As we enter the fall semester at the University of Wisconsin 2023, I want to welcome students back with enthusiastic greetings from our colleagues, friends, and supporters of the Meat Science and Animal Biologics Discovery (MSABD) program. The summer of 2023 was a time of extensive travel to scientific meetings both domestic and abroad. Several of our graduate students and undergraduates participated in and presented their research work at conferences and scientific meetings held in Atlanta, GA; Minneapolis, MN; Toronto, Canada; and Padova, Italy as well as locally at the Food Research Institute Spring meeting in Madison, WI. Several of these trips were supported by travel scholarships including the International Meat Science Travel Award and the Food Research Institute Gale Prince IAFP travel award. We thank our sponsors for providing generous financial support for these students to get the opportunity to travel to scientific conferences and represent MSABD. We also had a wide range of visitors for tours, meetings, and seminars. Dr. Todd Callaway from the University of Georgia and Dr. Steve Foley from the Food and Drug Administration National Center for Toxicological Research in Arkansas presented highly informative seminars to our faculty, staff, students as well as other attendees. The MSABD seminar series has been a great way to not only learn what research our colleagues at other institutions are conducting but also introduce them to our capabilities here as well for potential future collaborations. Dr. Dana Dittoe, a former postdoc at MSABD reflects on the eb and flow of her first year as an Assistant Meat Safety Professor at the University of Wyoming Animal Science Dept. We are quite happy for her in her new role (but not surprised to hear that she is doing well!). Finally, we want to introduce you to our newest MSABD Faculty member, Dr. Sara Gragg who brings extensive food safety research expertise to our program. Welcome Sara! In closing we look forward to an exciting fall semester at MSABD. Stay tuned!

Words from the Director: Steven Ricke

Current MSABD Personnel:

Faculty:
- Dr. Steven Ricke, Professor & Director
- Dr. Wei Guo, Assistant Professor Meat Science & Muscle Biology
- Dr. Mark Richards, Professor Meat Science
- Dr. Vanessa Leone, Assistant Professor Animal Biologics & Metabolism
- Dr. Jim Claus, Professor Meat Science
- Dr. Jeffery Sindelar, Professor & Extension Meat Specialist
- Dr. Sara Gragg, Associate Professor

Staff:
- Dillon Walker, Plant Operations Manager
- Max Sell, Retail Operations Manager
- Cindy Austin, BSL2 Lab Manager
- Laurie Sand, Research Lab Manager
- Colleen Crummy, Outreach Program Manager
- John Licari, Building Manager
- Dan Mechenich, Administrative Assistant
- Jordan Nehls, FSQ & Regulatory Manager
- Krysta Michalek, Plant Production Lead
- Heather Hunt, Outreach Specialist

Post Doctorates and (Visiting) Scientists:
- Dr. Eric Grunwald
- Dr. Sung Ki Lee
- Dr. Birol Kilic
- Dr. Jing Zhao
- Dr. Zachary Gregorich, Scientist (Dr. Guo)
- Dr. Samer Tolba, PostDoc (Dr. Leone)

Graduate Students:
- Adam Franzen, MS AN SCI (Dr. Claus)
- Sean Baker, PhD Food Science (Dr. Richards)
- Margaret Costello, MS AN SCI (Dr. Ricke)
- Jessica Brown, PhD AN SCI (Dr. Ricke)
- Alyssa Seitz, MS DY SCI (Dr. Sindelar)
- Jake Hermanson, PhD Nutritional Sciences (Dr. Leone)
- Zihan Zheng, (Dr. Guo)
- Yanghai Zhang, MS AN SCI (Dr. Guo)
- Elena Olson, PhD AN SCI (Dr. Ricke)
- Siyuan (Steven) Sheng, PhD AN SCI (Dr. Sindelar)
- Napatsawan Pharino, MS AN SCI (Dr. Claus)
- Yuting Wu, PhD Engineering (Dr. Richards)
- Evan Chrisler, PhD (Dr. Leone)
Leadership from the Food Safety and Inspection Service (FSIS) visited MSABD this past April as one stop on a tour of select USDA inspected facilities in Wisconsin. The tour was designed to allow FSIS to learn more about each facility and build connections with the staff there. Representatives from FSIS included Deputy Administrator Terri Nintemann, Assistant Administrator – Office of Public Health Science Dr. Denise Eblen, and Under Secretary for Food Safety – Office for Food Safety Dr. José Emilio Esteban. Having sparked the curiosity of such high-ranking government officials (see Sidebar 1), it is easy to see why MSABD was excited about the visit.

The visit was a resounding success and the excitement continued when the officials remarked that MSABD is a “gold standard” of sorts. Such a statement reinforces the potential of MSABD and the excellence reflected in the building’s design and the daily efforts of the staff and faculty.

As MSABD becomes even more established and awareness of the program grows, additional opportunities to build these connections and expand MSABD’s reach and impact will occur.

MSABD’s Food Safety, Quality, and Regulatory Manager Jordan Nehls and Biosafety Level II Lab Manager Cindy Austin led the FSIS members on a tour of MSABD before a larger discussion. The group observed a beef harvest in progress that morning before walking through the fabrication, processing, and packaging rooms. Afterwards, MSABD Director Dr. Steven Ricke and Department of Animal and Dairy Sciences Chair Dr. Kent Weigel joined the group for a discussion. A picture of the current state of meat processing in Wisconsin was quickly established. FSIS and MSABD also identified additional opportunities to network and work together. Even in a discussion where both sides stood to learn from a different perspective, it was the shared themes of promoting a capable meat industry in Wisconsin and beyond that created common ground and a bond.

Sidebar 1

What exactly is FSIS?

When a new President of the United States takes office, they select their Cabinet, which includes 15 individuals who lead their respective federal executive department. Besides the US Department of Agriculture (USDA), other federal executive departments include the Department of Defense, Department of Commerce, Department of Justice, and the Department of Health and Human Services. Within each federal executive department are agencies. Many of these agencies have become household names. Examples include the Federal Aviation Administration (FAA; Dept. of Transportation), the Centers for Disease Control and Prevention and the Food and Drug Administration (CDC, FDA; Department of Health and Human Services), and the Internal Revenue Service (Department of the Treasury). FSIS is an agency within the USDA with the stated mission of “ensuring that meat, poultry and egg products are safe, wholesome and properly labeled”.

Former UW Madison Chancellor Rebecca Blank served as the acting Secretary of Commerce for the US Department of Commerce in 2011 – 2013 and former Wisconsin Governor and University of Wisconsin System President Tommy Thompson led the US Department of Health and Human Services 2001 – 2005.
In May, a third iteration of the MSABD Advisory Board convened for the first time. The board is composed of MSABD Director Dr. Steven Ricke and industry and academic leadership. Over the course of the one and a half day meeting, the board listened to informational presentations from MSABD staff, faculty, and collaborators and discussed topics related to the six goals the board has tasked itself with. The six goals are listed below.

II. Building connections between individual board members and MSABD faculty/staff and between MSABD and external entities, such as industry partners.

III. Identifying MSABD’s strengths and weaknesses.

III. Discussing how MSABD and more broadly meat science contributes to and stays viable as a part of UW Madison’s College of Agriculture and Life Sciences (CALS).

IV. Exploring the possibility of a meat hub inspired by the Dairy Innovation Hub.

V. Furthering experiential learning in the style of Bob Kauffman at MSABD.

VI. Promoting the fundraising associated with the Kauffman project and the funding of endowments at MSABD covering, among other things, graduate student support.

A social and dinner in the MSABD lobby the first evening of the meeting allowed the board to further discuss topics in a more informal setting and network with staff, faculty, collaborators, and friends of MSABD.

Have you ever wondered about the differences between the meat industry and academia? Cindy Austin and Steven Sheng were interviewed about their experiences in an industry setting, compared to their current work at MSABD and in academics. Cindy Austin is the manager of the BSL-2 lab at MSABD, but formerly worked at an Oscar Mayer plant in Madison. Steven Sheng is completing his Doctorate degree in Meat Science, and is completing research in Dr. Sindelar’s lab regarding alternative meat curing agents. Previously, he was a Food Safety and Quality Assurance Manager for a meat plant in Chicago.

Both Cindy and Steven emphasized differences between an industry and academic setting in terms of teamwork and opportunities. Cindy has been a part of MSABD since its beginning, and she explained how through the creation of the new building, the staff became a tight-knit group. Even with the COVID-19 pandemic, they were able to help one another when getting the building up and running. This camaraderie continued after the new building was finished as well. At MSABD, everyone is able to rely on others to help guide them through unfamiliar processes. Collective knowledge and collaboration is key, and always accessible when needed.

MSABD also provides a wide variety of opportunities for its students, staff, faculty, and researchers. In an industry setting, typically each meat processing plant only handles one kind of meat. Plants are often designed to maximize production and the occupations are very specific and can be repetitive, focusing on a single concept. Cindy compared her current work to her work at Oscar Mayer, and noted how now at MSABD she is working with many more people, meat processing companies both big and small, sanitation companies, ingredient suppliers, and more. She is able to complete a wide variety of projects differing in topics, contrary to just focusing on work regarding single products. Part of the reason why Cindy and other researchers are able to focus on many different topics is because MSABD has the ability to process multiple species and conduct longitudinal studies. This ability opens up many new and valuable opportunities for research and more.

For steps going forward, Steven emphasized the importance of continuing to promote MSABD in the community. He helps with Extension, and has noticed that with its recent opening, many people do not know much about MSABD or what is done in the building. MSABD is actively training the next generation of meat scientists. Continued involvement and engagement with learners of all ages is necessary to introduce more people to the idea of meat science and animal biologics.

MSABD Advisory Board

Written by Erica Kallas - Student Outreach Specialist
MSABD All-Staff Meeting

Nearly three years after moving into the building, the MSABD staff assembled earlier this summer for the program’s first all-staff meeting. The meeting was a chance to reflect, build community, celebrate, and learn. As each “business unit” at MSABD became established and found its flow, less day-to-day management was required, and weekly staff meetings were eventually dropped.

While MSABD staff consider themselves a team and frequently collaborate, different “business units” work on their own projects, and the meeting was a chance for everyone to learn about the highlights and successes of each unit and share major news. Bucky’s Varsity Meats provided light refreshments.

The meeting began with a brief camaraderie building activity. Each attendee was given a blank coloring book page and a crayon of one of any 24 different colors. Over the next five minutes, attendees traded crayons with one another to realistically (or not!) color as much of their page as possible. Director Dr. Steven Ricke served as judge of the colorings, with the winner being bestowed a pair of cow print sunglasses and “eternal fame”.

Afterwards, Dillon Walker hosted the meeting. Several undergraduate students who graduated recently and had been working in the various labs at MSABD were recognized (Page 11). Next, representatives from the various “business units” of MSABD took turns at the podium.

A. Dan Mechenich (Administrative Assistant) debuted a new system for sharing pictures from conferences attended by MSABD for inclusion on the MSABD website and in the program newsletter.

B. Dillon Walker (Meat Plant Operations Manager), in conjunction with and on behalf of John Licari (Building Manager), introduced a new work order system designed to triage maintenance requests based on urgency.

C. Dillon provided an update on the USDA inspected processing plant. His update touched on new full-time staff Krysta Michalek (Plant Production Lead) and Jordan Nehls (Food Safety, Quality, and Regulatory Manager) and the current status of the undergraduate student workforce. He also provided stats on the number of animals harvested in the processing plant and fee-for-service projects since operations began, as well as future goals for the processing plant.

D. Max Sell (Retail Operations Manager) was pleased to announce record sales at Bucky’s Varsity Meats. In addition, transactions completed with funds deposited to a WisCard (indicative of sales to UW students and employees) were up 150% year-over-year, suggesting Bucky’s Varsity Meats plays an important role in providing the UW community with safe and wholesome food.

E. Director Dr. Steven Ricke overviewed the happenings of the research suite. He covered the hiring of a new Research Lab Manager (Laurie Sand) and faculty member (Dr. Sara Gragg - Page 10). The faculty are at full research capacity and have fully moved into the research suite after reaching an amicable agreement on how to share the common spaces. Several new grants between the faculty were highlighted, continuing a steady stream of grant funding at MSABD.

F. Dr. Jeff Sindelar (Professor, Meat Science Extension) delivered a retrospective of his Extension program (Page 17).

G. Cindy Austin (BSL2 Lab Manager) reviewed the happenings of the Biosafety Level II Lab at MSABD. Her presentation focused on many of the fee-for-service projects recently occurring at BSL2, as well as BSL2’s collaborations with the Food Research Institute (FRI) and the North American Meat Industry (NAMI).

The meeting was also an opportunity for the staff to practice their presentations as they again gave them to the MSABD Advisory Council a few weeks later (Page 3).
Graduate Research: Alyssa Seitz

Alyssa Seitz is currently pursuing a masters degree at MSABD under Dr. Jeff Sindelar. Alyssa is passionate about dairy cows: her favorite hobby is showing cows, she raises her own herd of Holsteins, and she coaches a county’s 4-H and FFA dairy judging teams. It is perhaps not surprising then that Alyssa’s research involves dairy cows. But should her advisor not be one of the other faculty in the Department of Animal and Dairy Sciences, one known for their expertise in dairy?

Alyssa’s research is based at MSABD because she is studying dairy-beef crosses. A dairy-beef cross is the offspring of a dairy cow that has been mated with a beef cattle (Sidebar 2). Dairy-beef crosses, which are raised primarily for meat production, are an attempt to increase revenue and provide stability for dairy farmers in a time of widely fluctuating milk prices. While they are currently widely found on farms across the United States, more research is needed to understand how dairy-beef crosses grow and develop differently than their purebred parents.

One major concern with dairy-beef crosses is their meat quality. Alyssa’s research follows a herd of approximately 100 dairy-beef cross from their birth to harvest and looks at what effect different feeds have on the dairy-beef crosses’ feed efficiency, body type, coat color, muscle growth, health, and meat quality. Alyssa’s research is putting qualitative data to the latter by running several taste testing panels in MSABD’s sensory analysis room. Here, Alyssa and a team of undergraduate researchers collect data on potential consumer’s perception of the appearance, aroma, tenderness, and taste of the dairy-beef crosses’ meat, as well as quantitative data on the consumer’s likelihood of theoretically purchasing the meat.

Alyssa’s research has even been featured on the well-known Midwest Farm Report. To view the article and listen to a radio interview with Alyssa, please visit: [https://www.midwestfarmreport.com/2023/03/17/for-dairy-beef-calves-feed-research-grows/](https://www.midwestfarmreport.com/2023/03/17/for-dairy-beef-calves-feed-research-grows/).

PhD Research: Sean Baker

This past summer’s visit to Gothenburg, Sweden brought Sean Baker, PhD candidate under Dr. Mark Richards, much closer to a small but prolific group of researchers working on heme protein oxidation. For two weeks, Sean worked at Chalmers Institute of Technology in the lab of Dr. Ingrid Undeland, professor of food science and Dr. Richard’s friend from graduate school and co-author on several papers. Dr. James Whalin, a fellow PhD candidate to Sean in Dr. Richard’s lab, also recently accepted a position in Dr. Undeland’s lab following his graduation this past spring.

The research Sean did while in Sweden was biologics based. By changing the pH, protein isolates can be extracted from the heads of salmon harvested in aquaculture, a by-product. The issue is that the isolate rapidly deteriorates and a fishy smell results. The research Sean helped with looks at how antioxidants can be used to help stabilize the isolates. Enter another agricultural by-product found in abundance in Wisconsin: cranberry seeds and hulls rich in antioxidants. The stabilized protein can be used as a filler in food products. Per Chalmers, “the recovery of valuable compounds from food industry’s side streams”, such as what Sean helped research, is a tool for improving food sustainability and is known as cross processing.

Sean’s short visit to Sweden was filled with professional growth. He was given the freedom to pursue hypotheses in real-time—a sort of if there is an opportunity, act on it and ask questions later mentality. He experienced having engineers and research technicians available in the lab to run samples for him based on his decisions. Seeing positive results from his research—Sean is confident a poster will result—helped build Sean’s confidence. He took the trust placed in him, to travel to Sweden alone after he himself proposed the trip, very seriously and did not disappoint. He dived headfirst into a new lab environment and quickly became a valuable asset to Dr. Undeland’s team. Sean is excited to try new ideas and approaches he picked up in Sweden in the lab back in Madison.

Spending time at Chalmers, one of the most prestigious institutions of higher education in Europe, and in Gothenburg, Sweden’s second city—slightly smaller than the Milwaukee metropolitan area, provided Sean a true Scandinavian experience. He enjoyed the architecture and time exploring the city, as well as genuine hospitality, and toured the Gothenburg Museum of Natural History with his lab-mates. Sean hopes he can return to Sweden again someday. For now, he returned to the US rejuvenated and with the knowledge that there are others out in the world working on the same thing as in his little corner of science.
Lauren Sroda, an incoming Senior at UW-Madison, is currently conducting research in Dr. Vanessa Leone’s lab at MSABD. Lauren is majoring in Biological Systems Engineering, which is the only engineering major in the College of Agricultural and Life Sciences. Lauren says that this major gives her the best of both worlds between CALS and engineering, as she is able to pursue both of her interests. Biological Systems Engineering has a focus on agriculture, specifically food and bioprocesses.

The chicken actually came much before MSABD. Lauren first became interested in doing research at MSABD after completing academic work through the Midwest Poultry Consortium in Iowa three summers ago. After completing these studies that entire summer, she says she was revved up to continue learning about poultry. So, her next step was joining UW-Madison’s Poultry Club! At one of their meetings, Professor Leone gave a presentation about her research at MSABD, which immediately piqued Lauren’s interest.

As a CALS Honors student—specifically through the CALS Honors in Research Program—Lauren was interested in getting involved in research on campus. And Professor Leone had the perfect project for her at MSABD.

The project that Lauren is working on at MSABD involves looking at the longitudinal microbiome of the facility. There have not been many studies previously conducted that are able to look at microbiomes before and throughout the opening of a facility, so this project contributes new insights to sanitation and potential food spoilage hazards. Lauren’s work involves taking swabs in ten key locations throughout MSABD that have high contact both with animals and humans. After the animals are processed and sanitation occurs, Lauren takes a swab of both the area and animal carcass, then goes into the lab to extract its DNA and see what kind of microbiome is there.

This research is very timely, as earlier this year the USDA gave a large grant to small farmers to support their work. As smaller farms and facilities often process multiple species, rather than just one like larger industries, it is important to see if the microbiome is as expected or if sanitation needs to be reassessed.

Lauren is early on in her research, but is looking for results regarding whether or not there are unwanted food spoilage microbes being brought into MSABD through animals. She recently completed research over the summer at MSABD through the Food Research Program, and she will continue her research until she graduates this December.

Some advice that Lauren has for students wanting to pursue her field, or research in general at UW-Madison, is to be a yes person. She emphasizes how time goes by so fast in college, so make the most of it! Be open to any and all opportunities at UW-Madison, and really see what is out there for you to do on campus. By taking these steps, Lauren was able to find her passion both in food science, and in research at MSABD. So go with the flow, even if it takes you in a direction you never imagined.
Besides learning to do research and becoming life-long learners, the graduate students at MSABD play a very active role in the program providing outreach. This often looks like giving tours to building visitors, assisting with Extension programming, and providing educational activities for youth in FFA, 4-H, school groups, and STEM camps. Besides being rewarding, helping out gives the graduate students an opportunity to create interest in meat science in others and to develop the communication skills needed to become the next generation of meat science leaders. One should never underestimate the positive impact they can have on others: Ms. Terri Nintemann, who serves as Deputy Administrator of the Food Safety and Inspection Service in the USDA (Page 2) credits participating in FFA and 4-H as a youth in building her passion for public service. The MSABD graduate students have shown creativity, generosity, and pose in providing outreach.

Adam Franzen (Page 12), who is pursuing a master’s degree under Dr. Jim Claus, recently provided an educational activity for a group of 3rd grade students. By asking them lots of questions, Adam kept the students engaged and interested. He showed the students a PowerPoint about MSABD and meat science. Then from the demo cooler in one of MSABD’s lecture halls, Adam demonstrated some basic meat processing skills on wholesale pork primals. Pat Pharino, another master’s student under Dr. Claus, operated the camera system for Adam. The activity finished with a fun video about how hotdogs are made.

More recently Adam provided an educational activity for middle school aged students in a STEM camp hosted by the Morgridge Institute for Research, the second year of the partnership between Morgridge and MSABD (Volume 2, Issue 2; Page 9). Adam provided the students with thin strips of two different types of meat. Using equipment to measure shear force, the students could numerically see that one type of meat required significantly more force from the machine to cut through. The students learned about how connective fibers in the meat cause this and what effect that has on the tenderness of meat.

For more on the educational activities that MSABD provides, please see the article on the 2023 Grandparents University (Page 20).

Digging Deeper: Meat Science Lexicon

The Meat Science Lexicon, developed in part by MSABD’s Dr. Jeff Sindelar and adjunct Dr. Dennis Seman, sought to standardize definitions in meat science. It contains many words familiar to both meat scientists and the general public. In each issue, we will look at what a few of the words really mean.

**fermentation** (fer-ˈmən-ˈtā-shən) *noun* 1. bacterial metabolism (or conversion) of carbohydrates (sugars) to an organic acid (primarily lactic acid) under mild heat conditions to preserve a food and/or contribute unique flavors.

Fermentation is all around us! In brewing and wine making, fermentation turns sugars into alcohol. Fermentation also creates carbon dioxide, which causes dough to rise. Common fermented dairy products include yogurt and sour cream. In meat, fermentation preserves because the resulting acids lower the pH of the meat below what many harmful bacteria can grow in. The unique flavors from meat fermentation are perhaps most commonly experienced through consuming summer sausage.

**curing** (ˈkyr-ĭng) *verb* 1. (specifically the inclusion of nitrate or nitrite salts) the application of salt (NaCl), nitrate/nitrite salts, and seasonings in meat, followed by heating (note that some long-term cured products are not heated) to produce a unique appearance, flavor, and texture, and enhance product safety and shelf-life.

People have been curing meat since antiquity, with early accounts of salted meats in Persia. Curing meat with salt was a mainstay for preservation, a well-known example being salted meat eaten on long sea voyages during the Age of Discovery. As the definition in the lexicon suggests, curing in time also became a way to make meat more enjoyable and gave rise to the French charcuterie board. Cured meats are of course still enjoyed today, with salami and pepperoni being common examples.
**UW Madison, MSABD, Johnsonville Foods Celebrate Partnership**

To help mark its 175th anniversary later this year, UW Madison sent a delegation to Sheboygan County earlier this summer to celebrate and strengthen some of the partnerships that exist between the University and industry there. Besides UW Madison Chancellor Jennifer Mnookin, Dr. Jeff Sindelar of MSABD joined the delegation, and the over thirty years of close collaboration between Johnsonville Foods and meat science at UW Madison was a key feature of the day’s festivities. At a Johnsonville company brat grill-out, both Chancellor Mnookin and Kevin Ladwig of Johnsonville Ventures, part of Johnsonville Foods, shared how proud of the relationship between UW Madison and Johnsonville Foods they are.

A common theme throughout the day was how UW Madison and its partners engage each other’s strengths to create results that benefit everyone in Wisconsin and beyond, which reflects not only MSABD’s mission, but also embodies UW Madison’s mission through the Wisconsin Idea. Johnsonville Foods is currently collaborating with MSABD on several research projects, and Johnsonville Foods provided both funds for and guidance on the design and construction of the MSABD building, with one of the two large classrooms there named the Johnsonville Lecture Hall.

For more information on the celebration, please visit: [Sheboygan recognizes partnerships with UW–Madison as university celebrates 175 years | Wisconsin Alumni Association (uwalumni.com)](http://uwalumni.com). The article also talks about the large (approximately 50 people) UW Madison alumnus presence in Johnsonville Foods’ employee workforce, and how the latter provides many internship opportunities for current UW Madison students.

**Dr. Steven Ricke Receives 2023 Poultry Science Association Distinguished Poultry Industry Career Award**

Dr. Steven Ricke’s trip to the Poultry Science Association (PSA) Annual Meeting this past July in Philadelphia was extra special as he was awarded the 2023 Poultry Science Association Distinguished Poultry Industry Career Award. The award is sponsored by the U.S. Poultry & Egg Association (USPOULTRY) and recognizes distinctive and outstanding contributions.

Reviewing what Dr. Ricke has accomplished in his career, it is not hard to agree with USPOULTRY President John Starky when he said that everyone involved believes Dr. Ricke has “...truly helped to grow and improve our industry.” Dr. Ricke is behind over 400 peer-reviewed research publications. And with over 200 invited talks, which now includes an invited presentation at the 76th Reciprocal Meat Conference in 2023, Dr. Ricke’s wisdom is highly sought after.

It was noted that Dr. Ricke’s research is often applied and aims to find solutions to issues facing the poultry and egg industry. This focus embodies not only a lot of what Dr. Ricke does, but also in large part the mission of MSABD as a whole. MSABD’s more novel ability to facilitate longitudinal studies also suits Dr. Ricke well as he researches the link between live bird production and poultry processing.

Much of Dr. Ricke’s research focuses on food safety, specifically the control of *Salmonella* and *Campylobacter*. An interesting facet of this is building an understanding of the mechanisms these pathogens use to survive in a variety of poultry production environments. Dr. Ricke has expanded on this to develop the concept of microbiome mapping: a snapshot of things like where the pathogens are physically located on the farm and in the processing plant, how they multiply and spread, and their dynamic relationship with other microorganisms and factors in their given environment. This research is even applied to the insides of chicken stomachs! - how pathogens inhabit the digestive tracks of live birds and what role feed additives might play in controlling the pathogens.

Dr. Ricke’s latest award follows up his PSA National Research Award (1999), American Egg Board Award (2006), Evonik Award for Achievement in Poultry Science (2019), and National Chicken Council Broiler Research Award (2020), as well as being named a PSA Fellow in 2017.
LSU Visits UW Madison; MSABD

A delegation from Louisiana State University, colloquially known as LSU, visited UW Madison and MSABD this past August. Members of the delegation included LSU’s president, a member of the LSU Board of Supervisors, and alumnus of LSU. Their visit was in part to learn about how faculty shared governance works at UW Madison. They were also interested in learning about the Wisconsin Idea (Vignette 1) and its connection to Extension. The tour of MSABD was led by MSABD faculty Dr. Jeff Sindelar and PhD student Jessica Brown.

Vignette 1

“The Wisconsin Idea, often articulated as ‘the boundaries of the university are the boundaries of the state,’ reflects the belief that UW-Madison teaching, research, outreach and public service should provide benefits beyond the classroom. First applied to the relationship between the university and the people of Wisconsin, it is now generally acknowledged to be national and global in scope.”

As MSABD consistently views itself and operates as a resource to Wisconsin’s meat industry, the Wisconsin Idea and Extension play a central role at MSABD. Dr. Sindelar, who holds an 80% Extension 20% Research appointment, has considered himself a bridge between academia, government, and industry. Between organizing everything from meat judging events for 4-H and FFA members to the Wisconsin Meat Industry Coalition Conference, giving meat science and/or food safety themed presentations, hosting a full lineup of short courses and workshops (Page 22), and more, Dr. Sindelar and MSABD benefit, enliven, and educates individuals from around the world outside of a conventional college education. And more broadly, things like the technical expertise MSABD’s faculty lend to research collaborations with industry partners is another example of the Wisconsin Idea at work.

To read more about LSU’s visit and see pictures from some of their other stops on campus, please visit: LSU delegation visits CALS to learn about agricultural programs – eCALS (wisc.edu). To learn more about Dr. Sindelar’s Extension program, please see Page 17.

MSABD Seminar Series

On Monday, March 13, Dr. Todd Callaway of the University of Georgia presented “Beef Quality and Quantity: How can the microbiome improve sustainability?” as the second presenter in the MSABD Seminar Series. Known for his work in ruminant microbiology and its effects on food safety and production efficiency, Dr. Callaway is also the Editor in Chief of the journal Foodborne Pathogens and Disease. Dr. Callaway’s research collaboration partners have included the United Nations and MSABD’s Dr. Steven Ricke, with whom Dr. Callaway has coauthored manuscripts and a book on direct-fed microbials and prebiotics. MSABD thanks Dr. Callaway and hopes he returns soon.

What drew you to animal sciences, and in particular ruminant microbiology?

I came into animal sciences like most of us, because I wanted to be a veterinarian. However, when I started seeing the science that underpinned the way we produce animals I was interested in working in a lab to see what went in to producing that research. I started working in a ruminant nutrition/riemien microbiology lab and fell in love with understanding how the ruminant animal was totally dependent on the microbial population of the gut. The beauty of that true symbiosis between the microbes and animal fascinated me, and still does. Which is why I study microbial ecology and how the microbes interact and impact the world around them.

During your seminar, you stressed the need for additional research to better understand the mechanisms at play in the microbiome and to approach microbiome research from other angles. How will you, the University of Georgia, and those you collaborate with accomplish this?

Much of our research is aimed at understanding how the microbial populations produce end-products that affect other microbes and the host animal. But also how the microbes can alter the footprint of animal production in terms of impact on sustainability by reducing methane production. We are studying how different feedstuffs interact with the genetics of the host animal to alter the footprint (especially in terms of carbon) of animal production.

If there was one thing you wished the general public knew about your research, what would it be?

I really wish people understood the levels to which humans were dependent on their daily unseen interactions with the microbes in themselves and in their environments.
Dr. Sara Gragg became the newest member of MSABD’s faculty this past August. According to her bio from Kansas State, at which she had been with the Department of Animal Sciences and Industry since 2013, “[h]er research program investigates pre-harvest and post-harvest issues affecting the meat and produce industries, with specific interests addressing the manner by which pathogens contaminate food products and the application of interventions to prevent and/or reduce pathogen presence.” As Dr. Gragg headed northeast to UW Madison, we asked her a few questions.

**A lot of the research you are doing in pathogen spread and reduction interventions, particularly regarding live animals, matches closely with the research and capabilities found at MSABD. What are you most looking forward to while working at MSABD and with the faculty/staff here?**

The research capabilities at MSABD are extraordinary and align perfectly with my areas of research. The ability to effectively simulate commercial procedures, processes, conditions, etc. on a large-scale level in a state-of-the-art facility within our own building is game-changing. I am looking forward to the convenience of having these facilities in our building and pairing with the Livestock Laboratory facility nearby. The faculty/staff at MSABD have diverse research areas and are exceptionally talented. I am certainly looking forward to collaborating with my new colleagues and expanding the breadth and depth of my research by engaging their areas of expertise. When you combine the phenomenal MSABD facilities with the incredibly talented people, there is nothing we can’t accomplish as a research team that specializes in Meat Science and Animal Biologies.

**MSABD is starting to produce academics who are going out and starting their own research labs, such as Dr. Dana Dittoe at the University of Wyoming. UW Madison being your second lab started, what wisdom do you have that will hopefully make setting up your research lab at MSABD go smoothly that you did not have when you started at Kansas State?**

When starting my lab at the new Olathe campus of Kansas State University I had a blank canvas. I joke that I didn’t even inherit a pipet tip because the building was new, and the labs had never been occupied. Therefore, I had the opportunity to “build the lab from scratch”, which included a steep learning curve in purchasing equipment from vendors, preparing biosafety manuals and institutional biosafety committee protocols, writing numerous standard operating procedures, appropriately outfitting a lab space to receive biological safety level 2 research approvals, and creating a functional workspace for high throughput research activities. I asked many questions along the way and became well acquainted with experts from the research compliance and environmental health and safety offices at the Manhattan campus. Although daunting at first, these experiences taught me a great deal about creating and managing a BSL-2 research space, and I have a solid understanding of what is required to efficiently establish a research program at UW-Madison.

**You already have many accomplishments with far-reaching implications, such as contributing to research on food safety in school cafeterias. What will you be most proud of regarding your time at Kansas State?**

I am most proud of the fantastic students that I had the honor of mentoring as a Kansas State University faculty member. Training the next generation of scientists to be ethical, knowledgeable, and hardworking leaders in the food industry is a privilege and a responsibility that I do not take lightly. Graduate students make our research programs possible. They are dedicated to their projects, to helping one another succeed, and the often unpredictable schedules that accompany research. It brings me great pride to see each student succeed.

**If there was one thing you wish everyone in the general public knew or understood about your research, what would it be?**

A portion of my research focuses on identifying and validating interventions to control foodborne pathogens, particularly in pork and beef. However, I also conduct many research studies that are focused on understanding and characterizing pathogen transmission in animals and/or a particular production chain. Many years ago, I gave a presentation about Salmonella in cattle lymph nodes. After the presentation, an individual expressed frustration because I spent time describing a problem but didn’t provide solutions. It may seem as though some of my research studies are focused on identifying issues rather than mitigation strategies, but I would like the general public to know that we must first identify and understand the challenges before we can problem solve and identify opportunities for mitigation.

**2023 AnDySci Classic**

The 2023 AnDySci Classic golf outing wrapped up another hallmark event for the Department of Animal & Dairy Sciences. Idyllic weather that May day at the University Ridge Golf Course in southwest Madison set the tone for students, faculty, staff, alumnus, and friends of the department to again spend time together and build connections. Also an important fundraiser, the outing raises money for student experiences, such as travel to team competitions. These outside-the-classroom experiences are similar to the experiential learning MSABD favors in the style of Dr. Kauffman (Page 23), and funds raised at the golf outing also support students at MSABD. MSABD’s Dr. Vanessa Leone helped run one of the on-course games while interacting with the golfers and discussing her research and other topics in animal sciences. MSABD Director Dr. Steven Ricke was also spotted at the outing. For more information on the outing and to view pictures from 2023, please visit: [https://andysci.wisc.edu/events2/dave-dickson-memorial-golf-course/](https://andysci.wisc.edu/events2/dave-dickson-memorial-golf-course/)
You mentioned some of the advanced technology in use today or soon, including genetic sequencing, algorithms, and user-friendly websites that visualize data. Do you think there are future applications for machine learning in salmonellosis related research?

Yes, I think that there is good opportunities to help better understand and apply the data that we have. Some of these machine learning approach may help to integrate sequence-type analyses with epidemiology to identify interventions that can limit Salmonella infections or in the case of diseases more quickly identify sources of the infection.

You mentioned Salmonella enterica still causes nearly 20,000 hospitalizations each year in the US, and yet tremendous progress has been made. How is salmonellosis related research different today than say 10 years ago?

I think that the biggest difference is the widespread adoption and utilization of whole genome sequencing to characterize and study Salmonella. Sequencing provides very rich data that can in many cases replace traditional methods for the characterization of Salmonella and lead to comprehensive data in a relatively short amount of time. With continued analytical tools the hope is to better address the ongoing challenges and limit the numbers of infections.

Where would you guide someone who wants to learn more about your research?

Our Division’s website is https://www.fda.gov/about-fda/nctr-research-offices-and-divisions/nctr-division-microbiology and contains a lot of information about our research activities and plans.

If there was one thing you wished the general public knew about your research, what would it be?

Our research is focused on supporting the FDA mission of improving public health by working to better understand factors that contribute to antimicrobial resistance and increased pathogenicity in Salmonella and related pathogens. These approaches have focused on the development of improved tools for utilizing whole genome sequencing data and laboratory-based methodologies.

Congratulations

Five undergraduate student researchers from MSABD graduated this past spring. Their contributions are much appreciated, and MSABD wishes them the best in their future endeavors.

Ashley Nelson
Yu Xiang Soon
Dawson Stroik
Peiheng Liu
Annie Noel
Adam was presented this recognition at the Wisconsin Association of Meat Processor’s banquet on Saturday, April 15th. Cathy Buege presented the plaque to Adam. Adam is from Janesville, Wisconsin. He received his BS degree in Animal Science at UW-Platteville. During his BS degree he worked at Weber’s processing plant in Cuba City. In the fall of 2020, Adam started a M.S. degree associated with Dr. James Claus’ research program in the new Meat Science & Animal Biologics Discovery building. Adam’s research focuses on the meat quality effects of vascularly rinsing carcasses. During the beginning of his program he also worked part time in quality assurance at Vallia Foods in Jefferson, WI. Adam has been very active in supporting research activities at UW and the harvest facility at UW. Adam provided a research presentation in 2022 at the Reciprocal Meat Conference in Iowa on some of his preliminary results. Adam has served as a Graduate Teaching Assistant in the Department’s Principles of Meat Science course and Commercial Meat Processing course. Adam aspires to pursue a career working in a meat packing plant. To learn more about Dr. Dennis Buege, please see Page 20.

Adam Franzen Becomes First Recipient of Prestigious Dennis R. Buege Meat Science Endowed Student Assistantship

Written by Dr. Jim Claus - MSABD Faculty

Adam was presented this recognition at the Wisconsin Association of Meat Processor’s banquet on Saturday, April 15th. Cathy Buege presented the plaque to Adam. Adam is from Janesville, Wisconsin. He received his BS degree in Animal Science at UW-Platteville. During his BS degree he worked at Weber’s processing plant in Cuba City. In the fall of 2020, Adam started a M.S. degree associated with Dr. James Claus’ research program in the new Meat Science & Animal Biologics Discovery building. Adam’s research focuses on the meat quality effects of vascularly rinsing carcasses. During the beginning of his program he also worked part time in quality assurance at Vallia Foods in Jefferson, WI. Adam has been very active in supporting research activities at UW and the harvest facility at UW. Adam provided a research presentation in 2022 at the Reciprocal Meat Conference in Iowa on some of his preliminary results. Adam has served as a Graduate Teaching Assistant in the Department’s Principles of Meat Science course and Commercial Meat Processing course. Adam aspires to pursue a career working in a meat packing plant. To learn more about Dr. Dennis Buege, please see Page 20.
Those from MSABD helped make the 2023 occurrence the largest Reciprocal Meat Conference (RMC) ever. In total, 970 attendees converged on St. Paul, MN. A notable feature was a concurrent technical session focused on biologics, where MSABD’s Dr. Steven Ricke presented “Welcome to the Gut Microbiome: Discovery and Innovation”. Joining him was Dr. Lauren Sammel of Sustainable Swine Resources, a partner of MSABD and its biologics working group. The session was moderated by MSAB Capital, LLC President Kevin Ladwig. Ladwig is another familiar face at MSABD, collaborating with the faculty and serving as a member of the MSABD Advisory Board. MSAB Capital, LLC, which acts as a venture fund for Johnsonville Holdings, seeks to invest in “early stage companies in life sciences and emerging technologies”, including those that involve biologics. Rounding out the session was Peter Gingras, President and CEO of Viscus Biologics LLC and another collaborator with MSABD, who presented on medical biomaterials. The session was an important step towards raising the visibility of biologics within the meat industry.

Six abstracts were presented at RMC (five from MSABD and one from the greater Department of Animal & Dairy Sciences:

- Carcass vascular rinse blend enhanced with different antimicrobials reduces Salmonella in inoculated pre-rigor ground beef (Serhat Al - Erciyes University (Jim Claus))
- Quantitive and qualitative Salmonella biomapping of commercial pork harvest facilities (Jessica Brown)
- The impact of humidity and fat content on Salmonella lethality on the surface of impingement-cooked meat and poultry products (Jordan Nehls)
- Endogenous and exogenous factors affecting hemoglobin mediated lipid oxidation in meleagris gallopavo (Sean Baker)
- Correlation between carcass traits and consumer perception of pork eating quality (Tiago da Silva Ribeiro (Jennifer Van Os) — Dept. Animal & Dairy Sci.)
- Inhibitory effect of commercial dry vinegar or cultured sugar-vinegar blends on clostridium perfringens and bacillus cereus during extended cooling of model uncured beef and poultry products (Cindy Austin - MSABD BSL2 Lab (Steven Ricke))
An Outside Perspective on Meat Science, Animal Biologics, and Anything In-Between

Written by Erica Kallas - Student Outreach Specialist

• **How did you first hear of MSABD?**

Before starting at MSABD the most I knew about it was 1. It had something to do with animals, and 2. It was somewhere near my residence hall freshman year. I was interested in getting a job on campus, and saw the Student Outreach Specialist position at MSABD listed in February. I also knew I wanted to get involved in outreach, so I applied for the position, and since then I have been learning more about meat science and animal biologics every day!

• **What have you learned about MSABD through your position?**

I have learned a lot through my position at MSABD. From social events, to Bucky’s Varsity Meats, to research, and to even the plant itself, I have learned a lot about the happenings in the building. And MSABD has something for everyone! One of my main goals going into the future is getting the word out to people like me a few months ago who may not know much about what goes on inside MSABD.

• **What surprised you the most about MSABD?**

The thing that surprised me the most about MSABD was just how prominent meat science and animal biologics are in other fields. I am currently majoring in Environmental Sciences and Global Health, and I never expected anything with food science to heavily relate to my course studies. This thought changed a lot, though, especially this summer when I took a Nutritional Science course. I learned about the cultural significance and aspects of health and nutrition across the globe, and throughout the entire course I continuously made connections to work and research at MSABD. These connections mainly were regarding MSABD’s focus on preventing food waste, increasing food accessibility, and more, but it was very eye opening to see its prominence in other fields.

• **What is the most intriguing part of MSABD to you?**

I am very intrigued about the role MSABD plays in sustainability. Like I mentioned above, one of my current majors is Environmental Sciences, and I have always been interested in methods and solutions regarding sustainability. With these interests, I was very happy to learn more about how MSABD promotes sustainable practices in the food industry through its research, projects, and funding. MSABD has the potential to greatly contribute to sustainability both here in Madison and on a much larger scale!

• **Should I get involved at MSABD?**

Yes! All of my bias aside, MSABD truly has something for everyone. Whether you only want to stop into Bucky’s Varsity Meats to pick up a carton of $2 eggs, or if you want to try getting involved in research, stop into the building! I believe in trying everything and keeping an open mind with whatever you do, as you never know when you could develop a new interest. Who knows- at MSABD, maybe you will find a research project, job position, or anything in-between that will become your new passion.
The MSABD community and friends gathered on a cold, snowy day early last December to celebrate the holidays and give a warm send-off to Dana Dittoe and Lindsey Wythe. Dana was heading west to start a position as assistant professor at the University of Wyoming while Lindsey was off to Texas A&M to pursue a PhD. For an update on Dana, please see Page 18. Attendees enjoyed a potluck lunch before speeches and farewell gift opening.

Last December 2022, two MSABD MS students, Lindsey Wythe and Jordan Nehls, successfully defended.

Lindsey’s defense seminar “Describing the Impact of Supplementing Broiler Diets With a Yeast Fermentate” was held December 19, 2022. As a member of Dr. Steven Ricke’s lab, she studied poultry feed additives. Lindsey is currently working on a PhD at Texas A&M University in her native Texas.

Two days later on December 21, Jordan (advisor Dr. Jeff Sindelar) presented her defense seminar “The Impact of Extrinsic and Intrinsic Factors Affecting the Lethality of Salmonella on the Surface of Impingement-Cooked Meat and Poultry Products”. Jordan’s research helped validate cooking methods that satisfy the updated FSIS Appendix A guidelines. Following her graduation, Jordan accepted a position as the Food Safety, Quality, and Regulatory Manager in the MSABD processing plant.

Shortly after her graduation, Jordan appeared in Quality Assurance Magazine’s March/April 2023 issue. The article touches on how Jordan’s passion for food safety has grown over the years and makes her a valuable employee. She is able to explain the “why” behind food safety to the undergraduate student employees in MSABD’s processing plant in a way that creates buy-in with best practices designed to prevent and control pathogens. To view the article, please visit: https://qualityassurancemag.com/article/jordan-nehls/

Congratulations to Lindsey and Jordan!

Holiday Potluck 2022

The MSABD community and friends gathered on a cold, snowy day early last December to celebrate the holidays and give a warm send-off to Dana Dittoe and Lindsey Wythe. Dana was heading west to start a position as assistant professor at the University of Wyoming while Lindsey was off to Texas A&M to pursue a PhD. For an update on Dana, please see Page 18. Attendees enjoyed a potluck lunch before speeches and farewell gift opening.

Dana admires a UW Madison themed insulated tumbler gifted her by her mentor Dr. Steven Ricke.

Wentworth Certificate of Excellence

A fund has been created in memory of Dr. Bernard “Bernie” Wentworth to award undergraduate students who receive a Certificate of Excellence for presenting a research abstract at the Poultry Science Association Annual Meeting monies to pursue their education. At various times between 1985 and 2004, Dr. Wentworth served as chair of the Poultry Science Department and associate chair of the Department of Meat and Animal Sciences Department at UW Madison (entities now part of the current Department of Animal & Dairy Sciences), as well as president of the Poultry Science Association. The fund, initiated by Dr. Wentworth’s family, will award $100 to each student until the funds are depleted and is currently accepting donations at: https://poultrysci.wufoo.com/forms/wentworth-certificate-of-excellence-donation-form.
Chilean Agricultural Delegation Visits MSABD

On May 18, MSABD hosted an agricultural delegation from Chile, consisting of Esteban Valenzuela (Minister of Agriculture of Chile), Francine Brossard (Director, Foundation for Agricultural Innovation), and Nicolas Perez Soto (Executive of Agricultural Innovation, Foundation for Agricultural Innovation). Earlier in the day, Dr. Valenzuela met with Chancellor Jennifer Mnookin and signed a Memorandum of Understanding with UW Madison. The delegation visited with MSABD Director Dr. Steven Ricke before touring the processing plant. The delegation was interested in MSABD’s poultry capabilities as poultry represents the largest share of Chile’s meat production. The delegation was also excited to learn about potato production in Central Wisconsin because Andean civilizations that included parts of present-day Chile were instrumental in making potatoes a food staple.

The delegation spent several days meeting with other University entities, including others in the Department of Animal & Dairy Sciences. For more information on the delegation’s time in Madison, please visit: [https://news.cals.wisc.edu/2023/05/22/chilean-ag-minister-visits-uw-madison-to-establish-educational-and-scientific-partnerships/](https://news.cals.wisc.edu/2023/05/22/chilean-ag-minister-visits-uw-madison-to-establish-educational-and-scientific-partnerships/).

MSABD’s focus on sustainability in the meat industry and beyond will continue to grow going into the future.
Impactful Extension

Dr. Jeff Sindelar’s Extension programming frequently receives high marks and attention in meat industry publications. The growing slate of short courses, workshops, and trainings cover a wide variety of meat science and meat processing principles, with each event providing a more in-depth exploration of a given topic. For those in Wisconsin, there is a good chance a local meat processor has benefited from Dr. Sindelar’s programming. Extension at MSABD helps ensure a viable meat industry in Wisconsin going forward. But what makes Extension at MSABD go beyond just checking the boxes and be so high impact?

“Usefulness of topics to me . . .” 4.23 / 5 (“Very Well”)

One reason for the success of MSABD Extension programming is how applicable it is to its audience. Dr. Sindelar knows what needs his audience has and what they want to learn about. He receives feedback – that the event is useful - from the audience in real-time when he sees participants get excited about the material and start to draw connections to other things they have learned or know. On a most literal level, Dr. Sindelar once joked that every meat processor in Wisconsin is making snack sticks, so it is not surprising that last summer MSABD hosted the Meat Snacks Short Course focusing on jerky, bars, and snack sticks. In all, the product development, problem solving, and regulatory compliance covered by MSABD Extension programming largely suites Wisconsin’s small meat processors as they provide the market with ever new artisan value-added products and adapt to changing consumer demands and updated guidelines issued by the Food Safety and Inspection Service.

Another reason for the success of MSABD Extension programming is that Dr. Sindelar has had a lot of practice. Dr. Sindelar launched his quintessential Master Meat Crafter program in 2010 and has been dedicatedly hosting and teaching in it ever since. When Dr. Sindelar joined UW Madison in 2007, he took over the Extension appointment and collective experience of Dr. Dennis Buege (Page 20), who taught precursor workshops called the Wisconsin Meat Processing Schools for decades and who came to be known for many in Wisconsin’s meat industry as the “Meat Science Guy”. Dr. Sindelar and the expert guest speakers he invites to present at his events have given thousands of presentations on meat science and/or food safety. Such close and frequent contact with Wisconsin’s meat industry allows Dr. Sindelar to stay in the loop and keep programming relevant. Dr. Sindelar also has an industrious team backing him up before, during, and after every event: Colleen Crummy (Outreach Program Manager), Heather Hunt (Outreach Specialist), graduate students, and MSABD staff, including in the processing plant and the biosafety level 2 lab. That said, there is an even greater collective knowledge when that of the participants in attendance is included. With an interactive format for MSABD Extension programming, not only do participants learn from each other, but Dr. Sindelar learns from them as well. One thing that defines Wisconsin’s meat industry is the tremendous variety not only in products, but also in the processors, which range in size from tiny to massive and sometimes have very different operations. Says Dr. Sindelar, “There’s so many opportunities for different formulations or different marketing platforms or different nutritional interests or different packaging systems.” Participants often walk away from MSABD Extension programming with ideas and knowledge they had not considered before and/or with a greater appreciation of how it might be applicable to their business. Best practices are shared and picked up upon. Ultimately, there is something for everyone of the nearly 1,000 attendees a year hailing from coast to coast and beyond internationally, whether it is an experienced meat processor looking to try something new or a small processor expanding into new market segments. There is also time built into events to further explore topics of interest that come up in discussion.

“Do you feel the information gained will help you and/or your business?” 4.46 / 5 (“Yes, Probably”)

A further reason for the success of MSABD Extension programming has to do with the MSABD building itself. When Dr. Sindelar launched Master Meat Crafter in 2010, meat science at UW Madison was based in the aging Muscle Biology Lab (MBL). Acquainted with the limitations of the MBL, Dr. Sindelar, in helping design MSABD, had the opportunity to create a dream space where all things Extension programming are possible. The result is a combination of the right equipment and a pilot plant design that enables demonstrations that mimic the environment and flow of a typical commercial meat processing plant. As Dr. Claus has observed in the hands-on lab portion of ANSCI 305: Introduction to Meat Science and Technology, learners invariably have questions they did not even realize they had until they try to repeat a process they watched demonstrated. The ability to ask questions and receive answers, as well as gain hands-on experience, are all things participants have valued when completing a survey on their experiences with MSABD Extension programming. Several participants commented that they will send their employees to attend an MSABD Extension event or bring them with on a return visit.

For a look at one of the articles exploring the realized value of Dr. Sindelar’s Extension program and its role as a resource to and supporter of Wisconsin’s meat industry, please visit: https://www.meatpoultry.com/articles/28153-smarter-meat-snack-processing.
Catching Up With
Dr. Dana Dittoe

While still adjusting to dry and thin air, April snowstorms that shut down the highway, and hills that cause her gas mileage to fluctuate all over, MSABD’s Dr. Dana Dittoe is right at home in her new role as Assistant Professor at the University of Wyoming in Laramie. She says the University of Wyoming has a very welcoming and family feel to it, which eased her apprehension and made it easy to start making friends. Her department head, a fellow microbiologist, is a macro-manager, allowing Dana the freedom to grow independently while also mentoring her. Wasting no time, the department has already asked her to participate as the lead representative for her department on the Institutional Biosafety Committee and the Faculty Senate.

Dana’s appointment is 35% teaching, which works out to seven credits a year, or one course a semester. The rest of her appointment is essentially research. Her first semester she taught a food microbiology course. Her 20 or so students are juniors and seniors with a microbiology background, but not necessarily as it relates to food science, taking the course as an elective.

Although Dana was given just a few days to prepare for her teaching responsibilities this past spring, she was afforded past materials and a textbook to develop her curriculum. She typically covers a chapter during each 50-minute lecture. But Dana is in tune with her students, making sure they comprehend what she is teaching, and that regular class attendance leads to higher exam scores. She is pushing to make the lab portion of the course required as she thinks seeing bacteria grow in a wet lab is what makes the knowledge really “click”. She schedules extra review sessions if needed. But perhaps most importantly, Dana has a rapport with her students, with class discussions coming naturally. One led to her students agreeing among themselves to reap the benefits of daily probiotic consumption for the rest of their lives, and there is a running joke in class that ice melting will release long-dormant fungi and cause a zombie apocalypse.

Next semester, Dana hopes to co-teach an introductory food science course. And down the road she hopes to teach some graduate level courses. Like at MSABD, new ideas for courses take a few years to become established, but Dana is hopeful her food microbiology course, with increasing positive reputation, will become required as part of the new animal science curriculum.

Wise beyond her years, Dana already sees how her experiences at MSABD shaped her success and has advice for those currently in PhD programs. She recommends they do as much guest lecturing and teaching as they can before they graduate. To that end, Dana credits teaching the lab portion of ANSCI 305: Introduction to Meat Science and in Dr. Sindelar’s Extension short courses at MSABD as instrumental in preparing her for teaching at Wyoming.

It will still take time for Dana to have her lab fully operational. However, Dana has begun work on a few shelf-life studies with vacuum packaged beef and is in the process of training her first graduate student. As well, Dana is busy mentoring students and serving on two student’s graduate committees. She says some days are overwhelming, and others feel like there is nothing to do. But with the responsibility her department has placed in her and the opportunities that come with that, as well as her personal system of constant improvement, Dana’s limit is the Wyoming sky.
In February the Department of Animal & Dairy Sciences released a newsletter featuring an article about two undergraduate students, one of who works at MSABD, in the department who returned to school after serving the United States in the military. Cosmic “Fox” Nekuda ’24 first served in the US Marine Corps after earning a degree in chemistry and physics education and teaching in western Kansas and before arriving at UW Madison. Fox landed on Animal Sciences after the University decided zoology was too close to his original degree. His “favorite part of the week” is working in the processing plant at MSABD. After graduation, Fox plans to be a food inspector and help “make sure that food, specifically meat, going out to consumers is healthy and safe to eat.”

This past spring, Dr. Sindelar was featured in CALS’ GROW Magazine to discuss lab-grown meat. While simple in concept and promising, there remain a few challenges to figure out.

**Six Key Facts about Lab-Grown Meat**

To help celebrate UW Madison’s 175th Anniversary (Page 8), Badger Talks Live highlighted some of the strong ties between community businesses and the University. Kevin Ladwig, of Johnsonville Ventures, was featured and mentioned MSABD and its collaborations on biologics discovery! Please visit: https://www.youtube.com/watch?v=Fc1jsxQ-z4.

As of August 29, MSABD has been searched for 50,000 times on Google!
Dr. Dennis Buege
University of Wisconsin - Madison

Dr. Dennis Buege was born in Juneau, WI in 1945. He earned an undergraduate degree 45 miles southwest in Madison at UW Madison. After the completion of his master's degree at Cornell University in Ithaca, NY, Dennis returned to Wisconsin and UW Madison to earn his PhD.

Previously working in industry at Hormel Foods, Dennis became the Extension Meat Specialist at UW Madison in 1977. Part of what convinced Dennis to make the move was knowing and having a very favorable impression of the faculty working on meat and food science at UW Madison at the time. Later in his career, Dennis would work with current MSABD faculty Dr. Jim Claus and Dr. Mark Richards.

Almost from the start, Dennis oversaw the Wisconsin Meat Processing Schools, precursor two-day workshops to the varied lineup of Extension short courses currently offered by MSABD’s Dr. Jeff Sindelar. Like Dr. Sindelar does today, Dennis coordinated and taught in his workshops. In time, Dennis became known in industry as the “Meat Science Guy”.

The latter year’s of Dennis’s career saw the rise of hazard analysis and critical control points, or HACCP, plans as an increasing emphasis was placed on food safety in production spaces. There was also increasing questioning of the health effects of meat consumption on human health. Dennis responded by educating others on HACCP and researching the composition and nutritional properties of meat products to see how they, in Dennis’s words, “might fit into the perspective of a ‘health’ diet.” Very much as MSABD does today, Dennis was a resource to industry regarding the issues they faced.

Perhaps inspired by the massive growth of the Wisconsin Association of Meat Processors’ (WAMP) Meat Product Show during his career, Dennis organized another meat product competition and auction held at the Wisconsin State Fair. In total, it raised hundreds of thousands of dollars to benefit youth programming at the 4-H Foundation. The fair also hosted the State Fair Meat Exhibit, which he incidentally first worked on as a student assistant to Dr. Quin Kolb, who was Extension Meat Specialist at UW Madison before Dennis. One of Dennis’s most memorable projects and the result of many road trips to Milwaukee, the exhibit, which was housed in the Ag Products Building, is thought to have reached over 100,000 Wisconsinites.

Dennis was a member of the American Meat Science Association (AMSA) for 38 years and at various times served both on the Board of Directors and as president. Over the years, Dennis traveled to and presented trainings in Bulgaria, Romania, Ukraine, and Costa Rica. He also served on assignment for the US Dairy Export Council in Thailand.

By the time of his retirement in 2006, Dennis had served as the major professor to several master’s and one PhD student. He rounded out his service on campus advising Academic Quadrathlon teams and the Saddle and Sirloin student organization. In what was one of the most enjoyable aspects of his career, Dennis also impacted countless youth through presentations to various county 4-H and FFA groups, in particular using his well-known sausage making demonstration.

Dennis is remembered for his easy-going manner and warm sense of humor – a touchstone of his outreach. His legacy continues today in the Dennis R. Buege Graduate Assistantship, which was awarded to MSABD’s Adam Franzen for 2023. Franzen was presented a plaque by Cathy Buege, Dennis’s wife, at the WAMP convention this past April (Page 12).

Grandparents University 2023

Written by Sean Baker, PhD - Food Science

Graduate students in the animal, meat, and food sciences welcomed the Grandparents University Class of 2023 to MSABD this past July! The Class of 2023, majoring in Meat Science, graduated 9 grandparents and 10 grandchildren, equipped with the necessary skills to become a food safety manager or a research and development scientist. During this 2-day course, students learned how to break down a whole chicken, the basics of food safety, and product development 101. This event was made possible by the incredible graduate students housed in MSABD, who volunteered their time to express their passion for science and community outreach. The full list of instructors can be seen below:

Dr. Jeff Sindelar (Professor and Extension Meat Science Specialist)
Sean Baker (PhD - Food Science)
Jessica Brown (PhD - Meat Science)
Alyssa Seitz (MS - Animal Nutrition and Meat Science)
Margaret Costello (MS - Animal and Dairy Science)
Pat Pharino (MS - Meat Science)
Jordan Nehls (MSABD Food Safety, Quality, and Regulatory Manager)
In April, MSABD welcomed Mr. Brad Schweid, Chief Administrative Officer of Schweid & Sons’. Schweid, who graduated from UW Madison in 1998, was behind Schweid & Sons’ partnering with grocery stores, including select Pick n’ Save and Metro Market locations in Madison, to introduce fresh, premium hamburgers. The move was so successful that Schweid & Sons’, based in New Jersey, has opened a second meat processing facility in Georgia.

While at MSABD, Schweid enjoyed a tour of MSABD’s processing plant led by Food Safety, Quality, and Regulatory Manager Jordan Nehls. Schweid also met with MSABD Director Dr. Steven Ricke and former MSABD Director Dan Schaefer. For more on Mr. Schweid’s visit to UW Madison, please visit: Connection and collaboration blossom on and off campus this spring – Office of Business Engagement – UW-Madison (wisc.edu) and https://www.linkedin.com/feed/update/urn:li:activity:7061379983084064768/.

Folklore has it that painstaking attention to detail was paid to nearly every nook and cranny of MSABD during the design of the building. That attention to detail can be seen in things like the features that promote food safety in the processing plant to the enhanced capabilities that facilitate Extension programming simply not possible in the old Muscle Biology Lab. But that attention to detail also carried over to everyday things like the furniture and light fixtures. Hopefully the fun facts below give you an even deeper appreciation of the MSABD building.

For Your FYI Information

It’s art! The “Shell Chair” on the MSABD mezzanine features a design first introduced in 1963 by renowned Danish furniture designer Hans J. Wegner, who is considered the “master of the chair”.

All in the Details

It’s tan! The color of the MSABD harvest floor has been called everything from yellow to brown to mustard (yuck!), but according to the manufacturer, RAL, it is officially tan. Before computer RGB and # HEX color codes, RAL created a standardized system for mixing its colors in 1927, eliminating the need to exchange color samples. Each of RAL’s 216 colors are assigned a code, but also a name in case of transposition. MSABD uses different colored floors to designate areas to help avoid cross-contamination.
Wisconsin Meat Processing School

The Wisconsin Meat Processing School offers students a broad overview of meat processing and was held March 21 – 23. After the basics of meat science and touching on non-meat ingredients, this class learned about different kinds of sausage products, ranging from fresh and emulsified to cooked and dry and semi-dry sausages. The production of all these varieties was demonstrated in the processing plant. Afterwards, cooking and smoking methods were covered, as well as some spices and flavorings commonly used. The class also learned how to make bacon and process ham. The students sampled artisanal products while learning about the process involved. In the latter half, the discussion shifted to microbiology and its impact on everything from product shelf life to pathogen control. Other topics covered included an introduction to R&D and proper meat plant sanitation. The following speakers presented over the three days.

- Arquimides Reyes
  UW River Falls

- Andy Milkowski
  UW Madison - MSABD

- Phil Schmidt
  The Meat Block

- Jake Sailer
  Sailer's Food Market & Meat Processing, Inc.

- Marty Wimmer
  Marlen International

- Bruce Armstrong
  Life Spice (retired)

- Justin Fugate
  Sailer’s Food Market & Meat Processing, Inc.

- Adam Borger
  UW Madison - Food Research Institute

Basic HACCP Training

Held in August, this course introduced participants to hazard analysis and critical control points (HACCP). Common biological, chemical, and physical hazards commonly encountered in meat processing were covered. Using an actual HACCP plan as an example, attendees explored the seven principles of HACCP. Participants also learned about specific pathogens, allergen controls, and product recalls. Proving their new knowledge, the class then passed a final test. Speakers:

- Hillary Cliff
  UW River Falls

- Adam Borger
  UW Madison - MSABD

- Jordan Nehls
  UW Madison - MSABD

- Cindy Austin
  UW Madison - MSABD

- Jeff Sindelar
  UW Madison - MSABD

- Alexi Valitchka
  WI DATCP

- Andrew Schultz
  WI DATCP

- Haley Kragness
  WI DATCP - Bureau of Meat Safety

with support from MSABD staff and students.

7 Principles of HACCP

Like an efficiency expert looks for bottlenecks, Principle 1 looks for the most likely points for health hazards to occur in the production flow.

Principle 2 is coming up with critical control points, or responses to the identified health hazards in Principle 1.

In Principle 3, scientific knowledge and FSIS regulations are applied to the critical control points from Principle 2 to create critical limits. It could be holding a product at a temperature for a set time known to kill pathogens.

Measurements are needed to know the product is reaching the example temperature (a critical limit) from Principle 3, which is the domain of Principle 4.

Principle 5 covers corrective actions should the measurements (Principle 4) show the critical limits (Principle 3) are not being satisfied. This may involve a product recall and plans to adjust the production flow to satisfy the critical limits of the critical control points.

Principle 6 establishes an auditing process to make sure the critical control points comply with FSIS regulations. This validates the HACCP plan and lets the auditor know the production flow is operating according to the HACCP plan.

Records of Principles 1-6 are the theme of Principle 7. The auditor can prove the product was made in a safe manner.
Cooked & Emulsified Sausage School

The Cooked & Emulsified Sausage School, one of six workshops in the Master Meat Crafter program, took place May 9 – 11. Participants learned about sausage processing and some of the spices, flavoring, and different casings frequently used. A demonstration in the processing plant with the bowl chopper and emulsifier showed some of the techniques and technology involved in sausage processing. With bratwurst as a case study, the class learned about adding fresh vs dried vs canned ingredients, including cheese, and low versus high temperature processing.

They then delved into sensory science – the study of how all those different products are perceived in terms of all five senses. Finally, shelf life and food safety were covered, with guidance on following USDA FSIS Appendix A and B guidelines provided. Speakers:

- Doug Reinemann
  UW Madison
- Kohl Schrader
  Poly-clip System USA
- Tom Katen
  Cargill (retired)
- Ryan Cox
  University of Minnesota
- Nick Lavieri
  Devro, Inc.
- Angela Arensmeier
  Kerry

Mark Richards
UW Madison - MSABD
Beth Button
UW Madison
Steve Sheng
UW Madison - MSABD
Michael Cropp
Kemin Food Technologies
Paul Hargarten
Hawkins, Inc.

with support from MSABD staff and students.

Publications

A new paper from the Guo Lab was published in the August 2023 issue of the Journal of Clinical Investigation (JCI) Insight. The paper, titled “Dysfunctional nucleocytoplasmic transport of RBM20 underlies dilated cardiomyopathy in mice”, describes research findings on the mechanisms that drive dilated cardiomyopathy. According to the American Heart Association, dilated cardiomyopathy is the most common type of cardiomyopathy, a heart muscle disease that “makes it harder for the heart to pump blood to the rest of the body.” The paper was highlighted in the issue as one of the editor’s picks. JCI Insight is a Gold Open Access journal and publishes “well-executed, high-quality studies that provide meaningful contributions to the understanding of the biology and/or treatment of disease, . . .” To view the August 2023 issue and Dr. Guo’s paper, please visit: https://insight.jci.org/this-month/2023/8.

The list of MSABD publications will be updated at the end of 2023.

Dr. Robert G. Kauffman

As many are aware, Dr. Robert G. Kauffman passed away earlier this year. Kauffman, selected to the Wisconsin Meat Industry Hall of Fame in 2004, will be missed. An emeritus professor and legend in meat science, Kauffman is remembered for, among other things, creating experiential learning opportunities for students. Dr. Dan Schaefer, former MSABD Director, wrote a tribute to Dr. Kauffman, which was published by the American Meat Science Association and can be viewed on MSABD’s Constant Contact: https://files.constantcontact.com/169a11a801/f8793bdf7-340e-4b29-9db9-df49c73ec6c7.pdf and https://files.constantcontact.com/169a11a801/b553fb36-35ad-4aa9-bf83-75df6f92629.pdf.
Selected MSA/MRAs:

- General Mills
- Rich Products
- Kerry
- AgriGro
- Ajinomoto
- Jones-Hamilton

Total (Confirmed) New Grants Received Since March 20, 2023:

Total (Confirmed) Current Active Research Projects:

Selected New Grants & Contracts:

<table>
<thead>
<tr>
<th>Dr. Jim Claus</th>
<th>MPSC Award</th>
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<tr>
<td>Dr. Wei Guo</td>
<td>AHA Award</td>
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<td>Dr. Vanessa Leone</td>
<td>F31; Multidisciplinary Hatch</td>
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<tr>
<td>Dr. Sara Gragg</td>
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<td>Dr. Steven Ricke</td>
<td>CIFT Award; USDA-NIFA Seed Grant</td>
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<tr>
<td>Dr. Jeff Sindelar</td>
<td>DATCP MTDP Contract</td>
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Dr. Wei Guo and his lab received the Transformational Project Award from the American Heart Association. The project is titled “Targeting titin for treatment of heart failure with preserved ejection fraction”. Valued at $300,000, the award has a funding duration spanning July 1, 2023 to June 30, 2026.

Meat Science & Animal Biologics Discovery Quarterly is currently sent to 5,339 subscribers.

In the next edition of Meat Science & Animal Biologics Discovery Quarterly, we will look into the many exciting developments in the Guo Lab, visit with Elena about her travels to Italy and Canada, and talk to Jordan Sand about his start-up business that uses technology developed at MSABD.