

Mark A. Rasmussen

Leopold Center for Sustainable Agriculture
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Education

M.B.A. Iowa State University, Ames, IA (1996)

Ph.D. University of Illinois, Champaign-Urbana, IL (1986)
Emphasis: Microbiology

M.S. University of Nebraska, Lincoln, NE (1979) Emphasis:
Ruminant Nutrition

B.S. University of Nebraska, Lincoln, NE (1976) Animal
Science and Agronomy

Professional History

July 2017-present, Director, Leopold Center for Sustainable Agriculture, Professor of Animal Science, Interdepartmental Microbiology, Iowa State University, 209 Curtiss Hall, Ames, IA 50011. www.leopold.iastate.edu

Manage Leopold Center operation as defined by Iowa Legislature. Develop plans for ongoing operations of the Leopold Center. Provide overall direction of program, lead and coordinate effort of the Center, establish and monitor budgets, manage and allocate resources, maintain and develop external collaborations, represent Center with University administrators, serve as spokesperson for Center, and interact with advisory board, external stakeholders, agricultural and environmental leaders and the general public. Additionally, serve as a tenured faculty member of Department of Animal Science, Interdepartmental Microbiology Program, and Sustainable Agriculture Program with research and lecture responsibilities. Current PRS: 80 Administration, 10 Service, 10 Research.

June 2012-June 2017, Director, Leopold Center for Sustainable Agriculture, Professor of Animal Science, Iowa State University, 209 Curtiss Hall, Ames, IA 50011. www.leopold.iastate.edu

Manage all aspects of Leopold Center operation including budget of \$2.5 million and 16 staff members. Provide overall direction of program, oversee Center grant program, lead and coordinate effort of the Center, establish and monitor budgets, manage and allocate resources, maintain and develop external collaborations, supervise personnel, represent Center with University administrators, serve as spokesperson for Center, and interact with advisory board, external stakeholders, agricultural and environmental leaders and the general public. Significant Center actions as Director include strategic plan development, completion of a review for the Iowa legislature and financial assessment and reorganization of the center. Additionally, serve as a tenured faculty member of Department of Animal Science, Interdepartmental Microbiology, and Sustainable Agriculture Program with research and lecture responsibilities.

April 2010-May 2012. Supervisory Microbiologist, Division Director, GS 0403-15

U.S. Food and Drug Administration, Center for Veterinary Medicine, Office of Research, **Division of Animal and Food Microbiology**, 8401 Muirkirk Road, Laurel, MD, 20708. **Technical regulatory activities:** Subject matter expert to provide technical guidance and research support for regulatory decisions regarding drugs, feed

additives and contaminants in animal feeds. Technical consultant for CVM on GAO studies concerning use of antimicrobials in livestock production. Member of Office of Foods' committee for validation of analytical methods for detection of microbial pathogens in foods and feeds. **Administrative duties:** Oversight responsibilities and supervision of the Division of Animal and Food Microbiology (25 staff members) including personnel for National Antimicrobial Resistance Monitoring System. I monitor research and laboratory activities of division, organize laboratory response to microbiological outbreaks situations and represent the Division and Center to FDA administrators, visitors and public stakeholders. Serve as member of senior management team for Office of Research (100 staff members) with a budget ~\$5.5 million.

March 2009-May 2012. Research Microbiologist, GS 0403-15

U.S. Food and Drug Administration, Center for Veterinary Medicine, Office of Research, Division of Animal and Food Microbiology, 8401 Muirkirk Road, Laurel, MD, 20708. Duties: **Plan and conduct research** designed to determine the presence of microbial pathogens and antimicrobial susceptibility profile of bacteria present in animal feeds and feed ingredients. Develop new research approaches for investigating pathogens found in animal feeds and in animal production environments. Develop and investigate procedures and practices for control of antimicrobial resistance in bacteria. Investigate: 1) Factors related to the presence of antimicrobial residues in distillers grains and 2) Use of efflux pump inhibitors from plants to reverse antimicrobial resistance in bacteria.

2006-2009: SarTec Corp. and Ever Cat Fuels, LLC, Anoka, MN. Recruited to an entrepreneurial opportunity in the agriculture and biofuels industries. Duties: 1) **Team Leader:** development of methods for cultivation of algae to fix carbon dioxide from the flue gas of coal fired electrical generating plants, 2) Member of a development team for biofuels and energy development project using transition metal oxide catalysts for continuous-flow biodiesel production, 3) **Project manager** of animal nutrition research related to use of biofuel co-products, 4) Evaluation of market opportunities for new nutritional products for cattle industry. Responsibilities: Develop new research and product initiatives. Organize research effort with internal scientific staff and external collaborators. Obtain external funding for corporate projects from federal SBIR, USDA Rural Development Programs and corporate investment partners. Serve as technical advisor to administrative and marketing staff. Train undergraduate students from Augsburg College in research protocols and procedures.

2002-2006: Research Leader, GS 0403-15

Pre-Harvest Food Safety and Enteric Disease Unit, USDA, ARS, National Animal Disease Center, Ames, IA **Supervisor and manager** of a research unit with a \$4.5 million research budget and 40 employees. The unit's food safety research consisted of projects on *E. coli*, *Salmonella*, competitive exclusion, antibiotic resistance, *Campylobacter*, plant toxins and gut microbiology/ecology. Responsibilities: **Lead and coordinate research** effort of unit, establish and monitor research budgets, **manage and allocate** research facilities, monitor external collaborations and contracts, supervise personnel, spokesperson for unit, interact with stakeholders and USDA officials. **Large research organization management and administrative duties:** Research Leader's served as members of **NADC Senior Management Team**. Additional service: NADC microbial agent inventory committee, USDA Ames Combined Support Services Plan, Ames Area A76 outside contracting committee and **evaluation panel for ARS Research Promotion and Evaluation System, 1999-2006.**

2000-2006: Lead Scientist/Microbiologist, GS 0403-14,15
USDA, ARS, National Animal Disease Center, Ames, IA

Direct food safety and animal health research projects: 1) Investigate **rumen protozoa as reservoirs** of bacterial pathogens and identify methods for rumen defaunation using plant extracts. Demonstrate proof of concept and present research results to other researchers and to industry. 2) Nutritional evaluation of plant secondary compounds. Effect of furan fatty acids on chickens. 3) **Subacute rumen acidosis in dairy cattle;** diagnosis, treatment and prevention using probiotic bacterial cultures of *Prevotella*. Established collaboration with Iowa State University and Agri-Food Canada to test efficacy in dairy cattle.

1996-2006: Lead Scientist/Microbiologist, GS 0403-13,14,15

USDA, ARS, National Animal Disease Center, Ames, IA **Entrepreneurship in Food Safety Technology:** Discovery, development and **commercialization** of an optical instrument technology based upon chlorophyll metabolites in the GI tract useful for the real-time detection of fecal contamination on animal carcasses. Member

of a three-person joint USDA and ISU discovery team. Responsibilities: Research and development, coordination of government, academic and industry development effort, pursuit of patent rights, technology transfer to private industry. Results: Patent issued 1999, prototype instruments assembled, and feasibility demonstrated to over 75 industry contacts, technology reviewed by numerous industry and public media outlets, technology transferred through license and research agreement to competitively selected firm for commercial development. Technology in use by domestic and international meat processing firms under the trade name VerifEYE™. Technology named as best practice for meat processing industry. This imaging technology was recognized in 2012 by **Iowa State as ranking 14th in lifetime earnings** generated for the university as a result of technology transfer activities.

1992-2006: Faculty, Collaborator status, Iowa State University, Department of Animal Science and Department of Biomedical Sciences, College of Veterinary Medicine.

Duties: **Lecturer in charge**, Animal Science/Microbiology 610, Microbiology of the Digestive Tract, 1991 to 1998. Lecturer for Animal Science 519, Ruminant Digestive Physiology, 2000-2006. Member of Graduate Faculty 1995-2006, 2012-present.

**1993-1996: Research Scientist/Microbiologist, GS 0403-13
USDA, ARS, National Animal Disease Center, Ames, IA**

Food Safety Research: **Ecology of *Escherichia coli* 0157:H7 in cattle**. Responsibilities: **Conduct and coordinate research**; establish research agreements with universities and industry; supervise students, postdoctoral associates, technicians, and summer interns; communicate research results. Results: Demonstrated that pre-slaughter feeding management can influence the microbiology of the GI tract. Dietary stress can increase the potential for pathogenic *E. coli* to establish in the gut which in turn can alter the risk of food-borne pathogen contamination of carcasses during processing. Results widely cited and considered influential to others in the field.

1995: Research Leader, USDA, ARS, National Animal Disease Center, Physiopathology Unit, Ames, IA

Due to a retirement, assigned to a rotating, temporary position as supervisor of research unit with a \$2.9 million research budget and 40 employees. Responsibilities: Coordinate research programs, monitor budgets, communicate unit research to internal and external stakeholders.

1988-1993: Microbiologist, USDA, ARS, National Animal Disease Center, Ames, IA

Research: Rumen metabolism of plant toxins. Responsibilities: Laboratory and animal research, laboratory personnel supervision, data analysis, and communication of research results. Results: 1) Identification of microbes responsible for selenium metabolism in the rumen. 2) Description of rumen microbial metabolism of lathyrogenic, non-protein amino acids contained in *Lathyrus sylvestris* (flatpea) in collaboration with ARS West Virginia laboratory, Beaver, WV. 3) Investigation of rumen degradation of fescue alkaloids in collaboration with Virginia Tech, Blacksburg, VA.

1986-1988: Research Scientist, Eastman Chemical Company, Eastman Kodak, Kingsport, TN

Research Duties: Discovery research in various aspects of animal nutrition and microbiology with an emphasis on cellulose digestion and fermentation. Responsibilities: Project manager, personnel supervision, research planning and coordination, data analysis and technical consultant to the marketing staff. Project successes: 1. Development of cellulose derivatives which disrupt microbial digestion of cellulose in the termite gut and thus provide an environmentally safe means of termite control. 2. Investigate production of kojic acid through fermentation for use as an intermediate feedstock in chemical synthesis. Biological research division eliminated by corporate restructuring, 1988.

1979-1981: Self-employed in production agriculture, Nebraska

Production and financial management of beef cattle (feedlot & brood cows), grain, and forage enterprises (~\$750,000 gross sales annually) on family farm near Hubbard, Nebraska.

1976-1977: Adjunct Faculty, Western Iowa Technical Community College, Sioux City, IA

Courses taught: Soils and Fertilizer Technology.

Academic and Other Service

- Consultation Clara Rayburn and team on sustainable food production, Silver Springs MD high school students, C-Span's Student Cam documentary competition, 2020, <https://youtu.be/UuOJ411YnsY>
- Session Moderator, Microbiology session, 13th Symp. Undergrad. Res. ISU Memorial Union, April 17, 2019.
- GPSA poster judge, ISU Memorial Union, April 24, 2019.
- Book reviewer: Columbia University Press. Sustainable Food Production: A Primer for the Twenty-First Century, authors Naeem, S., van Huysen, T., and Lipon, S., 2019.
- Serve as advisory board member for Midwest Grape and Wine Industry Institute, Iowa State University, 2012–present.
- Iowa State University Sustainability Committee, 2019-present.
- Faculty Advisor, ISU Iowa Learning Farms, 2018-present.
- Mentor, ISU Undergraduate Honors Student, Grace German, Animal Science, 2019-2020.
- Mentor, ISU Undergraduate Honors Student, Jazlyn Beeck, Geology, 2019-2020.
- **Graduate student advisor**, Jasmine Carroll, MS graduate student in microbiology. Project: Prevalence of APEC and antibiotic resistance of *E. coli* in poultry, 2015-2017. Iowa State University.
- Mentor, ISU Undergraduate Honors Student, Sam Sparland, Chemical Engineering, 2015-2016.
- Panel member, Postdoctoral Scholars' Professional Development Workshop, September 2015, Iowa State University.
- **Reviewer for Institute of Medicine** and National Research Council, A framework for assessing effects of the food system. Washington DC, 2015.
- Host and meeting organizer, DuPont Sustainability Committee, Ames, IA, 2015.
- Evaluator, Global Youth Institute, The World Food Prize, Des Moines, IA, 2014.
- Guest lecturer, University of Northern Iowa, Geog. 3220, Environmental Geography, Cedar Falls, IA, 2014.
- **Grant Reviewer, Minnesota Environment and Natural Resources Trust Fund, 2013.**
- External Evaluator, Faculty Tenure and Promotion, Department of Animal Sciences, The Ohio State University, Columbus, 2011.
- USDA/NIFA grant review panel service. Washington DC 2010.
- **FDA/CVM Master Regulatory Reviewer** promotion panel, 2010 - 2012.
- Undergraduate student advisor and supervisor, Augsburg College, Minneapolis, MN. Microbiological and algae culture projects. 2006-2009.
- **Graduate student advisor** and POS committee member, Department of Biomedical Sciences, Department of Food Science and Human Nutrition, Department of Animal Science, Interdepartmental programs in Toxicology and Microbiology, Iowa State University, 1992-2006. Various research projects for 18 students.
- **RPES** Panel service for the ARS, Research Promotion and Evaluation System, 1999-2006.
- **Professional Memberships:** American Society for Microbiology, Society for Industrial Microbiology, Nutritional Science Council, Sigma Xi.
- **President**, North Central Branch, American Society for Microbiology, 1998-2000; 2004-2005.
- Chair, organizing committee for annual meeting, North Central Branch-American Society for Microbiology, 1999 and 2005.
- Member, Combined Services Planning Committee, National Center for Animal Health, Ames, 2004-2005.
- Chair/member NADC Safety Committee, 1999-2002.
- Chair/member: Ames Area Combined Federal Campaign Committee, 2003-2006.
- Synod Council Member, Northeast Iowa Synod of ELCA, 2002-2005.
- Appointed member of “**ARS Committee on Ethics in Science**” Term of appointment: 2002-2004.
- Member of Organizing Committee, 4th International Conference on Emerging Zoonoses, 2003.
- Trustee, Colo-NESCO Educational Foundation, 1999-2001.
- Trustee, Zearing Public Library, Zearing IA. 1996-1999.
- USDA special assignment, Radiation Joint Planning Requirements Committee, 1996.
- **Member of the Graduate Faculty**, Iowa State University, Ames, IA; 1995-2006.
- Member of local planning committee and moderator for International Round Table on Livestock Odor Control, Iowa State University, Ames, 1994 and 1995.

- **Treasurer**, Conference on Rumen Function, 1993-2000.
 - Ames Area Civil Rights Committee, 1993-1996.
 - NADC Library Committee, 1992-2002.
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University Teaching

2020: Animal Science 603, Graduate Animal Nutrition Seminar, Iowa State University, Fall Semester, with Dr. Dawn Koltes.

2020: Animal Science 520, Digestive Physiology and Metabolism of Ruminants, Iowa State University, Spring Semester, Dr. Ranga Appuhamy.

2019: Guest panelist, Career Planning, U St 275x, Iowa State University, Fall Semester, Dr. Svitlana Zbarska.

2019: Guest Lecturer, "Shedding Some Light on Food Safety: An Entrepreneurial Tale, Food Science Human Nutrition 489, Iowa State University, Spring Semester, Dr. Lakshman Rajagopal.

2018: Animal Science 520, Digestive Physiology and Metabolism of Ruminants, Iowa State University, Spring Semester, Dr. Ranga Appuhamy.

2016: Guest Lecturer, Climate and Soil Carbonate, Chemical Engineering 430, Process and Plant Design, Iowa State University, Spring Semester, Dr. Cory Stiehl.

2015: Microbiology 604, Graduate Student Seminar. Iowa State University, Spring Semester. Dr. Laura Jarboe.

2015: Animal Science 603, Graduate Animal Nutrition Seminar. Iowa State University, Fall Semester. With Dr. James Russell.

2014: Animal Science 520, Digestive Physiology and Metabolism of Ruminants, and Veterinary Microbiology 525X, Intestinal Microbiology. Iowa State University. Spring Semester. Dr. James Russell and Dr. Nancy Cornick.

2011: Animal Science 340, Animal Health Management, Introduction to Gut Microbiology. University of Maryland. Spring semester. Dr. Sarah Balcom.

2000-2006: Animal Science 519, Digestive Physiology of Ruminants, Rumen Microbiology. Iowa State University. Spring semester. Dr. Allen Trenkle and Dr. James Russell.

2002-2005: Lecturer, Sociology 541, Agricultural Technological Innovation, Social Change and Development. Iowa State University. Fall semester. Dr. Robert Mazur.

1991-1998: Animal Science 610, Microbiology of the Digestive Tract. Iowa State University. Fall semester.

Advisor and POS Committee Service, Graduate Students, Iowa State University

Josie Booth: Animal Science

Yan Zheng: Human Nutrition

Ann Simons: Toxicology

Fernando Rodriguez: Microbiology

Akif Karsli: Animal Science

Kyle Ashby: Chemistry
 Elizabeth Davison: Dartmouth College
 Rhona Daly: University of Glasgow, UK
 Lisa Pelan: Veterinary Microbiology
 Sylvia Wawrzyniak: Animal Science
 Sara Johansson-Cutler: Animal Science
 Semakaleng Lebepe: Human Nutrition
 Siska Tjandrakusuma: Chemistry
 Jennifer McDowell: University of Glasgow, UK
 Vibhu Sharma: Chemical Engineering
 Maria Andrea Cerrillo: Animal Science
 Sylvia Duncan: Rowett Institute, UK
 Robin Anderson: Microbiology
 Jasmine Carroll: Microbiology

Manuscript/Proposal Review Service

American Journal of Physiology, Anaerobe, Applied Environmental Microbiology, BioResource Technology, Current Microbiology, Epidemiology and Infection, Foodborne Pathogens and Disease, Letters in Applied Microbiology, Microbiology, Journal of Agriculture and Food Chemistry, Journal of Animal Science, Journal of Applied Microbiology, Journal of Dairy Science, Journal of Range Management, Journal of the Science of Food and Agriculture, Preventative Veterinary Medicine, Sea Grant Program, USDA NRI, USDA SBIR, USDA NFIA.

Research Funding Activity (all grants total, ~\$3,440,000)

- Preventing the destruction of 6 billion animals annually using non-invasive *in ovo* sex detection in fertile layer eggs. 2019. With S. Lamont and J. Petrich, J. USDA NIFA, **\$500,000**.
- Validation of fluorescence analysis of grass-fed milk. 2017. With L. Peterman and J. Petrich. CROPP/FAFO, **\$42,000**.
- Rapid and comprehensive detection of antimicrobial resistance in bacterial pathogens. 2011. With R. Roberts et al. FDA Medical Countermeasures Initiative, **\$644,000**.
- Ultrafast continuous biodiesel production from multiple feedstocks using fixed bed reactors and metal oxide catalysts. 2009. For SarTec Corp. USDA SBIR, Phase II Contract, **\$350,000**.
- A novel system for the sequestration and conversion of carbon dioxide to useful products using stable metal oxide catalysts. 2009. For SarTec Corp. DOE SBIR, Phase I Contract, **\$100,000**.
- Continuous biodiesel production from multiple source feedstocks using zirconia catalyst. 2008. For SarTec Corp. USDA SBIR, Phase I Contract, **\$80,000**.
- Flue gas CO₂ capture with rapid growth algae to produce renewable fuel. 2008. With Clayton McNeff and Arlin Gyberg. Xcel Energy Contract, Renewable Development Fund, **\$350,000**.
- Algae culture systems and CO₂ fixation from power plant emissions. 2007. With Clayton McNeff and Arlin Gyberg. Great River Energy Contract, Renewable Energy Fund, **\$180,000**.
- Elimination of pathogens from livestock using a combination of Yucca saponins and sodium chlorate. 2006. With C. McNeff and R. Anderson. USDA SBIR, **\$80,000**.
- Characterization of the relationship between rumen protozoa and enhanced Salmonella virulence. 2004. With S. Carlson. National Cattlemen's Beef Association, **\$24,870**.
- Identification and detection of TSE infected tissues/animals using fluorescent spectroscopy. 2003. With J. Petrich et al. National Cattlemen's Beef Association, **\$40,000**. (declined over intellectual property issues)
- Development of methods for the real time and rapid identification and detection of TSE in living animals using fluorescent spectroscopy of the eye. 2003. With J. Petrich et. al. U.S. Dept. of Defense, **\$544,641**.
- Identification and detection of TSE infected tissues/animals using fluorescent spectroscopy. 2003. With J. Petrich. Iowa State Univ. Research Foundation, **\$30,000**.

- Real-time detection of factors contributing to bovine spongiform encephalopathy (BSE) and Creutzfeldt-Jakob Disease (CJD). 2002. With J. Petrich and T. Casey. Iowa State Univ. Research Foundation, **\$25,000.**
- Spectral analysis of the optical signatures of feces. 2002. With J. Petrich and T. Casey. eMerge Interactive, **\$28,804.**
- Detection of fecal contamination: Applications to the pork industry. 1999. With J. Petrich and T. Casey. Food Safety Consortium, **\$20,000.**
- Development of a prototype for the detection of fecal contamination. 1999. With J. Petrich and T. Casey. CATD, Iowa State Univ., **\$10,000.**
- Methods for detecting contamination on meat. 1999. With J. Petrich and T. Casey. eMerge Visions Systems CRADA, **\$150,000.**
- Real time detection of fecal and ingesta contamination. 1999. With J. Petrich. USDA Special Food Safety Grant, **\$151,876.**
- Cancer susceptibility: Modification with gut microflora. 1998. With S. Lebepe and S Hendrich. ISU Nutritional Science Council, **\$10,000.**
- Method and system for detecting contamination on meat carcasses. 1998. With J. Petrich and T. Casey. Iowa State Univ. Research Foundaton, **\$28,000.**
- Effect of Horse-Bac liquid on nutrient digestibility, gut physiology, and the response to exercise in horses. 1998. With P. Miller. TransAgra, **\$45,000.**
- A case of bovine resistance to fescue toxicosis: 1993. Potential for rumen modification. M. Rasmussen. Biotechnology Research and Development Corporation, **\$20,000.**
- Effect of feed withdrawal prior to slaughter on the population dynamics of food-borne pathogens in and the colon and feces of swine. 1993. With I. Wesley. National Pork Producers Council, **\$30,000**

Personal Invitations/Technical Research Presentations

- Invited Panelist: Harkin on Wellness Symposium, The Harkin Institute for Public Policy and Citizen Engagement, Drake University, 3/8/2021.
- Blog: It's a Matter of Trust. Iowa Learning Farms, Iowa State University, 9/2020. <https://iowalearningfarms.wordpress.com/2020/09/17/its-a-matter-of-trust/>
- Invited panelist: Agriculture and Climate. **Midwest Climate Summit**, Washington University, St. Louis, MO, 11/6/20.
- Invited presentation: Grassland, Climate and Cattle: Its Complicated. **Green Lands and Blue Water**, Minneapolis, MN, 11/19/19.
- Invited presentation: Livestock and Sustainable Agriculture. Future of Agriculture Conference, Whiterock Conservancy, Coon Rapids, IA, 11/14/19.
- Invited podcast: Cattle, Climate and Methane, Iowa Beef Center, 8/2019.
- Invited panelist: Improving post-mortem inspection of beef for human health. **Inter. Assn. Food Protection**, Louisville, KY, 7/24/19.
- Invited presentation: "Ruminants and grazing", **Stone Barns Center for Food and Agriculture**, Pocantico Hills, NY, 7/18/2019.
- Invited webinar: Are cattle really wrecking the planet? Iowa Learning Farms, Ames, IA, 3/20/2019.
- Invited presentation: Muddy Waters: The continuing story of the Leopold Center. Leopold and Agriculture Conference, Burlington, IA, 3/16/2019.
- Invited presentation: Climate Agriculture and Carbon. Ames Garden Club, Ames, IA, 2/21/19.
- Numerous interviews to radio, newspaper and magazine outlets as well as presentations before civic, agricultural and business organizations on the programs and activities of the Leopold Center. Throughout Iowa, 2012-present.
- Leopold Center quarterly newsletter: Conversations with the Director. Select recent titles: Is absentee farmland ownership a bad thing; An inconvenient landscape; When used according to label directions; Greening up what we eat; Can independent farmers survive; Erosion; For the Greater Good.

www.leopold.iastate.edu, 2012 to present.

- Invited presentation: Role of livestock in conservation systems. Sustaining our Iowa Land, Drake University, Des Moines, IA, 11/19/2015.
- Invited presentation: Agricultural sustainability: Some issues to consider. **DuPont Sustainability Committee**, Ames IA, 8/20/2015.
- Invited presentation: The challenges of sustainable agriculture in the corn-belt. **Philadelphia Society for Promoting Agriculture**, Philadelphia, PA, 6/4/2015.
- Invited presentation: Agricultural sustainability: Start with the soil. **Tuskegee University**, Tuskegee, AL, 4/8/2015.
- Seminar: GMOs the saga continues. Graduate Program in Sustainable Agriculture, Iowa State University, Ames, 1/14/2015.
- Invited presentation: The challenges of sustainable agriculture. Osher Lifelong Learning Institute, Ames, IA, 10/8/2014.
- Invited presentation: A Leopold Center summary on agriculture. **U.S. State Department**, Ames, IA, 8/21/2014.
- Invited presentation: Alternative agriculture and the Leopold Center. Young Professionals in Agriculture, Des Moines, IA, 2/11/2014.
- Invited presentation: Food Safety and FSMA. Stone Barns Board of Directors, Tarrytown, NY, 9/16/2013.
- Invited presentation: Alternative and sustainable agriculture. USDA/NCAUR, Peoria, IL, 8/22/2013.
- Invited presentation: Historical perspectives on microbial ecology and NADC's enteric disease research, 1st International NADC Animal Health and Food Safety Research Symposium, Ames, IA 11/9/2011.
- Presentation: OR/CVM distillers grains antimicrobial residue research update. Ann. Meet. CVM Field Committee, Rockville, MD 3/3/2011.
- Presentation: Antimicrobial resistance: Plant secondary compounds as efflux pump inhibitors. Amer. Registry of Prof. Anim. Sci., Beltsville, MD, 9/15/2010.
- Presentation: Research update, OR feeds microbiology program. Ann. Meet. CVM Field Committee, Bethesda, MD, 3/4/2010.
- Invited presentation: Microbial aspects of feeding livestock. **Center for Veterinary Medicine/FDA**, Laurel, MD, 12/12/2008.
- **Interview, WCCO Radio** with Don Shelby, Minneapolis, MN, "Biodiesel production using algae". 10/29/2008.
- Invited presentation: A novel continuous catalytic system for biodiesel production from algae. National Algae Association Meeting, The Woodlands, TX, 7/17/2008.
- Invited presentation: Research, innovation and opportunity in a bio-based economy. **Oregon State University**, Corvallis, OR, 7/11/2008.
- Invited presentation: A rumen full of research. University of Vermont, Burlington, VT, 5/8/2008.
- Invited presentation: Carbon dioxide management through algae cultivation. Biosciences Regional Conference, Minnesota West Community and Technical College, Worthington, MN, 3/28/2008.
- Invited presentation: An inside view of rumen protozoa. Department of Microbiology, South Dakota State University, Brookings, SD, 2/29/2008.
- Invited presentation: Food safety research: A view from within the animal. School of Veterinary Medicine, **University of California**, Davis, CA, 11/29/2007.
- Invited presentation: Cultivation of algae for fixation of carbon dioxide. **Minnesota Society of Professional Engineers**. Minneapolis, MN, 11/6/2007.
- Presentation: Carbon dioxide fixation at coal fired electrical generating plants using photosynthetic microbes. **Great River Energy**, Elk River, MN, 10/24/2007.
- Presentation: Research progress in rumen microbiology and physiology. Novus International, Inc. St. Charles, MO, 10/3/2007.
- Presentation: Progress in ruminant nutritional research. **Land O Lakes Purina**, LongView Animal Nutrition Center, Gray Summit, MO, 9/17/2007.
- Presentation: Cultivation of algae for carbon dioxide fixation and production of lipid feedstocks for biodiesel. **Xcel Energy**, Minneapolis, MN, 6/27/2007.
- Presentation: So just what goes on in the rumen? SarTec feedlot manager seminar, Las Vegas, NV,

12/5/2006.

- Invited presentation: Agricultural production, research and technology transfer. Department of Animal Science, **South Dakota State University**, Brookings, SD, 4/20/2006.
- Invited presentation: Rumen microbiology research at the National Animal Disease Center. Beef Day, Colorado Farm Show, Greeley, CO, 1/25/2006.
- Invited presentation: Control of pathogens using rumen defaunation. **Rushmore Conference on Enteric Diseases**, Rapid City, SD, 9/29/2005.
- Invited presentation: Rumen protozoa: A view from within. Iowa Feed and Nutrition Conference, Ames, IA, 4/5/2005.
- Invited presentation: Control of acidosis with *Prevotella*, Department of Animal Science, The Ohio State University, Wooster, OH, 6/30/2005.
- Invited presentation: Rumen protozoa: Friend or foe? SarTec seminar, Las Vegas, NV, 12/7/2004.
- Invited presentation: Rumen microbiology and food safety research at the National Animal Disease Center. Nutrition Services Associates annual meeting, San Antonio, TX, 9/8/2004.
- **Wise Burroughs Lecture**, Shedding light on food safety: The glare of carcass contamination, Iowa State University, Ames, IA, 2/18/2004.
- Invited presentation: Fluorescent detection of fecal contamination on carcasses. FSIS Workshop for Industry. Omaha, NE, 1/13/2004.
- Invited presentation, Control of rumen acidosis, Diamond V Mills, Cedar Rapids, IA, 2003.
- Invited presentation, Feed ingredients, phytochemicals and food safety pathogens, Southern Plains ARS Food Safety Stakeholder Meeting. College Station, TX, 2003.
- Invited presentation: Food safety research at NADC. **U.S. Animal Health Association**, St Louis, MO, 2002.
- **Paid Consultant**, Hoechst-Roussel Vet, Gut microbiology and antibiotic use in animal agriculture, 1999.
- Invited Participant: International *E coli*/Food Safety Workshop, Aberdeen, Scotland, 1998.
- **Interview, BBC Radio Scotland**, "The American experience with *E. coli* O157". 1998.
- Invited presentation, Rumen manipulation: New ideas to increase animal performance, Moormans, Quincy, IL, 1996
- Invited presentation, Duke's Club, Engineering rumen bacteria to metabolize plant toxins: Progress and problems, ISU School of Veterinary Medicine, 1996
- Invited presentation, Induction of hepatogenous photosensitivity by steroidal saponins: Role of the rumen, ISU Veterinary Physiology and Pharmacology Seminar, 1996.
- Invited Presentation, Degradation of plant toxins by ruminal microbes, Department of Veterinary Science, North Dakota State University, Fargo, ND, 1996.
- Invited presentation: Dietary stress and *E. coli* O157:H7, an ecological interpretation, **International Meat and Poultry HACCP Alliance Symposium**, Texas A&M, College Station, TX, 1994.
- **Consultant: National Livestock and Meat Board**: Blue Ribbon Task Force on *Escherichia coli* O157:H7, 1993.
- Invited presentation: Rumen microbial degradation of flatpea (*Lathyrus*) toxins, Department of Animal Science, Virginia Polytechnic Institute and State University, Blacksburg, VA, 1992.

Select Articles/Presentations by others on Research of Rasmussen et al.

- Moskvitch, K. "Glow in cattle's eyes may be a sign of mad cow disease." BBC News. September 11, 2010.
- Lundeen, T. "Cattle eyes may give clue to BSE." Feedstuffs. June 2, 2010.
- Fountain, H. "A simple test to detect nervous tissue in beef." The New York Times. August 12, 2008.
- Levy, P. "A blooming solution to gas crisis?" Minneapolis Star Tribune. July 14, 2008.
- Buntjei, J. "Researchers on the cutting edge." Worthington Daily Globe. March 28, 2008

- Lundeen, T. “Cattle protozoa shift antibiotic resistance.” *Feedstuffs*. October 16, 2006.
- Bertin-Cavarait, C. “Les protozoaires peuvent induire un caractère hyperinvasif chez les salmonellas.” *La Semaine Vétérinaire*. October 28, 2006.
- Bertin-Cavarait, C. “Les protozoaires du rumen sont impliqués dans le transfert de l’antibiorésistance.” **La Semaine Vétérinaire**. October 28, 2006.
- Portera, C. “Rumen protozoa boost Salmonella virulence, foster gene exchange.” *ASM Microbe*. May, 2006.
- Pons, L. “Keeping meat and poultry safe.” *ARS Agricultural Research*. October, 2006.
- Pons, L. “Protozoa bolster bacterial virulence inside animals.” *ARS Agricultural Research*. February, 2006.
- Lundeen, T. “Rumen protozoa.” *Nutrition & Health: Dairy, Feedstuffs*. February 13, 2006.
- **Modern Marvels, The History Channel**, “The Butcher.” Meat processing technology. February 1, 2005.
- Quaife, T. “No place to hide: Defaunation can remove a sanctuary for pathogenic Salmonella bacteria.” **Dairy Herd Management**. September, 2005.
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Awards and Recognition

- **Distinguished Achievement in Agriculture**, Gamma Sigma Delta, Iowa State Chapter, April 2020.
- **Deans Citation for Extraordinary Contributions**, College of Agriculture and Life Sciences, Iowa State University, March 2018.
- **FDA Outstanding Intercenter Scientific Collaboration Award**, CSI-Feed: Contamination with Salmonella Investigation Team, 2013.
- *U.S. Secretary of Agriculture’s Honors Award for Food Safety*, 2004.
- **ARS Award** for Superior Technology Transfer Achievement, 2003.
- Awarded **Federal Laboratory Consortium, Technology Transfer Award** for Carcass Contamination Imaging Technology, 2002.
- **Iowa “da Vinci” citation** for Science, Engineering and Technology Development, 2001.
- Awarded **R&D 100 Award** for Carcass Contamination Imaging Technology, *R&D Magazine*, 2000.
- Awarded **U.S. Patent #5,459,053**, 1995; and **#5,914,247**, 1999.
- **Beta Gamma Sigma**, Business Honor Society, Iowa State University, Ames, IA, 1995.

- USDA, ARS Certificate of Merit Awards, 1993-1999, 2004-2005.

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