

Cross-Canada Disease Report

Rapport des maladies diagnostiquées au Canada

Idiopathic vesicular disease in swine in Manitoba

In June of 2007, a ruptured vesicle, rounded with necrotic edges that were blue-grey (Figure 1), was noted on the snout of a pig from a trailer load of 187 Canadian market hogs that arrived at a harvest facility in Minnesota from Manitoba. Further investigation of these pigs identified 12 animals that had red coalescing erosions on the snout (Figure 2). Another 25% to 30% of the pigs had broken vesicles along the coronary band that were swollen and blanched white (Figure 3), with tissues separating from the edge of the hoof and dewclaws sloughing from their attachments (Figure 4). Approximately 80% of the pigs on the trailer were lame. Temperatures were normal in 2 pigs, 39.4°C to 40°C in 2 pigs, and 41.4°C in 2 other pigs. The United States Department of Agriculture (USDA) and the Minnesota Board of Animal Health sent samples to the Plum Island Animal Disease Center to test for foot-and-mouth disease virus and swine vesicular disease virus. Both these tests and those for vesicular stomatitis virus and vesicular exanthema of swine virus were negative; further testing identified the presence of porcine circovirus and porcine enterovirus (1).

A trace back and trace forward investigation was performed by the Canadian Food Inspection Agency (CFIA). The empty trailer was returned to Canada and quarantined until it had been cleaned, disinfected, and inspected according to standards used by the CFIA for foreign animal disease pathogens. The 187 pigs, which had been assembled in Winnipeg, were traced to 7 farms in Manitoba. Of the 187 pigs, 15 were sidelined by the USDA veterinarians as having significant lesions; the marketing tattoos on these pigs identified 3 of the 7 farms.

Idiopathic vesicular disease (IVD) is a sporadic condition affecting swine. This disease has been reported in pigs in Australia (2), Florida (3), New Zealand (4), and, most recently, Indiana (5). Several outbreaks occurred in Iowa and neighboring states from 1969 to 1982 (6). Outbreaks of IVD appear to have a seasonal pattern, occurring mainly between spring and fall. Although not a debilitating disease, IVD is significant because of its resemblance to vesicular foreign animal diseases, including foot and mouth disease, swine vesicular disease, vesicular stomatitis, and vesicular exanthema of swine. Its clinical signs also resemble those of porcine enterovirus group III infection (7), parvovirus infection (8,9), a calicivirus (San Miguel Sea Lion virus) infection of sea lions (10), mycotoxicosis (11), chemical burns and contact irritation, and photodermatitis due to furocoumarin derivatives associated with the consumption of



Figure 1. Ruptured vesicle on the snout of a pig with idiopathic vesicular disease.



Figure 2. Red coalescing lesions on the snout of a pig with idiopathic vesicular disease.

celery, parsnips, or carrots infested with the fungus *Sclerotinia sclerotiorum* (4).

The 7 farms involved in the suspect load were visited to determine if the cause of the idiopathic vesicular disease outbreak could be determined. The farms ranged in size from 320 to 861 sows; all farms finished their own pigs, with 2 of the farms finishing pigs off-site.



Figure 3. Swollen blanched, and broken vesicles along the coronary band of a pig with idiopathic vesicular disease.



Figure 4. Sloughing of the hoof of a pig with idiopathic vesicular disease.

There was no travel history of farm personnel to countries infected with vesicular diseases. No problems were noted in the breeding stock supplied to these farms in the months preceding the outbreak.

Personnel at the 7 farms were questioned regarding herd health and whether they had noticed any clinical signs of lameness or lesions on the snouts and coronary bands. No significant increases in lameness were reported by any of the farms; however, 1 farm reported an increase in lameness, but with no skin lesions in finisher hogs, approximately 7 wk prior to shipment of the load in question. These signs resolved within 1 wk and were attributed to mechanical problems in the delivery of erysipelas vaccine. Three of the farms had had recent problems with either porcine circovirus or swine influenza virus, but these problems had resolved well before the outbreak.

An interesting aspect of this case was the identification of Seneca Valley virus (SVV) by polymerase chain reaction (PCR). Seneca Valley virus is a member of the *Picornaviridae* and is closely related to, but distinct from, the genus *Cardiovirus*; a new genus *Senecavirus* has been proposed (12). Seven isolates of SVV have been identified, and these are believed to have evolved from 1 strain recently introduced into the swine population (13). There is no known association of SVV with disease in pigs (12).

This case is a reminder of the need for practitioners to be vigilant for signs of vesicular diseases and to regularly review the clinical signs and differential diagnoses for foreign animal diseases. Unfortunately, little is known about the causation of idiopathic vesicular disease, outbreaks of which occur sporadically.

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References

1. United States Department of Agriculture [homepage on the Internet] c2007 APHIS Newsroom [updated daily]. Available from http://www.aphis.usda.gov/newsroom/content/2007/06/re_ill_swine.shtml Last accessed 07/12/2007.
2. Munday BL, Ryan FB. Vesicular lesions in swine — possible association with the feeding of marine products. *Aust Vet J* 1982;59(6):193.
3. Gibbs EPJ, Stoddard HL, Yedloutchnig RJ, House JA, Legge M. A vesicular disease of pigs in Florida of unknown etiology. *Florida Vet J* 1983;12:25–27.
4. Montgomery JF, Oliver RE, Poole WSH. A vesiculo-bullous disease in pigs resembling foot and mouth disease I. Field cases. *NZ Vet J* 1987;35:21–26.
5. Amass SF, Schneider JL, Miller CA, Shawky SA, Stevenson GW, Woodruff ME. Idiopathic vesicular disease in a swine herd in Indiana. *J Swine Health Prod* 2004;12(4):192–196.
6. Kresse JI, Taylor WD, Stewart WW, Eernisee KA. Parvovirus infection in pigs with necrotic and vesicle-like lesions. *Vet Microbiol* 1985;10:525–531.
7. Knowles NJ. The association of group III porcine enteroviruses with epithelial tissue. *Vet Rec* 1988;122:441–442.
8. Lager KM, Mengeling WL. Porcine parvovirus associated with cutaneous lesions in piglets. *J Vet Diagn Invest* 1994;6:357–359.
9. Whitaker HK, Neu SM, Pace LW. Parvovirus infection in pigs with exudative skin disease. *J Vet Diagn Invest* 1990;2:244–246.
10. Madin SH. Vesicular exanthema of swine. In: Gibbs EPJ, ed. *Virus Diseases of Food Animals: A World Geography of Epidemiology and Control*. vol 2. Toronto: Academic Pr, 1981.
11. Osweiler GD. Mycotoxins. In: Straw BE, Zimmerman JJ, D'Allaire SD, Taylor DJ, eds. *Diseases of Swine*. 9th ed. Ames: Blackwell Publ, 2006:915–929.
12. Institute for Animal health [homepage on the Internet] c2007 Research, virus group pages, Picornaviridae, senecavirus. Available from <http://www.picornaviridae.com/senecavirus/senecavirus.htm> Last accessed 11/02/2007.
13. Knowles NJ, Hales LM, Jones BH, et al. Epidemiology of Seneca Valley virus: identification and characterization of isolates from pigs in the United States. *Northern Lights EUROPIIC 2006: 14th Meet Euro Study Group Mol Biol Picornaviruses 2006:Abstract G2*.

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