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Enterovirus type 1 infection in a Minnesota swine herd 2004-2005

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On April 19th, 2005 a wean to finisher operation in south eastern Minnesota called with a report of a number of downer pigs and paddling pigs in a 1000 head finishing barn. The pigs first started showing symptoms 2-3 days earlier and were unresponsive to both Ampicillin and Dexamethasone. I instructed the farmer to take several live and dead pigs to the University of Minnesota for diagnostic evaluation. The farm continued to have additional pigs go down over the course of the next 3 weeks with a total of 78 pigs dying or being destroyed because they were non-ambulatory. They weighed 60 to 120 pounds when they developed symptoms and there were no symptoms seen in the nurseries on this farm. They were down and paddling and also showed dog sitting behavior with an ascending paralysis and head tilt. These were consistent with a CNS lesion. The primary rule outs were Pseudorabies virus, viral or bacterial meningitis or a toxin. We ran a full toxicology screen which was negative. We also tested to viruses and bacteria. The results on the toxicology tests were negative. The Pseudorabies result was also negative. PRRS virus testing was positive on a PCR test on all the pigs. The bacteriology on the brain and meninges was negative. The diagnostic results came back as viral meningitis with inclusions in the brain and a suspected PRRS infection. The herd was buying pigs from a PRRS positive farm in Nebraska at the time. On consultation with the pathologist, Dr Marie Gramer, at the time the presenting symptoms appeared too severe for this to be PRRS only and in the intervening time a second and third group developed similar symptoms. Additional samples (live animals) were submitted on June 20th and both brain and spinal cord along with the normal tissue and blood samples were examined. This resulted in identification of lesions in both the brain and spinal cord from which Marie identified enterovirus as a potential cause of the meningitis. The spinal cord lesion is reasonably specific for this disease and it points out the necessity of examining more than just the brain when you have CNS signs. At that point samples were submitted to NVSL in Ames, Iowa for further testing and in attempt to identify the specific virus. We took steps to isolate the affected barns and instituted voluntary animal movement restrictions and enhanced clean up while we waited for NVSL. This process took about 6 weeks and we received the results on September 17th 2005. The ID was an Enterovirus Type I (Teschens/Telfan like virus). They were able to grow the virus and inoculate into nursery pigs and reproduce mild CNS signs. They also sequenced the virus and it is very similar to the Teschens/Telfan virus. This is a schedule B foreign animal disease. At this point USDA/APHIS became involved and the producer agreed to a voluntary quarantine and attempt to eradicate the disease.

During the four month period it took to get the final diagnosis the disease spread to 3 sites and a total of 8 barns. When the official diagnosis came the USDA/APHIS spent the following 4 weeks deciding how to proceed. Working with the producer we instituted a stop on all pig and personnel movement between sites immediately. We also instituted strict biosecurity and dedicated transport protocols. We started a directed cleaning/disinfection program using Vircon-S which has a label claim for Enterovirus and extended down time between groups. We also began working toward a site by site depopulation over the next 4 months. This was completed in February of 2005. We continued to see cases of the disease through February 2005 but they became steadily less severe and more sporadic. We have not seen any additional symptoms since we completed the depopulation and cleaning of the site although USDA is continuing to monitor the farm. We have tested the sow farm that these pigs originated from and all the tests were negative to date. The herd also sent pigs to several other locations and they have had no symptoms of the disease. We do not know where this came from. Enterovirus is a common inhabitant of the pig digestive tract and there are 9 known types, of which type I is the most pathogenic, and most are non-pathogenic. Serologic testing for this disease is of little or no value because of cross reactions between types. This disease has been described primarily in Eastern Europe and there has been one case reported in a farrow to finish operation in Indiana which is still ongoing as of February of 2005. It may have been a mutation on this farm which was than spread by the pigs, staff or transport. We were fortunate that our PRRS biosecurity protocols probably limited its spread to other farms and premises within this system.