

Passive Surveillance and Anthrax in North Dakota

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The summer of 2005 has been the summer of anthrax in North Dakota. Excessive early summer rains resulting in lowland flooding, followed by hot mid- to late-summer temperatures, helped create the current situation, not only in North Dakota, but also in South Dakota, Minnesota and, southern Manitoba. This is the largest anthrax outbreak in recent history. As of August 29, 97 premises in 15 counties in North Dakota have reported anthrax cases, which accounted for over 500 animal deaths. These deaths losses have included cattle, bison, equine (horse and donkey), elk, sheep, llama, and white-tailed deer.

As with other nonprogram diseases, there is no active surveillance for anthrax in North Dakota. Therefore, the State depends on passive surveillance for detecting diseases such as anthrax. There are various facets of passive surveillance. The section in the CFR that refers to Regionalization (9CFR §92.1), defines passive surveillance as “A surveillance system that does not depend on active participation by the responsible agency to seek out and monitor a restricted disease agent. The system relies on mandatory reporting, a pool of trained investigators, diagnostic submission procedures and laboratory support, and periodic public information and continuing education programs on diseases.”

First, this definition requires mandatory reporting of disease. Anthrax is a reportable disease. As such, according to the North Dakota Century Code, “any person who discovers, suspects, or has reason to believe that any animal belonging to that person, or belonging to any other person, is affected with a reportable disease as defined by the board (Board of Animal Health) shall report that knowledge, suspicion or belief to the State Veterinarian or any other agent or representative of the commissioner.” (NDCC §36-01-13)

Second, the CFR definition calls for a pool of trained investigators. In North Dakota, these investigators are comprised of the State’s veterinary practitioners. Because anthrax occurs with some regularity in North Dakota, most large-animal veterinarians keep anthrax in mind when investigating sudden animal deaths during summer. Discussion of anthrax outbreaks occurs at the North Dakota Veterinary Medical Association’s (NDVMA) annual meetings, and practitioners are generally aware of symptoms, sample collection, reporting requirements, and how to manage an outbreak in a herd.

Third, the CFR definition discusses diagnostic and laboratory support. In North Dakota, diagnostic and laboratory support are provided by the North Dakota State University Veterinary Diagnostic Laboratory (VDL). Pathologists at the VDL are very experienced in anthrax diagnostics and generally report a diagnosis within 24 hours of receiving a sample. To make an anthrax diagnosis, the VDL currently uses a gram stain on a blood smear followed by culture. However, the VDL is in the process of transitioning to PCR on blood, which will provide more rapid results and potentially fewer false negatives, common on autolytic samples. The VDL provides veterinarians with anthrax submission kits to help protect against potential human exposure to anthrax in the field, in transit, and in the laboratory. The VDL also reports confirmed cases to the State Veterinarian’s office.

The final facet of passive surveillance, according to the CFR definition, is periodic public information and continuing education programs on diseases. This is provided to veterinary practitioners through the NDVMA, mailings from the State Veterinarian's office, and to the public through the North Dakota State University Veterinary Cooperative Extension Service. For example, fact sheets specific to North Dakota have been created by the Cooperative Extension Service for livestock producers and the public, and press releases from the North Dakota Department of Agriculture and the State Veterinarian's office go out to the public when cases occur.

Vaccination for anthrax further complicates the effectiveness of passive surveillance. In the event of an outbreak, livestock producers are advised to vaccinate herds in affected areas to prevent death losses. The vaccine can be purchased from a veterinarian under a veterinarian/client/patient relationship and administered by the livestock producer. Thus, the purchase of vaccine does not indicate infection in a herd and does not assist in determining the extent of the disease.

Following this summer's anthrax outbreak, there is a general sense among veterinarians and producers in the endemic area that vaccination for anthrax will become part of the routine herd vaccination program. This will further reduce the sensitivity of passive surveillance for the disease since there will be a smaller population of susceptible animals.

Passive surveillance appears to be an effective tool for determining the presence of a disease in a State or area. However, it is not an effective tool for quantifying an outbreak. North Dakota has several regulatory requirements related to carcass disposal and quarantine of the herd. These regulatory requirements tend to be a "disincentive" to reporting the disease. Early in the course of an outbreak, case reporting is very good because of concern about the disease and proper handling of cases. However, as livestock producers learn of these regulatory impacts and knowledge is gained from various sources concerning the management of the disease, case reporting diminishes, in an effort to escape the regulatory impact and costs associated with using a veterinarian. The State Veterinarian's Office is seeking funding to assist livestock producers with carcass disposal and vaccination costs, not only to offset some of the cost of disposal and vaccination, but also, in effect, as an incentive to livestock producers that allow reporting of the presence of the disease on their premises.

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