



Healthy Texans: The Veterinary Perspective

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On Nov. 4, 1997, a yearling gelded horse in Fort Worth died while exhibiting signs of encephalitis. The brain was subsequently submitted to the Texas Department of Health's (TDH) Bureau of Laboratories where it tested positive for rabies. End of a typical "rabid animal in Texas" story, right? Actually, it was just the beginning. **Dr. Connie Hodges** and **Jan Buck** of the TDH Zoonosis Control office in Arlington began working in conjunction with the Tarrant County Animal Control, Texas Animal Health Commission, and Arkansas Livestock and Poultry Commission to piece together the travel history of the horse.

The horse was originally purchased from a small feedlot in Brandon, Manitoba, Canada, on Sept. 20 and began a journey through Arkansas and Texas that included three sale barns and five owners. The final sale occurred on Oct. 16. Once the horse exhibited clinical signs of illness, it was moved to Fort Worth where it died at a veterinary hospital. Fifteen Texas residents received postexposure rabies prophylaxis due to potential exposure to virus in the saliva. Nine horses and five dogs were also vaccinated and placed in strict isolation; two dogs were destroyed.

A unique genetic variant of the rabies virus in the horse's brain alerted personnel at the TDH rabies laboratory to the possibility that the horse from Fort Worth had been translocated from somewhere else. Rabies is caused by a virus that is genetically different among various reservoirs of animals. In fact, different parts of the world, including the United States, have their own unique rabies virus variants. For instance, skunk, fox, coyote, and bat rabies virus variants are found in Texas while the East coast of the United States is in the midst of an extensive epizootic due to the raccoon rabies variant. These variants are maintained in nature in a specific species but "spillover" of the virus into other species can occur. As an example, the raccoon rabies variant does not occur in Texas but rabid raccoons are reported in Texas. The actual culprit may be a skunk, coyote, fox or bat rabies variant.

Originally, it was assumed that the gelding was infected from the gray fox rabies epizootic area in West-Central Texas due to the results from a monoclonal antibody test (a categorizing procedure performed at the TDH on all rabies-positive specimens). This test indicated that the virus variant was either fox rabies or domestic dog/coyote rabies. The polymerase chain reaction (PCR) test, which is conducted subsequent to the monoclonal antibody, is a powerful molecular tool that enables small genetic differences to be found between similar virus variants. Conducting a PCR in conjunction with a restriction enzyme digestion¹ on the horse's brain revealed results unlike any other terrestrial or bat variant found in Texas. However, the laboratory staff knew that the north central skunk rabies virus variant had an identical monoclonal pattern as fox and domestic dog/coyote rabies. This variant is found only in western Canada and in portions of the northwestern United States. A TDH molecular epidemiologist, **Rodney Rohde**, confirmed that the horse indeed was infected with the north central

skunk rabies virus variant.

By combining two disciplines, traditional epidemiology with molecular technology, TDH personnel connected the final pieces of this mystery. Epidemiologic monitoring of rabies virus variants enables the TDH's Zoonosis Control staff to investigate historical perspectives of the different rabies variants and to identify translocations of rabid animals. If translocations go undetected, a potential index case of a different variant of rabies could be introduced to a virgin area, such as a rabid raccoon from the eastern U.S. being translocated to Texas. The detection of these translocations enables TDH to avert a potentially disastrous new epizootic.

¹Rohde, R.E., et al. 1997. Molecular epidemiology of rabies epizootics in Texas. *Clin. Diagnostic Virol.* 8:3, pp. 209-217. Edited by Jane Mahlow, DVM, MS and Pam Wilson, MEd, CHES

Zoonosis Control Division web sites

The ZCD has three linked web sites that provide relevant information on zoonoses and the Oral Rabies Vaccination Program (ORVP). The addresses are:

- for general zoonoses - <http://www.tdh.state.tx.us/zoonosis>
- for the ORVP - <http://www.tdh.state.tx.us/zoonosis/orvp>
- for ORVP drop-zone maps - <http://www.tdh.state.tx.us/zoonosis/orvp/gis/gis.htm>



TDH Zoonosis Control Division Regional Offices

Region	Phone	Location
1	806/767-0427	Lubbock
2	915/690-4430	Abilene
3	817/264-4492	Arlington
4 & 5	903/533-5212	Tyler
6	713/767-3300	Houston
7	254/778-6744	Temple
8	830/278-7173	Uvalde
9	915/683-9492	Midland
10	915/774-6241	El Paso
11	956/444-3224	Harlingen