# Curriculum Vitae


## Kalmia E. Kniel (Kali)
**Associate Professor, Microbial Food Safety**
**Department of Animal & Food Sciences**
**University of Delaware**
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**Education:**
January 1999-May 2002: Ph.D., Food Microbiology, Department of Food Science and Technology, Virginia Polytechnic Institute and State University, Blacksburg, VA

August 1996-December 1998: M.S., Molecular Cell Biology and Biotechnology, Department of Biology, Virginia Polytechnic Institute and State University, Blacksburg, VA

August 1992-May 1996: B.S., Biology, Minor: Sociology, Department of Biology, Virginia Polytechnic Institute and State University, Blacksburg, VA

**Professional Experience:**
September 2010-Present: Assistant Chair,
Department of Animal and Food Sciences, University of Delaware, Newark, DE

May 2010-Present: Associate Professor, Microbial Food Safety,
Department of Animal and Food Sciences, University of Delaware, Newark, DE

January 2004-April 2010: Assistant Professor, Food Virology and Parasitology,
Department of Animal and Food Sciences, University of Delaware, Newark, DE

June 2002-January 2004: Microbiologist, Animal Parasitic Diseases Laboratory,
Animal and Natural Resources Institute, Agricultural Research Service, United States Department of Agriculture, Beltsville, MD

January 1999-May 2002: Research Assistant, Food Microbiology, Department of Food Science and Technology, Virginia Polytechnic Institute and State University, Blacksburg, VA

January 1999-May 2002: Food Microbiology Laboratory Instructor and Guest Lecturer, Department of Food Science and Technology, Virginia Polytechnic Institute and State University, Blacksburg, VA

August 1998-December 1998: Pathogenic Bacteriology Laboratory Instructor,
Department of Biology, Virginia Polytechnic Institute and State University, Blacksburg, VA

August 1997-May 1998: General Microbiology Laboratory Instructor, Department of Biology, Virginia Polytechnic Institute and State University, Blacksburg, VA

January 1997-May 1997: General Biology Laboratory Instructor, Department of Biology, Virginia Polytechnic Institute and State University, Blacksburg, VA

August 1994-December 1998: Research Assistant, Cell Biology, Department of Biology, Virginia Polytechnic Institute and State University, Blacksburg, VA

**Honors:**

University of Delaware College of Agriculture and Natural Resources Outstanding Advisor Award (May 2012)

University of Delaware College of Agriculture and Natural Resources Advisor Appreciation Nominee (May 2009)

University of Delaware Excellence in Teaching Award Nominee (May 2008)

University of Delaware Distance Learning Fellow (December 2007)

DuPont Young Professional Grant Award (April 2006)

Institute for Transforming Undergraduate Education Fellow (December 2004)

United States Department of Agriculture Certificate of Merit (January 2004 and January 2003)

American Society for Parasitologists' Travel Award (May 2002)

Honorable Mention, Paper Competition, American Association for Vet. Parasitology (July 2001)

American Association for Veterinary Parasitology Travel Award (July 2001)

Graduate Student Assembly Travel Award (Spring 2001)

Virginia Tech Graduate Research Development Program (Spring 2001 and Fall 1997)

Virginia Tech Food Science & Technology Dept. Faculty Award (May 2000)

**Professional Societies:**

International Association for Food Protection (IAFP)

- Elected Vice-chair (2012) of Produce Safety and Quality Professional Development Group (member since 1999)
- Elected Vice-chair (2007) and Chair (2009) of Virus and Parasite Professional Development Group (member since 1999)
- Appointed member of Program Committee (2007-2010)
- Appointed member (2007) and chair (2009) of Teaching Awards Committee
- Appointed Editorial Board member of Journal of Food Protection (2008-present) and Food Protection Trends (2009-present)

Institute of Food Technologists (IFT)

- Selected for position as Student Outreach Initiation Lead for the Food Microbiology Division (2012)
- Selected for position as contributing member (2009) for Annual Meeting program
- Elected position of member at large for the Food Microbiology Division (2009)
- Elected position of secretary (2007-2011) and member at large (2011) for the Biotechnology Division
- Serve as moderator and student presentation judge for Food Microbiology Division and Biotechnology Division at IFT Annual Meeting (2009-2011)
- Serve as Food Safety and Defense Track Panel Member (2009-present)

American Society of Microbiologists (ASM)

- Appointed member of ASM Press Committee
- Member of Food Microbiology group
- Member of editorial board for Applied Environmental Microbiology (2012)

**Textbook:**

1. T.J. Montville, K. R. Matthews, and **K.E. Kniel**. Food Microbiology: An Introduction, Third Edition. ASM Press, Washington, D.C. 2012.

**Book Chapters:**

1. S. M. Markland, D. D'Souza, K. Kniel. Cases of public emetic events due to foodborne virus infections in "Global Safety of Fresh Produce", ed. J. Hoorfar. Woodhead Publishing Series in Food Science, Technology and Nutrition. 2013.
2. **K.E. Kniel**. Progress in intervention programmes to eradicate foodborne helminth infections in "Advances in Food Microbiology", ed. J. Sofos.. Woodhead Publishing Series in Food Science, Technology and Nutrition. 2013.
3. A.E.H. Shearer, **K.E., Kniel**, H. Chen and D.G. Hoover. High pressure effects on viruses in "High Pressure Processing of Food – Principles, Technology, and Applications", eds. G.V. Barbosa-Cánovas, H.L.M. Lelieveld and V.M. Balasubramaniam. Springer, 2012.
4. D.H. D'Souza, **K.E. Kniel** and L. Jaykus. Hepatitis A virus in ready-to-eat foods in "Rapid Detection, Characterization, and Enumeration of Foodborne Pathogens". Ed. J. Hoorfar. ASM Press, 2011, pp. 393-412.
5. **K.E. Kniel** and A.E.H. Shearer. Berries in "The Produce Contamination Problem", eds G. Sapers, E. Solomon, and K. Matthews. Elsevier, Inc. 2009, pp. 271-285.
6. **K. E. Kniel**. Getting Started in Your Academic Career in "Careers in Food Science", eds. R.W. Hartel and C.P. Klawitter. IFT Press. 2008, pp.305-316.

**Publications in Refereed Journals:**

1. Shearer, A.E.H., Snider, O.S., and **Kniel, K.E.** 2013. Implementation and Assessment of Food Safety Educational Materials for Secondary and Post-secondary Education. J. Food Science Education. *In press.*

2. Shearer, A.E.H., Snider, O.S., and **Kniel, K.E.** 2013. Development, Dissemination, and Pre-implementation Evaluation of Food Safety Educational Materials for Secondary Education. J. Food Science Education. *In press.*

3. Markland, S.M. Farkas, D.F., Kniel, K.E., and Hoover, D.G. Pathogenic psychrotolerant sporeformers: an emerging challenge for low-temperature storage of minimally processed foods. Foodborne Pathog Dis. 2013 May;10(5):413-9.

4. Hirneisen, K.A., and **Kniel, K.E**. 2013. Norovirus Surrogate Survival on Spinach during Pre-harvest Growth. Phytopathology Focus Issue. Apr;103(4):389-94.

5. Hirneisen, K.A., and Kniel, K.E. Comprative uptake of enteric viruses into spoinach and green onions. Food Environ Virol. 2013 Mar;5(1):24-34.

6. Hirneisen, K.A., and Kniel, K.E. 2013. Comparing Human Norovirus Surrogates: Murine Norovirus and Tulane Virus. J. Food Protect. 76:139-143.

7. Markland, S.M., Shortlidge, K.L., Hoover, D.G., Yaron, S., Patel, J., Singh, A., Shara, M. and **Kniel, K.E**. 2012. Survival of Pathogenic Escherichia Coli on Basil, Lettuce, and Spinach. Zoonoses and Public Health. *E.pub ahead of print December 28, 2012.*

8. Harris, L.J., Bender, J., Bihn, E.A., Blessington, T., Danyluk, M.D., Delaquis, P., Goodridge, L., Ibekwe ,A.M., Ilic, S., **Kniel, K.,** Lejeune, J.T., Schaffner, D.W., Stoeckel, D., Suslow, T.V. 2012. A Framework for Developing Research Protocols for Evaluation of Microbial Hazards and Controls during Production That Pertain to the Quality of Agricultural Water Contacting Fresh Produce That May Be Consumed Raw. J. Food Protection. 75:2251-2273.

9. Hirneisen, K.A., Hoover, D.G, and **Kniel, K.E**. Pressure Inactivation of Enteric Viruses in a Seafood Salad-like Product. J. Aquatic Foods. *In press.*

10. Hirneisen, K.A., and Kniel, K.E. 2012. Comparison of ELISA attachment and infectivity assays for murine norovirus. J. Virol. Methods. 186:14-20

11. Hirneisen, K.A., Sharma, M., and **Kniel, K.E.** 2012. Human Enteric Pathogen Internalization by Root Uptake into Food Crops. Foodborne Path. Dis. 9(5):396-405.

12. Ingram, D., Callahan, M., Ferguson, S., Hoover, D., Chiu, P., Shelton, D., Millner, P., Camp, M., Patel, J., **Kniel, K.**, and Sharma, M. 2012. The use of zero-valent iron biosand filters to reduce *E. coli* O157:H12 in irrigation water applied to spinach plants in a field setting. J. Appl. Micro. 112:551-560.

13. Boyer, R.R., Sumner, S.S., Williams, R.C., Kniel, K.E. and McKinney, J.M. 2011. Role of O-antigen on the *Escherichia coli* O157:H7 cells hydrophobicity, charge and ability to attach to lettuce. Int. J. Food Microbio. 147(3):228-232.

14. Hirneisen, K.A., Markland, S.M., and **Kniel, K.E**. 2011. Ozone inactivation of norovirus surrogates on fresh produce. J. Food Prot. 74(5):836-839.

15. Wei, J., Jin, Y., Sims, T. and **Kniel, K.E**. 2011. Internalization of murine norovirus 1 by *Lactuca sativa* during irrigation. Appl. Environ. Microbiol. 77(7):2508-2512.

16. Wei, J., Jin, Y., Sims, T. and **Kniel, K.E**. 2010. Fate of human enteric viruses during dairy manure based composting. J. Food Prot. 73(8):1543-1547.

17. Wei, J., Jin, Y., Sims, T., and **Kniel, K.E**. Survival of murine norovirus and hepatitis A virus in different types of manure and biosolids. Foodborne Path Dis. 2010. 7(8):901-906.

18. Attinti, R., Wei, J., **Kniel, K.**, Sims, J.T., Jin, Y. Virus attachment on sand measured by atomic force microscopy and their transport through sand columns. 2010. Environ. Sci. Technol. 44(7):2426-2432.

19. Wei, J., Jin, Y., Sims, T., **Kniel, K.E.** Manure- and biosolids-resident murine norovirus 1 attachment to and internalization by Romaine lettuce. 2010. Appl. Environ. Micro. 76: 578-583.

20. Black, E.P., Cascarino, J., Guan, D., **Kniel, K.E.**, Hicks, D.T., Pivarnik, L.F. and Hoover, D.G.. Coliphage as pressure surrogates for enteric viruses in foods. Innovative Food Science and Emerging Technologies. 2010. 11:239-244.

21. Black, E.P., Hirneisen, K., Hoover, D.G., **Kniel, K.E.** Fate of *E. coli* O157:H7 following high pressure processing and freezing. J. Applied Microbiology. 2010. 108(4):1352-1360.

22. Hirneisen,K., Black, E.P., Cascarino, J., Fino, V., Hoover, D.G., and **Kniel, K.E.** Viral Inactivation in Foods: A Review of Traditional and Novel Food Processing Technologies. Comprehensive Reviews in Food Science and Food Safety. 2009. 9(1):3-20.

23. Hirneisen, K.A., Hoover, D.G., **Kniel, K.E.** Isolation and infectivity of potential foodborne viral pathogens by immunomagnetic capture. Food Protection Trends. 2009. 29 (9):564-570.

24. **Kniel, K.** Rapid diagnostic methods in food safety: protozoa & parasites. Wiley Encyclopedia of Biotechnology. 2009. *In press*.

25. Hirneisen, K.A. and **Kniel, K.E**. Industrial uses of plant tissue culture. Wiley Encyclopedia of Biotechnology. 2009. *In press*.

26. Shearer, A.E.H. and **Kniel, K.E.** High hydrostatic pressure for development of vaccines. J. Food Protection. 2009. 72: 1500-1508.

27. Joerger, R.D., Satori, C.A., and **Kniel, K.E.** Comparison of genetic and physiological properties of *Salmonella enteric* isolates from chickens reveals one major difference between serovar Kentucky and other serovars: response to acid. Foodborne Pathogens and Disease. 2009. 6:503-512.

28. Sharma, M., Shearer, A.E.H., Hoover, D.G., Liu, M.N., Solomon, M.B., **Kniel, K.E**. Comparison of hydrostatic and hydrodynamic pressure to inactivate foodborne viruses. Innovative Food Science and Emerging Technologies. 2008. 9: 418-422.

29. Fino,V.R. and **Kniel, K.E.** Comparative recovery of foodborne viruses from fresh produce. Foodborne Pathogens and Disease. 2008. 2:819-825.

30. Fino, V.R., and **Kniel, K.E**. Ultraviolet Light Inactivation of Hepatitis A Virus, Aichi Virus, and Feline Calicivirus on Strawberries, Green Onions, and Lettuce. J. Food Protect. 2008. 71:908-913.

31. Solomon, E.B., Fino, V., Wei, J., and **Kniel, K.E**. Comparative susceptibilities of hepatitis A virus, feline calicivirus, bacteriophage MS2 and bacteriophage ΦX-174 to inactivation by quaternary ammonium and oxidative disinfectants. Int. J. Antimicrobial Agents. 2008. 33:288-289.

32. Jenkins, M.C., Higgins, J., Abrahante, J., **Kniel, K.E.**, O'Brien, C., Trout, J., Lancto, C., Abrahamsen, M., and Fayer, R. Fecundity of *Cryptosporidium parvum* is correlated with intracellular levels of the viral symbiont CPV. Int. J. Parasitol. 2008. 38:10511055. Epub 2007.

33. **Kniel, K.E.**, Shearer, A.E.H., Cascarino, J.L., Wilkins, G.C., and Jenkins, M.C. High hydrostatic pressure and ultraviolet light treatment of produce contaminated with *Eimeria acervulina* as a *Cyclospora cayetanensis* surrogate. J. Food Protection. 2007. J. Food Protection. 2007. 70:2837-2842.

34. Boyer, R.R., Sumner, S.S., Williams, R.C., Pierson, M.D., Popham, D.L., **Kniel, K.E.** Influence of curli expression by Escherichia coli 0157:H7 on the cell's overall hydrophobicity, charge, and ability to attach to lettuce. J. Food Protection. 2007. 70:1339-1345.

35. Sharma, M., **Kniel, K.E**., Derevianko, A., Ling, J., and Bhagwat, A.A. Sensitivity of Escherichia albertii, a potential foodborne pathogen, to food preservation treatments. Appl. Environ. Micro. 2007. 73:4351-4353.

36. Shearer, A.E.H, Wilkins, G.C., Jenkins, M.J., **Kniel, K.E.** Effects of High Hydrostatic Pressure on *Eimeria acervulina* Pathogenicity, Immunogenicity and Structural Integrity. 2006. Innovative Food Science and Emerging Technologies. 2007. 8:259-268.

37. Guan, D., Joerger, R., **Kniel, K.E.**, Calci, K.R., Hicks, D.T., Pivarnik, L.F., Hoover, D.G. Effect of high hydrostatic pressure on four genotypes of F-specific RNA bacteriophages. J. Applied Microbiology. 2007. 102:51-56.

38. Guan, D., Joerger, R., **Kniel, K.E**., Calci, K.R., Hicks, D.T., Pivarnik, L.F., Hoover, D.G. Response of four types of coliphages to high hydrostatic pressure. Food Microbiology. 2006. 23:546-551.

39. Joerger, R., Chen, H., **Kniel, K.E.** Characterization of a spontaneous, pressure-tolerant *Listeria monocytogenes* Scott A ctsR deletion mutant. Foodborne Path. Dis. 2006. 3(2):196-202.

40. **Kniel, K.E**. Survival of racoonpox virus in water. In J.A. Higgins (author), "Threat agents and water biosecurity." 2005. J. Wiley Encyclopedia of Water.

41. **Kniel, K.E**. and Jenkins, M.C. Detection of *Cryptosporidium parvum* oocysts on fresh vegetables and herbs using antibodies specific for a *C. parvum* viral antigen. J. Food Prot. 2005. 68(5): 1093-1096.

42. **Kniel, K.E.,** Sumner, S.S., Pierson, M.D., Zajac, A.M., Hackney, C.R., Fayer, R., and Lindsay, D.S. Effect of hydrogen peroxide and other protease inhibitors on *Cryptosporidium* excystation and *in vitro* development. J.Parasitol. 2004 Aug:90(4): 885-888.

43. Jenkins, M., Higgins, J., **Kniel, K.E.**, Trout, J., and Fayer, R. Protection of calves against cryptosporidiosis by oral inoculation with gamma-irradiated *Cryptosporidium parvum* oocysts. J. Parasitol. 2004 Oct:90(5):1178-1180.

44. **Kniel, K.E.,** Higgins, J.A., Trout, J.M., Fayer, R., and Jenkins, M.C. Characterization and use of a *Cryptosporidium parvum* viral antigen for detecting *C. parvum* oocysts in water. J. Microbiol. Meth. 2004 Aug: 58(2): 189-195.

45. **Kniel, K.E.,** Sumner, S.S., Lindsay,D.S., Hackney, C.R., Pierson, M.D., Zajac, A.M., Golden, D.A., and Fayer, R. Effect of organic acids and hydrogen peroxide on *Cryptosporidium parvum* viability in fruit juices. J. Food Protect. 2003 Sept; 66(9):1650-7.

46. **Kniel, K.E.,** Lindsay D.S., Sumner, S.S., Hackney, C.R., Pierson, M.D., Dubey, J.P. Examination of attachment and survival of *Toxoplasma gondii* oocysts on raspberries and blueberries. J. Parasitol. 2002 Aug; 88(4):790-3.

47. Seeman, B.K., Sumner, S.S., Marini, R., **Kniel, K.E**. Internalization of *Escherichia coli* in Apples under Natural Conditions. DFES. 2002 Sept: 667-673

48. ***Phelps, K.Kniel,** Lindsay, D.S., Sumner, S.S., and Fayer, R. Immunohistochemistry based assay to determine the effects of treatments on *Cryptosporidium parvum* viability. J. Eukaryotic Biol. 2001; Suppl:40S-41S.

49. Lindsay, D.S., ***Phelps, K.Kniel**, Smith, S., Sumner, S.S. Flick, G., and Dubey, J.P. 2001. Removal of *Toxoplasma gondii* oocysts from sea water by eastern oysters (*Crassostrea virginica*). J. Eukaryot. Microbiol. 2001; Suppl: 197S-198S.

50. *__Phelps, K.Kniel__, Walker, R.A. 2000. NEM tubulin inhibits minus end microtubule assembly by dynamic capping, Biochem. 39(14): 3877-3885.

51. Kao, Y.L., Deavours, B.E., *__Phelps, K.Kniel,__ Narasimulu, S.B., Safadi, F., Chaubal, R., Walker, R.A., Reddy, A.S.N. 2000. Bundling of microtubules by motor and tail domains of a kinesin-like calmodulin-binding protein from *Arabidopsis*: Regulation by $Ca^{2+}$/calmodulin, BBRC. (267): 201-207.

52. *__Phelps, K.Kniel__, Walker, R.A. 1999. NEM Inhibits Ncd motor function by modification of a cysteine in the stalk domain, Biochem. 1999; 38(33): 10750-10757.

*Indicates previous surname

**Published Research Abstracts:**

1. R. Banjeree, A. Singh, M.T. Callahan, C. Roberts, D. Ingram, J. Patel, D. G. Hoover, K.E. Kniel, M. Sharma. The use of zero-valent iron filtration to reduce *Escherichia coli* and *Listeria innocua* in irrigation water. IAFP Annual Meeting, Providence, RI, July 2012. P3-32.

2. S. Markland, K. Shortlidge, L. Cook, K. LeStrange, M. Sharma, K. Kniel. A comparison of *Escherichia coli* persistence on basil plants and soil using drip and overhead irrigation. IAFP Annual Meeting, Providence, RI, July 2012. P3-123.

3. K. LeStrange, S. Markland, K. Shortlidge, D.G. Hoover, K.E. Kniel. Evaluation of virulence profiles of environmental avian pathogenic *Escherichia coli* O157 isolates. IAFP Annual Meeting, Providence, RI, July 2012. P3-141.

4. Q. Wang, K. Hirneisen, S. Markland, K.E. Kniel. Enteric virus survival on alfalfa seeds and sprouts. IAFP Annual Meeting, Providence, RI, July 2012. P3-44.

5. A.E.H. Shearer, D.G. Hoover, K.E. Kniel. Antiviral effects of cell-free bacterial supernatants. IAFP Annual Meeting, Providence, RI, July 2012. P3-98.

6. K. Hirneisen and K.E. Kniel. Mechanisms of inactivation affect the relationship between viral attachment and infectivity. IAFP Annual Meeting, Providence, RI, July 2012. P1-114.
7. K. Hirneisen and K.E. Kniel. Norovirus Survival on Spinach during Pre-harvest Growth. IAFP Annual Meeting, Providence, RI, July 2012. T4-01.

8. K. Hirneisen and **K.E. Kniel**. Comparative Uptake of Enteric Viruses into Spinach and Green Onions. APS Human Pathogens on Plants Workshop, Hyattsville, MD, February 2012.

9. K. Hirneisen, S. Markland, Q. Wang, **K.E. Kniel**. Enteric Virus Survival on Alfalfa Seeds and Sprouts. APS Human Pathogens on Plants Workshop, Hyattsville, MD, February 2012.

10. S. Markland, **K.E. Kniel**, P.Setlow, and.G. Hoover. Inactivation of superdormant spores of *Bacillus weihenstehanensis* with ozone. IAFP Annual Meeting, Milwaukee, WI, August 2011.P1-91.

11. C. Mudd, M.T. Callahan, S. Ferguson, D.T. Ingram, D. Shelton, J. Patel, D.G. Hoover, J. Wei, **K.E. Kniel**, and M. Sharma. The use of zero-valent iron and biosand filtration to inactivate *E. coli* O157:H7 in irrigation water. IAFP Annual Meeting, Milwaukee, WI, August 2011.P2-62.

12. K. Hirneisen, J. Wei, and **K.E. Kniel**. Correlating attachment and infection of norovirus using an ELISA-based system. IAFP Annual Meeting, Milwaukee, WI, August 2011. P2-124.

13. A.E.H. Shearer, S. Snider and **K.E. Kniel**. Implementation and assessment of interactive food safety educational materials in secondary science. IAFP Annual Meeting, Milwaukee, WI, August 2011.P3-94.

14. K. Lestrange, C. Boettger, J. Wei, D.G. Hoover, **K.E. Kniel**. Isolation and characterization of avian pathogenic *E. coli* from Delmarva poultry. IAFP Annual Meeting, Milwaukee, WI, August 2011.P3-148.

15. **K. Kniel**, J. Wei, D. Shelton, J. Patel, D.G. Hoover, and M. Sharma. Optimization for the removal of *Salmonella*, *E. coli* O157:H7 and *E. coli* Oa57:H12 from water using zero-valent iron. IAFP Annual Meeting, Milwaukee, WI, August 2011.P3-25.

16. J. Wei, Y. Jim, T. Sims, **K.E. Kniel**. Internalization of murine norovirus-1 to Romaine lettuce. IAFP Annual Meeting, Anaheim, CA, August 2010. T4-06.

17. K. Hirneisen and **K.E. Kniel**. Hydroponic internalization of enteric viruses into green onions and spinach. IAFP Annual Meeting, Anaheim, CA, August 2010. T4-07.

18. D. Ingram, C. Mudd, S. Feguson, D. Hoover, **K.E. Kniel**, and M. Sharma. The effect of total organic carbon content and repeated irrigation on the persistence of *E. coli* O157:H7 on baby spinach. IAFP Annual Meeting, Anaheim, CA, August 2010. T4-09.

19. A.E.H. Shearer, O.S. Snider and **K.E. Kniel**. Development of an interactive food safety curriculum for secondary science education. IAFP Annual Meeting, Anaheim, CA, August 2010. P1-86.

20. S.M. Markland, **K. E. Kniel**, P.Setlow, and D.G. Hoover. Reduced-temperature growth studies of *Bacillus cereus* and *Bacillus weihenstephanensis*. IAFP Annual Meeting, Anaheim, CA, August 2010. P2-56.

21. J. Wei and **K.E. Kniel**. *Salmonella* survival and migration in soil in the presence of poultry litter. IAFP Annual Meeting, Anaheim, CA, August 2010. P2-114.

22. K. Gloska, K. Hirneisen, and **K.E. Kniel**. Effect of broad spectrum fertilizers on human picornaviruses IAFP Annual Meeting. Grapevine, TX. July 2009. P1-82.

23. J. Wei, Y. Jin, T. Sims and **K.E. Kniel**. Fate of Murine Norovirus-1 during dairy manure based composting. IAFP Annual Meeting. Grapevine, TX. July 2009. P1-84.

24. J. Wei and **K.E. Kniel**. Attachment of Norovirus in manure and biosolids to lettuce. IAFP Annual Meeting. Grapevine, TX. July 2009. T5-12.

25. D.T. Ingram, C. Mudd, S. Ferguson, **K.E. Kniel** and M. Sharma. Survival of Enterohemorrhagic and Avian Pathogenic *Escherichia coli* from spinach plants after overhead irrigation with (currently acceptable) contamination levels. IAFP Annual Meeting. Grapevine, TX. July 2009. P3-09.

26. K.A. Hirneisen, H. Chen, R.W. Worobo, K.R. Matthews and **K.E. Kniel**, Internalization of Enteric Viruses in Spinach and Green Onions. Annual Meeting. Grapevine, TX. July 2009. P3-17.

27. S.M. Markland, K. A. Hirnesen, **K. E. Kniel**. Ozone Inactivation of Norovirus Surrogates on Fresh Produce. IAFP Annual Meeting. Grapevine, TX. July 2009. P3-30.

28. A.E.H. Shearer and **K.E. Kniel**. Recovery and Infectivity of Norovirus in Bacterial Biofilms on Stainless Steel. IAFP Annual Meeting. Grapevine, TX. July 2009. P3-105.

29. K. A. Hirneisen, B. Jackson, E. Black, K. Schmidt, D.G. Hoover and **K.E. Kniel**. Pressure-mediated heat stabilization of Aichi virus, a human foodborne virus. IFT Annual Meeting, Anaheim, CA. June 2009.

30. R. Attinti, J. Wei, **K. Kniel**, T. Sims, and Y. Jin. Virus (MS2, Î¦X174 and Aichi) transport through sand columns and their interaction force measurements by atomic force microscopy. USDA National Water Conference. St. Louis, MO. February 2009.

31. J. Wei, Y. Jin, T. Sims, and **K.E. Kniel**. Survival of Human Adenovirus 41 in Applied Manure and Biosolids. USDA National Water Conference. St. Louis, MO. February 2009. T1-06.

32. E. Black, K.A. Hirneisen, D.G. Hoover, and **K.E. Kniel**. Inactivation of *Escherichia coli* O157:H7 on raw and frozen ground beef by high pressure processing. IAFP Annual Mtg., Columbus, OH. August 2008. P2-49.

33. K.A. Hirneisen, D.G. Hoover, D. Hicks, L. Pivarnick, and **K.E. Kniel**. Effects of Protein and Fat on Viral Inactivation through High Pressure Processing in Seafood Salad. IAFP Annual Mtg., Columbus, OH. August 2008. T2-12.

34. A.J. Laycock, M. Sharma, and **K.E. Kniel**. Addressing potential contaminants in soil for the study of pathogenic *E. coli* O157 and O8 strains. IAFP Annual Mtg., Columbus, OH. August 2008. P3-23.

35. A.E.H. Shearere, J.Wei, and **K.E. Kniel**. Influence of Biofilm-forming Bacteria on Association of Hepatitis A Virus with Lettuce. IAFP Annual Mtg., Columbus, OH. August 2008. P1-12.

36. J.Wei and **K.E. Kniel**. Survival of Murine Norovirus 1 in Manure and Biosolids. IAFP Annual Mtg., Columbus, OH. August 2008.

37. A. Derevianko, L. Schoonover, A. Laycock, **K.E. Kniel**. Ozonating Apple Cider to reduce *E. coli* O157:H7 and *Cryptosporidium parvum.* IAFP Annual Mtg., Columbus, OH. August 2008. T1-07.

38. A. Laycock, M. Sharma, and **K.E. Kniel**. Survival of *Salmonella* Heidelberg in Hummus. IFT Annual Mtg., New Orleans, LA. June 2008.

39. A.E.H. Shearer, G. Wilkins, M.C. Jenkins, **K.E. Kniel**. Effect of High-hydrostatic Pressure on Pathogenicity and Structural Integrity of *Eimeria acervulina*, a Protozoan Parasite and *Cyclospora cayetanensis* Surrogate. IAFP Annual Meeting. Orlando, FL. July 2007. P5-69

40. M. Sharma, **K.E. Kniel**, A. Derevianko, J. Ling, and A.A. Bhagwat. Sensitivity of *Escherichia alberti* to Food Preservation Treatments. IAFP Annual Meeting. Orlando, FL. July 2007. T3-05.

41. J.L. Cascarino, D.G. Hoover, D.T. Hicks, L.F. Pivarnik, and **K.E. Kniel**. Inactivation of Human Enteric Viruses and Viral Surrogates in Fresh Salsa Using High Hydrostatic Pressure. IAFP Annual Mtg., Orlando, FL. July 2007. P1-16.

42. V. Fino, E.B. Solomon, and **K.E. Kniel**. Comparative Susceptibilities of Hepatitis A, Feline calicivirus, Coliphages MS-2, And ΦX-174 To Inactivation By Quaternary Ammonium And Potassium Peroxymonosulfate Disinfectants. IAFP Annual Mtg, Orlando, FL July 2007. P4-12.

43. **K.E. Kniel**, A.E.H. Shearer, J. L. Cascarino, G. Wilkins, and M.C. Jenkins. Inactivation of Cyclospora Surrogate On Produce By Two Non-thermal Treatments. IAFP Annual Mtg, Orlando, FL July 2007. P5-47.

44. M. Sharma, **K.E. Kniel**, A. E. H. Shearer, M. Solomon, D. G. Hoover. Comparison of Hydrostatic and Hydrodynamic Pressure to Inactivate Foodborne Viruses. IAFP Annual Mtg, Orlando, FL July 2007. P5-45.

45. J.L. Cascarino and **K.E. Kniel**. Addressing Biosecurity Issues of the Dairy Industry: The Survival of Raccoonpox Virus in Milk. IAFP Annual Mtg., Orlando, FL July 2007. P5-02.

46. K.A. Hirneisen, D.G. Hoover, and **K.E. Kniel**. Isolation and Infection of Potential Foodborne Viral Pathogens. IAFP Annual Mtg., Orlando, FL July 2007. P3-44

47. A. Derevianko, L. Schoonover, A. Laycock, and **K.E. Kniel**. Ozonating Apple Cider to Reduce *E. coli* O157:H7 and Cryptosporidium parvum. IAFP Annual Mtg., Orlando, FL July 2007. P4-05.

48. A. Hartman, R. Williams, D. Lindsay, **K.E. Kniel**, S. Sumner, J. Eifert. Effect of metabolic enzymes on amylopectin content and infectivity of *C. parvum*. IAFP Annual Mtg., Orlando, FL July 2007.P5-37.

49. J. Higgins, C. Obrien, J. Abrahante, M. Abrahamsen, R. Fayer, **K.E. Kniel**, M. Jenkins. Intracellular levels of the viral symbiont CPV in Cryptosporidium parvum correlate with fecundity of the parasite in dairy calves. Amer. Assoc. Vet. Parasitol. Washington, D.C. July 2007.

50. D. Hicks, L. Pivarnick, N. Richard, R. McDermott, D. Hoover, and **K.E. Kniel**. Consumer awareness and willingness to pay for high pressure processing of ready-to-eat food. IFT, Chicago, IL. July 2007. 189-13.

51. V. Fino and **K.E. Kniel**. Comparative inactivation of foodborne viruses on fresh produce. IAFP Annual Mtg, Calgary, Canada, Aug 13-16, 2006.

52. J. Cascarino, D. Guan, D. Hoover, **K.E. Kniel**. The response of human viruses and viral surrogates in oyster slurry to hydrostatic pressure. IAFP Annual Mtg. Calgary, Canada, Aug 13-16, 2006.

53. V. Fino and **K.E. Kniel**. The influence of incubation time and produce surface in virus recovery. Institute of Food Technologists Annual Meeting, Orlando, FL, June 24-28, 2006.

54. J. Cascarino, A. Shearer, G. Wilkins, M. Jenkins, **K.E. Kniel**. Ultraviolet light treatment of raspberries inoculated with *Eimeria* as a surrogate for *Cyclospora*. IFT Annual. Mtg, Orlando, FL, June 24-28, 2006.

55. D. Guan, **K.E. Kniel**, H. Chen, D.H. Kingsley, V. Fino, D.G. Hoover. The potential of using F-specific RNA bacteriophage Qβ as a pressure surrogate for hepatitis A virus. IFT Annual Mtg. Orlando, FL, June 24-28, 2006.

56. D. Guan, **K.E. Kniel**, R.D. Joerger, D.G. Hoover. Effect of high hydrostatic pressure on four genotypes of F-specific RNA bacteriophages. IFT Annual Mtg. Orlando, FL, June 24-28, 2006.

57. A. Shearer, M. Jenkins, G. Wilkins, **K.E. Kniel**. Effect of high hydrostatic pressure on *Eimeria acervulina*. Southeastern Society of Parasitologists Mtg, Blacksburg, VA April 6-8, 2005. #IV-55.

58. A. Laycock, M. Jenkins, **K.E. Kniel.** The effect of ozone treatment on snow peas contaminated with *Eimeria acervulia* as a surrogate for *Cyclospora cayetanensis*. Southeastern Society of Parasitologists Mtg, Blacksburg, VA April 6-8, 2005. #III-30.

59. M. Tango, M. Jenkins, C. O'Brien, **K.E. Kniel**. A novel wash system for disinfection of *Cryptosporidium parvum* on green onions. Southeastern Society of Parasitologists Mtg, Blacksburg, VA April 6-8, 2005. #III-31.

60. J. Cascarino, M. Jenkins, **K.E. Kniel**. Efficacy of UV irradiation on pathogens. Southeastern Society of Parasitologists Mtg, Blacksburg, VA April 6-8, 2005. #III-30.

61. **K.E. Kniel** and M. Jenkins. Detection of *Cryptosporidium parcum* oocysts on fresh produce using a parasite viral protein. IAFP Annual Mtg. Phoenix, AZ, August 8-11, 2004. #T10.

62. **K.E. Kniel**, M. Jenkins, J. Higgins, J. Trout, R. Fayer. Using a viral symbiont to evaluate water samples for the presence of viabile *Cryptosporidium parvum* oocysts. IAFP Annual Mtg. New Orleans, LA August 10-13, 2003. #P227.

63. **K.E. Kniel**, S. Sumner, D. Lindsay. Effects of ozone on *Cryptosporidium parvum* oocysts in fresh fruit juices. The 10th International Congress of Parasitology, August 4-9, 2002, Vancouver, Canada.

64. **K.E. Kniel,** S. Sumner, and D. Lindsay. The use of oxidation to control *Cryptosporidium* infectivity, IAFP Annual Mtg. July 2002, San Diego, CA.

65. D. Lindsay and **K.E. Kniel**. *Toxoplasma gondii* as a surrogate for *Cyclospora cayetanensis*. American Association of Veterinary Parasitologists, July 13-16, 2002, Nashville, TN,

66. D. Lindsay and **K.E. Kniel**. A novel model for predicting infectivity of *Cyclospora cayetennensis* oocysts on produce, Southeastern Society of Parasitologists Meeting, April 10-13, 2002, Boone, NC

67. **K.E. Kniel,** S. Sumner, and D. Lindsay. Effects of hydrogen peroxide on the survival of *Cryptosporidium parvum* oocysts in unpasteurized fruit juices. IAFP Annual Mtg. August 5-8, 2001, Minneapolis, MN.

68. **K.E. Kniel,** S. Sumner, and D. Lindsay. Comparative study of *Toxoplasma gondii* oocysts on raspberries and blueberries. IAFP Annual Mtg. August 5-8, 2001, Minneapolis, MN.

69. **K.E. Kniel,** S. Sumner, and D. Lindsay. Inhibition of development of *Cryptosporidium parvum* in fresh fruit juices by chemical treatment. Annual Meeting of the American Association of Veterinary Parasitologists, July 14-17, 2001, Boston, MA,

70. **K.E. Kniel,** S. Sumner, and D. Lindsay. Effects of organic acids and hydrogen peroxide on the survival of *Cryptosporidium parvum* oocysts in fresh fruit Juices. International Workshop on Opportunistic Protists VII, June 13-17, 2001, Cincinnati, OH.

71. B. Seeman, S. Sumner, and **K.E. Kniel**. Internalization of *Escherichia coli* in apples outside laboratory conditions. IAFP Annual Mtg. August 6-9, 2000, Atlanta, GA.

72. **K.E. Kniel**, J. Koontz, and S. Sumner. Organic acids and hydrogen peroxide inhibit microbial viability in fresh juices. IAFP Annual Mtg. August 6-9, 2000, Atlanta, GA,

73. **K.E. Kniel** and R. Walker. Mechanism of NEM-inhibition on tubulin assembly. Annual American Society for Cell Biology Meeting, December 12-16, 1998, San Francisco, CA,

74. **K.E. Kniel** and R. Walker. NEM modification of kinesin and Ncd proteins. Annual American Society for Cell Biology Meeting, December 13-17, 1997, Washington, DC.

**Invited Presentations:**

1. Current Science associated with Risks to Produce Safety.Mid-Atlantic Crop Management School, Ocean City, MD. November 13, 2012.

2. Interactions of Human Pathogenic Viruses and Plants. Human Pathogens on Plants Workshop, American Phytopathological Society, College Park, MD. February 14, 2012.

3. Food Safety across the High School Curriculum. International Association for Food Protection Annual Meeting, Milwaukee, WI. August 2, 2011.

4. Lesser Known Foodborne Viruses. International Association for Food Protection Annual Meeting. Anaheim, CA. August 2, 2010.

5. Don't Forget the Little Folks: Lesser Known Foodborne Viruses and Parasites. International Association for Food Protection Annual Meeting. Grapevine, TX. July 13-16, 2009.

6. American Society for Microbiology Annual Meeting. Philadelphia, PA. May 21, 2009.

7. "Investigating Foodborne Outbreaks" and "Review of Foodborne Parasites and Viruses" European Regional Veterinary Command Continuing Education Conference, Frankfurt, Germany, October 2008.

8. Institute of Food Technologists Non-Thermal Processing Workshop, Non-thermal methods for the inactivation of food-and water-borne protozoa. Portland, OR. January 13-16, 2008.

9. DuPont Chemical Solutions Enterprise, Efficacy of select chemical disinfectants on human and animal pathogenic viruses. Wilmington, DE. Jan, 2007.

10. USDA-Eastern Regional Food Safety Conference XIV, Effects of non-thermal treatments on protozoa. Philadelphia, PA. October 31-November 1, 2005.

11. Emerging Disease Military Conference at Fort Dix, NJ, October 12, 2004, Waiter there's a fly in my soup" – An introduction to food and water-borne parasites and detection of these organisms.

12. Food Frights Forum, March 28, 2002, Blacksburg, VA, speaker and session leader, Food Safety: Biological Aspects

13. Virginia Environmental Health Association Meeting, October 20, 2000, Emerging Technologies in Food Microbiology

14. The IFT, Washington D.C. Section Meeting, Oct. 29, 1999, Blacksburg, VA, "Food Safety Research: Needs and Priorities

15. The 18th Annual Seminar of Cancer Researchers in Virginia, American Cancer Society Meeting, March 14, 1998, Blacksburg, VA, "NEM Modification of Kinesin and Ncd Proteins"

**Patents:**
**Kniel, K.E.** and Jenkins, M.C. U.S. Patent. USDA-ARS 2004, A sensitive antibody-based method for detecting *Cryptosporidium parvum* oocysts in water. S.N. 10/863,939

**External Funding chronologically:**

1. Hoover, D.G., **Kniel, K.E.**, Hicks, D., and Pivarnik, L., USDA-CSREES-Integrated Food Safety Program ($450,205) 9/01/04-8/31/07, Inactivation of viruses by pressure in ready to eat food products.

2. **Kniel, K.E.** ISEQ and ABC Graduate Fellowship ($40,000) 06/01/07-05/31/09. Fate of viral and bacterial pathogens during the growth of leafy greens.

3. **Kniel, K.E.**, CANR Seed Grant ($16, 538) 5/04-5/06, Survival of enteric viruses on salad greens, green onions and strawberries after treatment with ultraviolet light.

4. R. Joerger and **K.E. Kniel**. Avian Biosciences Center Grant ($7,000) 01/01/07-12/31/07. Virulence gene prevalence and its connection to cell invasion potential of *Salmonella enteric* isolated from poultry production environments.

5. **Kniel, K.E.**, University of Delaware Research Foundation ($20,000) 6/05-12/06, A validation study for the process of ozonation of apple cider in order to eliminate C*ryptosporidium parvum.*

6. Hoover, D.G. and **Kniel, K.E.**, CANR & USDA-ARS Research Partnership ($20,000), 12/05-12/06, Hydrodynamic and hydrostatic pressure inactivation of bacteriophage as a model system in food processing.

7. **Kniel, K.E.**. DuPont Young Professors Grant. ($75,000) 08/01/06-07/31/09, Microbial Food Safety.

8. Jin, Y., **Kniel, K.E.**, Simms, T., USDA-NRI Watershed Grant Program ($399,454), 9/1/06-8/31/09, Effect of land application of wastes on the fate and transport of pathogens in soil.

9. **Kniel, K.E.** USDA-NRI Food Safety Program ($94,401) 9/01/07-8/31/09, Survival and transmission of pathogenic viruses and protozoa in an agricultural environment.

10. Chiu, P., Jin, Y., and **Kniel, K.E.**. American Water Works Association Research Foundation ($220,407) 10/01/07-9/30/08, Enhancing removal of viruses in water treatment plants using zero-valent iron.

11. Chen, H., **Kniel, K.E.,** Hoover, D.G., and Joerger, R. USDA National Needs Fellowship. ($156,000) 09/01/08-08/31/10. (Coordinated partnerships with USDA-ARS and DuPont Chemical Solutions Enterprise.)

12. Chen, H., **Kniel, K.E**., Matthews, K., Worobo, R. USDA-NIFSI. ($590,000 total) 09/01/08-08/31/11, Control of hepatitis A virus and *E. coli* O157:H7 in green onions and spinach.

13. **Kniel, K.E**., Shearer, A.E.H., Snider, S. USDA-Challenge ($35,000) 07/01/09-06/30/11, Integrating food safety investigatioins into science curricula for secondary education.

14. Sims, T., Jin, Y., Sparks, D., Chen, H., **Kniel, K.E**., Saylor, W., Wu, C., Dou, Z., Ferguson, J., Galligan, D., Wu, Z., Wang, F., Zhang, F. Building research-based collaborations with China Agricultural University in the animal, food, and environmental sciences. University of Delaware Center for International Studies Global Partnerships and Initiatives Program. ($20,000) Collaborative program among UD, University of Pennsylvania New Bolton Center and China Agriculture University.

15. **K.E. Kniel**, D.G. Hoover,M. Sharma, J. Patel, D. Shelton. Center for Produce Safety. ($236,240) 10/01/09-09/30/11, Mitigation of irrigation water using zero-valent iron treatment.

16. D.G. Hoover, **K.E. Kniel**, M. Sharma, J. Patel, S. Yaron. Center for Produce Safety-BARD. ($200,000) 12/01/09-11/30/12, Persistence and detection of norovirus, *Salmonella* and pathogenic *E. coli* on basil and leafy greens.

17. **K.E. Kniel**, M. Sharma, and J. Barak. USDA-NIFA-AFRI Foundation ($600,000) 02/01/11-01/31/13, Plant Responses to Foodborne Bacteria and Viruses and Mechanisms used by Pathogens to Survive.

18. R. Buchanan, C. Walsh, D. Oryang, D. Schaffner, F. Hashem, J. LeJune, J. Meng, **K. Kniel**, K. Everts, K. Schneider, M. Sharma, M. Roberts, M. Grimley, M. Danyluk, M. Jay-Russell, P. Milner, R. Goodrich. USDA-SCRI-CAP ($5 million total, $162, 811 for UD) 07/01/11-06/30/13, Developing Scientifically-based Consensus Food Safety Metrics for Leafy Greens and Tomatoes.

19. L. Jaykus, M. Estes, J. Vinje, L. Saif, Wang, Petrosino, Atmar, J. Cannon, J. Jang, Tan, M. Janes, **K. Kniel**, Grego, C. Moe, A. Hall, et al. USDA-NIFA-AFRI-CAP (25 million total, $366,306 for UD) 09/01/11-08/31/16, Building Capacity To Control Viral Foodborne Disease: A Translational, Multidisciplinary Approach.