



# OHIO VETERINARY NEWSLETTER

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## Research

Bowman, A. S., Krogwold, R. A., Price, T., Davis, M., & Moeller, S. J. (2015). **Investigating the introduction of porcine epidemic diarrhea virus into an Ohio swine operation.** *BMC Veterinary Research*, 11(38). doi:10.1186/s12917-015-0348-2

**BACKGROUND:** With no fully licensed vaccines currently available for Porcine Epidemic Diarrhea virus (PEDV) in the U.S., prevention and control of PEDV disease is heavily reliant on biosecurity measures. Despite proven, effective biosecurity practices and multiple sites and production stages within and across designated production flows, an Ohio swine operation broke with confirmed PEDV in January, 2014.

**PURPOSE:** To discuss the epidemiologic investigation and subsequent bioassay findings from PEDV infection of a multi-site, multiple flow swine operation in Ohio.

**RESULTS:** The findings from the epidemiological investigation ruled out human introduction, delivery of potentially contaminated supplies, aerosol spread, and potentially contaminated transport vehicles. The study team found the presence of PEDV genetic material in starter pellet feed received from a new external supplier. A bioassay was performed in an experimental setting on ten 10-day old pigs. The results did not confirm that the contaminated feed was infectious, but it could not be ruled out due to the sensitivity of the test and the small amount of feed the individual and small number of pigs consumed. The mean Ct value of 36.5 indicated it was present in the feed at a very low concentration. RT-PCR detects viral RNA, and thus can only confirm the presence of viral nucleic acid in a sample, not necessarily presence of viable and infectious virus.

**CONCLUSIONS:** The authors concluded that because the timing of this outbreak coincided with a switch to new out-sourced feed pellets and due to the strong evidence provided by PEDV positive RT-PCR results of these feed pellets at both the swine operation and the supplier, it is believed that contaminated feed pellets were the source of this outbreak. The results of the epidemiologic investigation, proof of concept by other investigators, and the presence of PEDV RNA from unopened bags of feed all support feed as the source of the outbreak. The inability of a bioassay to prove the feed pellets were infectious after the outbreak occurred must be considered, but the low sensitivity of this assay does not rule out feed as the possible source. The results of the present and other studies demonstrate the need for strict biosecurity practices and thorough testing for feed and feed ingredients used in the pork industry. PEDV outbreaks can cause devastating financial losses and PEDV surveillance and prevention efforts are of the

## Location

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utmost importance.

### [ACCESS THE ARTICLE...](#)

Salgado, M., Alfaro, M., Salazar, F., Badilla, X., Troncoso, E., Zambrano, A., ...Collins, M. T. (2015). **Application of cattle slurry containing *Mycobacterium avium* subsp. *paratuberculosis* (MAP) to grassland soil and its effect on the relationship between MAP and free-living amoeba.** *Veterinary Microbiology*, 175(1), 26-34. doi: 10.1016/j.vetmic.2014.09.022

**BACKGROUND:** A disadvantage of using slurry from dairy farms to fertilize crops and pastures is that it often contains microbial pathogens that could potentially threaten both animal and public health; thus, it is vital to understand pathogen survival and behavior in order to properly manage the storage and application of slurry. *Mycobacterium avium* subsp. *paratuberculosis* (MAP), the causative agent of Johne's disease, is one of the pathogens of major concern regarding animal health.

**PURPOSE:** To investigate the epidemiology of MAP to gain a better understanding of the persistence or even amplification of MAP numbers in the environment after application of MAP-contaminated slurry to soils.

**RESULTS:** Soils irrigated with MAP-spiked or control dairy farm slurry were compared. MAP DNA was detected in soil for the 8-month study duration. MAP was detected by PCR from more soil samples for plots receiving MAP-spiked slurry (n = 61/66) than from soils receiving control slurry (n = 10/66 samples). Vital stains verified that intracellular MAP in amoeba was viable (infectious). More MAP was found in amoeba at the end of the study than immediately after slurry application. There was no relationship between MAP presence in soil and in amoeba over time.

**CONCLUSIONS:** Infection of amoeba by MAP provides a protected niche for the persistence and even possibly the replication of MAP in soils. As others have suggested, MAP-infected amoeba may act like a "Trojan horse" providing a means for persistence in soils and potentially a source of infection for grazing animals. The authors concluded that the evidence confirms that the MAP bacteria remains in grassland soil after application of contaminated slurry and that amoeba may play a critical role in this persistence. Successful control and prevention of Johne's disease requires a deeper understanding of the interactions among host animals, manure management, and the soil microbiome, free-living amoeba in particular.

### [ACCESS THE ARTICLE...](#)

Osorio, J. S., Trevisi, E., Ballou, M. A., Bertoni, G., Drackley, J. K., & Looor, J. J. (2013). **Effect of the level of maternal energy intake prepartum on immunometabolic markers, polymorphonuclear leukocyte function, and neutrophil gene network expression in neonatal Holstein heifer calves.** *Journal of Dairy Science*, 96(6), 3573-3587. doi: 10.3168/jds.2012-5759

**BACKGROUND:** The conventional approach to dry cow nutrition is to feed moderate-energy diets. The effects of dry cow nutrition on the immune function and metabolism in newborn calves are largely unknown.

**PURPOSE:** The objective was to conduct an initial evaluation of feeding a moderate-energy diet during the last 21 days before calving on metabolite, hormonal, and gene expression profiles of blood polymorphonuclear leukocyte and link that information with polymorphonuclear leukocyte function during the neonatal period.

**RESULTS:** Holstein cows fed a controlled-energy diet (CON; 1.24 Mcal/kg) for the entire dry period (~50 days) were compared to those fed the CON diet for the first 29 days of the dry period followed by a conventional moderate-energy diet (OVE; 1.47 Mcal/kg)

during the final 21 days. Calves from OVE dams weighed on average 5 kg less at birth. Blood glucose concentration in OVE calves had a more pronounced increase in the first 2 days at which point polymorphonuclear leukocyte averaged 85% in OVE and 62% in CON.

**CONCLUSIONS:** Managing the nutrition of dry cows is important because of the implications on colostrum components and prevention of hypocalcemia. The data provide evidence for a carry-over effect of maternal energy overfeeding during the last 3 weeks before calving on some measurements of metabolism in the calf at birth and the phagocytic capacity of blood neutrophils after colostrum feeding. The authors concluded that from a management standpoint, these data suggest that it might be feasible to design nutrient supplements to compliment colostrum in a way that metabolic and immunologic capability of the calf is improved.

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## Calendar



A full calendar of all upcoming events and continuing education opportunities offered by the College of Veterinary Medicine is available on the website at <http://vet.osu.edu/>

### [Ohio Dairy Health and Management Certificate Program](#)

Module 4 – Advanced Dairy Cattle Nutrition  
March 19-21, 2015

### **Dairy Reproduction & Genomics Workshop (more details to come...)**

May 7, 2015 (9:30 a.m. – 3:00 p.m.)  
Der Dutchman Restaurant, Plain City, Ohio

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The *Ohio Veterinary Newsletter* began in October of 1974 as a way for Veterinary Extension to relay relevant information to practicing veterinarians in Ohio. The aim is to communicate pertinent news from the Veterinary Extension Unit; unbiased, research-based information with practical relevance for veterinary practitioners working in food animal, equine, and shelter medicine; and a calendar of upcoming opportunities. Please feel free to provide your feedback and let us know what information is most helpful to you and your practice.

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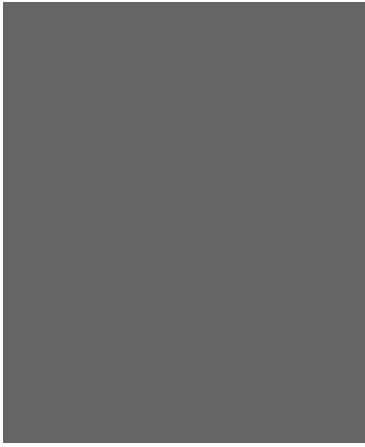
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