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Location
Veterinary Extension Unit housed within the

Department of Veterinary Preventive Medicine

News

Welcome Dr. Grace VanHoy, Clinical Instructor

The Ohio State University College of Veterinary Medicine Department of Preventive Medicine and the Veterinary Medical Center Parasitology Diagnostic Laboratory is

welcoming a new addition, Dr. Grace VanHoy. Dr. VanHoy completed a Master of Science specializing in vaccine-based approaches to gastrointestinal parasites in 2019. Along with her Master's degree, she successfully completed a residency training program at Ohio State Veterinary Medical Center Farm Animal Medicine and Surgery department and has achieved board certification with the American College of Veterinary Internal Medicine – Large Animal. Prior to that, she graduated from Ohio State in May 2015 with a Doctor of Veterinary Medicine degree. She traveled to the Buckeye State after graduation from Cal Poly San Luis Obispo, in California with a Bachelor of Science degree in Animal Sciences. Dr. VanHoy is originally from Modesto, California, in the heart of the central valley where much of the state's agriculture is based.

She will split her time with the OSU CVM Farm Animal Service as a Clinical Instructor. Dr. VanHoy is excited to offer her services to the Veterinary Preventive Medicine department and the Parasitology Diagnostic Lab, and to operate as a resource to the livestock community. The Parasitology Diagnostic Lab offers testing for both individual animals, as well as herd-based testing strategies and monitoring. The laboratory also does specialized testing such as identification of *Haemonchus contortus* ova. The management of gastrointestinal parasites in livestock requires a team approach, and centers on preventive and specific plans for each herd. Please do not hesitate to reach out to Dr. Grace VanHoy (vanhoy.2@osu.edu) as a resource!

Although the COVID-19 placed some limitations on the Parasitology Diagnostic Lab, we are ramping up and will be staffed from 2 p.m. to 6 p.m. Monday through Friday starting on Monday, May 18th. The laboratory email is vmc.parasitologylab@osu.edu. We offer routine fecal examinations, fecal egg counts, *H. contortus* ova staining, and a variety of other diagnostic parasitology laboratory services for submitting Ohio DVMs and OSU VMC clients.

More information about Dr. VanHoy:

https://vet.osu.edu/about-us/people/grace-vanhoy

Research

The following list includes selected research published in 2019 involving at least one investigator from OSU CVM. The list was selected as those that may have application or interest for food animal veterinary practitioners. The research is loosely categorized as dairy, swine, poultry, equine, and general.

Dairy

A Scanavez, A. L., Arruda, A. G., Stevenson, J. S., & D Mendonça, L. G. (2019). Evaluation of seasonal patterns and herd-level traits associated with insemination risk in large dairy herds in Kansas. *PloS one, 14*(5), e0217080. https://doi.org/10.1371/journal.pone.0217080

BACKGROUND: Adequate identification of estrus is crucial to achieve satisfactory reproductive performance in dairy farms. Even though several studies evaluated expression and identification of estrus at the cow level, limited data exist regarding estrus identification parameters at the herd level.

PURPOSE: To use data from large dairy farms located in Kansas to describe temporal patterns of insemination risk, and to investigate the association between insemination risk and several factors, including housing, milk yield, voluntary waiting period, proportion of primiparous cows in the milking herd, mastitis incidence, and mortality.

CONCLUSION: The authors concluded seasonal variability in insemination risk was minimal in the population studied and increased values were observed during the

autumn. Insemination risk was greater for dry-lot than free-stall herds. In addition, reduced mortality of lactating cows by 60 days in milk and longer voluntary waiting period for primiparous cows were positively associated with insemination risk.

ACCESS THE ARTICLE…

Bond, R. L., Midla, L. T., Gordon, E. D., Welker, F., Masterson, M. A., Mathys, D. A., & Mollenkopf, D. F. (2019). Effect of student transrectal palpation on early pregnancy loss in dairy cattle. *Journal of dairy science, 102*(10), 9236–9240. https://doi.org/10.3168/jds.2019-16515

BACKGROUND: Recent studies have established that bovine pregnancy diagnosis by palpation per rectum or transrectal ultrasonography by an experienced veterinary practitioner does not increase pregnancy loss in dairy cattle. However, the effect of transrectal palpation of the bovine reproductive tract by inexperienced individuals such as veterinary students on pregnancy wastage has not been established.

PURPOSE: To evaluate the difference in bovine pregnancy loss between cows that were evaluated for pregnancy status using transrectal ultrasonography by an experienced clinician and those that were first evaluated by transrectal ultrasonography by an experienced clinician and then immediately palpated by an inexperienced fourth-year veterinary student. We also investigated whether student completion of a formal bovine palpation techniques course offered at The Ohio State University College of Veterinary Medicine before palpation of privately owned animals would affect palpation-related pregnancy loss.

CONCLUSION: In this study, palpation of the reproductive tract for pregnancy diagnosis by inexperienced students did not increase the risk of bovine pregnancy wastage compared with diagnosis of pregnancy by an experienced clinician using transrectal ultrasonography. In addition, there was no difference in the risk of pregnancy loss between cows palpated by students who had participated in a formal palpation training course compared with students who had not taken the course. This result suggests that professional DVM students can be safely trained to perform bovine pregnancy diagnosis by transrectal palpation of the reproductive tract using privately owned animals without a negative financial impact on the client owners.

ACCESS THE ARTICLE…

Pempek, J. A., Watkins, L. R., Bruner, C. E., & Habing, G. G. (2019). A multisite, randomized field trial to evaluate the influence of lactoferrin on the morbidity and mortality of dairy calves with diarrhea. *Journal of dairy science, 102*(10), 9259–9267. https://doi.org/10.3168/jds.2019-16476

BACKGROUND: Antimicrobials used for treatment in dairy calves have an important public health impact, and those categorized as "highest priority critically important" by the World Health Organization, including third-generation cephalosporins, are commonly used to treat calf diarrhea in the US. Thus, reduced overall antimicrobial use on dairy farms necessitates research on viable alternative therapies for calf diarrhea.

PURPOSE: To use a multisite, randomized clinical trial to determine the effectiveness of lactoferrin as a treatment for naturally occurring cases of diarrhea in preweaned dairy calves.

CONCLUSION: The authors concluded that the results of this study suggest that a 3-day oral dose of lactoferrin at first diarrhea diagnosis does not reduce the risk of future morbidity or mortality in dairy calves.

ACCESS THE ARTICLE…

Yugo, D. M., Cossaboom, C. M., Heffron, C. L., Huang, Y. W., Kenney, S. P., Woolums, A. R., Hurley, D. J., Opriessnig, T., Li, L., Delwart, E., Kanevsky, I., & Meng, X. J. (2019). Evidence for an unknown agent antigenically related to the hepatitis E virus in dairy cows in the United States. *Journal of medical virology, 91*(4), 677–686. https://doi.org/10.1002/jmv.25339

BACKGROUND: Recently, a genotype 4 HEV was reportedly detected in fecal samples of cows, although independent confirmation is lacking. In this study, they first tested serum samples from 983 cows in different regions in the US for the presence of immunoglobulin G (IgG) anti-HEV and found that 20.4% of cows were seropositive. The highest seroprevalence rate (68.4%) was from a herd in Georgia.

PURPOSE: To determine if cattle in the United States are infected with Hepatitis E virus (HEV). In an attempt to genetically identify HEV in cattle, a prospective study was conducted in a known seropositive dairy herd by monitoring 10 newborn calves from birth to 6 months of age for evidence of HEV infection.

CONCLUSION: The authors concluded that the results suggest the existence of an agent antigenically related to HEV in cattle, although, contrary to published reports, they showed that the IgG recognizing HEV in cattle was not caused by HEV infection.

[ACCESS THE ARTICLE…](#)

Barragan, A. A., Lakritz, J., Carman, M. K., Bas, S., Hovingh, E., & Schuenemann, G. M. (2019). Short communication: Assessment of biomarkers of inflammation in the vaginal discharge of postpartum dairy cows diagnosed with clinical metritis. *Journal of dairy science, 102*(8), 7469–7475. https://doi.org/10.3168/jds.2018-15854

BACKGROUND: Clinical metritis, characterized by the presence of an enlarged uterus and abnormal red-brownish foul smelling vaginal discharge, is a prevalent condition that causes important economic losses to dairy operations. There is still a lack of knowledge regarding the usefulness of measuring these biomarkers in vaginal discharge to objectively assess the severity of clinical metritis and the correlation between local uterine inflammation and systemic inflammation.

PURPOSE: To assess (1) the concentrations of Hp and Hp-MMP 9 in the vaginal discharge of postpartum cows, and (2) the correlation between serum and vaginal discharge Hp and Hp-MMP 9 concentrations. We also assessed BHB concentrations and BCS for a more comprehensive picture of the effects of clinical metritis in dairy cattle.

CONCLUSION: The results of this study suggest that Hp and HpMMP 9 are increased in cows with vaginal discharges of 4 and 5; however, further research should be aimed at elucidating the mechanisms involved in the uterine local production or transportation into the uterus of Hp and HpMMP 9, while evaluating the potential negative effects of these inflammatory biomarkers on endometrial cell function and assessing the effects of anti-inflammatory therapy on the concentration of these molecules in the vaginal discharge of postpartum dairy cows.

[ACCESS THE ARTICLE…](#)

Meller, R. A., Wenner, B. A., Ashworth, J., Gehman, A. M., Lakritz, J., & Firkins, J. L. (2019). Potential roles of nitrate and live yeast culture in suppressing methane emission and influencing ruminal fermentation, digestibility, and milk production in lactating Jersey cows. *Journal of dairy science, 102*(7), 6144–6156. https://doi.org/10.3168/jds.2018-16008

BACKGROUND: Concern over the carbon footprint of the dairy industry has led to various dietary approaches to mitigate enteric CH_4 production. One approach is feeding the electron acceptor NO_3^-, thus outcompeting methanogens for aqueous H_2.

PURPOSE: To feed diets without or with NO_3^- and without or with LYC (Saccharomyces cerevisiae from Yea-Sacc 1026, Alltech Inc., Nicholasville, KY) to assess potential interactions on methane production, lactation performance, total-tract digestibility, ruminal fermentation characteristics, and ruminal microbial populations.

CONCLUSION: The authors concluded that LYC did not provide an additive benefit to feeding NO_3^- to further decrease CH_4 or prevent NO_2^- accumulation.

ACCESS THE ARTICLE…

Van Engen, N. K., Engelken, T., Lockard, C., Lakritz, J., Cernicchiaro, N., Wilson, B., Kreibel, C., Coetzee, J. F. (2019). The effect of pre-transportation or arrival meloxicam administration to calves entering the feedlot on morbidity, biomarkers, performance and carcass characteristics. *Translational Animal Sciences, 3*(2), 620-632. https://doi.org/10.1093/tas/txz070

BACKGROUND: Previous studies have reported reduced lung consolidation when nonsteroidal anti-inflammatory drugs (NSAIDs) were administered as an adjunct to antibiotics. European legislation requiring the reduction of antibiotics has incited research for early intervention with NSAIDs to reduce the use of antibiotics and have reported success. No investigation has focused on evaluating the effects of using NSAIDs in high-risk cattle, administered prior to transportation, on disease or performance outcomes past 21 days into the feeding period.

PURPOSE: To investigate the effects of using meloxicam as a pretransport or on arrival therapeutic on disease of bovine respiratory disease, biomarker outcomes associated with bovine respiratory disease, performance characteristics over the first 42 days on feed, and carcass traits at harvest in crossbred beef cattle.

CONCLUSION: The authors concluded that meloxicam administered prior to transportation or on arrival had no significant effect on the number of bovine respiratory disease cases. Additionally, there was no significant effect on ADG or G:F at 42 days on feed. ADG at the final day of the feeding period and carcass characteristics did not differ between groups. No significant treatment effects on transportation biomarkers were noted in the present study. Caution should be taken with interpretation for this study as budgetary and personnel constraints limited the number of sampling time points in the study. Meloxicam should still be considered as an option for ancillary treatment when considering the welfare of the animal; however, continued research into its potential benefit when administered in tandem with antibiotic therapeutics for bovine respiratory disease is necessary.

ACCESS THE ARTICLE…

Sutter, F., Borchardt, S., Schuenemann, G. M., Rauch, E., Erhard, M., & Heuwieser, W. (2019). Evaluation of 2 different treatment procedures after calving to improve harvesting of high-quantity and high-quality colostrum. *Journal of dairy science, 102*(10), 9370–9381. https://doi.org/10.3168/jds.2019-16524

BACKGROUND: Management and nutrition of the newborn calf during the first hours of life have the potential to permanently affect the lifetime performance of a dairy cow. Release of oxytocin is the prerequisite for milk ejection and complete colostrum harvest. A continuous ejection of colostrum is dependent on the presence of adequate circulating oxytocin concentration.

PURPOSE: To evaluate 2 different treatment procedures at the first milking after calving to increase colostrum quantity and improve colostrum quality by applying exogenous oxytocin or to stimulate endogenous oxytocin secretion.

CONCLUSION: Overall, none of the treatment procedures improved colostrum quantity. However, the administration of parental oxytocin and presence of the calf increased IgG concentration in colostrum of cows compared with the control group. The external validity in our study is limited; therefore, the results should be validated with a multicentric study design.

ACCESS THE ARTICLE…

Piñeiro, J. M., Menichetti, B. T., Barragan, A. A., Relling, A. E., Weiss, W. P., Bas, S., & Schuenemann, G. M. (2019). Associations of pre- and postpartum lying time with metabolic, inflammation, and health status of lactating dairy cows. *Journal of dairy science, 102*(4), 3348–3361. https://doi.org/10.3168/jds.2018-15386

BACKGROUND: Cows have a strong behavioral need to rest, spending approximately half of their time lying down. The effects of Lying Time during the transition period on metabolic stress, inflammation and health have not yet been fully investigated.

PURPOSE: To assess the associations of Lying Time 14 days before and after parturition with serum Ca, NEFA, and BHB concentrations, inflammation (haptoglobin and hemogram), and health status within the first 30 DIM.

CONCLUSION: The authors concluded that the results suggest Lying Time along with energy (NEFA and BHB) and Ca balance are critical for transition cow health. Prepartum NEFA had a positive quadratic association with prepartum Lying Time. Multiparous lactating cows had increased Lying Time concomitant with their postpartum health events. Primiparous cows spent more time standing during the transition period and showed a different behavioral response to sickness than multiparous cows.

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Piñeiro, J. M., Menichetti, B. T., Barragan, A. A., Relling, A. E., Weiss, W. P., Bas, S., & Schuenemann, G. M. (2019). Associations of postpartum lying time with culling, milk yield, cyclicity, and reproductive performance of lactating dairy cows. *Journal of dairy science, 102*(4), 3362–3375. https://doi.org/10.3168/jds.2018-15387

BACKGROUND: Herd-level factors affecting Lying Time, as well as cow-level factors affecting Lying Time should be considered when evaluating the association of Lying Time with milk yield. Research controlling confounders such as season, parity, and health events is needed to assess the association of Lying Time with milk yield. In addition, the association of Lying Time during the transition period with culling within 60 DIM, cyclicity, and reproductive performance has not been previously investigated.

PURPOSE: To assess the associations of Lying Time during the first 14 DIM with milk yield at first DHIA test day, culling within 60 DIM, cyclicity, and reproductive performance of lactating dairy cows.

CONCLUSION: The authors concluded that the results from this study suggest milk yield early in lactation was not correlated with mean Lying Time but had a weak negative correlation with the coefficient of variation of Lying Time during the first 14 DIM. In addition, Lying Time early in lactation had a positive linear association with culling within 60 DIM and a negative quadratic association with cyclicity. Additionally, both infectious and metabolic diseases decreased milk yield and the probability of pregnancy up to 300 DIM. Furthermore, multiparous lactating cows housed in freestall barns had an optimum range of 9 to 13 hours/day of Lying Time during 0 to 14 DIM, in which reproductive performance was maximized. These findings suggest that there is an optimum daily

Lying Time range for early postpartum dairy cows housed in freestall barns, which is different from that reported for mid-lactation cows, with the potential for improved survival, health, resumption of cyclicity, and subsequent overall performance.

ACCESS THE ARTICLE…

Lopes, F., Rosa, G., Pinedo, P., Santos, J., Chebel, R. C., Galvao, K. N., Schuenemann, G. M., Bicalho, R. C., Gilbert, R. O., Rodrigez-Zas, S., Seabury, C. M., & Thatcher, W. (2020). Genome-enable prediction for health traits using high-density SNP panel in US Holstein cattle. *Animal genetics, 51*(2), 192–199. https://doi.org/10.1111/age.12892

BACKGROUND: Efficient strategies for leave-one-out cross-validation (LOOCV) have been proposed and their theory fully described for genomic selection using analytical solutions, including the importance of sampling weights in the context of Bayesian inference. Such approaches permit the estimation of cross-validation results by running the model only once, with no need for the fully iterative implementation of LOOCV. These methods have the advantage of being computationally cost-efficient, reducing the total amount of time to run the analysis, and avoiding the use of parallel computing.

PURPOSE: To assess the potential of genomic selection in Holstein cattle by investigating the accuracy of molecular breeding values for health traits. Four Bayesian specifications of genomic regression models, namely Bayesian Ridge Regression (BRR), Bayes A, Bayes B, and Bayes Cπ, were compared in terms of prediction accuracy using the "LOOCV without cross-validation" approach.

CONCLUSION: Except for displaced abomasum, lameness and respiratory disease, the predictive abilities were similar between methods. Although the relatively low estimates of heritability might have limited the prediction accuracies of genomic breeding values, there was observed a strong relationship between the predictive ability and the heritability of the trait, where traits with higher heritability achieved higher accuracy and lower bias when compared with those with lower heritability. Overall, the information from high-density SNP panel can be successfully used to predict genomic breeding values of health traits in Holstein cattle, but the model choice will most likely depend on the genetic architecture of the trait.

ACCESS THE ARTICLE…

Swine

Arruda, A. G., Tousignant, S., Sanhueza, J., Vilalta, C., Poljak, Z., Torremorell, M., Alonso, C., & Corzo, C. A. (2019). Aerosol Detection and Transmission of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV): What Is the Evidence, and What Are the Knowledge Gaps? *Viruses, 11*(8), 712. https://doi.org/10.3390/v11080712

BACKGROUND: A general understanding, based on conclusions from the peer-reviewed literature, is that the role played by airborne transmission of pathogens in the epidemiology of infectious diseases is debatable, and likely to vary according to intrinsic and extrinsic factors.

PURPOSE: A review paper to examine peer-reviewed publications on the ability of PRRSV to become airborne, and its detection and transmission via air over different distances in order to identify evidence and knowledge gaps on the subject of aerosol transmission of PRRSV.

CONCLUSION: Considering the peer-reviewed publications summarized herein, one can conclude that airborne transmission of PRRSV is possible; but the probability over long distances appears to be relatively low.

Perez, A. M., Linhares, D., Arruda, A. G., VanderWaal, K., Machado, G., Vilalta, C., Sanhueza, J. M., Torrison, J., Torremorell, M., & Corzo, C. A. (2019). Individual or Common Good? Voluntary Data Sharing to Inform Disease Surveillance Systems in Food Animals. *Frontiers in veterinary science, 6*, 194. https://doi.org/10.3389/fvets.2019.00194

BACKGROUND: Reporting of PRRS outbreaks is not mandatory in the US. In the absence of a regulatory framework, PRRS control and elimination actions are voluntary. Examples of situations in which producers have decided to voluntarily share data for extended periods of time to support applied research and, ultimately, disease control in the absence of a regulatory framework have rarely been documented in the peer-reviewed literature.

PURPOSE: To review the largest voluntary initiative for data sharing among US swine producers, including a summary of its design and governance, and highlighting a number of epidemiological features of the disease that the project helped to elucidate over the last 10 years. The ultimate objective of this voluntary program is to build the capacity to respond in the event of an emerging disease, while supporting the prevention and control of endemic diseases of swine, such as PRRSv.

CONCLUSION: Altogether, this effort has supported, and is supporting, the design and implementation of prevention and control approaches for the most economically devastating swine disease affecting the US. The program, which has been voluntarily sustained and supported over an extended period of time by the swine industry in the absence of any regulatory framework and that includes data on approximately 50% of the sow population in the US, represents a unique example of a livestock industry self-organized surveillance program to generate scientific-driven solutions for emerging swine health issues in North America.

Sanhueza, J. M., Vilalta, C., Corzo, C., & Arruda, A. G. (2019). Factors affecting Porcine Reproductive and Respiratory Syndrome virus time-to-stability in breeding herds in the Midwestern United States. *Transboundary and emerging diseases, 66*(2), 823–830. https://doi.org/10.1111/tbed.13091

BACKGROUND: The time needed to wean porcine reproductive and respiratory syndrome (PRRS) virus negative pigs consistently from a breeding herd after an outbreak is referred to as time-to-stability (TTS). TTS is an important measure to plan herd closure as well as to manage economic expectations. There are several factors that can influence TTS.

PURPOSE: To evaluate the effect of recorded factors of interest on PRRS TTS in the Midwestern United States.

CONCLUSION: The season in which the PRRS outbreak occurred can play an influential role in the time required for a breeding herd to wean consistently PCR negative pigs. When a PRRS outbreak occurs during spring or summer months, the breeding herd may take significantly longer to reach stability compared to when the outbreak occurs in autumn/winter. Additionally, the PRRS restriction length fragment polymorphism (RFLP) pattern associated with the outbreak and previous PRRS exposure within a year can influence the TTS. This information may help farm managers and veterinarians to plan herd closure and manage expectations about the time required to wean negative pigs in breeding herds. Further investigations should aim to quantify the effect of intervention strategies on reducing TTS, especially when the outbreak occurs during spring/summer.

O'Shaughnessy, R. A., Habing, G. G., Gebreyes, W. A., Bowman, A. S., Weese, J. S., Rousseau, J., & Stull, J. W. (2019). *Clostridioides difficile* on Ohio swine farms (2015): A comparison of swine and human environments and assessment of on-farm risk factors. *Zoonoses and public health, 66*(7), 861–870. https://doi.org/10.1111/zph.12637

BACKGROUND: Given the likely high environmental presence of *C. difficile* in swine-contact areas (i.e. housing, corridors) on farms, the ability of *C. difficile* to persist in the environment for extended periods, and the close proximity of worker breakrooms to swine-contact areas, the possible contamination of breakroom surfaces may introduce numerous opportunities for transmission of *C. difficile* to swine farm workers.

PURPOSE: To compare the recovery of *C. difficile* and distribution of PCR-ribotypes in the swine and human environments from a sample of Ohio swine farms, and to identify factors associated with the recovery of *C. difficile* on farms, with the goals of characterizing the presence of *C. difficile* in an area on the swine farm that has not been highly studied but could present an unforeseen risk to farm worker health.

CONCLUSION: This study highlights the widespread presence of *C. difficile* on common surfaces in swine farm breakrooms, an area on farms which may pose a threat to farm worker health and in which there has been limited prior research. *Clostridioides difficile* was recovered from all farms. Samples collected from all on-farm locations recovered *C. difficile*, including farrowing rooms, breakrooms, and nursery rooms. Three ribotypes recovered from both swine and human environments (078, 412 and 005) have been previously implicated in human disease. Samples taken from farrowing rooms and breakrooms were found to have greater odds of *C. difficile* recovery than those taken from nursery rooms. Farms that weaned ≥23,500 pigs per year had lower odds of *C. difficile* recovery as compared to farms that weaned fewer pigs and weekly or more frequent cleaning of breakroom counters was associated with higher odds of *C. difficile* recovery.

ACCESS THE ARTICLE…

Lauterbach, S. E., Nelson, S. W., Robinson, M. E., Lorbach, J. N., Nolting, J. M., & Bowman, A. S. (2019). Assessing exhibition swine as potential disseminators of infectious disease through the detection of five respiratory pathogens at agricultural exhibitions. *Veterinary research, 50*(1), 63. https://doi.org/10.1186/s13567-019-0684-5

BACKGROUND: Widespread geographic movement and extensive comingling of exhibition swine facilitates the spread and transmission of infectious pathogens. With varying degrees of severity and impact on swine and human health, understanding the overall disease ecology and epidemiology of the exhibition swine population is vital to the development and implementation of disease mitigation strategies designed to protect animal and public health.

PURPOSE: To describe the overall estimated prevalence of five infectious respiratory viruses in swine at agricultural exhibitions and assess the potential epidemiological role of exhibition swine. The five viruses include: Influenza A virus (IAV), porcine hemagglutinating encephalomyelitis virus (PHEV), porcine reproductive and respiratory syndrome virus (PRRSV), porcine parainfuenza virus 1 (PPIV1), and influenza D virus (IDV).

CONCLUSION: The most commonly detected pathogen was IAV, which was detected in 498 (17.4%) pigs. Influenza A virus was detected in more pigs than the next two most prevalent pathogens combined, PHEV and PPIV1, which were detected in 251 (8.8%) and 201 (7.0%) pigs, respectively. Influenza D virus was the least prevalent and was only detected in two (0.07%) pigs. Co-infections were common with 165 (5.8%) pigs testing

positive for more than one pathogen, including four (0.14%) pigs testing positive for three pathogens, which were the most pathogens found in co-infected, individual pigs.

ACCESS THE ARTICLE…

Cramer, M. C., Pairis-Garcia, M. D., Bowman, A. S., Moeller, S. J., Zhang, Y., Sidhu, P. K., Magnin, G., & Coetzee, J. F. (2019). Pharmacokinetics of transdermal flunixin in sows. *Journal of veterinary pharmacology and therapeutics, 42*(4), 492–495. https://doi.org/10.1111/jvp.12772

BACKGROUND: Recent work on transdermal flunixin in calves demonstrated a longer half-life and more rapid administration when compared to IV admin, suggesting transdermal administration may be a promising administration route in farm animals. However, the pharmacokinetic (PK) properties of flunixin administered transdermal in mature swine have not been evaluated.

PURPOSE: To describe the pharmacokinetics (PK) of flunixin in 12 nonlactating sows following transdermal (TD) flunixin (3.33 mg/kg) and intravenous (IV; 2.20 mg/kg) flunixin meglumine (FM) administration using a crossover design with a 10-day washout period.

CONCLUSION: The authors concluded that the results demonstrate that topical administration is not an efficient route for delivering flunixin in mature sows.

ACCESS THE ARTICLE…

Thielen, P., Nolting, J. M., Nelson, S. W., Mehoke, T. S., Howser, C., & Bowman, A. S. (2019). Complete Genome Sequence of an Influenza D Virus Strain Identified in a Pig with Subclinical Infection in the United States. *Microbiology resource announcements, 8*(4), e01462-18. https://doi.org/10.1128/MRA.01462-18

BACKGROUND: Influenza D virus was first described in 2011 from a pig with respiratory disease; however, recent evidence indicates that cattle are the major viral reservoir.

PURPOSE: To describe the genome sequence of the eighth complete swine-origin influenza D virus deposited into GenBank, D/swine/Kentucky/17TOSU1262/2017, which was collected at a 2017 swine exhibition.

CONCLUSION: While the lack of publicly available IDV sequences hindered investigation, the IDV in this healthy pig likely resulted through spillover from cattle. This observation supports the need for additional monitoring of IDV to identify genomic diversity and transmissibility between species.

ACCESS THE ARTICLE…

Wang, Q., Vlasova, A. N., Kenney, S. P., & Saif, L. J. (2019). Emerging and re-emerging coronaviruses in pigs. *Current opinion in virology, 34*, 39–49. https://doi.org/10.1016/j.coviro.2018.12.001

BACKGROUND: Porcine epidemic diarrhea virus (PEDV), porcine deltacoronavirus (PDCoV), and swine acute diarrhea syndrome-coronavirus (SADS-CoV) are emerging/reemerging coronaviruses (CoVs). They cause acute gastroenteritis in neonatal piglets.

PURPOSE: A review to focus on the origin and potential for intra/interspecies transmission, host receptors for virus replication, antigenic relationships, comparative pathogenesis, and disease control and prevention of the three emerging porcine CoVs. For PEDV, they focus on the highly virulent PEDV strains.

CONCLUSION: PDCoV, SADS-CoV, and highly virulent PEDV emerged or reemerged recently. PEDV has spread to Asian, North American, and European countries, causing huge economic losses in the swine industry. Among the three enteric CoVs, PEDV has been studied more extensively and some vaccines have been developed, although their efficacy in the field is still questionable. For PDCoV and SADS-CoV, more research is needed to better understand their emergence, evolution, pathogenesis, and immune responses. Currently, disease control and prevention mainly depend on swine farm management, focusing on high biosecurity measures and disease containment within and among farms. Coronaviruses often spill over to other species: PEDV and PDCoV can infect cells from different species, and PDCoV can also infect calves. Currently, these emerging porcine CoVs are only known to infect pigs, but not humans. Nevertheless, continued monitoring of these porcine CoVs is necessary for both swine and public health.

ACCESS THE ARTICLE…

Poultry

Kruse, T. N., Messenger, K. M., Bowman, A. S., Aarnes, T. K., Wittum, T. E., & Flint, M. (2019). Pharmacokinetics and pharmacodynamics of alfaxalone after a single intramuscular or intravascular injection in mallard ducks (Anas platyrhynchos). *Journal of veterinary pharmacology and therapeutics, 42*(6), 713–721. https://doi.org/10.1111/jvp.12804

BACKGROUND: Waterfowl are generally anesthetized with inhalant anesthesia as it leads to quick induction and recovery times. However, inhalant anesthesia may not be practical in certain field conditions. Alfaxalone is a synthetic, neuroactive, hydrophobic steroid that has been used to induce and maintain short-term anesthesia in several avian and wildlife species. Overall, studies of alfaxalone used in avian species are limited with no known pharmacokinetic reports and very few pharmacodynamic ones.

PURPOSE: To evaluate the pharmacokinetics and pharmacodynamics of alfaxalone when administered as a single bolus at 10 mg/kg intravenously (IV) and intramuscularly (IM). Alfaxalone was chosen to determine if it would be suitable for field anesthesia.

CONCLUSION: The authors concluded that alfaxalone in this study appeared to be an adequate anesthetic agent for induction but not for extended or invasive procedures and was associated with poor induction and recovery qualities in mallard ducks.

ACCESS THE ARTICLE…

Stoute, S. T., Jackwood, D. J., Crossley, B. M., Michel, L. O., & Blakey, J. R. (2019). Molecular epidemiology of endemic and very virulent infectious bursal disease virus genogroups in backyard chickens in California, 2009-2017. *Journal of veterinary diagnostic investigation, 31*(3), 371–377. https://doi.org/10.1177/1040638719842193

BACKGROUND: Pathogenic strains of infectious bursal disease virus (IBDV) are associated with increased morbidity, mortality, and immunosuppression in susceptible chickens. Backyard poultry is increasing in popularity in the United States, but very little is known about the prevalence and molecular epidemiology of IBDV within these flocks.

PURPOSE: A retrospective study and phylogenetic analyses of IBDV detected in backyard chickens submitted to the California Animal Health and Food Safety (CAHFS) diagnostic laboratory system in 2009–2017.

CONCLUSION: There were 17 CAHFS autopsy cases of very virulent IBDV (vvIBDV) segment A detected by RT-rtPCR in backyard poultry flocks from 7 counties in California from 2009–2017. During this same time period, non-vvIBDV genotypes were detected by

RT-rtPCR in 16 autopsy cases originating from backyard poultry premises in 10 counties in California. Subsequent RT-PCR and phylogenetic analysis of a segment of the hvVP2 and VP1 gene identified vvIBDV, interserotypic reassortant IBDV (vvIBDV segment A and serotype 2 segment B), and non-vvIBDV (variant/subclinical IBDV and classic IBDV) strains in backyard flocks in California.

ACCESS THE ARTICLE…

Michel, L. O., Kimber, M. L., & Jackwood, D. J. (2019). New introduction of a very virulent infectious bursal disease virus in New York, USA. *Avian pathology, 48*(5), 486–491. https://doi.org/10.1080/03079457.2019.1626975

BACKGROUND: Bursa tissue samples from a pullet flock in New York State that was experiencing immune suppression related disease were sent to the laboratory in 2018.

PURPOSE: To describe a vvIBDV isolated from a pullet farm in New York State and designated 1/chicken/USA/1054NY/18.

CONCLUSION: This virus was found to be genetically most similar to IBDV from Ethiopia, suggesting it is a new introduction into the US. Its pathogenicity in specific-pathogen-free (SPF) chicks was assessed, and this confirmed a designation of vvIBDV.

ACCESS THE ARTICLE…

Equine

Moraes, C. R., Runcan, E. E., Blawut, B., & Coutinho da Silva, M. A. (2019). The use of iSperm technology for on-farm measurement of Equine sperm motility and concentration. *Translational Animal Science, 3*(4), 1513-1520. https://doi.org/10.1093/tas/txz115

BACKGROUND: There is a need for affordable, portable, and objective semen analysis equipment and software for on-farm analysis. The iSperm is a newly released semen analysis tool from Aidmics Biotechnology Co. LTD, which allows an iPad Mini to be transformed into a handheld microscope with objective semen analysis software for equine available through the Apple Store (version 4.5.2).

PURPOSE: To compare iSperm values for sperm motility and sperm concentration to current acceptable methods of equine semen analysis. The agreement between these different methods was then determined using statistical methods to assess the validity of using iSperm for assessment of equine sperm motility and concentration.

CONCLUSION: The authors concluded that iSperm is an appropriate method for concentration determination of equine sperm with results that do not differ statistically from the gold standards of the hemocytometer and NucleoCounter SP-100. iSperm total motility and progressive motility measurements additionally provide accurate measurement of motility that are not different from computer-assisted semen analysis values, making it a portable, simple, and affordable method for use in the field. Finally, more work is needed to improve the iSperm software for sperm velocity measurements in order for this method to be acceptable by research standards.

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General

Scott, H. M., Acuff, G., Bergeron, G., Bourassa, M. W., Gill, J., Graham, D. W., Kahn, L. H., Morley, P. S., Salois, M. J., Simjee, S., Singer, R. S., Smith, T. C., Storrs, C., & Wittum, T. E. (2019). Critically important antibiotics: criteria and approaches for measuring and reducing their use in food animal agriculture. *Annals of the New York Academy of Sciences, 1441*(1), 8–16. https://doi.org/10.1111/nyas.14058

BACKGROUND: Globally, increasing acquired antimicrobial resistance among pathogenic bacteria presents an urgent challenge to human and animal health. As a result, significant efforts, such as the One Health Initiative, are underway to curtail and optimize the use of critically important antimicrobials for human medicine in all applications, including food animal production.

PURPOSE: This review discusses the rationale behind multiple and competing "critically important antimicrobial" lists and their contexts as created by international, regional, and national organizations; identifies discrepancies among these lists; and describes issues surrounding risk management recommendations that have been made by regulatory organizations on the use of antibiotics in food animal production.

CONCLUSION: In order to prioritize and protect the most essential antibiotics used in human medicine, the WHO and national governments have created CIA lists. Competing lists for animal health also exist at similar scales and serve to prioritize antibiotics among the range of acceptable uses in food animal agriculture. Additional recommendations and regulations have been put in place to curtail the use of antibiotics, which have helped to reduce the use of antimicrobial use in food animal production.

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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 **https://vet.osu.edu/**

Dairy Cattle Welfare Council – Webinar Series

(Live webinars are free of charge, but you must register.)

Session I - Dairy Welfare Student Showcase: Student's presentations selected for the Annual Symposium"

- **May 27, 2020 at 5:00 p.m. EDT**

  - "*Disbudding affects social behavior and use of a shelter in group-housed dairy calves*"
    - Kaitlin Gingerich, University of Florida
  - "*Feeding behavior and consumption in milk-fed dairy calves: from birth onwards*"
    - Blair Downey, University of California-Davis
  - "*Dairy worker perspectives on performing euthanasia as an essential component of their job*"

- ▪ Hailey Simpson, Colorado State University

Session II - Dairy Welfare Student Showcase: Student's presentations selected for the Annual Symposium"

- **June 3, 2020 at 5:00 p.m. EDT**

    - ○ " *Dairy cattle preference for different types of outdoor access*"
        - ▪ Anne-Marieke Smid, University of British Columbia (current affiliation: University of Calgary)
    - ○ " *Stocking density impacts group-housed cows' ability to seek isolation before calving*"
        - ▪ Katherine Creutzinger, The Ohio State University
    - ○ "*Timely euthanasia of dairy cattle: exploring the producer perspective*"
        - ▪ Brooklyn Wagner, North Carolina State University

Register at https://www.dcwcouncil.org/webinar-series

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