LEON J. SPICER
Professor
Department of Animal Science
Oklahoma State University
Stillwater, OK 74078

Education:

1984	Michigan Sate University, East Lansing, Michigan, **Ph.D.** in Dairy Science
1979	University of Idaho, Moscow, Idaho, **M.S.** in Animal Science
1977	University of Minnesota, St. Paul, Minnesota, **B.S.** in Animal Science

Professional Appointments:

1998-	Professor, Department of Animal & Food Sciences, **Oklahoma State University**
2018	Visiting Professor, Department of Veterinary Medicine, University of Milan, Italy
2013-16	Harrington Chair in Animal Science, **Oklahoma State University**
2005	Visiting Professor, Department of Obstetrics and Gynecology, **Stanford University** Medical Center, Stanford, CA
1993-98	Associate Professor, Department of Animal Science, **Oklahoma State University**
1988-93	Assistant Professor, Department of Animal Science, **Oklahoma State University**
1987-88	Instructor, Division of Endocrinology, The Milton S. Hershey Medical Center, The **Pennsylvania State University**
1984-87	Project Assistant, Division of Endocrinology, The Milton S. Hershey Medical Center, The **Pennsylvania State University**

Professional Memberships:

International Embryo Technology Society
American Society of Animal Science
American Dairy Science Association
Sigma Xi - The Scientific Research Society
Society for the Study of Reproduction
The Endocrine Society

Selected Honors/Awards:

2018 Article published in *Reproduction* was a 'top downloaded article' in 2018.
2014 No. 10 ranked article in *Science Direct Top25* in 2014 in Domest. Anim. Endocrinol.;
2013 **Regents Distinguished Research Award**, OSU;
Harrington Chair in Animal Science, OSU;
Article listed in top 20 of "Most Read Articles" during 2013 in *Biol. Reprod.*
2011 The International Education Faculty Excellence Award, OSU;
No. 10 ranked article in *Top 25 Hottest Articles* in 2011 Domest Anim Endocrinol.
2010 **Regents Distinguished Teaching Award**, Oklahoma State University.
2009 OSU Faculty & Staff Appreciation Program Award, Academic Affairs & Intercollegiate Athletics Offices.
No. 1 ranked article in *Science Direct Top25* Jan.-Feb. in Domest Anim Endocrinol.;
No. 17 ranked article in *50 Most-Frequently Cited Articles* in J. Anim. Sci.

2008 Sigma Xi Chaper Lecturer Award; **Chair, OSU Faculty Council Research Committee**.
2006 Elected, member OSU Faculty Council;
Two *Science Direct Top25* articles within Domestic Animal Endocrinology.
2005 Who's Who Among America's Teachers;
Two *Science Direct Top25* articles within Domestic Animal Endocrinology;
Chair, Biological Sciences, Group I Graduate Faculty
2004 Pfizer Animal Health Physiology Award, American Dairy Science Association;
Two *Science Direct Top25* articles within Domestic Animal Endocrinology.
1999 President, Sigma Xi, The Scientific Research Society, Oklahoma State University.
1994 The James A. Whatley Award for Meritorious Research in Agricultural Science, Division of Agricultural Sciences and Natural Resources, Oklahoma State University.

Teaching:
2002-Present **AG 3803/3080**, Culture and Agriculture of Italy
2009-Present **AG 3803/3080**, Culture and Agriculture of Ireland
1995-present **ANSI 4543**, Dairy Cattle Science
1989-Present **ANSI 3443**, Animal Reproduction
1989-Present **ANSI 4900**, **ANSI 5010,** Special Problems
1990-1992 **ANSI 4900**, Techniques in Animal Biotechnology
1990-Present **ANSI 5000, 6000**- Research and Thesis
1989-Present **ANSI 5110**, Seminar

Advising:
1988-2018 Animal Science Undergraduate Advisor (n=35 / year)
1990-92; 1995-97; 2006-present Dairy Science Club Co-advisor

International Travel:
I have traveled to 26 countries and given 22 invited talks in 9 countries. In particular, I have traveled to Italy 20 times, Ireland 11 times and the Philippines 11 times.

Graduate Student Theses Completed (as Chair): Advisor: 24 M.S. students; 5 Ph.D. students;

Research: My research endeavors are both basic and applied that involve a wide range of in vivo and in vitro approaches to study nutritional and hormonal control of ovarian function and follicular development with the ultimate goal to improve reproductive efficiency of farm animals. Studies include: insulin-like growth factor-I (IGF-I) as an endocrine factor linked to energy balance in early lactating dairy cows; metabolic factors such as leptin, insulin, IGF-I and fibroblast growth factor-9 in ovarian follicular function and milk production; and use of microarrays for gene discovery. Experimental approaches span from evaluating control of steroidogenesis, mitogenesis and gene expression in ovarian cells to determining the effect of nutritional supplements on ovarian function and milk production in dairy cattle. My research efforts have been supported by extramural grants from NIH, USDA, and private industry.

Journal Editorial Boards:
2020-current Theriogenology
2014-17 Section Editor- Journal of Animal Science
2011-14 Associate Editor – Journal of Animal Science
2012-current BioMed Research International
2009-current Philippine Journal of Veterinary and Animal Sciences
2008-12 Journal of Biomedicine and Biotechnology
1999-2001 Domestic Animal Endocrinology
1999-2003 Biology of Reproduction
1996-2003 Frontiers in Bioscience
1994-95 Assisted Reproductive Technology/Andrology
1992-95 Journal of Animal Science

Publications (Total: 517; ***Peer-reviewed journal articles: 189***; Abstracts: 249; Other: 79) :

Peer-reviewed Publication List –Representative (2005-2020):

- Santiago, C.A.T., J.L. Voge, P.Y. Aad, D.T. Allen, D. Stein, J.R. Malayer and L.J. Spicer. Pregnancy-associated plasma protein-A and insulin-like growth factor binding protein mRNAs in granulosa cells of dominant and subordinate follicles of preovulatory cattle. Domest. Anim. Endocrinol. 28:46-63, 2005.

- Stein, D.R., D.T. Allen, K.W. Gates, T.G. Rehberger, K.J. Mertz, D.A. Jones and L.J. Spicer. Effects of feeding propionibacteria to dairy cows on milk yield, milk components, and reproduction. J. Dairy Sci. 89:111-125, 2006.

- Aad, P.Y., C.A.T. Santiago, J.L. Voge, J.R. Malayer and L.J. Spicer. Real-time RT-PCR quantification of pregnancy-associated plasma protein-A gene expression in bovine granulosa and theca cells. Dom. Anim. Endocr. 31:357-72, 2006.

- Spicer, L.J., P.Y. Aad, D. Allen, S. Mazerbourg, and A.J. Hsueh. Growth differentiation factor-9 has divergent effects on proliferation and steroidogenesis of bovine granulosa cells. J. Endocrinol. 189:329-339, 2006.

- Alemán, M.M., D. R. Stein, D. T. Allen, E. Perry, K. V. Lehloenya, T. G. Rehberger, K. J. Mertz, D. A. Jones, and L. J. Spicer. Effects of feeding two levels of propionibacteria to dairy cows on plasma hormones and metabolites. J. Dairy Res. 74:146-153, 2007.

- Spicer, L.J., and P.Y. Aad. Insulin-like growth factor (IGF) 2 stimulates steroidogenesis and mitosis of bovine granulosa cells through the IGF1 receptor: Role of follicle-stimulating hormone and IGF2 receptor. Biol. Reprod. 77:18-27, 2007.

- Lehloenya, K.V., D. R. Stein, D. T. Allen, G. E. Selk, D. A. Jones, M. M. Aleman, T. G. Rehberger, K. J. Mertz, and L. J. Spicer. Effects of feeding yeast and propionibacteria to dairy cows on milk yield and components, and reproduction. J. Anim. Physiol. & Anim. Nutr. 92:190-202, 2008.

- Spicer, L.J., P.Y. Aad, D. Allen, S. Mazerbourg, A. Payne, and A.J. Hsueh. Growth Differentiation Factor 9 (GDF9) stimulates proliferation and inhibits steroidogenesis by bovine theca cells: Influence of follicle size on responses to GDF9. Biol. Reprod. 78:243-253, 2008.

- Grado-Ahuir, J.A., P.Y. Aad, G. Ranzenigo, F. Caloni, F. Cremonesi and L. J. Spicer. Microarray analysis of insulin-like growth factor-I-induced changes in mRNA expression in cultured porcine granulosa cells: Possible role of IGF-I in angiogenesis. J. Anim. Sci. 87:1921-1933, 2009.

- Spicer, L.J., S. Sudo, P. Y. Aad, L. Shuo Wang, S.-Y. Chun, I. Ben-Shlomo, C. Klein, and A. J. W. Hsueh. The hedgehog-patched signaling pathway and function in the mammalian ovary: a novel role for hedgehog proteins in stimulating proliferation and steroidogenesis of theca cells. Reproduction 138:329-339, 2009.

- Spicer, L. J., N. B. Schreiber, D. V. Lagaly, P.Y. Aad, L.B. Douthit, and J. A. Grado-Ahuir. 2010. Effect of resistin on granulosa and theca cell function in cattle. Anim. Reprod. Sci. 124:19-27, 2011.

- Chase, C.C., Jr., T.H. Elsasser, L.J. Spicer, D.G. Riley, M.C. Lucy, A.C. Hammond, T.A. Olson, and S.W. Coleman. Effect of growth hormone administration to mature miniature Brahman cattle treated with or without insulin on circulating concentrations of insulin-like growth factor-I and other metabolic hormones and metabolites. Domest. Anim. Endocrinol. 41:1-13, 2011.

- Grado-Ahuir, J.A., P.Y. Aad, and L. J. Spicer. New insights into the pathogenesis of cystic follicles in cattle: Microarray analysis of gene expression in granulosa cells. J. Anim. Sci. 89:1796-1786, 2011.

- Aad, P. Y., S. E. Echternkamp, D. D. Syperd, N. B. Schreiber, and L. J. Spicer. The hedgehog system in ovarian follicles of cattle selected for twin ovulations and births: Evidence of a link between the IGF and hedgehog systems. Biol. Reprod. 87: 79-, 2012.

- Schreiber, N. B., and L. J. Spicer. Effects of fibroblast growth factor 9 (FGF9) on steroidogenesis and gene expression, and control of *FGF9* mRNA in bovine granulosa cells. Endocrinology 153:4491-4501, 2012.

- Schreiber, N. B., Totty, M., and L. J. Spicer. Expression and effect of fibroblast growth factor 9 in bovine theca cells. J. Endocrinology 215:167-175, 2012.

- Cortinovis, C., F. Pizzo, L. J. Spicer, and F. Caloni. Fusarium mycotoxins: effects on reproductive function in domestic animals - a review. Theriogenology 80:557-564, 2013.

- Aad, P.Y., S. E. Echternkamp, and L. J. Spicer. Possible role of IGF2 receptors in regulating selection of 2 dominant follicles in cattle selected for twin ovulations and births. Domest. Anim. Endocrinol. 45:187-195, 2013.

- Cortinovis, C., F. Caloni, N. Schreiber, and L. J. Spicer. Individual and combined effects of fumonisin B_1 and deoxynivalenol or zearalenone on porcine granulosa cell steroid production. Theriogenology 81:1042-49, 2014.

- Pizzo, F., F. Caloni, N. B. Schreiber, L. F. Schutz, M. L. Totty, M. Albonico, and L. J. Spicer. Direct effects of the algal toxin, domoic acid, on ovarian function: Bovine granulosa and theca cells as an in vitro model. Ecotoxicol Environ Saf. 113:314-320, 2015.

- Dentis, J. L., N. B. Schreiber, J. N. Gilliam, L. F. Schutz, and L. J. Spicer. Changes in brain ribonuclease (*BRB*) mRNA in granulosa cells (GCs) of dominant versus subordinate ovarian follicles of cattle and the regulation of *BRB* gene expression in bovine GCs. Domest. Anim. Endocr. 55:32-40, 2016.

- Albonico, M., L. F. Schütz, F. Caloni, C. Cortinovis, and L. J. Spicer. Toxicological effects of fumonisin B_1 alone and in combination with other fusariotoxins on bovine granulosa cells. Toxicon 118:47-53, 2016. Ervin, J., L. F. Schütz, and L. J. Spicer. Current status of the role of endothelins in regulating ovarian follicular function: a review. Anim. Reprod. Sci. 186:1-10, 2017.

- Schütz, L. F., R. E. Hurst, N. B. Schreiber, and L. J. Spicer. Transcriptome profiling of bovine ovarian theca cells treated with fibroblast growth factor 9. Domest. Anim. Endocrinol. 63:48-58, 2018. doi: 10.1016/j.domaniend.2017.12.002.

- Nichols, J. A., M. C. Perego, L. F. Schütz, A. M. Hemple, and L. J. Spicer. Hormonal regulation of vascular endothelial growth factor A (VEGFA) gene expression in granulosa and theca cells of cattle1. J Anim Sci. 97:3034-3045, 2019. doi:10.1093/jas/skz164.

- Bertero A, Moretti A, Spicer LJ, Caloni F. Fusarium Molds and Mycotoxins: Potential Species-Specific Effects. Toxins (Basel). 2018 Jun 15;10(6). pii: E244. doi: 10.3390/toxins10060244.

- Morrell, B. C., L. Zhang, L. F. Schütz, M. C. Perego, E. R. S. Maylem, and L. J. Spicer. Regulation of the transcription factor E2F8 gene expression in bovine ovarian cells. Mol. Cell. Endocrinol. 498:110572, 2019. doi: 10.1016/j.mce.2019.110572.

- Perego, M. C., B. C. Morrell, L. Zhang, L. F. Schütz, and L. J. Spicer. Developmental and hormonal regulation of Ubiquitin-like with plant homeodomain and really interesting new gene finger domains 1

(UHRF1) gene expression in ovarian granulosa and theca cells of cattle. J. Anim. Sci. 2020 Jul 1; 98(7):skaa205. doi: 10.1093/jas/skaa205.