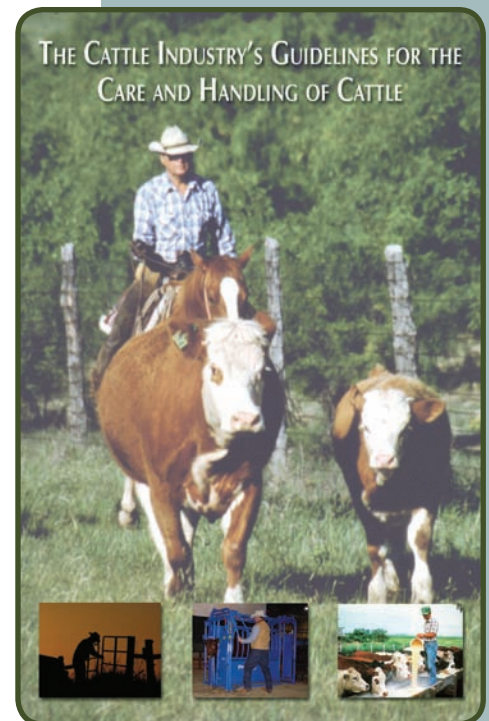
The Quality Assurance Marketing Code of Ethics, also part of the BQA program, have been in place since the 1980s. This code serves as a commitment from cattlemen who agree to only market healthy cattle, meaning cattle that:

- Do not pose a known public health threat;
- Have cleared proper withdrawal times;
- Do not have a terminal condition (including advanced lymphosarcoma, septicemia, etc.);
- Are not disabled;
- Are not severely emaciated, and;
- Do not have visible health conditions

By adhering to this code, cattlemen also agree to do everything possible to humanely gather, handle and transport cattle in accordance with accepted animal husbandry practices and humanely euthanize cattle when necessary to prevent suffering and protect public health.

Educating Cattlemen

More than 196,000 “Cattle Industry Guidelines for the Care and Handling of Cattle” booklets have been distributed to cattlemen around the country.



Expanding BQA Principles Beyond the Farm

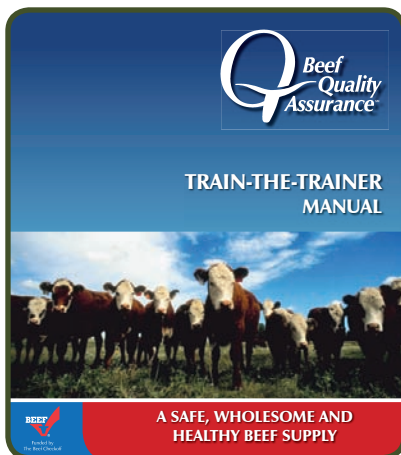
“ Handling and transportation of animals has drastically improved. There is no comparison to the 80s. ”

Dr. Temple Grandin,
Colorado State University

Recently, BQA resources have expanded to the different segments of the beef cattle lifecycle. In 2009, cattlemen helped to create the BQA Feedyard Assessment designed to help cattle feeders benchmark their operations in areas such as animal well-being, cattle handling, record keeping and more. Similarly, the BQA Stocker Self Assessment and Cow-Calf Assessment also help these cattle farmers and ranchers evaluate animal welfare, cattle handling and record keeping.

The Transportation Beef Quality Assurance (TBQA) Program was developed in recognition that cattle transporters play a critical role in cattle health and welfare. Proper handling and transport of cattle can reduce sickness in calves, prevent bruises and improve the quality of beef. TBQA includes cattle handling guidelines and diagrams; a variety of checklists for loading and unloading in hot or cold weather; tips for working with fit, injured or weak cattle; loading suggestions and worksheets; and biosecurity and emergency action plans. The program teaches cattle transporters to become master transporters by taking every step possible to keep cattle healthy and safe. The TBQA program includes a manual, as well as a DVD, with materials available in both English and Spanish. These best practices not only ensure the health and welfare of cattle, but also can save the beef industry millions of dollars each year. BQA also created and distributed 1,250 DVDs to each of the country's livestock auction markets, depicting proper handling specific to these facilities. Learn more about BQA at www.BQA.org.

NCBA, through resources that cattlemen invest in the beef checkoff, also coordinates the Stockman & Stewardship training sessions, which teach cattlemen handling methods that improve gathering, penning and transport. Much emphasis is placed on ways to increase cattle performance by reducing handling stress. Trainees also learn stockman and stewardship principles actually have a significant economic, as well as cattle quality of life, benefit when applied on a farm or ranch.



Implementing National Programs with State-Specific Needs

Today, BQA is a nationally coordinated, state-specific, voluntary program that provides guidelines for beef cattle production, helping every segment of the industry implement proper cattle management techniques and demonstrate a commitment to quality. Forty-three states now have BQA state coordinators who help educate and train cattle farmers and ranchers on BQA practices that best fit their geographic location and unique business model.

It is estimated that BQA influences the handling and management of more than 90 percent of the feedyard cattle raised in the United States today. Thanks to BQA's national on-line training center, which is available in both English and Spanish, more than 7,000 cattle farmers and ranchers have been certified in this system. U.S. cattle farmers and ranchers have embraced BQA because it is the right thing to do; but they also know the BQA principles support increased profitability and help them meet consumer expectations. In fact, Superior Livestock Auction results suggest that there is a \$2 to \$8 per hundredweight advantage for calves produced under BQA guidelines.⁶ An advisory board made up of cattlemen, veterinarians, university and extension scientists, meat scientists, auction markets and the transportation industry owners, among others, continually work to update and strengthen the program. State BQA Coordinators meet annually to report on their individually tailored state programs, share information, evaluate successes and identify areas for improvement.

Measuring Beef Quality

The BQA program has helped to consistently identify practices on the farm that impact overall beef quality and consumer beef eating experiences. Since 1991, cattlemen have invested their beef checkoff dollars in the National Beef Quality Audit (NBQA) to routinely provide snapshots of beef quality and to help identify areas of improvement. For example, the 2000 Quality Audit found bruising on beef carcasses, indicating an opportunity to improve the way cattle were being handled during transport. In response to this finding, cattlemen developed the Master Cattle Transporter program to encourage cattlemen and truckers to take extra precautions when handling cattle before, during and after transport. According to the 2005 Quality Audit, fewer beef carcasses had bruising, demonstrating application of these important producer education resources, and therefore, improved beef quality for consumers.⁷

As of 2005, cattlemen's investments in BQA have returned \$15 per head of cattle each year, translating to more than \$400 million in annual returns. The next Quality Audit is planned for 2011 and will be the most extensive audit to date.

Working with Animal Handling Pioneers

Temple Grandin, Ph.D., professor of animal science at Colorado State University, and designer of livestock handling facilities, is revered for her work improving cattle handling and has served as an advisor to a number of beef industry programs, including the TBQA program. Dr. Grandin has authored more than 400 articles in both scientific journals and livestock periodicals on animal handling, welfare and livestock facility design. Her research on the behavioral principles of livestock handling has led to significant improvements in the loading and unloading of cattle at facilities, as well as improved designs of corrals, intended to reduce stress in animals.

Dr. Grandin's work was popularized by the 2010 HBO Movie "Temple Grandin" in which Claire Danes gave an Emmy-award winning performance of the animal scientist. Dr. Grandin was also named one of TIME Magazine's top 100 most influential people in 2010.

In North America, almost one-half of the cattle are handled in a system that Dr. Grandin designed for meat processing facilities. In July 2010, Dr. Grandin received a Lifetime Achievement Award at the Annual Cattle Industry Summer Conference, thanks to her significant work with cattle farmers and ranchers.

Dr. Grandin is just one of the hundreds of researchers and scientists who have made it their life-long goal to conduct research that advances the efficiencies and quality of modern beef production. Dr. Grandin and her professional peers continue

Quality Beef

80 percent of cattlemen say they produce a better quality beef product than in the past.



Dr. Temple Grandin

Dr. Temple Grandin was named one of *TIME* magazine's top 100 most influential people in 2010. She has received a Lifetime Achievement Award from the cattle industry.

to work closely with U.S. cattle farmers and ranchers to implement her systems on their farms and to improve animal handling and transport. In fact, according to Dr. Grandin, and thanks in part to her work, “Handling and transportation of animals has drastically improved. There is no comparison to the 80s.”

Providing Healthy Living Conditions for Cattle

Most cattle are born and live outside. While some livestock may require housing or climate-controlled environments, cattle thrive in the outdoors and virtually any U.S. environment, without artificial shelter. During extreme weather conditions, cattle generally have access to well-drained resting areas and/or natural or constructed shelter.

The vast majority of the nation’s beef cattle spend most of their lives grazing on pasture before travelling to a feedyard where they are outside with room to move around and receive daily attention and eat a grain-based diet. Although feedyards may be referred to as “Confined Animal Feeding Operations,” or “CAFOs,” the beef industry does not really confine its animals. Learn more about the Beef Lifecycle on page 13.



Ensuring Proper Nutrition and Diets

Cattle are uniquely capable of digesting a variety of feedstuffs and are natural recyclers. Cattle turn inedible grasses and grain into high-quality, nutritious beef. The nutrient requirements of cattle vary according to age, sex, weight, body condition, stage of production and environmental temperature. Nutritionists on cattle farms and ranches provide specific information on the nutrient needs of cattle, nutrient availability in feed ingredients and suggest diets based on regional differences in nutrient values of available feedstuffs.

Managing and Preventing Disease in Cattle

The United States enjoys significantly lower animal disease rates compared to other countries, thanks in part to cattlemen-implemented herd health programs that address both the prevention and treatment of disease. While disease management and prevention programs may vary, depending upon the type of operation and the disease prevalence in a particular region of the United States, cattlemen work closely with their veterinarians to establish effective and individualized herd health programs.

Vaccinating Cattle to Manage Herd Health

The BQA program guidelines and science-based, on-farm practices play a critical role in maintaining cattle health. Good management also means vaccinating cattle to further ensure herd health. Vaccination protocols may vary considerably among individual farms and ranches based on factors such as geographic location, climate and cattle lifestage. Veterinarians play an important role in making recommendations for cattle vaccination plans. Several cattle diseases, including brucellosis, have been eradicated or are nearing eradication, thanks to strong vaccination programs in the United States.

Judiciously Using Antibiotics

Though the cattleman's primary goal is to prevent illness in the herd, it is natural for some cattle to become sick. Cattle farmers and ranchers make every effort to return sick or injured animals to good health because it is the right and humane thing to do. When antibiotics are necessary to maintain cattle health or treat sick cattle, cattlemen believe in using the smallest and most effective dose of antibiotics made specifically for cattle.

The health of U.S. cattle herds, as well as the continuous supply of safe beef, relies on the long-term efficacy of antibiotics; therefore, cattlemen follow The Producers Guide for Judicious Use of Antibiotics. These guidelines, which have been in place since 1987, were adapted from the American Veterinary Medical Association, American Association of Bovine Practitioners and the Academy of Veterinary Consultants' Appropriate Antibiotic Use Guidelines. They specifically call for:

- Avoiding the use of antibiotics that are important in human medicine;
- Using a narrow spectrum of antimicrobials whenever possible;
- Treating the fewest number of animals possible;
- Limiting antibiotic use to disease prevention or control, and;
- Not using antibiotics if the principle intent is to improve performance.

In September 2010, USDA Secretary Tom Vilsack addressed U.S. cattle farmers and ranchers at the 2010 NCBA Legislative Conference, saying, "The vast majority of [cattlemen] do not abuse the use of antibiotics in livestock production. The USDA's public position is, and always has been, that antibiotics need to be used judiciously, and we believe they already are."

Ensuring the Safe Use of Antibiotics

Before an antibiotic may be used in beef cattle production, it must go through a comprehensive, multi-step review by FDA to ensure animal health and human food safety. Approved products must also be continually proven safe to stay on the market. When an antibiotic is approved, FDA establishes a withdrawal period and safe residue levels based on rigorous scientific testing. By law, no meat sold in the United States is allowed to contain antibiotic residues that violate FDA standards. The USDA Food Safety and Inspection Service (FSIS) conducts tests to ensure beef products entering the food supply do not contain antibiotic levels that violate FDA standards.

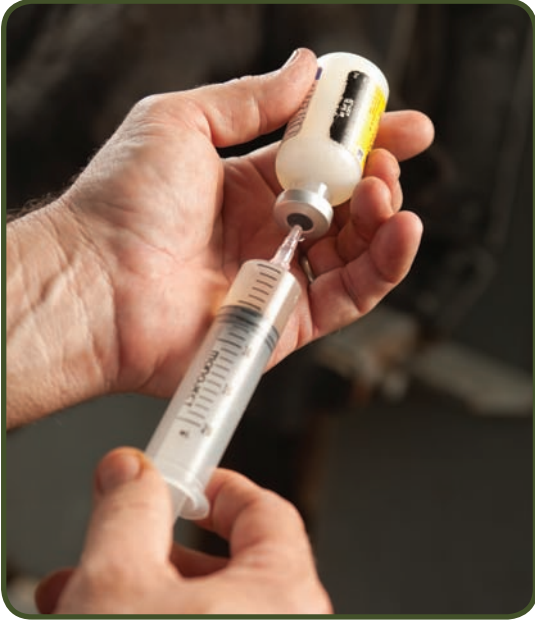


Antibiotic Approval

The New Animal Drug Application approval process requires a sponsor to submit an average of 75 different studies to prove an antibiotic's safety.

“The USDA's public position is, and always has been, that antibiotics need to be used judiciously, and we believe they already are.”

Tom Vilsack
USDA Secretary



Working to Reduce Disease Risk in Cattle

Thanks to the successful implementation of disease management tools, hard work on cattle farms and ranches throughout the country and collaboration with the government, several cattle diseases have been eradicated.

Eradication of cattle tick fever is perhaps one of the best examples of how cattlemen have worked to eliminate concerning diseases in cattle. In partnership with USDA, U.S. cattlemen helped eradicate cattle tick fever by the 1930s.

As early as 1825, some of the western states were reporting serious problems with a parasite, called screwworm. Animals with screwworm would die in seven to 14 days if not treated. Funds donated by cattlemen helped to finance construction of a plant in Texas that would help to research and eradicate screwworm. Thanks in part to cattlemen's contributions, self-sustaining screwworm populations were eliminated from the United States by 1966.

Cattle Brucellosis

Cattle farmers and ranchers have also helped lead efforts to reduce the incidence of brucellosis, a bacterial disease which spreads rapidly in cattle and may result in severe weight loss, infertility, lameness and loss of young. USDA's Animal and Plant Health Inspection Service (APHIS) Veterinary Services established a national brucellosis program in 1934. At that time, 11.5 percent of adult cattle tested positive for brucellosis.⁸ Vaccinations against brucellosis were developed as early as 1940, thanks to cattlemen's leadership and recognition that precautions needed to be taken to protect their herds against this disease. In 1954, Congress officially appropriated funds—which cattlemen contributed to—to eradicate brucellosis from domestic cattle herds.

By 1989, 27 states were classified as brucellosis-free and in 2007, the national herd prevalence hit an all-time low of 0.0001 percent, or one affected herd in approximately 1 million cattle herds.⁹ In February 2008, every state and the territories of Puerto Rico and the Virgin Islands achieved Class-Free State status (i.e., disease-free status) for the first time in the 74-year history of the program. This accomplishment was short-lived, however. In September 2008, Montana lost its Class-Free status after finding a second brucellosis-affected cattle herd within a year. In the last five years, Idaho and Wyoming, the other two states in the Greater Yellowstone Area, have lost their Class-Free status. All three states are now Class Free, but infected wildlife populations in the Greater Yellowstone Area were implicated as the source of outbreaks.

Perhaps one of the greatest challenges in completely eradicating many cattle diseases is managing the natural interaction between wildlife and cattle. More research and tools are needed in order to detect, understand transmission, prevent and treat diseases that are spread among wildlife and livestock.

Studies have shown that halting brucellosis eradication program efforts would result in an estimated \$80 million annual increase in beef and milk production costs in less than 10 years, which could lead to increased consumer costs as well.¹⁰

Bovine Tuberculosis

Thanks to cooperative beef industry, state and federal animal health efforts, U.S. cattle also are nearly free of tuberculosis (called bovine TB). Bovine TB is a serious disease with animal health, public health and international trade consequences. Bovine TB is a highly contagious airborne disease which can be transmitted by inhaling droplets of the bacteria from another animal or by orally ingesting the bacteria. As the disease progresses, weight loss, lack of appetite, weakness and a low-grade fever are common, and if the disease involves the lungs, cattle may have difficulty breathing.

Since 1917, America's cattle farmers and ranchers have worked as part of the federal-state government and beef industry cooperative to eradicate bovine TB in the United States. As a result, the disease prevalence rate in cattle herds has dropped from 5 percent in 1917 to less than 0.001 percent today.¹¹

Bovine Spongiform Encephalopathy

U.S. cattlemen have been proactively engaged in the prevention and mitigation of bovine spongiform encephalopathy (BSE)—more commonly known as “mad cow disease”—for more than 20 years, beginning when the disease was first discovered in the United Kingdom in 1986.

In 1988, USDA established an official BSE working group, which included representatives from the cattle industry. In 1989, the United States banned the import of cattle and cattle products from countries with BSE as an extra safeguard against the disease. A year later, the United States began a formal BSE testing and surveillance program, becoming the first country without the disease inside its borders to test cattle for the disease.

America's cattle farmers and ranchers continued to push for more safeguards against the disease and in 1996, cattlemen voluntarily banned the feeding practices that could spread the disease. Thanks to pressure from the cattle industry, the feed ban became official FDA policy in 1997. Additional safeguards, such as mandating removal from the food supply any tissues that could potentially carry BSE in cattle (e.g. brain and spinal cord), further helped ensure this diminishing disease has no affect on public health. All U.S. cattle are inspected by a USDA inspector or veterinarian before going to harvest. Any cattle showing signs of possible illness are condemned.

Maintaining Health

More than 75 percent of cattlemen say that appropriate use of animal health products such as vaccines and antibiotics are a vital asset to maintaining and improving the health of their cattle.



Interactive

[Click here to view a short video about animal welfare.](#)

“ The prevalence of the disease [BSE] in the United States is less than 1 case per million adult cattle, based on an adult cattle population in this country of 42 million animals. ”

USDA

USDA’s ongoing BSE surveillance program tests approximately 40,000 high-risk cattle annually, bringing the total of tested animals to more than 1 million since the program began. A scientific analysis of seven years of surveillance data found the estimated prevalence of BSE in the United States to be less than one infected animal per 1 million adult cattle.¹²

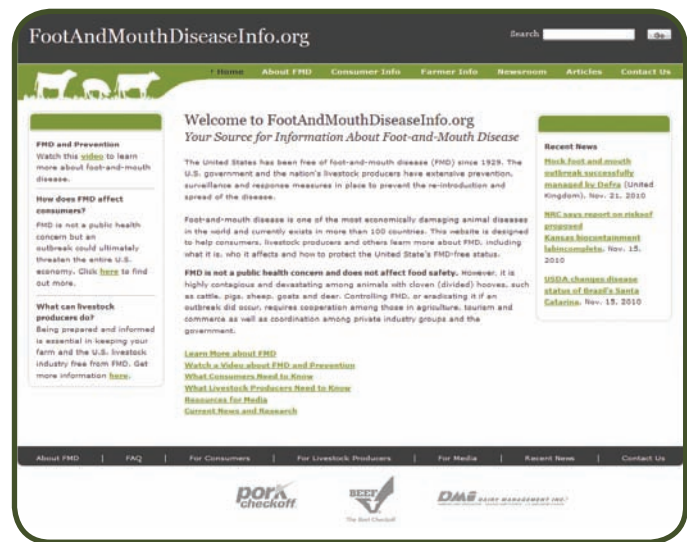
Working together, the beef industry and government have put in place science-based measures that have proven successful in preventing the spread of BSE in the United States. In May 2007, the World Organization for Animal Health (OIE), the leading international body for animal health, designated the United States a “controlled BSE risk,” country in recognition of these strong prevention measures. For more information, visit www.BSEInfo.org.

This disease is fast approaching eradication worldwide. In 2009, there were just two cases of BSE diagnosed outside Europe (one in Canada and one in Japan) and just 60 cases total (compared to more than 37,000 in the United Kingdom alone during peak occurrence in 1992).

Foot-and-Mouth Disease

The United States is free of foot-and-mouth disease (FMD), with the last documented U.S. case of FMD recorded in 1929. FMD is not a public health concern and does not affect food safety. However, it is highly contagious among animals with cloven (divided) hooves, such as cattle, pigs, sheep, goats and deer.

Since the late 1920s, cattlemen, other livestock farmers and ranchers, the federal government and state and animal health experts have worked to improve the country’s prevention, surveillance and response measures to prevent the re-introduction and spread of the disease. This prevention includes biosecurity measures that prohibit international travelers from carrying into the United States any agricultural products that could spread FMD and other harmful agricultural pests and diseases. FMD is one of the most economically damaging animal diseases in the world and currently exists in more than 100 countries. To learn more about FMD, visit www.FootAndMouthDiseaseInfo.org.



Working with Global Partners

Today, the United States is a leader in the global beef marketplace. U.S. cattle farmers and ranchers are committed to working with their global partners to achieve common animal health goals. For example, the United States participates alongside cattle leaders from Canada, Australia, New Zealand and Mexico in the Five Nations Beef Alliance (A photo of representatives from the five countries is below). These countries account for almost one-half of the world's beef and cattle exports and work together through the Alliance toward a shared vision of beef industry principles, such as animal health and wellbeing, pain management and other science-based standards.

Since the 1980s, the United States has participated in OIE, along with 176 other nations, in order to help combat animal diseases at a global level and improve animal health worldwide. U.S. cattlemen also participate in the Codex Alimentarius Commission, which was created in 1963 by the Food and Agriculture Organization (FAO) of the United Nations and the World Health Organization (WHO) to develop food standards, guidelines and related codes of practice under the Joint FAO/WHO Food Standards Programme.

The main purposes of these joint programs are protecting consumer health and ensuring fair food trade practices, as well as promoting coordination of all food standards work undertaken by international governmental and non-governmental organizations. By participating in discussions at the international level through these various organizations, the United States beef industry is able to be part of the research and science-based discussions at a global level that continuously help to improve practices in our country.



Disease Surveillance

USDA has done BSE surveillance since 1990 at 40 times the OIE-recommended level in the United States.

Cattlemen Care

96 percent of cattlemen say they work hard to ensure their cattle are properly handled and transported.

VISION FOR THE FUTURE



Cattle farmers and ranchers daily ensure the health of their animals in a variety of ways, but more work can always be done by:

- Continuing to conduct research on animal health, herd and disease management and nutrition in order to fill knowledge gaps, and ultimately eradicate disease.
- Continuing to expand and refine BQA programs, including development of a national BQA registration that helps the industry better quantify certification and encourages broader adoption of BQA standards.
- Continuing cattle farmer and rancher leadership in the global beef community and international animal health standard-setting efforts and continuing to share experiences, research and scientific information to further advance the ability to raise healthy cattle all over the world.
- Continuing to advance measures to protect against disease (from cattle, wildlife, predators, humans), in order to continuously produce food that will help feed a growing population.

HEALTHY ANIMALS REFERENCES

- ¹ Profile of U.S. Cattlemen, Aspen Media & Market Research, July 2010
- ² 1999 – 2000 Texas A&M Ranch to Rail, North/South Summary Report.
<http://animalscience.tamu.edu/images/pdf/beef/beef-r2r-992000.pdf>
- ³ T.G. Field, Beef Production and Management Decisions. 2007, Fifth Edition, Prentice Hall, ISBN 0-13-119838-6.
- ⁴ Las Vegas Review-Journal, Range on the Home. July 18, 1999.
http://nl.newsbank.com/nl-search/we/Archives?p_product=LVRB&p_theme=lvr&p_action=search&p_maxdocs=200&p_topdoc=1&p_text_direct-0=0FD3921FA54F4E96&p_field_direct-0=document_id&p_perpage=10&p_sort=YMD_date:D&s_trackval=GooglePM
- ⁵ U.S. Department of Agriculture (USDA) Economic Research Service,
<http://www.ers.usda.gov/briefing/cattle/background.htm>
- ⁶ L.C. Zimmerman, Factors Influencing the Price of Value-Added Calves at Superior Livestock Auction. Kansas State University, 2010.
<http://krex.k-state.edu/dspace/bitstream/2097/6991/3/LanceZimmerman2010.pdf>
- ⁷ Executive Summary of the 2005 National Beef Quality Assurance Audit,
<http://www.bqa.org/CMDocs/bqa/2005Audit.pdf>
- ⁸ American Veterinary Medical Association,
<http://www.avma.org/onlinews/javma/feb11/110201t.asp>
- ⁹ APHIS Veterinary Services, A Concept Paper for a New Direction for the Bovine Brucellosis Program.
http://wlsb.state.wy.us/Animal%20Health/Brucellosis/brucellosis_concept_paper.pdf
- ¹⁰ APHIS, Facts about Brucellosis.
http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/downloads/bruc-facts.pdf
- ¹¹ APHIS, A New Approach for Managing Bovine Tuberculosis: Veterinary Services' Proposed Action Plan,
http://www.aphis.usda.gov/animal_health/animal_diseases/tuberculosis/downloads/tb_concept_paper.pdf
- ¹² APHIS, An Estimate of Prevalence of BSE in the United States. June 2006.
http://www.aphis.usda.gov/newsroom/hot_issues/bse/downloads/BSEprev-estFINAL_7-20-06.pdf

Quality Assurance

BQA influences the handling and management of more than 90 percent of the feedyard cattle raised in the United States today.

