
Anthrax

Anthrax is a naturally occurring gram-positive, nonmotile, spore-forming bacterium which beef cattle may ingest while they are grazing or which can be transmitted to the animal through biting insects carrying the spores. Animals which die suddenly while exhibiting no other symptoms of disease are prime suspects of anthrax infection. While anthrax is not a USDA regulated disease, it has been reported among domestic or wild animals virtually every year since records have been available. The precise incidence of anthrax among animals in the United States is unknown and expert opinions in regard to the frequency and severity of anthrax by state differ widely. Thurman Fancher, Area 6 director for the Texas Animal Health Commission (TAHC), said in a press release, “Anthrax is under-reported, because many ranchers in this area automatically dispose of carcasses and vaccinate livestock... Anthrax is a reportable disease, however, and it’s important to know when an outbreak occurs, so other ranchers can be notified to vaccinate.”¹ The Livestock Commissioner of Kansas, George Teagarden, stated Kansas does not keep statistics on Anthrax, but there have been no reported cases in the 16 years he’s been in his position. He further stated he believes any case of Anthrax would definitely be reported.²

Anthrax currently persists in the United States at a relatively low incidence rate. The Anthrax spore can lie dormant in the soil for hundreds of years then become an active contagion given the right environmental conditions. Anthrax is not easily mistaken for other bovine related diseases; however, depending on the time period between death and discovery, some cattle which died of Anthrax may be identified by the untrained eye as having expired from other causes, i.e. lightning strike. Anthrax occurs worldwide. There are endemic areas in the United States where Anthrax cases are prevalent. The weather conditions which rejuvenate the Anthrax spores are typically a period of drought followed by a heavy rainfall event. One source states,

*“Anthrax is caused by infection with Bacillus anthracis, a gram-positive spore-forming rod. The spore form of this organism can survive in the environment for many decades. Certain environmental conditions appear to produce “anthrax zones,” areas wherein the soil is heavily contaminated with anthrax spores. Such conditions include soil rich in organic matter (pH < 6.0) and dramatic changes in climate, such as abundant rainfall following a prolonged drought. Partly because of its persistence in soil, anthrax is a rather important veterinary disease, especially of domestic herbivores. In addition to encountering anthrax while grazing in areas of high soil contamination, these herbivores may also acquire the disease from the bite of certain flies. Vultures may mechanically spread the organism in the environment. Anthrax zones in the United States closely parallel the cattle drive trails of the 1800s.”*³

Over the past hundred years, animal infections have occurred in nearly all states, with the highest frequency from the Midwest and West. Presently, anthrax is enzootic in west Texas and northwest Minnesota; sporadic in south Texas, Nevada, eastern North and South Dakota; and

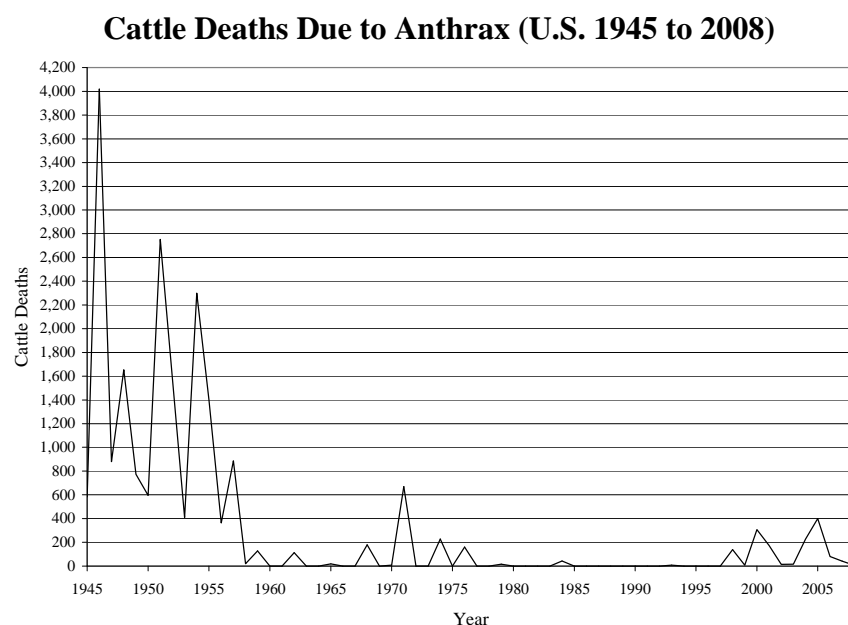
¹ Laura Hatfield, “Bad year for anthrax outbreaks in US livestock,” Center for Infectious Disease Research and Policy (CIDRAP), Aug. 4, 2005, <http://www.cidrap.umn.edu/cidrap/content/bt/anthrax/news/aug042005anthrax.html>.

² George Teagarden, phone call to author, March 22, 2010.

³ “Anthrax: Background and Epidemiology,” Centers for Disease Control and Prevention, accessed September 1, 2010, <http://www.enotalone.com/article/7027.html>.

only occasionally seen elsewhere.⁴ Some states have encouraged vaccination of all animals in endemic areas against Anthrax infection, for instance North Dakota. Other states have placed restrictions on the use of the vaccine and producers must get approval from their veterinarian to use the vaccine.

Please see the following figure that illustrates the number of cattle deaths historically reported due to anthrax in the United States.



Sources: NABC, WADS, South Dakota Anthrax website, and the Proceedings from the Annual Meetings of the USLSA 1957-1958

Endemic Anthrax is managed entirely by state and local animal health practitioners following local and state regulations. An example multi-state protocol document is contained at <http://www.agdepartment.com/Programs/Livestock/BOAH/UnifiedAnthraxRecommendations100415CleanFinal.pdf>

Anthrax outbreaks are managed by each individual state and are not reportable to USDA. However, other U.S. governmental agencies do require notification from states when an occurrence of Anthrax is discovered. The Department of Justice, the Department of Homeland Security, and the Department of Health and Human Services, each have specific agencies assigned to track and investigate Anthrax outbreaks in the United States. These agencies work cooperatively in the event of an Anthrax case being reported to verify the case occurred naturally and was not the result of human terrorism intervention. When a case of Anthrax is determined to be the result of terrorist activity, these agencies have protocols in place to investigate the criminal aspects of the incident and involve the appropriate animal and human health officials to contain the outbreak.

⁴ Merck Veterinary Manual, 6th Edition, ed. C.M. Fraser (Rahway, NJ: Merck & Co., 1986).

The animal health industry has also implemented training and testing classes for all levels of animal health practitioners and inspectors to supplement the protocols in force in the various states in the United States. Practitioners are given intense training on medical identifiers for the disease and current medical research relating to identifying the disease in a suspect animal visually, collection of tissue samples, transporting suspect animals to approved laboratories, chain of custody procedures for tissue samples from suspect animals, laboratory testing protocols, confirmation of infection protocols, notification procedures, among others. Producers and stakeholders are also invited to attend and participate in those training modules relevant to their particular area of interest.