

Richard S. Gates

Professor

University of Illinois at Urbana-Champaign

Department of Agricultural and Biological Engineering

Education

Ph.D.	Biological Engineering, Cornell University	1984
M.S.	Agricultural Engineering, Cornell University	1980
B.S.	Agricultural Engineering, University of Minnesota	1978

Professional Experience

Professor, Agricultural and Biological Engineering, University of Illinois at Urbana-Champaign	2008-present
Graduate Faculty, Faculty of Agric. Engineering, Federal University of Viçosa	2001-present
Chair, Biosystems and Agricultural Engineering, University of Kentucky	2002-2007
Professor, Biosystems and Agricultural Engineering, University of Kentucky	1996-2008
Associate Professor, Biosystems and Agricultural Engineering, University of Kentucky	1990-1996
Assistant Professor, Biosystems and Agricultural Engineering, University of Kentucky	1985-1990
Senior Research Support Specialist, Cornell University	1984-1985
Senior Systems Analyst, Cornell University	1983-1984

Research Interests

Research includes controlled environment systems research, with emphasis on biological and physiological responses and interactions between occupants and environment; controlled environment systems analysis, control and simulation; control systems development for controlled environment agriculture; post-harvest loss measurements; animal welfare in modern livestock farming; precision livestock farming.

Teaching

Teaching undergraduate and graduate courses in probability and statistics, thermal environmental engineering, controlled environment systems, residential housing design, computer aided design, structures and environment, psychrometrics, instrumentation, data acquisition and control, instrumentation, linear and nonlinear systems optimization.

Courses:

ABE 100 – Introduction to Agricultural & Biological Engineering (2009-2013)

TSM 311 – Humanity in the Food Web (2009-2012)

TSM 371 – Residential Housing Design (2009 – present, spring semester)

TSM 130 – Introduction to CAD (2011 – present)

ANSCI 205 and 403 – Guest lectures (4) each spring semester (2014-present)

Advisor – for 1/3 of TSM students (presently) and 50% of entering freshman and sophomores in ABE (2012-2016)

Current Extension and Consulting

Extension and consulting related to applications of research, including air emissions and mitigation, odor and siting issues, greenhouse and livestock environment control systems and livestock heat stress reduction.

Awards

Advising award, College of Engineering	2014, 2015
Fellow, American Society of Agricultural and Biological Engineering (ASABE)	2010
Presidential Citation for “ <i>Dedicating an Extraordinary Amount of Time and Effort to Ensure a Successful and Effective International Livestock Environment Symposium</i> ”, American Society of Agricultural and Biological Engineers	2009
ASABE Honorable Mention Paper Award for Ammonia Emissions from Two Empty Broiler Houses with Built-up Litter	2009
Presidential Citation for Leadership in Chairing the International Livestock Environment Symposium VIII, American Society of Agricultural and Biological Engineers (ASABE)	2008
Henry Giese Structures and Environment Award, American Society of Agricultural and Biological Engineers (ASABE)	2006
ASABE (ASAE) Superior Paper Awards	2014, 2013, 2005, 2004, 1996, 1995, 1989, 1987
ASHRAE Best Poster Award	1995
Outstanding Teacher Award, College of Engineering, Tau Beta Pi, and Department of Agricultural Engineering, University of Kentucky	1995

Professional Organization Membership

Registered Professional Engineer: KY PE-14892	1987-present
National Society of Professional Engineering	2017-present
American Society of Agricultural and Biological Engineers (ASABE)	1986-present
American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE)	1995-present
International Federation of Automatic Control (IFAC)	1995-present
International Commission of Agricultural Engineering (CIGR)	1986-present
Poultry Science Association (PSA)	1988- present
World Poultry Association (WPA)	2001-present
Council for Agricultural Science and Technology (CAST)	1997-2002

Professional Society Activity

ASABE Board of Directors	2008-2010
CIGR Section 2, Farm Buildings, Systems, Structures and Environment, Board Member – 1 of 2 American representatives	2002-present
ASAE Associate Editor, Structures and Environment Division	2000-2002 and 1990-1995
ASAE Nominating Committee	1999-2001
ASAE Technical Committee SE-301 Environmental Physiology	1987-present
ASAE Technical Committee SE-302 Greenhouse Environment Chairman, Vice Chair, Secretary	1997-1999
ASAE SE-405 Poultry Housing Systems (twice through officer rotation)	1987-present
ASHRAE Technical Committee 2.1 Plant and Animal Environments (Chair, Project Monitoring Subcommittee on \$125,000 grant to obtain Modern Poultry Heat and Moisture Production relations)	1995-present 1999-2003
Bluegrass Chapter of ASHRAE: past officer, Board of Governors	1998-2000

Honor Society Membership

Gamma Sigma Delta (Agriculture)	1990-present
Sigma Xi (Research)	1982-present
Alpha Epsilon (Agricultural Engineering)	1977-present

Patent

Timmons, M.B. and R.S. Gates. Method for controlling environment conditions of living organisms based upon time integrated variables. U.S. Patent Office Patent Number 5,573,199.	1995
---	------

Consulting

4/9 Livestock LLC	Danville, IN	2016-present
US Grains Council	Beijing, China	2014-present
Asian Agribusiness Consulting	Beijing, China	2015
Maxwell Farms	Winchester, IN	2014-2015
National Pork Producers Council	Des Moines, IA	2011-12
American Egg Board, National Pork Producers Council Independent Reviewer for National Air Emissions Monitoring project (US EPA Air Consent Agreement)		2009
Iowa State University	Ames, IA	1999, 2001
Heartland Pork Enterprises	Iowa Falls, IA	2000-2002
Cargill's Shady Brook Farms	Dayton, VA	2003
The Hanor Company	White Hall, IL	1999
AMBIAGRO – Núcleo de Pesquisa em Ambiência e Arquitetura de Sistemas Agro-Industriais, Federal University of Viçosa (UFV), Departamento de Engenharia Agrícola UFV	Viçosa, Brazil	2002-2008
Research Concepts, Inc.	Lenexa, KS	1992-1999
Ajinomoto-Heartland, Inc.	Chicago, IL	1998-2004
North Carolina State University	Raleigh, NC	1995

Sabbatical Leaves

Federal University of Viçosa, Dept of Agricultural Engineering, Brazil	Aug 2015 – 2016
Iowa State University, Department of Agricultural and Biosystems, Ames IA	Aug 2000- July 2001
University of Natal, Pietermaritzburg, South Africa	Jan-Aug 1993
Agricultural University of Athens, Greece	Jun-Jul 1993
Kitasato University, Towada-Shi, Aomori Japan	Jul-Aug 1993

Public Service Activities

Prof. Gates was the U.S. member of:

1. 3-person review team for the Biosystems Engineering program at the University of Sao Paulo – Pirassunga. This is the first review of the first such program in South America. 19-21 August 2015.
2. 6-person review team for the Catholic University of Belgium, the first such review that this University had ever commissioned. 2012.

Leader on undergraduate exchange programs between two Brazil Universities and the University of Illinois, and previously lead with Purdue on a funded Department of Education grant to establish the network.

Liaison for cooperative agreement between University of Kentucky and the Federal University of Viçosa, Brazil. This agreement provided a framework for exchange of students and faculty. The agreement was signed in September 2001 in Viçosa, with subsequent faculty and staff visits in 2002-2008.

Review manuscripts for:

Transactions of the ASABE/ASAE	annually
Biosystems Engineering	
Journal of Applied Engineering in Agriculture	annually
Journal of Applied Poultry Research	annually
Poultry Science	annually
ASHRAE Transactions	periodically
Scientia Agrícola (Brazil)	annually
IEEE CSM	2002
Computers & Electronics in Agriculture	periodically
Acta Horticultura	periodically

Review research proposals for:

USDA Agricultural Research Service	2010
USDA Small Business Innovative Research (SBIR)	1997-2008
USDA National Research Initiative (NRI) Competitive Grants Program. Served as Panel Manager several times in 1990s and 2000s.	Annually
U.S.-Israel Bi-National Agricultural Research Development (BARD)	1999, 2002, 2008, 2009
Ohio Agricultural Research and Development Center	1998, 2005
Belgium Research in Controlled Environment Agriculture	1994, 1999, 2001, 2003, 2008, 2010
U.S. EPA SBIR Panelist	2006, 2007
U.S. Department of Energy	2008
	2005, 2007
USDA NRI Agricultural Air Quality Panelist	
USDA SBIR Plant Production and Protection (Engineering): Topic Manager	2000
Panelist	1999
USDA NRI Agricultural Systems: Panel Manager and Panelist	1996, 1997, 1998
Review personnel dossiers for promotion and tenure, typically 3-6/yr	2000-present
Review USDA/ARS manuscripts for Beltsville, MD; Clay Center, NE; and Starkville, MS staff scientists (2-4 annually)	2000-present

Other Professional Service

Kentucky Rural Energy Consortium Co-founder, Research Programs Coordinator	2001-2008
United Egg Producers Environmental Scientific Panel, Research Subcommittee Chair	2003-2012
American Egg Board Project on "Social Sustainability of US Egg Production," Environment white paper task force.	2008-2014
External Examiner:	2008, 2005,
University of Natal, South Africa	2002, 1999,
1999 Craig Leat	M.Sc. 1996
1996 Tony Amankrah	M.Sc.
Federal University of Viçosa, Brazil	
2008 Marcelo Brauer	D.S.
2002 Tadayuki Yanagi, Jr.	D.S.
Catholic University of Leuven, Belgium	
2010 Sezin Eren Öscan	Ph.D.
2005 Cindy Boonen	Ph.D.
University College Dublin, Ireland	
2010 Conor Dowling	Ph.D.
Instructor: Statistics and Modeling Concepts for EMMS Data. Professional	2000, July

Development Workshop, sponsored by ASAE Technical Committee SE-301
 Environmental Physiology. Presented at the Annual International Meeting
 of the ASAE, July 2000. Milwaukee, WI
 Proctor of Fundamentals of Engineering Exam, Lexington, KY 1999

University Service – University of Illinois at Urbana-Champaign

Campus 2017- present
 Faculty Senate 2015-2018
 Senate Campus Operations Committee 2017-present
 Lemman Center for Brazilian Studies – Advisory Committee Member, Affiliate
 Director for two undergraduate semester study abroad programs: 2018 - present
 Affiliate, Center for Latin American and Caribbean Studies
 Bioenergy and Biological Systems Engineering: An Educational Consortium for a
 Sustainable Agriculture (*US-Brazil Partnership, with Purdue University,
 Universidade de São Paulo and Universidade Federal de Viçosa*) 2008-2014
 Transatlantic Biosystems Engineering Curriculum and Mobility (TABE.NET).
 (US-Europe Partnership, with Virginia Tech, University College Dublin,
 Madrid Polytechnic University, Agriculture University of Athens, and
 University of Bari, Italy

Department of Agricultural and Biological Engineering:

Chair, Promotion and Tenure Committee 2018-present
 Faculty Advisory Committee 2009-2011,
 2015-2018
 Course and Curriculum Committee 2008-present
 Graduate Committee 2009-present
 Search Committees: Department Head, Ag Safety & Health (chair) 2018-present

College of Agricultural, Consumer and Environmental Sciences

Dean’s Executive Committee 2017-present
 Search Committees: Metropolitan Food Systems, Precision Animal
 Management, Associate Director of Intl. Programs 2018-2019
 Office of Research Review Committee 2015-2016
 Dixon Springs Ag Center (DSAC) Faculty Advisory Council 2008-2010
 Paul A. Funk Recognition Award Committee 2008-2010,
 2018-2019
 College Promotion and Tenure Committee 2008-2010
 Research Academy Advisory Council 2009-2012
 Spitze Land-Grant Professional Career Excellence Award Committee 2008-2010

College of Engineering

Dean’s Executive Committee (Alternate) 2009-2015

University Service – University of Kentucky

Search Committee, Office of International Affairs, Asst Director of Study Abroad	Fall 2005
Promotion and Tenure Area Committee, Science and Engineering	2001-2003
Director of Graduate Studies, Department of Biosystems and Agricultural Engineering	2001-2003
Dean's Faculty Advisory Council, College of Engineering	1998-2000
Research Committee, Chair, Department of Biosystems and Agricultural Engineering	2001-2002
Computer Committee, Department of Biosystems and Agricultural Engineering	1988-1995, 2000-2002
Graduate Committee, Department of Biosystems and Agricultural Engineering	1995-2001

INVENTIONS

Features included on some of the inventions listed below illustrate the relevance and impact of research work on industry. Many features and innovations contained within these products have been widely adopted by the U.S. and European agricultural equipment industry. For example, technical features contained in the OpTimer (late 1980's design) have been widely copied and are now standard features on commercially available controllers used for livestock, poultry and greenhouse environment control systems.

- Time Integrated Variable Controller (TIV), an environmental control unit that manipulates livestock environment based on a running average temperature. Patented (with M. B. Timmons, Cornell University). Marketed by Thevco, Montreal, Quebec. 2002-2008.
- Dual Zone (DZ) Greenhouse Stage Controller, heating and ventilation stage controller, with day/night setpoint automation, power relays and capability for independent control of two zones or houses. 1999-2004.
- Oxygen Monitor and Control for Contained Aquaculture. A microprocessor-based device (AquaStager) to actuate supplemental oxygenation equipment. Marketed by Aquatic Eco-Systems, Inc. 1994-1999.
- Shinwa Environmental Controller (SEC), a microprocessor-based environmental control unit for staged ventilation of broiler and swine buildings. Utilizes a programmable staging feature to facilitate installation in different structures. Transition between interval timed-based minimum ventilation to stage 1 of temperature-control ventilation is performed proportional control of the on-time. This feature has become standard for most new control systems. Marketed by Aerotech, Inc. as the AeroStager 1989-1997.
- Profit Producer, a microprocessor-based environmental control system that implements economic optimization strategies in broiler housing. 1986-1989.
- OpTimer, a ten minute cycle timer driven by a commercially available environmental controller, translates an analog signal to a timer function for minimum ventilation in livestock housing. This control logic, similar to that used in the SEC, has been widely adopted by industry. 1989.
- VariTimer, an independent ten minute cycle timer with temperature sensing. Consultant to Optim Ag Ltd. and Research Concepts Inc. for prototype development. 1989.
- Side Kick, a device that translates a pulse width modulated signal into ten discrete fan stages, for U.S.A. livestock environmental control systems. This concept was immediately picked up and promoted by Opticon and Fancom in the Netherlands, and can now be found on all domestic-manufactured systems as well, including those from Chore-Time, Acme Engineering, Thevco, etc. 1989.

RESEARCH ACTIVITIES – Current Hatch and USDA Regional Projects

NCDC 235: Precision Animal Management, Project establishment team
NE-1035/1335/1835: Commercial Greenhouse Production. 2008-present.
NCCC-09: MWPS: Research and Extension Education Materials. 2017-present
NE-1442/1942: Poultry Production Systems and Well-being: Sustainability for Tomorrow. 2017 - present
NCERA-219 Swine Production Management to Enhance Animal Welfare. 2011-present
NCERA-101: Controlled Environment Technology and Use. 2011-present.

Previously PI for S1025, S1032, W173, W1173, W2173, NE-1022, NE-1035, NCERA-29
Chair, S1025 2011-2012

Extramural Funding

Pending

1. Livestock 4.0: Smart Tools to Assess Animal Health and Productivity. De Sousa, Rafael Viera, L. Martello, R. Tabile, K.O.S. Miranda, T. Brown-Brandl, R.S. Gates, R.Y. Tsukahara, J.I. Oliveira Jr. University of São Paulo, Office of the Dean, Program on Intelligent Digital Systems. \$R76,617 (approx.. \$20,000). 2019.

Current and Recent

1. Dry matter loss rates and safe storage time of soybeans using a Dynamic Grain Respiration Measurement System. R.S. Gates. ACES OIP International Seed Grant. \$4,000 student support. 2019.
2. Institutional Project of Internationalization. L.A. Peternelli, A.F. de Carvalho, S.E.F. Guimaraes, A.P. Filho, F.M. Zerbini Junior, C.E.G.R. Schaefer, R.S. Gates. CAPES Brazilian Ministry of Education (PRINT program). R\$24M (approximately 6.3M USD). 2019-2023.
3. Manure Management Technology Assessment and Recommendations to North Carolina Pork Producers Association. R.S. Gates, N. Akdeniz, J.A. Ogejo, J. Harmon. \$60,000. 11/2018 – 9/2019.
4. Developing Faculty and Student Collaboration in Design and Control of Ventilation in Swine Facilities. R.S. Gates and D.J. Moura. Illinois/FAPESP program. \$20,000 from the University of Illinois Lemann Center for Brazilian Studies; R\$78,085 from Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) 2018-2020.
5. Biosecure Animal Mortality Composting for Reducing Release Risk of Pathogens and ARGs. N. Akdeniz, Y. Zhang, R.S. Gates. USDA AFRI. \$299,877. 2/2018 – 1/2020
6. Certified Livestock Manager Training Program. Illinois Department of Agriculture. R.S. Gates. 2018-2019, 2017-2018, 2016-2017. \$75,000/year

Recent Submissions

1. Value-added Poultry Carcass Processing with Hydrothermal Liquefaction. N. Akdeniz, R.S. Gates, Y. Zhang. USDA AFRI. \$500,000 5/2019-4/2022
2. Valorization of eggshell waste towards production of bioactive peptides. M. Danao, K. Majumder, R.S. Gates, K. Koelkebeck. USDA AFRI. \$500,000. 7/2019 – 6/2021 (\$72,116 subaward)
3. Cyberinformatic Tools for Enhancing the Well-Being of Neonatal Piglets. R.S. Gates, G. Chowdhary, T. Brown-Brandl, G. Rohrer. USDA AFRI. \$500,000 2/1/2019-1/31/2021

4. Application of phosphate-enriched biochar to reduce gas and odor emissions from deep-pit manure storages. National Pork Board. N. Akdeniz, W. Zheng, R.S. Gates. 2019-2020. \$64,929.
5. Improving Sustainability Practices in Protected Culture Horticulture Production Systems. ACES Extension ICE Program. B. Aly, R.S. Gates, L. Christianson, B. Branham, N. Johannig, J. Zakes. 2019-2021. \$60,000
6. 2nd Workshop on Post-Harvest Loss/2^o Workshop de Perdas Pós-Colheita. ADM-CARES program and ACES Office of International Programs. R.S. Gates, M-G. Danao, R. Zandonadi. October 2018. \$36,000.
7. Value-added Eggshell, Eggshell Membrane, and Egg White Residue. M-G. Danao, R.S. Gates. USDA AFRI \$300,000 (\$85,333 subcontract). 1/2018 – 12/2021.
8. Review of Eggshell Waste Handling, Treatment Practices, and Valorization Opportunities in the U.S. Egg Industry. \$79,422. US Egg Industry Center. 2018-2019
9. Broiler Facility Energy Use using Hybrid Ventilation Controls and Effects of Air Velocity and Temperature on Meat-Type Quail in Brazil. ACES International Joint Research Program. \$20,000. 2018-2019.
10. Developing Faculty/Student Exchanges for Livestock Facilities and Manure Management. \$4,000. ACES Office of Intl Programs: Seed Grant. 2018.
11. Seasonal reproductive failure and poor litter performance in parity 1 sows due to environmental variation and physiological responses in gestation and farrowing. National Pork Board. R. Knox, R.S. Gates, L. Ochoa, J. Connor and K. Bhalerao. \$99,937. 2017-2019.
12. Enhanced Under-Represented Undergraduate Training in Global Food Security. USDA NIFA AFRI Research and Experiential Experiences for Undergraduates. R.S. Gates, C. Gundersen, B. Fiese, M. Blumthal, J. Thompson. \$300,000. 2017-2020.
13. Enhanced Undergraduate Training in Global Food Security. Partners of the Americas (US Dept of State). \$50,000. 2016-2017.
14. Chile-USA Study Abroad Program with Service-Learning: Lean Manufacturing. Partners of the Americas Foundation, DOS and NAFSA. \$70,000. R.S. Gates, T. Finis, M. Blumthal and B. Litchfield
15. Development of a novel two-step, automated euthanasia systems for humane euthanasia of piglets using nitrous oxide. USDA NIFA AFRI. D.C. Lay Jr., R.S. Gates, J.-L. Rault, C. Johnson. \$499,216.
16. Environmental Probiotics: Manipulating Microbial Ecology of Poultry Housing to Reduce Egg-borne Pathogens. A. Kent, A.R. Green and R.S. Gates. National Science Foundation, Ecology of Infectious Diseases Program. \$1,891,081. 2013 – 2017. Not funded.
17. Modernizing Agricultural Education and Training Systems Program. US Agency for International Development. R.S. Gates and J.E. Pettigrew. 2012-2017. \$6,250,004. Not funded.
18. Integrated Approaches to Climate Change and Variability for the Midwest Pork Industry. USDA AFRI Global Climate Change. D. Meisenger, et al. 5 years. 2012 – 2017. \$10,000,000. Not funded.
19. A USA-China-Brazil Consortium for Environment-Enhancing Energy Research and Education. NSFPIRE Program. Y. Zhang et al. 3 years 2012-2015. \$5,000,000. Not funded.
20. Microbial Community Analysis to Identify Risk Factors in Manure Foaming. National Pork Board. R.S. Gates, A. Kent, T. Funk and L. Pepple. 2012-2013. \$30,000. Not funded.

21. Vertical Vegetable Farming R&D for Total Resilience in Leafy Vegetable Supply for Singapore. Collaborator. Proposal for NRF-funding for Meeting Future Food Demands for Singapore, submitted by AFV of Singapore, Singapore University of Technology and Design, Advanced Digital Sciences Center, University of Illinois and SkyGreens PL. Approximately \$10,000,000. Not funded.
22. Improving Safety of Deep-Pitted Swine Barns. NIOSH Ag Center, University of Nebraska – Lincoln (subcontract to University of Minnesota). R.S. Gates, M.Robert, A.Kent, R. Aherin, T.Funk. 2011-2016. \$219,164. Not funded.
23. Specialty Crops Enterprises for Enhanced Local Self-Reliance and Resilience. X. Wang and R.S. Gates. USDA SCRI. Subcontract to Ohio State. 2011-2016. \$1,000,933. Not funded.
24. Environmental Probiotics: Manipulating Microbial Ecology of Poultry Housing to Reduce Egg-borne Pathogens. A. Kent, A.R. Green and R.S. Gates. National Science Foundation, Ecology of Infectious Diseases Program. \$1,891,081. 2011 – 2014. Not funded.
25. USPCE Integrated, Sustainable Approaches to Climate Change for the Midwestern Pork Industry. USDA AFRI Global Climate Change Program. \$20,000,000. D. Meisenger, R.S. Gates, L.D. Jacobson, E. Cortus and J. Koziel. (University of Illinois subcontract, \$4.6M) 2011-2015. Not funded.
26. Environmental Management Risk Factors for E. coli Peritonitis in Layer Hens: A Basis for Prevention and Control. USDA AFRI, Foundational Programs, Animal Health. A.R. Green, A. Kent, Kohrt, Gates. \$499,925. 2011-2016. Not funded.
27. Developing Scholars in Agricultural Systems Engineering for a Bio-Based Economy. USDA National Needs Program. 2011-2015. Co-PI with M.G. Danao, S.R. Eckhoff, R.S. Gates and Y. Zhang. \$236,000. Not funded
28. Decision Support for Environmental Management of Cage and Cage-Alternative Layer Housing Systems for Thermal Comfort and Air Quality. USDA AFRI Animal Welfare Program. A.R. Green, R.S. Gates and Y. Johnson. \$699,899. Not funded
29. Establishing vibrant specialty crops enterprises for building self-reliant and resilient cities. R.S. Gates, X. Wang, T. Funk and D. Warnock. USDA Specialty Crops Research Initiative. Subcontract to Ohio State University. \$1,499,967. Not funded.
30. Developing Scholars in Agricultural Systems Engineering for a Bio-Based Economy. USDA National Needs Program. 2010-2014. Co-PI with M.G. Danao, S.R. Eckhoff, R.S. Gates and Y. Zhang. \$236,000. Not funded
31. Sustainable and Competitive Controlled Environment Plant Production Systems (CEPPS). USDA Specialty Crops Research Initiative Planning Grant. Co-PI with D. Warnock (NRES), B. Branham (NRES) and K.C. Ting (ABE). 2009-2010. \$50,000. Not funded
32. Quantifying and Reducing Uncertainty in Ventilation Rate Measurements to Improve Emission Estimation from AFOs. USDA Agriculture and Food Research Initiative. Co-PI with K.D. Casey (Texas A&M) and Y. Liang (University of Arkansas). 2009-2012. \$600,000 (\$222,992 subcontract to UIUC). Not funded
33. Dairy Producer Management Strategies for Composted Bedded Pack in Loose Housing that Minimize GHG Emissions and Maintain Herd Productivity. USDA Agriculture and Food Research Initiative. Co-PI with J.L. Taraba, G.B. Day, V., M. Coyne, J.M. Bewley, and D.G. Overhults (University of Kentucky). \$599,985. (\$102,520 subcontract to UIUC.) Not funded

Recently Completed Funded Research and Extension Activities

1. Elevated CO₂ Effects on Turkey Poults aged 0-3 Weeks. Industrial Collaborative Research, Hendrix Genetics. \$30,000. 2017.
2. Development of a novel two-step, automated euthanasia system for humane euthanasia of piglets using nitrous oxide. USDA NIFA AFRI. D.C. Lay Jr., R.S. Gates, J.-L. Rault. \$499,216. 2015-2017.
3. Decision Support for Environmental Management of Cage and Cage-Alternative Layer Housing Systems for Thermal Comfort and Air Quality. USDA AFRI. A.R. Green, R.S. Gates, Y. J. Johnson-Walker, H. Cheng. 2012-2017. \$699,896.
4. Thermal Perches as Cooling Devices for Reducing Heat Stress in Caged Laying Hens. USDA NIFA AFRI. H.W. Cheng, P.Y. Hester, R.S. Gates, M.M. Makagon, W. Wigle, N.J. Olynk Widmar. 2013-2017. \$499,814.
5. Measurement and documentation of Brazilian postharvest loss. ADM Institute for Postharvest Loss, University of Illinois. M. Arends-Kuenning, R.S. Gates, M.-G. C. Danao (UIUC); M. Garcias, A.L. Kassouf (ESALQ); R. Zandonadi, R. Nogueira, S. Ruffato (UFMT). \$300,000. 2015-2017.
6. *Ambiência Animal em Condições de Climas Quentes – Ferramentas e Sistemas Inteligentes de Avaliação do Cenário Térmico, Aéreo e Comportamental e Suas Relações no Espaço e no Tempo Para a Avicultura de Postura.* (Animal Environments in Hot Climates: Tools and Intelligent Systems for Evaluating the Thermal Environment and its Relation to Space and Time in Laying Hen Facilities.) *Ciências Sem Fronteiras* (Science Without Borders). *Programa de Pesquisador Visitante Especial.* (Special Visiting Researcher program). *Conselho Nacional de Desenvolvimento Científico e Tecnológico* (CNPq). 2013-2016. R\$92,000. Supports monthly stipend, travel, Brazilian graduate students and up to three months per year in Brazil for three years.
7. Microbial Ecology Evaluation of Foam Production in Swine Deep-Pit Manure Storages. Iowa Pork Producers, subcontract with Iowa State University. R.S. Gates, L. Pepple, A. Kent. 2012 – 2013: \$156,713. 2013-2014: \$114,762, 2015-2016: \$77,933.
8. Measurement, Documentation and Postharvest Processing for the Prevention of Postharvest Losses of Soybeans and Corn in Brazil. ADM Institute for Post-Harvest Loss. M.G. Danao, R.S. Gates, M.R. Paulsen, K.D. Rausch. 2012-2015. \$585,000.
9. Certified Livestock Manager Training Program . Illinois Department of Agriculture. R.S. Gates and L. Pepple. 2013-14, 2014-15, 2015-2016. \$75,000/year.
10. *Modificações ambientais em aviários de postura em alta densidade de alojamento e seus efeitos sobre o desempenho produtivo das aves e a qualidade dos ovos.* (Modified Environment in High Density Laying Hen Facilities and its Effect on Productive Improvement and Egg Quality.) *FAPEMIG- Fundação de Amparo à Pesquisa do Estado de Minas Gerais.* (Research Agency of the state of Minas Gerais, Brazil).
11. *Programa Bolsa Pesquisador Visitante Especial* (Special Visiting Researcher Program, State of Minas Gerais, Brazil). R\$17,500. 2013
12. Microbial Community Analysis to Identify Risk Factors in Manure Foaming. National Pork Board. R.S. Gates, T. Funk, A. Kent and L. Pepple 2011-2012. \$29,983.
13. Mitigation Monitoring and Microbial Assessment of Gas-Phase Biofilters and Extension Outreach. U.S. Department of Agriculture, Air Quality Program. K.A. Janni, J. Schilling, L.D. Jacobson, J. Harmon, S. Hoff, R. Nicolai, and R.S. Gates. February 1, 2010 Project Duration: 3 years. 2010-2013. \$597,806. (\$6,812 subcontract.)

14. Bioenergy and Biological Systems Engineering: An Educational Consortium for a Sustainable Agriculture. R.S. Gates, A.R. Green, L.R. Rodriguez, K.C. Ting, Y. Zhang (UIUC), and B. Engel, R. Mohtar and O. Campanella (Purdue University), U.S. Department of Education Fund for the Improvement of Post-Secondary Education U.S.-Brazil Program. PI. University of Illinois at Urbana-Champaign, Purdue University, University of São Paulo-Pirassununga, and Federal University of Viçosa. \$250,000.
15. Transatlantic Biosystems Engineering Curriculum and Mobility (TABE.NET). U.S. Department of Education Fund for the Improvement of Post-Secondary Education Atlantis Program. M.L. Wolfe and S. Mostaghami (Virginia Polytechnic Institution) and R.S. Gates (UIUC). September 1, 2009. Project duration: 4 years. 2009-2013. \$192,000.
16. Integrating education and development of a biodegradable litter amendment to mitigate ammonia emissions from poultry houses. USDA NRI Air Quality program. Co-PI with J. Arogo, Virginia Polytechnic Institution. 2009-2013. \$77,128 subcontract to UIUC.
17. Mitigation Monitoring and Microbial Assessment of Gas-Phase Biofilters and Extension Outreach. USDA NRI Air Quality program. K.A. Janni, J. Schilling, L.D. Jacobson, J. Harmon, S. Hoff, R. Nicolai, R.S. Gates. 2010-2013. \$597,806.
18. Characterization of PM2.5 and PM10 particulate emissions and the relationship to activity in typical poultry houses. \$532,346, 2008-2010, W.F. Ritter, E.R. Benson, M.V. Johnston, G.L. VanWicklen, and R.S. Gates).
19. Feeding DDGS and Other Altered Diets to Egg Laying Hens to Demonstrate Economically Viable Reductions in Ammonia Emissions – a United Egg Producers Endeavor with University Collaborators. United Egg Producers, Inc. (\$1,847,248 request; \$25,908 subcontract to UI). 2008-2010. USDANRCS Conservation Innovation Grants program.
20. Feeding DDGS and Other Altered Diets to Egg Laying Hens to Demonstrate Economically Viable Reductions in Ammonia Emissions – a United Egg Producers Endeavor with University Collaborators. United Egg Producers, Inc. (\$1,847,248; \$24,972 subcontract to UK). 2007-2008. USDA NRCS Conservation Innovation Grants program.
21. Gaseous production from impermeable swine waste storage tanks and its abatement using biofilters. USDA National Research Initiative Air Quality Program. 2008-2010. \$41,572 subcontract to UIUC.
22. Poultry House Evaluation Service. Kentucky Poultry Federation (\$825,716 request to Kentucky Agricultural Development Board, \$395,566 subcontract to UK). 2007-2010. D.G. Overhults, R.S. Gates and A.J. Pescatore.
23. Development of Line-Scan Image Algorithms for Inspection of Poultry Carcasses. USDA ARS Specific Cooperative Agreement. \$10,000. 2007-2008.
24. Fan Assessment Numeration Systems (FANS) for Agricultural Building Ventilation Measurement in Emissions Testing. Contract with Purdue University. 2007. R.S. Gates, P.I. \$60,000
25. Gaseous production from impermeable swine waste storage tanks and its abatement using biofilters. USDA National Research Initiative Air Quality Program. R.S. Gates, A. Singh, S.F. Higgins and E.G. Wilkerson. \$487,087, 2007-2009.
26. Biosystems and Agricultural Engineering – Educational Consortium for Sustainable Plant and Animal Production Systems. \$204,000. Project leader. With Iowa State University, and four Brazilian Universities

(Viçosa, Lavras, Campina Grande, Piracicaba). U.S. Department of Education's Fund for the Improvement of Postsecondary Education (FIPSE), 2003-2008.

27. Energy Seed Grant Technical Merit Review. Governor's Office of Energy Policy, Division of Renewable Energy and Energy Efficiency. R.S. Gates. \$27,963, 2006-2008.
28. Ammonia Gas Sensors for Agricultural Applications. Synkera Technologies Inc. R.S. Gates. \$15,535. 2006-2007.
29. Field Verification of Ammonia Emission Mitigation Strategies for Layer Houses. H. Xin, R. Burns, R.S. Gates, P. Patterson and E.F. Wheeler. US Poultry & Egg. \$75,285 to Iowa State University.
30. Kentucky Rural Energy Supply Program, C. Metcalf (University of Louisville, \$1,984,000 U.S. Department of Energy). R.S. Gates, S.E. Nokes, D.G. Colliver and M.D. Montross \$268,600 (subcontract awarded by University of Louisville for competitive grants administration). 2005-2007.
31. Total Suspended Particulate, PM10, PM2.5, Hydrogen Sulfide and Hydrocarbon National Consent Agreement Emissions Determination from Broiler Production Systems. R.T. Burns, H. Xin, R. Gates and S. Hoff. \$648,231 awarded by Tyson Foods. 2005 -2007. (UK subcontract \$60,000).
32. Ammonia Emissions Determination from Broiler Production Systems. R.T. Burns, H. Xin and R.S. Gates. \$399,525 awarded by Tyson Foods. 2005-2007. (UK subcontract \$92,121).
33. Effect of enzyme inhibitors on ammonia emission from broiler houses. \$18,000. R.S. Gates, A. Singh, K. Casey and A. Pescatore. North Carolina Animal and Poultry Waste Management Center. 2004-2006
34. Energy-Star Energy Efficient State Fair Exhibit. \$22,700. R.E. Fehr, G. Hash and R.S. Gates. KY Natural Resources and Environmental Protection Cabinet, Division of Energy. 2004-2005.
35. A Cooperative Extension Program for Kentucky's Building Systems Energy Needs. \$63,066. R.E. Fehr and R.S. Gates. KY Natural Resources and Environmental Protection Cabinet, Division of Energy. 2004-2005.
36. Reduced Ammonia Emissions from Poultry Houses by Enhanced Manure and Diet Management. \$870,000. USDA IFAFS. 2001-2005. Project leader. Participants include University of Kentucky, Iowa State, Penn State, University of Nebraska, USDA-ARS Southern Poultry Lab, US-EPA, and a private nutritionist.
37. Development of Robust, Automatic Calibration Algorithms for On-line Detection of Diseased and defective Poultry Carcasses. \$358,043. PI. 2002-2007. USDA-ARS, Instrumentation and Sensing Laboratory, Beltsville, MD.
38. Developing a Low-Cost, Portable Vision Device for Inspecting Agricultural Products for Safety. \$356,570. PI. USDA-ARS. 2002-2006. Instrumentation and Sensing Laboratory, Beltsville, MD.
39. Energy-Star Energy Efficient State Fair Exhibit. \$20,000. PI. KY Division of Energy. 2003-2004.
40. A Cooperative Extension Program for Kentucky's Building Systems Energy Needs. \$59,882. PI. KY Division of Energy. 2003-2004.
41. Estudo de um Sistema de Resfriamento Adiabático Evaporativo, com o Emprego de Materiais Alternativos em Instalações Climatizadas para Produção Animal, nas Condições Brasileiras. (Study of alternative evaporative cooling materials for animal production in Brazilian conditions) FAPEMIG – Fundação de Amparo à Pesquisa do Estado de Minas Gerais, Brasil (Research Funding Agency of State of Minas

Gerais). Ref. CAG 679/2002. R\$21,000 2002-2004. This funded Ricardo Vigoderis' M.S. project. Co-PI. (PI: Prof Ilda Tinôco).

42. Sistema de Mensuração de Amônia em Ambientes Abertos e Aplicação em Manejos de Criação de Frango de Corte e Suínos, nas Diferentes Estações Climáticas no Sul e Sudeste do Brasil – Avaliação da Qualidade do Ar, Produção de Calor, Conforto Térmico e Desempenho. (Amonia measurement system for open buildings with application to broilers and swine facilities in Southern and Southeastern Brazil – Evaluation of Air Quality, Heat Production and Thermal Comfort). CNPq – National Council of Technological and Scientific Development (Technology and Science Ministry, Brazilian Federal Agency). Support for 6 graduate students, 6 undergraduate students and 1 researcher. 2003-2006. Co-PI. (PI: Prof Ilda Tinôco).
43. Avaliação do Sistema de Cama Sobreposta na Produção de Suínos na Fase de Crescimento e Terminal, em Condição de Inverno no Sul do Brasil. (Evaluation of a deep-bed litter system in swine nursery and finishing facilities during winter in southern Brazil). CAPES – Coordenação de Aperfeiçoamento de Pessoal de Nível Superior and EMBRAPA – Empresa Brasileira de Agropecuária (Brazilian Research on Agro-business, Concordia) with Federal University of Viçosa. R\$30,000 for one M.S. student project. 2001-2003. Co-PI. (PI: Prof Ilda Tinôco).
44. Quantification of Feeding and Drinking Behavior of Poultry for Enhanced Animal Well-Being. \$150,709. USDA NRI. 2000-2001. PI.
45. Amino Acid Nutrition in Broiler Diets. \$15,000 gift. Ajinomoto Heartland Inc. Co-PI with H. Xin, Iowa State University. 2001.
46. Amino Acid Nutrition in Layer Diets. \$10,000 gift. Ajinomoto Heartland Inc. University of Kentucky. 2001. PI.
47. Optimizing Partial Surface Wetting to Cool Caged Layers. U.S. Poultry and Egg Association. \$52,279. Co-PI with H. Xin, Iowa State University and M. Beck, University of Nebraska. 2001-2002.
48. Cooling Cage Laying Hens by Partial Surface Wetting, U.S. Poultry and Egg Association. \$24,000. 2000-01. Co-PI with H. Xin, Iowa State University. 2000-2001.
49. Towards a dynamic system for controlling mist propagation of softwood cuttings. Gloeckner Foundation. \$10,000 (2000-2001), \$9,000 (1999-2000). Co-PI with R. Geneve, Horticulture Department.
50. Evaluating Improved Environmental Systems for Tobacco Greenhouses. \$9,475. With G.A. Duncan. Council for Burley Tobacco. 1998-2000.
51. Equipment grants for automated greenhouse environment control. \$7,529. Co-PI with G.A. Duncan. 1999-2000.
52. Ammonia Emissions from Poultry Litter. Heartland Lysine, Inc. PI. \$28,200 gift. 1999-2000.
53. Development of an instrumentation system to measure individual chicken feeding and drinking behavior as influenced by environment and nutrition interactions. \$54,000. 1998-2000. With Drs. H. Xin and M. Puma, Iowa State University and Heartland Lysine, Inc.

TEACHING AND STUDENT ACTIVITIES – UNIVERSITY OF ILLINOIS

Courses Taught

TSM 371	Residential Housing Design	Spring 2009-present
TSM 130	Basics of AutoCAD	Each semester since Fall 2015-Spring 2018, each fall to present
TSM 199	Basics of AutoCAD	Each semester Fall 2011- Spring 2015
ABE 100	Introduction to Agricultural and Biological Engineering	Fall 2009-2013
TSM 311	Humanity and the Food Web	Fall 2009, Spring 2010

TEACHING AND STUDENT ACTIVITIES – UNIVERSITY OF KENTUCKY

Courses Taught

AEN 103	Surveying (for Landscape Architects)	Fall 2005
AEN 202	Biosystems Engineering Problems (Biometrics)	Annually, 1990-1999
BAE 202	Statistical Methods for Biosystems Engineering	Spring, 2008
GEN 300	Co-taught. (This course was an introduction to French culture and agriculture and required as part of cooperative two-week visit or six-week internship with the ENESAD program in Dijon, France.)	Spring 1996, 1997
	Traveled with 14 University of Kentucky, 9 University of Nebraska and 1 Clemson student	1996
AEN 302	Analytical and Numerical Methods in Biosystems	Annually, 1988-1997
ASC 340	Poultry Production Systems: guest lecturer on environment control	1994-2000
BAE 450	Fundamentals of Electricity for Agriculture (special problem)	2005
AEN 427G	Structures	1991, 1992
BAE 427	Structures and Environment Design	2002-2008
AEN 599	PC-Based Data Acquisition and Control	1994-1999, co-taught 2001
PLS 605	Graduate Research in Horticulture: guest lecturer on VPD control	1998, 1999
AEN/ME 647	Systems Optimization I	1999, 2002, 2003, 2004
AEN 658	Instrumentation for Research	1992, co-taught 2002
AEN 750	Special Problems, as required for graduate students	approximately each 3 semesters

Advising at University of Illinois and Kentucky

Faculty Advisor for ASABE Student Branch, 2018-2019

Faculty freshman-sophomore advisor for the Department of Agricultural and Biological Engineering's Technical Systems Management degree program, 2018-present.

Faculty freshman-sophomore advisor for the Department of Agricultural and Biological Engineering's engineering degree program, 2012-2017.

Undergraduate advisor for the Bioenvironmental Engineering Section, Department of Agricultural and Biological Engineering, University of Illinois.

Faculty advisor for the Controlled Environment Systems Engineering Program in the Department of Biosystems and Agricultural Engineering, University of Kentucky. Encouraged student participation in local ASHRAE Chapter. Provided job placement and summer training of students.

Graduate Students Advised

University of Illinois at Urbana-Champaign

Name	Degree	Year
Yijie Xiong	Ph.D.	In progress, Advisor
Christina Lyvers Tucker	Ph.D.	In progress, committee member
Michael Stablein	Ph.D.	In progress, committee member
Chris Miller	Ph.D.	UC-Davis, In progress, committee member
Abigail Brake	M.S.	In progress, co-Advisor
Michael Stablein	M.S.	Completed, August 2018, committee member. Title: Augmented Growth of <i>Haematococcus Pluvialis</i> using Nitrogen Nutrients from Post Hydrothermal Liquefaction Wastewater (PHWW)
Ana Pereira da Silva	M.S.	Completed, December 2018. Advisor Title: Dry Matter Loss Rates of Soybeans: Effects of Respiration Measurement System, Damage by Splits, and Moisture Content at Elevated Temperatures
Patricia Paulausky	M.S.	Completed, December 2018. Advisor. Title: Application of an Agent-Based Modeling Approach to Study the Postharvest Loss of Food Grains in India
Lucas Trevisan	M.S.	Completed, December 2017. Advisor. Title: Evaluating Dry Matter Loss Rates of 14 to 22% Moisture Content Soybeans at 35°C Using a Dynamic Grain Respiration Measurement System
Shan-Jen Yang	Ph.D.	Completed, December 2017. committee member Title: Development of Dynamic Computational Model for an Integrated Farming System
Yanxi Lu	M.S.	Completed, August 2016, committee member Title: Evaluating New Ventilation Rate and Evaporative Cooling for Modern Swine Production.
Zhonghua Zheng	M.S.	Completed, 2016, committee member Title: Impedance-based moisture content sensor assessment for gas-phase biofilters
Kaneeeka Sood	M.S.	Completed, December 2015. Co-advisor Design and Evaluation of a Grain Respiration Measurement System for Dry Matter Loss of Soybeans
Akaterini Kasimati	M.S.	Completed May 2015, Advisor Characterizing Water Holding Capacity and Total Solids of Manure-Bedding Mixtures
Boyu Ji	M.S.	Completed May 2015, Advisor An Innovative Portable Monitoring Unit for Air Quality in Animal Housing
Peng Li	Ph.D.	Withdrew from program
Laura M. Pepple	Ph.D.	Withdrew from program
Brett Ramirez	M.S.	Completed May 2014, committee member
Wilhelmi, Christopher	M.S.	Completed Dec. 2014, non-thesis MS, committee member
Jonathon Olsen	Ph.D.	January-December 2013, Advisor
Yijie Xiong	M.S.	Completed December 2013, co-advisor

Yi Sun	M.S.	Completed December 2013, co-advisor
Ryan Johnson	M.S.	Completed August 2013, committee member
Liangcheng Yang	Ph.D.	Completed May 2013, committee member
G. Tatiana Sales	Ph.D.	Completed August 2012, co-advisor
D. Barker	Ph.D.	Completed 2012, committee member
Shi-Fang Chen	Ph.D.	Completed 2012, committee member
W. (David) Liu	Ph.D.	Withdrew from school
W. Yan	Ph.D.	Completed 2010, committee member
X. Yang	Ph.D.	Completed 2010, committee member
J. McClure	Ph.D.	Completed 2010, committee member
C. Cirone	M.S.	Completed 2010, committee member

Federal University of Viçosa, Brazil

Name	Degree	Year / Title
German Sanchez	M.S.	In progress, advisor
Tatiany C. dos Santos	D.S.	In progress, advisor
Monique O. Vilela	D.S.	In progress, advisor
Carlos G. Teles Junior	D.S.	In progress, advisor
Márcia G. Cândido Lima	D.S.	Completed, February 2019, co-advisor Title: Thermal Tolerance, Performance, and Physiology of Egg-Type Pullets when Subjected to Different Levels of Heat Stress During the Brooding and Growing Phases Sequentially
Willian Rufino Andrade	M.S.	Completed, February 2019, advisor Title: Effect of Biochar Addition on Anaerobic Digestion of Laying Hen Manure
Letícia Cibele da Silva Ramos Freitas	D.S.	Completed, August 2018, co-advisor Title: Variabilidade Espacial das Condições Térmicas, Intensidade Luminosa e Qualidade de Ovos em Aviários Verticais de Galinhas Poedeiras Ventilados Naturalmente
Luis Gustavo F. Franca	D.S.	Completed, August, 2017, advisor Title: Excreção de nitrogênio por galinhas poedeiras submetidas a diferentes temperaturas e níveis de energia meabolizável na ração.
Tatiany C. dos Santos	M.S.	Completed, July 2016, advisor Title: Associação de diferentes temperaturas e velocidades do ar sobre as respostas comportamentais, temperature supervície corporal e produção de codornas jaonesas (Coturnix coturnix joponca)
Monique O. Vilela	M.S.	Completed, July 2016, advisor Title: Comportamento e desmphno produtivo de codornas joponesas subetidas a diferentes regimes de calor e umidade, combinados com diferentes níveis de velocidade do ar
Carlos G. Teles Junior	M.S.	Completed April 2016, advisor Title: Análise de Imagem na Avaliação do Comportamento Ingestivo e Ganho de Massa Corporal de Frangos de Corte Em Fase Inicial, Submetidos a Diferentes Ambientes Térmico
Múcio Mendes	D.S.	Completed Nov 2015, advisor Title: Caracterização do Ambiente Térmico De Aviários de Postura, em Sistemas Verticais, Ventilados Naturalmente E por Pressão Negativa Em Modo Túnel

Maria F.V. Araujo	D.S.	Completed May 2015, advisor Title: Efeitos de Duas Condições Climáticas, Duas Linhagens e Dois Sistemas de Ventilação no Desempenho Produtivo de Galinhas Poedeiras Alojadas em Sistemas Verticais de Criação
Maurílio Duarte Batista	M.S.	Completed, 2014 (advisor) Effective microorganisms (EM) como bioalimentadoras na digestão anaeróbia de resíduos de bovinos
Múcio Mendes	M.S.	Completed, 2012 (co-advisor) Caracterização química e física de excretas de codornas européias submetidas a variações de temperatura em câmaras climáticas como indicativo de níveis de estresse calórico, emissão de amônia e adequação a compostagem
Michelle dos Santos	M.S.	Completed, 2012 (committee member)
Jairo A. Osorio Saraz	D.S.	Completed, December 2010 (co-advisor)
Olga Marin	M.S.	Completed, December 2010 (co-advisor)
Marcos Oliveira de Paula	D.S.	Completed, December 2009 (committee member)
Maira Freire do Amaral	M.S.	2007 (co-advisor)
Claudio Elíar do Silva	M.S.	2002 (co-advisor)
Ricardo Brauer Vigoderis	M.S.	2002 (co-advisor)
Marcelo Bastos Cordeiro	M.S.	2003 (co-advisor)
Robson de Paulo	M.S.	2003 (co-advisor)
Mariano Silva	M.S.	2003 (co-advisor)
Tadayuki Yanagi	D.S.	2002 (at Iowa State University, co-advisor, Federal University of Viçosa, Brazil).
Claudio Elíar do Silva	D.S.	In progress, Federal University of Viçosa, Brazil
Marcelo Bastos Cordeiro	D.S.	In progress, Federal University of Viçosa, Brazil
Mariano Silva	D.S.	In progress, Federal University of Viçosa, Brazil
Ellie Derbyshire	M.S.	2007
J. Swamy	M.S.	2007
Ricardo Brauer Vigoderis	D.S.	2006, Federal University of Viçosa, Brazil
George Day		2005
Carmen Agouridis		2004
Keng Chuah		2004
Mari Chinn		2003
Czar Crofchek		2001
Sefa Tarhan		2001
Neil Paton (Animal Science)		2001
Tami Brown-Brandl		1997
W. Peter Sun		1998
Thomas F. Burks		1997
Ron E. Lacey		1992
John Chastain		1991
James Usry		1989

University of Kentucky

Name	Degree	Year
Flavio Damasceno	Ph.D.	Completed 2012, committee member
Lucas de Melo	M.S.	Completed 2012, committee member
Gabriella Morello	M.S.	Completed 2011, committee member
Igor Lopez	M.S.	Completed 2011, committee member
Guilherme del Nero Maia	Ph.D.	Completed 2010, committee member

Jamie Marsh	M.S.	2008
G. Tatiana Sales	M.S.	2008
Peng Li	M.S.	2008 (co-advisor)
Guilherme Maia	Ph.D.	In progress, 2009 completion expected
Kenneth Casey	Ph.D.	2005
Joseph Purswell	Ph.D.	2004
G. Avery Watkins	M.S.	2004
Virginia-Bibb Golden	M.S.	2004
Jeremiah Davis	M.S.	2004 (co-advisor)
Angela Green	M.S.	2004
Erin Wilkerson	M.S.	2002
Sérgio Zolnier	Ph.D.	1999
Kevin Chao, Ph.D.	Ph.D.	1996
Christian Mach	M.S.	2000
Nan Tao	M.S.	1999
Hsien-Chung Chi	M.S.	1993
Shu Hui Zhang	M.S.	1992
Jeff Tolzin	M.S.	1988

M.S. Committee member for the following students in various Departments at the University of Kentucky

Department	Name	Year
Biosystems and Agricultural Engineering	Morgan Hayes	2008
	Mari Chinn	2000
	Elizabeth Bullock	1999
	Ronnie Paul	1999
	Jane Patterson	1999
	Sefa Tarhan	1996
	Karen Lochte	1995
	Wen Ping Qiu	1992
	W. Peter Sun	1992
	T.F. Burks	1989
	G. Scott Osborn	1988
	John P. Chastain	1987
Entomology	David Held	1999
Veterinary Sciences	Cédric Holtz	2000

External Examiner

Name	Degree	Year	University
Conor Dowling	Ph.D.	2012	University College Dublin, Ireland
Sezin Eren Öscan	Ph.D.	2011	M-3 Bio-Res, Katholic University of Leuven, Belgium
Cindy Boonen	Ph.D.	2005	Agricultural Engineering, Katholic University of Leuven, Belgium
Craig M. Leat	M.Sc.	1999	Agricultural Engineering, University of Natal, South Africa
Tony Amankra	M.Sc.	1996	Agricultural Engineering, University of Natal, South Africa

Other Student, Post-Doctoral and Advising Activities

Host

Name	Dates	University
-------------	--------------	-------------------

Juliana Soares Zeymer	2019	Doctoral Student, Federal University of Viçosa, 6-month sandwich with me at UIUC
Zhi Zhang	2018-2019	Professor, NW Ag & Forestry University, Shaanxi, China, 1-yr sabbatical
Marcia G.L. Candido	2017-2018	Doctoral Student, Federal University of Viçosa, 1-yr sandwich with me at UIUC
Domingos Sarvio Valente	2017-2018	Professor, Federal University of Viçosa, 1-yr sabbatical with us at UIUC
Tania Baptista dos Santos	2013-2014	Professor, 1-yr sabbatical, State University of Mato Grosso do Sul, Aquadiana, Brazil
Mohammadamin Kashiha	2013	Doctoral Student, Catholic University of Leuven, Belgium
Danilo Pereira	2012-2013	Professor, 1-yr sabbatical, State University of São Paulo at Tupá, Brazil
Ana Paula de Assis Maia	2010-2011	Doctoral Student, 6 month sandwich program, State University of Campinas (UNICAMP), Campinas, São Paulo, Brazil.
Giselle Borges	2010-2011	Doctoral Student, 1-year sandwich program, University of São Paulo – Piracicaba (ESALQ)
Karla Lima	2009-2010	Doctoral Student, 1-year sandwich program, State University of Campinas (UNICAMP), Campinas, São Paulo, Brazil.
Professor Wallace Nascimento	2004-2005	Sabbatical leave from Federal University of Campina Grande
Professor Ilda F.F. Tinôco	2002-2003	Sabbatical leave from Federal University of Vicoso, MG Brazil
Professor Adelson A. Tinôco	2002-2003	Sabbatical leave from Federal University of Vicoso, MG Brazil
Professor N.S. Ferguson	1997-1998	Sabbatical leave from University of Natal, South Africa
P. Huang	1994	Post-doctoral study visit, Hunan Normal University, China

Past Chair, Graduate Committee, Department of Biosystems and Agricultural Engineering, University of Kentucky: Review all applications for admission, graduate student research proposals and progress reports.

Special Projects: Support for Horticultural Science undergraduate theses projects.

ASAE Student Branch: Faculty Advisor 1996-1997; Hosted Southeast Student Rally in Lexington, KY 1998.

Student Recruitment: Meet with prospective students, attend shows, field days and openhouses, and provide tours of campus facilities and departmental laboratories as needed.

EXTENSION AND OUTREACH ACTIVITIES (partial list of recent activities)

Greenhouse Engineering

In cooperation with Professor George Duncan, obtained support from the Burley Tobacco Council to improve humidity control in greenhouses used to germinate and grow tobacco transplants. These plants are raised in float trays, and moisture control requires proper adjustment of ventilation and heating systems to balance energy costs, plant hardiness, disease control, and ease of operation. 1999-2004.

- Example automated systems for mechanical and curtain-sided houses were developed and installed in four cooperators facilities (Lincoln, Davies, Shelby [2], and Montgomery counties in Kentucky), and monitored for two years to obtain data on performance, suitability of use, and assess humidity control. 2000-2004.
- Outcomes of the project to date include: an extension fact sheet, a draft video on greenhouse ventilation basics, web-based presentations on greenhouse control for Extension Agent training, development of quizzes for Cooperative Extension County Agent Training, and presentation of findings for both mechanically ventilated and curtain-sided automation.

Livestock and Poultry Systems – Recent activities include:

- Certified Livestock Managers Training – an Extension training and certification program for livestock and poultry producers in the state of Illinois. Annually, hosting 10-15 5-h workshops around the state.
- Poultry House Evaluation Service – develop programs for energy efficiency evaluation of broiler housing, specific to housing systems by integrator companies. Produce quarterly newsletters (Cheeps & Chirps). Generalize evaluation findings to each integrator (seven in Kentucky).
- Agricultural Air Quality. Addressing the need for science-based estimates, including evaluating various management strategies. Hosted stakeholder meetings at venues including: individual state poultry association meetings (Kentucky, Iowa, Pennsylvania, and Nebraska), Midwest Poultry Federation, Multi-State Poultry Nutrition Symposium, provide training in Brazil and France, a CIGR-sponsored symposium in Europe in 2003 and EurAGEN in 2004, and Air and Waste Management Symposia in 2003, 2004 and 2005, Virginia Extension agent training 2008.
- Development of algorithms, wiring, installation and testing of TIV control in Kentucky and New York dairy facilities. Successfully convinced the world's largest agricultural environmental controller manufacturer to incorporate the software technology onto their existing products (sales exceeded 50,000 units in 2000).
- Work with Kentucky broiler companies' concerns for young, partially-feathered birds in tunnel ventilation experiencing wind chill. Provided estimate of effective temperature and guidelines for maximum tunnel velocity at different ages of birds. Annually since 1990.
- Troubleshoot and evaluate environment controls in pullet houses with excessive heating bills, condensation and poor indoor air mixing. Provide guidelines and education of fundamentals.
- Evaluate and provide guidelines for daily management of broiler facilities at high elevations in a dry climate, with poor inlet control and significant dust. Developed a simple method for manual inlet adjustment for workers, based on visual inspection of number of fans operating (Maputo, South Africa). 1993.
- Cooperate with colleagues (Drs. Tobin, Harkin) in Gluck Equine Center to develop two systems for Kentucky horse industry. The first is a motion system to assess the efficacy of different drug dose-response via horse activity, rather than blood samples. A second project involves early lameness detection (navicular disease) utilizing a force plate to obtain weight distribution. This latter system was constructed and tested for an M.S. project (C. Holtz). 1999.

- Environmental control in livestock and greenhouse facilities, with Brazilian colleagues, including a signed cooperative exchange agreement between the University of Kentucky and the Federal University of Vicosa (UFV) 2001. Projects with Brazilian agencies and companies including EMBRAPA, Coopervale, and UFV.

Extension Publications and Presentations

1. Ellis, M., N. Cooper, Y. Xiong and R.S. Gates. 2017. Measuring postnatal changes in piglet body temperature. National Hog Farmer, December.
2. Gates, R.S. and T. Funk. 2014. The Illinois Certified Livestock Manager (CLM) Training Program. Extension Bulletin, Department of Agricultural and Biological Engineering, University of Illinois at Urbana-Champaign. (English and Chinese).
3. Gates, R.S. and D. G. Overhults. 2008. How much attic insulation? Cheeps and Chirps 1(4):4-5. KY Poultry Federation, Lexington KY.
4. Gates, R.S. 2008. Greenhouse Gas Emissions (GHG) From Broiler Houses: A Non-Issue? Cheeps and Chirps 1(3):5. KY Poultry Federation, Lexington KY.
5. Gates, R.S. 2008. The Fan Assessment Numeration System (FANS). Cheeps and Chirps 1(3):3. KY Poultry Federation, Lexington KY.
6. Overhults, D.G. R.S. Gates and J. Jacobs. 2008. Poultry House Evaluation Service (PHES) Progress. Cheeps and Chirps 1(3):1,4-5. KY Poultry Federation, Lexington KY.
7. Gates, R.S. 2008. Update on Ammonia Emissions Reporting Requirements. Cheeps and Chirps 1(2):3. KY Poultry Federation, Lexington KY.
8. Duncan, G.A., R.S. Gates and M. Montross. 2005. Measuring relative humidity in agricultural environments. AEN-87. Cooperative Extension Service, University of Kentucky: Lexington, KY.
9. Gates, R. S. 2004. Technology for measuring emissions: Limitations/Benefits. In Proceedings 2004 National Poultry Waste Management Symposium, Memphis, TN. Editors J.B. Hess and K.D. Robertson. Pp. 107-119.
10. Gates, R.S., K. D. Casey, E. F. Wheeler, H. Xin, A.J. Pescatore, J. L. Zajackowski, J.R. Bicudo, P. A. Topper, Y. Liang, and M. Ford. 2004. Broiler house ammonia emissions: U.S. baseline data. Multi-State Poultry Feeding and Nutrition and Health and Management Conference and Degussa Corp. Technical Symposium: Indianapolis, IN.
11. Liang, Y., H. Xin, R.S. Gates, and E. F. Wheeler. 2003. Updates on ammonia emission from Iowa layer houses. Proceedings, Iowa Egg Industry Symposium: Ames, IA.
12. Gates, R.S., H. Xin and E.F. Wheeler. 2002. Ammonia losses, evaluations and solutions for poultry systems. Proc., 2002 National Poultry Waste Management Symposium. Editor, Patterson, P.H, J.P. Blake and K.D. Robertson. NPWM Committee. Pp. 79-88.
13. Xin, H., Y. Liang, R.S. Gates and E.F. Wheeler. 2002. Measurement of ammonia emissions from laying hen houses. Proceedings of the Iowa Poultry Industry Symposium held in Scheman Continuing Education Center. November 12. Ames, IA. Pp.53-58.
14. Simposio de Ambiencia na Produção Animal, held during March 2002 at Federal University of Viçosa, Department of Agricultural Engineering. Reviewed graduate student projects, participated in Dr. Yanagi's dissertation defense, lectured on environment control systems.

15. Gates, R.S. 2001. Dietary protein and ammonia production in broiler facilities. Invited Lecture. Midwest Poultry Federation: Nutrition Symposia: St. Paul, MN.
16. Gates, R.S. 2000. Manipulação da Dieta Avícola Considerando a redução na emissão de poluentes ao ambiente (Poultry diet manipulation to reduce output of pollutants to environment). Invited Lecture. Sponsored by EMBRAPA: Concordia: Brazil.
17. Gates, R.S., A.J. Pescatore, M.J. Ford, J.L. Taraba, K. Liberty, A.H. Cantor, and D.J. Burnham. 2000. The effect of feeding low protein diets on ammonia emission and total ammoniacal nitrogen in broiler litter. Proceedings, National Poultry Waste Management Symposium: Springdale AR. Pp. 169-180.
18. Gates, R.S. 2000. Introduction to psychrometric properties and processes. Tech/CPD seminar for Parameter Generation and Control (PGC), Inc.: Asheville, NC.
19. Gates, R.S., J.L. Taraba and K.R. Liberty. 1998a. Precision nutrition and litter volatilization dynamics. Proceedings, National Poultry Waste Management Symposium: Ocean City, MD. Pp. 378-386.
20. Gates, R.S. and G.A. Duncan. 1998. Ventilation system design parameters for greenhouses for tobacco production. AEU-90 Agricultural Engineering Update Series.
21. Poultry Housing and Equipment Handbook. Northeast Region Agricultural Engineering Series (NRAES). Editor and co-author: Chapter 5, Monitoring and Control Systems. Co-author: Chapter 4, Ventilation, Heating and Cooling. Co-author: Chapter 3, Poultry Production Systems.
22. Turner, L.W. and R.S. Gates. 1996. Modified environment systems for animals and plants. USDA Challenge Grant on Incorporating Biology in Senior Engineering Design. Video training tape, workbook. Tempe, AZ. July.
23. Turner, L.W., T.C. Bridges, J.L. Usry, and R.S. Gates. 1995. NCPIG Swine Growth Model Version 1.0 User's Guide and Model Documentation. University of Kentucky College of Agriculture, Department of Biosystems and Agricultural Engineering Special Publication. March.
24. Gates, R.S. 1994. Regional variation in heat stress for broiler housing. Oral presentation to Kentucky Poultry Federation, October. Lake Barkley State Resort Park: Cadiz KY.
25. Gates, R.S. 1993. Economic optimization of broiler production. Oral presentation given on three separate occasions to: Iwate Poultry Farm, Kitasato University Faculty, and researchers in livestock environment.
26. Gates, R.S., L.W. Turner and D.G. Overhults. 1992. Performance of microprocessor controllers. EPRI TR-100175, Project 2782-4, Final Report. Electric Power Research Institute: Palo Alto, CA.
27. Gates, R.S. 1991. Considerations for environmental controllers in poultry facilities. Multi-state Newsletter, Poultry Extension and Research, Vol. 3(1). Cooperative Extension Series of the States of Illinois, Indiana, Kentucky, Michigan, and Ohio.
28. Gates, R.S., D.G. Overhults, L.W. Turner, and R.L. Fehr. 1991. Transient surge protection for agricultural facilities. AEN 70, AEU-58, University of Kentucky Cooperative Extension Service: Lexington, KY.
29. Gates, R.S. and D.G. Overhults. 1991. Electronic controls for broiler houses. AEN-71, AEU-56, University of Kentucky Cooperative Extension Service: Lexington, KY.
30. Overhults, D.G. and R.S. Gates. 1991. Electronic controls for swine buildings. AEU-57. University of Kentucky Cooperative Extension Service: Lexington, KY.

31. Gates, R.S. 1989. Recent trends in environmental control of poultry facilities. Multi-State Newsletter, Poultry Extension and Research, Vol. 1(5). Cooperative Extension Services of the States of Illinois, Indiana, Kentucky, Michigan, and Ohio.
32. Timmons, M.B. and R.S. Gates. 1988. Bird weighing as an integrated part of bird management. Poultry 4(4):27-29. Misset International.
33. Gates, R.S. 1987. Evaporative cooling for enhanced egg production. Presentation to the Kentucky Egg Council. October 1-2. Lake Cumberland State Resort Park: Jamestown KY.
34. Burks, T.F., L.W. Turner, W.L. Crist, J.L. Taraba, and R.S. Gates. 1988. Simulating cow throughput and labor efficiency in the dairy parlor. 1988. Dairy Research Report, University of Kentucky, College of Agriculture, Agricultural Experiment Station: Lexington, KY.

RESEARCH PUBLICATIONS

Publications in Refereed Journals.....	171
In Review	2
In Preparation.....	19
Book Chapters/Proceedings Editor	7
Abstracts, Papers and Presentations at Professional Meetings.....	310
Invited Presentations and Lectures	37
Others (Extension Newsletters, Popular Press, Speeches).....	>33

BOOK CHAPTERS AND PROCEEDINGS

1. Gates, R.S., H. Xin, B. Li and R. Zhao, editors. 2013. International Symposium on Animal Environment and Welfare. 19-22 October, 2013. Rongchang, Chongqing, China. 543 pp.
2. Purswell, J.L. and R.S. Gates. 2013. Chapter 8: Automation in Animal Housing and Production. Pp 205-230 In: Agricultural Automation. Fundamentals and Practices. Zhang, Q. and Pierce F.J. editors. Taylor & Francis Group, LLC. ISBN: 13:978-1-4398-8057-9. 397 pp.
3. Cambra-Lopez, M. and R.S. Gates, editors. 2012. IX International Livestock Environment Symposium (ILES IX). Proceedings of the Ninth International Livestock Environment Symposium. 8-12 July. Valencia, Spain. St. Joseph, MI: ASABE.
4. Bridges, T.C. and R.S. Gates. 2009. Chapter 7: Modeling of Animal Bioenergetics for Environmental Management Applications. pp 151-179. In: DeShazer, J.A., ed. Livestock Energetics and Thermal Environmental Management, ASABE: St. Joseph, MI. 209pp.
5. Moura, D. and R.S. Gates, editors. 2008. Livestock Environment VIII: Proceedings of the Eighth International Livestock Environment Symposium. 31 Aug – 4 September, Iguassu Falls, Brazil. St. Joseph, MI: ASABE.
6. Tinôco, I.F.F. and R.S. Gates. 2005. Ambiência e construções para matrizes pesadas. Chapter 2 in: Manejo de Matrizes de Corte. Fundação Apnco de Ciência e Tecnologia Avícolas, (FACTA) Publishers : Campinas, SP, Brazil. pp. 11-34 of 421.
7. Gates, R.S. 2001. Equipment for Poultry Production. Chapter 5.1.3.5 In: Encyclopedia of Life Support Systems, UNESCO/EOLSS Publishers Co. Ltd.: Oxford UK. Web version only.

REFEREED JOURNALS

1. Freitas, L.C., I.F.F. Tinôco, J.V. Toledo, M.G.L. Cândido, M. Barbari, R.S. Gates. 2018. Development and validation of a data logger for thermal characterization in laying hen facilities. Revista Brasileira de Engenharia Agrícola e Ambiental (AGRIAMBI), accepted for publication.
2. Santos, T., R.S. Gates, I.F.F. Tinôco, S. Zolnier and K. Rocha. 2019. Productive performance and surface temperatures of Japanese quail exposed to different environment conditions at start of lay. Poultry Science. Poultry Science, 0:1-10. (doi: 10.3382/ps/pez068)
3. Hu, J., P. Hester, Y. Xiong, R.S. Gates, M. Makagon, and H. Cheng. 2018. Effect of cooled perches on the efficacy of an induced molt in White Leghorn laying hens exposed to cyclic heat. Poultry Science, accepted for publication.

4. Hu, J., P. Hester, M. Makagon, Y. Xiong, R.S. Gates and H. Cheng. 2019. Effect of cooled perches on performance, plumage condition, and foot health of caged White Leghorn hens exposed to cyclic heat. *Poultry Science*, 0:1-15. (doi: 10.3382/ps/pez039)
5. Hu, J., P. Hester, M. Makagon, Y. Xiong, R.S. Gates and H. Cheng. 2018. Effect of cooled perches on physiological parameters of caged White Leghorn hens exposed to cyclic heat. *Poultry Science*, 0:1-9. (doi: 10.3382/ps/pez012)
6. Xiong, Y., R.S. Gates and A.R. Green. 2018. Factors affecting trailer thermal environment experienced by market pigs transported in the US. *Animals* 8(11):203. (doi:10.3390/ani8110203).
7. Freitas, L.C.S.R., I.F.F. Tinôco, R.S. Gates, C.F.Souza, M. Barbari and C.G.S. Teles Junior. 2018. Spatial behavior of the thermo-luminous conditions of facility laying hens in naturally ventilated vertical system. *Ciencia e Agrotecnologia*, 42(5):550-560 (doi:10.1590/1413-70542018425019618)
8. Smith, R.K., J-L. Rault, R.S. Gates and D.C. Lay Jr. 2018. A two-step process of nitrous oxide before carbon dioxide for humanely euthanizing piglets: on-farm trials. *Animals* 8(4):52. (doi: 10.3390/ani8040052).
9. Cândido, M.G.L., Y. Xiong, R.S. Gates, I.F.F. Tinôco and K.W. Koelkebeck. 2018. Effects of carbon dioxide on turkey poult performance and behavior. *Poultry Science*: (doi: 10.3382/ps/pey128).
10. Souza, C.F., R.S. Gates, M.D. Duarte and I.F.F. Tinôco. 2017. Effective Microorganisms (EM) as biofeeders for anaerobic digestion. *Rev. Engenharia Agric* 25(6):491-499.
11. Zheng, Z., L. Yang, R.S. Gates, J. Wu and X. Wang. 2017. Impedance-based moisture content sensor assessment for gas-phase biofilter media. *Transactions of the ASABE* 60(6):2163-2173. (doi 12.1303/trans.12335)
12. Santos, T.C., R.S. Gates, I.F.F. Tinoco, S. Zolnier and F.C. Baeta. 2017. Behavior of Japanese quail in different air velocities and temperatures. *Pesq. Agropec. Bras.* 52(5):344-354. (doi 10.1590/s0100-204x2017000500008)
13. Sama, M.P., G.B. Day V., L.M. Pepple and R.S. Gates. 2017. Fourth-generation Fan Assessment Numeration System (FANS) design and performance specification. *Transactions of the ASABE.* 60(2):507-516. (doi 10.13031/trans.12119)
14. Hu, J.Y., P.Y. Hester, M.M. Makagon, G. Vezzoli, R.S. Gates, Y.J. Xiong and H.W. Cheng. 2016. Cooled perch effects on performance and well-being traits in caged White Leghorn hens. *Poultry Sci* 95(12):2737-2746. (doi 10.3382/ps/pew248)
15. Bullock, E.L., D.R. Edwards, P.A. Moore, Jr. and R.S. Gates. 20016. Effects of chemical amendments to swine manure on runoff quality. *Transactions of the ASABE.* 59(6): 1651-1660. (doi 10.13031/trans.59.11636)
16. Bridges, T and R.S. Gates. 2016. Modeling the growth of thoroughbred horses: the relationship of birth weight, gestation time and wither height at maturity. *Transactions of the ASABE.* 59(5): 1383-1391. (doi 10.13031/trans.59.11690)
17. Ji, B., W. Zheng, R.S. Gates and A.R. Green. 2016. Design and performance evaluation of the upgraded Portable Monitoring Unit for barn air quality. *Comput. Electron. Agric.* 124:132-140. (doi 10.1016/j.compag.2016.03.030)

18. Mostafa, E., C. Nannen, J. Henseler, B. Diekmann, R. Gates and W. Buescher. 2016. Physical properties of particulate matter from animal houses – empirical studies to improve emissions modeling. *Environ Sci Pollut Res.* (doi 10.1007/s11356-016-6424-8)
19. Danao M.-G.C., R.S. Zandonadi, and R.S. Gates. 2015. Development of a grain monitoring probe to measure temperature, relative humidity, carbon dioxide levels and logistical information during handling and transportation of soybeans. *Comput. Electron. Agric.* 119:74-82. (doi 10.1016/j.compag.2015.10.008)
20. Maia, G.D.N., A.R. Green, B.C. Ramirez, Y. Sun, L.F. Rodriguez, D.W. Shike, and R.S. Gates. 2015. A novel ruminant emission measurement system: Part II-Commissioning. *Transactions of the ASABE.* 58(6):1801-1815. (doi 10.13031/trans.58.10753)
21. Maia, G.D.N., B.C. Ramirez, A.R. Green, J.R. Segers, D.W. Shike, L.F. Rodriguez and R.S. Gates. 2015. A novel ruminant emission measurement system: Part I. Design evaluation and description. *Transactions of the ASABE* 58(3):749-762. (doi 10.13031/trans.58.10752)
22. Sales, G.T., A.R. Green, R.S. Gates, T.M. Brown-Brandl and R.A. Eigenberg. 2015. Quantifying detection performance of a passive low-frequency RFID system in an environmental preference chamber. *Computers and Electronics in Agriculture.* 114:261-268. (doi 10.1016/j.compag.2015.03.008)
23. Xiong, Y., A.R. Green, and R.S. Gates. 2015. Characteristics of trailer thermal environment during commercial swine transport managed under US industry guidelines. *Animals* 5(2):226-244. (doi 10.3390/ani5020226)
24. Zhi, Z., R.S. Gates, Z. Zhirong and H. Xiohui. 2015. Evaluation of ventilation performance and energy efficiency of greenhouse fans. *Int J Agric & Biol Eng* 8(1):103-110. (doi 10.3965/j-ijabe.20150801.014)
25. Saraz, J.A.O., I.F.F. Tinoco, R.S. Gates, K.S.O. Rocha and O.L.Z. Marin. 2015 A simple methodology to measure ammonia flux generated in poultry houses submitted to natural ventilation. *Rev Colomb Cienc Pecu* 28(1):3-12
26. Ramirez, B.C., G.D.N. Maia, A.R. Green, D.W. Shike, L.F. Rodriguez and R.S. Gates. 2014. Design and validation of a precision orifice meter for ventilation rate control in open-circuit respiration chambers. *Transactions of the ASABE* 57(6). (doi 10.13031/trans.57.10754)
27. Danao, M.-G.C, S.-F. Chen and R.S. Gates. 2014. Uncertainty estimation of ethanol concentration in simulated breath using enzyme-based biosensors. *Accreditation and Quality Assurance.* 19(6):415-422. (doi 10.1007/s00769-014-1088-x)
28. Saraz, J.A.O., I.F.Ferreira-Tinoco, R.S. Gates, K.S. Oliveira-Rocha, E.M. Combatt-Caballero and F. Campos-de Sousa. 2014. Adaptation and validation of a methodology for determining ammonia flux generated by litter in naturally ventilated poultry houses. *Revista Dyna.*:81(187):137-143
29. Ferraz, P.F.P., T. Yanagi Junior, Y.F.H. Julio, J.O. Castro, R.S. Gates, G.M. Reis and A.T. Campos. 2014. Predicting chick body mass by artificial intelligence-based models. *Pesq. Agropec. Bras.* 49(7):559-568. (doi10.1590/S0100-204X2014000700009.)
30. Kashiha, M., A.R. Green. A.R., G.T. Sales or Lust, D. Berckmans, and R.S. Gates. 2014. Performance of an image analysis processing system for hen tracking in an environmental preference chamber. *J Poultry Science.* 93:1-10. (doi 10.3382/ps.2014-04078)
31. Koelkebeck, K.W., S. dePersio, K. Lima, P.C. Harrison, C. Utterback, P. Utterback, R. Gates, A. Green and J.M. Campbell. 2014. Evaluation of feeding spray-dried bovine plasma protein on production

- performance of laying hens exposed to high ambient temperatures. *J Applied Poultry Research*. 23(3):393-402 (doi 10.3382/japr.2013-00876)
32. Zheng, W., Y. Zhao, H. Xin, R.S. Gates, B. Li., Y. Zhang and M. Soupir. 2014. Airborne particulate matter and culturable bacteria reduction from spraying slightly acidic electrolyzed water in an experimental aviary laying-hen housing chamber. *Transactions of the ASABE* 57(1):229-236. (doi 10.13031/trans.57.10306)
 33. Morello, G.M., D.G. Overhults, G.B. Day V., R.S. Gates, I.M. Lopes and J. Earnest Jr. 2014. Using the Fan Assessment Numeration System (FANS) in-situ: A procedure for minimizing errors during fan tests. *Transactions of the ASABE* 57(1):199-209. (doi 10.13031/trans.57.10190)
 34. Yang, L., A.D. Kent, X. Wang, T.L. Funk, R.S. Gates, and Y. Zhang. 2014. Moisture effects on gas-phase biofilter ammonia removal efficiency, nitrous oxide generation and microbial communities. *Journal of Hazardous Materials*.271:292-301. (doi 10.1016/j.jhazmat.2014.01.058)
 35. Bridges, T.C., R.S. Gates, E.M. Smith and L.W. Turner. 2013. Modeling the growth of laboratory and farm animals: Part 2. Polytocus animals and the relationship of birth weight, gestation time, and mature size. *Transactions of the ASABE* 56(3):1133-1144 (doi 10.13031/trans.56.10071) **Superior Paper Award, ASABE*
 36. Zheng, W., Y. Zhao, H. Xin, R.S. Gates, Y. Zhang and M. Soupir. 2013. Concentrations and size distributions of airborne particulate matter and bacteria in an experimental aviary laying-hen chamber. *Transactions of the ASABE* 56(6):1493-1501. (doi 10.13031/trans.56.10141)
 37. Yang, L., X. Wang, T.L. Funk, S. Shi, R.S. Gates and Y. Zhang. 2013. Moisture monitoring and control in gas-phase biofilters to achieve high ammonia removal efficiency and low nitrous oxide generation. *Transactions of the ASABE* 56(5):1895-1903. (doi 10.13031/trans.56.9843)
 38. Yang, L., X. Wang, T.L. Funk, R.S. Gates and Y. Zhang. 2013. Impedance-based moisture sensor design and test for gas-phase biofilter applications. *Transactions of the ASABE* 56(4):1613-1621. (doi 10.13031/trans.56.10141)
 39. Pereira, D.F., B.C.B. Miyamoto, G.D.N. Maia, G.T. Sales, M.M. Magalhaes and R.S. Gates. 2013. Machine vision to identify broiler breeder behavior. *Computers and Electronics in Agriculture*. 99:194-199. (doi 10.1016/j.compag.2013.09.012)
 40. Calvet, S., R.S. Gates, G. Zhang, F. Estelles, N. W.M. Ogink, S. Pedersen and D. Berckmans. 2013. Measuring gas emissions from livestock buildings: A review on uncertainty analysis and error sources. *Biosystems Engineering*: 116 (2013): 221-231. (doi 10.1016/j.biosystemseng.2012.11.004)
 41. Yang, X., X. Wang, T.L. Funk, Y. Zhang and R.S. Gates. 2013. Total Endotoxin and (1→3)- β -D-Glucan in animal confinement buildings: effect of building types and seasons. *Atmospheric Environment*. (doi 10.1080/10962247.2013.810556)
 42. Sales, G.T., A.R. Green and R.S. Gates. 2013. Commissioning an animal preference chamber for behavioral studies with laying hens exposed to atmospheric ammonia. *Computers and Electronics in Agriculture*: 95:48-57. (doi 10.1016/j.compag.2013.04.004)
 43. Trabue, S., K. Scoggin, L.L. McConnell, H. Li, A. Turner, R. Burns, H. Xin, R. Gates, A. Hasson, S. Ogunjemiyo, R. Maghirang and J. Hatfield. 2013. Performance of commercial non-methane hydrocarbon analyzers in monitoring oxygenated volatile organic compounds emitted from animal feeding operations. *Journal of the AWMA*. (doi 10.1080/10962247.2013.804464)

44. Saraz, J.A.O., I.F.F. Tinoco, R.S. Gates, M.O. Paula and L.B. Mendes. 2013. Evaluation of different methods for determining ammonia emissions in poultry buildings and their applicability to open facilities. *Revista Dyna* 80(178):51-60.
45. Santos, M.O., M.A. Martins, J.S. R. Coimbra, R.S. Gates and L.P. Corrêdo. 2013. Rheological behavior of *Chlorella* sp. E *Scenedesmus* sp. cultures in different biomass concentrations. *Engenharia Agrícola*. 33(5):1063-1071.
46. Yang, L., X. Wang, T.L. Funk, R.S. Gates and Y. Zhang. 2012. Transport and fate of nitrogen-containing compounds in gas-phase biofilters: a swing test to mitigate ammonia. *Transactions of the ASABE* 55(5):1951-1958.
47. Maia, G.D.N., G.T. Sales, G.B. Day V, R.S. Gates and J.L. Taraba. 2012. Characterizing physical properties of gas-phase biofilter media. *Transactions of the ASABE*. 55(5):1939-1950.
48. Maia, G.D.N., G.B. Day V., R.S. Gates, J.L. Taraba and M.S. Coyne. 2012. Moisture effects of greenhouse gases generation in nitrifying gas-phase compost biofilters. *Water Research* 46 (9), 3023-3031. (doi 10.1016/j.watres.2012.03.007)
49. Yanagi, J., H. Xin and R.S. Gates. 2012. A research facility for studying poultry responses to heat stress and its relief. *J Ag Safety & Health* 18(2):255-250. (doi 10.13031/2013.7787)
50. Xin, H., R.S. Gates, A.R. Green, F.M. Mitloehner, P.A. Moore Jr., and C.M. Wathes. 2011. Environmental impacts and sustainability of egg production systems. *Poultry Science* 90(1):263-277. (doi 10.3382/ps.2010-00877)
51. Yang, L., X. Wang, T.L. Funk and R.S. Gates. 2011. Biofilter media characterization and airflow resistance test. *Transactions of the ASABE*. 54(3):1127-1136.
52. Maia G. D. N., R.S. Gates, G.B. Day V, G. B. and J.L. Taraba, 2011 Ammonia biofiltration and nitrous oxide generation during the start-up of gas-phase compost biofilters. *Atmospheric Environment*. 46:659-664.
53. Maia, G.D.N., G.B. Day V., R.S. Gates and J.L. Taraba. 2011. Biofilter media characterization using water sorption isotherms. *Transactions of the ASABE* 54(4):1445-1451.
54. Yang, X., X. Wang, Y. Zhang, J. Lee, J. Su and R.S. Gates. 2011. Characterization of trace elements and ions in PM10 and PM2.5 emitted from animal confinement buildings. *J Atm Env.* (doi 10.1016/j.atmosenv.2011.09.037)
55. Kuczynski, T., V. Blanes-Vidal, B. Li, R.S. Gates, I.A. Naas, D.J. Moura, D. Berckmans and T. Banhazi. 2011. Impact of global climate change on the health, welfare and productivity of intensively housed livestock. *Intl J Ag&Biol Engng* 4(2):1-22.
56. Fulcher, A., R. Geneve, E. Wilkerson, T. Steele and R.S. Gates. 2011. Using transpiration chambers to detect initial transpiration in cuttings and quantify transpiration in seedlings. *Acta Hort.* 893:1037-1042.
57. Tinoco, I.F.F., J.A.O. Saraz, R. Piexoto, M. de Paula and R.S. Gates. 2010. Development and evaluation of prefabricated concrete roof made with lightweight expanded clay arid applied to covering facilities for animal production. *Revista Dyna*, 63(2):5651-5660.

58. Purswell, J.L. R.S. Gates, L.M. Lawrence and J.D. Davis. 2010. Thermal environment in a four-horse slant-load trailer. *Transactions of the ASABE* 53(6):1885-1894.
59. Casey, K.D., R.S. Gates, R.C. Shores, E.D. Thoma, and D.B. Harris. 2010. Ammonia emissions from a U.S. broiler house – comparison of concurrent measurements using three different technologies. *Journal of Air and Waste Management Association*. 60(8):939-948.
60. Gates, R.S., K.D. Casey, H. Xin, and R.T. Burns. 2009. Building emissions uncertainty estimates. *Transactions of the ASABE* 52(4):1345-1351.
61. Xin, H., H. Li, R.T. Burns, R.S. Gates, D.G. Overhults, and J.W. Earnest. 2009. Use of CO₂ concentration difference or CO₂ balance to assess ventilation rate of broiler houses. *Transactions of the ASABE* 52(4):1353-1361.
62. Singh, A., K.D. Casey, W.D. King, A.J. Pescatore, R.S. Gates, and M.J. Ford. 2009. Efficacy of urease inhibitor to reduce ammonia emission from poultry houses. *Journal of Applied Poultry Research*. 18:34-42.
63. Bridges, T.C., R.S. Gates, E.M. Smith and L.W. Turner. 2008. Modeling the growth of laboratory and farm animals Part 1: Monotocus animals and the relationship of birth weight, gestation time and mature size. *Transactions of the ASABE* 51(6):2123-2133.
64. Moody, L.B., H. Li, R.T. Burns, H. Xin, R. S. Gates, S.J. Hoff and D.G. Overhults. 2008. Southeastern Broiler Gaseous and Particulate matter Emissions Monitoring Quality Assurance Project Plan. Published as Special ASABE peer reviewed publication. 289 pages. ASABE. St. Joseph, MI. http://asae.frymulti.com/aqap_handbook.asp?confid=aqap2008
65. Gates, R.S. and H. Xin. 2008. Extracting poultry behavior from time-series weigh scale records. *Computers and Electronics in Agriculture* 62(1):8-14.
66. Green, A.R., R.S. Gates, L.M. Lawrence, and E.F. Wheeler. 2008. Continuous recording reliability analysis of three monitoring systems for horse core body temperature. *Computers and Electronics in Agriculture* 61(1):88-95.
67. Gates, R.S., K.D. Casey, E.F. Wheeler, H. Xin, and A.J. Pescatore. 2008. U.S. broiler housing ammonia emissions inventory model. *Atmospheric Environment* 42(14):3342-3350. Doi 10.1016/j.atmosenv.2007.06.057
68. Topper, P.A., E.F. Wheeler, J.S. Zajackowski, R.S. Gates, H. Xin, Y. Liang, and K.D. Casey. 2008. Ammonia emissions from two empty broiler houses with built-up litter. *Transactions of the ASABE* 51(1):219-225. Honorable Mention Paper Award.
69. Casey, K.D., R.S. Gates, E.F. Wheeler, H. Xin, Y. Liang, A. Pescatore, and M. Ford. 2008. On-farm fan performance: implications for ventilation and operating cost. *Journal of Applied Poultry Research* 17(2):283-295.
70. Green, A.R., R.S. Gates and L.M. Lawrence. 2007. Equine thermoregulatory responses during summertime road transport and stall confinement. *Brazilian Journal of Biosystems Engineering* 1(1):83-92.

71. Darr, M. J., T.S. Stombaugh, S.A. Shearer, and R.S. Gates. 2007. A new course to teach microcontrollers and embedded networking to Biosystems and Agricultural Engineers. *International Journal of Engineering Education* Vol. 23
72. Vigoderis, R.B., I.F.F. Tinôco, A.F.L. Filho, J.N. Silva, R.S. Gates, D.G. Pauli, C.E. Silva and M.C.C. Guimaraes. 2007. Construção de túnel de vento reduzido, visando a avaliação de argila expandida em sistemas de resfriamento adiabático evaporativo para arrefecimento térmico em galpões de produção animal. *Engenharia na Agricultura* 15(3):191-199.
73. Casey, K.D., S.E. Ford, J.W. McClure, Y. Zhang, and R.S. Gates. 2007. Determining fan performance using FANS: an investigation of performance impacts. *Applied Engineering in Agriculture* 23(3):333-338.
74. Casey, K.D., J.R. Bicudo, D.R. Schmidt, A. Singh, S.W. Gay, R.S. Gates, L.D. Jacobson, and S.J. Hoff. 2006. Air quality and emissions from livestock and poultry production/waste management systems. *Animal Agriculture and the Environment: National Center for Manure and Animal Waste Management White Papers*. J.M. Rice, D.F. Caldwell, F.J. Humenik, eds. ASABE: St. Joseph, MI. Pp. 1-40.
75. Wheeler, E.F., K.D. Casey, R.S. Gates, H. Xin, J.L. Zajaczkowski, P.A. Topper, Y. Liang, and A.J. Pescatore. 2006. Ammonia emissions from twelve U.S.A. broiler houses. *Transactions of the ASABE* 49(5):1495-1512.
76. Montross, M. D., G.A. Duncan and R.S. Gates. 2006. Development and testing of a low-cost condensation testing system. *Applied Engineering in Agriculture* 22(4):603-608.
77. Liang, Y., H. Xin, H. Li, R.S. Gates, E.F. Wheeler, and K.D. Casey. 2006. Effect of measurement interval on estimation of ammonia emission rates for layer houses. *Transactions of the ASAE* 49(1): 183-186.
78. Purswell, J.L., R.S. Gates, L.M. Lawrence, J.D. Jacob, T.S. Stombaugh, and R.J. Coleman. 2006. Air exchange rate in a horse trailer during road transport. *Transactions of the ASAE* 49(1):193-201.
79. Liang, Y., H. Xin, E.F. Wheeler, R.S. Gates, H. Li, J.S. Zajaczkowski, P. A. Topper, K.D. Casey, B.R. Behrends, D.J. Burnham, and F.J. Zajaczkowski. 2005. Ammonia emissions from U.S. laying houses in Iowa and Pennsylvania. *Transactions of the ASAE* 48(5):1927-1941.
80. Gates, R.S., H. Xin, K.D. Casey, Y. Liang and E.F. Wheeler. 2005. Method for measuring ammonia emissions from poultry houses. *Journal of Applied Poultry Research* 14(3):622-634.
81. Green, A.R., R.S. Gates and L.M. Lawrence. 2005. Measurement of horse core body temperature. *Journal of Thermal Biology* 30(1):370-377.
82. Li, H., H. Xin, Y. Liang, R.S. Gates, E.F. Wheeler, and A.J. Heber. 2005. Comparison of direct vs. indirect ventilation rate determination rates in layer barns using manure belts. *Transactions of the ASAE* 48(1):367-372
83. Pescatore, A.J., K.D. Casey and R.S. Gates. 2005. Ammonia emissions from broiler houses. *Journal of Applied Poultry Research* 14(3):635-637.
84. Wilkerson, E.G., R.S. Gates, S. Zolnier, S.T. Kester, and R.L. Geneve. 2005. Predicting rooting stages in poinsettia cuttings using a root zone temperature-based model. *Journal of the American Society for Horticultural Science* 130(3):302-307.

85. Wilkerson, E.G., R.S. Gates, S. Zolnier, S.T. Kester, and R.L. Geneve. 2005. Transpiration capacity in poinsettia cuttings at different rooting stages and the development of a cutting coefficient for scheduling mist. *Journal of the American Society for Horticultural Science* 130(3):295-301.
86. Santos, R.C., I.F.F. Tinôco, J.N. da Silva, M.B. Cordeiro, M.O. de Paula, and R.S. Gates. 2004. Influência das coberturas de barro, cimento-aminato e alumínio, com duas alturas de pé-direito, no conforto térmico de galpões para produção de aves e suínos, em condições de inverno. *Engenharia na Agricultura* 12(2):145-153.
87. Singh, A., J.R. Bicudo, A.L. Tinôco, I.F.F. Tinôco, R.S. Gates, K.D. Casey, and A.J. Pescatore. 2004. Characterization of built-up broiler litter using trench and random walk methods. *Journal of Applied Poultry Research* 13:426-432.
88. Gates, R.S., K.D. Casey, H. Xin, E.F. Wheeler, and J.D. Simmons. 2004. Fan assessment numeration system (FANS) design and calibration specifications. *Transactions of the ASAE* 47(5):1709-1715.
89. Persyn, K.E., H. Xin, D. Nettleton, A. Ikeguchi, and R.S. Gates. 2004. Feeding behaviors of laying hens with or without beak trimming. *Transactions of the ASAE* 47(2):591-596.
90. Geneve, R.L., R.S. Gates, S. Zolnier, E. Wilkerson, and S.T. Kester. 2004. Environmental control systems for mist propagation of cuttings. *Acta Horticulturae* 630:297-303.
91. Brown-Brandl, T., J. A. Nienaber, H. Xin, and R.S. Gates. 2004. A literature review of swine heat production. *Transactions of the ASAE* 47(1):259-270.
92. Zolnier, S., G.B. Lyra and R.S. Gates. 2004. Evapotranspiration estimates for greenhouse lettuce using an intermittent nutrient film technique. *Transactions of the ASAE* 47(1):271-282.
93. Singh, A., J. R. Bicudo, A. L. Tinôco, I. F. Tinôco, I.F.F., R.S. Gates, K.D. Casey, and A.J. Pescatore. 2004. Characterization of built-up broiler litter using trench and random walk sampling methods. *J Applied Poultry Research* 13(3):426-432.
94. Chepete, H.J., H. Xin, M. Puma, and R.S. Gates. 2004. Heat and moisture production of pullets and layers with or without the contribution of feces (4720 RP-1044). *ASHRAE Transactions* 110(2):286-299.
95. Bridges, T.C., L.W. Turner, R.S. Gates, and D.G. Overhults. 2003. Assessing the benefits of misting-cooling systems for growing/finishing swine as affected by environment and pig placement date. *Applied Engineering in Agriculture* 19(3):361-366.
96. Brown-Brandl, T., Y. Yanagi, Jr., H. Xin, R.S. Gates, R.A. Bucklin, and G.S. Ross. 2003. A new telemetry system for measuring core body temperature in livestock and poultry. *Applied Engineering in Agriculture* 19(5):583-589.
97. Wilkerson, E. and R.S. Gates. 2003. Controlled environment system for studying root zone temperature effects on poinsettia propagation. *Applied Engineering in Agriculture* 19(4):483-489. (doi 10.13031/2013.14920)
98. Chinn, M.S., S.E. Nokes and R.S. Gates. 2003. PC based data acquisition for a solid state cultivation deep bed reactor. *Applied Engineering in Agriculture* 19(2):237-245.
99. Zolnier, S., R.S. Gates, R.L. Geneve, and J.W. Buxton. 2003. Evapotranspiration-based mist control for poinsettia propagation. *Transactions of the ASAE* 46(1):135-145.

100. Tinôco, I.F.F., R.S. Gates, and A.L.A. Tinôco. 2003. Environmental thermal comfort and performance of broiler chickens raised at high stocking density and different positive ventilation systems under heat stress conditions. *Poultry Science* 66(1):20-35.
101. Tinôco, I.F.F., R.S. Gates, A.L.A. Tinôco, F.D.C. Baeta, and P.R. Cecon. 2003. Evaluation of broiler breeder housing in high temperature Brazilian conditions. *Transactions of the ASAE* 70786(1):10.25.
102. Tinôco, I.F.F., R.S. Gates, F.D.C. Baeta, and A.L.A. Tinôco. 2003. Stocking density and effects on the performance on broiler chickens grown under water fogging and positive tunnel ventilation systems. *Poultry Science*, EUA 66868(1):1-15.
103. Yanagi, Jr., T., H. Xin and R.S. Gates. 2002. A research facility for studying poultry responses to heat stress and its relief. *Applied Engineering in Agriculture* 18(2): 255-260.
- 104.** Yanagi, Jr., T., H. Xin and R.S. Gates. 2002. Optimization of partial surface wetting to cool caged laying hens. *Transactions of the ASAE* 45(4):1091-1100. **(Honorable Mention Paper Award).**
105. Xin, H., R.S. Gates, M.C. Puma, and D.U. Ahn. 2002. Drinking water temperature effects on laying hens subjected to warm cyclic environments. *Poultry Science* 81:608-617.
106. Albright, L.D., R.S. Gates, K.G. Arvanitis, and A.E. Drysdale. 2001. Control strategies for plant shoot and root environments on earth and in space. *IEEE Control Systems: Agriculture and the Environment* 21(5):28-47.
107. Gates, R.S., K. Chao and N. Sigrimis. 2001. Identifying design parameters for fuzzy control of staged ventilation control systems. *Computers and Electronics in Agriculture* 31:61-74.
108. Zolnier, S., R.S. Gates, R.L. Geneve, and J.W. Buxton. 2001. Surface diffusive resistances of rooted poinsettia cuttings under controlled-environment conditions. *Transactions of the ASAE* 44(6): 1779-1787.
109. Puma, M.C., H. Xin, R.S. Gates, and D.J. Burnham. 2001. An instrumentation system for studying feeding and drinking behavior of individual poultry. *Applied Engineering in Agriculture* 17(3): 365-374.
110. Zolnier, S., R.S. Gates, R.G. Anderson, S.E. Nokes, and G.A. Duncan. 2001. Non-water-stressed baseline as a tool for dynamic control of a misting system for propagation of poinsettias. *Transactions of the ASAE* 44(1)137-147.
111. Hussein, A.S., A.H. Cantor, R.S. Gates, A.J. Pescatore, D. Burnham, M.J. Ford, and N.D. Paton. 2001. Effect of low protein diets with amino acid supplementation on broiler growth. *Journal of Applied Poultry Research* 10:354-363.
112. Bridges, T.C., L.W. Turner, R.S. Gates, and E.M. Smith. 2000. Relativity of growth in laboratory and farm animals. Part 1: Representation of physiological age and the growth rate time constant. *Transactions of the ASAE* 43(6):1803-1810.
113. Bridges, T.C., L.W. Turner, R.S. Gates, and E.M. Smith. 2000. Relativity of growth in laboratory and farm animals. Part 2: Birth weight as a predictor of animal maturity. *Transactions of the ASAE* 43(6):1811-1820.
114. Held, D., D.A. Potter, R.S. Gates, and R.G. Anderson. 2000. Modified atmosphere treatments as a potential disinfection technique for arthropod pests in greenhouses. *Journal of Economic Entomology* 94(2):430-438.

115. Burks, T.F., S.A. Shearer, R.S. Gates, and K.D. Donohue. 2000. Backpropagation neural network design and evaluation for classifying weed species using color image texture features. *Transactions of the ASAE* 43(4):1029-1037.
116. Chao, K, R.S. Gates and N.S. Sigrimis. 2000. Fuzzy logic controller design for staged heating and ventilating systems. *Transactions of the ASAE* 43(6):1885-1894.
117. Colliver, D.G., R.S. Gates, T.F. Burks, and H. Zhang. 2000. Development of the design climatic data for the 1997 ASHRAE Handbook-Fundamentals (RP-890). *ASHRAE Transactions* 106(1):3-14.
118. Sigrimis, N.A., K.C. Arvanitis and R.S. Gates. 2000. A learning technique for a general purpose optimizer. *Computers and Electronics in Agriculture* 26(2):83-103.
119. Zolnier, S., R.S. Gates, J. Buxton, and C. Mach. 2000. Psychrometric and ventilation constraints for vapor pressure deficit control. *Computers and Electronics in Agriculture* 26(3):343-359.
120. Colliver, D.G., R.S. Gates, H. Zhang, and K.T. Priddy. 1998. Sequences of extreme temperature and humidity for design calculations (828-RP). *ASHRAE Transactions* 104(1):133-144.
121. Bridges, T.C., L.W. Turner and R.S. Gates. 1998. Economic evaluation of misting-cooling systems for growing/finishing swine through modeling. *Applied Engineering in Agriculture* 14(4):425-430.
122. Burks, T.F., L.W. Turner, R.S. Gates, T.C. Bridges, and W.L. Crist. 1998. A stochastic simulation model for predicting cow throughput in dairy parlors. *Transactions of the ASAE* 41(6):1789-1797.
123. Chao, K., R.S. Gates and R.G. Anderson. 1998. Knowledge-based control systems for single stem rose production - Part I: Systems analysis and design. *Transactions of the ASAE* 41(3):1153-1161.
124. Chao, K., R.S. Gates and R.G. Anderson. 1998. Knowledge-based control systems for single stem rose production - Part II: Implementation and field evaluation. *Transactions of the ASAE* 41(4):1163-1172.
125. Ferguson, N.S., R.S. Gates, J.L. Taraba, A.H. Cantor, A.J. Pescatore, M.J. Ford, and D.J. Burnham. 1998. The effect of dietary crude protein on growth, ammonia concentration and litter composition in broilers. *Poultry Science* 77:1481-1487.
126. Ferguson, N.S., R.S. Gates, J.L. Taraba, A.H. Cantor, A.J. Pescatore, M.L. Straw, M.J. Ford, and D.J. Burnham. 1998. The effect of dietary protein and phosphorus on ammonia concentration and litter composition in broilers. *Poultry Science* 77:1085-1093.
127. Lochte-Watson, K.R., F.A. Payne, R.S. Gates, and C.L. Hicks. 1998. Effects of pH, protein, fat and calcium on diffuse reflectance of milk. *Transactions of the ASAE* 41(3):701-707.
128. Payne, F.A., R.C. Freels, S.E. Nokes, and R.S. Gates. 1998. Diffuse reflectance changes during the culture of cottage cheese. *Transactions of the ASAE* 41(3):709-713.
129. Turner, L.W., T.C. Bridges, R.D. Coffey, R.S. Gates, G.R. Parker, T.M. Brown-Brandl, and D.G. Overhults. 1998. Comparison of observed and simulated grow-finish swine performance under summer conditions. *Applied Engineering in Agriculture* 14(4):419-423.
130. Zhang, H., R.S. Gates and D.G. Colliver. 1997. Turing machine approach to solve psychrometric attributes. *Transactions of the ASAE* 40(3):823-831.

131. Chao, K. and R.S. Gates. 1996. Design of switching control systems for ventilated greenhouses. Transactions of the ASAE 39(4):1513-1523.
132. Gates, R.S., D.G. Overhults and S.H. Zhang. 1996. Minimum ventilation for modern broiler facilities. Transactions of the ASAE 39(3):1135-1144.
133. Payne, F.A., R.S. Gates and B.F. Fannin. 1996. Measurement precision for a fiber optic diffuse reflectance sensor. Transactions of the ASAE 39(6):2193-2198.
134. Bridges, T.C., R.S. Gates, K.L. Chao, L.W. Turner, and H. Minagawa. 1995. Techniques for development of swine performance response surfaces. Transactions of the ASAE 38(5):1505-1511.
135. Chao, K.L., R.S. Gates and H. Chi. 1995. Diagnostic hardware/software system for environmental controllers. Transactions of the ASAE 38(3):939-947.
136. Colliver, D.G., H. Zhang, R.S. Gates, and K.T. Priddy. 1995. Determination of the 1, 2 and 5% occurrences of extreme dew-point temperatures and mean coincident dry-bulb temperatures (RP-754). ASHRAE Transactions 101(2):265-286.
137. Gates, R.S., L.W. Turner, H. Chi, and J. Usry. 1995. Automated weighing of group-housed growing-finishing swine. Transactions of the ASAE 38(5):1479-1486.
138. Gates, R.S., H. Zhang, D.G. Colliver, and D.G. Overhults. 1995. Regional variation in temperature humidity index for poultry housing. Transactions of the ASAE 38(1):197-205.
139. Timmons, M.B., R.S. Gates, R.W. Bottcher, T.A. Carter, J.T. Brake, and M.J. Wineland. 1995. Simulation analysis of a new temperature control method for poultry housing. Journal of Agricultural Engineering Research 62(4):237-245.
140. Gates, R.S. 1994. Dew point temperature error from measuring dry bulb temperature and relative humidity. Transactions of the ASAE 37(2):687-688.
141. Bridges, T.C., R.S. Gates and L.W. Turner. 1992. Stochastic assessment of evaporative misting for growing-finishing swine in Kentucky. Applied Engineering in Agriculture 8(5):685-693.
142. Gates, R.S., D.G. Overhults, R.W. Bottcher, and S.H. Zhang. 1992. Field calibration of a transient model for broiler misting. Transactions of the ASAE 35(5):1623-1631.
143. Gates, R.S., L.W. Turner and D.G. Overhults. 1992a. A survey of environmental controllers. Transactions of the ASAE 35(3):993-998.
144. Gates, R.S., L.W. Turner and D.G. Overhults. 1992b. Transient overvoltage testing of environmental controllers. Transactions of the ASAE 35(2):727-733.
145. Gates, R.S., D.G. Overhults and L.W. Turner. 1992c. Mechanical backup systems for electronic environmental controllers. Applied Engineering in Agriculture 8(4):491-497.
146. Parker, B.F., G.M. White, M.R. Lindley, R.S. Gates, M. Collins, S. Lowry, and T.C. Bridges. 1992. Forced-air drying of baled alfalfa hay. Transactions of the ASAE 35(2):607-615.

147. Turner, L.W., J. P. Chastain, R.W. Hemken, R.S. Gates, and W.L. Crist. 1992. Reducing heat stress in dairy cows through sprinkler and fan cooling. *Applied Engineering in Agriculture* 8(2):251-256.
148. Bottcher, R.W., G.R. Baughman, R.S. Gates, and M.B. Timmons. 1991. Characterizing efficiency of misting systems for poultry. *Transactions of the ASAE* 34(2):586-590.
149. Gates, R.S., D.G. Overhults, B.L. Walcott, and S.A. Shearer. 1991. Constant velocity air inlet controller. *Computers and Electronics in Agriculture* 6:175-190.
150. Gates, R.S., M.B. Timmons and R.W. Bottcher. 1991. Numerical optimization of evaporative misting systems. *Transactions of the ASAE* 34(1):575-580.
151. Gates, R.S., J.L. Usry, J.A. Nienaber, L.W. Turner, and T.C. Bridges. 1991. Optimal misting method for cooling livestock housing. *Transactions of the ASAE* 34(5):2199-2206.
152. Jones, P.T., S.A. Shearer and R.S. Gates. 1991. Extraction algorithm for feather sexing poultry chicks. *Transactions of the ASAE* 34(2):635-640.
153. Usry, J.L., L.W. Turner, T.S. Stahly, T.C. Bridges, and R.S. Gates. 1991. GI tract simulation model of the growing pig. *Transactions of the ASAE* 34(4):1879-1883.
154. Tolzin, J.L., R.S. Gates, G.M. White, and B.F. Parker. 1990. Effect of cracks on the pressure – velocity relationship of air forced through baled alfalfa hay. *Transactions of the ASAE* 33(6):1959-1966.
155. Gates, R.S. and M.B. Timmons. 1989. Economic optimization of tom turkey production. *Poultry Science* 68:470-475.
156. Timmons, M.B. and R.S. Gates. 1989. Temperature dependent efficacy of evaporative cooling for broilers. *Transactions of the ASAE* 5(2):215-224.
157. Gates, R.S. and M.B. Timmons. 1988. Method to assess economic risk applied to environmental control options for animal housing. *Transactions of the ASAE* 31(1):197-201.
158. Gates, R.S. and M.B. Timmons. 1988. Stochastic and deterministic analysis of evaporative cooling benefits for laying hens. *Transactions of the ASAE* 31(3): 904-909.
159. Timmons, M.B. and R.S. Gates. 1988. Energetic model of production characteristics for tom turkeys. *Transactions of the ASAE* 31(5):1544-1551.
160. Timmons, M.B. and R.S. Gates. 1988. Predictive model of evaporative cooling and laying hen performance to air temperature and evaporative cooling. *Transactions of the ASAE* 31(5):1503-1509.
161. Merrill, W.G., R. Sagi, L.G. Petersson, T.V. Bui, H.N. Erb, D.M. Galton, and R.S. Gates. 1987. Effects of premilking stimulation on complete lactation milk yield and milking performance. *Journal of Dairy Science* 70(8):1676-1684.
162. Timmons, M.B. and R.S. Gates. 1987. Relative humidity as a ventilation control parameter in broiler housing. *Transactions of the ASAE* 30(4):1111-1115.
163. Gates, R.S., R.E. Pitt, A. Ruina, and J.R. Cooke. 1986. Cell wall elastic constitutive laws and stress-strain behavior of plant vegetative tissue. *Biorheology* 23(5)453-466.

164. Gates, R.S. and N.R. Scott. 1986. Measurements of effective teat load during machine milking. *Transactions of the ASAE* 29(4):1124-1130.
165. Timmons, M.B. and R.S. Gates. 1986. Economic optimization of broiler production. *Transactions of the ASAE* 29(5):1373-1378, 1384.
166. Upadhyaya, S.K., J.R. Cooke, R.S. Gates, and R.H. Rand. 1986. A finite element analysis of the mechanical and thermal strength of avian eggs. *Journal of Agricultural Engineering Research* 33(1):57-78.
167. Gates, R.S., N.R. Scott, R.E. Pitt, and D.L. Bartel. 1985. Elastic constitutive laws for cow teat tissue undergoing finite deformations. *Biorheology* 22(6):495-507.
168. Magee, C., R. Sagi, N.R. Scott, and R.S. Gates. 1984. Bacterial transport within and among various teatcup and cluster assemblies during milking. *Journal of Dairy Science* 67(9):2034-2040.
169. Gates, R.S., R. Sagi and R.W. Guest. 1982. Criteria for optimizing the size and configuration of milk pipelines. *Journal of Dairy Science* 65(3):410-418.
170. Sagi, R.S., R.S. Gates and N.R. Scott. 1982. Milking characteristics of teatcups with reduced liner wall movement. *Journal of Dairy Science* 66(2):266-274.
171. Gates, R.S., R. Sagi and N.R. Scott. 1981. Theoretical considerations in sizing milk pipelines. *Transactions of the ASAE* 24(6):1600-1604.

Manuscripts in Review

1. Candido, M., I.F.F. Tinoco, L. Albina, P. Cecon, R. Andrade and R.S. Gates. 2019. Effects of environment air temperature on pullet development. *Poultry Science*.
2. Maia, A.P.A., Green-Miller, A., P.K. Paulausky, D.J. Moura, R.S. Gates, A.S. Mendes and C. Souza. 2019. Selection of doors for a choice test with laying hens. *Applied Animal Behaviour Science (APPLAN)*.

Manuscripts in Preparation

1. Mostafa, E., W. Buescher, A. Kresse, R.S. Gates. 2018. Mitigation of methane, ammonia and nitrous oxide emissions from pig barns by slurry aeration and acid scrubber. *Biosystems Engineering*
2. Xiong, Y., R. S. Gates, T. L. Funk, W. Zheng, M. M. Boddington, and B. T. Lohmar. Challenges for manure management in China.
3. Xiong, Y., R.S. Gates, J. Y. Hu, W. Zheng, M.M. Makagon, Y. Hester, and H.W. Cheng. 2017. Performance assessment of cooled perch system for heat stress events in egg laying production. *Journal TBD*.
4. Kasimati, A., L.M. Pepple, R.S. Gates, M. Hayes and D.W. Shike. Characterizing water holding capacity and total solids of bedding-manure mixtures. *Transactions of the ASABE*
5. Yang S-J., Wang X, Gates RS. A system simulation approach for estimating the integrated effect between swine growth performance and swine barn management: a dynamic model and its sensitivity analysis
6. Viera MF, Gates RS, Tinôco IFF, Souza C. Historical production performance of two laying hen lineages reared in high density naturally ventilated housing in Brazil.

7. Rosa DD, Gates RS, Bekal S, Rocha KSO, Zheng W, Tinôco IFF, Bahlerao K. Evaluation of Salmonella contamination in whole eggs with and without cracks using 3M Petrifilm Salmonella Express System and qPCR methods.
8. Batista, M.D., C.F. Souza, R.S. Gates, I.F. Tinoco, S. Miranda and F.F. Alvares. Using cultures of 'effective microorganisms (EM) as inoculum in substrates for anaerobic digestion.
9. Senyondo, S.N., J.A.Ogejo and R.S. Gates. Using a biodegradable litter amendment to reduce ammonia emissions from broiler houses. Journal of the AWMA.
10. Green, A.R., G.T. Sales, C. Chu, R.S. Gates and A. Kent. Microbial ecology and environmental quality in cage and cage-free egg-laying facilities.
11. Pepple, L.M., R.S. Gates and A.D. Kent. 2013. Microbial community analysis on liquid swine manure from foaming and non-foaming deep-pits manure storages. Applied Engineering in Agriculture.
12. Burns, R.T., H. Li, H. Xin, R.S. Gates, D.G. Overhults, J.W. Earnest and L. Moody. Aerial emissions from broiler houses in the southeastern United States – Part 1 – Ammonia Emissions. Transactions of the ASABE.
13. Burns, R.T., H. Li, H. Xin, R.S. Gates, D.G. Overhults, J.W. Earnest and L. Moody. Aerial emissions from broiler houses in the southeastern United States – Part 2: Greenhouse gases. Transactions of the ASABE.
14. Burns, R.T., H. Li, H. Xin, R.S. Gates, D.G. Overhults, J.W. Earnest and L. Moody. Aerial emissions from broiler houses in the southeastern United States – Part 3 - Hydrogen sulfide and nonmethane hydrocarbon. Transactions of the ASABE.
15. Burns, R.T., H. Li, H. Xin, R.S. Gates, D.G. Overhults, J.W. Earnest and L. Moody. Aerial emissions from broiler houses in the southeastern United States: part 4 - particulate matter. Transactions of the ASABE
16. Li, H. R.T. Burns, H. Xin and R.S. Gates. Development of a Continuous Emissions Monitoring System for Commercial Broiler Houses: Part 1 - Gaseous Emissions Monitoring. Transactions of the ASABE.
17. Li, H. R.T. Burns, H. Xin and R.S. Gates. Development of a Continuous Emissions Monitoring System for Commercial Broiler Houses: Part 2 - Particulate Matter Emissions Monitoring. Transactions of the ASABE.
18. Li, H. R.T. Burns, H. Xin and R.S. Gates. Development of a Continuous Emissions Monitoring System for Commercial Broiler Houses: Part 3 – Data Acquisition System. Transactions of the ASABE.
19. Gates, R.S., Li, H., Amaral, D.G. Overhults, E. Wilkerson, J.W. Earnest, R.T. Burns and H. Xin. Analysis of different methods to compute ammonia concentration and emission rate. Transactions of the ASABE.

PROCEEDINGS AND CONFERENCE PAPERS

1. Cândido, M.G.L., Xiong, Y., R.S. Gates, I.F.F. Tinôco, and K.W. Koelkebeck. 2018. Application of image analysis to assess the activity of turkey poults exposed to different carbon dioxide concentrations. 2018 PSA Latin American Scientific Conference, 6-8November, Campinas, SP, Brazil.

2. Xiong, Y., R.S. Gates, N.C. Cooper and M.Ellis. 2018. Neo-natal piglet core body temperature model from surface temperature and environment measurements. Paper ILES18-128, 25-27 September. 10th Intl. Livestock Env. Symp, Omaha NE USA.
3. Santos, T.C., R.S. Gates, I.F.F. Tinôco, S. Zolnier, L.C.S.R. Freitas and M.G.L. Cândido. 2018. Effect of different levels of air velocity and heat stress on Japanese quail behavior at start of lay. Paper ILES18-151, 25-27 September. 10th Intl. Livestock Env. Symp, Omaha NE USA.
4. Santos, T.C., R.S. Gates, I.F.F. Tinôco, S. Zolnier, R.R.Andrade, L.C.S.R. Freitas and M.G.L. Cândido. 2018. Effect of different levels of air velocity and heat stress on Japanese quail performance at start of lay. Paper ILES18-152, 25-27 September. 10th Intl. Livestock Env. Symp, Omaha NE USA.
5. Cândido, M.G.L., I.F.F. Tinôco, R.S. Gates, R.R. Andrade and I.T.A. Martins. 2018. Evaluation of environmental temperature in pullet weight gain and uniformity. Paper ILES18-127, 25-27 September. 10th Intl. Livestock Env. Symp, Omaha NE USA.
6. Freitas, L.C.S.R., I.F.F. Tinôco, R.S. Gates, T.C. dos Santos and M.G.L. Cândido. 2018. Light intensity, egg weight and egg size in a vertical aviary of naturally ventilated laying hens. Paper ILES18-149, 25-27 September. 10th Intl. Livestock Env. Symp, Omaha NE USA.
7. Tucker, C., A.R. Green-Miller, R.S. Gates, S. Myint and J. Salak-Johnson. 2018. Behavioral responses of laying hens to atmospheric ammonia in an environmental preference chamber. Paper ILES18-106, 25-27 September. 10th Intl. Livestock Env. Symp, Omaha NE USA.
8. Teles Junior, C.G.S., R.S. Gates, I.F.F. Tinôco, C.F. Souza and M.O. Vilela. 2018. Computational program to evaluate thermal comfort in animal production facilities. Paper ILES18-127, 25-27 September. 10th Intl. Livestock Env. Symp, Omaha NE USA.
9. Xiong, Y., M.G.L. Cândido, R.S. Gates, I.F.F. Tinôco and K.W. Koelkebeck. 2018. Effects of carbon dioxide on turkey poult performance and behavior. Poultry Science Annual Meeting, 23-26 July, San Antonio, TX, USA.
10. Pereira da Silva, A.B., M.-G.C. Danao, R.S. Gates and K.D. Rausch. 2018. Dry matter loss and chemical changes to soybeans at 14, 18 and 22% moisture and 30 °C measured in a dynamic grain respiration system. Paper No. 1801406, 29 July – 2 August. ASABE Intl Mtg, Detroit MI USA.
11. Pereira da Silva, A.B., T.B. Scatolini, M.-G.C. Danao, R.S. Gates and K.D. Rausch. 2018. Effects of splits content on dry matter loss rates of soybeans measured using a static grain respiration measurement system. Paper No. 1810413, 29 July – 2 August. ASABE Intl Mtg, Detroit MI USA.
12. França, L.G.F.F., R.S. Gates, I.F.F. Tinôco, C.F. Souza and M.L. Cândido. 2018. Nitrogen excretion by laying hens fed with different energetic levels of rations and in controlled thermal environments (thermal stress). Paper No. 1801170, 29 July – 2 August. ASABE Intl Mtg, Detroit MI USA.
13. Camilo da Silva, J., J.S. Neves, M.F.A. Vieira, R.S. Gates and I.F.F. Tinôco. 2018. Repostas produtivas de galinhas poedeiras da linhagem DeKalb White em período de altas temperaturas. Presented at XV Seminário Anual de Iniciação Científica da Universidade Federal Rural da Amazônia-Campus Paragominas. 4-7 December 2017.
14. J.S. Neves, J.C. da Silva, M.F.A. Vieira, R.S. Gates and I.F.F. Tinôco. 2017. Desempenho zootécnico de galinhas poedeiras da linhagem Hy-Line W36 em condições de temperaturas elevadas no estado de Minas Gerais. Presented at XV Seminário Anual de Iniciação Científica da Universidade Federal Rural da Amazônia-Campus Paragominas. 4-7 December 2017.
15. Pereira da Silva, A.B., M.J. Brantis Junior, L.R. Trevisan, M.-G.C. Danao, R.S. Gates, K.D. Rausch. 2017. Comparison of respiration rates from static and dynamic measurement systems for soybeans at 18% moisture and 35 C. Paper 1700075, 17-19 July. ASABE Intl Mtg, Spokane WA USA.
16. Danao, M.-G.C., A.B. Pereira da Silva, R.S. Gates, K.D. Rausch. Determination of safe grain storage time – a review. Paper 1700075, 17-19 July. ASABE Intl Mtg, Spokane WA USA.

17. Trevisan, L.R., M.-G. C. Danao, R.S. Gates, K.D. Rausch. 2017. Variability of dry matter loss rates of 18% moisture soybeans at 35 C. Paper 1700991, 17-19 July. ASABE Intl Mtg, Spokane WA USA.
18. Xiong, Y., R.S. Gates. 2017. Characterizing water utilization in US dairies to identify opportunities for reutilization. Paper 1701034, 17-19 July. ASABE Intl Mtg, Spokane WA USA.
19. França, L.G.F., R.S. Gates, I.F.F. Tinôco, C.F. Souza. 2017. Analysis of the maximum potential of ammonia emission, from laying hen manure, through the dynamic of systems. EMILI 2017, 21-24 May. St. Malo, France.
20. França, L.G.F., R.S. Gates, I.F.F. Tinôco, C.F. Souza. 2017. Comparison of ammonia emitted by systems for laying hens, with storage of manure and without storage of manure. EMILI 2017, 21-24 May. St. Malo, France.
21. Teles Junior, C.G.S., R.S. Gates, I.F.F. Tinôco, C.F. Souza, M.O. Vilela, C. B. Ferreira, M.G.L. Candido, L.C.S.R. Freitas, R.R. Andrade. 2016. Nonlinear model for estimating broiler feed consumption as a function of thermal environment and age. 1st Asian Conference on Precision Livestock Farming, 9- 11 September. Beijing, China.
22. Teles Junior, C.G.S., R.S. Gates, C.F. Souza, I.F.F. Tinôco, M.O. Vilela, K.P. Oliveira, K.S. O. Rocha., L.C.S. R. Freitas, T.C. dos Santos. 2016. Assessment of feeding behavior of broilers through image analysis. 1st Asian Conference on Precision Livestock Farming, 9-11 September. Beijing, China.
23. Vilela, M.O., R.S. Gates, C.G.S. Teles Junior, C.F. Souza, I.F.F. Tinôco, R.R. Andrade, T.C. dos Santos. 2016. Algorithm for predicting thermal environment for swine in different phases of growth, using Black Globe Temperature-Humidity Index. 1st Asian Conference on Precision Livestock Farming, 9-11 September. Beijing, China
24. Santos, T.C., C.C.S. Carvalho, R.S. Gates, I.F.F. Tinôco, G.C. Silva, T.A. Diniz. 2016. Effect of water basins on concrete floor surface temperature in pens with and without water basins on swine behavior. 1st Asian Conference on Precision Livestock Farming, 9-11 September. Beijing, China
25. Xiong, Y. and R.S. Gates. 2016. Hot weather temperature distribution inside a loaded commercial swine trailer. 1st Asian Conference on Precision Livestock Farming, 9-11 September. Beijing, China
26. Trevisan, L., M.-G.C. Danao K. Sood and R.S. Gates. 2016. Rates of dry matter loss of high moisture soybeans stored at 25 to 45C. Paper No. 16-2461253. Poster, Presented at the Annual International Meeting of the ASABE, Orlando FL. 17-20 July. St. Joseph, MI:ASABE
27. Xiong, Y., W. Zheng, R.S. Gates, K.S.O. Rocha, J.Hu, M.M. Makagon, P.Y. Hester and H.W.Cheng. 2016. Cooled perch system performance for heat stress trials on laying hens: Year 2. Paper No. 16-2460523, Presented at the Annual International Meeting of the ASABE, Orlando FL. 17-20 July. St. Joseph, MI:ASABE
28. Zheng, W., R.S. Gates, K.W. Koelkebeck, Y. Xiong, and A. Green. 2016. Assessing cold weather ventilation using Intelligent Portable Monitoring Units (iPMUs) in a layer barn. Paper No. 16-2460212. Presented at the Annual International Meeting of the ASABE, Orlando FL. 17-20 July. St. Joseph, MI:ASABE
29. Zheng, W., R.S. Gates, Y. Xiong and K.S. Oliveira Rocha. 2016. Design of a portable two-step gas euthanasia system for neonatal pigs. Paper No. 16-202460198. Presented at the Annual International Meeting of the ASABE, Orlando FL. 17-20 July. St. Joseph, MI:ASABE
30. Lu, Y., M. Hayes, R.S. Gates and X. Wang. 2016. Evaluating effect of evaporative cooling and ventilation systems on indoor temperature for modern swine barns. Oral Presentation No. 16-2460311. Presented at the Annual International Meeting of the ASABE, Orlando FL. 17-20 July. St. Joseph, MI:ASABE
31. Yang, S.-J., X. Wang and R.S. Gates. 2016. Numerical economic evaluation on evaporative cooling pad control strategies for mechanically-ventilated growing-finishing swine barn. Paper No. 16-2456704.

Presented at the Annual International Meeting of the ASABE, Orlando FL. 17-20 July. St. Joseph, MI:ASABE

32. Teles Junior, R.S. Gates, I.F.F. Tinoco, M. Barbari, M.O. Vilela, L.C.S.R. Freitas, M.G.L.Candido, R.R.Andrade, T.C. Santos. 2016. Developing algorithm for the evaluating of impact of heat stress about dairy cattle crossbred. CIGR-EurAgEng Conference, June 26-29, Aarhus, Denmark.
33. Gates RS. Overview of animal housing in North America. 2016. Keynote presentation. ISIAPAS/V SIMCRA. Federal University of Viçosa, 7-10 June.
34. Vilela MO, Teles Junior CGS, Oliveira JL, Freitas LCSR, Gates RS, Cândido MGL, Santos TC. 2016. Modelo para a estimative da temperature de globo negro em função da temperaturae umidade relative do ar. Paper and poster presentation. I SIAPAS/V SIMCRA. Federal University of Viçosa, 7-10June.
35. Vilela MO, Teles Junior CGS, Gates RS, Andrade RR, Oliveira MCTB, Oliveira JL, Arcila JCP. 2016. Algoritmo para predição do ambiente térmico para suínos em diferentes fases de criação, com base no ITGU. Paper and poster presentation. I SIAPAS/V SIMCRA. Federal University of Viçosa, 7-10June.
36. Vilela MO, Gates RS, Tinôco IFF, Teles Junior CGS, Esteves VBL, Morais CV, Rocha KSO. 2016. Influencia do estresse por calor associado a dois niveis de velocidade do ar e duas faixas de umidade relative no comportamento de codornas Japonesas (*Coturnix coturnix japonica*). 2016. Paper and poster presentation. I SIAPAS/V SIMCRA. Federal University of Viçosa, 7-10June.
37. Teles Junior CGS, Gates RS, Souza CF, Tinôco IFF, Vilela MO, Oliveira KP, Rocha KSO. 2016. Avaliação do comportamento ingestivo de frangos de corte através de análise de imagens digitais. 2016. Paper and poster presentation. I SIAPAS/V SIMCRA. Federal University of Viçosa, 7-10June.
38. Santos TC, Gates RS, Andrade RR, Tinôco IFF, Carvalho CCS, Teles Junior CGS, Vilela MO. 2016. Contribuição dos índices de conforto térmico na produção animal. 2016. Paper and poster presentation. I SIAPAS/V SIMCRA. Federal University of Viçosa, 7-10 June.
39. Santos, TC, Carvalho CCS, Gates RS, Andrade RR, Freitas LCSR, Teles Junior CGS, Cândido MGL. Influência da temperatura superficial do piso de concreto em baias com e sem lâmina d'agua no comportamento de suínos. 2016. Paper and poster presentation. I SIAPAS/V SIMCRA. Federal University of Viçosa, 7-10 June.
40. Rocha KSOR, Gates RS, Zheng W, Xiong Y, Tinôco IFF. Chicken foot pad area measurements, modelling and simulation for thermal perch analyses. 2016. Paper and poster presentation. I SIAPAS/V SIMCRA. Federal University of Viçosa, 7-10 June.
41. Zheng W, Gates RS, Koelkebeck KW. Assessing cold weather ventilation using intelligent portable monitoring units (iPMU) in a layer barn. 2016. Paper and poster presentation. I SIAPAS/V SIMCRA. Federal University of Viçosa, 7-10 June.
42. Xiong Y, Gates RS. Hot weather temperature distribution inside a loaded commercial swine trailer. 2016. Paper and poster presentation. I SIAPAS/V SIMCRA. Federal University of Viçosa, 7-10June.
43. Oliveira LGB, Danao MC, Zandonadi RS, Gates RS, Pacheco de Souza A. Pacheco de Souza A. 2015. As variações nas condições de grãos e logística durante o transporte de soja da fazenda para o armazenamento em Sinop, MT. (Variations in soybean harvest conditions and logistics during truck transport from farm to storage in Sinop, Mato Grosso.) Poster. XLIV Congresso Brasileiro de Engenharia Agrícola (CONBEA). São Pedro, São Paulo, Brazil. (Extended abstract)
44. Danao MC, Oliveira LGB, Zandonadi RS, Gates RS, Pacheco de Souza A. 2015. Assessing grain trailer conditions during soybean transport from harvest to storage in Sinop, Mato Grosso, Brazil. Lecture. ASABE Annual International Meeting. New Orleans, Louisiana, USA. (Abstract)
45. Gates, R.S. Y. Xiong, R. Zimmerman, T. Funk and M. Hayes. 2015. Alternative mechanical ventilation strategies for filtered-air systems in North American livestock barns. Paper No. 152190012. Presented at the Annual International Meeting of the ASABE, New Orleans, LA. 26-29 July. St. Joseph, MI:ASABE

46. Sood K, Danao MC, Gates RS, Rausch KD. 2015. Measurement of soybean respiration for dry matter loss estimation. Poster. ASABE Annual International Meeting. New Orleans, Louisiana, USA. (Abstract)
47. Xiong, Y., R.S. Gates, J. Hu, K.S.O. Rocha, M.M. Makagon, P.Y. Hester and H.W. Cheng. 2015. Performance Assessment of Cooled Perch System for Heat Stress Trials in Egg Laying Production: Year 1. Paper No. 152183776. Presented at the Annual International Meeting of the ASABE, New Orleans, LA. 26-29 July. St. Joseph, MI:ASABE
48. Xiong, Y., R.S. Gates and T.L. Funk. 2015. A Survey Study of Manure management situations in modern China livestock operations. Paper No. 152190232. Presented at the Annual International Meeting of the ASABE, New Orleans, LA. 26-29 July. St. Joseph, MI:ASABE
49. Kasimati, A., L.M. Pepple, M. Hayes, D.W. Shike and R.S. Gates. 2015. Characterizing water holding capacity and total solids of bedding-manure mixtures. Paper No. 152187784. Presented at the Annual International Meeting of the ASABE, New Orleans, LA. 26-29 July. St. Joseph, MI:ASABE
50. Rocha, K.S.O., I.F.F. Tinôco, R.S. Gates, W. Zheng, E.L. Azevedo, J.H. Martins, D.D. Rosa. 2015. Similarity applied to modeling and simulation in computational fluid dynamics (CFD) of animal welfare during transport of broilers. Paper No. xyz. Presented at the Annual International Meeting of the ASABE, New Orleans, LA. 26-29 July. St. Joseph, MI:ASABE
51. Santos, T.C., C.C.S. Carvalho, G.C. Silva, T.A. Diniz, I.F.F. Tinoco, M. Barbari, R.S. Gates, M.O. Vilela, C.G.S. Teles and C.F. Souza. 2015. Bioclimatic evaluation of enthalpy of growing pigs housed and finishing in semiarid regions of Brazil. Precision Livestock Farming 2015 - Papers Presented at the 7th European Conference on Precision Livestock Farming, ECPLF 2015. European Conference on Precision Livestock Farming, p. 588-591 4 p.
52. Kashiha, M. A., A.R. Green, T.G. Sales, C. Bahr, D. Berckmans and R.S. Gates. 2015. Application of image processing on hen tracking in an environmental preference chamber Precision Livestock Farming 2015 - Papers Presented at the 7th European Conference on Precision Livestock Farming, ECPLF 2015. European Conference on Precision Livestock Farming, p. 185-194 10 p.
53. Gates, R.S. 2015. Gas and dust emissions from animal production facilities in the USA. Paper and speech. EMILI 2015. International Symposium on Emissions of gas and dust from livestock. 24-26 March, 2015. Florianópolis, SC, Brazil.
54. Wilhelmi, C.R., M.-G.C. Danao, R.S. Zandonadi and R.S. Gates. 2014. Measurement and analysis of soybean transportation conditions from farm to storage in the middle-north region of Mato Grosso, Brazil. Poster presented at XLII Congresso Brasileiro de Engenharia Agrícola, 27-31 July, Campo Grande – MS, Brazil.
55. De Marchi, J., R.S. Zandonadi, M.-G.C. Danao, and R.S. Gates. 2014. Development of an experimental apparatus for monitoring intergranular grain environment parameters during transport. Poster presented at XLII Congresso Brasileiro de Engenharia Agrícola, 27-31 July, Campo Grande – MS, Brazil.
56. Liedtke, E.A., P.Y. Hester, G. Vezzoli, R.S. Gates, S.A. Enneking, H.-W. Cheng and M.M. Makagaon. 2014. The effects of chilled perches on body surface temperature of laying hens exposed to an acute heat stress episode. Poster presented at Poultry Science meeting, July.
57. Makagon, M.M., P.Y. Hester, G. Vezzoli, R.S. Gates, S.A. Enneking and H.-W. Cheng. 2014. Access to cooling perches affects the behavioral responses of laying hens during acute heat stress. Poster presented at the AISAE, Spain.
58. Cheng, H.W., M. M. Makagon, R. S. Gates, J. Y. Hu, S. A. Enneking, and P. Y. Hester. 2014. The effect of thermally cooled perches installed in cages on White Leghorn hen performance. Poultry Sci. 93 (E-Suppl.1):92
59. Hester, P. Y., M. M. Makagon, R. S. Gates, J. Y. Hu, S. A. Enneking, and H.W. Cheng. 2014. The musculoskeletal health of caged White Leghorn hens with access to thermally cooled perches. Poultry Sci. 93 (E-Suppl.1):93

60. Curran, T., R.S. Gates, F. Gentile, D. Scott, F. Ayuga, D. Briassoulis and C. Zhang. 2014. International student collaboration in Biosystems Engineering using video podcasts in design classes. Paper No. 141909810. ASABE and CSBE/SCGAB Annual International Meeting, Montreal. 13-16 July. St. Joseph, MI: ASABE.
61. Ji, B. R.S. Gates, A.R. Green and X. Guo. 2014. Upgrade of Portable Monitoring Unit. Paper No. 141899399. ASABE and CSBE/SCGAB Annual International Meeting, Montreal. 13-16 July. St. Joseph, MI: ASABE.
62. Kasimati, A., L.M. Pepple, M. Hayes and R.S. Gates. 2014. Evaluating corn cob bedding water holding capacity with manure addition. Paper No. 141888513. ASABE and CSBE/SCGAB Annual International Meeting, Montreal. 13-16 July. St. Joseph, MI: ASABE.
63. Wilhelmi, C.R., M.-G.C. Danao, R.S. Gates, R.S. Zandonadi and A.C. Hansen. 2014. Condition assessment of trucks used for soybean transport in Mato Grosso, Brazil. Paper No 141905584. ASABE and CSBE/SCGAB Annual International Meeting, Montreal. 13-16 July. St. Joseph, MI: ASABE.
64. Wilhelmi, C.R., M.-G.C. Danao, R.S. Gates, R.S. Zandonadi and A.C. Hansen and J. Marchi. 2014. Measurement and analysis of soybean transportation conditions from farm to storage in Mato Grosso, Brazil. Paper No 141905615. ASABE and CSBE/SCGAB Annual International Meeting, Montreal. 13-16 July. St. Joseph, MI: ASABE
65. Gates, R.S., S.A. Enneking, Y. Xiong, P.Y. Hester, J.M. Makagon and H.W. Cheng. 2014. Design and performance of cooled perches for alternative egg laying production systems. Paper No. 141901235. ASABE and CSBE/SCGAB Annual International Meeting, Montreal. 13-16 July. St. Joseph, MI: ASABE.
66. Gates, R.S., M.D. Batista, C.F. Souza, I.F.F. Tinoco, S. Miranda and F.F. Alvares. 2014. Using cultures of “Effective Microorganisms” (EM) as inoculum in substrates for anaerobic digestion. Paper No 1913620. ASABE and CSBE/SCGAB Annual International Meeting, Montreal. 13-16 July. St. Joseph, MI: ASABE.
67. Gates, R.S., J.W.W. Olsen and H.H. Stein. 2014. HVAC system design for swine calorimetry unit. Paper No 141912296. ASABE and CSBE/SCGAB Annual International Meeting, Montreal. 13-16 July. St. Joseph, MI: ASABE.
68. Gates, R.S. 2014. Workshop Controladores e Sensores em Galpões –Controladores – Experiência American (Workshop on controllers and sensors in banrs – controllers – US Experience.). Lecture and paper presented at the 13th Poultry and Swine Technical-Scientific Seminar, 15 May. Florinaópolis SC, Brazil.
69. Pepple, L. and R.S. Gates. 2013. Evaluation of available design criteria for modern deep-bed pack beef production facilities. Proceedings Intl Symp on Animal Environment and Welfare, 19-22 October, Rongchang, Chongqing, China. Pages 282-288.
70. Xiong, Y., A.R. Green, J. Su and R.S. Gates. 2013. Thermal conditions of a commercial US swine transport trailer during hot, mild and cold weather. Proceedings Intl Symp on Animal Environment and Welfare, 19-22 October, Rongchang, Chongqing, China. Pages 473-488.
71. Gates, R.S. 2013. Broilers Dark House Workshop – Metodologias para Mensuração de Gases em Aviários Tipo Túnel (Methods for measuring gases in tunnel ventilated poultry housing). Lecture and paper presented at the 12th Poultry and Swine Technical-Scientific Seminar, 15 May. Florinaópolis SC, Brazil.
72. Gates, R.S. 2013. Broilers Dark House Workshop – American Experience. Lecture and paper presented at the 12th Poultry and Swine Technical-Scientific Seminar, 14 May. Florinaópolis SC, Brazil.
73. Ramirez, B.C., A.R. Green, D.W. Shike, R.S. Gates and L.F. Rodriguez. 2013. Design and validation of a calibrated orifice meter for sub-500 liter per minute flow rate applications. Paper No. 13-1618475. ASABE International Meeting. Kansas City MO, 21-24 July. ASABE: St. Joseph, MI.

74. Olsen, J.W., C.R. Wilhelmi, R.S. Zandonadi, M-G. C. Danao and R.S. Gates. 2013. Monitoring grain bed conditions during truck transport of soybeans in Brazil. Paper No. 13-1619395. ASABE International Meeting. Kansas City MO, 21-24 July. ASABE: St. Joseph, MI.
75. Turner, G. IV., L. Pepple, T. Funk and R.S. Gates. 2013. Evaluation of a mechanical foam mitigation device in swine deep-pit manure storage. Paper No. 13-1595267. ASABE International Meeting. Kansas City MO, 21-24 July. ASABE: St. Joseph, MI.
76. Zheng, W., Y. Zhao, H. Xin, B. Li, R.S. Gates, Y. Zhang and M. Soupir. 2013. Airborne particulate matter and bacteria reduction from spraying slightly acidic electrolyzed water in an experimental aviary laying-hen housing system. Paper No. 13-1619362. ASABE International Meeting. Kansas City MO, 21-24 July. ASABE: St. Joseph, MI.
77. Xiong, Y., A.R. Green, R.S. Gates, J. Su. 2013. Evaluation of hot weather management strategies for pig transport. Paper No. 13-1608601. ASABE Annual International Meeting. Kansas City, Missouri, July 21-24. ASABE: St. Joseph, MI.
78. Mendes, M.A.S.A., R.S. Gates, I.F.F. Tinoco, M.F.A. Viera, M.F.S.A. Mendes, K.R.A. Inoue and J.N. Silva. 2013. Determination of nitrogen content in manure from quails raised under thermoneutral conditions and heat stress. Pp 893-898 In: Proceedings of the Conference on Precision Livestock Farming, ECPLF.
79. Lopez, I.M., G.B. Day V, D.G. Overhults, R.S. Gates and F.A. Damasceno. 2012. Use of transitions on fan testing with the Fan Assessment Numeration System (FANS) unit: design and evaluation. Paper No. 12-1337359. ASABE Annual International Meeting. Dallas, Texas, 29 Jul – 1 Aug. ASABE: St. Joseph, MI.
80. Maia, G.D.N., G. T. Sales, G.B. Day V, R.S. Gates and J.L. Taraba. 2012. Characterizing physical properties of gas-phase biofilter media. ASABE Paper No. 12-131337260. ASABE Annual International Meeting. Dallas, Texas, 29 Jul – 1 Aug. ASABE: St. Joseph, MI.
81. Morello, G.M., D.G. Overhults, I.M. Lopes, J. Earnest, R.S. Gates, A.J. Pescatore, J. Jacob and M. Miller. 2012. Broiler facilities in Kentucky: energy related characteristics of housing and equipment. Paper No. 12-1337231. ASABE Annual International Meeting. Dallas, Texas, 29 Jul – 1 Aug. ASABE: St. Joseph, MI.
82. Saraz, J.A.O., K.S.O. Rocha, I.F.F. Tinoco, L.B. Mendes, T. Norton, R.O. Hernandez and R.S. Gates. 2012. CFD modeling of air quality inside naturally ventilated broiler barns as a function of barn spatial arrangement. Paper No. 12-1340840. ASABE Annual International Meeting. Dallas, Texas, 29 Jul – 1 Aug. ASABE: St. Joseph, MI.
83. Zheng, W., G.T. Sales, A.R. Green and R.S. Gates. 2012. Task-based learning and memory in laying hens. Paper No. 12-1338349. ASABE Annual International Meeting. Dallas, Texas, 29 Jul – 1 Aug. ASABE: St. Joseph, MI.
84. Pepple, L. M. Sama, G.B. Day V, R.S. Gates and S.E. Ford. 2012. Calibration drift assessment and upgrades to the Fan Assessment Numeration System (FANS). Paper No. 12-1337770. ASABE Annual International Meeting. Dallas, Texas, 29 Jul – 1 Aug. ASABE: St. Joseph, MI.
85. Sales, G.T., A.R. Green, R.S. Gates, T.M. Brown-Brandl and R.A. Eigenberg. 2012. Ammonia tolerance of laying hens considering social effects and previous experience. Paper No. 12-1338106. ASABE Annual International Meeting. Dallas, Texas, 29 Jul – 1 Aug. ASABE: St. Joseph, MI.
86. Pepple, L.M., R. S. Gates, T. L. Funk, A. D. Kent. 2012. Microbial community analysis on liquid swine manure for foaming and non-foaming deep-pits. Proc. Of International Congress of Agricultural Engineering. Valencia, Spain. July 8-12, Paper Number #C1353
87. Purswell, J.L., W.A. Dozier III, H.A. Olanrewaju, J.D. Davis, H. Xin and R.S. Gates. 2012. Effect of Temperature-Humidity Index on live performance in broiler chickens grown from 49-63 days of age.

Ninth International Livestock Environment Symposium, Valencia, Spain, July 8-12, Paper Number ILES12-0265.

88. Araujo, F.V., R.S. Gates, I.F.F. Tinoco, D. Cassuce, B. Santos and G. Costa. 2012. Analysis of quality of health of different broiler litter reused sequentially. Ninth International Livestock Environment Symposium, Valencia, Spain, July 8-12, Paper Number ILES12-0866.
89. Chen, Y., H.Xin, H. Li, T. Shepherd, M. Hayes, J. Stinn, R.T. Burns, R.S. Gates and H. Dong. 2012. Comparison of ammonia emissions from poultry houses based on diurnal integration vs. daily means of gas concentration and building ventilation rate. Ninth International Livestock Environment Symposium, Valencia, Spain, July 8-12, Paper Number ILES12-0965.
90. Xiong, Y., J. Su, W. Zheng, A.R. Green and R.S. Gates. 2012. Instrumentation system for thermal environment of swine transport trailers. Ninth International Livestock Environment Symposium, Valencia, Spain, July 8-12, Paper Number ILES12-2242.
91. Kent, A.D., A.R. Green, C. Chu, G.T. Sales and R.S. Gates. 2012. Management factors influence microbial ecology in commercial poultry. 97th ESA Annual Convention.
92. Maia, A.P., A.R. Green, G.T. Sales, D.J. Moura, G. Borges and R.S. Gates. 2011. Sampling frequency and duration for behavioural analysis and effectiveness of electronic tracking. Poster #17, Proc. 45th Congress of the ISAE, 31 July – 4 August. Indianapolis, Indiana. Wageningen Academic Publishers: Wageningen, NL.
93. Saraz, J.A.O, K.S.O. Rocha, I.F.F. Tinoco, L.B. Mendes, R.S. Gates, O.L.Z. Marin, F.A. Damasceno. 2011. Use of CFD modeling for determination of ammonia emission in non-insulated poultry houses with natural ventilation. ASABE Paper No. 11-0781. ASABE Annual International Meeting. 7-10 Aug. Louisville, KY. ASABE: St. Joseph, MI.
94. Yang, L., X. Wang, T.L. Funk, R.S. Gates, A. Kent, and Y. Zhang. 2011. NH₃ removal biofilter kinetic study: the role of nitrate, nitrite and ammonium. ASABE Annual International Meeting. Louisville, Kentucky, Aug 7-10. ASABE: St. Joseph, MI.
95. Borges, G., K.O.S. Miranda, A.R. Green, G.T. Sales, Maia, A.P.A. and R.S. Gates. 2011. Methodology to collect animal vocalization in different animal systems. ASABE Paper No. 11-0007. ASABE Intl Mtg. Aug 7-10. Louisville, KY. ASABE: St. Joseph, MI.
96. Robert, M., A. Kasimati, A.C. Clarindo, T.C. Bragatto, T. Funk and R.S. Gates. 2011. Evaluation of commercial products to mitigate swine manure foam. ASABE Paper No. 1100021. ASABE Intl Mtg. Aug 7-10. Louisville, KY. ASABE: St. Joseph, MI.
97. Sales, G.T., A.R. Green, R.S. Gates, A.P.A. Maia and G. Borges. 2011. Commissioning results for an environmental preference chamber for animals. ASABE Paper No. 11-0005. ASABE Intl Mtg. Aug 7-10. Louisville, KY. ASABE: St. Joseph, MI.
98. Maia G. D. N., R. S. Gates, A. R. Green, L. F. Rodriguez, D. W. Shike, G. B. Day V. and J.L. Taraba. 2011. Viability of the infra-red photoacoustic system on the measurement of greenhouse gases and ammonia. ASABE Paper No. 11-11821. ASABE Intl Mtg. Aug 7-10. Louisville, KY. ASABE: St. Joseph, MI.
99. Curran, T., P. Barreiro, G. Vox, T. A. Dillaha, S. C. Zahos and R. S. Gates. 2011. Undergraduate Design Experiences in the Trans-Atlantic Biosystems Engineering Network (TABE.NET). ASABE Paper No. 11-11389. ASABE Intl Mtg. Aug 7-10. Louisville, KY. ASABE: St. Joseph, MI.
100. Borges, G., R.S. Gates, G.T. Sales and K.O.S. Miranda. 2010. Fuzzy logic application on the determination of noise levels as an indicative of swine welfare in controlled environments. ASABE Paper No. 10-0916. ASABE: St. Joseph, MI.

101. Borges, G., K.O.S. Miranda, R.S. Gates, G.T. Sales. 2010. Environmental conditions effects in noise emissions by piglets in an intensive production farm. ASABE Paper No. 10-09625. ASABE: St. Joseph, MI.
102. Lopes, I.M., D.G. Overhults, G.M. Morello, J. Earnest Jr., R.S. Gates, A. Pescatore, J. Jacob and M. Miller. 2010. Assessing air leakage in commercial broiler houses. ASABE Paper No. 0-09236. ASABE: St. Joseph, MI.
103. Morello, G.M., D.G. Overhults, I.M. Lopes, J. Earnest Jr., R.S. Gates, A. Pescatore, J. Jacob and M. Miller. 2010. Influence of fan operations on FANS (Fan Assessment Numeration System) test results. ASABE Paper No. 10-09235. ASABE: St. Joseph, MI.
104. Overhults, D.G., I.M. Lopes, G.M. Morello, A. Pescatore, M. Miller, R.S. Gates and J.W. Earnest, Jr. 2010. Energy use in Kentucky broiler houses. ASABE Paper No. 10-09232. ASABE: St. Joseph, MI.
105. Overhults, D. G., G. M. Morello, I. M. Lopes, A. Pescatore, J. Jacob, M. Miller, R. S. Gates, and J. W. Earnest, Jr. 2010. Broiler house fan performance. ASABE Paper No. 10-09240. ASABE, St. Joseph, MI.
106. Sales, G.T., A.R. Green and R.S. Gates. 2010. Performance assessment of an environmental preference chamber for animals. ASABE Paper No. 10-09155. ASABE: St. Joseph, MI.
107. Souza, C.F., G.B. Day V., J.L. Taraba, R.S. Gates and W.P.M. Ferreira. 2010. BIOG-C: Modeling the volumetric methane production in the anaerobic digestion process applied to swine wastes. ASABE Paper No. 10-09181. ASABE: St. Joseph, MI.
108. Yang, L. X. Wang, T.L. Funk, R.S. Gates and N. Jiang. 2010. Optimization of livestock air pollutants removal biofilter Part I: media selection. ASABE Paper No. 1009802. ASABE: St. Joseph, MI.
109. Yan, W., D. Barker, Y. Sun, Y. Zhang and R.S. Gates. 2010. Performance simulation of high volume low speed fans in a free stall barn. XVIIth World Congress of the International Commission of Agricultural Engineering (CIGR), 13-17 June, Quebec City, Canada.
110. Del Nero Maia, G.B. Day V., R.S. Gates, J.L. Taraba, G.T. Sales and N. Lovanh. 2009. Ammonia removal and nitrous oxide production in gas-phase compost biofilters. I Simpósio Internacional sobre Gerenciamento de Resíduos de Animais. 12-13 March - Florianópolis – SC. EMBRAPA, Brasília, Brazil.
111. Sales, G.T., G.B. Day V., R.S. Gates, N. Lovanh, G. Del Nero Maia and A. Singh. 2009. Assessment of biofilter media particle sizes for removing ammonia. . I Simpósio Internacional sobre Gerenciamento de Resíduos de Animais. 12-13 March - Florianópolis – SC. EMBRAPA, Brasília, Brazil.
112. Green, A.R., R.S. Gates and G.T. Sales. 2009. Animal Preferences for Environmental Conditions in Hot Weather. CIGR Workshop on Animal Housing in Hot Climates. October 21-25. Chongqing, China: CIGR.
113. Amaral, M.F.P., R.S. Gates, D.G. Overhults, I.F.F. Tinôco, H. Li, R.T. Burns, H. Xin, and J.E. Earnest. 2008. Analysis of different methods to compute ammonia concentration and emission rate. Proceedings, Eighth International Symposium, Livestock Environment VIII, Sept 1-4, Iguassu Falls, Brazil. ASABE: St. Joseph MI.
114. Burns, R.T., H. Li, H. Xin, R.S. Gates, D.G. Overhults, and J.E. Earnest. 2008. Quantification of particulate emissions from broiler houses in the southeastern United States. Proceedings, Eighth

International Symposium, Livestock Environment VIII, Sept 1-4, Iguassu Falls, Brazil. ASABE: St. Joseph MI.

115. Burns, R.T., H. Li, H. Xin, R.S. Gates, D.G. Overhults, J.E. Earnest, and L. Moody. 2008. Greenhouse gas (GHG) emissions from broiler houses in the southeastern United States. ASABE Paper No. 08-4649. ASABE: St. Joseph, MI.
116. de Carvahlo, V.F., T. Yanagi, Jr, H. Xin, R.S. Gates, F.A. Damasceno, and S.R.P. de Moraes. 2008. Modeling thermal environment to evaluate the performance of broiler chickens lodged in acclimatized housing. Proceedings, Eighth International Symposium, Livestock Environment VIII, Sept 1-4, Iguassu Falls, Brazil. ASABE: St. Joseph MI.
117. Del Nero Maia, G., R.S. Gates, G.B. Day V, G.T. Sales, A. Singh, and J.L. Taraba. 2008. Contaminant gas generation as product of degraded ammonia during biofiltration. ASABE Paper No. 08-4630. ASABE: St. Joseph, MI.
118. Del Nero Maia, G., R.S. Gates, G.B. Day V., M.D. Montross, and J.L. Taraba. 2008. Comparison of water sorption isotherms applied to compost biofilters of different particle sizes. ASABE Paper No. 08-4642. ASABE: St. Joseph, MI.
119. Gates, R.S., K.D. Casey, H. Xin, R.T. Burns, and H. Li. 2008. Uncertainty analysis in animal building aerial emissions measurements. Proceedings, Eighth International Symposium, Livestock Environment VIII, Sept 1-4, Iguassu Falls, Brazil. ASABE: St. Joseph MI.
120. Hayes, M.D., T.S. Stombaugh, E.S. Vanzant, and R.S. Gates. 2008. Utilizing thermal imaging to locate blood flow in the bovine ear. ASABE Paper No. 08-4075. ASABE: St. Joseph, MI.
121. Hayes, M.D., E.S. Vanzant, T.S. Stombaugh, and R.S. Gates. 2008. Comparison of bovine blood absorption coefficients to human curves. Proceedings, Eighth International Symposium, Livestock Environment VIII, Sept 1-4, Iguassu Falls, Brazil. ASABE: St. Joseph MI.
122. Vigoderis, R.B., I.F.F. Tinoco, M.B. Cordeiro, M.B. Bueno, R.S. Gates, J.N. Silva and J.P. Souza Junior. 2008. Performance evaluation of broilers under different heating systems in the south of Brazil. Proceedings, Eighth International Symposium, Livestock Environment VIII, Sept 1-4, Iguassu Falls, Brazil. ASABE: St. Joseph MI.
123. Cordeiro, M.B., I.F.F. Tinoco, R.B. Vigoderas, P.A.V. Oliveira, R.S. Gates and H. Xin. 2008. Ammonia concentration evaluation in deep-bedded and concrete floor housing systems for grow-finish swine in Brazil. Pp 485-487 in: Proceedings, Eighth International Symposium, Livestock Environment VIII, Sept 1-4, Iguassu Falls, Brazil. ASABE: St. Joseph MI.
124. Li, H., R.T. Burns, H. Xin, R.S. Gates, S. Trabue, D.G. Overhults, L. Moody, and J.E. Earnest. 2008. Hydrogen sulfide and non-methane hydrocarbon emissions from broiler houses in the southeastern United States. ASABE Paper No. 08-4417. ASABE: St. Joseph, MI.
125. Li, P., R.S. Gates, M.D. Montross, J. Tidwell, and M.B. Timmons. 2008. Evaluation of water evaporation and energy fluxes in controlled environmental saltwater shrimp production system. ASABE Paper No. 08-4320. ASABE: St. Joseph, MI.
126. Liang, Y., H. Xin, H. Li, R.S. Gates, E.F. Wheeler, K.D. Casey, B.R. Behrends, and D.J. Burnham. 2008. Dietary manipulation to reduce ammonia emission from high-rise layer houses. Proceedings,

National Conference on Mitigating Air Emissions from Animal Feeding Operations: Exploring the advantages, limitations, and economics of mitigation technologies. Des Moines, IA.

127. Marsh, J.R., R.S. Gates, G.B. Day V, G.E. Aiken, and E.G. Wilkerson. 2008. Assessment of an injectable RFID temperature sensor for indication of horse well-being. ASABE Paper No. 08-4764. ASABE: St. Joseph, MI.
128. Marsh, J.R., R.S. Gates, G.B. Day V, G.E. Aiken, and E.G. Wilkerson. 2008. Assessment of an injectable temperature sensor for indication of horse well-being. Proceedings, Eighth International Symposium, Livestock Environment VIII, Sept 1-4, Iguassu Falls, Brazil. ASABE: St. Joseph MI.
129. Menegali, I., I.F.F. Tinôco, R.S. Gates, F.C. Baêta, and K.R.A. Inoue. 2008. Effect of two different minimum ventilation systems on the thermal comfort and productive performance of broiler chickens in winter conditions. Proceedings, Eighth International Symposium, Livestock Environment VIII, Sept 1-4, Iguassu Falls, Brazil. ASABE: St. Joseph MI.
130. Sales, G.T., G.B. Day V, R.S. Gates, N. Lovanh, G. Del Nero Maia, and A. Sing. 2008. Assessment of different biofilter media particle sizes for ammonia removal optimization. ASABE Paper No. 08-4201. ASABE: St. Joseph, MI.
131. Sales, G.T., E.T. Fialho, T. Yanagi, Jr., R.T.F de Freitas, V.H. Teixeira, R.S. Gates, and G.B. Day. 2008. Thermal environment influence on the swine reproductive performance. Proceedings, Eighth International Symposium, Livestock Environment VIII, Sept 1-4, Iguassu Falls, Brazil. ASABE: St. Joseph MI.
132. Sama, M.P., R.S. Gates, W.C. Adams, G.B. Day, and C.L. King. 2008. Fan assessment numeration system (FANS) scaling and upgrades. ASABE Paper No. 08-4723. ASABE: St. Joseph, MI.
133. Wheeler, E.F., K.D. Casey, R.S. Gates, H. Xin, Y. Liang, and P. Topper. 2008. Litter management strategies in relation to ammonia emissions from floor-raised birds. Proceedings, National Conference on Mitigating Air Emissions from Animal Feeding Operations: Exploring the advantages, limitations, and economics of mitigation technologies. Des Moines, IA.
134. Wheeler, E.F., K.D. Casey, R.S. Gates, H. Xin, P.A. Topper, and Y. Liang. 2008. Ammonia emissions from USA broiler chicken barns managed with new bedding, built-up litter, or acid-treated litter. Proceedings, Eighth International Symposium, Livestock Environment VIII, Sept 1-4, Iguassu Falls, Brazil. ASABE: St. Joseph MI.
135. D. De Moura and R.S. Gates. Preface. Proceedings, Eighth International Symposium, Livestock Environment VIII, Sept 1-4, Iguassu Falls, Brazil. ASABE: St. Joseph MI.
136. Amaral, M.F.P., R.S. Gates, E.G. Wilkerson, D.G. Overhults, I.F.F. Tinôco, H. Li, R.T. Burns, H. Xin, and J.W. Earnest. 2007. Comparison between two systems for ammonia emission monitoring in broiler houses. Proceedings, International Symposium on Air Quality and Waste Management for Agriculture. Broomfield, CO. ASABE: St. Joseph, MI.
137. Burns, R.T., H. Xin, R.S. Gates, H. Li, L.B. Moody, D.G. Overhults, J. Earnest, and S. Hoff. 2007. Continuous monitoring method for ammonia emissions from poultry broiler houses in the United States. Ammonia Conference Abstract Book. G.J., Monteny, E. Hartung, M. van den Top, and D. Starmans, editors. Wageningen Academic Publishers: Wageningen, The Netherlands.

138. Burns, R.T., H. Xin, R.S. Gates, H. Li, D.G. Overhults, L. Moody, and J.W. Earnest. 2007. Ammonia emissions from poultry broiler systems in the southeastern United States. Proceedings, International Symposium on Air Quality and Waste Management for Agriculture. Broomfield, CO. ASABE: St. Joseph, MI.
139. Casey, K.D., R.S. Gates, E.F. Wheeler, H. Xin, and Y. Liang. 2007. Quantifying uncertainty for the multi-state broiler ammonia emissions project. Ammonia Conference Abstract Book. G.J., Monteny, E. Hartung, M. van den Top, and D. Starmans, editors. Wageningen Academic Publishers: Wageningen, The Netherlands.
140. Wheeler, E.F., R.S. Gates, H. Xin, K. Casey, P. Topper, and Y. Liang. 2007. Ammonia emissions from layer hen and broiler chicken houses in the U.S.A. Ammonia Conference Abstract Book. G.-J. Monteny, E. Hartung, M. van den Top, and D. Starmans, editors. Wageningen Academic Publishers: Wageningen, The Netherlands.
141. Burns, R.T., H. Xin, H. Li, S. Hoff, L. Moody, R. Gates, D. Overhults, and J. Earnest. 2006. Monitoring system design for the southeastern broiler gaseous and particulate matter air emissions monitoring project. Proceedings, Symposium on Air Quality Measurement Methods and Technology. Durham, NC. AWMA: Pittsburgh, PA.
142. Burns, R., H. Xin, R. Gates, H. Li, S. Hoff, L. Moody, D. Overhults, and J. Earnest. 2006. Monitoring system design for the southeastern broiler gaseous and particulate matter air emissions monitoring project. Workshop on Agricultural Air Quality: State of the Science. June 5-8. Bolger Conference Center: Potomac, MD.
143. Casey, K.D., R.S. Gates, E.F. Wheeler, and H. Xin. 2006. Comparison of measured estimates of annual ammonia emissions from poultry production facilities with mass balance modeling approaches. Workshop on Agricultural Air Quality: State of the Science. June 5-8. Bolger Conference Center: Potomac, MD.
144. Gates, R.S., K.D. Casey, E.F. Wheeler, and H. Xin. 2006. Estimating annual ammonia emissions from U.S. broiler facilities. Workshop on Agricultural Air Quality: State of the Science. June 5-8. Bolger Conference Center: Potomac, MD.
145. Moody, L., H. Li, R. Burns, H. Xin, and R. Gates. 2006. Quality assurance project plan (QAPP) implementation for the southeastern broiler gaseous and particulate matter air emissions monitoring project. Presentation, Workshop on Agricultural Air Quality: State of the Science. June 5-8. Bolger Conference Center: Potomac, MD.
146. Casey, K.D., R.S. Gates, A. Singh, A.J. Pescatore, E.F. Wheeler, H. Xin, and Y. Liang. 2006. Managing litter to reduce ammonia emissions from broiler chicken houses in the U.S.A. Proceedings, Poultry Information Exchange 2006. PIX Association Inc.: Surfers Paradise, Gold Coast, Australia.
147. Maia, G.D.N., R.S. Gates, E.G. Wilkerson, S.F. Higgins, A. Singh, and J.L. Taraba. 2006. Characterization of headspace gases in ventilated and impermeable swine manure tanks and their abatement using biofiltration. ASABE Paper No. 06-4027. ASABE: St. Joseph, MI.
148. Paula, M.O.D., C.D.F. Souza, I.F.F. Tinoco, B.F. Tinoco, E.N. Silva and R.S. Gates. 2006. Corrosion of mortar coverings used in structures of management exposed to swine and bovine wastes. ASABE Paper, ASABE: St. Joseph, MI
149. Santos, C.R., C.F. Souza, I.F.F. Tinoco, H.V. Mendonca, M.C.C. Guimaraes, and R.S. Gates. 2006. Evaluation of the thermal comfort of goats reared in deep bedding systems in the southeast of Brazil. ASABE Paper, ASABE: St. Joseph, MI
150. Mogami, C.A., C.F. Souza, V.T. Paim, I.F. Tinoco, F.C. Baeta and R.S. Gates. 2006. Methane concentration in biogas produced from dejection of milk goats fed with different diets. . ASABE Paper, ASABE: St. Joseph, MI

151. Moody, L.B., H. Li, R.T. Burns, H. Xin, and R. Gates. 2006. Quality assurance project plan (QAPP) for monitoring gaseous and particulate matter emissions from southeastern broiler houses. Proceedings, Air and Waste Management Association Air Monitoring Conference. AWMA: Pittsburg, PA.
152. Moody, L., H. Li, R. Burns, H. Xin, and R. Gates. 2006. Quality assurance project plan (QAPP) for monitoring gaseous and particulate matter air emissions from southeastern broiler houses. Proceedings, Symposium on Air Quality Measurement Methods and Technology. Durham, NC. AWMA: Pittsburgh, PA.
153. Casey, K.D., R.S. Gates, A. Singh, A.J. Pescatore, E.F. Wheeler, H. Xin, and Y. Liang. 2005. The effect of litter management on ammonia emissions from U.S. broiler chicken houses. Paper No. 615, Air and Waste Management Association 98th Annual Conference, Minneapolis, MN. AWMA: Pittsburgh, PA.
154. Crofcheck, C., R.S. Gates, S.R. Workman, M.D. Montross, H. Xin, B. Steward, S. Mikelson, S. Taylor, and I.F.F. Tinoco. 2005. Consortium for sustainable plant and animal production systems: an undergraduate exchange program. ASAE Paper No. 05-8015. ASAE: St. Joseph, MI.
155. Gates, R.S., K.D. Casey, A.J. Pescatore, E.F. Wheeler, and H. Xin. 2005. Assessing annual U.S. broiler house emissions. Paper No. 1292, Air and Waste Management Association 98th Annual Conference, Minneapolis, MN. AWMA: Pittsburgh, PA.
156. Green, A.R., G.A. Watkins, G.B. Day, J.R. Barnett, and R.S. Gates. 2005. Design of a biofilter for swine waste facility. Proceedings, Seventh International Symposium, Livestock Environment VII, Beijing, China. ASAE: St. Joseph MI.
157. Minagawa, H. and R.S. Gates. 2005. Growth and production of layers raised in a controlled thermal environment compared to those in an environment non-controlled. Proceedings, Seventh International Symposium, Livestock Environment VII, Beijing, China. ASAE: St. Joseph MI.
158. Purswell, J.L., R.S. Gates, L.M. Lawrence, T.S. Stombaugh, R.J. Coleman, and W.C. Adams. 2005. Air exchange rate in a horse trailer during transport. Proceedings, Seventh International Symposium, Livestock Environment VII, Beijing, China. ASAE: St. Joseph MI. Pp. 13-20.
159. Singh, A., K.D. Casey, A.J. Pescatore, R.S. Gates, M. Ford, and W.D. King. 2005. Urease inhibitor: a novel approach to reduce ammonia emissions in poultry litter. ASAE Paper No. 05-4162. Presentation, ASAE International Meeting, Tampa FL. July 17-20. ASAE: St. Joseph, MI.
160. Singh, A., K.D. Casey, A.J. Pescatore, and R.S. Gates. 2005. Efficacy of urease inhibitor to reduce ammonia emissions from broiler litter. Proceedings, Animal Waste Management Symposium, Research Triangle Park, NC. Pp. 18.
161. Thoma, E.D., R.C. Shores, D.B. Harris, D.F. Natshke, R.A. Hashmonay, K.D. Casey, and R.S. Gates. 2005. Measurement of ammonia emissions from mechanically ventilated poultry houses using multipath tunable diode laser spectroscopy. Paper No. 542, Air and Waste Management Association 98th Annual Conference, Minneapolis, MN. AWMA: Pittsburgh, PA.
162. Casey, K.D., R.S. Gates, E.F. Wheeler, H. Xin, J.S. Zajaczkowski, P.A. Topper, and Y. Liang. 2004. Ammonia emissions from Kentucky broiler houses during winter, spring and summer. Paper No. 629. Air and Waste Management Association Conference, Indianapolis, IN. AWMA: Pittsburgh, PA.
163. Davis, J.D., J.L. Purswell, J.R. Bicudo, E.S. Vanzant, and R.S. Gates. 2004. Methods of remote, continuous temperature detection in beef cattle. ASAE Paper No. MC04-202. ASAE Mid-Central Section. ASAE: St. Joseph, MI.

164. Gates, R.S. 2004. Technology for Measuring Emissions: Limitations/Benefits. Proceedings, National Poultry Waste Management Symposium. J.B. Hess and K.D. Roberson, editors. Memphis, TN. Pp.107-119.
165. Gates, R.S., K.D. Casey, E.F. Wheeler, H. Xin, A.J. Pescatore, J.L. Zajackowski, J.R. Bicudo, P.A. Topper, Y. Liang, and M. Ford. 2004. Broiler house ammonia emissions: U.S. baseline data. Multi-State Poultry Feeding and Nutrition and Health and Management Conference and Degussa Corporation Technical Symposium. Indianapolis, IN.
166. Li, H., H. Xin, Y. Liang, R.S. Gates, and E.F. Wheeler. 2004. Determination of ventilation rates for a manure-belt laying house using CO₂ balance. ASAE Paper No. MC04-201. ASAE Mid-Central Section. ASAE: St. Joseph MI.
167. Pescatore, A.J., K.D. Casey, R.S. Gates, M.J. Ford, E.F. Wheeler, and H. Xin. 2004 Ammonia emissions from broiler houses during three consecutive flocks. Proceedings, XXII World's Poultry Congress, Istanbul, Turkey.
168. Pescatore, A.J., M.J. Ford, K.D. Casey, and R.S. Gates. 2004 Variation in the capacity of ventilation fans in broiler houses as determined by fan analysis numeration system. Proceedings, XXII World's Poultry Congress, Istanbul, Turkey.
169. Xin, H., Y. Liang, R.S. Gates, and E.F. Wheeler. 2004. Ammonia emissions from Iowa layer houses. Midwest Poultry Federation: St. Paul, MN.
170. Agoridis, C.T., D.R. Edwards, S.R. Workman, J.R. Bicudo, J.L. Taraba, E.S. Vanzant and R.S. Gates. 2004. Effects of atle grazing and BMPs on stream water quality. ASAE Paper, ASAE International Meeting, Ottawa, Ontario, Canada. August 1-4. ASAE: St. Joseph, MI.
171. Green, A.R., R.S. Gates, L.R. Purswell, and L.M. Lawrence. 2004. Instrumentation reliability and performance for continuous monitoring of core body temperature and heart rate in horses. ASAE Paper No. 04-403. Presentation, ASAE International Meeting, Ottawa, Ontario, Canada. August 1-4. ASAE: St. Joseph, MI.
172. Green, A.R, R.S. Gates, J.L. Purswell, L.M. Lawrence, and E.F. Wheeler. 2004. Horse physiological response to short duration transport. ASAE Paper No. 04-4035. Presentation, ASAE International Meeting, Ottawa, Ontario, Canada. August 1-4. ASAE: St. Joseph, MI.
173. Li., H., H. Xin, Y. Liang, R.S. Gates, E.F. Wheeler, and A.J. Heber. 2004. Comparison of direct vs. indirect ventilation rate determination for manure belt laying hen houses. ASAE Paper No. 04-4177. Presentation, ASAE International Meeting, Ottawa, Ontario, Canada. August 1-4. ASAE: St. Joseph, MI.
174. Liang, Y., H. Xin, E.F. Wheeler, R.S. Gates, H. Li, J.S. Zajackowski, P. Topper, and K.D. Casey. 2004. Ammonia emission from U.S. Layer Houses. ASAE Paper No. 04-4104. Presentation, ASAE International Meeting, Ottawa, Ontario, Canada. August 1-4. ASAE: St. Joseph, MI.
175. Norikane, J.H., R.G. Anderson, R.S. Gates, and D.A. Potter. 2004. The system performance of a modified atmosphere treatment for arthropod pest control. ASAE Paper No. 04-4102. Presentation, ASAE International Meeting, Ottawa, Ontario, Canada. August 1-4. ASAE: St. Joseph, MI.
176. Purswell, J.L., J. D. Jacob, R.S. Gates, and K. Salito. 2004. Scale model measurements of ventilation in a horse trailer. ASAE Paper No. 04-4006. Presentation, ASAE International Meeting, Ottawa, Ontario, Canada. August 1-4. ASAE: St. Joseph, MI.

177. Purswell, J.L., A.R. Green, R.S. Gates, and L.M. Lawrence. 2004. Measuring ventilation and ventilation effectiveness in horse trailers. ASAE Paper No. 04-4007. Presentation, ASAE International Meeting, Ottawa, Ontario, Canada. August 1-4. ASAE: St. Joseph, MI.
178. Stevenson, R.N., H. Xin, R.S. Gates, M. Beck, and D. Berckmans. 2004. Evaluating effects of cage stocking density on welfare behaviors of group-housed hens. ASAE Paper No. 04-4004. Presentation, ASAE International Meeting, Ottawa, Ontario, Canada. August 1-4. ASAE: St. Joseph, MI.
179. Wheeler, E.F., K.D. Casey, J. Zajaczkowski, P. Topper, R.S. Gates, H. Xin, and Y. Liang. 2004. Seasonal ammonia emission variation among twelve U.S. Broiler Houses. ASAE Paper No. 04-4105. Presentation, ASAE International Meeting, Ottawa, Ontario, Canada. August 1-4. ASAE: St. Joseph, MI.
180. Bicudo, J.R., R.S. Gates and E. Vanzant. 2003. Effects of air and water temperature and stream access on grazing cattle water-intake rates. ASAE Paper No. 03-4034. ASAE International Meeting, Las Vegas NV. ASAE: St. Joseph, MI.
181. Casey, K.D., R.S. Gates, E.F. Wheeler, J.S. Zajaczkowski, P.A. Topper, H. Xin, and Y. Liang. 2003. Ammonia emissions from broiler houses in Kentucky during winter. International Symposium on Gaseous and Odour Emissions from Animal Production Facilities. Horsens, Jutland, Denmark. CIGR.
182. Casey, K.D., R.S. Gates, E.F. Wheeler, J.S. Zajaczkowski, P.A. Topper, H. Xin, and Y. Liang. 2003. Ammonia emissions from Kentucky broiler houses during winter and spring. Proceedings, National Clean Air Conference: Linking Air Pollution Science, Policy and Management. Newcastle, NSW, Australia.
183. Davis, J.D., E.S. Vanzant, J.L. Purswell, A.R. Green, J.R. Bicudo, R.S. Gates, L. Holloway, and W. Smith. 2003. Methods of remote, continuous temperature detection in beef cattle. ASAE Paper No. 03-4008. ASAE International Meeting, Las Vegas NV. ASAE: St. Joseph, MI.
184. Duncan, G.A., F.A. Payne, R.S. Gates, M. Montross, and T. Stombaugh. 2003. Electronic accountability system for cantaloupe processing in producer's COOP. ASAE Paper No. 03-6214. ASAE International Meeting, Las Vegas NV. ASAE: St. Joseph, MI.
185. Green, A.R., J.L. Purswell, J.D. Davis, R.S. Gates, L. Lawrence, R. Coleman, and E.F. Wheeler. 2003. Methods for assessing horse well being during transport. ASAE Paper No. 03-4092. ASAE International Meeting, Las Vegas NV. ASAE: St. Joseph, MI.
186. Liang, Y., H. Xin, A. Tanaka, S.H. Lee, H. Li, E.F. Wheeler, R.S. Gates, J.S. Zajaczkowski, P. Topper, and K.D. Casey. 2003. Ammonia emissions from layer houses in Iowa. International Symposium on Gaseous and Odour Emissions from Animal Production Facilities. Horsens, Jutland, Denmark. CIGR.
187. Liang, Y., H. Xin, A. Tanaka, S.H. Lee, H. Li, E.F. Wheeler, R.S. Gates, J.S. Zajaczkowski, P. Topper, and K.D. Casey. 2003. Ammonia emissions from U.S. poultry houses: Part II – Layer houses. Proceedings, 3rd International Conference on Air Pollution from Agricultural Operations. Raleigh/Durham, NC. ASAE: St. Joseph, MI.
188. Persyn, K.E., H. Xin, A. Ikeguchi, and R.S. Gates. 2003. Feeding behaviors and pecking force of chicks with or without beak trimming. ASAE Paper No. 03-4005. ASAE International Meeting, Las Vegas, NV. ASAE: St. Joseph, MI.
189. Purswell, J.L., A.R. Green, J.D. Davis, R.S. Gates, L. Lawrence, and R. Coleman. 2003. Measuring ventilation of a horse trailer during transport. ASAE Paper No. 03-4091. ASAE International Meeting, Las Vegas, NV. ASAE: St. Joseph, MI.

190. Tinôco, I.F.F., R.S. Gates, A.L.A. Tinôco, F.C. Baêta, P.R. Cecon, and H. Xin. 2003. Evaluation of broiler breeder housing in high temperature Brazilian conditions. ASAE Paper No. 03-6185. ASAE International Meeting, Las Vegas, NV. ASAE: St. Joseph, MI.
191. Tinôco, A.L.A., T.O. Toledo, I.F.F. Tinôco, R.S. Gates, and H. Xin. 2003. A challenge for industry – to transform chicken skin into leather to benefit food safety and human health. ASAE Paper No. 03-4038. ASAE International Meeting, Las Vegas, NV. ASAE: St. Joseph, MI.
192. Vigoderis, R., I.F.F. Tinôco, A.L. Filho, J. Silva, and R.S. Gates. 2003. Prototype development for the evaluation of porous materials that compound systems of adiabatic cooling. ASAE Paper No. 03-4063. ASAE International Meeting, Las Vegas, NV. ASAE: St. Joseph, MI.
193. Wheeler, E.F., J.S. Zajackowski, P.A. Topper, R.S. Gates, H. Xin, K.D. Casey, and Y. Liang. 2003. Ammonia emissions from broiler houses in Pennsylvania during winter. International Symposium on Gaseous and Odour Emissions from Animal Production Facilities. Horsens, Jutland, Denmark. CIGR.
194. Wheeler, E.F., K.D. Casey, J.S. Zajackowski, P.A. Topper, R.S. Gates, H. Xin, Y. Liang, and A. Tanaka. 2003. Ammonia emissions from U.S. poultry houses: Part III – broiler houses. Proceedings, 3rd International Conference on Air Pollution from Agricultural Operations. Raleigh/Durham, NC. ASAE: St. Joseph, MI.
195. Xin, H., Y. Liang, A. Tanaka, R.S. Gates, E.F. Wheeler, K.D. Casey, A.J. Heber, J. Ni, and H. Li. 2003. Ammonia emissions from U.S. poultry houses: Part I – Measurement system and techniques. Proceedings, 3rd International Conference on Air Pollution from Agricultural Operations. Raleigh/Durham, NC. ASAE: St. Joseph, MI.
196. Bicudo, J.R. and R.S. Gates. 2002. Water consumption, air and water temperature issues related to portable water systems for grazing cattle. ASAE Paper No. 02-4052. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.
197. Braun, M., M.D. Montross, C. Beaman, R.S. Gates, and G.A. Duncan. 2002. Development and testing of a condensation sensor for environmental control. ASAE Paper No. 02-4013. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.
198. Casey, K.D., E.F. Wheeler, R.S. Gates, X. Xin, P.A. Topper, Y. Liang, A.J. Heber, and L.D. Jacobson. 2002. Quality assured measurements of livestock building emissions: Part 4. Building ventilation rate. Air and Waste Management Association Conference, San Francisco, CA. AWMA: Pittsburgh, PA.
199. Colliver, D.G., R.S. Gates and E.G. Wilkerson. 2002. Selection of appropriate design weather conditions for sizing Evaporative pad cooling systems. ASAE Paper No. 02-4038. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.
200. Gates, R.S. 2002. Static pressure and temperature controlled ventilation system for a caged broiler research facility. World Congress of Computers in Agriculture and Natural Resources, Iguassu Falls, Brazil.
201. Gates, R.S., J.D. Simmons, K.D. Casey, T.J. Greis, H. Xin, E.F. Wheeler, C.L. King, and J.R. Barnett. 2002. Fan assessment numeration system (FANS) design and calibration specifications. ASAE Paper No. 02-4124. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.
202. Gates, R.S., H. Xin and E.F. Wheeler. 2002. Ammonia losses, evaluations and solutions for poultry systems. Proceedings, National Poultry Waste Management Symposium. P.H. Patterson, J.P. Blake and K.D. Robertson, editors. NPWM Committee. Pp. 79-88.

203. Persyn, K.E., H. Xin and R.S. Gates. 2002. Effects of beak trimming on poultry ingestion behavior. ASAE Paper No. 02-4070. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.
204. Wheeler, E.F., R.S. Gates, H. Xin, J.S. Zajaczkowski, P.A. Topper, and K.D. Casey. 2002. Field estimation of ventilation capacity using FANS. ASAE Paper No. 02-4125. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.
205. Wilkerson, E.G., R.S. Gates and R.L. Geneve. 2002. Effects of root zone temperature on root development and water uptake during poinsettia propagation. ASAE Paper No. 02-4111. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.
206. Xin, H., T. Wang, R.S. Gates, E.F. Wheeler, K.D. Casey, A.J. Heber, J. Ni, and T. Lim. 2002. A portable system for continuous ammonia measurement in the field. ASAE Paper No. 02-4168. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.
207. Yanagi, Jr., T., H. Xin and R.S. Gates. 2002. A measurement and control system for studying animal-environment interactions. World Congress of Computers in Agriculture and Natural Resources, Iguassu Falls, Brazil.
208. Zolnier, S., G.B. Lyra, R.S. Gates, L.C. Costa, G.C. Sedyama, and M.A.N. Sedyama. 2002. Evapotranspiration estimates for hydroponic lettuce in Brazil. ASAE Paper No. 02-3153. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.
209. Bottcher, R.W., R. D. Munilla, K.M. Keener, R.S. Gates. 2001. Dispersion of livestock building ventilation using windbreaks and ducts. ASAE Paper No. 01-4071, ASAE International Meeting, Sacramento, CA. ASAE: St. Joseph, MI.
210. Bridges, T.C., L.W. Turner, R.S. Gates, and D.G. Overhults. 2001. Assessing the benefits of misting-cooling systems for growing/finishing swine as affected by environment and starting date. ASAE Paper No. 01-4027 ASAE International Meeting, Sacramento, CA. ASAE: St. Joseph, MI.
211. Brown-Brandl, T.M., T. Yanagi, Jr., H. Xin, R.S. Gates, R. Bucklin, and G. Ross. 2001. Telemetry system for measuring core body temperature in livestock. ASAE Paper No. 01-4032. ASAE International Meeting, Sacramento, CA. ASAE: St. Joseph, MI.
212. Chepete, H.J., H. Xin, M. Puma, and R.S. Gates. 2001. Heat and moisture production of pullets and layers with or without the contribution of feces. ASAE Paper No. 01-4048. ASAE International Meeting, Sacramento, CA. ASAE: St. Joseph, MI.
213. Colliver, D.G., T.C. Bridges and R.S. Gates. 2001. 1-, 3-, 5- and 7-Day periods of extreme high dry-bulb temperature and enthalpy. ASAE Paper No. 01-4021. ASAE International Meeting, Sacramento, CA. ASAE: St. Joseph, MI.
214. Gates, R.S. 2001. Ammonia volatilization as affected by broiler litter rewetting and dietary manipulation. International Symposium: Addressing animal production and environmental issues. Research Triangle Park, NC. North Carolina State Animal and Poultry Waste Management Center: Raleigh, NC.
215. Gates, R.S., L.W. Turner, J. Zulovich, and J. Wurm. 2001. Potential for heat stress relief using desiccant systems in swine breeding facilities. Building Systems 2001. Rio de Janeiro, Brazil.
216. Gates, R.S. and H. Xin. 2001. Comparative analysis of measurement techniques of feeding and drinking behavior of individual poultry subjected to warm environmental condition. ASAE Paper No. 01-4033. ASAE International Meeting, Sacramento, CA. ASAE: St. Joseph, MI.

217. Wilkerson, E. and R.S. Gates. 2001. An empirical model for water uptake and root development of poinsettia cuttings. ASAE Paper No. 01-3040. ASAE International Meeting, Sacramento, CA. ASAE: St. Joseph, MI.
218. Yanagi Jr., T., H. Xin and R.S. Gates. 2001. Modeling partial surface evaporative cooling of chickens. ASAE Paper No. 01-3011. ASAE International Meeting, Sacramento, CA. ASAE: St. Joseph, MI.
219. Yanagi Jr., T. H. Xin and R.S. Gates. 2001. Optimization of intermittent partial surface cooling for heat stress relief of laying hens. ASAE Paper No. 01-4110. ASAE International Meeting, Sacramento, CA. ASAE: St. Joseph, MI.
220. Yanagi Jr., T., H. Xin and R.S. Gates. 2001. Thermal discomfort index for laying hens. ASAE Paper No. 01-4064. ASAE International Meeting, Sacramento, CA. ASAE: St. Joseph, MI.
221. Zolnier, S., R.S. Gates, R.G. Anderson, J.L. Buxton, and R. Geneve. 2001. Evapotranspiração de estacas de poinsettia sob condições parcialmente molhadas durante o período diurno (Day-time evapotranspiration of partially-rooted poinsettia cuttings). Proceedings, XXX Brazilian Congress of Agricultural Engineering – CONBEA 2001. Mabu Hotel & Resort, Foz do Iguaçu – Paraná, Brazil.
222. Zolnier, S., R.S. Gates, R.G. Anderson, J.L. Buxton, and R. Geneve. 2001. Evapotranspiração de estacas de poinsettia sob condições parcialmente molhadas durante o período noturno (Night-time evapotranspiration of partially-rooted poinsettia cuttings). Proceedings, XXX Brazilian Congress of Agricultural Engineering – CONBEA 2001. Mabu Hotel and Resort, Foz do Iguaçu – Paraná, Brazil.
223. Anderson, R.G., R.S. Gates, R.L. Geneve, and S. Zolnier. 2000. Dynamic control for mist propagation of poinsettias. Proceedings, 15th International Congress for Plastics in Agriculture.
224. Bridges, T.C., L.W. Turner and R.S. Gates. 2000. Swine performance enhancement with cooling as influenced by summer growth period and weather. Proceedings, First International Conference on Swine Housing, Des Moines, IA. ASAE: St. Joseph, MI. Pp.348-356.
225. Gates, R.S. and C. Mach. 2000. Vapor pressure deficit control algorithm for plant studies. Proceedings, IFAC-BioRobotics II, Sekai City, Osaka, Japan.
226. Gates, R.S., K. Chao and N. Sigrimis. 2000. Fuzzy PI-like staged environment controller. Proceedings, CIGR Conference, Tsukuba City, Japan.
227. Gates, R.S., A.J. Pescatore, M.J. Ford, J.L. Taraba, K. Liberty, A.H. Cantor, and D.J. Burnham. 2000. The effect of feeding low protein diets on ammonia emission and total ammoniacal nitrogen in broiler litter. Proceedings, National Poultry Waste Management Symposium, Springdale, AR. Pp.169-180.
228. Gates, R.S., A.J. Pescatore, J. Taraba, A.H. Cantor, K. Liberty, M.J. Ford, and D. Burnham. 2000. Dietary manipulation of crude protein and amino acids for reduced ammonia emission from broiler litter. ASAE Paper No. 00-4024. ASAE International Meeting, Milwaukee, WI. ASAE: St. Joseph, MI.
229. Gates, R.S. J.L. Taraba, K. Liberty, A.J. Pescatore, A.H. Cantor, M.J. Ford, and D.J. Burnham. 2000. Dietary manipulation for reduced ammonia emission and TAN in broiler litter. Proceedings, Second International Conference on Air Pollution from Agricultural Operations, Des Moines, IA. ASAE: St. Joseph, MI.
230. Golden, V., L.W. Turner, G. Coleman, and R.S. Gates. 2000. Equine response to environmental factors: A literature review and recommendations for design and environmental modification. ASAE Paper No. 00-4074. ASAE International Meeting, Milwaukee, WI. ASAE: St. Joseph, MI.

231. Johnson, F.G., J. Zulovich, R.S. Gates, L.W. Turner, and J. Wurm. 2000. Desiccant system's potential for swine facilities applications. Proceedings, First International Conference on Swine Housing, Des Moines, IA. ASAE: St. Joseph, MI. Pp. 26-33.
232. Mach, C., R.S. Gates, D.G. Colliver, J.W. Buxton, and R.G. Anderson. 2000. Implementation and results from a steady state vapor pressure deficit crop to air controller. ASAE Paper No. 00-4088. ASAE International Meeting, Milwaukee, WI. ASAE: St. Joseph, MI.
233. Puma, M., H. Xin, R.S. Gates, and D. Burnham. 2000. Feeding and drinking patterns and growth performance of individual broilers at selected cycling air temperature and drinking water temperatures. ASAE Paper No. 00-4068. ASAE International Meeting, Milwaukee, WI. ASAE: St. Joseph, MI.
234. Taraba, J.L., R.S. Gates, L.W. Turner, and A. Lee. 2000. Ventilation, feed and loading methods effects on hydrogen sulfide emissions from swine slurry. Proceedings, Second International Conference on Air Pollution from Agricultural Operations, Des Moines, IA. ASAE: St. Joseph MI.
235. Wilkerson, E., R.L. Geneve and R.S. Gates. 2000. Image analysis for indication of seed germination. ASAE Paper No. 00-3025. ASAE International Meeting, Milwaukee, WI. ASAE: St. Joseph, MI.
236. Bottcher, R.W., D.G. Overhults, R.S. Gates, and M.B. Timmons. 1999. Field studies of time integrated variable control in broiler growout housing. ASAE Paper No. 99-4223. ASAE: St. Joseph, MI.
237. Duncan, G.A. and R.S. Gates. 1999. Greenhouse environment issues and results for float bed tobacco transplants. ASAE Paper No. 99-4167. ASAE: St. Joseph, MI.
238. Gates, R.S. and G.A. Duncan. 1999. Ventilation system design parameters for greenhouses for tobacco production. AEU-90. Department of Biosystems and Agricultural Engineering, College of Agriculture, University of Kentucky: Lexington KY.
239. Gates, R.S., K. Chao and N.S. Sigrimis. 1999. Fuzzy control simulation of plant and animal environments. ASAE Paper No. 99-3136. ASAE: St. Joseph, MI.
240. Harkins, J.D, C. Holtz, J. Boyles, W.E. Woods, A.F. Lehner, W. Carter, W. Karpiesiuk, R.S. Gates, M. Fisher, and T. Tobin. 1999. Behavioral and cardiac effects of clenbuterol, terbutaline, and furosemide in the horse: an overview. International Meeting on Clenbuterol Analyses, Chicago IL. Association of Racing Commissions.
241. Mach, C., R.S. Gates, D.G. Colliver, J.W. Buxton, and R. Anderson. 1999. Design and evaluation of vapor pressure deficit based control strategies. ASAE Paper No. 99-4111. ASAE: St. Joseph, MI.
242. Puma, M., H. Xin, R.S. Gates, and D. Burnham. 1999. An instrumentation system for measuring feeding and drinking behavior of poultry. ASAE Paper No. 99-4209. ASAE: St. Joseph, MI.
243. Zolnier, S., R.S. Gates, R. Anderson, and R. Geneve. 1999. Evaluating novel misting control techniques for poinsettia propagation. ASAE Paper No. 99-4164. ASAE: St. Joseph, MI.
244. Zolnier, S., R.S. Gates, J.W. Buxton, G.A. Duncan, and S.E. Nokes. 1999. Evapotranspiration based misting control for poinsettia propagation. ASAE Paper No. 99-4119. ASAE: St. Joseph, MI. .
245. Gates, R.S., J.L. Taraba and K.R. Liberty. 1998. Precision nutrition and litter volatilization dynamics. Proceedings, National Poultry Waste Management Symposium, Ocean City, MD.
246. Gates, R.S., K. Chao and N. Sigrimis. 1998. Design parameters for fuzzy-based control of agricultural ventilation systems. In: Control Applications and Ergonomics in Agriculture. First Workshop on Intelligent

Control for Agricultural Application. International Federation of Automatic Control: Elsevier Science Ltd., Oxford, UK.

247. Gates, R.S., S. Zolnier and J. W. Buxton. 1998. Vapor pressure deficit control strategies for plant production. In: Control Applications and Ergonomics in Agriculture. First Workshop on Intelligent Control for Agricultural Application. International Federation of Automatic Control: Elsevier Science Ltd., Oxford, UK. Pp. 283-288.
248. Tao, N., R.S. Gates, W.E. Murphy, J. Buxton, and D.G. Colliver. 1998. A sunlit plant growth chamber with vapor pressure modification. ASAE Paper No. 98-4152. ASAE International Meeting, Orlando, FL. ASAE: St. Joseph, MI.
249. Turner, L.W., T.C. Bridges and R.S. Gates. 1998. Use of the NCPIG swine growth model for heat stress assessment. In: Control Applications and Ergonomics in Agriculture. First Workshop on Intelligent Control for Agricultural Application. International Federation of Automatic Control: Elsevier Science Ltd., Oxford, UK.
250. Zolnier, S., R.S. Gates, R.L. Geneve, J.W. Buxton, and S.E. Nokes. 1998. Canopy surface resistance of rooted poinsettia cuttings under controlled environment conditions. ASAE Paper No. 98-4161. ASAE International Meeting, Orlando, FL. ASAE: St. Joseph, MI.
251. Zolnier, S., R.S. Gates, R.G. Anderson, S.E. Nokes, and W.E. Murphy. 1998. Non-water-stressed baseline as a tool for dynamic control of a misting system for propagation of poinsettias. ASAE Paper No. 98-4162. ASAE International Meeting, Orlando, FL. ASAE: St. Joseph, MI.
252. Ferguson, N.S., R.S. Gates, A.H. Cantor, J.L. Taraba, A.J. Pescatore, M.L. Straw, M.J. Ford, L.W. Turner, and D.J. Burhnam. 1997. Effects of dietary crude protein on growth, ammonia concentration and litter composition in broilers. ASAE Paper No. 97-4069. ASAE International Meeting, Minneapolis, MN. ASAE: St. Joseph, MI.
253. Ferguson, N.S., R.S. Gates, A.H. Cantor, J.L. Taraba, A.J. Pescatore, M.L. Straw, M.J. Ford, L.W. Turner, and D.J. Burhnam. 1997. Reduced N and P waste production for broilers through diet manipulation. ASAE Paper No. 97-4034. ASAE International Meeting, Minneapolis, MN. ASAE: St. Joseph, MI.
254. Gates, R.S., J.L. Taraba, N.S. Ferguson, and L.W. Turner. 1997. A technique for determining ammonia equilibrium and volatilization from broiler litter. ASAE Paper No. 97-4074. ASAE International Meeting, Minneapolis, MN. ASAE: St. Joseph, MI.
255. Gates, R.S., M.B. Timmons, D.G. Overhults, and R.W. Bottcher. 1997. Fuzzy reasoning for environment control during periods of heat stress. Proceedings, Fifth International Symposium, Livestock Environment V, Bloomington MN. ASAE: St. Joseph, MI.
256. Overhults, D.G. and R.S. Gates. 1997. Energy requirements for operating tunnel ventilated broiler houses. Proceedings, Fifth International Symposium, Livestock Environment V, Bloomington, MN. ASAE: St. Joseph MI.
257. Turner, L.W., T.C. Bridges, R. Coffey, R.S. Gates, G. Parker, T.M. Brown-Brandl, and D.G. Overhults. 1997. Comparison of observed and simulated grow-finish swine performance under summer conditions. Proceedings, Fifth International Symposium, Livestock Environment V, Bloomington, MN. ASAE: St. Joseph MI.
258. Turner, L.W., R.S. Gates, C.M. Wathes, and E. Audsley. 1997. Using fuzzy logic for assessment of dust and ammonia effects on swine respiratory disease. Proceedings, Fifth International Symposium, Livestock Environment V, Bloomington, MN. ASAE: St. Joseph, MI.
259. Chao, K. And R.S. Gates. 1995. Design of switching controller systems for greenhouse production. ASAE Paper No. 95-5097. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.

260. Payne, F.A., R.S. Gates and B.L. Fannin. 1995. Measurement precision for a fiber optic diffuse reflectance sensor. ASAE Paper No. 95-6788. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.
261. Turner, L., R.S. Gates, R.D. Coffey, G.L. Cromwell, H.J. Monague, and T.C. Bridges. 1995. Forced evaporative cooling of growing-finishing swine. ASAE Paper No. 95-4462. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.
262. Zhang, H., R.S. Gates and D.G. Colliver. 1995. Turing machines approach to solve psychrometric attributes. ASAE Paper No. 95-3260. ASAE International Meeting, Chicago, IL. ASAE: St. Joseph, MI.
263. Bridges, T.C., R.S. Gates, K.L. Chao, L.W. Turner, and H. Minagawa. 1994. Techniques for development of swine performance response surfaces. ASAE Paper No. 94-4023. ASAE International Summer Meeting, Kansas City, MO. ASAE: St. Joseph, MI.
264. Burkes, T.F., S.A. Shearer and R.S. Gates. 1994. Neural network classification of plant canopy images from textural features. ASAE Paper No. 94-3510. ASAE International Winter Meeting, Atlanta, GA. ASAE: St. Joseph, MI.
265. Chao, K., R.S. Gates and R.G. Anderson. 1994. Neural-fuzzy inference system for daily growth of single stem roses. ASAE Paper No. 94-4015. ASAE International Meeting, Kansas City, MO. ASAE: St. Joseph, MI.
266. Gates, R.S., H. Minagawa, M.B. Timmons and H. Chi. 1994. Economic optimization of Japanese swine production. ASAE Paper No. 94-4085. ASAE International Summer Meeting, Kansas City, MO. ASAE: St. Joseph, MI.
267. Gates, R.S., S.A. Shearer, L.W. Turner, and F.A. Payne. 1994. Using simulation in teaching core courses in analysis of biosystems. ASAE Paper No. 94-3614. ASAE International Winter Meeting, Atlanta, GA. ASAE: St. Joseph, MI.
268. Gates, R.S., H. Zhang, D.G. Colliver, and D.G. Overhults. 1994. Livestock heat stress parameters from long-term weather data. ASAE Paper No. 94-4017. ASAE Internantional Summer Meeting, Kansas City, MO. ASAE: St. Joseph, MI.
269. Overhults, D.G. and R.S. Gates. 1994. Energy use in tunnel ventilated broiler housing with different controls. ASAE Paper No. 94-4561. ASAE International Winter Meeting, Atlanta, GA. ASAE: St. Joseph, MI.
270. Timmons, M.B., R.S. Gates, R.W. Bottcher, T.A. Carter, J.T. Brake, and M.J. Wineland. 1994. TIV Algorithms for Poultry Environment Control. ASAE Paper No. 94-4082. ASAE International Summer Meeting, Kansas City, MO. ASAE: St. Joseph, MI.
271. Colliver, D.G., H. Zhang, R.S. Gates, and T.C. Bridges. 1993. Monthly mean dry bulb temperatures and dew point depressions. ASAE Paper No. 93-6504. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
272. Gates, R.S., D.G. Overhults and S.H. Zhang. 1993. Heat and moisture production for modern broilers. Proceedings, Livestock Environment IV. Fourth International Symposium, University of Warwick, Coventry England. E. Collins and C. Boon, editors. ASAE: St. Joseph, MI.
273. Overhults, D.G. and R.S. Gates. 1993. Energy use in tunnel ventilated broiler houses. Proceedings, Livestock Environment IV. Fourth International Symposium, University of Warwick, Coventry England. E. Collins and C. Boon, editors. ASAE: St. Joseph, MI.

274. Chao, K.L., R.S. Gates and H. Chi. 1992. Diagnostic hardware/software system for environmental controllers. ASAE Paper No. 92-3560. ASAE International Winter Meeting, Nashville, TN. ASAE: St. Joseph, MI.
275. Gates, R.S., S.H. Zhang and D.G. Overhults. 1992. Minimum ventilation for broiler housing. ASAE Paper No. 92-4532. ASAE International Winter Meeting, Nashville, TN. ASAE: St. Joseph, MI.
276. Gates, R.S, D.G. Colliver and K.T. Priddy. 1992. Stochastic uncertainty in broiler optimization. ASAE Paper No. 92-3511. ASAE International Winter Meeting, Nashville, TN. ASAE: St. Joseph, MI.
277. Bridges, T.C., R.S. Gates, L.W. Turner, and J.L. Usry. 1991. Stochastic assessment of evaporative misting on growing-finishing swine in Kentucky. ASAE Paper No. 91-4508. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
278. Fehr, R.L. and R.S. Gates. 1991. Data communications options for livestock environmental controllers. ASAE Paper No. 91-3032. ASAE International Summer Meeting, Albuquerque, NM. ASAE: St. Joseph, MI.
279. Gates, R.S., D.G. Overhults, R.W. Bottcher, and S.H. Zhang. 1991. Field calibration of a transient model for broiler misting. ASAE Paper No. 91-4561. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
280. Gates, R.S. and D.G. Overhults. 1991. Field evaluation of environmental controllers. ASAE Paper No. 91-4037. ASAE International Summer Meeting, Albuquerque, NM. ASAE: St. Joseph, MI.
281. Gates, R.S., D.G. Overhults and L.W. Turner. 1991. Transient overvoltage testing of environmental controllers. ASAE Paper No. 91-4035. ASAE International Summer Meeting, Albuquerque, NM. ASAE: St. Joseph, MI.
282. Gates, R.S., J.L. Usry and L.W. Turner. 1991. Computerized swine weighing system. ASAE Paper No. 91-4507. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
283. Overhults, D.G. and R.S. Gates. 1991. Electrical wiring for tunnel ventilated broiler houses. ASAE Paper No. 91-4553. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
284. Gates, R.S., J.L. Usry, J.A. Nienaber, L.W. Turner, and T.C. Bridges. 1990. Optimal misting method for growing-finishing hogs. ASAE Paper No. 90-4507. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
285. Parker, B.F., G.M. White, R.S. Gates, M. Collins, S. Lowry, and T.C. Bridges. 1990. Forced air baled hay drying. ASAE Paper No. 90-6031. ASAE International Summer Meeting, Columbus, OH. ASAE: St. Joseph, MI.
286. Turner, L.W., J.P. Chastain, R.S. Gates, and B.F. Parker. 1990. A Cooperative University industry agricultural electric research and extension program. ASAE Paper No. 90-3563. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
287. Usry, J.L., L.W. Turner, T.S. Stahly, T.C. Bridges, and R.S. Gates. 1990. Validation of a swine digestion/passage model (DIGEST). ASAE Paper No. 90-4509. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
288. Burks, T.F., L.W. Turner, W.L. Crist, J.L. Taraba, and R.S. Gates. 1989. PARSIM: a stochastic simulation model for determining cow throughput and labor utilization in dairy parlors. ASAE Paper No. 89-7036. ASAE International Summer Meeting, Quebec City, Quebec, Canada. ASAE: St. Joseph, MI.

289. Gates, R.S. and D.G. Overhults. 1989. Constant velocity inlet baffle. ASAE Paper No. 89-4556. ASAE International Winter Meeting, New Orleans, LA. ASAE: St. Joseph, MI.
290. Gates, R.S., M.B. Timmons and R.W. Bottcher. 1989. Optimization techniques for evaporative cooling systems. ASAE Paper No. 89-7023. ASAE International Summer Meeting, Quebec City, Quebec, Canada. ASAE: St. Joseph, MI.
291. Gates, R.S., L.W. Turner, G. Turner, and J.W. Tuttle. 1989. Measured heat production of chicks. ASAE Paper No 89-4513. ASAE International Winter Meeting, New Orleans, LA. ASAE: St. Joseph, MI.
292. Jones, P.T., S.A. Shearer and R.S. Gates. 1989. Machine vision algorithm for sexing of poultry chicks. ASAE Paper No. 89-3574. ASAE International Winter Meeting, New Orleans, LA. ASAE: St. Joseph, MI.
293. Tuttle, J., R.S. Gates, L.W. Turner, and G.M. Turner. 1989. Heat and moisture production of day old leghorn-type chicks. Presentation, 78th Annual Meeting of the Poultry Science Association, Madison, WI. July 25-28.
294. Timmons, M.B. and R.S. Gates. 1989. Computer management models for poultry systems. ASAE Paper No. 89-4045. ASAE International Summer Meeting, Quebec City, Quebec, Canada. ASAE: St. Joseph, MI.
295. Turner, L.W., J.P. Chastain, R.W. Hemken, R.S. Gates, and W.L. Crist. 1989. Reducing heat stress in dairy cows through sprinkler and fan cooling. ASAE Paper No. 89-4025. ASAE International Summer Meeting, Quebec City, Quebec, Canada. ASAE: St. Joseph, MI.
296. Gates, R.S. and M.B. Timmons. 1988. Economic optimization of tom turkey production. ASAE Paper No. 88-4067. ASAE International Summer Meeting, Rapid City, SD. ASAE: St. Joseph, MI.
297. Gates, R.S. and M.B. Timmons. 1988. Microprocessor controlled broiler environment for optimal production. Proceedings, Third International Livestock Environment Symposium, Toronto, Canada. Pp. 232-241.
298. Gates, R.S., M.B. Timmons and J.T.M. van Sonsbeek. 1988. Feed energy consumption for turkeys at optimal economic temperatures. ASAE Paper No. 88-4532. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
299. Parker, B.F., G.M. White, R.S. Gates, and M. Collins. 1988. Solar drying of baled alfalfa. ASAE Paper No. 88-4539. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
300. Tolzin, J.L., R.S. Gates, G.M. White, and B.F. Parker. 1988. Effects of cracks on the pressure-velocity relationship of baled alfalfa hay. ASAE Paper No. 88-6582. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
301. Gates, R.S. 1987. Teat tissue stresses from non-axisymmetric loads. ASAE Paper No. 87-4515. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
302. Gates, R.S. and M.B. Timmons. 1987. Microprocessor controlled broiler environment for optimal production. Proceedings, 2nd Technical Session of the International Committee of Agricultural Engineers (CIGR) on Latest Developments in Livestock Housing. University of Illinois at Urbana-Champaign: Urbana, IL.
303. Parker, B.F., M. Collins, R.S. Gates, G.M. White, G.M. Turner, S.A. Shearer, and J.L. Tolzin. 1987. Drying of baled alfalfa hay. ASAE Paper No. 87-1548. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
304. Parker, B.F., G.M. White, R.S. Gates, G.M. Turner, M. Collins, and J.L. Tolzin. 1987. Solar drying of alfalfa hay. Proceedings, American Solar Energy Society Annual Meeting, Portland, OR.

305. Scott, N.R., D.M. Galton, D.J. Aneshansely, E.A. Lissik, R.S. Gates, S.T. Mahan, and P.D. Zehr. 1987. Mechanisms of transfer of organisms through the teat canal. International Mastitis Symposium, Quebec, Quebec, Canada.
306. Timmons, M.B. and R.S. Gates. 1987. Predictive model of heat production and growth characteristics for large meat-type tom turkeys. ASAE Paper No. 87-4513. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
307. Timmons, M.B. and R.S. Gates. 1987. Temperature dependent efficacy of evaporative cooling for broilers. ASAE Paper No. 87-4544. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
308. Turner, L.W., S.G. Jackson, R.S. Gates, and C.H. Hood. 1987. Horse housing in Kentucky – an evaluation from the viewpoint of the engineer and the horseman. ASAE Paper No. 87-4009. ASAE International Summer Meeting, Baltimore, MD. ASAE: St. Joseph, MI.
309. Gates, R.S. and M.B. Timmons. 1986. Impact of evaporative cooling in layer housing. ASAE Paper No. 86-4536. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
310. Gates, R.S. and M.B. Timmons. 1986. Real-time economic optimization of broiler production. ASAE Paper No. 86-4552. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
311. Parker, B.F., G.M. White, R.S. Gates, M. Collins, and J. Tolzin. 1986. Development of hay dryers using automatic bale wagons. ASAE Paper No. 86-6542. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
312. Timmons, M.B. and R.S. Gates. 1986. Dynamic air quality control in broiler housing. ASAE Paper No. 86-4539. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
313. Timmons, M.B. and R.S. Gates. 1985. Optimizing broiler production with an expert system. ASAE Paper No. 85-4547. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
314. Timmons, M.B. and R.S. Gates. 1985. Risk analysis methodology applied to environmental control options for animal housing: Part I. Poultry Layers. ASAE Paper No. 85-4507. ASAE International Winter Meeting, Chicago, IL. ASAE: St. Joseph, MI.
315. Gates, R.S., J.R. Cooke and S.K. Upadhyaya. 1984. Eggshell stresses from flat plate and thermal loads. ASAE Paper No. 84-5519. ASAE International Winter Meeting, New Orleans, LA. ASAE: St. Joseph, MI.
316. Gates, R.S., R.E. Pitt, A. Ruina, and J.R. Cooke. 1984. The deformed shape of a spherical cell membrane of constant volume under flat plate loading. ASAE Paper No. 84-6503. ASAE International Winter Meeting, New Orleans, LA. ASAE: St. Joseph, MI.
317. Gates, R.S., N.R. Scott, R.E. Pitt, and D.L. Bartel. 1984. Biomechanics of teat/liner interactions. ASAE Paper No. 84-3535. ASAE International Winter Meeting, New Orleans, LA. ASAE: St. Joseph, MI.
318. Merrill, W.G., R. Sagi, L.G. Petersson, T.V. Bui, R.C. Gorewit, D.M. Galton, and R.S. Gates. 1983. Effects of intensity of pre-milking stimulation on complete lactation milk yield and milking performance. Proceedings, 78th Annual Meeting of the American Dairy Association. University of Wisconsin: Madison, WI.
319. Sagi, R., R.S. Gates and N.R. Scott. 1983. Bacterial transfer within and between modified teatcups. Proceedings, 78th Annual Meeting of the American Dairy Association. University of Wisconsin: Madison, WI.

320. Sagi, R., R.S. Gates and N.R. Scott. 1982. Milking characteristics of teatcups with reduced liner wall movement. *Journal of Dairy Science* 65 (Supplement 1):174.
321. Gates, R.S., R. Sagi, N.R. Scott, and R.W. Guest. 1980. Criteria for determining pipeline diameter for milking systems. ASAE Paper No. 80-3028. ASAE International Summer Meeting, San Antonio, TX. ASAE: St. Joseph, MI.
322. Scott, N.R., M.J. Delwiche, R. Sagi, J.A. Balthazar, R.S. Gates, C. Magee, M.K. Doane, R.P. Natzke, R.C. Gorewit, W.G. Merrill, and R.W. Guest. 1980. Computer assisted management and recent advances in machine milking research. Proceedings, National Milking Center Design Conference, Rochester, NY.

INVITED PRESENTATIONS AND LECTURES

1. Gates, R.S. Uncertainty estimates for livestock facility emissions estimates. 2017. Invited lecture, EMILI conference. 21-24 May. St. Malo, France.
2. Gates, R.S. Feeding behavior and feed consumption of broilers using image analysis. 2016. 1st Asian Conference on Precision Livestock Farming, 9-11 September. Beijing, China
3. Gates RS. Overview of animal housing in North America. 2016. Keynote presentation. ISIAPAS/V SIMCRA. Federal University of Viçosa, 7-10 June.
4. Gates RS. Preferência dos animais – estudo sobre o comportamento animal. Invited presentation, I Congresso de Zootecnia da Precisão 2016, AveSui annual conference, 2-5 May, Florianópolis, Brazil.
5. Gates, R.S. 2015. Sustainable Practices for the U.S. Livestock Industry. Invited presentation, Brazilian Congress of Agrometeorology – CBAgro 2015. 27 August. Lavras, MG.
6. Gates, R.S. 2015. Gas and dust emissions from animal production facilities in the USA. Paper and speech. EMILI 2015. 2nd International Symposium on Emissions of gas and dust from livestock. 24-26 March, 2015. Florianópolis, SC, Brazil.
7. Gates, R.S. 2015. Animal welfare research: one engineering scientist's perspective. Presented to the Animal Sciences Department Graduate Seminar, 17 April, Purdue University, West Lafayette, IN.
8. Gates, R.S. 2015. Emissão de gases e poeiras na produção pecuária nos Estados Unidos. Presented at 2nd International Symp on Emissions of Gas and Dust from Livestock. 24-26 March, Florianópolis, SC, Brazil.
9. Gates, R.S., T. Funk and Y. Xiong. 2014. The Development of Nutrient Management Practices and Technologies in the U.S. 2014 U.S.-China Swine Industry Symposium: Livestock Nutrient Management-Issues, Policies, and Technology. 12 September. Beijing, PRC.
10. Gates, R.S. 2014. Research and Extension Programs at the U of I. Presented at the annual IRCAEW workshop. 12-14 September, Ha'rbín, PRC.
11. Gates, R.S. 2014. Controladores – Experiência Americana (Controllers – U.S. Experience). Presentation at the Workshop on Controllers and Sensors in Barns, at the AveSui Convention and Trade Show, 15 May, Florianópolis-SC, Brazil.
12. Gates, R.S. on behalf of D.G. Overhults. 2014. Necessidade de Isolamento em Clima Quente (Necessity of Insulation in Hot Climates). Presentation at the Poultry Environment Panel, 14 May, Florianópolis-SC, Brazil.
13. Gates, R.S. 2013. Broilers Dark House Workshop – Metodologias para Mensuração de Gases em Aviários Tipo Túnel (Methods for measuring gases in tunnel ventilated poultry housing). Lecture and paper presented at the 12th Poultry and Swine Technical-Scientific Seminar, 15 May. Florianópolis SC, Brazil.

14. Gates, R.S. 2013. Broilers Dark House Workshop – American Experience. Lecture and paper presented at the 12th Poultry and Swine Technical-Scientific Seminar, 14 May. Florinaópolis SC, Brazil.
15. Gates, R.S. 2012. Preventing postharvest Loss: an initiative at the University of Illinois. Brazilian Conference on Agricultural Engineering (CONBEA). 12 July, Londrina, PR, Brazil
16. Gates, R.S. 2012. Prevenindo a perda pós-colheita: uma iniciativa da University of Illinois. Presented to Brazilian Studies Association (BRASA). 7 September, Urbana, IL.
17. Gates, R.S. 2011. Agricultural and Biological Engineering at the University of Illinois. Faculty and students of the University of Sao Paulo – Pirassununga campus. 4 November.
18. Gates, R.S. 2011. Strategies for cooling in high-density laying hen housing systems. International Symposium on Health, Environment and Animal Welfare. Invited lecture 19-22 October. Chonqing, PRC
19. Gates, R.S. 2011. An engineering perspective on laying hen welfare, with consideration for pigs too. International Symposium on Health, Environment and Animal Welfare. Invited lecture given on behalf of Dr. A.R. Green. 19-22 October. Chonqing, PRC.
20. Gates, R.S. 2011. Agricultural and Biological Engineering at the University of Illinois. Faculty of the University of Florence. 1 June, Florence, Italy. Gates, R.S. 2011. Ag & Biological Engineering: New research trends in bioenvironmental engineering. Invited lecture to University of Florence doctoral students. 31 May, Florence, Italy.
21. Gates, R.S. 2011. Design of new farm buildings: trends in the USA. Invited lecture to University of Florence Agricultural Sciences students. 30 May, Florence, Italy.
22. Gates, R.S. 2009. Plant and animal environmental control for the 21st century. Bioproducts and Biosystems Engineering Department Centennial Lecture Series, February 12. University of Minnesota, St. Paul.
23. Management of odors in poultry: overview of U.S. Colombian Poultry Federation, Medellin, Colombia.
24. Gates, R.S. 2008. Emission Measurement Technologies. Invited lecture, National Poultry Waste Management Symposium. 21-23 October, Des Moines IA.
25. Gates, R.S. 2008. U.S. animal feeding operations air emissions mitigation: state of science. Keynote address. Conference on Mitigating Air Emissions from Animal Feeding Operations: Exploring the advantages, limitations, and economics of mitigation technologies. May 19-21. Des Moines, IA.
26. Gates, R.S. 2008. Broiler, turkey and layer building ammonia emissions overview. Presentation, U.S. Poultry and Egg Association Environmental Management Seminar. March 5-6. Atlanta, GA.
27. Gates, R.S. 2006. Recent advances in livestock and poultry production systems. Invited lecture, IV Biometeorology Brazilian Conference. April 11-14. Ribeirão Preto, SP, Brazil.
28. Gates, R.S. and T. Banhazi. 2002. Applicable technologies for controlled environment systems (CES) in livestock production. Presentation, ASAP/ISAH Joint Conference. July 7-11. Adelaide, SA, Australia.
29. Gates, R.S. 2002. Poultry and livestock housing with solid waste management. Presentation, Sixth Discover Conference on Food Animal Agriculture – Nitrogen Losses to the Atmosphere from

Livestock and Poultry Operations. April 28-May 1. Nashville IN. American Dairy Science Association: Savoy, IL.

30. Gates, R.S. 2001. Ammonia volatilization as affected by broiler litter rewetting and dietary manipulation. International Symposium addressing animal production and environmental issues. Research Triangle Park. North Carolina State Animal and Poultry Waste Management Center: Raleigh, NC.
31. Gates, R.S. 2001. New tendencies related to life support systems. Keynote Speech (with paper), Agribuildings 2001 Conference. Sponsored by ASAE and CIGR. September. University of Campinas, Campinas, SP, Brazil.
32. Gates, R.S. 2001. Dietary protein and ammonia production in broiler facilities. Invited Lecture, Midwest Poultry Federation Nutrition Symposia. March 13-15. St. Paul, MN.
33. Gates, R.S. 2000. Information technology and computational intelligence in real-time applications. Invited Lecture, Inaugural Session of CIGR Section VII. December. Tsukuba City, Japan.
34. Gates, R.S. 2000. Statistics and modeling concepts for EMMS Data. Instructor, Professional Development Workshop. SE-301 Environmental Physiology (Sponsor). July. ASAE: St. Joseph, MI.
35. Gates, R.S. 2000. Introduction to psychrometric properties and processes. Tech/CPD Seminar for Parameter Generation and Control (PGC), Inc. March. Asheville, NC.
36. Gates, R.S. 2000. Manipulação da Dieta Avícola Considerando a redução na emissão de poluentes ao ambiente (Poultry diet manipulation to reduce output of pollutants to environment). Invited Lecture, sponsored by EMBRAPA. April. Concordia, Brazil.
37. Tuttle, J., R.S. Gates, L.W. Turner, and G.M. Turner. 1989. Heat and moisture production of day old leghorn-type chicks. Presentation, 78th Annual Meeting of the Poultry Science Association, Madison, WI. July 25-28.

OTHER PUBLICATIONS AND REPORTS

1. Colliver, D., J. Bush, A. Davis, M. Montross, R. Fehr, R. Gates, G. Halich, and S. Nokes. 2008. Kentucky resources to meet energy needs of the 25'x'25 Initiative. Biosystems and Agricultural Engineering No. AEN-93, University of Kentucky: Lexington, KY.
2. Zhang, H., R.S. Gates and D.G. Colliver. 1995. Development and documentation of a psychrometric Turing machine. Department of Biosystems and Agricultural Engineering, Agricultural Experiment Station Paper No. RIS 95-10. University of Kentucky: Lexington, KY.
3. Colliver, D.G., H. Zhang, R.S. Gates, and T.K. Priddy. 1994. Design data for the 1%, 2 1/2% and 5% occurrences of extreme dew-point temperature, with area coincident dry-bulb temperature. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE). Project ASHRAE 754-RP, Volumes 1, 2 and 3 Draft Final Report. Approximately 900 pages.
4. Burks, T.F., L.W. Turner, W.L. Crist, J.L. Taraba, and R.S. Gates. 1988. Simulating cow throughput and labor efficiency in the dairy parlor. Dairy Research Report, University of Kentucky, College of Agriculture, Agricultural Experiment Station: Lexington, KY.