Curriculum Vitae

Chanhee Lee, Ph.D.

Associate Professor
Department of Animal Sciences
Ohio Agricultural Research and Development Center
The Ohio State University
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Employment

Associate Professor (May 2021 - present)
Department of Animal Sciences, Ohio Agricultural Research and Development Center
The Ohio State University

Assistant Professor (Sept 2015 – May 2021)
Department of Animal Sciences, Ohio Agricultural Research and Development Center
The Ohio State University

Post Doctoral Fellow (April 2013 - Aug 2015)
Agriculture and Agri-Food Canada, Lethbridge Research Centre, Canada

Post Doctoral Associate (May 2012 - Feb 2013)
The Pennsylvania State University, U.S.A.

Education

Doctor of Philosophy, Animal Sciences (Aug 2008 - May 2012)
The Pennsylvania State University, Pennsylvania, U.S.A.

Master of Science, Animal Sciences (Mar 2005 - Feb 2007)
Seoul National University, Seoul, South Korea

Bachelor of Science, Animal Sciences (Mar 1999 - Feb 2005)
Konkuk University, Seoul, South Korea

Peer-reviewed journal publications

2021

58. Rebelo, L. R., and **C. Lee.** 2021. Technical Note: A modified device to place abomasal infusion lines for rumen-cannulated cattle. JDS communications (under review)
57. Zynda, H. M., J. E. Copelin, L. R. Rebelo, W. P. Weiss, M. Wilken, and **C. Lee**. 2021. Effects of corn distillers' grains with yeast or manipulation of dietary cation and anion difference on production, nutrient digestibility, and gas emissions from manure in lactating dairy cows. J. Dairy Sci. (under review)
56. **Lee, C.**, J. E. Copelin, and M. T. Socha. 2021. Effect of zinc sources and experimental conditions on zinc balance in growing wethers. Trans. Anim. Sci. (accepted)
55. Zynda, H. M., J. E. Copelin, W. P. Weiss, F. Sun, and **C. Lee**. 2021. Effects of reducing dietary cation-anion difference on lactation performance and nutrient digestibility of lactating cows and ammonia emissions from manure. J. Dairy Sci. (under review)
54. **Lee, C.**, J. E. Copelin, L. R. Rebelo, and W. P. Weiss. 2021. Effects of feeding a diet with reduced dietary cation and anion difference to lactating cows on production and nutrient digestibility and ammonia emissions from manure. Anim. Feed Sci. Technol. 280:115068
53. Roman-Garcia, Y., Mitchell, **C. Lee**, M, Socha, T. Park, B. A. Wenner, and J. L. Firkins. 2021. Conditions stimulating NDF degradation by dosing branched chain volatile fatty acids. III: Relation with solid passage rate and pH on prokaryotic fatty acid profile and community in continuous culture. J. Dairy Sci. 104:9868-9885.
52. Roman-Garcia, Y., B. Denton, K. Mitchell, **C. Lee**, M, Socha, and J. L. Firkins. 2021. Conditions stimulating NDF degradation by dosing branched chain volatile fatty acids. II: Relation with solid passage rate and pH on NDF degradation and microbial function in continuous culture. J. Dairy Sci. 104:9853-9867.
51. Roman-Garcia, Y., B. Denton, K. Mitchell, **C. Lee**, M, Socha, and J. L. Firkins. 2021. Conditions stimulating NDF degradation by dosing branched chain volatile fatty acids. I: Comparison with branched chain amino acids and forage source in ruminal batch cultures. J. Dairy Sci. 104:6739-6755.
50. Morris, D. L., J. L. Firkins, **C. Lee**, W. P. Weiss, and P. J. Kononoff. 2020. Relationship between urinary energy and urinary N or C excretion in lactating Jersey cows. J. Dairy Sci. 104:6727-6738.
49. Copelin, J. E., J. L. Firkins, M. T. Socha, and **C. Lee**. 2021. Effects of diet fermentability and supplementation of 2-hydroxy-(4-methylthio) butanoic acid and isoacids on milk fat depression in lactating dairy cows: 1. production, milk fatty acid profile, and nutrient digestibility. J. Dairy Sci. 104: 1591-1603.
48. **Lee, C.**, J. E. Copelin, J. L. Firkins, T. Park, K. E. Mitchell, M. T. Socha, and D. Luchini. 2021. Effects of diet fermentability and supplementation of 2-hydroxy-(4-methylthio) butanoic acid and isoacids on milk fat depression in lactation dairy cows: 2. Rumen fermentation, fatty acid profile, and bacterial community structure. J. Dairy Sci. 104:1604-1619.

2020

47. **Lee, C.**, J. E. Copelin, P. A. Dieter, and E. Berry. 2020. Effects of trace mineral supply from rumen boluses on performance, carcass characteristics, and fecal bacterial profile in beef cattle. Anim. Feed Sci. Technol. 269:114626.
46. **Lee, C.**, S-H, Kim, K. A. Beauchemin, P. Celi and S. M. Duval. 2020. Short-term eating preference of beef cattle fed high forage or high grain diets supplemented with 3-nitrooxypropanol. Animals 10:64.
45. **Lee, C.**, D. L. Morris, K. M. Lefever, and P. A. Dieter. 2020. Feeding a diet with high corn distillers grain with solubles to dairy cows alters manure characteristics and ammonia and hydrogen sulfide emissions from manure. J. Dairy Sci. 103:2363-2372.

2019

44. Lee, J-S., N. Kacem, W-S. Kim, D. Q. Peng, Y-J. Kim, Y-G. Joung, **C. Lee**, and H-G. Lee. 2019. Effect of Saccharomyces boulardii supplementation on performance and physiological traits of Holstein calves under heat stress conditions. Animals 9:510-520.
****Contribution:** assisting with designing the experiment, data interpretation and writing the manuscript
43. **Lee, C.**, N. E. Lobos and W. P. Weiss. 2019. Effects of supplementing rumen-protected amino acids during prepartum and postpartum periods on performance of dairy cows. J. Dairy Sci. 102:11026-11039.
42. Kim, S-H., **C. Lee,** H. A. Pechtl, J. M. Hettick, M. R. Campler, M. D. Pairis-Garcia, K. A. Beauchemin, P. Celi , and S. M. Duval. 2019. Effects of 3-nitrooxypropanol on enteric methane production, rumen fermentation, and feeding behavior in beef cattle fed a high forage or high grain diet. J. Anim. Sci. 97:2687-2699.
41. Rebelo, L. R., I. C. Luna, J. D. Messana, R. C. Araujo, T. A. Simioni, Y. T. Granja-Salcedo, E. S. Vito, **C. Lee**, I. A. M. A. Teixeira, J. A. Rooke, T. T. Berchielli. 2019. Effect of replacing soybean meal with urea or encapsulated nitrate with or without elemental sulfur on nitrogen digestion and methane emissions in feedlot cattle. Anim. Feed Sci. Technol. 257:114293.
****Contribution:** assisting with data interpretation and writing the manuscript
40. Morris, D. L., A. W. Tebbe, W. P. Weiss, and **C. Lee.** 2019. Short Communication: Impacts of drying and analytical methods on nitrogen concentrations of feeds, feces, milk, and urine of dairy cows. J. Dairy Sci. 102:5212-5218.
39. **Lee, C.**, D. L. Morris, J. E. Copelin, J. M. Hettick, and I. H. Kwon. 2019. Effects of Lysophospholipids on short-term production, nitrogen utilization, and rumen fermentation and microbial population in lactating dairy cows. J. Dairy Sci. 102:3110-3120.
38. **Lee, C.**, D. L. Morris, and P. A. Dieter. 2019. Validating and optimizing spot sampling of urine to estimate urine output with creatinine as a marker in dairy cows. J. Dairy Sci. 102:236-245

2018

37. Morris, D. L., L. R. Rebelo, P. A. Dieter, and **C. Lee**. 2018. Validating intrinsic markers and optimizing spot sampling frequency to estimate fecal outputs. J. Dairy Sci. 101:7980-7989.

36. **Lee, C.**, A. W. Tebbe, J. M. Campbell, and W. P. Weiss. 2018. Effects of spray-dried plasma protein product on early lactation dairy cows. J. Dairy Sci. 101:6019-6031
35. Morris, D. L., S-H, Kim, P. Kononoff, and **C. Lee**. 2018. Continuous 11-week feeding of reduced-fat distillers grains with and without monensin reduces lactation performance of dairy cows. J. Dairy Sci. 101:5971-5983.
34. Morris, D. L., S-H, Kim, and **C. Lee**. 2018. Effects of feeding reduced-fat distillers grains with and without monensin on nitrogen, phosphorus, and sulfur utilization and excretion in dairy cows. J. Dairy Sci. 101:7106-7116.
33. Kim, S. H., L. L. Mamuad, E. J. Kim, H. G. Sung, G. S. Bae, K. K. Cho, **C. Lee,** and S. S. Lee. 2017. Effect of different concentrate diet levels on rumen fluid inoculum used for determination of in vitro rumen fermentation, methane concentration, and methanogen abundance and diversity. Italian J. Anim. Sci. 17:359-367.
****Contribution:** assisting with data interpretation and writing the manuscript

2017

32. **Lee, C.,** R. C. Araujo, K. M. Koenig, and K. A. Beauchemin. 2017. In situ and in vitro evaluation of a slow release form of nitrate for ruminants: nitrate release rates, rumen nitrate metabolism and production of methane, hydrogen, and nitrous oxide. Anim. Feed Sci. Technol. 231:97-106.
31. **Lee, C.,** R. C. Araujo, K. M. Koenig, and K. A. Beauchemin. 2017. Effects of encapsulated nitrate on growth performance, nitrate toxicity, and enteric methane emissions in feedlot beef steers: backgrounding phase. J. Anim. Sci. 95:3700-3711.
30. **Lee, C.**, R. C. Araujo, K. M. Koenig, and K. A. Beauchemin. 2017. Effects of encapsulated nitrate on growth performance, carcass characteristics, nitrate residues in tissues, and enteric methane emissions in feedlot beef steers: finishing phase. J. Anim. Sci. 95:3712-3726.
29. Biswas, A. A., S. S. Lee, L. L. Mamuad, S. H. Kim, Y. J. Choi, **C. Lee**, K. Lee, G. S. Bae, and S. S. Lee. 2017. Effects of illite supplementation on in vitro and in vivo rumen fermentation, microbial population and methane emission of Hanwoo steers fed high concentrate diets. Anim. Sci. J. 89:114-121.
****Contribution:** assisting with data interpretation and writing the manuscript

2016

28. **Lee, C.**, R. C. Araujo, K. M. Koenig, M. Hile, E. E. Fabian, and K. A. Beauchemin. 2016. Effect of feeding encapsulated nitrate on ammonia and greenhouse gas emissions from manure of beef cattle. J. Environ. Qual. 45:1979-1987.

2015

27. **Lee, C.**, J. Oh, A. N. Hristov, K. Harvatine, and G. I. Zanton. 2015. Effect of 2-hydroxy-4-methylthio-butanoic acid on ruminal fermentation, digestibility, and performance of lactating dairy cows. J. Dairy Sci. 98: 1234-1247.
26. **Lee, C.**, F. Giallongo, A. N. Hristov, H. Lapierre, T. W. Cassidy, K. S. Heyler, G. A. Varga, and C. Parys. 2015. Effect of dietary protein level and rumen-protected amino

acid supplementation on dietary amino acid recovery in milk protein in lactating dairy cows. J. Dairy Sci. 98:1885-1902.

25. **Lee, C.**, R. C. Araujo, K. M. Koenig, and K. A. Beauchemin. 2015. Effects of encapsulated nitrate on enteric methane production, and nitrogen and energy utilization in beef heifers. J. Anim. Sci. 93:2391-2404.
24. **Lee, C.**, R. C. Araujo, K. M. Koenig, and K. A. Beauchemin. 2015. Effects of encapsulated nitrate on eating behavior, rumen fermentation, and blood profile of beef heifers fed restrictively or ad libitum. J. Anim. Sci. 93:2405-2418.
23. **Lee, C.**, R. C. Araujo, K. M. Koenig, and K. A. Beauchemin. 2015. Effects of feed consumption rate of beef cattle offered a diet supplemented with nitrate ad libitum or restrictively on potential toxicity of nitrate. J. Anim. Sci. 93:4956-4966.

2014

22. **Lee, C.**, G. W. Feyereisen, A. N. Hristov, C. J. Dell, J. Kaye, and D. Beegle. 2014. Effects of dietary protein concentration on ammonia volatilization, nitrate leaching, and plant nitrogen uptake from dairy manure applied to lysimeters. J. Environ. Qual. 43:398-408.
21. **Lee, C.**, and K. A. Beauchemin. 2014. A review of feeding supplementary nitrate to ruminant animals: methane emissions, nitrate toxicity, and production performance. Can. J. Anim. Sci. 94:557-570.

< 2013

20. Hristov, A. N., **C. Lee**, T. Cassidy, K. Heyler, J. A. Tekippe, G. A. Varga, B. Corl, and R. C. Brandt. 2013. Effect of Origanum vulgare L. leaves on rumen fermentation, production, and milk fatty acid composition in lactating dairy cows. J. Dairy Sci. 96:1189.
19. Gerber, P. J., A. N. Hristov, B. Henderson, H. Makkar, J. Oh, **C. Lee**, R. Meinen, F. Montes, T. Ott, J. Firkins, Al Rotz, C. Dell, A. Adesogan, W. Z. Yang, J. Tricarico, E. Kebreab, G. Waghorn, J. Dijkstra, and S. Oosting. 2013. Technical options for the mitigation of direct methane and nitrous oxide emissions from livestock – a review. Animal 7 Suppl. 2:220-234.
18. **Lee, C.**, and A. N. Hristov. 2013. Short communication: Evaluation of acid-insoluble ash and indigestible neutral-detergent fiber as total tract digestibility markers in dairy cows fed corn silage-based diets. J. Dairy Sci. 96:5295-5299.
17. **Lee, C.**, and A. N. Hristov. 2013. Short communication: Comparison of three solid digesta passage markers in dairy cows. J. Dairy Sci. 97:1725-1729.
16. Tekippe, J. A., R. Tacoma, A. N. Hristov, **C. Lee**, J. Oh, K. S. Heyler, T. W. Cassidy, G. A. Varga, and D. Bravo. 2013. Effect of essential oils on ruminal fermentation and lactation performance of dairy cows. J. Dairy Sci. 96:7892-7903.
15. Hristov, A. N., J. Oh, J. Firkins, J. Dijkstra, E. Kebreab, G. Waghorn, H. P. S. Makkar, A. T. Adesogan, W. Yang, **C. Lee**, P. J. Gerber, B. Henderson, and J. M. Tricarico. 2013. Special topics - Mitigation of methane and nitrous oxide emissions from animal operations: I. A review of enteric methane mitigation options. J. Anim. Sci. 91:5045-5069.

14. Seo, J. K., M. H. Kim, J. Y. Yang, H. J. Kim, **C. Lee**, K. H. Kim, Jong K. Ha. 2013. Effects of synchronicity of carbohydrate and protein degradation on rumen fermentation characteristics and microbial protein synthesis. Asian-Aust. J. Anim. Sci. 26:358-365.
13. Oh, J., A. N. Hristov, **C. Lee**, T. Cassidy, K. Heyler, G. A. Varga, J. Pate, S. Walusimbi, E. Brzezicka, K. Toyokawa, J. Werner, S. S. Donkin, R. Elias, S. Dowd, D. Bravo. 2013. Immune and production responses of dairy cows to postruminal supplementation with phytonutrients. J. Dairy Sci. 96:7830-7843.
12. **Lee, C.**, A. N. Hristov, C. J. Dell, G. W. Feyereisen, J. Kaye, and D. Beegle. 2012. Effect of dietary protein concentration on ammonia and greenhouse gas emissions from dairy manure. J. Dairy Sci. 95:1930-1941.
11. **Lee, C.**, A. N. Hristov, K. S. Heyler, T. W. Cassidy, H. Lapierre, G. A. Varga, and C. Parys. 2012. Effects of metabolizable protein supply and amino acid supplementation on nitrogen utilization, milk production and ammonia emissions from manure in dairy cows. J. Dairy Sci. 95:5253.
10. **Lee, C.,** A. N. Hristov, T. W. Cassidy, K. S. Heyler, H. Lapierre, G. A. Varga, M. J. de Veth, R. A. Patton, and C. Parys. 2012. Rumen-protected lysine, methionine, and histidine increase milk protein yield in dairy cows fed metabolizable protein-deficient diet. J. Dairy Sci. 95:6042.
9. Hristov, A. N., **C. Lee**, R. A. Hristova, P. Huhtanen, and J. L. Firkins. 2012. A meta-analsis of variability in continuous culture ruminal fermentation and digestibility data. J. Dairy Sci. 95:5299.
8. Hristov, A. N., T. R. Callaway, **C. Lee**, and S. E. Dowd. 2012. Rumen bacterial, archaeal, and fungal diversity of dairy cows in response to ingestion of lauric or myristic acids. J. Anim. Sci. 90:4449-4457.
7. Hristov, A. N., **C. Lee**, T. Cassidy, M. Long, K. Heyler, B. Corl, and R. Forster. 2011. Effects of lauric and myristic acids on ruminal fermentation, production, and milk fatty acid composition in lactating dairy cows. J. Dairy Sci. 94:382-395.
6. Hristov, A. N., C. Domitrovich, A. Wachter, T. Cassidy, **C. Lee**, K. J. Shingfield, P. Kairenius, J. Davis, and J. Brown. J. 2011. Effect of replacing solvent-extracted canola meal with high-oil traditional canola, high-oleic acid canola, or high-erucic acid rapeseed meals on milk production and milk fatty acid composition in lactating dairy cows. J. Dairy Sci. 94:4057.
5. **Lee, C.**, A. N. Hristov, K. S. Heyler, T. W. Cassidy, M. Long, B. A. Corl, and S. K. R. Karnati. 2011. Effects of dietary protein concentration and coconut oil supplementation on nitrogen utilization and production in dairy cows. J. Dairy Sci. 94:5544.
4. **Lee, C.**, A. N. Hristov, T. Cassidy, and K. Heyler. 2011. Nitrogen isotope fractionation and origin of ammonia nitrogen volatilized from cattle manure in simulated storage. Atmosphere. 2:256.
3. Upadhaya, S. D., H. G. Sung, **C. Lee**, S. Y. Lee, S. W. Kim, K. J. Cho, and J. K. Ha. 2009. Comparative study on the aflatoxin B1 degradation ability of rumen fluid from Holstein steers and Korean native goats. J. Vet. Sci.10:29.
2. Hwang, I. H., **C. Lee**, S. W. Kim, H. G. Sung, S. Y. Lee, S. S. Lee, H. Hong, Y. Kwak, and J. K. Ha. 2008. Effects of mixtures of tween80 and cellulolytic enzymes on nutrient digestion and cellulolytic bacterial adhesion. Asian-Aust. J. Anim. Sci. 21:1604.

1. **Lee, C.**, H. G. Sung, M. Eslami, S. Y. Lee, J. Y. Song, S. S. Lee, and J. K. Ha. 2007. Effects of tween 80 pretreatment on dry matter disappearance of rice Straw and cellulolytic bacterial adhesion. Asian-Aust. J. Anim. Sci. 20:1397.

Book chapters

Alvarez, V. B., Eastridge, M. L., **Lee, C.**, Sarantis, S. D., 2022. Sustainable Processing: Minimizing the Impact of the Dairy Industry on the Environment – Toward Zero Carbon Footprint. In: McSweeney, P.L.H., McNamara, J.P. (Eds.), Encyclopedia of Dairy Sciences, vol. 4. Elsevier, Academic Press, pp. 846–854. https://dx.doi.org/10.1016/B978-0-12-818766-1.00307-X.

Hristov, A. N., J. Oh, **C. Lee**, R. Meinen, F, Montes, T, Ott, J. Firkins, A. Rotz, C. Dell, A. Adesogan, W. Z. Yang, J. Tricarico, E. Kebreab, G. Waghorn, J. Dijkstra, and S. Oosting. 2014. Mitigation of greenhouse gas emissions in livestock production – a review of technical options for non-CO_2 emissiosn (eds. P. Gerber, B. Henderson, and H. Makkar). FAO, Rome, Italy.

Honors and awards received

2020 Selected for an interview with high impact Early Career Researchers in Journal of Dairy Science (https://www.journals.elsevier.com/journal-of-dairy-science/news/read-interviews-with-high-impact-early-career-researchers)
2018-2019 Excellence in Undergraduate Research Mentoring Award, The Ohio State University.
2017 The environmental health & safety 2017 laboratory safety Dean's list award, The Ohio State University.
2016 The environmental health & safety 2016 laboratory safety Dean's list award, The Ohio State University.
2012 ADSA-ASAS Northeast Section Graduate Student Competition (Oral presentation) - First Place
2013-2015, NSERC Post-Doctoral Fellowship (Canada)
2010-2011, Darrow's Ruminant Nutrition Scholarship (The Pennsylvania State University)
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2008-2009, Darrow's Ruminant Nutrition Scholarship (The Pennsylvania State University)