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In This Issue

Research

- [The effect of a furnished individual hutch pre-weaning on calf behavior, response to novelty, and growth](#)
- [Cow-level associations of lameness, behavior, and milk yield of cows milked in automated systems](#)
- [Comparison of a commercially available oral nutritional supplement and intravenous fluid therapy for dehydration in dairy calves](#)
- [Phenotypic and Genotypic Diversity of Salmonella in Finishing Swine](#)

Calendar

- [ODHMCP](#)
- [Dairy Cattle Welfare Symposium](#)

Research

Pempek, J. A., Eastridge, M. L., & Proudfoot, K. L. (2017). **The effect of a furnished individual hutch pre-weaning on calf behavior, response to novelty, and growth.** *Journal of Dairy Science*. Advance online publication. doi: 10.3168/jds.2016-12180

BACKGROUND: Recent research has shown benefits from the social housing of calves, but less research has focused on other forms of enrichment, such as adding complexity to their physical environment. More physical complexity in a farm animal's environment may also improve feed intake and growth. Although little research has been done with calves, research using pigs has determined that the addition of extra space and an area with peat and straw improved feed intake and food conversion ratios compared with pigs housed in standard pens. The authors stated the need for research to determine whether physical enrichments added to a standard hutch can also affect calf growth early in life.

PURPOSE: The overall goal was to assess the use and effect of physical enrichment items (chosen to stimulate grooming, play, and oral behaviors) in a furnished hutch compared with a standard hutch. The specific objectives were to (1) determine the duration and frequency of item use by calves; (2) determine the effect of the furnished hutch on calf behavior; (3) determine the effect of the furnished hutch on calves' response to environmental and social novelty post-weaning; and (4) determine the effect of the furnished hutch on starter intake and growth.

RESULTS: Furnished hutches contained 2 artificial teats, a stationary brush, a calf "lollie," and a rubber chain link for calves to manipulate. Calves used all of the items depending on the time of day, but they spent the most time using the brush. Calves housed in furnished hutches spent almost 50% more time engaged in locomotor play, but they spent the same amount of time sucking pen fixtures as calves housed in standard hutches. They observed no effect of treatment on growth, starter intake, or behavioral response to social and environmental novelty after weaning.

CONCLUSIONS: The authors concluded that calves used all of the items provided in the furnished hutch, and use depended on week of life and time of day. The furnished hutch increased the amount of time calves engaged in locomotor play but did not change the

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amount of time calves spent sucking on pen fixtures, their response to novelty, starter intake, or growth.

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King, M. T. M., LeBlanc, S. J., Pajor, E. A., & DeVries, T. J. (2017). **Cow-level associations of lameness, behavior, and milk yield of cows milked in automated systems.** *Journal of Dairy Science.* Advance online publication. doi: 10.3168/jds.2016-12281

BACKGROUND: For any herd, lameness has negative implications for productivity and behavior, but this may be heightened in automatic milking systems (AMS) due to the (ideally) voluntary nature of cows visiting the milking unit. Demonstrating the negative changes associated with lameness, especially when accounting for other factors, would help dairy producers gain a better appreciation of the negative effects of even moderate cases of lameness and would likely motivate them to improve their lameness monitoring and treatment protocols. To date, no researchers have examined associations of lameness with both productivity and behavior at the cow level in AMS while also evaluating and controlling for many other cow-level factors.

PURPOSE: The objective was to compare the behavior and productivity of lame and nonlame cows while accounting for body condition, parity, DIM, and other environmental factors. Comparisons were made regarding daily milk yield, milking and refusal frequencies, lying behavior, rumination behavior, and a measure of activity.

RESULTS: When accounting for other factors, lame cows produced 1.6 kg/d less milk in 0.3 fewer milkings/d. Lame cows were 2.2 times more likely to be fetched more than 1 time during the 6-d period and spent 38 min/d more time lying down in bouts that were 3.5 min longer in comparison with nonlame cows. As the number of cows per AMS unit increased, the frequency of milkings and refusals per cow per day decreased and cow activity increased. For each 13.3 percentage point increase in freestall stocking density (cows per stall), daily lying time decreased by 13 min/d and cows were 1.6 times more likely to be fetched more than 1 time during the 6-d period. There was no difference in daily rumination or activity between lame and nonlame cows or in night:day rumination time, but lame cows had greater night:day activity ratios.

CONCLUSIONS: The authors concluded that when accounting for other cow-level factors, lame cows produced less milk in fewer milkings each day, were more likely to be fetched, and spent more time lying down in bouts that were longer compared with nonlame cows. Cow-level risk factors identified for lameness in AMS were lower body condition, higher parity, and lower environmental temperature.

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Taylor, J. D., Rodenburg, M., & Snider, T. A. (2017). **Comparison of a commercially available oral nutritional supplement and intravenous fluid therapy for dehydration in dairy calves.** *Journal of Dairy Science.* Advance online publication. doi: 10.3168/jds.2016-12198

BACKGROUND: Intravenous fluids have been proven as an effective treatment for diarrheic calves; however, administration is time consuming, invasive, and requires a relatively high level of employee training and skill. Oral rehydration therapy (ORT) has been a long accepted alternative, but extensive variability is present in available products. The commercially available product Diaque (Boehringer-Ingelheim Vetmedica Inc., St. Joseph, MO) is an oral rehydration nutritional supplement that satisfies all of the necessary criteria, while also containing additional nutrients and constituents (including protein, fat, and additional glucose).

PURPOSE: The objective was to compare the efficacy of a nutritional supplement ORT to i.v. administered lactated Ringer's solution (LRS) in rehydrating, maintaining acid-base

balance, and limiting electrolyte derangements in moderately dehydrated, diarrheic calves.

RESULTS: Treatment A consisted of administering the nutritional supplement according to label directions (100 g in 1.9 L of warm water, 3 times a day), and treatment B consisted of i.v. LRS (2 L, once a day). Clinical signs and laboratory results were obtained once daily by a blinded observer. The induction method was effective in creating the desired effect, as demonstrated by weight loss and subjective health and hydration scores. Both treatment groups experienced increases in body weight, base excess, and bicarbonate, and decreases in total protein and packed cell volume following treatment.

CONCLUSIONS: The authors concluded that this study indicates that calves that were moderately dehydrated by an induced hyperosmotic diarrhea were effectively rehydrated by both i.v. LRS as well as a commercial nutritional supplement. Having a proven, effective oral rehydrating supplement as an effective treatment option gives producers a safe and easy to use alternative to administering i.v. fluids. This protocol can enable them to better treat diarrhea and prevent calfhood mortality.

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Pires, A. F., Funk, J. A., Habing, G. G., & Bolin, C. (2016). **Phenotypic and Genotypic Diversity of Salmonella in Finishing Swine.** *Foodborne Pathogens and Disease*, 13(4), 182-189. doi: 10.1089/fpd.2015.2012

BACKGROUND: Pulsed-field gel electrophoresis (PFGE) with XbaI restriction enzyme has been used to determine the genetic relatedness of strains from different sources (i.e., swine environment, trucks, individual pigs, and carcasses), mainly in cross-sectional. These methods are also used routinely to investigate human outbreaks. There are fewer reports of using these methods to evaluate changes in strain relatedness over time and within farms. Such knowledge might be used to develop and implement more targeted control measures and surveillance programs based on specific serovars and genotype distribution.

PURPOSE: To gain a better understanding of the transmission and ecology of Salmonella and demonstrate the relatedness of Salmonella isolates from different ecological niches (i.e., barn environment, nursery, and individual pigs) and evolution over time in three finishing sites, belonging to a unique production system in the Midwestern United States.

RESULTS: Among the 107 Salmonella isolates submitted for pulsed-field gel electrophoresis (PFGE) analysis, there were 25 distinct subtypes. PFGE genotyping results were consistent with the serotype findings. A large number of distinguishable PFGE patterns (i.e., within the same serovar) were observed and different combinations of subtypes were identified within and across sites and cohorts. New subtypes may result of the introduction of new strains, genetic changes, or ongoing transmission of evolved strains within the production system. The same subtypes were detected intermittently during the study period.

CONCLUSIONS: Genotypic diversity of Salmonella isolates within and across cohorts and sites was evident, as different combinations of subtypes were isolated in each cohort of pigs. New subtypes may result of the introduction of new strains, genetic changes, or ongoing transmission of evolved strains within the production system. The intermittent presence of the same subtype might reflect the establishment and adaptation of strains in different ecological niches and production stages. The presence of the same subtype over several cohorts of pigs was explained in part by persistence of the same subtype in nurseries and potential residual contamination from the barn. The diversity of subtypes elucidates the complexity of infection and circulation of Salmonella serovars and genotypes in commercial swine systems.

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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 10 – "Vaccinology and Immunology"

- May 4-5, 2017
- Hilton Garden Inn; Columbus, Ohio

Spots are always available for specific module plan

2nd Annual Dairy Cattle Welfare Symposium

Intersection of Best Practices and Sustainability

- June 1-3, 2017
- The Pfister Hotel; Milwaukee, Wisconsin

Early bird registration is now open at <https://dcwcouncil.org/>.

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