



OHIO VETERINARY NEWSLETTER

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Ohio State University Veterinary Extension

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News

The *Ohio Veterinary Newsletter* began in October of 1974 as a way for Veterinary Extension to relay relevant information to practicing veterinarians in Ohio.

We have decided to resume this effort for the entire Department of Veterinary Preventive Medicine and will periodically send out electronic notices containing pertinent news from the Department; 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.

Research

Jung, K., Wang, Q., Scheuer, K.A., Lu, Z., Zhang, Y., & Saif, L.J. (2014). **Pathology of US porcine epidemic diarrhea virus strain PC21A in gnotobiotic pigs.** *Emerging Infectious Diseases*, 20(4), 662-665.

Porcine epidemic diarrhea virus (PEDv) was first reported in the US (Iowa) during May, 2013; and the virus moved rapidly across the country. The present study was conducted to understand the progression of the disease and compare it to the strains originally seen in Europe and Asia. A sample of intestinal material was taken from a 1-day old piglet with diarrhea in Ohio. The strain was analyzed and treated to ensure that coronavirus-like particles were the only pathogens present. There were 5 gnotobiotic piglets experimentally infected with a sixth piglet serving as a negative control. Individual pigs were euthanized at either acute, mid, and later stages of infection for pathologic examination of small and large intestine tissue, lung, liver, heart, kidney, spleen, and mesenteric lymph node. The findings were similar to those seen in natural infections occurring in Asia and the US. The authors concluded that US PEDV PC21A is highly enteropathogenic and acutely infects the entire intestine, but the jejunum and ileum are the primary sites of infection. The virus causes severe atrophic enteritis accompanied by viremia that leads to severe diarrhea and vomiting.

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Lowe, J., Gauger, P., Harmon, K., Zhang, J., Connor, J., Yeske, P., Loula,

prevention in neonatal thoroughbreds

Calendar

- ODHMCP
- Organic Livestock and Poultry Health

Location

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T., Levis, I., Dufresne, L., & Main, R. (2014). **Role of transportation in spread of porcine epidemic diarrhea virus infection, United States.** *Emerging Infectious Diseases*, 20(5), 872-874.

With the rapid movement of PEDv, there was concern that the virus was being spread by transportation equipment as seen with another enteric coronavirus. The purpose of this study was to assess the risks of transmission by harvest facilities and transport vehicles by estimating the incidence of trailer contamination during unloading at harvest facilities. Samples were collected from 575 trailers before and after pigs were unloaded at 6 different harvest facilities. Information collected included: company and trailer id, time of unloading, dock used, whether the driver stepped on the dock, and whether facility personnel entered the trailer. Prior to unloading 6.6% of the trailers were already contaminated with PEDv and an additional 5.2% that were clean upon arrival were found to be contaminated during the unloading process. It was interesting that 34.2% of those that arrived contaminated were negative after unloading. The researchers suspect that pigs were not actively shedding virus, but that trailers were previously contaminated and viral quantities were low or at the limit of detection. Contamination was 4.15 times more likely if harvest facility staff entered the trailer and 3.35 times more likely if another contaminated trailer unloaded immediately prior. The authors concluded that collection points are a source of contamination of trailers that return to the farm and likely contributed to the rapid spread. The implications are that improved sanitation, hygiene, and segregation practices for both swine and workers are important to limit the spread via fomites.

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Heinze, C.R., Freeman, L.M., Martin, C.R., Power, M.L., & Fascetti, A.J. (2014). **Comparison of the nutrient composition of commercial dog milk replacers with that of dog milk.** *Journal of the American Veterinary Medicine Association*, 244(12), 1413-1422.

The purpose of this study was to compare the concentrations of various nutrients in commercially available dog milk replacers with those found in natural dog milk. Milk was collected from 5 healthy lactating dogs and compared with 15 different milk replacer products. There were 21 essential nutrients analyzed and none of the milk replacers contained all of the nutrients at levels equal to dog milk. The 3 milk replacers closest to dog milk had no measurable DHA, excessive linoleic acid, low energy density, and inappropriate calcium-to-phosphorus ratios. All milk replacers tested had a total protein concentration within or higher than dog milk; however, not all essential amino acid concentrations were within the range of dog milk. Another important aspect found in the evaluation of milk replacers was that many manufacturers used standardized feeding directions on the basis of volume rather than adjusting for the caloric density of their product and the needs of growing puppies. The authors concluded that currently available milk replacers have variable nutrient concentrations and are not close matches to dog milk. In addition, not all milk replacers are the same and those with serious nutritional concerns should be avoided.

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Arthington, J. D., Moriel, P., Martins, P. G., Lamb, G. C., & Havenga, L. J. (2014). **Effects of trace mineral injections on measures of performance and trace mineral status of pre- and postweaned beef calves.** *Journal of Animal Science*, 92(6), 2630-2640.

Supplementation using injectable trace minerals (ITM) provides targeted delivery of known quantities to individual animals as well as removing the variability associated with voluntary free-choice consumption. In addition, it removes the problems caused by weather and wildlife at the mineral box. The objective of this research was to investigate the influence of ITM in beef calves throughout a traditional cow/calf production cycle,

including pre- and postweaned calf performance. The study consisted of 3 experiments with results analyzed using liver biopsies and feedstuff analysis. The first experiment involved treating calves within 24 hours after birth with a 1ml subcutaneous injection of trace mineral (treatment group) or saline (control group). Two additional treatments were administered around 100 and 200 days of age. Cow-calf pairs also had access to free-choice salt-based mineral supplement. There were no differences found in average daily gain; however, ITM calves had higher liver concentration of copper and lower iron than the control group which received saline injections. The second experiment looked at 24 heifer calves from experiment 1 over a 14-day period from time of weaning, hauling, and entry into a feedlot. Shrunken weight did not differ between ITM calves and saline-injected heifers, but ITM calves had lower average daily gains over the 14 day period. Experiment 3 examined 34 weaned heifers not part of experiments 1 or 2. ITM calves and saline-injected calves were treated on day 0, 51, and 127. There were no differences in shrunken weights, but ITM heifers had higher average daily gains. The authors concluded that ITM at birth, 100 days, and 200 days of age increased copper and selenium levels without affecting weight gain. An additional treatment at weaning increased copper, selenium, and zinc and reduced weight gain over the 13-day postweaning period.

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Voelk, V., Graber, H. U., van den Borne, B. H., Sartori, C., Steiner, A., Bodmer, M., & Haerdi-Landerer, M. C. (2014). **A longitudinal study investigating the prevalence of *Staphylococcus aureus* genotype B in seasonally communal dairy herds.** *Journal of Dairy Science*, 97(7), 4184-4192.

Staphylococcus aureus is major pathogen causing mastitis and production losses. Specifically, *Staph. Aureus* genotype B (GTB) is associated with high prevalence and high somatic cell counts within infected herds which indicates that it is likely more contagious and virulent than other genotypes. The purpose of this study was to evaluate the development of *Staph. Aureus* GTB prevalence in communal operations, where cows from different herds of origin were commingled during the summer grazing season. The researchers tested milk samples and environmental samples taken from equipment, farm workers, and herding dogs over a period of 66-76 days. Milk samples from each cow and worker samples (hands and elbows) were taken at the beginning and end of the communal period. Nasal swabs of herding dogs were taken at the beginning of the study period. This involved 829 lactating dairy cows from 110 herds of origin at 9 different operations in eastern Switzerland. Positive results were found at the beginning in 7 of 9 operations ranging from 2.2-38.9%. At the end, all operations were positive with a range of 1-72.1%. The between-herd of origin prevalence increased from 27.3% to 56.6%. At the beginning, all environmental samples (equipment, humans, dogs) were negative. At the end, 4 employees at 3 different operations were positive. The authors concluded that comingling significantly increased the spread and recommend grouping infected cows separately and milking last. In addition, both personnel and equipment should be considered as potential transmission vectors.

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Tanabe, S., Suzuki, T., Wasano, Y., Nakajima, F., Kawasaki, H., Tsuda, T.,...Morita, H. (2014). **Anti-inflammatory and intestinal barrier-protective activities of commensal lactobacilli and bifidobacteria in Thoroughbreds: Role of probiotics in diarrhea prevention in neonatal thoroughbreds.** *Journal of Equine Science*, 25(2), 37-43.

Diarrhea is a major concern in Thoroughbred yearlings. Effective probiotics can improve intestinal flora and reduce diarrhea in mammals. A product called LacFi™ was created using *Lactobacillus ruminis* KK14, *L. equi* KK15, *L. reuteri* KK18, *L. johnsoii* KK21, and *B. Boum* HU. The purpose of this study was to investigate the regulative effects of the five strains of bacteria included in LacFi™ on splenocytes and intestinal epithelial cells to

evaluate diarrhea prevention. They also looked at the incidence of diarrhea in neonatal Thoroughbreds following treatment with LacFi™. In the laboratory, all 5 strains significantly suppressed the cytokine IL-17. They also found that it was probable that the 5 strains protected against epithelial barrier impairment, but further investigation is needed to confirm. In the field, 101 neonatal Thoroughbreds were treated on days 2, 3, 4, 5 following birth and then again once per week up to 4 weeks of age. The experiment lasted 20 weeks with individuals evaluated every two weeks. The strains found in LacFi™ were isolated in the feces of those treated and not in the control group. The incidence of diarrhea was reduced from 75.9% in the control group to 30.7% in the treatment group. The diarrhea observed with the treatment group occurred later in their development and was also shorter in duration. The authors concluded that the probiotic regulated intestinal function and contributed to diarrhea prevention. They believe it is likely useful in place of medical treatment in those individuals that develop diarrhea.

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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 2 – Advanced Dairy Reproduction
August 7-9, 2014

[Organic Livestock and Poultry Health Series](#)

Webinar - Certified Organic Livestock Standards
Thursday, July 10, 2014 at 1:00 pm

Webinar - Organic Livestock Inputs
Wednesday, October 1, 2014 at 1:00 pm



THE OHIO STATE UNIVERSITY

COLLEGE OF VETERINARY MEDICINE