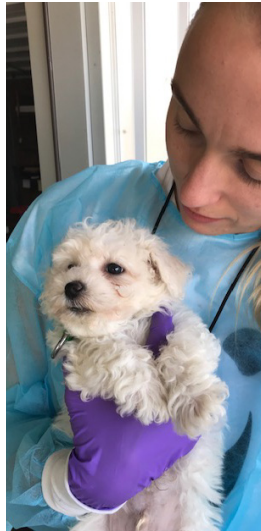
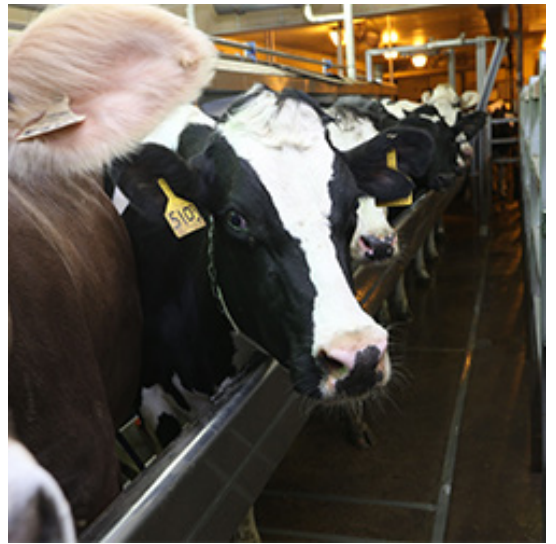


CAWS IS JOINTLY FUNDED BY THE COLLEGES OF AGRICULTURE & VETERINARY MEDICINE

We facilitate the well-being of animals using sound science and ethics to investigate and promote the best animal care and management practices.



CENTER FOR ANIMAL WELFARE SCIENCE



We facilitate the well-being of animals using sound science and ethics to investigate and promote the best animal care and management practices.

Director's message

Animal welfare has frequently been described as a 'wicked' problem because so often the fundamental nature of the issues involved are multi-faceted, inter-related, and ambiguous. Finding solutions under these circumstances can be particularly challenging, as is communicating effectively with different audiences with interests in animal welfare. Having diverse faculty whose collective expertise can be leveraged to envision novel, timely solutions through scientific discovery, teaching, and public engagement makes CAWS an invaluable resource, particularly because discussions around animal welfare have become so polarized. CAWS faculty members hail from renowned departments, including some that are ranked at the top world-wide such as Agricultural & Biological Engineering (#1) and Agricultural Economics (#4). We also have a strong Extension program that delivers fact-based science directly to stakeholders in keeping with the mission of the land-grant universities.

Heading into 2022, we will continue to work with 'wicked problems' that require diverse perspectives to arrive at sustainable solutions. Change happens quickly, but perseverance does bring progress. CAWS faculty are ready for the challenge. Read on to learn about highlights of our members' work this fall and earlier in the year.

Candace Cronney, PhD
Director, Center for Animal Welfare Science
Professor, Animal Behavior and Well-being

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CAWS RESPONDS TO COVID-19

CAWS faculty provide insights and answers on how COVID-19 is impacting animal welfare.

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- [Purdue Experts on COVID-19 video](#)

Nicole Olynk Widmar, PhD

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OUR MISSION IS TO PROMOTE ANIMAL WELFARE THROUGH SCIENCE-BASED INFORMATION AND EDUCATION TO ADVANCE SOCIALLY RESPONSIBLE DECISIONS CONCERNING ANIMAL CARE.

ONLINE CERTIFICATION COURSE

CAWS is working toward development of a new online certification course on animal welfare. All interested members will be able to participate and benefit. The focus will be on professionals and stakeholders with limited access to animal welfare courses who may then better serve Indiana and national agriculture.



ONLINE SEMINARS

With the success of our online symposium in 2021, we have plans to continue our CAWS Seminar Series with an online component in order to make it accessible to a larger audience. By transitioning to a hybrid method we can build community and provide valuable opportunities to interact with experts from anywhere in the world.

PROMOTING RESOURCES

Dr. Marisa Erasmus, an associate professor and extension specialist is collaborating with the new [Poultry Extension Collaborative \(PEC\) which consists of faculty from](#)

THE SHELL EGG ACADEMY (SEA)

Darrin Karcher's successful Purdue Extension program, [Shell Egg Academy \(SEA\)](#) was held virtually on June 21-25, 2021. SEA is a learning experience and education opportunity for the egg production and processing industries. Welfare considerations in housing systems continues to be a component of the curriculum.

Darrin Karcher, PhD / CAWS Steering Committee Member

[Purdue University, Virginia Tech, University of Georgia, and University of Maryland.](#)

The online resource will help advance poultry welfare and disseminate science-based information to guide poultry welfare decisions in practice. All major poultry species that are commercially produced are covered.

AVMA ANIMAL WELFARE ASSESSMENT CONTEST

Purdue graduate students Meagan Abraham, Katie Bachert, Guadalupe Ceja and Brittney Emmert participated in the virtual AVMA Welfare Judging and Assessment Contest and

received first place in the Graduate Team assessment division. Meagan also placed 5th in the individual graduate student division.

Dr. Erasmus provided coaching to the Purdue team members. Dr. Croney served as one of the judges for the online contest held November 19-21, 2021.

FACULTY RESEARCH HIGHLIGHTS

CAWS continues to support and promote the work of Purdue researchers and extension specialists. We are fortunate to add five new faculty to our roster of collaborators in 2021. As we expand our researcher base, we can continue to grow our industry partnerships.

NEW FACULTY

Luiz F. Brito, PhD
Assistant Professor
Animal Sciences
Quantitative Genetics and Genomics

Betty Feng, PhD
Assistant Professor
Food Science

Kari J. Ekenstedt, DVM, PhD
Assistant Professor
Basic Medical Sciences
Companion Animal Genetics

Greg Fraley, PhD
Terry and Sandra Tucker
Family Endowed Chair of
Poultry Science
Animal Sciences
Poultry neuroendocrinology
and welfare

Robert M. Stwalley III, PhD
Agricultural & Biological
Engineering
Thermodynamics, energy
analysis, and heat transfer
associated with animal
culture

GENETICS & ANIMAL WELFARE

The addition of new faculty working in the area of genetics provides CAWS with an opportunity to help develop new genetic breeding tools to improve animal welfare.

>>> Brito's research focuses on the definition of novel phenotypes and genomic tools to enable successful implementation of genomic selection for improved animal welfare and overall resilience in livestock while maintaining or increasing productive efficiency. This includes genetic selection for thermal tolerance, temperament, health issues, and adaptation in precision livestock farms.

>>> Ekenstedt's research group uses the latest molecular genetics and genomics tools to study Mendelian and complex genetic traits and diseases in canine populations.



Brito



Feng



Ekenstedt



Fraley



Stwalley

>>> Fraley specializes in how environmental changes can alter brain chemistry and gene expression that regulates feeding, growth and reproduction, specifically in regards to poultry.

^^^ Stwalley and collaborator Schinckel are working to commercialize a swine cooling pad, which improves animal welfare by reducing the physiological effects of thermal stress on the animal. Actively pumping waste heat away from a sow in a farrowing barn allows her to maintain an appetite and milk production in a warm environment better suited for new born piglets. They believe that their efforts are leading to greater understanding of the complexities of metabolic heat production in swine and should eventually improve the overall quality of life of commercially produced pigs.

The following are a few program highlights from 2021. Please see our website for more information.

FERNANDEZ-JURICIC, FRALEY & KARCHER LABS

CAWS members, **Esteban Fernandez-Juricic** (Biological Sciences), **Greg Fraley** and **Darrin Karcher** (Animal Sciences), were recently funded by the US Poultry and Egg Association to evaluate how laying hens perceive their environments in commercial cage-free facilities. Welfare quality assessments will be part of the data collected to more closely link the connection between welfare outcomes, lighting and laying hen visualization in cage-free production.

KARCHER LAB

The Karcher lab has numerous projects on-going related to laying hen welfare.

Meagan Abraham (PhD student) is running her second experiment on pullet stocking density. She is evaluating the impact of 3 different stocking densities and 2 different resource levels (feeder space) on welfare outcomes for brown and white pullets.

Brittney Emmert (PhD student) is developing a new procedure for evaluating bone strength and material properties using the Biodent. She is working with a commercial industry partner who is housing laying hens under two different types of lighting and evaluating the impact

on hen welfare and skeletal quality.

Torey Fischer, Jazmine Whitaker (pictured on right) and Carl Kroger (all MS students) have joined the lab Fall semester and will be initiating research projects next semester related to laying hens and ducks.

FRALEY LAB

The Fraley lab has a long history of trying to better understand how the environment affects brain chemistry and subsequent behavior and welfare of animals. One ongoing project has involved lighting. Most lighting in poultry houses has been designed for the convenience of the people, with small considerations for the birds' physiology. When LED lights were developed, many poultry scientists and producers began experimenting with monochromatic lights in order to improve production and welfare. An important aspect of light is that in order for any color of light to affect a bird, that bird must express photoreceptors that respond to that color light. Birds have photoreceptors not only in their retinas, but in their brains as well. One important project the Fraley lab has undertaken is to best understand when different color-receptive photoreceptors are expressed in ducks



Pictured (above) Taylor Jansen, undergraduate student working with Drs. Stwalley, Schinckel and Johnson presented a poster at the National animal science meetings.

Poster title: Electronically controlled cooling pads improve litter growth and thermoregulatory measures and increase total heat production in heat stressed lactating sows

developmentally. We have learned that lighting in incubators does not affect the expression of retinal or brain photoreceptors, but there is an important increase in one brain photoreceptor, melanopsin (OPN4), at around the time of hatch. This brain photoreceptor is known to activate the thyroid hormone axis, so appropriate stimulation of this receptor may help improve skeletal health as well as neurochemistry associated with improved welfare. A better understanding of photoreceptor expression in birds can help us to design lighting systems in poultry houses to provide our birds with the optimal environment for their productivity, health and welfare. This project has resulted in two published manuscripts in 2021.

STWALLEY & SCHINCKEL

Dr. Stwalley (ABE) and Dr. Schinckel (ANSC) strongly believe in the vertical integration of research and learning. They are training students to understand that improved care of domestic animals yields improved results. Current ABE doctoral student Tyler Field is in the process of adding an Internet-of-Things network to the farrowing barn at ASREC. This effort will allow a much quicker implementation

of new monitoring and computer-directed actuation technologies into the facility. New doctoral student ABE Samantha Neeno will be taking advantage of that network to support on-going efforts at measuring individual sow food and water consumption in real time, along with improving the efficiency and control of piglet warming pads. New ABE master's student Allana Brown will be developing an electronic feed bucket to provide more detailing feeding information about animal eating patterns.

ME senior Javier Flores and ECET sophomore Mahira Morris have developed a networkable vaginal thermometer for sows to determine internal body temperature during lactation in real time. ECE junior Nadia Flores is developing a 3D representation of the various thermal conditions by location within a typical farrowing barn.

ANSC senior Michaiiah Galvin has done periodic regression of body temperatures and respiration rates within a day to better understand diurnal patterns in swine. Their efforts are providing better and more detailed instrumentation and local climate control within

buildings for commercial swine. Their work is clearly demonstrating the positive benefits from improving the living conditions for our domestic animals from merely tolerable to comfortable. ///



OGATA & WENG

Drs. Niwako Ogata and Hsin-Yi Weng received a grant from Morris Animal Foundation to study the impact of COVID-19 pandemic on human-animal relationship. They have been collecting longitudinal data since June 2020 and will continue the data collect until the end of 2023.

ENGAGEMENT HIGHLIGHTS



O'HARE & BECK

Drs. Maggie O'Haire and Alan Beck organized and executed the 2021 Centers for the Human-Animal Bond (CHAB) virtual conference held on November 4-5, 2021. The event provided a critical opportunity to bring together a diverse set of national and international academic Human-Animal Interaction centers and institutes.

The event served as a platform for interdisciplinary conversation with opportunities for the exchange and discussion of new ideas for future research in regards to animal-assisted interventions and additional dimensions of the human-animal bond.

INCREASING ACCESS TO THE DISCIPLINE THROUGH INCLUSIVE EXCELLENCE

CAWS is building on the 2019 CAWS conference on the topic of increasing access to the discipline through inclusive excellence.

COLLABORATING WITH TUSKEGEE UNIVERSITY

Dr. Croney is collaborating with Dr. Sara Crawford, National Pork Board and Dr. Olga Bolden-Tiller, Tuskegee University to expand animal behavior and welfare coursework offered at Tuskegee, providing live and in-person lectures and labs for Tuskegee students since the 2019 conference. The goal is to further collaborate on mentoring students and to develop and expand research collaborations with Tuskegee on animal welfare. Participation by other interested CAWS participants is welcomed.



Dr. Sara Crawford, National Pork Board



Dr. Olga Bolden-Tiller, Tuskegee University

PATHWAYS TO ANIMAL WELFARE SCIENCE

CAWS has a new focus on illustrating pathways to animal welfare science graduate study and careers with the goal of showcasing our students while also demonstrating some of the diverse ways in which students can gain access to the discipline. A new website is under development to feature interviews with graduate students who are members of the Center. Graduate students were asked to respond to several questions in hopes that their answers might help perspective students understand their pathways to Animal Welfare Science.

SECURING SPONSORSHIPS

CAWS is continuing to work to secure sponsorships to help remove barriers to participation in our animal welfare science education programs. Read on for an example of how corporate partnerships on the 2021 CAWS symposium provided a first step toward this goal.

The screenshot shows a webpage titled "PATHWAYS TO ANIMAL WELFARE SCIENCE" from Purdue University's Center for Animal Welfare Science. It features an interview with Leanne Nieforth, a graduate student in Animal Welfare & Human-Animal Interaction. The page includes her name, a photo of her with horses, and several interview questions and answers. The questions cover her field of study, her parents' influence, her background, her research on the human-animal bond, her advice to students, and her reasons for choosing Purdue. The answers provide detailed insights into her academic and professional journey.

ILLUSTRATING PATHWAYS TO ANIMAL WELFARE SCIENCE GRADUATE STUDY AND CAREERS

CAWS SYMPOSIUM

The 2021 CAWS Symposium was held virtually May 19-20. The two-day event explored the effects of COVID-19 on animal welfare, human health and well-being. Experiences and lessons learned about managing animal welfare during a human health crisis were discussed, incorporating perspectives from farmers, veterinarians, scientists, and global food producers. Implications for the US food chain as well as those working with animals in other sectors were explored, along with lessons learned about the practical, economic, and socio-ethical considerations that are needed for immediate implementation and improved preparation in the future.

SPONSORSHIP

Cargill generously provided corporate sponsorship for this year's symposium which allowed us to provide scholarships to attendees for whom registration fees might have deterred participation. Two speakers graciously donated back their honoraria to provide additional assistance. The efforts to ensure inclusive excellence through outreach and support for new as well as established participants in animal welfare science are intended to extend the theme of our 2019 symposium entitled, "Building Capacity to Advance Animal Welfare Science". That program was funded by a grant from

the National Institute of Food and Agriculture in the United States Department of Agriculture (USDA NIFA), in collaboration with Tuskegee Univ., North Carolina A&T State, and the Univ. of North Carolina at Chapel Hill.

STAKEHOLDERS

In addition to 22 academic institutions, the following organizations participated in activities this year:

- American Kennel Club
- American Veterinary Medical Association
- Arizona Farm Bureau
- Cargill
- Chicago Zoological Society
- Covance
- Elanco
- Ethicon Endo-Surgery
- Hill's Pet Nutrition
- IN State Board of Animal Health
- KY Department of Agriculture Animal Care Advisory Board
- Merck Animal Health
- National Cattlemen's Beef Association
- National Pork Board
- New Fashion Pork
- Pet Friendly Services of Indiana
- Petland Charities
- Pinnacle Pet
- Tyson
- USDA
- Validus
- Veterinary United



SCHOLARSHIPS

14 scholarships were provided to students from the following institutions:

- Alabama A&M University
- George Mason University
- Louisiana State University
- Prairie View A&M University
- Tuskegee University

PROGRAM SATISFACTION

Extremely satisfied - 72%
Somewhat satisfied - 24%

PARTICIPANT COMMENTS

"This was a phenomenal symposium. All of the speakers were excellent and I enjoyed the variety of talks - from companion animals to livestock. The One Welfare message was really well done and has opened my eyes to what else research in my area needs to include. The Covid-19 focus/relevance was interesting as well. I learned a lot from this symposium. Thank you to all of the speakers and organizers!"

"I thought this remote symposium was very well done. Operated smoothly with the opportunity for questions. Speakers were outstanding."

The following are a sample of publications by Center faculty that received high profile media, involved multiple CAWS collaborators, or had high impact.

JOURNAL ARTICLES

- Abraham, M. E., S. L. Weimer, K. Scoles, J. I. Vargas, T. A. Johnson, C. Robison, L. Hoverman et al. "Orange corn diets associated with lower severity of footpad dermatitis in broilers." *Poultry Science* 100, no. 5 (2021): 101054.
- Barnard S, Flint H, Shreyer T, **Cronney C** (2021) Evaluation of an easy-to-use protocol for assessing behaviors of dogs retiring from commercial breeding kennels. *PLoS ONE* 16(8): e0255883. <https://doi.org/10.1371/journal.pone.0255883>.
- Cronney, C. C.**, & Boysen, S. T. (2021). Acquisition of a joystick-operated video task by Pigs (*sus scrofa*). *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.631755>.
- Ni, J.-Q., Erasmus, M.A., Cronney, C.C., Li, C., Li, Y.**, 2021. A critical review of advancement in scientific research on food animal welfare-related air pollution. *Journal of Hazardous Materials*. 408 (124468), 1-13. <http://doi.org/10.1016/j.jhazmat.2020.124468>.
- Schmiess, J. and **J.L. Lusk**. "Tradeoffs between Animal Welfare and Environmental Impacts of Beef Production: An Analysis of Presentation Effects on Consumer Choice." *Journal of Agricultural and Resource Economics*. forthcoming. doi: 10.22004/ag.econ.310530.
- Thomovsky SA, **Ogata N**. A canine's behavior and cognitive state as it relates to immobility and the success of physical rehabilitation in the non-ambulatory spinal cord patient. *Front. Vet. Sci.* 8:599320.
- Valiyamattam GJ, **Kritchevsky J, Beck AM**. Demographics and outcome of dogs and cats enrolled in the PetSafe program at the Purdue University College of Veterinary Medicine: 2004-2019. *J Am Vet Med Assoc*. 2021 Nov 18:1-6. doi: 10.2460/javma.20.09.0522. Epub ahead of print. PMID: 34793327.
- Van Wyk, B*. and **G.S. Fraley**. 2021. Ontogeny of OPN4, OPN5, GnRH and GnIH mRNA expression in the posthatch male and female Pekin duck (*Anas platyrhynchos domesticus*) suggests OPN4 may have additional functions beyond reproduction. *Animals* 11 (4): 1121 DOI: 10.3390/ani11041121.
- Vostrizansky,* A., A. Barce*, Z. Gum*, D. Shafer, D. Jeffrey, **G. S. Fraley**, P. D. Rivera. 2021. Pre-hatch increase in brain OPN4 mRNA relative to retinal photoreceptors during ontogeny in the Pekin duck. *Poultry Science*. In press.



Dr. Jayson Lusk, PhD

INVITED TALKS

- Lusk, J.L.** "The Future of Beef and Dairy" Invited presentation for Zoetis company meeting. April, 2021.
- Lusk, J.L.** "COVID Impacts on Livestock Supply Chains." Center for Animal Welfare Science Symposium, College of Veterinary Medicine, Purdue University, May 2021.

BLOG POSTS

- 'Big Data' in Animal Industries (**Widmar**) https://agribusiness.purdue.edu/consumer_corner/big-data-in-animal-industries/
- 'Big Data' in Animal Industries: Scale is Challenging, But Use is Wicked (**Widmar**) https://agribusiness.purdue.edu/consumer_corner/big-data-in-animal-industries-scale-is-challenging/
- Department Head/Distinguished Professor of Agricultural Economics Jayson Lusk's blog provided many important insights this year as we navigated the impacts of COVID-19 and the market. <https://jaysonlusk.com/>.

CAWS TEAM RECEIVES AGSEED FUNDING

Navigating the narratives: developing communications to address science-policy and stakeholder engagement gaps in agricultural animal welfare

CAWS faculty members **Candace Croney, Nicole Widmar, Jayson Lusk, Jiqin Ni, Marisa Erasmus,** and **Darrin Karcher** along with Mark Kepler received a two-year research and extension project grant from Purdue University's AgSeed program. Funding for AgSeed was established through Crossroads funding from the Indiana Legislature to foster the state's leadership in plant and animal agriculture and rural growth. Below is the project overview for this collaborative effort with faculty from the Department of Comparative Pathobiology, Agricultural Economics, Agricultural & Biological Engineering, and Animal Sciences.

Insufficient incorporation of science and diverse, inclusive perspectives on animal welfare and its role in sustainable agricultural food systems raise risks of unintended negative consequences for many who are impacted by decision-making. For instance, California's passage of the Prevention of Cruelty to Farm Animals Act, which imposes new standards for livestock and poultry housing, has created an unfunded mandate for US livestock and poultry producers. There are significant ripple effects for other states, including Indiana, which must also comply with the law. It is unlikely that voters and legislators fully understand the scientific and socio-ethical implication of such decision-making or the tradeoffs between different aspects of animal welfare, environmental, economic, and human health and well-being that are entailed. As similar dynamics occur throughout the US, it is increasingly critical for animal welfare scientists to help bridge science-policy and stakeholder knowledge gaps to enrich decision-making, reduce risks to members of the public and to the food supply chain, and support sustainable agriculture. To meet these needs the team will develop and widely disseminate a series of white paper analyses of contentious agricultural animal welfare issues, along with infographics, webinars and a symposium targeted to meet the demands of diverse audiences. Online media analyses will help gauge public knowledge and perceptions of key issues and inform the products developed. These new resources will facilitate decision-making, dialogue, and consensus-building by diverse members of the public and legislators, and aid in informing different media outlets.



Candace Croney



Niccole Widmar



Jayson Lusk



Jiqin Ni



Marisa Erasmus



Darrin Karcher

BUILDING COMMUNITY

TO ADDRESS US DOG DEMANDS WHILE ENSURING ANIMAL WELFARE, ETHICS, AND SUSTAINABILITY

The demand for dogs continues to grow fueled by numerous factors, including the myriad benefits of the human-animal bond and recently, by social distancing policies resulting from the COVID-19 pandemic. High demand for dogs has led to the emergence of diverse markets for them, many of which raise significant animal welfare concerns and potentially worsen existing ones. Growing demand combined with constrained supply is likely to drive up costs of dog procurement and indirectly exacerbate human health and quality of life disparities that already exist as a function of socio-economic status.

"It is therefore urgent for thought leaders and influencers in various pet industry sectors and in animal sheltering and rescue to come together to discuss how to address the need for ethical and sustainable supply and sourcing of dogs and collaboratively identify potential solutions."

- C. Croney

WORKING GROUP MEETING

To begin tackling the needs in this area of animal welfare, Dr. Candace Croney convened the



Sustainable, Ethical Dog Sourcing Meeting - December 6-7, 2021

first of a series of small working group meetings on ethical, sustainable supply of dogs in North America on December 6-7, 2021. Invited participants included national and international leaders on canine welfare from diverse groups, including Animal Wellbeing International, the American Kennel Club, the American Pet Products Association, the American Veterinary Medical Association, the Association for Animal Welfare Advancement, The HABRI Foundation, PetSmart Charities, Mars,

Michelson Found Animals Foundation, Royal Canin and many others. The meeting was facilitated by Mark Cushing, founder and CEO of the Animal Policy Group. The meeting introduced attendees to relevant science needed to inform discussions about dog supply and demand. The wicked problem of addressing canine welfare in the context of sustainable pet supply and ethical sourcing of dogs was discussed along with implications for equitable access to dogs and the

benefits of the human-animal bond. The iterative process that has begun will culminate in a first of its kind collaborative working paper defining sustainability for companion dog sourcing, and identifying goals, challenges, collaborative opportunities, and benchmarks toward progress. This effort was made possible as part of a grant obtained by **Dr. Croney** (PI) and **Dr. Kari Ekenstedt** (Co-PI) funded by the Life of Riley at SpringPoint.

UPCOMING EVENTS



THE SHELL EGG ACADEMY (SEA)



Dr. Nicole Olynk Widmar, CAWS Steering Committee Member

CONSUMER CORNER MICRO-COURSE

Join Drs. **Nicole Olynk Widmar** (pictured above), **Candace Croney**, and Carson Reeling for the first ever Consumer Corner micro-course, held in collaboration with the Center for Animal Welfare Science! During this short, live, online session, you'll draw insights from Consumer Corner letters and articles to take a historic look at livestock industry changes and garner insights that help us process today's pressing issues during the micro-course. Then, you'll take a look forward and ponder carbon markets and dive into the multitude of political, regulatory and social issues intertwined there and discuss what it means for your decision making.

This micro-course will be held virtually April 6, 2022 from 10:00 a.m.-12:00 p.m. and 1:00 p.m.-3:30 p.m. ET. For more information, visit the website (https://agribusiness.purdue.edu/consumer_corner) or contact Aissa Good at aissa@purdue.edu or (765) 299-3486 to register. The cost to register is \$495/person.

THE SHELL EGG ACADEMY (SEA)

The Shell Egg Academy (SEA), created by Dr. **Darrin Karcher**, has continued to evolve to meet industry and consumer needs. The 2022 SEA will be held in person at Purdue University April 26-28. The program will be geared toward upper management within egg companies and those in similar positions who are looking for a deeper understanding of topics related to food safety – live production, sanitation, food borne illness outbreaks, FDA Egg Rule, egg quality and egg industry trends with an eye on consumer perspective. These topics will be structured with some instruction but with a greater emphasis on group activities and scenarios to facilitate larger discussion points revolving around these topics. Full schedule, registration and sponsorship opportunities will open in early January 2022 on the SEA's website, www.shelleggacademy.org. Program questions about the academy may be directed to Darrin Karcher at dkarcher@purdue.edu. To be added to the SEA's email list to be alerted when new information is available and registration opens, please email info@empoweredeventslc.com or call (763) 284-6763.

TRIBUTE TO BERNIE ROLLIN

'FATHER OF VETERINARY MEDICAL ETHICS'

The Center for Animal Welfare Science at Purdue University mourns the passing of Bernard "Bernie" Rollin, a pioneer in animal welfare and 'father of veterinary medical ethics,' on November 19, at age 78.

Dr. Rollin was a distinguished professor of animal sciences at Colorado State University prior to his retirement. He was internationally known for his over 30 years of work in animal welfare. He was a major architect of the 1982 federal laws that enforce the humane treatment of animals in research. He published more than 20 books. Especial-

ly influential were his books Farm Animal Welfare (1995), Animal Rights and Human Morality (1981, 1993 & 2006), and Science and Ethics (2006).

In addition to Dr. Rollin's contribution to the discipline of Animal Welfare Science, he was a mentor and friend to several of us. Throughout the years, he frequently shared his wisdom, support, and guidance with our students. He will be greatly missed for his leadership, charismatic presence, and characteristic sense of humor.



Bernie Rollin generously gave his time to the Center, serving as the keynote speaker for the inaugural CAWS symposium in 2015.

**To all of the members of CAWS and the animal welfare science community,
we wish you a wonderful holiday and a happy new year.**

CAWS IS JOINTLY FUNDED BY THE
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