

January 2005

**LAWRENCE K. FOX**

Professor and Veterinarian

Veterinary Clinical Medicine and Surgery  
and Department of Animal Sciences  
Washington State University  
Pullman, WA 99164-6351

**EDUCATION**

Formal education

University of Wisconsin, Dairy Science, Madison, WI	Ph.D. 1983
Virginia Tech, Dairy Science, Blacksburg, VA	M.S. 1980
Cornell University, Animal Science, Ithaca, NY	B.S. 1977

Major subjects

M.S. Mastitis  
Ph.D. Mastitis

Thesis subjects

M.S. Effect of glucocorticoids on milk neutrophil function.  
Ph.D. Factors related to loss in milk production.

**EMPLOYMENT**

<u>Dates</u>	<u>Title</u>	<u>Address</u>
1983-1985	Extension Dairy Specialist	Univ. of Hawaii, Honolulu
1985-1991	Asst. Professor and Asst. Veterinarian, Dept. of Animal Sciences and Dept. of Veterinary Clinical Medicine and Surgery	Washington State University
1991-present	Assoc. Professor and Assoc. Veterinarian, Dept. of Animal Sciences and Dept. of Veterinary Clinical Medicine and Surgery	Washington State University
1997-present	Professor and Veterinarian Dept. of Animal Sciences and Dept. of Veterinary Clinical Medicine and Surgery	Washington State University

**CLINICAL SPECIALTY:** Mastitis

## MEMBERSHIPS

### Professional

American Dairy Science Association  
National Mastitis Council

### Honorary

Gamma Sigma Delta  
Sigma Xi

## HONORS AND AWARDS

National: ADSA West Agro Inc. Mastitis, 1991  
ADSA Merial Dairy Management, 2003  
University: Department of Animal Sciences Teacher of the Year, 1988

## COMMITTEE SERVICE

### International

Supporting visiting faculty, Dr. El-Rashidy, Cairo Ministry of Agriculture in Egypt, 1990

### National and International

American Dairy Science Association Representative to the National Mastitis Council, 1986-89.  
Research Committee, National Mastitis Council, 1985-present.  
Program Committee, National Mastitis Council, 1988.  
Ad Hoc Research Priorities Committee, National Mastitis Council, 1988.  
Animal Health Committee, Am. Dairy Sci. Assoc., Vice Chairman, 1987; Chairman, 1988 and 2000 and 2001.  
Technology Transfer Session, National Mastitis Council, Chairman, 1989-present.  
Board of Directors, National Mastitis Council, 1992-95.  
Executive Board, National Mastitis Council, 1996-98.  
West Agro Mastitis Research Selection Committee, American Dairy Science Association, 1992-94; Chairman 1994.  
Milk Synthesis Committee, American Dairy Science Association, 1993-1995.

### Regional

Technical Representative from Washington State to NE 112 Regional Project on Mastitis, 1986-present.  
Secretary, Vice Chair and Chair, NE 112 Regional Project, 1989-91;; 97-2000.

### University

General Education Committee, 1992-1997  
Chair, Math Subcommittee, 1992-1997  
Chair, Ecology of the Planet Area of Coherence Subcommittee, 1993-1997  
Program assessment, 2000-2001

### College

CVM Liaison Officer to Dairy Federation, 1992-present

### Department

Curriculum Committee, Dept. of Animal Sciences, WSU (1985-1988).  
 Awards Committee, Dept. of Animal Sciences, WSU (1985-95), Chair 1993-95, 2001-2003.  
 Academic Quadrathlon Committee, Dept. of Animal Sciences, WSU (1986-present).  
 Graduate Advisory Committee, Dept. of Vet. Clin. Med. and Surg., WSU, 1990-present; Chairman, 1992-present.  
 Search Committees, Departments of Animal Sciences and Vet. Clin. Med. and Surg., WSU, 1987; Extension Dairy Specialist and Large Animal Theriogenology positions, 1990.  
 Land and Facilities Committee, Dept. of Animal Sciences, WSU, 1992-present.  
 Feed Mill Committee, Department of Animal Sciences, WSU, 1992-present.  
 Faculty member in charge, Knotts Dairy Center, WSU, 1992-present.  
 Dairy Commodity Committee, Department of Animal Sciences, WSU, Chair, 1992-present.  
 Buckley Facilities Committee, 1991-present.  
 Dairy Shortcourse Advisory Committee, 1993-present.

### Professional Service

Editorial Review Board: *J. of Dairy Science* -  
*Small Ruminant Research* - 3-5 manuscripts per year  
*Journal of Veterinary Medicine B*, *ibid*  
*JAVMA* *ibid.*

## COURSES TAUGHT

<u>Institution</u>	<u>Number(*)</u>	<u>Name</u>	<u>Years</u>
Univ. of Hawaii	AS 450 (45)	Dairy Production	1983-84
Washington State Univ.	AS 272 (7)	Dairy Cattle Traits	1985-present
Washington State Univ.	AS 472 (14)	Dairy Production	1985-90
Washington State Univ.	AS 472 (12)	Dairy Production	1991-present
Washington State Univ.	AS 499 (15)	Adv. Dairy Management	1987
Washington State Univ.	AS 473/573 (45)	Adv. Dairy Management	1988-present
Washington State Univ.	VMS 575 (15)	Sr. Mastitis Block	1986
Washington State Univ.	AS 500 (15)	An. Sci. Grad. Seminar	1986-87
Washington State Univ.	AS 172 (10)	Intro. Dairy Lab.	1989, 91
	AS 172 (15)	Intro. Dairy Lab.	1992-present

\*Number of classes taught/yr.

Guest Lectures in the Following Courses

<u>Institution</u>	<u>Number(*)</u>	<u>Name</u>	<u>Years</u>
Washington State Univ.	VMS 575 (16)	Sr. Large Animal Block	1985-88
Washington State Univ.	FSHN 305 (2)	Quality Milk Production	1985-89
Washington State Univ.	VMS 356 (2)	Large Animal Medicine	1988-89, 93
Washington State Univ.	VMS 461 (3)	Animal Restraint	1985-present
Washington State Univ.	VMS 261 (3)	Accidents and Diseases	1990-present

\*Number of classes taught/yr.

**GRADUATE STUDENT ADVISEES AND THESIS TITLES**M.S. Degree

Lawrence Tjoelker, M.S., Committee Member. Influence of in vivo and in vitro vitamin A and  $\beta$ -carotene treatment before and after dry off on bovine peripheral blood lymphocyte and neutrophil function.

Deena Volle, M.S., Committee Member. Milk progesterone enzyme immunoassay: Sampling time variation and prediction of estrus.

Cathy Hutton, M.S., Committee Chair. Investigation of management factors which influence the somatic cell count status of the herd.

Kamarudin Md Isa, M.S., Committee Chair. Reservoir and fomites of *S. marcescens* intramammary infection.

Mark Rishniw, M.S., Committee Member. Utility of color-coded ultrafast computed tomography to detect graded changes in regional coronary blood flow in dogs.

Mahmoudou Hamadou Diall, Committee Member. Evaluation of the effectiveness of the contagious bovine pleuropneumonia vaccination program in Segou region of Mali.

Jim Burmeister, M.S., Committee Chair. Studies to investigate the effect of preliminary/postmilking teat disinfectant combination on teat skin condition.

Tony Ebling, M.S., Committee Chair. Bovine Mammary Immune Response to an Experimental Intramammary Infection with a *Staphylococcus aureus* Strain containing a Gene of Staphylococcal Enterotoxin C1.

Lori Oura, M.S., Committee Chair, Evaluation of Two Experimental Postmilking Teat Dips in Reducing New Intramammary Infection by Contagious Mastitis Pathogens.

Mary Kate Biddle, M.S., Committee Chair, Diagnosis of Mycoplasma mastitis.

Alicia Borm, M.S., Committee Chair, Preterm treatment of heifer mastitis.

Ph.D. Degree

Ho Park, Ph.D., Committee Member. Analysis of the immune response in the bovine mammary gland with *Staphylococcus aureus* infection.

Jerry Roberson, Ph.D., Committee Chair. The epidemiology of *S. aureus* intramammary infection in primiparous dairy cows at first parturition.

George Barrington, Ph.D., Committee Member. Hormonal regulation of bovine mammary immunoglobulin G<sub>1</sub> receptor.

John Middleton, PhD, Committee Chair. *Staphylococcus aureus* intramammary infections in the face of routine contagious mastitis pathogen control procedures: The role of *Staphylococcus aureus strain* and possible intervention strategies.

Mary Kate Biddle, PhD., Committee Chair.

Jooyoun Park, PhD., Committee Member

Sam Mosley, PhD., Committee Member

Current students

Mary Katherine Biddle, Ph.D., Committee Chair  
Alicia Borm, M.S., Committee Chair

Jooyoun Park, PhD., Committee Member  
Sam Mosley, PhD., Committee Member

Visiting faculty

A.A. El-Rashidy, 1990

**PUBLICATIONS**Refereed Journals

1. L.K. Fox, R.N. Zadoks and C.T. Gaskins. 2005. Biofilm production by *Staphylococcus aureus* associated with intramammary infection. *Vet Micro.* 107: 295-299.
2. Zecconi, A., R. Piccinini, and L.K. Fox. 2004. Epidemiologic study of non-contagious intramammary infections in nine commercial dairy herds following a *Staphylococcus aureus* control program. *J. Vet Med. B* 51:333-336
3. Biddle, M.K., L. K. Fox, D. D. Hancock, C. T. Gaskins, and M. A. Evans Effects of Storage Time and Thawing Methods on the Recovery of *Mycoplasma* Species in Milk Samples from Cows with Intramammary Infections *J. Dairy Sci.* 2004 87: 933-936.
4. Zecconi, A., R. Piccinini, and L. K. Fox. 2003. Epidemiologic study of intramammary infections with *Staphylococcus aureus* during a control program in nine commercial dairy herds. *JAVMA.* 223: 684-688.
5. Fox, L.K., L.Y. Oura, and C.R. Ames. 2003. Teat Skin pH. *J. Dairy Sci.* 86:3951:3952
6. Silk, A.S., L. K. Fox, and D. D. Hancock. 2003. Removal of hair surrounding the teat and associated bacterial counts on teat skin surface, in milk, and intramammary infections. *J. Vet. Med. B.* 50:1-4.
7. Joo, Y.S., J. S. Moon, L.K. Fox, G.H. Suh, N. H. Kwon, S. H. Kim, and Y. H. Park. 2003. Comparison of natural resistance-associated macrophage protein (NRAMP-1) expression between cows with high and low milk somatic cells counts. *Asian-Aust. J. Anim. Sci.* 16:1830-1836.
8. Biddle, Mary K , Larry K. Fox, and Dale D. Hancock 2003. Patterns of mycoplasma shedding in the milk of dairy cows with intramammary mycoplasma infection. *JAVMA* 223:1163-1166
9. Fox, L.K., G. A. Bohach, S. U. Lee, K.T. Park, and Y.H. Park. 2003. Mastitis: Effect on milk quality, causative agents and control. *Kor. J. Vet. Publ Health.* 27:69-76.
10. Lee, S. U., Y. H. Park, W. C. Davis, L. K. Fox, and G. A. Bohach. 2003. The properties of human and bovine CD8+CD26+ T Cells induced by a microbial superantigen. *Advances in Experimental Medicine and Biology* 524:1-4.
11. Fox, LK, Hancock, DD, Mickelson, A, and A. Britten. 2003. Bulk tank milk analysis: Factors associated with appearance of *Mycoplasma* sp in milk. *J. Vet. Med B* 50:235-240

12. Middleton JR, Hebert VR, Fox LK, Tomaszewska E, Lakritz J. 2003. Elimination kinetics of chlorhexidine in milk following intramammary infusion to stop lactation in mastitic mammary gland quarters of cows. *J Am Vet Med Assoc.* 222(12): 1746-1749
13. Hebert V.R., J.R. Middleton, E. Tomaszewska, and L.K. Fox. 2003. Methodology for quantifying residues of chlorhexidine in raw dairy milk. *J. Ag. and Food Chem.* 51:567-570.
14. R. N. Zadoks, W. B. van Leeuwen, D. Kreft, L. K. Fox, H. W. Barkema, Y. H. Schukken, and A. van Belkum. 2002. Comparison of *Staphylococcus aureus* isolates from bovine and human skin, milking equipment, and bovine milk by phage typing, pulsed-field gel electrophoresis, and binary typing. *J. Clin. Microbiol.* 40:3894-3902.
15. Middleton J.R., L.K. Fox, J.M. Gay, J.W. Tyler, and T.E. Besser. 2002. Use of pulsed-field gel electrophoresis for detecting differences in *Staphylococcus aureus* strain populations between dairy herds with different cattle importation practices. *Epidemiol. Infect.* 129:387-395.
16. Middleton J.R., and L.K. Fox. 2002. Influence of *Staphylococcus aureus* strain on mammary quarter milk production. *Vet Rec.* 150(13):411-412.
17. Middleton J.R., L.K.Fox, J.M. Gay, J.W. Tyler, and T.E. Besser. 2002. Influence of *Staphylococcus aureus* strain-type on mammary quarter milk somatic cell count and N-acetyl-beta-D-glucosaminidase activity in cattle from eight dairies. *J. Dairy Sci.* 85:1133-40.
18. Oura, L.Y., L.K. Fox, C.C. Warf, and G. K. Kemp. 2002. Efficacy of two acidified chlorite postmilking teat disinfectants with sodium dodecylbenzene sulfonic acid on prevention of contagious mastitis using an experimental challenge protocol. *J. Dairy Sci.* 85:252-257.
19. Lee, S.U., W. Ferens, W. C. Davis, M.J. Hamilton, Y.H. Park, L.K. Fox, J. Naessens, and G. A. Bohach. 2001. Identity of activation molecule 3 on superantigen-stimulated bovine cells is CD 26. *Infect. Immun.* 66:573-580.
20. Middleton J.R., L.K. Fox, and T.H. Smith. 2001. Management strategies to decrease the prevalence of mastitis caused by one strain of *Staphylococcus aureus* in a dairy herd. *JAVMA.* 218:1615-1618
21. Middleton, J. R., and L. K. Fox. 2001. Therapeutic cessation of lactation of *Staphylococcus aureus*-infected mammary quarters. *J. Dairy Sci.*, 84:1976-1978
22. Joo, Y. S., L. K. Fox, W. C. Davis, G. A. Bohach, and Y. H. Park. 2001. *Staphylococcus aureus* associated with mammary glands of cows: Genotyping to distinguish different strains among herds. *Vet Micro* 80:131-138
23. Ebling, T.L., L.K. Fox, K.W. Bayles, G. A. Bohach, K.M. Byrne, W.C. Davis, and W.A. Ferens. 2001. Bovine mammary immune response to an experimental intramammary infection with a *Staphylococcus aureus* strain containing a gene for staphylococcal enterotoxin C1. *J. Dairy Sci.* 84:2044-2050.
24. Middleton JR, L.K. Fox, and T.H. Smith. 2001. Management strategies to decrease the prevalence of mastitis caused by one strain of *Staphylococcus aureus* in a dairy herd. *JAVMA.* 218:1615-1618
25. Ebling, T.L., L.K. Fox, and K.M. Byrne. 2000. Isolation of bovine mammary lymphocytes for fluorescent activated flow cytometry. *Methods in Cell Science.* 22:239-245.
26. Fox, L.K. and D. S. Adams. 2000. The ability of the enzyme linked immunosorbent assay to detect antibody against *Staphylococcus aureus* in milk

- following experimental intramammary infection. *Vet. Med. J. Series B.* 47:517-526.
27. Nickerson, S.C., W.E. Owens, L.K. Fox, C.C. Scheifinger, T.R. Shryock, and T.E. Spike. 1999. Comparison of Tilimcosin and cephalosporin as therapeutics for *Staphylococcus aureus* mastitis at dry-off. *J. of Dairy Sci.* 82:696-703.
  28. Ferens, W.A., W.L. Goff, W.C. Davis, L.K. Fox, C. Deobald, M.J. Hamilton, G.A. Bohach. 1998. Induction of type 2 cytokines by a staphylococcal enterotoxin superantigen. *J. Nat. Toxins* 7:193-213.
  29. Ferens, W.A., W.C. Davis, M.J. Hamilton, Y.H. Park, C.F. Deobald, L. Fox, and G. Bohach. 1998. Activation of bovine lymphocyte subpopulations by Staphylococcal enterotoxin C. *Infection and Immunity* 66:573-580.
  30. Lee, S.U., M. Quesnell, L.K. Fox, J.W. Yoon, Y.H. Park, W.C. Davis, D. Falk, C.F. Deobald, and G.A. Bohach. 1998. Characterization of Staphylococcal bovine mastitis isolates using the polymerase chain reaction. *J of Food Protection* 61:1384-1386.
  31. Roberson, J.R., L.K. Fox, D.D. Hancock, J.M. Gay, and T.E. Besser. 1998. Sources of intramammary infections from *Staphylococcus aureus* in dairy heifers at first parturition. *J. Dairy Sci.* 81:687-693.
  32. Burmeister, J.E., L.K. Fox, J.K. Hillers, and D.D. Hancock. 1998. A comparison of two methods of evaluation of teat skin pathology. *J. Dairy Sci.* 81:1904-1909.
  33. Burmeister, J.E., L.K. Fox, J.K. Hillers, and D.D. Hancock. 1998. Effects of premilking and postmilking teat disinfectants on teat skin condition. *J. Dairy Sci.* 81:1910-1916.
  34. Kelm, S.C., J.C. Detilleux, A.E. Freeman, M.E. Kehrli, A.B. Dietz, L.K. Fox, J.E. Butler, I. Kasckovics, and D.H. Kelley. 1997. Genetic association between parameters of innate immunity and measures of mastitis in periparturient Holstein cattle. *J. Dairy Sci.* 80:1767-1775.
  35. Fox, L.K. and J.E. Burmeister. 1998. Barrier teat dip application during cold, windy conditions: *Staphylococcus aureus* colonization and teat skin health. *Dairy, Food and Environmental Sanitation* 18:20-22.
  36. Burmeister, J.E., L.K. Fox, D.D. Hancock, C.C. Gay, J.M. Gay, S.M. Parish, J.W. Tyler, and C.T. Gaskins. 1998. Transepidermal water loss of bovine teats. *J. Dairy Research* 63:623-628.
  37. Smith, T.H., L.K. Fox, and J.R. Middleton. 1998. Outbreak of mastitis caused by one strain of *Staphylococcus aureus* in a closed dairy herd. *JAVMA* 212:553-556.
  38. Bayles, K.W., C.A. Wesson, L.E. Liou, L.K. Fox, G.A. Bohach, and W.R. Trumble. 1998. Intracellular *Staphylococcus aureus* escapes the endosome and induces apoptosis in epithelial cells. *Infection and Immunity* 66:336-342.
  39. Fox, L.K. 1997. Recovery of mastitis pathogens from udder cloths following several laundering methods. *Dairy Food and Environmental Sanitation* 17:14-19.
  40. Kamarudin, M.I., L.K. Fox, C.T. Gaskins, and J.M. Gay. 1997. Adherence of *Serratia marcescens*, *Escherichia coli*, *Streptococcus agalactiae*, and *Staphylococcus aureus* to bovine mammary gland epithelial cells. *Malaysian J. Animl. Sci.* 2:23-27.
  41. Detilleux, J.C., A.E. Freeman, M.E. Kehrli, A.B. Dietz, L.K. Fox, J.E. Butler, I. Kasckovics, and D.H. Kelly. 1997. Genetic association between parameters of innate immunity and resistance to mastitis in periparturient cattle. *J. Dairy Sci.* 1767-1775.



42. Fox, L.K., T.E. Besser, and S.M. Jackson. 1996. Coagulase negative *Staphylococcus aureus* causing intramammary infections in the bovine. *JAVMA* 209:1143-1146.
43. Fox, L.K., and M.S. Cumming. 1996. Relationship between thickness, chapping and *Staphylococcus aureus* colonization of bovine teat skin. *J Dairy Res.* 63:367-375.
44. Burmeister, J.E., L.K. Fox, D.D. Hancock, C.C. Gay, J.M. Gay, S.M. Parish, J.W. Tyler, and C.T. Gaskins. 1996. Transepidermal water loss of bovine teats. *J. Dairy Res.* 63:623-628.
45. Roberson, J.R., L.K. Fox, D.D. Hancock, J.M. Gay and T.E. Besser. 1996. Prevalence of coagulase-positive Staphylococci, other than *Staphylococcus aureus*, in bovine mastitis. *Am. J. Vet. Res.* 57:54-58.
46. Kamarudin, M.I., L.K. Fox, C.T. Gaskins, and J.M. Gay. 1996. Environmental reservoirs for *Serratia marcescens* intramammary infections in dairy cows. *JAVMA* 208:555-558.
47. Sanderson, M.W., J.M. Gay, D.D. Hancock, C.C. Gay, L.K. Fox, and T.E. Besser. 1995. Sensitivity of bacteriologic culture for detection of *Escherichia coli* 0157:H7 in bovine. *J. Clin. Micro.* 33:2616-2619.
48. Detilleux, J.C., M.E. Kehrli, A.E. Freeman, L.K. Fox, and D.H. Kelly. 1995. Mastitis of periparturient Holstein cattle: A phenotypic and genetic study. *J. Dairy Sci.* 78:2285-2293.
49. Burmeister, J.E., L.K. Fox, D.D. Hancock, C.C. Gay, J.M. Gay, S.M. Parish, and J.W. Tyler. 1995. A survey of dairy managers in the Pacific Northwest identifying premilking/postmilking teat disinfectant combinations, management practices, and climatic conditions associated with teat chapping. *J. Dairy Sci.* 78:2073-2082.
50. Watts, J.L., S.A. Salmon, R.J. Yancey, S.C. Nickerson, L.J. Weaver, C. Holmberg, J.W. Pankey, and L.K. Fox. 1995. Antimicrobial susceptibility of microorganisms isolated from the mammary gland of dairy heifers. *J. Dairy Sci.* 78:1637-1643.
51. Hallberg, J.W., K.J. Dame, S.T. Chester, C.C. Miller, L.K. Fox, S.C. Nickerson, J.W. Pankey and L.J. Weaver. 1995. The visual appearance and somatic cell counts of mammary secretions collected during gestation and early post-partum from primigravid heifers. *J. Dairy Sci.* 78:1629-1636.
52. Fox, L.K., S.T. Chester, J.W. Hallberg, S.C. Nickerson, J.W. Pankey, and L.D. Weaver. 1995. Survey of intramammary infections in dairy heifers at breeding age and first parturition. *J. Dairy Sci.* 78:1619-1628.
53. Matthews, K.R., S.J. Kumar, S.A. O'Conner, L.K. Fox, R.J. Harmon, J.W. Pankey, and S.P. Oliver. 1994. Genomic fingerprints of *Staphylococcus aureus* of bovine origin by polymerase chain reaction-based DNA fingerprinting. *Epidem. Infect.* 112:177-186.
54. Roberson, J.R., L.K. Fox, and D.D. Hancock. 1994. Ecology of *Staphylococcus aureus* isolated from various sites on dairy farms. *J. Dairy Sci.* 77:3354-3364.
55. Park, Y.H., C.R. Wyatt, M.J. Hamilton, L.K. Fox, and W.C. Davis. 1994. A subset of mammary gland adT lymphocytes downregulates BoCD4 T lymphocyte response to *Staphylococcus aureus* in cattle with intramammary infection. *Korean J. Immun.* 16:19-27.
56. Fox, L.K., and R.J. Norell. 1994. *Staphylococcus aureus* colonization of teat skin as affected by postmilking teat treatment during inclement conditions. *J. Dairy Sci.* 77:2281-2288.

57. Roberson, J.R., L.K. Fox, D.D. Hancock, and C.C. Gay. 1994. Coagulase positive *Staphylococcus* intramammary infections in dairy heifers. *J. Dairy Sci.* 77:958-969.
58. Park, Y.H., L.K. Fox, M.J. Hamilton, and W.C. Davis. 1993. Suppression of proliferative response of CoCD4+ T lymphocytes by activated CoCD8+ lymphocytes in the mammary gland of cows with *Staphylococcus aureus* mastitis. *Vet. Immunol. Immunopath.* 36:137-151.
59. Fox, L.K., D.D. Hancock, and S.D. Horner. 1992. Selective intramammary antibiotic therapy during nonlactating period in goats. *Small Ruminant Research.* 9:313-318.
60. Adams, D.S., D.D. Hancock, L.K. Fox, and J.S. McDonald. 1992. Frequency of reisolation of *Staphylococcus aureus* from multiple sequential milk samples. *JAVMA* 205:575-578.
61. Roberson, J.R., L.K. Fox, D.D. Hancock, and T.E. Besser. 1992. Evaluation of methods for differentiation of coagulase-positive *Staphylococci*. *J. Clin. Micro.* 38:3217-3219.
62. Fox, L.K., C.T. Gaskins, D.D. Hancock, D. Newkirk, and C.T. Hutton. 1992. Comparison of selective enrichment media to isolate *Staphylococcus aureus* from teat skin and milking unit liners. *Cornell Vet.* 82:225-231.
63. El-Rashidy, A.A., L.K. Fox, and J.M. Gay. 1992. Diagnosis of *Staphylococcus aureus* intramammary infection by detection of specific antibody titer in milk. *J. Dairy Sci.* 75:1430-1435.
64. Park, Y.H., L.K. Fox, M.J. Hamilton, and W.C. Davis. 1992. Bovine mononuclear leukocyte subpopulations in peripheral blood and mammary gland secretions during lactation. *J. Dairy Sci.* 75:998-1006.
65. Fox, L.K. 1992. Colonization by *Staphylococcus aureus* on chapped teat skin: Effect of iodine and chlorhexidine postmilking disinfectants. *J. Dairy Sci.* 75:66-71.
66. Hutton, C.T., L.K. Fox, and D.D. Hancock. 1991. Risk factors associated with herd group milk somatic cell count and prevalence of coagulase positive *Staphylococcal* IMI. *Prev. Vet. Med.* 11:25-35.
67. Fox, L.K., J.A. Nagy, J.K. Hillers, J.D. Cronrath, and D.A. Ratkowsky. 1991. Effects of postmilking teat treatment on the colonization of *Staphylococcus aureus* on chapped teat skin. *Am. J. Vet. Res.* 52:799-802.
68. Fox, L.K., M. Gershman, D.D. Hancock, and C.T. Hutton. 1991. Fomites and reservoirs of *Staphylococcus aureus* intramammary infections: The effect of milking time hygiene. *Cornell Vet.* 81:183-193.
69. Hutton, C.T., L.K. Fox, and D.D. Hancock. 1990. Mastitis control practices. Differences between with high and low milk somatic cell counts. *J. Dairy Sci.* 73:1135-1143.
70. Fox, L.K., H.D. Liggit, T. Yilma, and L.B. Corbeil. 1989. The effect of interferon and intramammary administration on mammary phagocyte function. *J. Vet. Med. B.* 37:28-30.
71. Fox, L.K., and D.D. Hancock. 1989. The effect of segregation on prevention of intramammary infections by *Staphylococcus aureus*. *J. Dairy Sci.* 72:540-544.
72. Fox, L.K., D.D. Hancock, J.S. McDonald, and C.T. Gaskins. 1988. N-acetyl- $\beta$ -D-glucosaminidase activity in whole milk and milk fractions. *J. Dairy Sci.* 71:2915-2922.

73. Fox, L.K., and J.S. McDonald. 1988. Functional activity of neutrophils from bovine mammary glands infected with *Staphylococcus aureus*. *J. Dairy Sci.* 71:3521-3524.
74. Fox, L.K., J.S. McDonald, and L.B. Corbeil. 1988. Function of phagocytes collected from lacteal secretions of lactating and dry cows. *Am. J. Vet. Res.* 49:678-681.
75. Woodward, W.D., A.C.S. Ward, L.K. Fox and L.B. Corbeil. 1988. Teat skin normal flora and colonization with mastitis pathogen inhibitors. *Vet. Micro.* A:357-365.
76. Fox, L.K., J.S. McDonald, and L.B. Corbeil. 1987. Milk phagocyte function as determined by fluorescent microscopy. *Vet. Med., Series B.* 34:549-551.
77. Fox, L.K., D. Hancock, C.W. Weems, W. Toma, and E. Chang. 1987. Effect of intramammary antibiotic therapy at calving on udder health traits. *J. Dairy Sci.* 7:1696-1700.
78. Fox, L.K., L. L. Timms, and L.H. Schultz. 1986. Changes in bovine milk secretion following intramammary infusions of concanavalin A, oyster-glycogen and water. *J. Dairy Sci.* 69:1259-1269.
79. Fox, L.K., G. E. Shook, and L.H. Schultz. 1985. Factors related to milk loss in quarters with somatic cell counts. *J. Dairy Sci.* 68:2100.
80. Fox, L.K., and L.H. Schultz. 1985. Effect of infection status on quarter milk production and composition following an omitted milking. *J. Dairy Sci.* 68:418-423.
81. Fox, L.K., and C.W. Heald. 1981. Effect of cortisol on the bactericidal function of the bovine milk neutrophil in vitro. *Am. J. Vet. Res.* 42:1933-1936.
82. Fox, L.K., C.W. Heald, F.C. Gwazdauskas, and W.E. Vinson. 1981. Concentrations of glucocorticoids, bovine serum albumin, and somatic cells in mastitic milk. *J. Dairy Sci.* 64:2258-2261.
83. Fox, L.K., W.R. Butler, R.W. Everett, and R.P. Natzke. 1980. Effect of adrenocorticotropin on milk and plasma cortisol concentrations. *J. Dairy Sci.* 64:1794-1803.

*Manuscripts in press*

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- Biddle, MK, L.K. Fox, D.D. Hancock, C.T. Gaskins, and M.A. Evans. 2003. Effects of Storage Time and Thawing Methods on the Recovery of *Mycoplasma Species* in Milk Samples from Cows with Intramammary Infections. *J. Dairy Sci.* Accepted

*Manuscripts submitted*

Sang-Un Lee, Yong Ho Park, William C. Davis, Lawrence K. Fox, and Gregory A. Bohach. 2003. bovine T cells induced by Staphylococcal superantigens has an immunoregulatory function.

Sang-Un Lee, Yong Ho Park, Lawrence K. Fox, William C. Davis, George Barrington, and Gregory A. Bohach. 2003. The in vivo effect of staphylococcal enterotoxin type C1 on bovine mammary gland.

Abstracts

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2. L.K. Fox. 2003. Use of Cloth Towels to Clean and Dry Udders: Evaluation of Laundering Procedures and Cost Effectiveness. Western Dairy News. 3(9) 2-3.
3. Fox, L.K. 2001. Managing the manance of mycoplasma mastitis. Hoards Dairyman. 146:490.
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5. Fox, L.K. and G. Willet. 1998. Cloths are less costly than paper towels for prepping cows. Hoards Dairyman. 143:618
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2. Fox, L.K. 1997. Level of *S. aureus* reflects value of mastitis program. Hoard's Dairyman 142:334.
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8. Fox, L.K. and D.D. Hancock. 1990. Follow the basics to control *S. aureus*. Hoard's Dairyman.
9. Fox, L.K. 1989. Staph mastitis. Coming soon to an udder near you? Holstein World. 86:122.
10. Fox, L. 1987. Low SCC dairies earn those scores by bits. Dairy. 43:60.

## ADDRESSES

### Invited

Mastitis control on large dairy herds. Corso di Aggiornamento Professionale en la Gestione sanitaria della produzione del latte. Lodi, Italy, Oct. 18, 2003

Heifer mastitis. Corso di Aggiornamento Professionale en la Gestione sanitaria della produzione del latte. Lodi, Italy, Oct. 18, 2003  
 Corso di Aggiornamento Professionale en la Gestione sanitaria della produzione del latte. Lodi, Italy, Oct. 18, 2003

Mastitis: Effect on Milk Quality, Causative Agents, and Control, Seoul National University, Korea, April 10 and 11, 2003

Staphylococcus aureus Mastitis: Critical Factors Associated with Infections. 35<sup>th</sup> Annual BC Dairy Expo, Tradex, Abbotsford, BC, Canada, March 19-21

*Staphylococcus aureus* mastitis. World Dairy Congress, Leon, Mexico, July 15, 2002.

Mycoplasma mastitis. World Dairy Congress, Leon, Mexico, July 15, 2002

Streptococcal mastitis. World Dairy Congress, Leon, Mexico, July 15, 2002

Mycoplasma mastitis, series of talks sponsored by the Vermont Department of Ag. and the University of Vermont, Oct. 17-19, 2000

*Staphylococcus aureus* mastitis: Critical factors associated with infections, World Dairy Congress, Carretero, Mexico, July 26, 2000.

Mycoplasma and Streptococcal Mastitis. Dairy Discussion Group at Buckley Forage Facility, Oct. 26, 1999

Economics of udder cloth towels. 1, 1-hr talk at The University of California, Dairy Days, March 1998.

La risposta americana al problema delle mastiti da *Staph. aureus*. Istituto zooprofilattico Sperimentale della Lombardia e delle Emilia, Boscia, Italy, Nov. 26 and 28, 1996.

*Serratia marcescens* mastitis. 1, .5-hr lecture. Spring Veterinary Conference, 1995.

- Clinical mastitis: Just the tip of the iceberg. 1, 1-hr talk at the University of California, Davis, Dairy Days, March 1995.
- Monitoring your bulk tank for milk quality. 3, 1-h laboratory exercises, Buckley Forage Field Day, August 1995.
- Use of recycled manure solids for dairy cattle bedding: 1, 1-hr lecture. Spring Veterinary Conference, 1993.
- Antibiotic detection systems for milk: 1, 1-hr lecture. Spring Veterinary Conference, 1993.
- Mastitis control: 3, 2-hr lectures to Washington State Dairy Producer meetings. January 9, 13, 14, 1992, at Sequim, Carnation and Deer Park, WA.
- Milkers school, workshop on mastitis control for Spanish speaking milkers: 2, 2-hr sessions. May 8, 1992, Snohomish County.
- Mastitis Seminar, Univ. R/E/ Center, Caldwell, ID, March 12, 1991.
- Characteristics of woodshavings and dairy waste solids bedding: The effects on teat skin environmental mastitis pathogen load and incidence of mastitis. WSU Forage Field Day, August, 1991. Puyallup, WA.
- Mastitis workshop: 4, 2-hr lectures on mastitis and its control. B.C. Ministry of Agriculture and Fisheries. November 5-6, 1991, Abbotsford, B.C., Canada.
- Condition scoring in dairy cows. Spring Veterinary Shortcourse. 1990.
- Computerized ration analysis and balancing. Spring Veterinary Shortcourse. 1990.
- Mastitis control. L.K. Fox. Fifth Annual Dairy Field Day. 1990. Honolulu, HI.
- Managing for high quality milk. A-Plus WHETS lecture.
- Mastitis Control Programs. Lewis/Chehalis County Dairy Extension Program, July 18, 1990.
- Ecology of *S. aureus* Mastitis. Spring Veterinary Shortcourse. 1988.
- Continuing education for extension agents; Mastitis update; three 1-hour lectures, 1988.
- Staphylococcal Mastitis: Intramammary infection by coagulase positive and negative organisms. WSVMA Continuing Education Food Animal Seminar, May 25, 1988.
- Nutrition and Mastitis. Darigold Inland Empire Dairy Seminar, 1988.
- Body Condition Scoring in Dairy Cattle. Spring Veterinary Shortcourse. 1987.
- Incidence and Prevalence of Mastitis Caused by Staphylococci: The Effect of Segregation on Prevention of New Coagulase-Positive Staphylococci Intramammary Infections. Spring Veterinary Shortcourse. 1987.
- Control of Contagious Mastitis. Lower Columbia Dairyman's Shortcourse, Northwest Dairy Shortcourse, 1987.

Effect of segregation on prevention of intramammary infection by coagulase - positive staphylococci: A preliminary report. National Mastitis Council, Feb. 1987.

Dairying in Hawaii. Presented at the NW Dairy Shortcourse (1986) and the Sunnyside Annual DHIA meeting. 1987.

Mastitis Control Programs: Current and Future. Five hour presentation given in 10 dairy regions in WA state: Vancouver, Jan. 1986; Chehalis, Jan. 1986; Snohomish, Jan. 1986; Enumclaw, Jan. 1986; Skagit, Jan. 1986; Linden, Jan. 1986; Ellensburg, Jan. 1986; Spokane, Feb. 1986; Sunnyside, Feb. 1986; Moses Lake, March 1986. In cooperation with the CES Dairy Agent program.

The Field Disease Investigation Unit. Presented at the Lower Columbia Dairyman's Shortcourse. 1986.

Continuing Education for Practicing Veterinarians. Role of Predipping and Backflushing in Mastitis Control. Spring Veterinary Conference. 1986.

Antibiotic Therapy During the Dry and Peripartum Periods. Spring Veterinary Conference. 1986.

Milking Machine Evaluation. Fall Veterinary Shortcourse. 1986.



Other: (Guest Lectures)

Staphylococcal mastitis: New wrinkles in an old disease. 3, 2-hr lectures given on behalf of the Wisconsin Veterinary Medical Association, Kimberly, Eau Claire, and Janesville, WI, 1995.

Managing for high quality milk. A-Plus WHETS lecture.

Proper udder management during the dry period, A-Plus WHETS lecture.

Staphylococcal mastitis. VMS 536, 1987.

Mastitis management, VMS 509, 1986.

Coliform mastitis. VMS 536, 1985.

Antibiotic residues in milk. VMS 433, 1985.

Mastitis and its control. Milk Technology, Food Sci. 374, 1985 & 1987.

Mastitis and its control. Dairy Lab, Animal Science 172, 1985-1987.

Dairying in the tropics. Dairy Science Club, 1985.

Mastitis physiology/pathology and control. Cooperative University Dairy Students (CUDS), 1985-88.