

LIMIN KUNG, JR.

**Department of Animal & Food Sciences
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EDUCATION

1978-1982	Ph.D.	Dairy Nutrition	Michigan State University
1976-1978	M.S.	Ruminant Nutrition	University of Hawaii
1972-1976	B.S.	Animal Science	University of Hawaii

EMPLOYMENT RECORD

1999 – current	S. Hallock du Pont Professor of Animal Sciences, Dairy Extension Leader - University of Delaware, Department of Animal & Food Sciences Research (~60%): silage and ruminal fermentation Teaching (~30%): ruminant nutrition & metabolism Cooperative Extension (~10%): dairy
1997 - current	Graduate Faculty, Rutgers University
1993 - 1998	Associate Professor, University of Delaware, Department of Animal & Food Sciences
1987 - 1992	Assistant Professor, University of Delaware, Department of Animal Science and Agricultural Biochemistry
1985 - 1987	Research Specialist, Monsanto Company, Animal Science Division, Bovine Somatotropin Development Group
1983 - 1985	Senior Research Nutritionist, Monsanto Company, Animal Science Division, Feed Ingredients
1982 - 1983	Research Associate, U.S. Dairy Forage Research Center
1978 - 1982	Graduate Research Assistant, Michigan State University
1976 - 1978	Graduate Research Assistant, University of Hawaii

RESEARCH PUBLICATIONS (2008-present)

Young, K. M., J. M. Lim, M. C. Der Bedrosian, and L. Kung, Jr. 2012. Effect of exogenous protease enzymes on the fermentation and nutritive value of corn silage. *J. Dairy Sci.* 95:6687-6694.

Der Bedrosian, M. C., K. E. Nestor, and L. Kung, Jr. 2012. The effects of hybrid, maturity, and length of storage on the composition and nutritive value of corn silage. *J. Dairy Sci.* 95:5115-5126.

Teller, R. S., R. J. Schmidt, L. W. Whitlow, and L. Kung, Jr. 2012. Effect of physical damage to ears of corn before harvest and treatment with various additives on the concentration of mycotoxins, silage fermentation, and aerobic stability of corn silage. *J. Dairy Sci.* 95:1428-1436.

Kung, Jr., L., E. C. Stough, E. E. McDonell, R. J. Schmidt, M. W. Hofherr, L. J. Reich, and C. M. Klingerman. 2010. The effect of wide swathing on wilting times and nutritive value of alfalfa haylage. *J. Dairy Sci.* 93:1770-1773.

Schmidt, R. J., and L. Kung, Jr. 2010. The effects of *Lactobacillus buchneri* with or without a homolactic bacterium on the fermentation and aerobic stability of corn silages made at different locations. *J. Dairy Sci.* 93:1616-1624.

Reich, L. J., and L. Kung, Jr. 2010. Effects of combining *Lactobacillus buchneri* 40788 with various lactic acid bacteria on the fermentation and aerobic stability of corn silage. *Anim. Feed Sci. Tech.* 159:105-109.

Hu, W., M. E. Persia, and L. Kung, Jr. 2010. In vitro ruminal fermentability of a modified corn cultivar expressing a thermotolerant α -amylase. *J. Dairy Sci.* 93:4846-4849.

Hu, W. R. J. Schmidt, E. E. McDonell, C. M. Klingerman, and L. Kung, Jr. 2009. The effect of *Lactobacillus buchneri* 40788 or *Lactobacillus plantarum* mtd-1 on the fermentation and aerobic stability of corn silages ensiled at two dry matter contents. *J. Dairy Sci.* 92:3907-3914.

Hu, W., and L. Kung, Jr. 2009. Effect of dietary ratio of Na:K on feed intake, milk production and mineral metabolism in mid-lactation dairy cows. *J. Dairy Sci.* 92:2711-2718.

Klingerman, C. M., W. Hu, E. E. McDonell, M. C. Der Bedrosian, and L. Kung, Jr. 2009. An evaluation of exogenous enzymes with amylolytic activity for dairy cows. *J. Dairy Sci.* 92:1050-1059.

Schmidt, R. J., W. Hu, J. A. Mills, and L. Kung, Jr. 2009. The development of lactic acid bacteria and *Lactobacillus buchneri* and their effects on the fermentation of alfalfa silage. *J. Dairy Sci.* 92:5005-5010.

Mari, L. J., R. J. Schmidt, L. G. Nussio, C. M. Hallada, and L. Kung, Jr. 2009. An evaluation of the effectiveness of *Lactobacillus buchneri* 40788 to alter fermentation and improve the aerobic stability of corn silage in farm silos. *J. Dairy Sci.* 92: 1174-1176.

Schmidt, R. J., M. Emara, and L. Kung, Jr. 2008. The use of a quantitative real-time polymerase chain reaction assay for identification and enumeration of *Lactobacillus buchneri* in silages. *J. Appl. Micro.* 105:920-929.

Kung, Jr., L., P. Williams, R. J. Schmidt, and W. Hu. 2008. A blend of essential plant oils used as an additive to alter silage fermentation or used as a feed additive for lactating dairy cows. *J. Dairy Sci.* 91: 4793-4800.

Kung, Jr., L., B. M. Moulder, C. M. Mulrooney, R. S. Teller, and R. J. Schmidt. 2008. The effect of silage cutting height on the nutritive value of a normal corn silage hybrid compared to brown midrib corn silage fed to lactating cows. *J. Dairy Sci.* 91:1451-1457.

Mulrooney, C. N., and L. Kung, Jr. 2008. The effect of water temperature on the viability of silage inoculants. *J. Dairy Sci.* 91:236-240.

PUBLICATIONS – submitted and under review

Santos, M. C., C. Golt, R. D. Joerger, G. D. Mechor, and L. Kung, Jr. 2013. Identification and characterization of yeasts from high moisture corn and corn silages in the USA. Submitted July, 2013 to *J Appl. Microbiol.*

Kung, Jr., L., and M. C. Windle. 2013. Effect of an exogenous protease added at the time of ensiling on in vitro starch digestibility of high –moisture corn. To be submitted July, 2013 to *J. Dairy Sci.*

Windle, M., and L. Kung, Jr. 2013. The effects of an exogenous protease on the fermentation and nutritive value of poorly-processed or well-processed corn silage. To be submitted Aug, 2013 to *J. Dairy Sci.*

Windle, M., and L. Kung, Jr. 2013. A survey of the expected concentrations of lactic acid bacteria, pH, elapsed time in the tank, and temperature of the inoculant-water mixes used to treat silages. To be submitted Aug, 2013 to *J. Dairy Sci.*

RESEARCH ABSTRACTS (2008-present)

Merrill, C., M. C. Windle, W. F. Souza, I. R. Ipharraguerre, and L. Kung Jr. 2013. The evaluation of a flavor enhancer on intake and production of high producing lactating dairy cows. *J. Dairy Sci.* 91(E-Suppl. 1):424.

Block, E., L. Kung, Jr., and C. Merrill. 2013. Production performance parameters of early lactation dairy cows fed a diet supplemented with Megalac or a fatty acid prill containing high levels of palmitic acid. *J. Dairy Sci.* 91(E-Suppl. 1):237.

Windle, M. C., and L. Kung, Jr. 2013. The effect of a feed additive on the feeding value of a silage-based TMR exposed to air. *J. Dairy Sci.* 91(E-Suppl. 1):16.

M. Windle, C. Merrill, M. Agarussi, L. Rosa, K. Freedman, C. Asay, N. Walker, and L. Kung, Jr. 2013. The effects of an exogenous protease on the fermentation and nutritive value of poorly-processed or well-processed corn silage. *J. Dairy Sci.* 91(E-Suppl. 1):313.

Windle, M., C. Merrill, L. Rosa, M. Agarussi, R. Savage, C. Asay, N. Walker, and L. Kung, Jr. 2013. The effects of an exogenous protease on the fermentation and nutritive value of corn silage. *J. Dairy Sci.* 91 (E-Suppl. 1):313.

Windle, M., and L. Kung, Jr. 2013. A survey of the expected concentrations of lactic acid bacteria, pH, elapsed time in the tank, and temperature of the inoculant-water mixes used to treat silages. *J. Dairy Sci.* 91(E-Suppl. 1):556.

Der Bedrosian, M. C., L. Kung, Jr., K. E. Nestor, C. L. Preseault, A. L. Lock. 2012. The effect of ensiling duration on fatty acid profile and concentration of corn silage. *J. Anim. Sci.* 90 (E-Suppl. 3):460

Merrill, C., A. P. T. P. Roth, M. A. Santos, M. C. Der Bedrosian, L. Kung. 2012. Characterization of aerobic deterioration of corn silage treated with stabilizers. *J. Anim. Sci.* 90 (E-Suppl. 3):461

Lim, J. M., E. A. Cummings, H. M. Darby, and L. Kung Jr. 2012. A preliminary evaluation of corn silage impacted by Hurricane Irene in 2011. *J. Dairy Sci.* 95(Suppl. 2):538.

Lim, J. M., M. C. Santos, M. C. der Bedrosian, K. E. Nestor, and L. Kung, Jr. 2012. The effect of feeding normal corn silage, BMR corn silage or 50:50 mixture of the two on the production performance of lactating cows. *J. Dairy Sci.* 95(Suppl. 2):598.

Young, K. M., M. C. Der Bedrosian, J. M. Lim, A. P. T. P. Roth, S. A. Santos, and L. Kung, Jr. 2011. The effects of protease enzymes and storage on the ensiling and nutritive value of corn silage. *J. Dairy Sci.* 94(E-Suppl. 1):214.

Santos, M. C., A. L. Lock, G. D. Mechor, and L. Kung, Jr. 2011. Spoilage yeasts in silage have the potential to directly impact rumen fermentation. *J. Dairy Sci.* 94(E-Suppl. 1):207.

Lim, J. M., M. C. Santos, J. P. Riguera, M. C. Der Bedrosian, K. E. Nestor, and L. Kung, Jr. 2011. The nutritive value of mature corn silage from BMR, non-BMR and a 50:50 mix ensiled for varying lengths of time. *J. Dairy Sci.* 94(E-Suppl. 1):233.

Santos, M. C., C. Golt, R. D. Joerger, G. D. Mechor, and L. Kung. 2011. Identification and characterization of spoilage yeasts from high moisture corn and corn silages. *J. Dairy Sci.* 94(E-Suppl. 1):550.

Lim, J. M. M. C. Santos, J. P. Rigueira, M. C. Der Bedrosian, and L. Kung, Jr. 2010. Dispersion of an inert marker in water on freshly chopped whole plant corn by two methods to simulate addition of an inoculant. *J. Anim. Sci.* 88(E Suppl. 2):624.

*Der Bedrosian, M.C., L. Kung Jr., and K. E. Nestor Jr. 2010. The effects of length of storage on the composition and nutritive value of corn silage. *J. Anim. Sci.* 88(E Suppl. 2):176.

***2nd place award – NE Grad Student Oral Paper Competition, ADSA National Mtg, Denver, CO.**

Griswold, K. E., E. E. McDonell, L. Kung, Jr., and P. H. Craig. 2010. Effect of bunker silo sidewall plastic on fermentation, nutrient content and digestibility of corn silage. *J Dairy Sci.* 93 (E Suppl. 1):622.

Hu, W., M. C. Santos, G. B. Muraro, M. C. Der Bedrosian, and L. Kung, Jr. 2009. The effect of *Lactobacillus buchneri* PTA6138 on the fermentation, aerobic stability of corn silage. *Proc XV Intl. Silage Conf., Univ. of Wis., Madison.*

Pereira, O.G., M. C. Santos, and L. Kung, Jr. 2009. The effects of microbial inoculants and enzymes on the fermentation of fresh alfalfa or alfalfa that was freshly frozen and thawed before ensiling. *Proc XV Intl. Silage Conf., Univ. of Wis., Madison.*

Santos, M. C., L. T. Tatit, M.C. Der Bedrosian, W. Hu, O. G. Pereira, L. Williams, M. Gilinsky, and L. Kung, Jr. 2009. Effects of microbial inoculants and dry matter content (maturity) at harvest on the fermentation, aerobic stability and digestion of NDF of two corn silage hybrids. *J. Dairy Sci.* 92, E-Suppl.

Klingerman, C. M., E. E. McDonell, W. Hu, M. C. Der Bedrosian, and L. Kung, Jr. 2008. Exogenous amylase enzymes for lactating dairy cows. *J. Dairy Sci.* 91, E-Suppl. 1:262.

Reich, L. J., M. W. Hofherr, R. J. Schmidt, W. Hu, and L. Kung, Jr. 2008. The effect of combining *Lactobacillus buchneri* 40788 with lactic acid bacteria on the fermentation, microbial populations and aerobic stability of brown midrib corn silage. *J. Dairy Sci.* 91, E-Suppl. 1:32.

Hu, W., R.J. Schmidt, E.E. McDonell, C.M. Klingerman, L. Kung, Jr. 2008. The effect of *Lactobacillus buchneri* 40788 or *Lactobacillus plantarum* MTD-1 on the fermentation and aerobic stability of corn silages ensiled at two dry matter contents. *J. Dairy Sci.* 91, E-Suppl. 1:31.

Mari, L. J., R. J. Schmidt, L. G. Nussio, C. M. Hallada, and L. Kung, Jr. 2008. An evaluation of the effectiveness of *Lactobacillus buchneri* 40788 to improve the aerobic stability of corn silage in farm silos. *J. Dairy Sci.* 91, E-Suppl. 1:31.

Hofherr, M. W., L. J. Reich, M. C. Der Bedrosian, M. C. Santos, W. Hu, and L. Kung, Jr. 2008. Effect of a microbial inoculant producing ferulic acid esterase on the fermentation and NDF digestibility of normal and BMR corn silages. *J. Dairy Sci.* 91, E-Suppl. 1:32.

Hu, W., M. E. Persia, and L. Kung, Jr. 2008. Influence of an α -amylase on in vitro ruminal fermentation and starch degradation. *J. Dairy Sci.* 91, E-Suppl. 1:269.

Kung, Jr., L. 2008. Fermentation – Beyond the basics. Dairy Extension Symposium – Focus on Forages. Midwest Animal Science. Mtgs *J. Anim. Sci.* 86(E-Suppl. 3):22.

Kung, Jr., L. 2008. Sulfur metabolism in the rumen. Sulfur in ruminant diets symposium. Midwest Anim. Sci. Mtgs. *J. Anim. Sci.* 86(E-Suppl. 3):21.

BOOK CHAPTERS (2008-present)

Kung, Limin, Jr. 2012. Chapter: Understanding the aerobic stability of silages. *In* New Silage Bible. Ed. Kazuo Ataku. Rakuno Gakuen University, Ebetsu, Japan. Pp 28-34.

MISCELLANEOUS PUBLICATIONS: (Proc., Compendiums, etc.) (2008-present)

Kung, Jr., L., M. C. Santos, M. C. Windle, and J. M. Lim. 2012. Hot topics in the work of silages. *Proc. Penn State Nutrition Conference.* Pp 55-57. Pennsylvania State University Cooperative Extension, State College, PA.

Kung, Jr., L. 2012. Managing the aerobic stability of silages. *Proc. Great Lakes Forage and Grazing Conference.* MSU Extension, East Lansing, MI.

Kung, Jr., L. 2012. The art and science of making quality silage. *Proc. Great Lakes Forage and Grazing Conference.* MSU Extension, East Lansing, MI.

Kung, Jr., L., J. M. Lim, D. J. Hudson, J. M. Smith, H. Darby, L. E. Chase, and R. D. Joerger. 2012. Flooded corn silage study results – a preliminary report. *Proc. Cornell Nutrition Conference*. Pp 167-174. Cornell University. Ithaca, NY.

Kung, Jr., L. 2011. Corn silage spoilage and how to control it from field to storage. *Proc. Pennsylvania Agronomic Society Meeting*. State College, PA.

Kung, Jr., L. 2011. Managing silage. *Proc. Virginia Feed Association and Cow College Conference*. Roanoke, VA. Feb 17.

Kung, Jr., L. 2011. Silage fermentation. *Proc. Dairy Short Course*. Cornell University and Miner Institute. Chazy, NY. June 13.

Kung, Jr., L. 2011. Silo management. *Proc. Dairy Short Course*. Cornell University and Miner Institute. Chazy, NY. June 13.

Kung, Jr., L. 2011. Quality forages for dairy cows. *Proc. Focus on Forage Workshops*. Agra Point. Halifax, Nova Scotia. Mar

Kung, Jr., L. 2010. The aerobic stability of silage. *Proc. 40th California Alfalfa & Forage Symposium*. 30 Nov - 1-2 Dec. Pg. 89-102. Visalia, California. Department of Agronomy and Range Science Extension. University of California, Davis.

Kung, Jr., L. 2010. Understanding the biology of silage preservation to maximize the quality and protect the environment. *Proc. 40th California Alfalfa & Forage Symposium*. Pg. 41-54. Visalia, California. Department of Agronomy and Range Science Extension. University of California, Davis.

Kung, Jr. L., and M. Der Bedrosian. 2010. Effect of time of storage on the nutritive value of silages. *Proc of the PSU Dairy Cattle Nutrition Workshops*. Pg 79-83. Nov. 11, 2010. Grantville, PA. Dept of Animal and Dairy Sciences, Pennsylvania State University, University Park, PA.

Kung, Jr. L., and M. Der Bedrosian. 2010. How well do we really understand silage fermentation? *Proc. Cornell Nutrition Conference*. Pg 87-93. Oct. 19-21, 2010. Syracuse, NY. Dept. of Animal Science, Cornell University, Ithaca.

Kung, Jr., L. 2010. Getting the most out of your forage. *Proc. Dairy Focus Conference*. Mar, 2010. Halifax, Nova Scotia.

Kung, L., Jr. 2009. Potential factors that may limit the effectiveness of silage additives. *Proc. XV Intl. Silage Conf*. Madison, WI., July 27-29. Pp 37-45.

Kung, L., Jr. 2009. Side effects of microbial inoculants on silage fermentation. *Proc. Int. Symposium on the Conservation of Forages*. University of Sao Paulo, ESALQ. Piracicaba, SP, Brazil.

Kung, L., Jr. 2009. Forage management from field to silo. *Proc. Northeast Ag & Feed Alliance Mtg*. Apr 7 and 9. Syracuse, NY and West Lebanon, VT. NEAFA, Albany, NY.

Kung, L., Jr. 2009. Getting the most out of your silage. *Proc. Western Canadian Dairy Conference*. University of Alberta, Edmonton, CA. *Advances in Dairy Technology*. 21:349-357.

Kung, L., Jr. 2008. Making quality silage. *Proc. Ontario Forage Council Annual Meeting*. Winchester and Shakespeare, Ontario, CA. Dec 2-3.

Kung, L., Jr. 2008. Aerobic stability of silages. *Proc. 2nd International Symposium on Animal Production under Grazing*. Pp. 233-248. University of Vicosa, Brazil. Nov 12-15.

Kung, L., Jr., 2008. The end products of silage fermentation and microbial populations and their relationships to animal performance. *Proc. Amer. Soc. Bovine. Prac. Annual Mtg.* Charlotte, NC. Sept 26-28.

Strategies for improving the aerobic stability of silages. *Proc. California Animal Nutrition Conference*. Pp. 19-33. Cal State Univ., Fresno, CA. May 21-22.

Harvest and storage management for corn silage. *Proc. Alabama Dairy Days*. Auburn University. Auburn, AL. Apr 29.

Kung, L., Jr. 2008. Improving silage quality. *Proc. Mid Atlantic Nutrition Conf.* Pp. 122-127. University of MD. Mar 26-27.

Kung, L., Jr. 2008. Cutting, harvest & storage management for forages. *Proc. Carver County Dairy Expo*. Cologne, MN. Feb. 18.

Kung, L., Jr. 2008. Harvesting, storage and feeding corn silage. *Proc. Intermountain Nutrition Conference*. Salt Lake City, UT. Jan. 29.

GRADUATE STUDENTS/SENIOR THESIS

Primary advisor and completion date

Megan Smith, Ph.D. current

Jon Lim, Ph.D. 2013

Michelle Windle, Ph.D. 2013

Caitlyn Merrill, M.S. 2013

Mateus Santos, Ph.D. 2011

Erin McDonnell, M.S. 2008

Renato Schmidt, Ph.D. 2008

Committee member

Maris McCarthy, M.S. 2011

Primary advisor – Completed Senior Thesis

Cooper Asay, 2013

Kaylin Young, 2011

Lindsay Reich, 2008

COLLABORATIVE RESEARCH

2013 – The effect of various silage additives on the volatile organic compounds from silages. Collaborative project with Dr. Suzanne Johanningsmeier, NC State University, ARS.

Michelle Windle spent 2 weeks analyzing samples via GC/MS in Suzanne's lab.

2013-2015 – Member of Science without Borders Grant at the University of Vicosa, Brazil.
Main PI: Dr. Odilon Pereira, University of Vicosa. I will be spending 1 month for each of the next 3 years conducting research and teaching short courses at the University of Vicosa.

2011 – Leader, cooperative research project with University of Vermont on effects of Hurricane Irene on the corn silage crop of 2011. Cooperators: Dr. Heather Darby, Dr. Dan Hudson
Obtained \$40,000 from industry sources to fund this project.

RESEARCH FUNDING**2012-2013**

Studies on an experimental protease for increasing starch-D in corn silage and HMC- 2012 growing season. AB Vista, Marlborough Wiltshire, UK \$55,000

Effects of antifungal agents on the aerobic stability of silages- 2012 growing season. Agro/Salinity, Sweden \$20,000

Continued studies on silage fermentation - 2012 growing season. Lallemand Animal Nutrition, Milwaukee, WI \$37,000

An evaluation of a calcium-salt of fatty acids versus a high C16 source of fatty acids on milk production and composition. Church and Dwight, Princeton, NJ \$32,000

High forage rations with BMR-corn silage for lactating dairy cows. Mycogen Seeds, Indianapolis, IN \$35,000

2011-2012

Effect of an experimental mixture of fibrolytic enzymes on the fermentation and nutritive value of corn silage. AB Vista, Marlborough Wiltshire, UK \$18,000

Effect of an experimental mixture of fibrolytic enzymes applied directly to forages and fed to lactating cows. AB Vista, Marlborough Wiltshire, UK \$36,000

Effect of a feed flavor enhancer on intake and production of lactating cows. Lucta USA, Libertyville, IL \$35,520

Effect of a rumen protected methionine supplement on milk production and composition of high producing dairy cows. Balchem Corp., New Hampton, NY \$25,000

Continued studies on silage fermentation. Lallemand Animal Nutrition, Milwaukee, WI \$52,000

Hurricane Irene on the nutritive value of harvested corn for silage in the Northeast US. Various Industry sources. \$35,000

2010-11

Effect of feeding aerobically challenged corn silage on rumen metabolism. Prince Agri Products, Quincy, IL. \$25,000

Evaluation of *L. buchneri* strains and doses for corn silage. Ecosyl Products, Ltd., Stokesley, UK. \$10,000

Fibrolytic enzymes used as silage additives or applied directly onto feed. Sage/AB Vista, Marlborough, UK. \$50,400

Effect of adding a nitrogenous by product to corn silage and its effects after prolonged ensiling. Ajinomoto USA Inc. Eddyville, IA. \$10,000

2009-10

The effect of feeding normal corn silage, BMR corn silage or a 50:50 mixture of the two on production from lactating cows. Dow AgriSciences, Indianapolis, IN. \$35,000

The effect of ensiling time and stage of harvest maturity on the nutritive value of normal and BMR corn forage hybrids. Dow AgriSciences. \$27,000

Studies on silage fermentation. Lallemand Animal Nutrition. Milwaukee, WI. \$35,000 and College of Agriculture. \$21,000

Effect of Levucell and or corn silage treated with *L. buchneri* for lactating cows. Lallemand Animal Nutrition. Milwaukee, WI. \$33,000

2008-09

Can live yeast replace sodium bicarbonate for lactating dairy cows? Lallemand Animal Nutrition. Milwaukee, WI. \$33,600

The ability of corn with beta-glucanase activity to improve the NDF-D of corn silage. Syngenta. \$12,000

Identification of spoilage yeasts throughout the US and the potential for negative effects on rumen fermentation and milk fat synthesis. Elanco. Indianapolis, IN. \$30,000.

HOSTED VISITING SCIENTISTS AND STUDENTS

**sandwich students are Ph.D. students from Brazil that spend a year conducting research in US Universities and then return home to complete their degrees in Brazil*

2013 Thiago Da Silva, Ph.D., “sandwich” student*. University of Vicosa. Vicosa, Minas Gerais, Brazil.

2012 Dr. Mustafa Kizilsimsek, Faculty of Agriculture. Sabbatical. Department of Field Crops. University of Kahramanmaras Sutcu Imam. Kahramanmaras, Turkey.

2012 Mariele Agarussi, undergraduate intern. University of Vicosa. Vicosa, Minas Gerais, Brazil. Lilian Rosa, Ph.D., “sandwich” student. University of Vicosa. Vicosa, Minas Gerais, Brazil.

2011 Dr. Cihat Yildiz, Faculty of Agriculture. Sabbatical. Department of Agricultural Machinery University of Ataturk. Erzurum, Turkey.

2011 Wender Souza, Ph.D., “sandwich” student. University of Vicosa. Vicosa, Minas Gerais, Brazil.

Anna Roth, Ph.D., “sandwich” student. University of Sao Paulo State. Sao Paulo, Brazil.

2010 Joao Riguera, Ph.D., “sandwich” student. University of Vicosa. Vicosa, Minas Gerais, Brazil.

2009 Dr. Odilon Pereira, Faculty. Sabbatical. Department of Animal Science. University of Viçosa. Vicosa, Minas Gerais, Brazil.

Luciana Tatit, undergraduate intern. University of Sao Paulo. Piracicaba, Brazil.

Fernanda Traldi, undergraduate intern. University of Sao Paulo. Piracicaba, Brazil.

Priscilla Schneider, undergraduate intern. University of Sao Paulo. Piracicaba, Brazil.

COOPERATIVE EXTENSION & SERVICE

Primary Responsibilities:

- Editing and publishing of the Delaware Dairy Newsletter (2-3 issues per year)
- Editing and publishing of the annual Proc. of the Delmarva Dairy Day
- Organizing/hosting of the Annual Delmarva Dairy Days
- Short Course Programming for Delaware Dairies

Extension publications can be found at - <http://ag.udel.edu/anfs/faculty/kung/Publications.htm>

Proceedings of the Delmarva Dairy Days (2008-present)

- 2013 Proc. Delmarva Dairy Days
- 2012 Proc. Delmarva Dairy Days
- 2011 Proc. Delmarva Dairy Days
- 2010 Proc. Delmarva Dairy Days
- 2009 Proc. Delmarva Dairy Days
- 2008 Proc. Delmarva Dairy Days

Delaware Dairy Newsletter articles (2008-present)

- Kung, L., Jr. 2013. Managing microbial inoculants for silage. Delaware Dairy Newsletter. Spring.
- Kung, L., Jr. 2012. Dealing with summer heat. Delaware Dairy Newsletter. Summer.
- Kung, L., Jr. 2012. Reminders that can help to maintain silage quality. Delaware Dairy Newsletter. Summer.
- Kung, L., Jr. 2012. The first cutting challenge. Dairy Newsletter. Spring.
- Kung, L., Jr., and M. Der Bedrosian. 2010. Effect of time of storage on changes in nutrient composition and value of silages. Delaware Dairy Newsletter. Winter.
- Kung, L., Jr. 2008. Evaluating corn silage hybrids. Dairy Newsletter. Summer.

TEACHING (2008-present)

- 2013 Spring PLSC 441 (8 students, 3 cr) Forage Resource Management - Co-instructor w/ Vasilas and Taylor
- 2012 Fall ANFS 454 (7 students, 3 cr) Ruminant Nutrition and Metabolism
- 2011 Fall ANFS 251 (74 students, 3 cr) Animal Nutrition
ANFS 252 (2 sections, 1 cr each; 43 and 19 students) Animal Nutrition Lab
- 2010 Fall ANFS 251 (88 students, 3 cr) Animal Nutrition
ANFS 252 (2 sections, 1 cr; 42 and 40 students) Animal Nutrition Lab

2009 Fall ANFS 454 (6 students, 3 cr) Ruminant Nutrition and Metabolism

INVITED TECHNICAL PRESENTATIONS (2008-present)

(number in parenthesis = number of people at the talk)

2013 The effects of length of storage on the nutritive value and aerobic stability of silages. *III International Symposium on Forage Quality and Conservation*. Campinas, Sao Paulo, Brazil. July 22. (200)

Environmental impact of forage conservation. *50th Annual Meeting of the Brazilian Society of Animal Science*. Campinas, Sao Paulo, Brazil. July 25. (250)

Negative effects of silage quality and effects on animal performance: prevention and remediation. *California Animal Nutrition Conference*. Fresno, CA. May 15. (250)

Management of corn silage for optimal quality. *Conner Marketing Dairy Mtg.* Turlock, CA. May 14. (40)

Silage inoculants: what they do and how to manage them. *Conner Marketing Dairy Mtg.* Fresno, CA. May 13. (15)

Best silage management practices to reduce nutrient waste and shrink on dairy farms. *Virginia Department of Conservation and Recreation*. Providence Forge, VA. Apr 16. (30)

Wild yeasts: their role in spoiled silages and effects on animal performance. *Mid Atlantic States Bovine Conference*. Hagerstown, MD. Apr 5. (40)

Managing silages to maximize nutritive value and reduce shrink. *Mid Atlantic States Bovine Conference*. Hagerstown, MD. Apr 5. (40)

Management of inoculants to maximize their potential benefit for silages. *McArthur's Dairy Silage Seminar*. Okeechobee, FL. Apr 3. (30)

The detrimental effects of yeasts in silage. *Larsen Co-op Dairy Mtg.* New London, WI. Mar 6. (20)

Lactobacillus buchneri for silages: mode of action. *Ag Consulting Technical Training Mtg.* DeForest, WI. Mar 5. (10)

Protecting expensive forages with inoculants and forage management. *SW Wisconsin Dairy Mtg.* Platteville, WI. Feb 28. (30)

What's new in the world of forages? *Vita Plus Dairy Mtg.* Pearl City, IL. Feb 27. (20)

Brown mid rib corn silage: one path to high forage diets. *North Central Co-op Dairy Mtg.* Fremont, MI. Feb 26. (25)

Protease treatment for corn silages: improving ruminal starch digestion. *River Dale Feed & Grain Dairy Mtg.* Ithaca, MI. Feb 25. (20)

Making excellent quality silage. *Professional Crop Producers Annual Meeting.* Lancaster, PA. Feb 21. (200)

Reducing silage shrink. 2013 *Vermont Agronomy Plus Meetings: Strategies for Thriving in the New Dairy Economy.* Webinar. Jan 8.

Maximizing net farm income via forage management. *Mycogen Seeds/Turkey Farms LLC Winter Dairy Mtg.* Woodstown, NJ. Jan 14. (30)

Wild yeasts in silages. *Renaissance Feeds Dairy Mtg.* Statesville, NC. Jan 16. (30)

Managing forage and silage quality. *Renaissance Feeds Dairy Mtg.* Statesville, NC. Jan 16. (30)

Factors affecting the efficacy of microbial inoculants. *Big Gain Technical Meeting.* Mankato, MN. Jan 23. (30)

Challenges of silage fermentation as affected by type of crop. *Big Gain Technical Meeting.* Mankato, MN. Jan 23. (30)

Silage management. *Penn State Univ. Dairy Extension Mtg.* Ellittsburg, PA. Jan 25. (180)

Optimizing the use of microbial inoculants. *Penn State Univ. Dairy Extension Mtg.* Ellittsburg, PA. Jan 25. (180)

Reducing silage shrink. 2013. *Vermont Agronomy Plus Meetings: Strategies for Thriving in the New Dairy Economy.* Webinar. Jan 30.

Managing your microbial inoculants for silage. 2013 *Delmarva Dairy Day.* Feb 14. (90)

2012 Hot topics in the world of silage. *Virginia Forage and Grasslands Council Dairy Meetings.* Dayton, VA. Dec. 5 (35); Rocky Mt, VA. Dec 6 (55); Wytheville, VA. Dec 7. (35)

Forage and silage management. *Virginia Forage and Grasslands Council Dairy Meetings.* Dayton, VA. Dec. 5 (35); Rocky Mt, VA. Dec 6 (55); Wytheville, VA. Dec 7. (35)

Hot topics in the world of silage. *Penn State Nutrition Conference.* Grantville, PA. Nov 14. (450)

The effect of Hurricane Irene on the corn silage of 2011. *Penn State Nutrition Conference.* (Workshop Session). Grantville, PA. Nov 14. (20)

The effects of wild yeasts in silages. *Holtz/Nelson Dairy Consultant Meeting.* Syracuse, NY. Nov 9. (25)

Flooded corn silage study results – a preliminary report. *Cornell Nutrition Conference.* Syracuse, NY. Oct 25. (120)

Managing your harvest for corn silage. *Marsyt Lancaster Dairy Meeting*. Lancaster, PA. Aug 2. (50)

Inoculants for silage. *Marsyt Lancaster Dairy Meeting*. Lancaster, PA. Aug 2. (50)

Managing your harvest for corn silage. *Marsyt Shippensburg Dairy Meeting*. Shippensburg, PA. Aug 1. (20)

Inoculants for silage. *Marsyt Shippensburg Dairy Meeting*. Shippensburg, PA. Aug 1. (20)

The effects of wild yeasts on silage and rumen fermentation. *Bucknell Nutrition Conference*. July 25. (90)

The impact of Hurricane Irene on the corn silage crop of 2011. *Bucknell Nutrition Conference*. 2 breakout sessions. July 25. (15 and 10)

How the length of ensiling affects the fermentation and nutritive value of silages. *National Forage Conference*. Nantwich, Cheshire, UK. June 27. (190)

The rumen and its microbes. *Washington College Microbiology Class*. Newark, DE. May 25. (17)

Inoculation of silages. *Ag Partners Dairy Mtg*. Plum City, WI. Apr 4. (25)

Managing wild yeasts in silages. *Ag Partners Dairy Mtg*. Goodhue, MN. Apr 3. (40)

Forage quality of hurricane damaged crops in the Northeast US. *Mid Atlantic Nutrition Conference*. Timonium, Maryland. Mar 29. (50)

Managing the aerobic stability of silages. **Keynote Presentation**. *Great Lakes Forage and Grazing Conference*. East Lansing, MI. Mar 7. (100)

The art and science of making quality silage. *Great Lakes Forage and Grazing Conference*. East Lansing, MI. Mar 8. (100)

Weather impacts on the 2011 corn silage crop. *Blue Seal Dairy Seminar*. Schaeferstown, PA. Feb 17. (50)

Factors affecting silo benchmarking. *Vitapulus Minnesota Dairy Mtgs*. Fond du lac, WI. Feb 7. (35)

Factors affecting silo benchmarking. *Vitapulus Minnesota Dairy Mtgs*. DePere, WI. Feb 7. (30)

Silage fermentation and inoculation. *Vitapulus Minnesota Dairy Mtgs*. Melrose, MN. Feb 6. (15)

Silage fermentation and inoculation. *Vitapulus Minnesota Dairy Mtgs*. Albany, MN. Feb 6. (30)

The effect of length of fermentation on nutrient availability. *Hoover Feeds Winter Dairy Seminar*. East Earl, PA. Feb 2. (275)

The effect molds and yeasts on feedstuffs and cattle. *Hoover Feeds Winter Dairy Seminar*. East Earl, PA. Feb 2. (275)

Silage fermentation and inoculation. *Vitaplus Minnesota Dairy Mtgs*. Melrose, MN. Feb 6. (15)

Silage fermentation and inoculation. *Vitaplus Minnesota Dairy Mtgs*. Albany, MN. Feb 6. (30)

2011 What's new in the world of forages? *Vita Plus Dairy Summit*. Wisconsin Dells, WI. Dec 8. Two presentations (125 and 100)

Silage additives. *Lallemand Dairy Mtg*. Watertown, NY. Dec 7. (35)

The effect of time of ensiling on the nutritive value of corn silage. *Seedway/Lallemand Dairy Meeting*. Syracuse, NY. Dec 6. (60)

Why cows are cool. *Blue and Gold Discovery Days*. University of Delaware, Newark. Oct. 2. (25)

The use of microbial inoculants in silages. *Tecnofarm Symposium*. Piacenza, Italy. Oct 14, 2011. (250)

Ensiling of forages. Practical management. **Keynote Presentation**. *Tecnofarm Symposium*. Piacenza, Italy. Oct 14. (250)

Harvesting challenges for forages affected by Hurricane Irene. *Seedway/Lallemand Webinar*. Sept 18. (30)

Factors affecting the digestibility of fiber in diets for lactating cows. *Big Gain Forage Seminar*. LaCrosse, WI. Aug 18. (30)

Wild yeasts in silages and their potential to affect the performance of ruminants. *Big Gain Forage Seminar*. LaCrosse, WI. Aug 18. (30)

Use of silage inoculants. *Diamond V Technical Webinar*. June 24. (8)

Silage fermentation. *Cornell Dairy Short Course*. Cornell University and Miner Institute. Chazy, NY. June 13. (70)

Silo management. *Cornell Dairy Short Course*. Cornell University and Miner Institute. Chazy, NY. June 13. (70)

Basic forage quality. *Tecnofarm Seminar*. Rome, Italy. May 15. (30)

Microbial inoculation of silages. *Tecnofarm Seminar*. Rome, Italy. May 15. (30)

Understanding basic silage fermentation. *University of Parma, Dept. of Agronomy Seminar. Parma, Italy.* May 13. (90)

Microbial inoculation of silages. *University of Parma, Dept. of Agronomy Seminar. Parma, Italy.* May 13. (90)

Can microbial inoculants improve fiber digestibility in silages? *JR Distributing Technical Mtg.* Sioux Falls, SD. Apr 1. (15)

Use of microbial inoculants to improve fermentation and aerobic stability. *JR Distributing Technical Mtg.* Sioux Falls, SD. Mar 31. (15)

Impacts of wild yeasts in silages and the rumen. *Big Gain South Dakota Producer Mtg.* Sioux Falls, SD. Mar 30. (20)

Optimizing silage fermentation. *Big Gain Wisconsin Technical Meeting.* Dodgeville, WI. Mar 30. (12)

Optimizing silage fermentation. *Marathon Feed Producer Meeting.* Abbotsford, WI. Mar 29. (20)

Managing wild yeasts in silage. *Big Gain Minnesota Technical Meeting.* Preston, MN. Mar 28. (20)

Focus on forage workshops. *Agra Point.* Mar. 15-17. Halifax (20), Truro (20), Antigonish (35), Nova Scotia. 3-one hr farm demos, 3-two hr lectures.

Managing the aerobic stability of silages. *Vanbeek Nutrition Dairy Meeting.* Dallas, Texas. Mar 1. (35)

The aerobic stability of silages. *Vita Plus Custom Harvester Meeting.* Madison, WI. Feb 23. (80)

BMR corn silage: facts, fiction and real world experiences. *Virginia Feed Association and Cow College Conference.* Roanoke, VA. Feb 18. (30)

Managing corn silage in the field and silo. *Renaissance Nutrition Dairy Meeting.* Rocky Mount, VA. Feb 17. (15)

Managing silage. *Virginia Feed Association and Cow College Conference.* Roanoke, VA. Feb 17. (40)

Managing corn silage in the field and silo. *Renaissance Nutrition Dairy Meeting.* Dayton, VA. Feb 16. (25)

Evaluating and managing corn silage. *Hubbard Feeds Technical Seminar.* Tampa, FL. Feb 8. (15)

Issues on forage quality: BMR hybrids, lignin content, reducing shrink. *Vita Plus Producer Roundtable Discussion.* Jan 25. (25)

Issues on forage quality: BMR hybrids, lignin content, reducing shrink. *Vita Plus Producer Roundtable Discussion*. Jan 25. (20)

Challenges of silage fermentation, storage, and feedout. *Centra-Sota Agronomy and Feed Meeting*. Albany, MN. Jan 24. (20)

Wild yeasts in silage. *Kent Feeds Dairy Webinar*. Jan 20. (40)

Corn silage spoilage and how to control it from field to storage. *Pennsylvania Agronomic Society Meeting*. State College, PA. Jan 19. (40)

Forage challenges in today's market. *FCI Nutrition Dairy Producers Mtg*. Waterville, ME. Jan 13. (30)

What you need to know when corn is greater than \$6/bu. *Duprey's Producer Mtg*. Jan 12. (30)

Silage fermentation. *FCI Nutrition Technical Group Meeting*. Middlebury, VT. Jan 12. (10)

2010 The aerobic stability of silage. *Proc. 40th California Alfalfa & Forage Symposium*. Visalia, California. Dec 1-2. (75)

Understanding the biology of silage preservation to maximize the quality and protect the environment. *Proc. 40th California Alfalfa & Forage Symposium*. Visalia, California. Dec 1-2. (40)

Effect of time of storage on the nutritive value of silages. *Penn State Dairy Nutrition Workshops*. Nov. 11. Grantville. PA. (135)

How well do we really understand silage fermentation? *Cornell Nutrition Conference*. Oct. 19-21, 2010. Syracuse, NY. (350)

Managing the aerobic stability of silages through silo management and additives. (3 presentations) *Lallemand Animal Nutrition Dairy Mtgs*. Madison, WI; Greenbay, WI; Albany, MN. Aug 2-6. (20, 15, 25)

Implications of wild yeasts in silages. *Prince Agri Technical Seminar*. St. Louis, MO. May 18. (15)

Sulfur metabolism in ruminants. *Dept. of Dairy and Animal Sci. Penn State Univ*. College Park, PA. Apr 30 (25)

Harvesting and management of hay crop forages. *Blue Seal Dairy Webinar*. Apr 20. (45)

How length of storage affects the nutritive value silages. *Apligen Technical Seminar*. Aguascalientes, MX. Apr 21. (40)

Why silage additives don't work all the time. *Expo Leche*. Aguascalientes, MX. Apr 21 (350)

Wild yeasts in silages. *Vitaplus Technical Seminar*. Stearns County, MN. Apr 8. (15)

What's new in the forage world. *Ag Partners Dairy Group*, Minneapolis, MN. Apr 9. (15)

Getting the most out of your forage. *Agra Point Dairy Focus Conference*. Halifax, Nova Scotia. Mar 24. (280)

Silage fermentation and microbial inoculants for silages. *Falmouth Coop Dairy Mtg.* Falmouth, MI. Mar 11. (25)

Silage fermentation and microbial inoculants for silages. *Renaissance Nutrition Dairy Mtgs.* (2 presentations each at 2 locations) North Adams, MI. Mar 9 (12), Coopersville, MI, Mar 10 (15)

Update on forage management. *Van Beek Nutrition Technical Mtg.* St. Johns, MI. Mar 8. (10)

How time of storage affects the nutritive value of corn silage. *Agribasics Dairy Meeting*. Gap, PA. Mar 4. (30)

Choosing an effective inoculant for silage. *Agribasics Dairy Meeting*. Gap, PA. Mar 3. (30)

Silage fermentation: the basics. *Seedway Winter Mtg.* Oneonta, NY. Mar 2. (20)

Silage fermentation and inoculation. *Renaissance Nutrition Dairy Mtg.* Campbell Hill, IL. Feb 25. (18)

Optimizing the nutritive value of forages. *VitaPlus Dairy Meeting*. St. John's, MI. Feb. 24. (35)

University of DE Research Summary. *Michigan State University Dairy Research Group Seminar*. East Lansing, MI. Feb 23. (30)

Baleage systems. *Professional Crop Producers Conference*. Grantville, PA. Feb 17. (30)

Maximizing the use and preservation of high moisture corn. *Big Gain Beef Seminar*. Adrian, MN. Feb 11. (12)

How time of storage affects the nutritive value of corn silage. *JR Distributing Technical Seminar*. Sioux Falls, SD. Feb 10. (20)

Improving fiber digestion with microbial inoculants. *JR Distributing Technical Seminar*. Sioux Falls, SD. Feb 10. (20)

Principles of producing high quality silage. *World Ag Expo Hay and Forage Seminar*. Tulare, CA. Feb 9. (100)

Improving silage fermentation. *Renaissance Nutrition, Dairy Mtg.* Manchester, CT. Jan 27. (30)

How to evaluate corn silage hybrid evaluations. *Renaissance Nutrition, Dairy Mtg.* Manchester, CT. Jan 27. (30)

Silage fermentation and use of additives. *Seedway Dairy Meeting*. Binghamton, NY. Jan 26. (20)

Improving the effectiveness of silage additives; Improving your corn silage supply from seed to feed. (2 presentations) *PSU Cooperative Extension Silage Meeting*. Lancaster, PA. Jan 21. (110)

Effect of hybrid, stage of maturity, and length of ensiling on the nutritive value of corn silage. *Renaissance Nutrition Meeting*. Duncansville, PA. Jan 20. (20)

Nutritional characteristics, ruminal fermentation and production responses from feeding high moisture corn to dairy cows. *Bioleche Dairy Seminars*. Orsono and Puerto Varas City, Chile. (3 presentations) Jan 12, 13, 14. (30, 80, 30)

2009 Silage management. *Growmarks Seeds Winter Dairy Meetings*. 2 presentations. Grantville, PA - Dec 15. (50) and Rochester, NY- Dec 16. (60)

The importance of forage quality for dairy cattle. *Mid Atlantic Crop School*. Ocean City, MD. (2 presentations) Nov 18. (20 and 15)

Side effects of microbial inoculants on silage fermentation. *Int. Symposium on the Conservation of Forages*. **Keynote Presentation**. Sao Pedro, SP, Brazil. Oct 28. (200)

Aerobic spoilage of silages. *Short Course, ESALQ*. Sao Pedro, SP, Brazil. Oct 27. (30)

Controlling aerobic stability with microbial inoculants. *Short Course, ESALQ*. Sao Pedro, SP, Brazil. Oct 27. (30)

Potential factors that may limit the effectiveness of silage additives. *Cornell Dairy Nutrition Short Course*. Chazy, NY. Aug 17-19. (60)

Silage fermentation end products and microbial populations: relationships to silage quality and animal productivity. *Cornell Dairy Nutrition Short Course*. Chazy, NY. Aug 17-19. (60)

Spoilage yeasts in silages: diversity and potential negative effects on ruminal productivity. *Vita Plus Technical Seminar*. Madison, WI. Aug 12. (10)

Potential factors that may limit the effectiveness of silage additives. *Proc. XV Intl. Silage Conf.* Madison, WI. July 27-29. (240)

Why forage quality is critical during low milk prices. *Prince Agriculture Dairy Mtgs.* May. (3 presentations) May 12 - Stevensville, TX (40), May 13- Clovis, NM (10), May 14 - Amarillo, TX (15)

Forage management from field to silo. *Northeast Ag & Feed Alliance Mtg.* (2 presentations) Apr 7 -Syracuse, NY (90) and Apr 9 - West Lebanon, VT. (150)

Plastics and weights for sealing bunkers and piles. *Renaissance Nutrition Dairy Mtg.* Frederick, MD. Mar 26. (10)

The use of yeast in dairy rations. *Vicor Dairy Meeting*. Lancaster, PA. Mar 19. (20)

Getting the most out of your silage. *Western Canadian Dairy Conference*. Red Deer, Alberta, Canada. Mar 13. (550).

An update on forage management. *Western Large Herd Dairy Conference*. Reno, NV. Mar 10. (80).

Increasing your milk check with good forage not more grain. *Whitman's Annual Feed Meeting*. Greenwich, VT. Feb 26. (80)

Packing bunker silos. *Miller Spraying Feed Meeting*. Lewis County, NY. Mar 27. (12)

Choosing an effective silage inoculant. *Pennsylvania Professional Crop Producers Conference*. Feb 17. College Park, PA. (30)

The importance of NDF digestion in rations for dairy cows. *2009 Big Gain Forage Symposium*. Madison, WI. Feb 4. (30)

The basics of silage fermentation and the use of inoculants. *Clearwater Feed and Grain Winter Meeting*. Clearwater, NE. Feb 2. (20)

Managing bags, bunkers and piles. *Vita Plus Minnesota/Iowa Winter Dairy Meetings*. 5 presentations: Belle Plaine, MN, Jan 21 (45), Brookings, SD, Jan 21 (20), Edgerton, MN, Jan 22 (20), Orange City, IA, Jan 22 (15), Owatonna, MN, Jan 23 (25).

Making quality silage. *Southern States Dairy FeedMaster Program*. Raleigh, NC. Jan 6. (35)

2008 New strategies in forage and silage management. *Renaissance Nutrition Dairy Meeting*. Roaring Spring, PA. Dec 18. (20)

NDF digestion and its relation to BMR corn silage. *Van Beek Nutrition Technical Meeting*. Sioux City, IA. Dec 9. (35)

Making quality silage. *Ontario Forage Council Annual Meeting*. Winchester and Shakespeare, Ontario, CA. Dec 2 (90) and Dec 3 (150).

Aerobic stability of silages. *2nd International Symposium on Animal Production under Grazing*. Vicosa, Brazil. Nov 13-15. (300)

Rumen microbiology and its relation to fiber digestion. *Dept. of Animal Science Lecture*. Univ. of Visoca. Vicosa, Brazil. Nov 11. (25)

Factors affecting forage quality. *Dept. of Animal Science Lecture*. Univ. of Visoca, Brazil. Nov 11. (25)

Silage workshop: hands on wet lab. *Amer. Soc. Bovine. Prac. Annual Mtg*. Charlotte, NC. Sept. 27. (30)

The end products of silage fermentation and microbial populations and their relationships to animal performance. *Amer. Soc. Bovine. Prac. Annual Mtg.* Charlotte, NC. Sept 26. (150)

Silage update. *CP Feeds Technical Meeting.* Greenbay, WI. Aug 6. (8)

Bunker management meetings. Big Gain Silage Meetings.(2 presentations) Brainard, MN and Madison, WI. July 21 and 22. (10 and 10)

Burping can be dangerous if you are a ruminant. *4-State Dairy Conference.* Dubuque, IA. June 11. (2 breakout sessions – 30 and 40)

Update on forage and silage management. *4-State Dairy Conference.* Dubuque, IA. June 11. (350)

Managing harvested forages for maximum returns. *Prince Agriculture California Dairy Seminars.* (4 presentations) Hilmar (20), Stockton (45), Tulare (25) and Chowchilla (30), CA. June 2-4.

Strategies for improving the aerobic stability of silages. *California Animal Nutrition Conference.* Fresno, CA. May 21. (200)

Cutting, harvest and storage management of forages. *Alabama Dairy Days.* Auburn, AL. Apr 29. (60)

Direct-fed microbials for dairy cattle. *Prince Agriculture/Phibro Animal Health Cow Academy.* Rochester, NY. Apr 15. (40)

Silage fermentation. *Prince Agriculture/Phibro Animal Health Cow Academy.* Rochester, NY. Apr 14. (40)

Improving forage digestibility. *MidAtlantic Nutrition Conf.* Timonium, MD. Mar 27. (50)

Microbial inoculants. *Big Gain Dairy Seminar.* Hutchinson, MN. Mar 20. (25)

Managing piles and bunker silos. *Big Gain Dairy Seminar.* Sauk Center, MN. Mar 19. (20)

Microbial inoculation of silages. *Feedstuff Bagging Silage Seminar.* Waverly, MN. Mar 19. (25)

Fermentation – Beyond the basics. *Dairy Extension Symposium – Focus on forage – beyond fermentation basics.* *Midwest Animal Science Mtg.* Des Moines, IA. Mar 18. (60)

Sulfur metabolism in the rumen. *Beef/Small ruminant Extension I – Sulfur in ruminants diet symposium.* *Midwest Animal Science Mtg.* Des Moines, IA. Mar 18. (75)

Evaluation of corn silage hybrids. *Pennfield Silage Summit.* Galena, MD. Mar 14. (30)

Using silage inoculants to improve silage quality. *Pennfield Silage Summit.* Galena, MD. Mar 14. (30)

Basic concepts of silage fermentation. *Seedway Dairy Meeting*. Binghamton, NY. Mar 5. (15)

Maximizing the quality of conserved forages. *Seedway Dairy Meeting*. Lowville, NY. Mar 5. (25)

Evaluating corn hybrids using MILK2006 and CornPicker. *Miner Institute Annual Corn Congress Mtg.* Chazy, NY. Mar 4. (100)

Getting the most out of bunks, piles and bag silos. *Miner Institute Annual Corn Congress Mtg.* Chazy, NY. Mar 4. (100)

Managing silage piles. *Vita Plus Dairy Mtg.* Albany, MN. Feb 19. (20)

Cutting, harvest & storage management for forages. *Carver County Dairy Expo*. Cologne, MN. Feb. 18. (2 talks; 50 and 35)

Improving silage with microbial inoculants. *Archer Daniels Midland Nutrition Alliance/Sensenigs Feed Mill Meetings*. Ronks, Pa. Feb 8. (90)

Improving silage with microbial inoculants. *Archer Daniels Midland Nutrition Alliance/Sensenigs Feed Mill Meetings*. Ronks, Pa. Feb 7. (120)

Improving silage with microbial inoculants. *Archer Daniels Midland Nutrition Alliance/Sensenigs Feed Mill Meetings*. New Holland, Pa. Feb 6. (150)

Management and feeding of high corn silage rations. *Inter-Mountain Nutrition Conference*. Salt Lake City, UT. Jan 29. (90)

Effective fiber for dairy cows. *DE Dairy Days*. Hartley, DE. Jan 9. (45)

HONORS AND AWARDS

- 2009 *American Feed Ingredient Dairy Research Award* - in recognition of outstanding research contributions to the American Dairy Industry
- 2007 *Merit Award for Outstanding Excellence – Dairy Extension Team* - in recognition of outstanding contributions to extension practices in DE
- 2003 *Outstanding Master's Graduate Student Advising and Mentoring Award* - in recognition of outstanding mentoring of MS graduate students
- 1999 *Pioneer Hi-Bred Forage Award* – in recognition of outstanding research and education in the area of forage production
- 1982 *National Milk Producers Federation Award* - in recognition of outstanding academic achievement in dairy science and devotion to the practical application of research in the dairy industry

PROFESSIONAL SOCIETIES

American Society of Animal Science
American Dairy Science Association

