

Curriculum Vitae for Michael M. Schutz

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Professional Preparation:

Iowa State University	Ph.D.	1991	Animal Breeding and Genetics
University of Minnesota	M.S.	1987	Animal Breeding and Genetics
University of Minnesota	B.S.	1984	Animal Science

Appointments:

2018-	Professor and Head	Department of Animal Science	University of MN
2014-18	Assistant Director ANR	Purdue Extension	Purdue University
2013-14	Associate Dept. Head	Department of Animal Sciences	Purdue University
2010-18	Professor	Department of Animal Sciences	Purdue University
2004-14	Extension Coordinator	Department of Animal Sciences	Purdue University
2002-10	Associate Professor	Department of Animal Sciences	Purdue University
1996-18	IN Ext. Dairy Specialist	Department of Animal Sciences	Purdue University
1996-02	Assistant Professor	Department of Animal Sciences	Purdue University
1994-96	Chief Geneticist	Canadian Beef Improvement	Canadian Beef Imp.
1991-94	Research Associate	Animal Improvement Programs	US Dept. Agriculture

Leadership Development:

- North Central National Extension Leadership Development Program, 2006.
- Navigating Differences Diversity Training, February 2016.
- North Central Agricultural Administrators Bootcamp, June 2017.
- Addressing Micro-aggressions in Academia, October 2017.
- Selected as Committee on Institutional Cooperation Academic Leadership Program Fellow 2013-2014.
- University of Minnesota, Leadership Development for New Department Heads 2018-2019.
- Attended Workshop on UMN Budget processes with Associate VP and Budget Director Julie Tonneson, February 2020.
- Attended Big Ten Alliance Leadership Training for Department Heads, Chicago, IL November 2020.
- Attended National meetings of Animal Science Department Heads in February 2019 (New Orleans), February 2020 (Washington DC), February 2021 (virtual), February 2022 (Washington DC), February 2023 (Denver), April 2024 (Athens GA), and April 2025 (Des Moines, co-host).
- Academic Development Leadership Program (Dept. Heads and Chairs), UMN, 2021-2022.
- Attended UMN Keeping our Faculty Symposium. March 3 to 4, 2022.
- Participated in CFANS Equity Certificate Hosted Online (ECHO) sessions on Addressing Implicit Bias and Microaggressions, Ableism and Disability, Classism, Religious and Spiritual Identities,
- Attended CFANS Inclusive Excellence Forum, April 9, 2025.

Selected Professional Activities, Awards, and Honors:

- Distinguished Service Award, Upper Midwest Dairy Industry Association. September 26,

2024.

- Honorary Minnesota State FFA Degree, MN FFA. April 22, 2024.
- Outstanding Faculty, UMN Block and Bridle, April 23, 2022.
- Superintendent National FFA Milk Quality and Products Career Development Event 2018-present.
- TEAM Award, Purdue University, College of Agriculture, Dicamba Response Team, November 7, 2018.
- Appointed Treasurer of Federation of Animal Science Societies, 2018-2021.
- Distinguished Service Award, Indiana Dairy Producers, 2018.
- Gary Sorg Memorial Award for Professional Achievement, Delta Chapter, Delta Theta Sigma, University of Minnesota, March 19, 2016.
- Golden Graduate Award, University of Minnesota Gopher Dairy Club, outstanding contributions to the dairy industry. February 21, 2016.
- Honorary American FFA Degree, National FFA. 2014.
- Cooperative Extension Team Award, Indiana Extension Educators Association, Indiana Dairy Youth Conference Team, 2013.
- International Award, Indiana Extension Educators Association, Farmer-to-Farmer Program: Food Security/Ethiopia, 2013.
- Steve Atkisson Indiana Dairy Service Award, Indiana Milk Quality Professionals, 2012.
- Team Award, Purdue University Cooperative Extension Specialists Association, Purdue Dairy Extension Team, 2011.
- Selected as Purdue Faculty Service-Learning Intern, 2011.
- Award of Merit, Purdue University Chapter of Gamma Sigma Delta, 2010.
- Honorary Professor, Faculty of Animal Science, Ion Ionescu de La Brad University of Agricultural Sciences and Veterinary Medicine, Iasi Romania, 2009.
- President, Dairy Practices Council 2009-2012, vice-president 2006-2009.
- Eric G. Sharvelle Purdue University Distinguished Extension Specialist Award, 2008.
- Extension Team Diversity Award, Epsilon Sigma Phi, for Sharing More Than a Border Program, 2008.
- Achievement in Global Awareness, Epsilon Sigma Phi, 2008.
- Dairy Executive Committee, US Extension Dairy Specialists, 2006-2012.
- Dairy Practices Council, Certificate of Appreciation of Service, Louisville, KY, 2006, 2012.
- Epsilon Sigma Phi (Extension Professionals' Organization), elected 2006.
- Purdue University Cooperative Extension Service Team Award for Confined Animal Feeding Workshop Team, Lafayette, IN, October 2002.
- Dairy Practices Council, Board Member from Education in Dairy Production, 2002-2006.
- Howard County 4-H Appreciation Award for 3 years of service, Columbia City, MD, 1995.
- United States Department of Agriculture Certificate of Merit for "Reporting research and coordinating industry efforts to report Somatic Cell Score evaluations to dairy producers," Beltsville, MD, 1993.
- Iowa State University, Research Excellence Award for outstanding research in a graduate program, Ames, IA, 1991.
- American Dairy Science Association Member 1983-present
 - Journal of Dairy Science, Genetics Section Editor, 2002-2009.
 - Appointed Secretary-Treasurer American Dairy Science Association, 2012-2015
 - Midwest Section President, 2006-2007, VP, 2005-2006, Secretary, 2004-2005.
 - Genetics, Extension, and Graduate Paper Contest Committees.

UMN Department Head Overview

In June 2018, Dr. Michael Schutz joined the faculty of the University of Minnesota as a Professor of Animal Science and the ninth Head of the Department of Animal Science since its formation in 1966 in the College of Food, Agricultural and Natural Resource Sciences (CFANS). Presently, Schutz leads 28 faculty contributing about 25 FTE to departmental activities. That faculty list includes 23 tenured or tenure track faculty, 4 term faculty, and one senior instructor. Three tenured faculty have primarily administrative appointments. The tenured or tenure track faculty includes 4 faculty located at Research and Outreach Centers. Three staff to support academic programs and 3 farm managers report directly to Dr. Schutz. Additionally, the Department has 8 employees in support positions and 8 staff supported by sponsored projects.

The faculty of the department offers the highly regarded Animal Science major, which remains the largest major in CFANS. The Animal Science major allows students to select a sub-plan in Industry and Business, Production, Companion Animal, Equine, or Pre-Vet Science. As of Fall 2025, the major had a combined enrollment of 390 students. The Department is also the administrative home to the Animal Science Graduate Program consisting of 19 MS and 17 PhD students.

Under the direction of Dr. Schutz, Department of Animal Science maintains several teaching and research facilities, including the Dairy Teaching and Research Center, the Poultry Teaching and Research Facility, the Swine and Sheep Teaching facility, equine pastures, and the Livestock Arena on campus. The department also oversees the Beef Research and Teaching facility at Rosemount ROC approximately 30 miles from campus at UMORE Park and a Meats Lab with slaughter, processing, and further processing (smokehouse) in the Andrew Boss Laboratory of Meat Science building on the St. Paul Campus. Further, faculty contribute to research at swine and dairy calf facilities at SROC (Waseca, MN), organic and pasture-based dairy and swine facilities at WCROC (Morris, MN), and beef research facilities at NCROC (Grand Rapids, MN).

In addition to Department Head responsibilities, Dr. Schutz continues to contribute to Extension and applied research efforts in dairy management, particularly related to milk quality. He continues his leadership role with the FFA Milk Quality and Products Career Development Event at the national, regional, and state levels. Further, he represents the University on the Upper Midwest Dairy Industry Association and on the Policy Committee for Minnesota Milk. He recently completed his first MS student at the University of Minnesota, collaborates on projects related to genetic differences of pure and crossbred cows and calves; and is leading another project pertaining to the level of colostrum production by Jersey cows.

Major Areas of Responsibility:

1. Leadership

- Leads in establishment of department priorities, goals and areas of emphasis including those involving cross-disciplinary activities or inter-departmental programs; provides vision and direction of programs to keep relevant and competitive; ascertains how well department goals are being met; and facilitates periodic formal review of department programs.
- Fosters effective working relationships among departmental personnel to accomplish goals.
- Fosters internal and external collaborations, explores partnership opportunities and revenue sources.

- Promotes and practices principles of affirmative action and equal opportunity. Fosters a climate that respects diversity and the professional development of personnel.
 - Responsible for departmental human resource management, including recruitment, development, and retention.
 - Conducts departmental personnel performance evaluations; directs departmental faculty promotion and tenure process; and determines faculty salaries.
 - Participates in the development of collegiate policy and collegiate strategic planning and supports these activities within the Department.
 - Plans and conducts departmental personnel meetings; initiates nominations for internal and external awards; and coordinates all department committee assignments and activities.
 - Supports the department's graduate and undergraduate programs to fulfill the academic mission.
 - Enhances a sense of community in the Department by promoting successes and relevance within and outside the Department.
 - Works effectively with geographically dispersed faculty located at outlying Research and Outreach Centers.
2. Fiscal Responsibility
- Actively engages in securing adequate resources for the Department to strengthen and broaden its mission and nurture collaborations with other units at the University; and reviews and realigns resources to support faculty and programs.
 - Directs preparation and monitoring of departmental budgets and records; allocates and manages departmental funds and resources including personnel, space, and equipment; and oversees campus-based animal care facilities.
3. Communication/Transparency
- Communicates on a regular basis with departmental personnel.
 - Consults with the Department's Faculty Consultative Committee to seek faculty input into decision-making processes.
 - Enhances external relations and the Department's image within CFANS, the University and beyond.

Key Accomplishments as UMN Department Head

- Oversees and ensures accountability for an annual budget of approximately \$5M in recurring and \$500,000 in non-recurring funds.
- Implements budgetary restructuring to offset ongoing structural deficit in operations of fully depreciated beef, dairy, poultry, and swine research and teaching facilities.
- Collaborated with CFANS Development to establish the Gene and Marita Rouse Scholarship and Ridgeway Graduate Fellowship and secure contributions to support designation of a teaching lab and support undergraduate participation in study abroad programs.
- Maintains prioritized list of faculty position requests. Hired an outstanding and diverse pool of assistant professors in Poultry Reproduction (R&T), Dairy Nutrition (R&T), Dairy Systems Management (E&R), Beef Systems Management (E&R), Livestock Sustainability (R&T), and Poultry Health (R).
- Successfully led the Department of Animal Science through the challenges of the Covid Pandemic which had a profound impact on students, faculty, and staff.

- Secured the opportunity for UMN Department of Animal Science to host the Midwest Poultry Consortium's Center of Excellence (COE) program in Poultry Science. The COE annually attracts 30 to 35 students from North Central Universities and University of Florida to take 9 credits of intensive Poultry Science courses at the University over 6 weeks, prior to embarking on an internship. Recently led efforts to extend contract through 2035.
- Encouraged the development of an online Poultry Health Certificate program and an online Applied Masters of Poultry Science degree program through collaborations with the College of Veterinary Medicine.
- Expanded number of graduate faculty in the Animal Sciences graduate program by adding faculty with academic homes in other CFANS departments, College of Veterinary Medicine, and other UMN Colleges to support graduate program emphases in Genetics, Nutrition, Physiology and Production Systems.
- Increased the 4-year graduation rate of students matriculating during my tenure as head, despite a greater immediate decline during Covid for Animal Science and CFANS students than the University as a whole.
- Successfully sought opportunities to improve the equitability of compensation for non-tenure track Assistant and Associate Teaching Faculty.
- Encouraged and oversaw transition of several courses to on-line or hybrid delivery before, during, and after the Covid pandemic.
- Enhanced communications with alumni and stakeholders through monthly e-mail delivery of *Animal Science Connections*, a monthly newsletter.
- Designated space and funding to furnish a permanent dedicated Animal Science Teaching Laboratory.
- Strengthened internal and external communications by enhancing the daylong Animal Science Showcase to feature our work, recognize outstanding alumni and attract alumni and student employers and established monthly faculty meetings, bi-weekly updates, internal newsletter, and refilling communications specialist.
- Established Virtual Animal Science Alumni Gatherings to foster outreach with alumni.
- Developed creative solutions to support research, teaching, and outreach efforts with aging livestock and poultry facility infrastructure.
- Supported feasibility study and pre-design efforts for the proposed new Future of Advanced Agriculture for Minnesota animal facilities.
- Promoted adoption of Writing Enhanced Curriculum and Diversity Enhanced Curriculum within the Animal Science Major.
- Supported efforts of the Diversity and Inclusion Committee by dedicating the Sally Noll Conference Room to celebrate her as the first female faculty member in UMN Animal Science at her retirement, establishing a wellness room, conducting an Inclusivity Survey, and purchasing a bulletin board specifically for inclusivity items.
- Co-Directed project with Dr. Sandra Godden in Vet Med to secure 5 years of PhD Student Fellowship support for two female students from Sub-Saharan Africa with funding from Bill and Melinda Gates Foundation through Acceligen (Recombinetics).
- Conducted Town Hall on inclusivity for Animal Science Students.
- Supported implementation of Diversity Enhanced Curriculum in Animal Science Curriculum, 2023.
- Led faculty through departmental self-assessment and External Departmental Review.

- Encouraged implementation of career readiness programs through Teaching and Extension to meet state needs by exploration feasibility of 4-year Vet. Tech. Degree with CVM, developing a Badge Program in Meat Processing (Partnership with UMC and Central Lakes), and fostering connections with MN State Colleges and Universities with agriculture programs.

Purdue University Program Overview:

In 1996, Dr. Michael M. Schutz was recruited to Purdue University to develop “*an educational and technology transfer program in dairy management and facilitate an interdisciplinary team approach to provide technical support and problem-solving assistance for Indiana’s dairy industry.*” While there, he impacted the Engagement, Learning, and Discovery missions of Indiana’s Land-Grant University. Dr. Schutz influenced the Indiana dairy industry by 1) organizing individuals to provide leadership to Indiana’s growing dairy industry 2) improving milk quality, 3) guiding dairy producers through major changes in dairy farm economic conditions, and 4) engaging youth in preparation for dairy-related careers.

Leadership skills and enthusiasm for extension resulted in Dr. Schutz being named Departmental Extension Coordinator, a position he held from 2004-2014. Dr. Schutz was the 2008 recipient of the prestigious Sharvelle Award as Purdue’s outstanding Extension Specialist and was recognized for his efforts in working with diverse audiences and global awareness. In 2012, Indiana Milk Quality Professionals presented him with the Steve Atkisson Dairy Service Award for service to the Indiana dairy industry. His emergence as a leading Extension dairy specialist nationally was recognized by his being named a member of the Dairy Extension Executive Council for USDA-Cooperative State Research, Education, and Extension Service. In 2013, he was named Associate Department Head for Animal Sciences, and in 2014, he was appointed Assistant Director of Extension for Agriculture and Natural Resources, giving leadership to 92 County Extension Educators and 60 Extension Specialists.

Prior to his appointment as Assistant Director, Dr. Schutz utilized his engagement with the Indiana Dairy Industry to enhance his co-instruction of Animal Sciences 444 (Dairy Production) and to conceive, create, and deliver Animal Sciences 495E (Dairy Farm Evaluation) to challenge advanced level undergraduate students to critically assess modern dairy enterprises. Attesting to the success of this course, Dairy Challenge Teams he coached as an optional activity have won first place platinum recognition at the North American Intercollegiate Dairy Challenge. He also served as undergraduate advisor to 20 to 30 students each semester and as an advisor for the Purdue University Dairy Club.

Additionally, Dr. Schutz supported his outreach program with multidisciplinary research in dairy cattle genetics and management in the areas of 1) pre-partum milking of dairy heifers, 2) genetic decision making for pasture-based dairy farms, and 3) technologies for early intervention to allow prevention and alleviation of animal disease. His international reputation in dairy cattle genetics resulted in his appointment as Senior Editor of the Genetics section of the *Journal of Dairy Science*.

Key Accomplishments as Assistant Director of Extension

- Oversaw three Assistant Extension Program Leaders, three State Extension Educators, and an Administrative Assistant. Jointly evaluates 92 county-based Extension Educators.
- Led strategic planning for ANR to coincide with College of Agriculture five-year plan of work.

- Expanded efforts in commercial agriculture, water resources and soil health, and diversified farming and food systems (local foods, organic agriculture, beginning farmers, urban agriculture, and student farm) by recruiting, hiring and mentoring part-time assistant program leaders, resulting in greater program delivery and participation, as well as impact and its evaluation.
- Enhanced communication among specialists and educators by expanding ANR Advisory Committee size and roles to increase diversity. He also created a new Extension Seminar Series to allow Educators and Specialists to learn more about each other's outstanding programs. Seminars are livestreamed and recorded for on-line viewing. Educators are invited to meet with specialists while on campus when they present.
- Collaborated with Program Leaders in Community Development to accommodate requests from State Senate to conduct a study on CAFO issues that resulted in a comparison of all county ordinances and individual fact sheets for all 92 IN counties to assist local decision makers.
- With counterpart in Agricultural Research, co-administered the \$1M AGSEED competitive grants program, including developing call for proposals, collecting proposals (80 to 90 per year), recruiting review panels, chairing review panel sessions, and awarding research funds.
- Expanded Purdue Extension efforts to build an effective program-wide effort in conservation and soil health by networking with NRCS, SWCD, Indiana State Department of Agriculture, Indiana Department of Environmental Management and other government and non-government organizations.
- Enhanced on-boarding efforts for ANR Educators and Specialists.
 - Schutz developed Apprentice Educator Program for all Extension program areas. Utilized Development program to attract and draw new talent to ANR Educator ranks. Successfully recruited apprentice educators, all of whom have or are interviewed for full-time Extension Educator positions. Reevaluated program with District Directors to determine future and improve understanding of expectations of mentors.
 - Developed Tier 2 on-boarding program for new ANR Educators, including development of resource materials for their use.
 - Built daylong onboarding program for new Campus specialists.
- Collaborated to develop eight reporting areas, according to established Focus Groups, to allow development of logic models and broad reporting criteria.
- Created and supported teams to address new and emerging issues in ANR
 - Led efforts for Purdue Extension's initial response to 2015 flooding in many counties of Indiana.
 - Reestablished Purdue Extension's visibility in efforts of Indiana State Association of Soil and Water Conservation Districts.
 - Collaborated with Program Leader and Assistant Program Leader in Extension Community Development to reestablish Purdue Land Use Team and secured representation on Indiana Land Resources Council.

- Assembled and facilitated team to address release of FSMA Produce Safety Rule and to align Purdue Extension vision for Food Safety Educational initiatives.
- Networked with Indiana Board of Animal Health, EDEN, and other agencies to clarify, communicate, and explain expectations of ANR educators in the event of an HPAI outbreak. Served as liaison between the Communications Center and Extension during Dubois County HPAI outbreak.
- Created Purdue Extension Agrosecurity Team to collaborate with IBOAH to secure funding for animal emergency management preparedness training with successful meetings held around state.
- Developed a team to address precision agriculture workforce development needs in Indiana.

Key Accomplishments as Extension Specialist:

- **Indiana Dairy Leadership.** As in many states, the organizations involved in the dairy industry in Indiana had been very fragmented. Dr. Schutz envisioned and led the development of Indiana Professional Dairy Producers (IPDP), with support of the Extension Dairy Team. He encouraged leading Indiana dairy producers to gather in November 1998 to learn about professional dairy producer organizations in other states. They formed Indiana Professional Dairy Producers, an organization that provides a proactive voice to the Indiana dairy industry and continues to grow in numbers and importance. Schutz continued to serve as an advisor to that organization's board of directors and coordinated with the board in developing collaborative educational efforts such as the Indiana Regional Dairy Meetings, Indiana Dairy Conference, and the Kentuckiana Dairy Exchange until his departure in 2018. Dr. Schutz also served as an advisor to the Board of the Indiana State Dairy Association, Indiana Dairy Industry Development Board, Indiana Milk Quality Professionals, and Milk Promotion Services of Indiana.
- **Improvement of Milk Quality.** A goal of Dr. Schutz's Extension and research program was to enhance milk quality. To assist producers in improving milk quality and safety and enhance their revenues through incentives for improved milk quality, Dr. Schutz initiated several extension programs. A series of milker schools were conducted around Indiana. The web page <http://www.milkquality.org> featured the first interactive on-line milk quality school of its kind in English and Spanish. These successful programs on milk quality and antibiotic usage were supported by milk cooperatives and reached more than 400 dairy farms. Schutz was instrumental in the development of the Indiana Milk Quality Conference to address all aspects of milk quality from cow to consumer, and formation of the Indiana Milk Quality Professionals organization that sprouted from the conference. Additionally, Dr. Schutz impacted dairy farms throughout the US by his involvement with the Dairy Practices Council, for which he served as President. Through Dairy Practices Council, Schutz co-authored a seminal guideline on milking procedures to protect milk quality and addressed the annual conference on several topics.
- **Financial Management for Dairy Producers.** Many changes occurred in the Federal Milk Market Order system early in Dr. Schutz's Extension career. Changes in the milk and dairy product pricing system resulted in extremely volatile market conditions with wide swings in milk prices at the farm gate. Dr. Schutz partnered with the Department of Agricultural Economics and was seen as the key contact for the dairy industry and milk price information. Dr. Schutz conducted meetings in Indiana on using Basic Formula Price (BFP) Contracts to hedge future milk prices and preparing for changes in the USDA Federal Milk Market Order reform process. Annually, Dr. Schutz prepared extension programs and

materials related to the financial outlook for milk prices.

- **Youth Programs.** Dr. Schutz collaborated with other Extension personnel to give leadership to the following youth-directed extension efforts: (1) Dairy Program in the Animal Sciences 4-H Workshop for Youth, (2) Indiana 4-H Dairy Quiz Bowl, (3) Indiana 4-H Dairy Skillathon and Young Producer Contest, (4) Indiana 4-H and FFA dairy cattle and milk quality and product activities for youth, (5) National FFA Milk Quality and Dairy Products Career Development Event, (6) Indiana Dairy Youth Conference, and (7) Dairy Youth Leadership Academy.

In 2018, Dr. Schutz assumed the role of Superintendent for the National FFA Milk Quality and Dairy Foods CDE and has continued in that role to present. He has served on the planning committee since 2002.

- **International University Outreach Activities.** Dr. Schutz participated in several International Outreach Activities in countries including Brazil (Genetic Selection Indexes), Mexico (Changes to US Genetic Evaluations and Economics of Artificial Insemination versus Natural Service), and Bulgaria (Milk Quality, Genetic Selection, Milk Marketing, and Health Management). He collaborated with several Indiana Veterinarians to lead a series of programs in dairy farm management practices to support milk quality and herd health in Romania and has initiated collaboration with the faculty of Ion Ionescu De La Brad University of Agricultural Science and Veterinary Medicine, Iasi, Romania and collaborators at their Dancu Research Farm to enhance the utilization of dairy farm resources to demonstrate best management practices to regional dairy producers.

Accomplishments in Extension Faculty Leadership:

- **Chair, Dairy Common Interest Group.** Dr. Schutz accelerated his efforts to engage the Indiana dairy industry initially by leading and coordinating the development of the Dairy Common Interest Group (CIG) under the structure of the Purdue University Cooperative Extension Service's Plan of Work in the spring of 1998. Under Dr. Schutz's leadership, the Dairy CIG, composed of campus and county-based ANR educators with interest in dairy, was the first commodity group to organize and remained active, despite losing several campus and county-based personnel. Impact of the Dairy CIG was notable and immediate. The Dairy CIG, renamed the Purdue Dairy Team in 2002, was instrumental in delivering the Dairy Excel program for development of leadership and management skills to outstanding dairy producers in Northern Indiana. Other early activities of the Dairy CIG include a series of county dairy programs called the "Purdue Dairy Road Show" in southern Indiana, Northern Indiana Dairy Day, and Michiana Dairy Tour.
- **Animal Sciences Departmental Extension Coordinator.** Dr. Schutz served as acting Animal Sciences Department Extension Coordinator from September 1, 1998, to March 1, 1999. Major accomplishments included departmental coordination of "Charting a Course for the Family Farm" program, fostering communications between departmental extension staff and administration, and coordinating and conducting monthly departmental extension staff meetings. In January 2004, Dr. Schutz was appointed Animal Sciences Departmental Extension Coordinator and remained in that role for ten years. He initiated a periodic "Livestock Issues Update" to discuss issues of importance to animal agriculture, and to call these to the attention of the Agricultural Communications writers as possible leads to bolster the number of positive and beneficial stories about animal agriculture. With his departmental colleagues, he coordinated an annual program featuring timely topics affecting livestock

producers as a professional development opportunity for ANR Extension Educators. The program involved Extension specialists from several departments and was annually attended by 35 key ANR county educators each year

- **National Extension Leadership Development.** In 2006, Dr. Schutz was selected among campus-based Extension Specialists to participate in the North Central NELD program. The NELD program is designed *to build leadership in Cooperative Extension at all levels and provide current and future Extension leaders with the vision, courage, and tools to lead in a changing world.* Schutz remained engaged with the other five county-based Extension Educators of the 2006 Purdue NELD class. Together, they conceived, developed, and in November 2007, delivered a training program for fellow Extension Educators entitled “Sharing More Than a Border”. The program’s goal was to highlight successful Extension programs for working with recent Mexican immigrants and culturally diverse clientele and to encourage more adoption of similar programs throughout Indiana. The success of this program was recognized with several team awards for programs in diversity.
- **Utilization of Technologies for Extension Program Delivery.** Dr. Schutz was always a leader in utilization of new technologies for Extension Program Delivery. One of his first undertakings upon his arrival at Purdue University in 1996 was the development of a Purdue Dairy Page on the World Wide Web. Dr. Schutz served as Genetics Domain Leader for development of the National Dairy Database of Agricultural Databases for Decision Support (ADDs). He led the review of more than 120 papers related to dairy genetics and dairy cattle improvement for the database of educational materials that was released March 2000. Dr. Schutz, along with collaborators, developed *Milking for Quality*, an on-line certification program for milkers on dairy farms. This program was the first such on-line program in the dairy industry and was made available in English and Spanish. More recently, Schutz supported efforts through *eXtension* and DAIReXNET for the dairy industry community of practice. Most recently, Dr. Schutz has co-lead the development of the Purdue Dairy Digest, a series of more than 300 weekly podcasts on dairy farm management topics.
- **Scholarship of Extension.** Dr. Schutz’s efforts in engaging the dairy industry and supporting his Extension efforts with research and discovery to address issues of concern to dairy producers has been recognized. Schutz was asked to describe his programs as part of the orientation program for newly hired Purdue University Extension Specialists. Furthermore, he was invited by Dean of Continuing Education and Conferences to share his area of engagement and views on the scholarship of engagement in a Back-to-the-Classroom campus-wide panel discussion for Purdue University President’s Council during 2008 fall Homecoming activities. In September 2009, Dr. Schutz was part of an invited panel on the Scholarship of Engagement at the 10th Annual Outreach Scholarship Conference, September 28-30, 2009, in Athens, GA.
- **Financial Management.** Throughout his career, Dr. Schutz has developed his abilities in creating budgets, managing accounts, and balancing income and expenses. Initially this was through his faculty role in securing and managing grant funds. Furthermore, as treasurer of Indiana Professional Dairy Producers, he led all aspects of budgeting and advising the board of directors on financial matters. Further, he held national leadership roles with several organizations. He also served three years as treasurer of the American Dairy Science Association where he oversaw the development of the \$2,000,000 annual budget and board management of the multimillion-dollar investment portfolio. He also

managed a \$50,000 budget for ANR in Extension at Purdue and assists the Extension Director in various budgeting matters.

Extension Publications Related to Technology Transfer:

Fact Sheets and Bulletins:

1. Schutz, M.M., and W. Singleton. 1997. Summertime Heat Detection. (AS-517).
2. Schutz, M.M., S.A. Hendress, R E. Jones, and C.P. Rusk. 1998. Evaluating Dairy Cattle Using Lifetime Production. (AS-522).
3. Patrick, G., and M.M. Schutz. 1998. Tax Planning 1998 for Dairy Producers. (ID-223).
4. Schutz, M.M., and K. Foster. 1998. Strategies for Reinvesting Dairy Profits. Charting a Course for the family Farm. (FF-15).
5. Schutz, M.M., and S.J. Kenyon. 1999. BST in Milk. Animal Issues. (AI-7).
6. Kearney, J.F., and M.M. Schutz. 2000. Changes to US Genetic Evaluation System. (AS-544W).
7. Dairy Outlook:
 - a. Schutz, M.M., and C. Hurt 1997. Milk Prices to Recover Seasonally. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - b. Schutz, M.M. 1998. Dairy Outlook Brightens. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - c. Schutz, M.M. 1999. Dairy Outlook Brightens. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - d. Schutz, M.M. 1999. Dairy Has the Strong Economy to Thank. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - e. Schutz, M.M. 1999. Dairy to Face a Production Surge. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - f. Schutz, M.M. 2000. Milk Prices to Recover Somewhat. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - g. Schutz, M.M. 2001. Milk Prices may slip. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - h. Schutz, M.M. 2002. Dairy Troubles Will Continue. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - i. Schutz, M.M. 2003. Higher Milk Prices—At Least for a While. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - j. Schutz, M.M. 2004. Dairies Let a Good Thing Slip. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - k. Schutz, M.M. 2005. Milk Prices to Slip. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - l. Schutz, M.M. 2006. Dairy Prices in the Doldrums. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - m. Schutz, M.M. 2007. Milk Prices Soaring for Now. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - n. Schutz, M.M. 2009. Dairy Prices Put Squeeze on Farmers. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
 - o. Olynk, N., and M. M. Schutz. 2010. Better Prices Butter Up Farmers. In *Agricultural Outlook*. Agricultural Economics Department, Purdue University.
8. Schutz, M.M., 2003. Dairy Price Situation and Outlook for 2003. Agriculture in Transition Series (FF-42-W).
9. Daniels, K. J., and M. M. Schutz. 2003. Profitability Considerations for Dairy Producers. Agriculture in Transition Series (FF-44-W).
10. Schutz, M.M., 2003. What if I must exit the dairy industry? Agriculture in Transition Series (FF-46-W).
11. Schutz, M.M., 2004. Extension's Role in Conflict Resolution and Consumer Education. Joint Extension Symposium. In Proceedings of Combined Animal, Dairy, and Poultry

- Extension Workshop. ADSA/ASAS/PSA Joint Mtg., St. Louis, MO. pp. 45-50.
12. Schutz, M.M., 2007. Gingerich Farms. *In* 2007 Indiana Farm Management Profiles. (CES-360). pp. 14-19.
 13. Milk Price Outlook:
 14. Bridges, G.A., R. Lemenager, B. Richert, M. Schutz. 2010. Zeralonone concerns in reproducing livestock. (AS-598-W).
 15. Olynk, N., and Schutz, M.M., 2010. Better Prices Butter Up Farmers. *In* Purdue Agricultural Economics Report. (October). pp. 7-8.
 16. Olynk, N., and Schutz, M.M., 2011. Butter softens the squeeze of Dairy Farms Margins. *In* Purdue Agricultural Economics Report. (October). p. 6.
 17. Schutz, M.M., 2012. Should I Quit Dairying Because of the Drought? (Number pending).
 18. Schutz, M.M., and L.M. Feree. 2012. Raw Milk FAQs. AS-612-W.
 19. Widmar Olynk, N., and M.M. Schutz, 2012. Dairy Situation Improving after Price/Cost Squeeze. *In* Purdue Agricultural Economics Report. (December). pp. 8-9.
 20. Widmar Olynk, N., and M.M. Schutz, 2013. Milk Prices Hold Steady: Lower Feed Prices Boost Margins. *In* Purdue Agricultural Economics Report. (December). pp. 8-9.
 21. Widmar Olynk, N., and M.M. Schutz, 2014. Dairy Enthusiasm Edging Lower. *In* Purdue Agricultural Economics Report. (December). p. 6.
 22. Widmar Olynk, N., and M.M. Schutz, 2015. Applying the Breaks to Dairy Production Growth. *In* Purdue Agricultural Economics Report. (December). P. 8.
 23. Schutz, M.M., and N. Widmar Olynk, 2016. Milk prices expected to increase with stable feed costs. *In* Purdue Agricultural Economics Report. (December). P. 9.
 24. Schutz, M.M. 2018. Selection for Gestation Length in Dairy Cattle. *Dairy Star*. (September)
 25. Schutz, M.M. 2019. Grouping of Dairy Calves. *Dairy Star*. (March)
 26. Schutz, M.M. 2019. Considerations Before Investing in Precision Farming Technologies. *Dairy Star*. (July).
 27. Schutz, M.M. 2019. Investment in Polled Genetics. *Dairy Star*. (October).
 28. Schutz, M.M. 2020 Timing of Milking Procedures. *Dairy Star*. (February)
 29. Schutz, M.M. 2020 Dairy Practices Council Coming to Minnesota. *Dairy Star*. (July)
 30. Schutz, M.M. 2020 Precision Dairy Farming Buzz Words. *Dairy Star*. (September)
 31. Schutz, M.M. 2021 Dairy Heifer Inventories. *Dairy Star*. (February)
 32. Schutz, M.M. 2021 BCS Gold Standard. *Dairy Star*. (July)
 33. Schutz, M.M. 2021 DPR Trends. *Dairy Star*. (October)
 34. Schutz, M.M. 2022 SCC Trends. *Dairy Star*. (January)
 35. Schutz, M.M. 2022 Fat and Protein Trends *Dairy Star*. (July)
 36. Schutz, M.M. 2022 Using Lab Pasteurized Counts. (October)
 37. Schutz, M.M. 2023 Another Look at Days Dry. *Dairy Star*. (January)
 38. Schutz, M.M. 2023 Drying Off High Producers. *Dairy Star* (July)
 39. Schutz, M.M. 2023 Jersey Colostrum Production. *Dairy Star*. (October)
 40. Schutz, M.M. 2024 Teat End Condition, Scoring. *Dairy Star*. (January)
 41. Schutz, M.M. 2024 Teat Swab Scoring. *Dairy Star*. (July)
 42. Schutz, M.M. 2024 Precision Dairy Farming Tools for Quality Milk. (October)
 43. Schutz, M.M. 2025 Drying Off High Producers. (January)
 44. Schutz, M.M. 2025 Comparing Yields from Different Ages and Seasons. (January)
 45. Schutz, M.M. 2025 Rapid Progress on Butterfat. (July)
 46. Schutz, M.M. 2025 Cost of Mastitis. (October)

Extension Presentations/Workshops (Last 10 years):

1. Schutz, M. 2014. Bird Control on Dairy Farms. Indiana Regional Dairy Meetings, Warrenton, IN.
2. Schutz, M., B. Richert, and D. Karcher. 2017. Biosecurity on Livestock Farms. Indiana Agriculture Insurance Agents.

3. Schutz, M., Progress in reducing SCC. 2022. Four-state Dairy Extension Planning Meeting, Dubuque.
4. Schutz M. 2022. LPC's Role in Monitoring Milk Quality. Upper Midwest Dairy Industry Association Annual Conference.

Teaching Activities:

Dr. Schutz utilized his engagement with the Indiana dairy industry to enhance his creative endeavors in learning. He utilized this interaction with industry to co-instruct Animal Sciences 444 (Dairy Production) and to conceive, create, and deliver Animal Sciences 485 (Dairy Farm Evaluation) to challenge advanced level undergraduate students to critically assess modern dairy enterprises. Attesting to the success of this course, Dairy Challenge Teams he coached have won first place platinum recognition at the North American Intercollegiate Dairy Challenge in 2008 and 2009 along with other high placings. Dr. Schutz also was co-instructor of domestic and international travel courses and instructed the dairy portion of the ruminant production course in Veterinary and Clinical Sciences. Outside of the classroom, Dr. Schutz annually served as an undergraduate advisor to 20 to 30 students. Additionally, during his entire tenure at Purdue, Dr. Schutz served as advisor to award-winning Purdue University Dairy Club. Additionally, Dr. Schutz mentored students in the College of Agriculture Leadership Certificate program and mentored nine undergraduate student research or extension projects and continues this effort at UMN.

Innovations in Teaching:

- a. Created a dairy judging program tailored to allow incorporation of lifetime production information into the Indiana dairy judging contest for youth. Implementation of this program allows students more opportunities to learn about the information upon which true culling and selection decisions are made.
- b. As co-instructor for AnSc 444 Dairy Production, developed interactive learning experiences to demonstrate principles of genetic selection, and use of dairy risk management in making milk marketing decisions. All examples used actual cows that students were assigned to track throughout the course.
- c. Developed a course titled "Dairy Farm Evaluation". This course provides students with an opportunity to integrate and apply knowledge of dairy cattle management, nutrition, reproduction, genetics, milk quality, animal handling, physical farm facilities, and personnel and farm financial management practices. Students develop critical analysis skills and apply troubleshooting principles in the identification and resolution of dairy farm management issues in a learning environment that is structured around farm field trips. Students have opportunity to participate in North American Intercollegiate Dairy Challenge activities. With Ohio State and Michigan State Universities, Schutz, along with Dr. Tamilee Nennich, hosted the North American Intercollegiate Dairy Challenge in 2013 and 2014. Their efforts included serving as first-time hosts of the Dairy Challenge Academy for underclassmen.

Advisee Summary:

18 undergraduate research projects, 8 M.S. theses, and 2 Ph.D. dissertations supervised,

Recent Research Areas:

- **Standardization of milk records for milking interval.** In cooperation with the National Dairy Herd Improvement Association and USDA's Animal Improvement Programs

Laboratory, Dr. Schutz initiated work to estimate new factors to standardize milking interval.

- **Optimum genetic selection for pasture-based dairy producers.** This research initially focused on determining the presence of minor genotype by environment interactions in dairy cattle management systems and then developing appropriate economic weights in selection indices for use by dairy graziers.
- **Assessment of intervention technologies for dairy cattle.** This ongoing research will uncover the cost-benefit relationships of dairy farm investments in intervention technologies, such as automatic temperature monitoring and automatic body condition scoring.
- **Assessing chronic stress in calves.** Preference for sucrose has proven to be an indicator of stress in calves. Follow-up work is exploring the impact of stressors, such as time of grouping and group size, on heifer and veal calves.

Funding:

During his time at Purdue University, Dr. Schutz secured a total of \$1,813,832 to support his programs; \$521,104 for engagement and \$1,292,728 for discovery as a PI or co-PI.

Research Publication List (H-index= 32, Google Scholars):

Refereed Articles:

1. Brown, D.R., C.M. Koehler, G.L. Lindberg, A.E. Freeman, J.E. Mayfield, A.M. Meyers, M.M. Schutz, and D.C. Beitz. 1989. Molecular analysis of cytoplasmic genetic variation in Holstein cows. *J. Anim. Sci.* 67:1926-1932.
2. Schutz, M.M., L.B. Hansen, G.R. Steuernagel, and A.L. Kuck. 1990. Variation of milk, fat, protein, and somatic cells for dairy cattle. *J. Dairy Sci.* 73:484-493.
3. Schutz, M.M., L.B. Hansen, G.R. Steuernagel, J.K. Reneau, and A.L. Kuck. 1990. Genetic parameters for somatic cells, protein, and fat in milk of Holsteins. *J. Dairy Sci.* 73:494-502.
4. Schutz, M.M., A.E. Freeman, D.C. Beitz, and J.E. Mayfield. 1992. The importance of maternal lineages on milk yield traits of dairy cattle. *J. Dairy Sci.* 75:1331-1341.
5. Miller, R.H., M.J. Paape, L.A. Fulton, and M.M. Schutz. 1993. Relation of milk somatic cell count to milk yields for Holstein heifers after first calving. *J. Dairy Sci.* 76: 728-733.
6. Schutz, M.M., P.M. VanRaden, P.J. Boettcher, and L.B. Hansen. 1993. Relation between somatic cell score and type trait evaluations of Holstein sires. *J. Dairy Sci.* 76:658-663.
7. Schutz, M.M., A.E. Freeman, G.L. Lindberg, and D.C. Beitz. 1993. Effects of maternal lineages grouped by mitochondrial DNA genotypes on milk yield and composition. *J. Dairy Sci.* 76:621-629.
8. Schutz, M.M. 1994. Genetic evaluation of somatic cell scores for United States dairy cattle. *J. Dairy Sci.* 78:2113-2129.
9. Schutz, M.M., P.M. VanRaden, and G.R. Wiggans. 1994. Genetic variation in lactation means of somatic cell scores for six breeds of dairy cattle. *J. Dairy Sci.* 77:284-293.

10. Schutz, M.M., A.E. Freeman, C.M. Koehler, G.L. Lindberg, and D.C. Beitz. 1994. The effect of mitochondrial DNA on milk production and health of dairy cattle. *Livest. Prod. Sci.* 37:283-295.
11. Shook, G.E. and M.M. Schutz. 1994. Selection on somatic cell score to improve resistance to mastitis in the US. *J. Dairy Sci.* 77:648-658.
12. Norman, H.D., T.R. Meinert, M.M. Schutz, and J.R. Wright. 1995. Age and seasonal effects on Holstein yield for four regions of the United States over time. *J. Dairy Sci.* 78:1855-1861.
13. Schutz, M.M., P.M. VanRaden, G.R. Wiggans, and H.D. Norman. 1995. Standardization of lactation means of somatic cell scores for calculation of genetic evaluations. *J. Dairy Sci.* 78:1843-1854.
14. Schutz, M.M., and E.M. Pajor. 2001. Control of Dairy Cattle Behavior. *J. Dairy Sci.* 84(E. Suppl.): E31-E38.
15. Boettcher, P.J., J. Fatehi, and M.M. Schutz. 2003. Genotype-by-Environment Interactions in Conventional versus pasture-based dairies in Canada. *J. Dairy Sci.* 86:383-406.
16. Kearney, J.F., M.M. Schutz, P.J. Boettcher, and K.A. Weigel. 2004. Genotype by environment interaction in grazing versus confinement dairy production. I. Milk production traits. *J. Dairy Sci.* 87:501-509.
17. Kearney, J.F., M.M. Schutz, and P.J. Boettcher. 2004. Genotype by environment interaction in grazing versus confinement dairy production. II. Health and reproduction. *J. Dairy Sci.* 87:510-516.
18. Schutz, M.M., and J.S. Ayres. 2005. Extension's Role in Conflict Resolution and Consumer Education. *J. Appl. Poult. Res.* 14:406-413.
19. Eicher S.D., H.W. Cheng, A.D. Sorrells, and M.M. Schutz. 2006. Short Communication: Behavioral and physiological indicators of sensitivity or chronic pain following tail docking. *J. Dairy Sci.* 89:3047-3051.
20. K.J. Daniels, S.S. Donkin, S.D. Eicher, E.A. Pajor, and M.M. Schutz. 2007. Effects of Prepartum Milking on Production and Health of First Calf Heifers, *J. Dairy Sci.* 90:2293-2301.
21. Fahey, A.G., M.M. Schutz, D.L. Lofgren, T.S. Stewart, A.P. Schinckel. 2007. Genotype by environment interaction for production traits while accounting for heteroscedasticity. *J. Dairy Sci.* 90:3889-3899.
22. S.D. Eicher, M. Schutz, F. Kearney, S. Willard, S. Bowers, S. Gandy and K. Graves. 2007. Prepartum milking effects on parlour behaviour, endocrine and immune responses in Holstein heifers. *J. Dairy Res.* 74:418-425.
23. Kalbasi, A., M. Schutz, and W. Auvermann. 2008. Carcass rendering systems for farm mortalities: A review. *J. Env. Eng. and Sci.* 7:199-211.

24. Wilcox, C.S., M.M. Schutz, D.C. Lay, S.S. Donkin, and S.D. Eicher. 2008. Short communication: Effect of temporary glycosuria on molasses consumption in Holstein calves. *J. Dairy Sci.* 91:3607-3610.
25. Bewley, J.M., A.M. Peacock, O. Lewis, R.E. Boyce, D.J. Roberts, M.P. Coffey, S.J. Kenyon, and M.M. Schutz, 2008. Potential for estimation of body condition scores in dairy cattle from digital images *J. Dairy Sci.* 91: 3439-3453.
26. Bewley, J.M., M.W. Grott, M.E. Einstein, M.M. Schutz. 2008. ^{Impact} of intake water temperatures on reticular temperatures of lactating dairy cows. *J. Dairy Sci.* 91:3880-3887.
27. Bewley, J.M., and M.M. Schutz. 2008. An interdisciplinary review of body condition scoring for dairy cattle. *The Prof. Animal Scientist* 24:507-529. [Second most cited article in journal for 2010].
28. Bewley, J.M., M.E. Einstein, M.W. Grott, and M.M. Schutz. 2008. Comparison of reticular and rectal core-body temperatures in lactating dairy cows. *J. Dairy Sci.* 91:4661-4672.
29. Maciuc, V., S. T. Creangă, M.M. Schutz, S. Acatincăi, N. Bucătaru. 2008. Results of genetic estimation for Frisian type cattle from North-Eastern Romania. *Lucrări științifice seria zootehnie CD, vol 51 U.Ș.A.M.V. Iași.*
30. O'Driscoll, K., S.D. Eicher, M.M. Schutz, and A.C. Lossie. 2009. The effect of floor surface on dairy cow immune function and locomotion score. *J. Dairy Sci.* 92:4249-4261.
31. Bewley, J.M., R.E. Boyce, J. Hockin, L. Munksgaard, S.D. Eicher, M.E. Einstein, and M.M. Schutz. 2010. Influence of milk yield, stage of lactation and body condition on dairy cattle lying behaviour using an automated activity monitoring sensor. *Journal of Dairy Res.* 77:1-6.
32. Bewley, J.M., R.E. Boyce, D.J. Roberts, M.P. Coffey, M.M. Schutz. 2010. Comparison of two methods of assessing dairy cow body condition score. *J. Dairy Res.* 77:95-98.
33. Bewley, J.M., M.D. Boehlje, A.W. Gray, H. Hogeveen, S.J. Kenyon, S.D. Eicher, and M.M. Schutz. 2010. Stochastic Simulation Using *@Risk* for Dairy Business Investment Decisions. *Agricultural Finance Rev.* 70:97-125.
34. Bewley, J.M., M.D. Boehlje, A.W. Gray, H. Hogeveen, S.J. Kenyon, S.D. Eicher, and M.M. Schutz. 2010. Assessing the Potential Value for an Automated Dairy Cattle Body Condition Scoring System through Stochastic Simulation. *Agricultural Finance Rev.* 70:126-150.
35. V. Maciuc, Ș. T. Creangă, M. M. Schutz, M. Russel, V. Ujică. 2008. Montbeliard breed in eastern Romania. *Lucrări Stiintifice, Seria Zootehnie, 54:434-440.*
36. Navarro, J.I., L.J. Unruh Snyder, R.P. Lemenager, M.C. Claeys, M.M. Schutz, S.S. Donkin, T. R. Johnson, K. Foster, M. Marshall, D. Buckmaster, and S. L. Lake. 2011. Resources Inventory of Beef and Dairy Operations for the Use of Ethanol Coproducts. *Journal of Extension* 49, Num 2, 16p.

37. Eicher, S.D., D.C. Lay, Jr., J.D. Arthington, and M.M. Schutz. 2013. Effects of rubber flooring during the first two lactations on production, locomotion, hoof health, immune functions, and stress. *J. Dairy Sci.* 96:3639-3651. [Selected as one of top 10 papers of 2013 that "increase our understanding of the pathophysiology of disease or change the way we diagnose, treat, and control disease of food animals" by Annual Conference of the American College of Veterinary Internal Medicine.]
38. Abdelfattah, E.M., M.M. Schutz, D.C. Lay, Jr., J.N. Marchant-Forde, and S.D. Eicher. 2013. Effect of group size on behavior, health, production, and welfare of veal calves. *J. Anim. Sci.* 91:5455-5465.
39. Wilcox, C.S., M.M. Schutz, M.R. Rostagno, D.C. Lay, Jr., and S.D. Eicher. 2013. Repeated mixing and isolation: measuring chronic, intermittent stress in Holstein calves. *J. Dairy Sci.* 96:7223-7233.
40. Schroer, R.C., T.D. Nennich, T.S. Dennis, M.M. Schutz, S.S. Donkin, and D. Little. 2014. Intake and growth of prepubertal dairy heifers fed reduced-fat dried distiller's grains. *Prof. Anim. Sci.* 30:93-98.
41. Gay, K.D., N.J. Widmar, T.D. Nennich, A.P. Schinckel, J.B. Cole, and M.M. Schutz. 2014. Development of a lifetime merit-based selection index for US dairy grazing systems. *J. Dairy Sci.* 97:4568-4578.
42. Cutshaw, R.L., A.P. Schinckel, M.M. Schutz, J. Fix, and M. Einstein. 2014. Relationships among sow productivity traits within purebred and crossbred litters. *Livestock Science*, <http://dx.doi.org/10.1016/j.livsci.2014.10.007> .
43. Cutshaw, R.L., A.P. Schinckel, M.M. Schutz, J. S. Fix, M. Brubaker, and M.E. Einstein. 2014. Sources of variation in purebred pig growth, live ultrasound backfat, and loin muscle area. *The Prof. Animal Scientist* 30:534-542.
44. LaFollette, L. K., Knobloch, N. A., Schutz, M. M., & Brady, C. M. 2015. Consumers' Motivations and Dairy Production Beliefs Regarding Participation in an Educational Dairy Farm Event. *Journal of Agricultural Education*, 56(2), 153-169.
45. Abdelfattah, E.M., M.M. Karousa, M.M. Schutz, D.C. Lay, Jr., J.N. Marchant-Forde, and S.D. Eicher. 2015. Acute phase cytokines, TAC1, and Toll-like receptor4 mRNA expression and health associated with group size in veal calves. *Vet. Immunology and Immunopathology* 164(3-4):118-26.
46. Abdelfattah, E.M., Lay Jr, D.C., Marchant Forde, J.N., Karousa, M.M., Schutz, M.M., Eicher, S.D. 2017. Short communication: Effect of age at group housing on behavior, cortisol, health, and leukocyte differential counts of neonatal bull dairy calves. *Journal of Dairy Science*. 101(1):596-602. <https://doi.org/10.3168/jds.2017-12632>
47. Thompson, N.M., N. Olynk Widmar, M.M. Schutz, J.B. Cole, C.A. Wolf. 2017. Economic and social considerations of breeding for polled cows versus dehorning. *J. Dairy Sci.* 100:4941-4952.
48. Lopez-Villalobos, N., M. Correa Luna, J.L. Burke, N.W. Sneddon, M.M. Schutz, D.J. Donaghy, and P.D. Kemp. 2018. Genetic parameters for milk urea concentration and milk