2025 North American Regional Meeting of the ISAE

May 14th-15th, University of Guelph

Overview

The Campbell Centre is hosting the 2025 North American Regional Meeting of the International Society of Applied Ethology (ISAE). This meeting brings together ISAE members – students, researchers, and faculty – to share their work, collaborate, and learn from one another. The meeting will take place on May 14th and 15th, 2025 in the Arboretum Centre at the University of Guelph.

Sponsors

A big thank you to our sponsors, who have helped make this conference possible:

Schedule

Day One - May 14th, 2025

Time	Speaker	Title
Time	*Speaker*	**Title**
9:00	Georgia Mason	Opening remarks
9:05	Georgia Mason	Welcome and Land Acknowledgment
9:10	Georgia Mason	Overview of the day
Session One: Enrichment – Chair: Rosie Whittle, University of Arkansas / ISAE Membership Secretary		
9:20	Hee Jin Chung	Individual cat responses to a standard moving toy, and their connection to other cat characteristics, behaviors, and hunting history
9:40	Michelle Gygax	May the force be with you: Maximum force and access attempts as a measure of strength of preference in mice
10:00	Marjorie Cellier	Enhancing Statistical Power in Animal Behavior Research: A Case Study on Enrichment in Dairy Cows Using Data Augmentation Methods
10:20	Emily Webberson	Sniffing for Fun: Evaluating the effect of olfactory enrichment on cats' toy preference and interaction
10:40		**30 Minute Break & Posters**
11:10		Workshops
12:40		**90 Minute Lunch & Posters**
Session Two: Literature reviews and meta-analyses – Chair: Aveil Oberhammer, University of Guelph		
14:10	Jessica Cait	The impact of social isolation on laboratory rodent health, replicability and translatability: a systematic review and meta-analysis
14:30	Gustavo Dias	Exploring sleep in farmed ungulates: A Scoping Review
14:50	Zarah Deutsch	Behavioral Measures used to assess Salmonid welfare: a scoping review
15:10	**Keynote: Dr. Cassandra Tucker**	Invisible harm: how our blind spots reveal unanswered questions in animal welfare

Time	Speaker	Title
15:50	*Jennifer Link*	Using behavior modification strategies to improve nail trim success and reduce negative responses in adult shelter cats
16:10	*Lauren Hare*	Veterinary appointments with the owner present versus absent: assessing cat responses and owner attitudes
16:30		**30 Minute Break & Posters**
17:00	*Christine Kuo*	Understanding how farmers change practices: Switching to social housing for dairy calves
17:20	*Erica Cheung*	"But my horse is well cared for": insights into attitudes and perceptions of equestrians towards performance horse welfare
17:40	*Nattawipa Ampaiwan*	Feline stakeholder attitudes and opinions on community cat welfare

Day Two - May 15th, 2025

Time	Speaker	Title
8:30	*Janice Siegford, Michigan State University/ISAE President*	Introduction

Session Four: Abnormal Repetitive Behaviour – *Chair: Lindsey Kitchenham, University of Guelph*

| Time	Speaker	Title
8:40	*Ana Rentsch*	Assessment of Experimental Feed Restriction on Frustration Indicators and Locomotion Strategies in Laying Hen Pullets
9:00	*Isabelle M. McDonald-Gilmartin*	Continuous recording of oral abnormal repetitive behaviors in Jersey and Holstein post-weaned heifers
9:20	*Gabrielle B. Clark*	Does increased juvenile enrichment attenuate long-term stereotypic behaviour in farmed mink (Neogale vison)?
9:40	*Abigail Tillotson*	The effects of periodic environmental enrichment at different life stages on the welfare and behaviour of growing pigs
10:00	*Jasmin Schiestel*	Beyond the Peck: Exploring the Use of Pecking Blocks on Foraging in Brown- and White- Feathered Birds on Commercial Rearing Farms in Ontario
10:20	*Lea Nicklas*	Can prebiotic galacto-oligosaccharides prevent stress-induced feather pecking and feather damage in laying hens?
10:40		**30 Minute Break & Posters**

Session Five: Health, Metabolism & Behaviour – Chair: Carol Tinga, University of Guelph

Time	Speaker	Title
11:10	Steeley Ellis	A ramp-to-roost journey: Does keel bone damage or footpad health affect the use of ramps to access elevated structures in older laying hens?
11:30	Paula Olivares Guzmán	Relationship between gait traits and mobility scores of beef cattle for the development of an automatic lameness detection system
11:50	Emiline Sundman	Behaviors of feedlot cattle in a chronic pen: changes over time and associations with mortality and recovery outcomes
12:10	Rosie Whittle	Can chute behavior predict subclinical morbidity in beef calves?
12:30		**90 Minute Lunch & Posters**
14:00	Elena Contreras	Behavioral ethogram of adult commercial broiler hybrid chickens rescued from slaughter: A pilot study
14:20	Guadalupe Ceja	Evaluating the relationship between temperament, productivity, and metabolic status in dairy cows

Session Six: Social/Parental Behaviour – Chair: Lydia Conrad, University of Guelph

Time	Speaker	Title
14:40	Martyna Lagoda	The effect of coping style and early life environment on play behaviour in suckling pigs
15:00	Kyleigh M. Turner	Separated but not forgotten: Calf behavioral responses to temporary separation and reunion with the dam
15:20	Joanna Magee	The impact of housing on the activity time budget of post-weaned sows
15:40		**30 Minute Break & Posters**
16:10	**Keynote: Dr. Daniel Mills**	Animal faces: Beyond the rational
16:50	Georgia Mason and Janice Siegford	Wrap up and prizes

Locations and Events
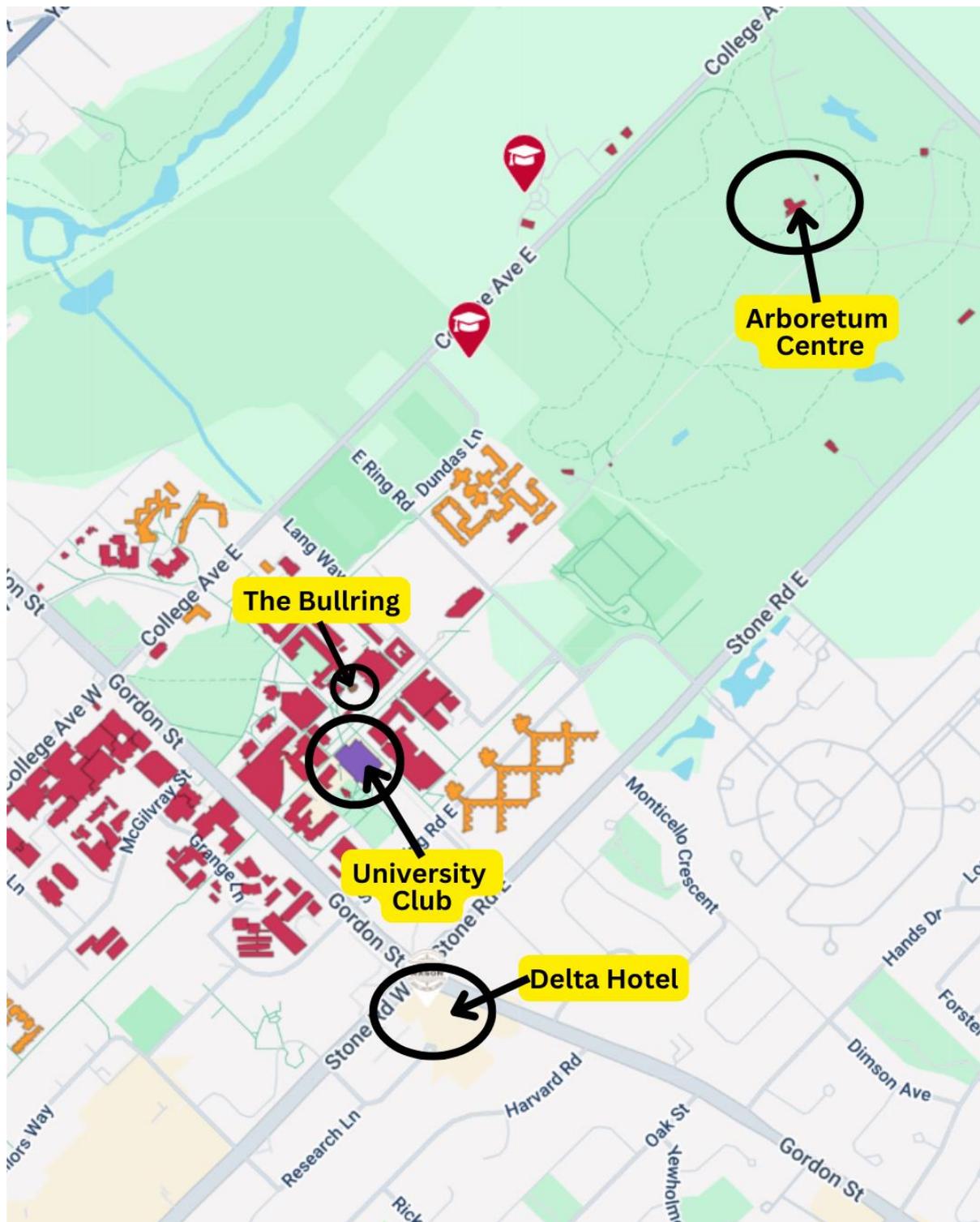
Arboretum Centre

The Conference will be held at the Arboretum Centre, located at College Ave East, Guelph ON, Canada, N1G 2W1. Please note the venue is not air conditioned, and food and posters will be on the West Lawn beside the conference Centre so please wear layers. The Arboretum also features lovely trails and gardens which you can walk through during breaks or before or after the conference. You can read more about the Arboretum here: https://arboretum.uoguelph.ca/

The Bullring

For those who have signed up for dinner at the Bullring on the evening of May 14th, we will be hosting a casual get together will food and non-alcoholic drinks included. You can find the Bullring at 07 Trent Ln, Guelph, ON N1G 1Y4.

Banquet at the University Club

Our banquet will take place at 6:30pm at the University Club, located on the 5th floor of the University Centre. After dinner, we will have a square dancing demonstration and session for those interested.

Keynotes

Day 1: Invisible harm: how our blind spots reveal unanswered questions in animal welfare

Dr. Cassandra Tucker, *University of California, Davis*

Concerns about animal welfare are rooted in ethical considerations for how we, as a society, house and manage animals we use for food or other human purposes. As a result, how we view animal welfare considerations varies with our perspectives, beliefs and values. In my work as a researcher interested in animal welfare and generating knowledge to inform best practice on farms, I have encountered blind spots in these considerations. These blind spots are my own as well as those of farmers, caregivers and other stakeholders. Rather than offering a comprehensive list, I will focus on four types of blind spots that I believe obscure harm but also serve as a source of information. Indeed, my experience has been that some of our blind spots can reveal unanswered questions and point to areas that are ripe for further investigation and action. The first blind spot that meets these criteria is "out of sight, out of mind". When engaging in this way of looking away, we underestimate damage to parts of the animal's body that are not easily seen by humans (e.g. disbudding or castration wounds) or miss behaviors that are performed at times of day or on a scale that we, as humans, do not easily recognize (e.g. abnormal behaviors). The second type of blind spot is what I call "wrapped in positivity" where we choose an optimistic interpretation of an animals' response (e.g. categorize an abnormal oral behavior as cute or funny rather than concerning) or rationalize how we house or manage cattle as being what is best for them. My experience is that topics in this category range from easily addressed to deeply ingrained. The third category I describe as "beyond imagination", where the scale of change needed to address the concern is so immense that it is difficult to envision it. Indeed, incrementalism is common in research and can affect the scale of the questions we tackle and, as a result, the knowledge we generate. Lastly, the fourth category is "barn blindness", where problems are apparent to some but so common that many do not see them as concerning or, in some cases, notice that harm that has occurred. I will give examples of these four types of blind spots and how recognizing them has led to insights and change either within the academic or farming communities.

Day 2: Animal faces: Beyond the rational

Dr. Daniel S. Mills, *University of Lincoln*

Faces are complex and are processed globally; they are of primary importance in emotional communication. This has a range of implications for both scientists and pet owners, ranging from the skill required to read faces effectively, through problems of oversimplifying specific facial signals, to seemingly irrational human responses towards animals and their care. In this presentation I will discuss how we tend to interpret the faces of other species and the implications of this, drawing on my research over the last 10 years on emotion expression in dogs and cats, and the behaviour and welfare problems we encounter as a result.

Workshops

Field Research in Ecology and Evolution Diversified (FREED) workshop on increasing diversity in research programs

This workshop will open with a talk from ecology/evolution grad students explaining FREED as an organization, and what lessons we've learned and think are applicable for all researchers including applied ethologists. The next part of the workshop will be a roundtable discussion where people can ask questions about our organization and ask for/share advice on implementing EDI practices in their own research programs.

Avoiding a polarised future: Synthesising diverse perspectives on the future of farm animal welfare

What does the future of farm animal welfare look like to you?

Join Katie Koralesky, Bianca Vandresen, and Jen-Yun Chou to share your views on how scientists can engage diverse actors to move toward a sustainable, non-polarized future for farm animal welfare. During this workshop, we will dive into this topic through different activities, including small-group discussions, a frame reflection exercise (to encourage thinking from a different perspective), and others.

As well, we will be collecting data during this workshop (data collection has been approved by the

University of British Columbia Behavioural Research Ethics Board). Views on this topic can be grounded in values, previous experiences, and concerns related to the environment, animal care, and society. Our aim is to use this data to develop recommendations on how to include diverse voices in discussions about the future of farm animal welfare by recognizing the shared and different values individuals hold. There will be an option to participate but opt out of data collection.

Observer reliability in animal behavior research: a workshop

Cassandra B. Tucker, Sarah J.J. Adcock, Jennifer M.C. Van Os, Carly Moody, and Blair C. Downey

We have built a website that outlines our approach to observer reliability (https://www.animalbehaviorreliability.com/). In this workshop, led by three of the website authors, we will examine factors and considerations that affect the repeatability of the dependent variables commonly used in ethology. Workshop participants will gain concrete, specific skills to apply in their own behavioral research.

Abstracts - Talks

Individual cat responses to a standard moving toy, and their connection to other cat characteristics, behaviors, and hunting history

Hee Jin Chung[1], Dr. Andrew Sih[1], Dr. Carly Moody[1]

[1]University of California, Davis

Cat owners are encouraged to play with their cats as an enrichment strategy to promote natural behaviors, positive cat-owner interactions, and positive welfare. However, little is known about how cat characteristics and hunting history may influence individual cat responses to a standardized method of object play. Our study aimed to use citizen science to conduct standardized behavioral assay trials with pet cats, and explore connections between cat management, hunting history, and play behavior. Adult US cat owners were recruited to participate via social media through convenience and snowball sampling. Respondents (N=133) completed an online questionnaire, collecting information on participant and cat demographics, cat management, hunting history, and play behavior in the home. Participants were then mailed a standard wand toy and given directions to video record three 2-minute videos of themselves moving the toy in a consistent figure-8 motion at a moderate speed in front of their cat. A descriptive summary of the questionnaire data revealed that participants were mainly women (83.5%) living in suburban areas (65.4%), and cats were mainly mixed-breed (73.7%), ranging from 1 to 11+ years old with a mean of 5.1 years old. Forty-five percent of participants reported that their cat has hunted wild animals in the past, and about half of all participants (50.4%) indicated their cat is currently provided some form of outdoor access (free-roaming or controlled). Overall, 36.4% of owners reported playing with their cats more than once a day, 33.3% once a day, and 24.0% a few times a week. Owners most frequently rated their cat as somewhat playful (54.1%) or extremely playful (30.8%), and rated themselves as somewhat successful (46.6%) or extremely successful (37.6%) at engaging their cat during play sessions. Interestingly, we found that cats' outdoor status and hunting history did not predict their visual orientation towards the toy, number of attacks made towards the toy, or their latency to walk away from the toy. In contrast, we found that older cats (p<0.001), cats who were rated by their owners as less playful (p<0.01), and cats who less frequently received a new toy (p=0.03) spent less time engaging with the toy. Overall, the study results will help improve our understanding of inter-cat differences during cat-owner play, and have implications for cat management, conservation, and cat-human relationships.

May the force be with you: Maximum force and access attempts as a measure of strength of preference in mice

Michelle Gygax[1,2], Janja Novak[1], Bernhard Voelkl[1], Stefanie Lina Krebs[1], Georgia Mason[2], Hanno Würbel[1]

[1]University of Bern, [2]University of Guelph

Understanding animals' resource preferences is key to improving housing. Microeconomic theory suggests 'reservation price', the maximum price paid for a resource (Maximum Price Paid, MPP), as a reliable way to infer preference strength. Subjects trained to push weighted doors for resource access, for instance, can be exposed to heavier weights until they stop paying. In welfare research, MPPs have successfully revealed that mink value swimming; and cows, grazing. However, this method is time-consuming; requires specialised equipment; generates discontinuous outcome measures; and the closure of highly-weighted doors may even hurt animals. We therefore developed novel load cell-equipped doors to measure Maximum Force Exerted (MFE) as a refined alternative to using weighted doors. We also quantified attempts to open blocked doors, to see if these reflect preference strength in animals denied access. Forty mice of two strains (C57BL/6NRj, RjOrl:SWISS) and both sexes were pair-housed in five consecutive batches in four six-chambered apparatuses. Each chamber was accessed via a load cell-equipped door, and contained one of five resources (wheel, burrow, climbing frame, shelf, gnawing stick) or was left empty as a control (placement randomized across cages and batches). After three weeks, we blocked access to resources for 48h and assessed MFE and repeated attempts to enter the now inaccessible chambers. Linear mixed-effects models with resource-type, sex, strain and interactions as fixed effects, and mouse ID, cage, and batch as random effects, assessed which resources mice exerted the highest forces for; and evaluated whether MFE predicted number of attempts. MFE strongly predicted access attempts (F =159.0, p < 0.0001; Adj R2 = 0.769). Mice exerted the highest forces and had the most attempts to reach the burrow (MFE: F=100.5, p < 0.0001 | #Attempts: F=2.25, p < 0.0001), wheel (MFE: F=63.43, p < 0.011 | #Attempts: F=2.34, p < 0.0001), and climbing frame (MFE: F=91.8, p < 0.0001 | #Attempts: F=1.65, p < 0.0001). However, both measures showed significant resource*sex effects, because which resource was most strongly preferred seemed to vary between males and females (analyses ongoing), indicating a need for further research with more power. Our load cell-equipped doors provide a refined method to assess preference strength via MFE. Strengths of preference also predicted the access attempts of thwarted mice: a measure now easily adaptable for diverse other species, without the difficulties of measuring force.

Enhancing Statistical Power in Animal Behavior Research: A Case Study on Enrichment in Dairy Cows Using Data Augmentation Methods

Marjorie Cellier[1,2], Thomas Gisiger [2,3], Abdoulaye Baniré Diallo[2,3], Elsa Vasseur[1,2]

[1]Department of Animal Science, McGill University, [2]Research and Innovation Chair in Animal Welfare and Artificial Intelligence (WELL-E), McGill University, [3]Département d'informatique, UQAM

Research on animals often faces a critical limitation: small sample sizes limit statistical power, making it challenging to detect behavioral differences. Artificial data augmentation offers a promising solution by increasing dataset size. This study explores the potential of data augmentation in behavioral research through a case study on dairy cow enrichment in tie-stall housing.

Ten Holstein dairy cows were tested using a crossover design over two weeks, with a four-day washout period. Two enrichment types were evaluated: a standard Kong and a modified version with additional visual (white tape) and tactile (chains) elements. Each device was suspended in the stall. Behavioral interactions with the enrichment were recorded using GoPro cameras for 45-minute sessions and annotated using The Observer XT software. A linear mixed model was applied, with interaction type, day, and treatment as fixed effects, and individuals nested within day as a random effect.

Preliminary results showed no significant difference in the percentage of time spent interacting with the two Kong types (standard: 6.9±5.3% of their time; modified: 6.6±6.6% of their time, p=0.48). However, cows spent more time (p<0.001) pushing and sniffing (2.49±2.32; 2.42±1.87% of their time, respectively) the Kong (regardless of type) than licking, grooming or biting (1.04±2.33; 0.47±0.77; 0.34±0.71% of their time, respectively). Given the limited number of cows, observation days, and overall interactions recorded, artificial data augmentation is a potential avenue to enhance dataset size, refine statistical analyses, and improve the interpretation of results.

To address this, we will test three augmentation methods: the first will increase the volume of video footage; the second will expand the sample size of variables extracted from the videos, such as different types of interactions; while the third method will focus on increasing video annotations themselves. Data augmented with each method will then be analyzed using the same standard linear model approach, and a comparison of similarities and differences will be conducted.

By augmenting behavioral data, we aim to better capture potential patterns that might otherwise go undetected due to limited statistical power. Beyond improving data reliability, artificial data augmentation also has ethical implications, as it contributes to the 3Rs principle by minimizing the need for additional experimental subjects while ensuring meaningful scientific insights.

This study highlights the challenges posed by small sample sizes in animal behavior research and underscores the potential for artificial data augmentation to improve statistical robustness. Future work should explore integrating these methods into behavioral studies.

Sniffing for Fun: Evaluating the effect of olfactory enrichment on cats' toy preference and interaction

Emily Webberson[1], *Anastasia C. Stellato[1], Kristina A. O'Hanley[1], Lingna Zhang[2], Edgar O. Aviles-Rosa[1]*

[1]*Animal and Food Sciences Department, Texas Tech University,* [2]*Laboratory of Companion Animal Science, College of Animal Science, South China Agricultural University*

Toys and olfactory enrichment are common methods used to promote welfare by encouraging natural play behavior in numerous species; however, no research has previously evaluated how olfactory enrichment affects toy interaction in cats. The objective of this study was to evaluate if the addition of a cat's preferred odor to moving or stationary toys increases their interaction with those toys. Pet cats (N=31) participated in three, 5-minute free operant preference assessments to determine their preferred odor among three options (i.e., catnip, silver vine, and Feliway®) and an unscented control. After identifying their preferred odor, their interaction time was evaluated with both a moving and stationary toy, that was either scented with their preferred odor or was unscented. Cats' interaction during the preference tests was video recorded and preference for an odor or toy was defined as the stimulus that received the most interaction time (in seconds). Cats interacted with catnip (85.24 s; 95% CI [59.64, 110.85]) and silver vine (57.99 s; 95% CI [35.32, 80.66]) more than with the control (3.36 s; 95% CI [0.98, 5.75]) and Feliway® (8.11 s; 95% CI [4.24, 11.97]). A linear mixed model was used to assess the effect of odor (scented vs unscented), toy type (stationary vs moving) and their interaction (e.g., scented, stationary) on cat interaction time with the toys. Cats spent significantly more time interacting with moving toys, whether scented (59.04 s; 95% CI [28.27, 122.14]) or unscented (58.24 s; 95% CI [27.88, 120.50]), compared to unscented, stationary toys (12.27 s; 95% CI [5.47, 26.21]). Cats also interacted more with scented, stationary toys (38.01 s; 95% CI [18.02, 79.02]) than with unscented, stationary toys (12.27 s; 95% CI [5.47, 26.21]) but did not statistically differ from their interaction with moving toys. These results suggest that cats prefer moving or scented, stationary toys compared to unscented, stationary toys. The addition of olfactory enrichment on cat toys may therefore serve as a simple and effective method to promote pet cat welfare by encouraging natural play behavior with stationary toys.

The impact of social isolation on laboratory rodent health, replicability and translatability: a systematic review and meta-analysis

Jessica Cait[1, 2], Marc T. Avey[2], Georgia J. Mason[1]

[1]University of Guelph, [2]Canadian Council on Animal Care

Over 120 million rodents are used in biomedical studies globally each year, yet most of this research is non-replicable and very little translates to human therapies (termed the replicability and translatability 'crises', respectively). Furthermore, many laboratory rodents are isolated in barren, 'shoebox-sized' conventional housing that compromises welfare, inducing chronic stress. Our previous meta-analysis showed that, compared to rodents in larger, well-resourced enclosures allowing the expression of natural behaviour, those in small conventional cages are more susceptible to stress-sensitive diseases (anxiety, cancer, cardiovascular disease, depression, stroke) and have shortened lifespans. Additional meta-analyses of interactions between housing (conventional versus well-resourced) and disease modifiers being studied (e.g., therapeutic drugs) revealed that housing quality can alter research findings, impacting replicability. Furthermore, using conventional housing may overestimate the therapeutic benefits of tested drugs, impacting translatability. Here we build on this work to investigate chronic stress effects in individually housed rodents. We hypothesize that poor welfare from social isolation similarly impacts animal health. We further hypothesize that these effects similarly alter research findings, impacting replicability and translatability. To test these hypotheses, we conducted a systematic review. Following best practices for reducing bias, we detailed our research plan in an online protocol prior to conducting our study (https://hdl.handle.net/10214/28126). We searched five databases (Ovid, CABI, Web of Science, Proquest, SCOPUS) on May 26, 2024, finding 2,384 potentially relevant articles. Two independent reviewers conducted all steps to minimize error and bias. We screened all articles for eligibility (published in English, using mice or rats, and using social isolation as an intervention), resulting in 121 articles meeting inclusion criteria from which data were extracted. These spanned all five previously studied stress sensitive diseases, and mortality, while including one new disease: viral infection. Twenty-eight articles also assessed the efficacy of disease modifiers. Data analysis is ongoing, via random effects meta-analyses, including meta-analyses of statistical interactions (using 'article' as the unit of replication). Results will help reveal how social isolation impacts laboratory rodents' health and address whether these effects can alter experimental results, reducing replicability and translatability. These data, combined with previous work on rodent housing, will allow us to assess the importance of welfare as a key variable that should be considered when conducting animal research, and when addressing both replicability and translatability crises. If our hypotheses are supported, this would suggest that social housing is important not just for animal welfare but also for rigorous, effective biomedical science.

Exploring sleep in farmed ungulates: A Scoping Review

Gustavo Dias[1], Emma Ternman[2], Kathryn Proudfoot[1]

[1]University of Prince Edward Island, [2]Nord University

Sleep is crucial to the overall welfare of animals and has been extensively studied in humans and rodents. Recently, animal welfare scientists have begun to explore sleep studies in farmed animals. The objectives of this scoping review are to 1) explore the extent to which sleep has been studied in farmed ungulates, emphasizing how it relates to animal welfare, 2) describe different methods used to estimate sleep in farmed ungulates, and 3) identify gaps in the current literature and areas for further research. A protocol for the review is currently underway; preliminary methods and results will be presented. A comprehensive literature search was implemented using three databases (CAB Abstracts, Web of Science, and PubMed) to identify studies using farmed ungulates that included sleep either as an outcome or an intervention. The search initially resulted in 3,024 citations; using Covidence software. The process of screening articles was iterative and included initial screening by one author (GD) with consultation by all authors. This process resulted in 82 articles, including observational (56%) and experimental studies (44%). Most studies focused on bovine (53%), with fewer on ovine (16%), equine (14%), swine (11%), and caprine (6%). Studies either used a single method to estimate sleep, including sleep-like behavior (49%), polysomnography (29%), accelerometer (5%), other (1%), or a combination of two of these methods (16%). Observational studies assessed relationships between physiological changes in animals during sleep (24%), described sleep in general (17%), explored changes in sleep over different life stages (13%), assessed links between housing and sleep (9%), or other relationships between sleep (9%). An additional 28% of observational papers validated methods to estimate sleep, with a majority focused on bovine (85%). Experimental studies were categorized according to their intervention using concepts related to animal welfare, including those that altered biological functioning (42%), naturalness (42%), or affective states (5%), and assessed sleep as an outcome. The remaining 11% of experimental studies used sleep deprivation as an intervention to assess how it affected animals. This review revealed an emphasis on observational studies related to sleep in farmed animals, which has provided an important foundation to allow for the growth of experimental work. We encourage researchers to validate methods to assess sleep in non-bovine species, such as equine, swine, ovine, and caprine. More experimental research is also encouraged to understand how sleep relates to affective states, as this is an active area of research in humans but is not well explored in farmed animals.

Behavioral Measures used to assess Salmonid welfare: a scoping review

Zarah Deutsch[1], Briana Hagen[2], Joy Mench[1], Carly Moody[1]

[1]Department of Animal Science, University of California Davis, [2]The Canadian Centre for Agricultural Wellbeing

Hundreds of millions of salmonids are raised annually across the globe for aquaculture, hatchery, and research purposes. In recent years, there has been increased public interest in the welfare of fish species in food systems, which is reflected in an increase in welfare-focused salmonid research. To our knowledge there has been no systematic, comprehensive review of outcome measures used to evaluate salmonid welfare. Thus, we performed a scoping review to: 1) understand the scope of research evaluating salmonid welfare, 2) organize the variables used to measure salmonid welfare into key areas, 3) highlight gaps in the current research, and 4) suggest areas of future research. Inclusion criteria included analytical and observational research written in English, with at least one measure meant to assess Salmonid welfare. We performed an initial search using a combination of the words "welfare/wellbeing" and variations on the word "salmonid" and associated species, which produced 2,533 unique articles. Two levels of screening were performed; level one screened abstracts and titles using questions related to our inclusion criteria, and level 2 involved full text screening to retain literature with at least one outcome variable meant to measure Salmonid welfare. These screening strategies resulted in 228 primary peer-reviewed journal articles, for which data extraction was performed. Atlantic salmon and Rainbow trout were the most frequently studied species (57% and 37%, respectively), and Norway was the most common study location (45%). Most of the outcomes used to measure welfare were related to health or physiology, including external lesions (31%), cortisol (11%), and internal measures of health (39%; e.g, blood chemistry, organ function, histologic findings.). Behavioral outcomes of welfare were used less frequently (24% of studies) and relatively few studies (12%) used both behavioral and physiological or health outcomes. Diverse behavioral indicators of welfare were reported, including preference testing, Qualitative Behavioral Analysis, judgement bias testing, and indicators of aggression. This talk will emphasize the behavioral findings from this report, highlighting the current state of research and suggesting areas of behavioral study that could benefit from additional focus.

Using behavior modification strategies to improve nail trim success and reduce negative responses in adult shelter cats

Jennifer Link[1], *Julie Posluns[2], Carly Moody[1]*

[1]University of California, Davis, [2]Cat School, Toronto

Nail trims are a routine procedure required throughout a cat's life to maintain their claws and reduce the risk of nail-related injuries (i.e., overgrowth into the paw pad, broken nail bed). However, cat nail trims often involve full body restraint, which is negative and may increase the risk of fear and aggression-related behaviors. In a shelter setting, cats are exposed to various stimuli (i.e., loud noises, unfamiliar people and animals) which may exacerbate fear and/or aggression-related responses. Thus, we aimed to produce a practical and effective nail trim training protocol for adult shelter cats that incorporated desensitization and counterconditioning (D&CC), as well as cooperative care methods for increasing the likelihood of nail trim success (all 10 front claws clipped). We predicted that cats undergoing the nail trim protocol would be more likely to have a successful nail trim compared to cats who did not undergo the training protocol. Sixty adult shelter cats from the Sacramento SPCA were randomly assigned to one of 3 groups: 1) protocol (underwent the training protocol; n = 20), 2) handling-only (handled and habituated to handler prior to the nail trim test; n = 20), or 3) control (no exposure to handler prior to the nail trim; n = 20). Cats were blocked by sex, neuter status, age, and length of shelter stay. Cooperative care methods were incorporated into both the protocol and handling-only groups. This involved a small mat placed on the floor and only interacting with a cat when their two front paws were placed on the mat. Cats in all three groups underwent a nail trim test which was video recorded. A logistic regression model revealed greater odds of completing a nail trim (yes/no) during the nail trim test for protocol group cats compared to both the handling-only (OR: 7.43, 95% CI: 1.78, 31.04, p = 0.002) and control group cats (OR: 10.52, 95% CI: 2.27, 48.76, p = 0.006). Additionally, cats in the protocol group took an average of 2 days (min: 1, max: 4) to complete the protocol. This finding suggests that desensitization and counterconditioning combined with cooperative care strategies are effective at increasing nail trim success in the study population. For increased generalizability, further research should examine the usefulness of this protocol when conducted by shelter staff.

Veterinary appointments with the owner present versus absent: assessing cat responses and owner attitudes

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Cats display negative responses during routine veterinary examinations, which is a welfare concern and directly impacts the examination and diagnostic process. Research suggests caregiver presence during veterinary examinations helps reduce dog stress; however, little research has examined the impact of caregiver presence on cat responses. As well, cat caregivers' attitudes towards their presence during these examinations remain unknown. Thus, we aimed to: 1) assess the impact of caregiver presence versus absence on cat responses during a mock physical examination, and 2) survey cat caregivers on their attitudes towards being present versus absent during routine veterinary examinations and procedures. Participants were primary cat caregivers living in Greater Sacramento (CA, USA) with a healthy adult cat (1–10 years old). Caregivers completed an online pre-appointment questionnaire collecting caregiver and cat demographics, participant ratings on routine veterinary examination and diagnostic procedures, and how their presence impacts themselves and their cat. Participants (N=33) attended two mock examinations with their cat: one they were present and one they were absent. Appointments were counter-balanced and randomized after balancing for cat sex and age. Examinations were video recorded, and cat behavioral responses scored using behavior software. Descriptive statistics were performed for all cat response and questionnaire data. Regression modelling was used to analyze cat response outcomes, and Wilcoxon-Signed Rank tests used to detect differences in questionnaire Likert-scale ratings. Results show caregivers rated themselves (p < 0.0001) and their cat (p < 0.0001) as more comfortable when they are present versus absent during a physical examination. Participants indicated being more comfortable when present versus absent during invasive procedures (e.g., blood draw) in the examination (p < 0.0001) and treatment area (p = 0.002). Cat response results (N = 32) showed an increased rate of vocalizations during the habituation (IRR: 3.23, 95% CI: 1.47, 7.10, p= 0.004) and examination (IRR: 3.18, 95% CI: 1.31, 7.70, p=0.007) phases when the caregiver was absent versus present, suggesting a mild stress response. Questionnaire results suggest cat caregivers may be more comfortable being present during routine examinations and procedures, and perceive their cat as being more comfortable when they are present. More research is needed to replicate these results on a wider scale for greater generalizability. Overall, we recommend offering caregivers a choice to be present during routine examinations and procedures to support client satisfaction.

Understanding how farmers change practices: Switching to social housing for dairy calves

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Rearing dairy calves in pairs or groups (i.e., social housing) can be beneficial for their welfare, but individual housing remains the norm on many commercial farms in the global North. Transitioning to social housing for indoor housed calves will be required in Canada as of 2031 under the Code of Practice for the Care and Handling of Dairy Cattle. Although some research has investigated producer perceptions of social housing, to our knowledge no research has investigated farmers' experiences with transitioning from individual to social housing. We aimed to describe dairy farmers' experiences with transitioning from individual to social calf housing, including the processes leading up to, implementing, and sustaining (or discontinuing) the use of social housing. We used the Innovation-Decision Process, an innovation adoption approach which uses stages to conceptualize the steps an individual takes to adopt a new practice. We conducted in-person semi-structured interviews with dairy farmers in British Columbia, Canada, who had transitioned from individual to social housing during the preweaning period (n=12), as well as those that transitioned back to individual housing (n=3). During interviews, participants collaborated with the interviewer in constructing a timeline of how calf housing transitioned on their farm. Interviews were anonymized, transcribed, and thematically coded in NVivo. Our findings indicate that amongst our participants, initial motivation to adopt social housing was driven by calf-based (e.g. calf socialization) and farm-based reasons (e.g. labour saving), though producers also held concerns about social housing (e.g. calf health). In cases where producers built or renovated a facility to adopt social housing, they discussed priorities such as ensuring the facility was easy to clean and well ventilated. After implementing social housing, producers varied in the challenges (e.g. competition between calves) and benefits (e.g. calf growth) they experienced with social housing. Producers also discussed their problem-solving approaches to modify their calf setup to better work for their farm, sometimes cycling through multiple adaptations before settling on a system that worked for them, or in the case of three of our participants, returning to individual housing due to an inability to solve the issue. The results of this research can help to inform an understanding of farmers' motivators, needs, and concerns when transitioning to social housing for calves. More generally, the methods employed in this research may provide further insight into how changes in farm practice occur, helping to inform the adoption of other refinements.

"But my horse is well cared for": insights into attitudes and perceptions of equestrians towards performance horse welfare

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There is growing concern amongst stakeholders about the welfare of horses involved in competition. Despite research demonstrating the negative effects on horse welfare of many common management and training practices, equestrian culture seems rooted in tradition that appears slow to change. The present study seeks to increase our understanding of human factors underlying the persistence of welfare-compromising management and training practices. Individual semi-structured interviews were conducted with 22 equestrians from classical equestrian disciplines in North America and the UK. Equestrians' attitudes towards horses, horse welfare, and opinions on future change were explored. Interviews were transcribed and analysed using reflexive thematic analysis to derive five main themes. First, the theme 'welfare issues perceived but sometimes justified' showed that respondents were aware of and concerned about horse welfare. Respondents described several welfare issues related to management and training yet also expressed dissonance reducing strategies, including trivialisation, reframing and justification. Conceptions of the 'good life for a horse' constructed the second theme, where respondents demonstrated conflicting views on what quality of life means for performance horses. The 'objectification of the horse' theme explored how respondents emphasised the value of horses in terms of their usefulness, while the theme 'instrumentalisation of care' showed how management practices were often centred around equestrian activities and motivated by how they facilitated the function of the horse more than care about the horse. Finally, the theme 'enculturation in equestrianism' considers how individuals uptake the attitudes and practices of equestrian culture and the barrier to change this presents. This study deepens our understanding of why horse welfare issues persist in classical equestrian disciplines, by extending the frame of fundamental concern to socio-cultural factors, which may not be entirely rational. An appreciation of this should be used to inform future human behaviour change strategies to promote improved horse welfare.

Feline stakeholder attitudes and opinions on community cat welfare

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Of the approximately 800 million cats living globally, 60% of them are free roaming. Free-roaming cats, or "community cats" as they're often referred to, include both stray (pets abandoned or lost) and feral cats (unsocialized domestic cats). Community cats experience different welfare challenges than owned cats, such as exposure to extreme temperatures, potentially unstable social groups, and nutritional uncertainty, among others. Assessing and monitoring the well-being of community cats is vital to ensuring their overall welfare, but accessible and validated tools are lacking, and the few available focus only on animal health. The ultimate aim of our study is to create a valid and reliable tool to assess welfare in community cats, however, understanding how welfare is currently being measured in the field is an important first step in the development of a more robust tool. Therefore, the objectives of the current study are: 1) identify currently utilized methods for assessing community cat welfare, and 2) evaluate demographic characteristics of participants that might influence stakeholders' perceptions and approaches. Through targeted snowball sampling methods, we conducted two rounds of surveys using the Delphi technique to investigate agreement among experts. The first survey received 596 full responses from feline experts which were analyzed using qualitative content analysis. Results confirm that there is currently no standardized measurement tool specifically designed to assess community cat welfare. To explore existing approaches, we asked participants to describe the welfare criteria they consider when evaluating community cats. Five common themes emerged: (1) presence of supportive caregivers, (2) resource availability and quality (e.g., shelter, safety, food, and water conditions), (3) health status (e.g., access to veterinary care), (4) ability to perform natural feline behaviors, and (5) management of cat colony population (e.g., TNR/TNVR, adoption/rehome, bylaws). These initial findings were synthesized into 45 welfare-related statements and sent back to participants for comments on importance and relative weight for community cat welfare. A total of 269 participants completed the second survey (45% response rate). Surprisingly, 74% agreed that stray and feral cats require different welfare criteria, despite the challenges in distinguishing between these groups. Professional background significantly influenced the weighting of welfare priorities. For example, shelter staff and veterinarians often differed from caregivers in their views on welfare for stray and feral cats, emphasizing different priorities and concerns related to outdoor living, access to care, and nutrition. These findings highlight both the diversity of stakeholder perspectives and the complexity of reaching consensus on community cat welfare standards. Moving forward, these insights will guide the next phase of this project: the development of a standardized community cat welfare assessment tool that integrates the perspectives of key stakeholder groups, existing literature, and input from an expert panel.

Assessment of Experimental Feed Restriction on Frustration Indicators and Locomotion Strategies in Laying Hen Pullets

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Quantitative feed restriction, while rarely used commercially, is frequently used to experimentally slow the growth of egg-laying pullets (young hens). We previously observed feed-restricted caged pullets grazing throughout the day, while floor-housed pullets consumed all feed within one hour of distribution, possibly increasing social and nutritive stress. We aimed to assess signs of frustration (abnormal pecking and increased aggression) and shifts in vertical locomotion (from high- to low-energy strategies) in feed-restricted layer pullets. Six hundred Lohmann LSL-lite pullets were placed in four rooms with six furnished floor-pens each (n= 24 pens) at 12 weeks of age (WoA). Twelve pens (3 per room) were fed ad lib and 12 fed twice-daily meals with a 10% restriction between 13 and 21 WoA. Each pen was video recorded weekly on two consecutive days between 15-22 WoA. Videos from 20 WoA were lost to technical issues. Bouts of abnormal feeding behaviour (Abn: wall-, perch-, tissue-, and severe feather pecking), aggressive behaviour (Agg: aggressive pecking, sparring, aggressive displacement), aerial locomotion (Aer: flights and jumps), and ramp use (Ramp: locomotion on ramp) were recorded continuously for five minutes four times per day (1h pre- and post-meals). The total bouts were divided by group size for each observation. One observer watched all videos. Unfortunately, distinguishable feeder types prevented blinding. An ethogram was developed and refined until intra-observer-reliability reached kappa > 0.9. Data were analysed in R by fitting Generalized-/Linear Mixed Effect Models with nested random effects. Abn was overall low (mean: 0.08 ± 0.012 bouts/bird/5min) and was affected by a feeding x age interaction ($\chi2= 26.46$, df= 6, P= 0.0002). Restricted birds ages 16-19 WoA showed 14% more Abn bouts than ad lib birds, with age effects increasing Abn by 79-201%. Agg was more frequent (mean Agg: 0.17 ± 0.021 bouts/bird/5min) and was also affected by an interaction of feeding x age ($\chi2= 17.22$, df= 6, P= 0.009). Agg was 10% less frequent in restricted birds at 19 and 21 WoA, and age effects increased Agg by 86-439%. In restricted pullets, Agg was 49% more frequent post-meals than pre-meals ($\chi2= 7.03$, df= 1, P= 0.008). Aer and Ramp were not statistically dependent on feeding (P= 0.96 and P= 0.29, respectively). Temporary feed restriction of layer pullets in small social groups may introduce a nutritive stressor. However, the small effect size, the effect's immediate reversibility, and lack of social conflict or energy conservation suggest the method can be used with caution, including regular monitoring of body weight and plumage condition.

Continuous recording of oral abnormal repetitive behaviors in Jersey and Holstein post-weaned heifers

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Dairy cattle perform abnormal repetitive behaviors (ARBs) like tongue rolling (TR) and non-nutritive oral manipulation (NNOM). Few studies have focused on post-weaned heifers. We used continuous sampling to assess the population prevalence of oral ARBs in this age class. We delineated the form of tongue rolling to include when this behavior involves an object in the repetitive pattern (object tongue rolling, OTR) and characterized the types of NNOM based on what the animal is specifically manipulating (Feed bin, Water trough, Bedding, Other). Our objective was to assess differences in these oral ARBs between the most common breeds of dairy cattle in the United States, Jerseys (n=8) and Holsteins (n=8). Previous literature has found that Jerseys spend more time both grazing and eating per unit of BW compared with Holsteins; differences in feeding behavior may predispose Jerseys to perform more oral behavior overall. Indeed, year-old Jersey heifers show more abnormal oral behavior than Holsteins, thus we expected this pattern in all 6 ARBs (TR, OTR, NNOM: Feed bunk, Water trough, Bedding, Other) in post-weaned heifers. Heifers (105±10.1 d) were enrolled after a minimum of 4 d (average 13.7±4.3 d) after entering into a loose housed pen. The pen was bedded with rice hulls and heifers were fed a total mixed ration ad libitum from a bunk. It was always filled to capacity (8 individuals) and through rolling enrollment, there were 4.1±1.4 focal heifers on each day of video recording. One individual was observed at a time and scored continuously for all behaviors from 08:00-14:00 h on one day. A Wilcoxon Rank Sum test was used to compare breeds. Jerseys and Holsteins spent similar amounts of time engaged in Other NNOM (1.86±0.58 vs. 0.74±0.29%, p=0.30), Bedding NNOM (0.09±0.04 vs. 0.02±0.02%, p=0.28), Water trough NNOM (0.09±0.05 vs. 0.04±0.03%, p=0.16), and TR (0.39±0.28 vs. 0.19±0.12%, p=0.90), respectively. Jerseys performed significantly more OTR than Holsteins who performed none (0.11±0.06 vs.0±0% of time; p<0.01). Jerseys also tended to perform more Feed bunk NNOM than Holsteins (0.09±0.04 vs. 0.01±0.01%; p=0.05). In agreement with our predictions, Jerseys performed more OTR and Feed bunk NNOM than Holsteins, but, unexpectedly, show no differences in the remaining behaviors. We are currently coding video to expand this analysis to a larger sample and for a full 24 h/heifer, and suspect that the limited data presented here may not yet paint the complete picture of our results.

Does increased juvenile enrichment attenuate long-term stereotypic behaviour in farmed mink (Neogale vison)?

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Stereotypic behaviour (SB) is a prevalent welfare issue in fur farmed American mink (Neogale vison). Environmental enrichment is known to effectively reduce some forms of mink SB, while other forms of SB appear resistant to this treatment. In such studies, mink SB is typically assessed while enrichment is present in the cage. A singular enrichment per cage is a standard provision on Canadian fur farms, although the age at which enrichment is introduced may be variable, as is changing of enrichments. Therefore, we aimed to investigate whether housing with more numerous, diverse, and novel enrichments as juveniles would positively impact adult SB, compared to rearing with a singular standard enrichment. Throughout the juvenile period (4-15 weeks of age), enriched kits (EK) were housed with a mobile enrichment item exchanged biweekly to maintain novelty (a golf ball, wiffle ball, hockey ball, or pig's ear), a hanging enrichment item exchanged monthly and/or replenished when torn down (a plastic chain or length of sisal rope), and a standard PVC ring enrichment that was permanently present in the cage. Non-enriched kits (consisting of a standard housed [SH] group and a group provided with relatively high-quality bedding materials at whelping [EW]) were housed with only a standard PVC ring during the juvenile period. The following October, after one year of living in equal enrichment conditions, SB performance was quantified in 37 EK, 31 SH, and 36 EW females, respectively. Behavioural data (average proportions of observations where SB occurred) were analysed using Kruskal-Wallis tests and Dwass-Steel-Critchlow-Flinger pair-wise comparisons. There were no significant differences in SB development between groups (0.176 ± 0.188, 0.179 ± 0.227, and 0.113 ± 0.170 observations on average of locomotor SB and 0.038 ± 0.071, 0.060 ± 0.142, and 0.025 ± 0.067 observations on average of whole-body SB for EK, SH, and EW mink, respectively; $p>0.05$), and thus it could not be concluded that increased juvenile enrichment can attenuate long-term SB. However, we suggest that above-standard enrichment may have the potential to mitigate SB when provided until at least seven months of age, when SB is estimated to become fully developed in mink. Alternatively, we consider that the negative contrast effect of enrichment removal may outweigh the benefits of increased juvenile enrichment or cause frustration-induced SBs to develop; we present a review of existing literature on the topic of SB in mink to support our hypotheses for the lack of effects observed.

The effects of periodic environmental enrichment at different life stages on the welfare and behaviour of growing pigs

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Environmental enrichment reduces damaging behaviours associated with intensive housing, and improves pigs' ability to cope with new, stressful situations. This study investigated the effects of a simple periodic enrichment provided in early (0-9 weeks) and/or late (10-21 weeks) life stages. Over three replications, 24 litters (n=239 piglets) were randomly assigned to either Control (C) or Enriched (E) treatments. Three days/week starting one week after birth, E pens were given six pieces of loosely crumpled newsprint sprayed with a calming liquid solution (Phytozen®) which has been shown to reduce aggression in finisher pigs. At 9 weeks of age (WOA) half of E and C pigs were switched to the opposite treatment producing four treatments in late life: CC, CE, EC, and EE (10 pigs/pen). Ease of handling was scored (range 1-5) at weighing, and movement between farrowing, nursery, and grow-finish (GF) was timed. At 17 WOA, behaviour was recorded over 5 hours (9:00am-2:00pm) wherein total of 50 mins (first 30 minutes of hour 1, 10 mins during hour 3 and 5) of continuous video was transcribed/focal pig (4 focal pigs/pen, n=96). Damaging behaviours throughout GF were evaluated by body lesion scoring at 13, 17, and 19 WOA, and weekly tail lesion scoring. Data were analysed using mixed linear models, with main effects of treatment, sex, and their interactions. At 9 WOA, E pigs were easier to handle at weighing (mean score, E: 1.30, C: 1.46; p=0.014) and moved from nursery to GF faster than C pigs (E: 212±11s, C: 250±11s; p<0.05). At 17 WOA, E pigs during late life (EE and CE) performed less pen-mate manipulation (EE and CE: 52±8s; CC and EC: 86±11s; p=0.021) and more pen exploration (EE and CE: 356±50s; CC and EC: 170±22s; p=0.011) compared to C pigs (EC and CC). Throughout GF, EE and CE pigs had fewer body lesions than CC and EC (mean scores, EE: 2.17±1.09, CE: 2.43±1.09, CC: 3.50±1.08, EC: 3.89±1.08, p<0.001). Furthermore, EE and CE pigs had lower tail bite severity scores than CC or EC (mean scores, EE: 1.00±1.07, CE: 1.28±1.07, CC: 1.51±1.07, EC: 1.61±1.07; p<0.001). Access to this periodic enrichment improved handling of 9-week-old pigs and reduced damaging pen-mate directed behaviours during late life. Future research should focus on timing, type, and amount of enrichment provided and the presence/absence of Phytozen®. Results support the periodic provision of loosely crumpled newsprint with added Phytozen® as a practical way to improve pig welfare.

Beyond the Peck: Exploring the Use of Pecking Blocks on Foraging in Brown- and White- Feathered Birds on Commercial Rearing Farms in Ontario

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Feather pecking poses a significant welfare challenge in egg production, and the use of edible enrichment, such as pecking blocks (PB), is proposed as a potential management solution. This study aimed to evaluate the preferences of brown- and white-feathered hens for three different commercial PB types (A, B, and C) by observing their interactions with the blocks including pecking and scratching behavior. Six rearing farms in Ontario, Canada, participated in a broader study on PB use. Each farm had sections with and without PB (control), ensuring equal numbers for both conditions. At 12 weeks of age, PBs of each type (A, B, or C) were placed in the sections at a density of one block per 1000 birds, while the control sections received no PB. Cameras were installed above each PB or the equivalent control location (12 locations total). Observations were recorded over a 3-hour period, starting two hours after lights on and ending two hours before lights off, on a single day when the birds were 18 weeks old (25,920 minutes in total). A trained observer recorded the number of pecks directed at each PB type or the substrate in the control sections using 10-minute interval instantaneous scans. The effects of hen strain, PB treatment, and their interaction on pecking behavior were analyzed using a generalized linear mixed model with a Poisson distribution, with farm as a random effect.

Preliminary results indicate a significant interaction between hen strain and PB type ($P=0.002$). Brown-feathered hens peck more with PB A (96.8 ± 6.8 pecks/block/strain) compared to PB B (81.4 ± 6.4 pecks/block/strain) and PB C (76.9 ± 5.5 pecks/block/strain). In contrast, white-feathered hens showed similar amounts of pecking with PBs A and B (47.7 ± 5.1 pecks/block/strain and 46.6 ± 5.1 pecks/block/strain, respectively), but pecked less with PB C (32.2 ± 3.6 pecks/block/strain). Both strains showed the fewer pecks in the control sections, where only substrate was available (brown: 12.9 ± 1.0, white: 5.4 ± 0.7 pecks/block/strain).

These findings suggest that brown- and white-feathered hens have variation in relative preferences for edible enrichment, which should be considered when designing enrichment strategies for commercial farms. Ongoing analysis will further explore the long-term effects of PB use during rearing on the behavior of laying flocks.

Can prebiotic galacto-oligosaccharides prevent stress-induced feather pecking and feather damage in laying hens?

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The microbiota-gut-brain axis is involved in feather pecking (FP) in laying hens. During severe FP, one hen pecks at and repeatedly pulls another hen's feathers. This can be painful, damage the hen's feather cover, impact thermoregulation, and affect locomotion. The prebiotic galacto-oligosaccharide (GOS) may change communication along the gut-brain axis by increasing the growth of beneficial bacteria. Since single-strain probiotics can mitigate stress-induced severe FP and feather cover damage, it was hypothesized that GOS might have similar beneficial effects. To investigate this, 144 White Leghorn laying hens from genetic lines selected for high or low FP activity were housed in 12 floor pens with an approximately equal proportions of birds from each line. From 19 to 22 weeks of age (woa), half the pens (GOS) received water supplemented with Nutrabiotic® GOS (74% GOS; Dairy Crest Limited, Davidstow, United Kingdom), while the remaining pens received plain water (Control). From 23 to 26 woa, half the pens in each water treatment were exposed to chronic social stress through repeated mixing of unfamiliar hens (Stressed), while the other pens remained undisturbed (Undisturbed). Blinded observers recorded FP, which was analyzed with a generalized linear mixed model in SAS, including fixed effects for treatment, the preceding period's behavior as a covariate, and repeated measures at the pen level. Feather cover damage, an indirect measure of FP, was ranked by a blinded observer according to severity before and after the water treatment and following the stress treatment. FP behaviour did not differ between GOS and Control hens during the supplementation period (p = 0.39) or the stress period (p = 0.83). At the start of the study, all hens exhibited perfect feather cover. Only 57.4% of GOS-supplemented hens retained perfect feather cover, compared to 73.2% of Control hens. Stressed and undisturbed hens did not differ in FP behaviour (p = 0.28) nor was there an interaction between the supplementation and stress treatments (p = 0.53). The feather cover remained unchanged in undisturbed control hens. However, the proportion of hens with no feather damage decreased by 13.9-18.4% in the other three groups. Altogether, these results indicate that GOS did not improve FP behaviour nor prevented feather cover damage. Consequently, the hypothesis that GOS may mitigate FP behaviour in young hens is rejected. It is possible that GOS supplementation could offer the hypothesized benefits in older hens with a more established microbiome.

A ramp-to-roost journey: Does keel bone damage or footpad health affect the use of ramps to access elevated structures in older laying hens?

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Perching is a highly motivated behaviour in laying hens. However, it is unknown whether painful conditions such as keel fractures or foot health problems affect a hen's abilities to ascend to or descend from elevated structures. We housed 32 Dekalb White (DW, 72 Week of Age (WOA), from commercial aviaries with ramps), 32 Bovans Brown (BB, 72 WOA, from commercial aviaries with ramps) and 32 White Leghorn (WL, 54 WOA, from custom aviaries with no ramps) laying hens in 4 floor pens/strain (N=12). Within each pen, there were 2 birds of each health status (n=8); healthy, keel bone damage (fracture or severe deviations as determined by radiographs), footpad problem (including footpad lesions or toe damage), or both, with birds individually identified using numbered backpacks. Three elevated structures were offered in pairs over three 2-week periods: round perch (diameter=2.54cm), flattened oval perch (2.54x5.08cm), and a wire platform (38cm), all were 1.5m long and elevated 81cm above the ground. A ramp was placed 45° to each elevated structure. Observers, blinded to hens' condition, performed continuous video observations for one-hour following lights on and one-hour preceding lights off (4 days/period) to identify whether birds used the ramp (R) or aerial (A) transition, which comprised jumping and/or flying, to ascend to, or descend from, their nighttime roosting locations. A total of 769 descents for dawn and 801 ascents for dusk were analysed using a Generalized Linear Mixed Model with fixed effects of condition, strain, method and the interactions of condition*method and strain*method. The interactions were used to test the hypotheses that condition and strain would affect method of navigation. At dawn, A was the predominant method for descending from the roost (A:85.56% vs R:14.43%, P<0.0001). There were no effects of condition*method (P=0.5099) or strain*method (P=0.0607). At dusk, there were no effects of condition*method (P=0.8933) to ascend to the roost, however, there was an interaction of strain*method (P<0.0001). DW and BB used R for 72.64% and 61.69% of ascents, respectively. In contrast, WL used R only 25.99% of the time, but this may be related to a lack of previous experience with ramps. In conclusion, keel damage and foot health did not influence how older laying hens navigated elevated structures. Hens generally used different methods for ascending to and descending from roosting structures and the ramp was the most common method for ascent by the majority of hens.

Relationship between gait traits and mobility scores of beef cattle for the development of an automated lameness detection system

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Lameness is a painful condition that affects cattle gait due to infection, injury, or abnormal conformation. Several scoring systems have been developed to assess lameness severity in cattle, a key indicator in determining an animal's fitness for transport. These scoring systems rely on observer training and experience and variability in these can lead to poor inter- and intra-observer agreement. Most scoring systems have been developed using dairy cattle. These scoring systems may not be suitable for beef cattle due to genetic variation in gait traits among different beef breeds and environmental factors that influence movement. Pose estimation, a computer vision technique that determines object position and orientation, can quantitatively measure gait traits, e.g., angles, distances, stance and swing times. The objective of this study was to determine associations between gait traits and a mobility scoring (MS) system for beef cattle. Videos of individual beef cattle were captured as they exited the processing barn at 4 commercial feedlots in southern Alberta. Five trained researchers evaluated a total of 230 animals for the absence, presence, and severity of gait traits: stiffness and limp (mild, moderate, severe), head bob (slight, obvious), head drop, arched back, non-weight bearing, and shortness of stride. The MS system used was a modified (NCBA, Zinpro, and NAMI) four-point scale (0-3): MS0 - no gait abnormalities; MS1 - mild stiffness or mild limp, MS2 - moderate to severe stiffness or moderate limp, and MS3 - severe limp bearing little or no weight on affected limb. Pearson's chi-squared tests were used to determine associations between individual MS and observed gait traits. Mild stiffness was associated with MS1, while moderate and severe stiffness were associated with both, MS2 and MS3 ($\chi 2=1.6e3$, $P < 0.01$). Limp severity increased with MS>0 ($\chi 2=5.0e3$, $P < 0.01$). No/slight head bob was associated with MS0 and MS1, while obvious head bob was associated with MS2 and MS3 ($\chi 2=981.8$, $P < 0.01$). Arched back was associated with MS2 and MS3 ($\chi 2=566.0$, $P < 0.01$), non-weight bearing was associated with MS3 ($\chi 2=961.8$, $P < 0.01$), and shortness of stride was associated with MS1, MS2, and MS3 ($\chi 2=700.9$, $P< 0.01$). These results suggest a strong association between MS and gait traits observed by trained researchers, confirming their potential usefulness in the development of an automated lameness detection system in beef cattle to improve early lameness detection and, consequently, beef cattle health and welfare.

Behaviors of feedlot cattle in a chronic pen: changes over time and associations with mortality and recovery outcomes

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In feedlot production, ill and injured cattle with long-term or severe conditions are often moved to a specialized chronic pen. The chronic pen is an understudied area of feedlot production, where additional metrics are needed to help caretakers evaluate if cattle are recovering or at risk for a mortality event. The two objectives of this project were: 1) to identify if cattle behavior at entry to the chronic pen is associated with final outcomes (recovery vs. mortality), and 2) for cattle that died or were euthanized, describe changes in behavior between their first and last 48h with respect to chronic pen entry and exit. All cattle that entered the chronic pen at a 2,400-head commercial feedlot in Iowa from August 2022 to February 2023 were enrolled (n=93). This abstract presents results for a subset of cattle with completed behavioral observations. Cattle were individually marked for behavioral observation. Three trail cameras placed around the pen captured still images at 15m intervals. Data was collected during daylight hours using an ethogram with three non-mutually exclusive behavior groups: posture (standing or lying), resource proximity (head in feed bunk, within 1 body length of the hay or water, or none), and isolation. Raw data for each time point were converted to proportions of scans in which each animal was in view and checked for normality. Mann-Whitney U tests were performed to compare entry behaviors between recovery and mortality cattle (Objective 1) (n = 39 cattle). Cattle that later died spent fewer scans with their head in the feed bunk (p = 0.04) and more scans isolated (p = 0.03) compared to those that later recovered. Wilcoxon signed-rank tests were performed to evaluate behavioral changes as cattle approached a mortality event (Objective 2, n = 12 cattle). In their last 48h, cattle spent more scans lying (p = 0.012), and fewer scans with their head in feed bunk (p = 0.018) and standing near the hay bale (p = 0.003) than in their first 48h in the chronic pen. They also tended to spend more scans isolated before their mortality event (p = 0.083). All other behaviors were not significantly different between time points. With further development, these behavioral indicators could provide caretakers with additional tools for evaluating chronic cattle recovery and welfare, as well as for identifying at-risk cattle for whom intervention, such as euthanasia, may be warranted.

Can chute behavior predict subclinical morbidity in beef calves?

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Beef stocker calves experience multiple stressors, including weaning, transport, commingling of social groups at auction and in feedlots, handling, and processing stressors. These stressors can compromise their immunity and increase the risk of Bovine Respiratory Disease. This study aimed to explore the chute behavior of stocker calves to determine if it could predict morbidity.

A total of 92 male mixed-breed, weaning-aged calves were included in this study. Calf behavior was video recorded in a round race chute. Data collection occurred on arrival (d-1), also days (d) 0, 14, 28, and 41 (end of study). Calves were weighed, blood was drawn to measure serum haptoglobin (ng/mL) and chute behavior was recorded through subjective chute score, chute exit velocity (m/s), and presence or absence of behaviors in the chute (head tossing, vocalizing, thrashing, pushing, lying down). Subjective chute score and behavior were only analyzed for d-1 and d0. This study showed high morbidity and antibiotics were administered as needed.

For the analysis, calves were grouped based on the number of antibiotic treatments they received: None, Once, Twice or Chronic (more than two). These categories and trial day were used as fixed factors for all analyses. Linear mixed effects models were fitted for all outcome variables, except for chute behavior occurrences, which were analyzed using general linear mixed effects models with a binomial distribution. Pen and calf number were included as random factors.

Chronic calves weighed less (245±5.19 kg) than None calves throughout (271±6.24 kg, t=3.59 p=0.003) and had lower average daily gain (0.42±0.11 kg) than None (0.87±0.13 kg, t=3.28, p=0.008) and Once calves (0.80±0.08 kg, t=3.47, p=0.005). Similarly, Chronic calves had greater serum haptoglobin (284226±147106 ng/mL) than None (27125±20120 ng/mL, t=2.88, p=0.031) and Once calves (28514±10675 ng/mL, t=3.98, p=0.002). Serum haptoglobin concentrations were greater on d0 (618573±308871 ng/mL) than all other days (d14 69132±34519 ng/mL, t=3.99, p=0.001; d28 27010±13487 ng/mL, t=5.70, p<0.001; d41 16207±8093 ng/mL, t=6.63, p<0.001). Antibiotic treatment category did not affect chute behavior or chute score (p>0.05). Pushing behavior in the chute was 1.84x more likely on d-1 than d0 (χ2=4.91, p=0.027). Vocalization was 6.38x more likely on d0 than d-1 (χ2=6.00, p=0.01). Chute exit velocity was faster for Chronic (3.29±0.28 m/s) than Twice calves (2.42±0.21 m/s, t=2.40, p=0.04), and was faster (F=35.88, p<0.001) on d-1 (3.31±0.17 m/s) and d0 (3.28±0.17 m/s) than d14 (2.57±0.16 m/s), d28 (2.06±0.16 m/s), and d41 (2.59±0.16 m/s).

Despite subclinical signs of sickness detected through haptoglobin levels, this study found little evidence that chute behavior on arrival predicts future morbidity in beef calves.

Behavioral ethogram of adult commercial broiler hybrid chickens rescued from slaughter: A pilot study

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(1) Commercial broiler hybrid (CBH) chickens bred for rapid growth can experience immobility and health complications. A sound CBH typically spends over 75% of the day lying, inactive, which increases with lameness and as birds reach slaughter weight at 6-7 weeks (Weeks et al 2000; Jacobs et al 2021). Critics argue that CBHs cannot maintain health and good welfare beyond slaughter age. However, some farm sanctuaries anecdotally report successful management of older CBHs with regulated feeding and enrichment, although such observations remain unpublished in scientific literature. This pilot study characterized the behavioral repertoire of a small cohort of adult CBHs rescued from slaughter and used an ethogram to document adult CBH behaviors for the first time. We hypothesized that adult CBHs can be healthy and display positive welfare behaviors distinct from those in production environments.

(2) Five CBH females (2-3 years old) were observed in a 49 m^2 climate-and-light-controlled indoor enclosure with windows, enrichment, dirt, and foraging substrate. Using established ethograms (Abeyesinghe et al. 2021; Adler et al. 2023), we recorded 11 active behaviors, 4 inactive behaviors, human interaction, and health parameters. Behaviors were recorded by live observation within the habitat or live video. Focal sampling of all behaviors of each bird (n=5) occurred every minute for 5 minutes (repeated 4 times; n=100 sample points/behavior) during 30-minute periods between 08:30 (after completion of feeding) to 14:30 h (before feeding time) over one week. The percentage of sample points on which the behavior occurred was calculated for each behavior.

(3) Active behaviors occurred in 74% of sample points. This included foraging (41%), interaction with other objects/enrichment (18%), preening (20%), locomotion without foraging (21%), drinking while standing (8%), other behaviors including wing flap, feather ruffle, stretch (4%). In human presence, birds spent 78% of time within 0.5 m of the observer. Health parameter scores were: Gait 0/3 (n=5); Hock burn 0/4 (n=5); Pododermatitis 0/4 (n=3), 1/4 (n=2); Feather cover 0/5 (n=5); Breast plumage dirtiness 0/3 (n=5). (4) Activity levels and behaviors differed markedly from those reported in production settings, challenging assumptions regarding adult CBH behavior and welfare. Although limited by sample size, our findings suggest adult CBHs can, with proper care, lead healthy lives with positive welfare. This pilot study provides the foundation for a larger project incorporating additional sample points, diagnostics, and larger cohorts to further elucidate the behavior and welfare of adult CBHs in sanctuary and companion settings.

Evaluating the relationship between temperament, productivity, and metabolic status in dairy cows

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Understanding animal temperament may enhance commercial management practices, optimizing production efficiency and welfare. Common temperament tests assess specific temperament traits like fearfulness and excitability but may overlook other behavioral dimensions. The startle response, a universal reflexive reaction linked to shyness–boldness, exploration–avoidance, and activity, has been used as a temperament test in other species but remains underexplored in dairy research. Therefore, we aimed to evaluate the relationship between startle response, milk production, and metabolic status in dairy cows. We hypothesized that greater startle response would be associated with lower milk yield (MY) and altered metabolic status, measured using the fat-to-protein ratio (FPR). Thirteen Holstein cows (parity 2–3; 57–94 days in milk [DIM] at trial onset) were studied over a 45-day period in a commercial production facility. Daily MY (kg/d), total rumination time (RUM; min/d), and FPR were recorded using a commercial automated milking system. After cows entered the dry period, a startle test was conducted to assess behavioral reactivity. Each cow was individually tested in a 20' × 20' enclosed pen containing one umbrella centered on each of the four walls (n = 4 umbrellas). Startle behaviors measured include startle magnitude (MAG; total continuous movement duration immediately post-stimulus until cow ceases to move; measured in seconds) and activity (total movement within 1 min post-stimulus; measured in seconds). Cows were tested in a random order and observers were blinded to production data during behavioral scoring. Data were analyzed using SAS 9.4, with significance set at $P < 0.05$. Regression analysis (PROC REG) was used to examine relationships between startle response and production traits. MAG was significantly correlated with FPR ($P < 0.01$; $R^2 = 0.17$), while activity also showed a weak but significant correlation with FPR ($P < 0.01$; $R^2 = 0.03$). Milk yield was positively associated with RUM ($P < 0.01$; $R^2 = 0.45$) and activity ($P < 0.01$; $R^2 = 0.45$). However, there was no significant correlation between MAG and MY ($P = 0.47$; $R^2 = 0.43$) or between RUM and MY ($P = 0.21$; $R^2 = 0.02$). These findings suggest that while startle response may have some association with metabolic status, it does not appear to strongly influence MY. Additional physiological and management factors likely contribute to production variability. Future research should further explore startle response as a potential behavioral phenotype to better understand its role in predicting production traits and overall dairy cow performance.

The effect of coping style and early life environment on play behaviour in suckling pigs

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The level of cognitive stimulation in early-life environments and coping styles (personality) can interact to influence pig behaviour. Examining interactions between these factors can help to understand the conditions which influence the expression of play. This study aimed to determine whether piglets with opposing personalities express different levels of play, and whether this depends on their environment. Piglets from three batches of ten litters were raised in conventional farrowing pens with two litters/batch assigned to one of five treatments: COM: opportunity to commingle with the neighbouring litter; ES: extra space (6m2 vs. 4.35m2); TOY: rotation of three chewable plastic toys; STRAW: straw on a mat; and CON: control litters reared as standard. On day 18±1 after birth, piglets were back-tested, and their personality determined based on Luo et al., (2019; Proactive: ≥3 escape attempts, or two escape attempts plus ≥25 high-pitched vocalisations; Passive: two escape attempts plus ≤24 high-pitched vocalisations, or ≤1 escape attempts). On days 5, 10, 15, 20, and 24 litters were filmed from 09:00–15:00, and based on when pigs were active, 6x30 min periods/day were selected to observe play behaviour (object, social, and locomotor-play). The frequency of behaviours was summed across all observation days to produce a total frequency for each behaviour. Associations between behaviour, treatment, personality, and their interaction were analysed by mixed-effects regression with sow as the random effect in Stata-18. Personalities were evenly distributed within each treatment. Personality interacted with treatment to influence the frequency of behaviours (P<0.05). Passive piglets expressed more object and social-play in STRAW (z-statistic: 2.1; 2.03) and TOY (z-statistic: 1.98; 3.54 respectively), and more locomotor-play in TOY (z-statistic: 3.87) compared to proactive piglets (P<0.05). The frequency of play did not differ between personalities in CON, ES and COM (P>0.05). The ES treatment had the highest frequency (mean±SE; z-statistic) of social (25.8±5.41;4.8) and locomotor (70.8±13.21; 5.4) play; TOY had the highest frequency of object-play (13.5±6.75; 1.99). CON, STRAW, and COM had intermediate to low frequencies of each behaviour. Greater expression of play by passive piglets in STRAW and TOY could reflect the higher tendency of this personality to be behaviourally flexible and to show a stronger behaviour response to changes in their environment, i.e.: provision of enrichment/novelty. Lower levels of play expressed by proactive piglets reflect their tendency to show a transient response to novelty/changes in their environment. Providing piglets with extra space facilitates the greatest amount and variety of play types and supports play regardless of personality.

Separated but not forgotten: Calf behavioral responses to temporary separation and reunion with the dam

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Current dairy industry practices often involve separating the calf from the dam immediately after birth, but little is known about the calf's behavioral response to separation and its impact on affective state. The objective of this study was to evaluate behavioral responses of dairy calves during temporary separation and reunion with the dam. Holstein dairy cow-calf pairs (n=7) were housed in individual box stalls for approximately 48 hours (range: 36-60h) before testing. Temporary separation tests were conducted in 3 phases (pre-separation, separation, and reunion) of 90 min each between 1330 to 1830h. During separation, the calf was moved to a separate pen while the cow stayed in the home pen. Both had auditory but no visual contact. Distractions were removed and outside noise was reduced with closed doors. Cameras continuously recorded the first 60 min of each phase and behaviors were analyzed using BORIS software. Six behaviors were recorded: suckling udder, allogrooming the dam, touching/sniffing the dam, exploring/searching (of surfaces in pen), locomotory play, and self-grooming. Behavioral differences between all phases (except dam-directed behaviors not possible during separation) were analyzed using Kruskal-Wallis test. Suckle udder duration was greater in reunion (mean ± SD) (223.03±172.32 s) than pre-separation when it never occurred (P<0.01). There was no difference between phases in allogrooming (pre-separation: 0.81±2.13 s; reunion: 8.28±2.69 s; P=0.23), or touching/sniffing the dam (pre-separation: 22.90±18.26 s; reunion: 24.90±19.73 s; P=0.85). There was no difference in exploring/searching surfaces in the pen (pre-separation: 216.09±196.41 s; separation: 234.61±145.87 s; reunion: 136.07±134.20 s; P=0.31) phases. There was also no difference between phases in playing (pre-separation: 3.65±9.65 s; separation: 2.36±6.24 s; reunion: 8.90±15.52 s; P=0.43) or self-grooming (pre-separation: 16.36±30.16 s; separation: 8.76±9.53 s; reunion: 5.64±9.78 s; P=0.87). Overall, of the behaviors measured, calves showed little change in response to temporary separation; however, calves appeared to show a rebound in suckling behavior upon reunion, even after a short separation period. This may suggest that suckling is a comfort behavior after experiencing a negative event, which deserves further examination as a measure of affective state.

The impact of housing on the activity time budget of post-weaned sows

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Proposition 12 is a far-reaching ballot initiative passed in California that allows female breeding pigs to be confined in a crate only during farrowing and lactation. A unique aspect of Proposition 12, compared with other legislation, is that immediately post-weaned sows cannot be crated. Little is known about the welfare of post-weaned sows, as previous research has focused on productivity and the physical health of the animals, rather than psychological health. Here we examine the impact of housing on the activity time budget of behaviors associated with positive and negative welfare. We hypothesized that post-weaned sows housed in groups, when compared to animals housed individually in stalls or small pens, will exhibit more behaviors associated with positive welfare and fewer associated with negative welfare. Immediately after weaning at 28 to 35 days of lactation, 53 parity-one sows in 5 batches were randomly assigned to one of three treatment housing types without enrichment: stall (limited mobility/limited social contact), and two types of Proposition 12 compliant housing systems - individual pen (increased mobility/limited social contact) or group (most mobility/full social contact). Scan sampling and instantaneous recording methods were used to code 15 different behaviors at 5 minutes intervals on day 1, 4 and 7 post-weaning. Data was collected only between 6am and 8am, 10:30pm and 12pm and 2:30pm and 8pm to avoid coding behaviors possibly influenced by humans performing basic husbandry tasks. The odds ratio (OR) or likelihood of different behaviors being observed between treatments was modeled and tested for statistical significance using logistical regression mixed models with housing and day post-weaning as fixed effects and sow ID and batch as random effects.
Significant treatment effects ($p<0.05$) were found for 5 different behaviors which could be categorized as related to negative or positive welfare states. Compared to stalled sows, group housed animals exhibited differences in multiple behaviors associated with positive welfare including increased movement (OR = 3.97) and increased nosing of other pigs (OR = 3.62) while engaging in only a single negative behavior, aggression (OR = 6.44). In contrast, individually penned animals only exhibited differences in negative behaviors including reduced lying (OR = 0.58) and increased interaction with the pen (OR = 1.97). This work highlights the complexity of sow housing, as two Proposition 12 compliant housing schemes produced different behavioral time budgets and suggest different welfare outcomes. These findings also implicate social contact, in addition to confinement, as a possible determinant of housing impact on sow behavior and welfare.

Poster Presentations

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39	*Jordan Tonooka*	A descriptive survey on the early rearing environments of dairy goat kids in the US – Focus on environmental enrichment
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Abstracts - Posters

Stimulating Minds: Investigating the motivation of calves to engage with cognitive enrichment through participation measures.

Georgiana Amarioarei[1,2],Marjorie Cellier[1,2], Nadège Aigueperse[1,3], Tania Wolfe[1,2], Nicolas de Montigny[1,4], Hayda Marcia Soares Almeida[1,4], Elise Shepley[1,5], Abdoulaye Baniré Diallo[1,4], Elsa Vasseur[1,2]

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Introducing cognitive enrichment from an early age has the potential to enhance an animal's capacity to learn both simple and complex tasks, promote neural plasticity, and support cognitive development. This is applicable for young cattle who are at a critical stage in their development and could benefit from the influence cognitive enrichment has on their behavioral expression. This study aims to explore the motivation of weaned dairy calves to engage with cognitive enrichment by analyzing measures of participation over time. Furthermore, we will investigate whether calf performance in the form of measured success rates is a factor influencing the motivation to participate. We hypothesize that providing the opportunity to access cognitive enrichment will have an effect on the calves' motivation to participate in cognitive challenges and engage with the enrichment. Additionally, we expect there to be a correlation between participation and ability to solve the cognitive tasks. Our study involved a total of four pairs of weaned calves (n=8). The experimental groups were presented with three variations of a puzzle box, each equipped with unique challenges that offer different solutions (push, slide, pull). These boxes were provided to the calves over the span of nine days in an isolated corridor behind their pen. We investigated participation through measuring the frequency to visit the enrichment and we measured the success rates of each calf by processing a predetermined pass/fail criteria of daily performance. Our preliminary results show that on day one of the experiment, the average participation was 2.7 ± 1.4 with a success rate of $58 \pm 0.4\%$. By day nine, participation was 2.6 ± 1.6 with an average success rate of $76 \pm 0.4\%$. These results indicate that there may be no notable change in participation level over time such that the animals are consistently motivated to access enrichment. Moreover, these results allude that there may be a progressive increase in performance success, possibly due to consistent participation. For future analysis, these results will be used in conjunction with the durations and latencies of use, to investigate further potential correlations between participation and success rate.

Hoofing it to new homes: How the transition towards a new housing system is experienced by dairy cows.

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In response to a 2023 change in the Dairy Code of Practice that prohibits continuous tethering as of 2027, there is a predicted rise in the construction of free-stall and stall-free barns, and more cows transitioning between housing systems. The transition period of dairy cattle after a housing change is of interest from a welfare standpoint as there are behavioural adjustments, and potential stressors that could influence their ability to adapt to a new environment. Therefore, this study aims to understand how the transition towards a new barn is experienced by lactating dairy cows and is divided into 2 case studies: (1) Examining how the transition to a new housing system affects the cows' time-budget and how long it takes to stabilize, and (2) Assessing how previous housing system influences the behaviour of cows and their reactivity to milking once they have adapted to their new environment.

Thirty-eight cows from various farms were relocated to a bedded-pack barn on an enrollment basis. Initially, cows remained in their original groups for 10 days before being regrouped into larger groups. Data was collected after arrival via video recordings (2-3 hours, three times per day, three times a week, for 5 weeks) and live observations of milking reactivity at the parlour, conducted twice weekly. In the first case study, we will establish the time-budget of two groups (n=8 & 11 cows) using scan sampling at the group level. In the second case study, the individual time-budgets of a subsample of cows from four groups (n=8-11 per group) will be assessed by scan sampling for two weeks following regrouping, and analysed to explore how previous housing system affects the behaviours of dairy cows once adapted to their environment. As for milking reactivity, preliminary results showed that more tie-stall cows were reactive than free-stall cows on the first and last day of the experiment. Behaviours include kicking (1st day: tie-stall=12.5% of cows, free-stall=8.3%; last day: tie-stall=12.5%, free-stall=8.3%), stomping (1st day: tie-stall=75%, free-stall=41.7%; last day: tie-stall=50%, free-stall=25%), and reactivity to the milking attachment (1st day: tie-stall=25%, free-stall=16.7%; last day: tie-stall=25%, free-stall=0%). This could be due to free-stall cows being used to traveling at milking, compared to tie-stall cows that get milked at their stall.

Overall, this study will provide insights into how dairy cows respond to housing transitions and the role previous housing systems play in their adaptation.

Design and implementation of individual fear tests for cage-free laying hens

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As the laying hen industry transitions to cage-free systems, balancing efficient production with bird welfare will ensure long-term industry sustainability. One aspect of welfare is affective state, which considers the animal's individual experience. Fear tests, designed to capture responses to specific events and stimuli, are one way of assessing affect. As part of a larger study on hens in aviaries with differing configurations, two tests were designed to assess levels of fear in novel situations at two timepoints across the two designs. We hypothesized that age of hens would have a larger impact on levels of fear than aviary type, as many management factors were the same. At 16 weeks of age (WOA), Hy-Line Brown pullets were moved into 3 rooms with two different styles of aviary (A= 2 rooms, B=1 room), each with 4 pens. Testing took place at pre-peak lay (PRE) from 17-24 WOA and post-peak lay (POST) from 36-42 WOA with 5 hens from each pen (A=40 hens, B=20 hens). Emergence testing (EMT) measured willingness and latency to exit an enclosed box into a novel arena, while human approach (HAT) measured willingness and latency to approach (within 60 cm) a novel human sitting at the opposite end of the arena. Willingness to emerge or approach were analyzed using Fisher's Exact Test, and latency values for hens that did emerge or approach were analyzed using a general linear mixed model with fixed effects of timepoint and aviary type and random effect of room nested within aviary type (SAS 9.4). Analysis of EMT showed a variation of responses and latencies, but no effects of timepoint or housing type on the variables measured ($p > 0.05$). For HAT, willingness to approach the novel human did differ between timepoints, with 78.3% of hens approaching the human in the PRE timepoint but only 43.3% in POST ($p = 0.0002$). There were no differences between aviary types. For hens that did approach, there was no effect of timepoint or housing on latency ($p > 0.05$). The lack of major differences across ages and housing types is not surprising given the consistency of genetics and management within this flock. The decreased approach toward humans in the second timepoint could be explained by less human presence on the farm as hens aged. Future applications of these tests to more diverse populations of hens could be a valuable tool in assessing affective states of individual birds within larger flocks.

Tele-advice for Supporting Cats with Chronic Mobility Problems and their Caregivers

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A prevalent chronic health condition in companion cats is degenerative joint disease (DJD), commonly referred to as arthritis. This disease may result in ongoing mobility-related pain and problems, which require long-term at-home management, and regular veterinary monitoring appointments. However, many caregivers do not routinely bring their cat to a veterinarian. Veterinary video tele-advice represents one possible solution to reduce accessibility barriers; improving compliance with treatment plans and access to care and education. Thus, we aimed to assess the perceptions of caregivers on using video tele-advice appointments for supporting at-home care and management of their cat(s) living with chronic mobility problems such as DJD. Caregivers of cats with chronic mobility problems from the US and Canada (N=106) completed a recruitment survey and were randomly allocated to a treatment (n=63) or control (n=43) group. Both groups completed two questionnaires approximately four months apart, which included questions regarding their cat's mobility and their attitudes towards video visits. During these four months, participants in the treatment group received a video tele-advice visit every 3 weeks (6 visits total). Participants in the control group did not receive these visits. Data analyses involved descriptive statistics, examining differences between initial and final survey responses for treatment and control groups via Wilcoxon Signed Rank Tests, and a linear mixed model to evaluate impacts of various explanatory variables on reported cat mobility. Most participants were women (79.2%), aged 30-49 (56.6%), living in suburban areas (50%), and residing in California (26.4%). Cats included 63 spayed females and 43 neutered males, with an average age of 12.2 (min: 1, max: 21) years old. Overall, participants indicated they were very interested (initial control: 60.5%, final control: 51.2%; initial & final treatment: 60.3%) in using video appointments to help manage their cat's chronic mobility problems at home. Comparison of initial and final questionnaire responses indicated that ratings of perceived helpfulness (p=0.0032) and knowledge (p<0.0001) of home management strategies increased for those in the treatment group but not those in the control group over the course of the study. Regression results suggested a greater interest in telehealth for home-management associated with caregivers caring for cats with higher mobility impairment (p=0.046). Findings suggest that caregivers of cats with mobility problems perceive video telehealth visits as benefitting both themselves and their cat. Veterinarians should consider incorporating video telehealth check-ins for their patients with chronic conditions such as DJD, who may benefit from increased access to care but may show resistance to frequent in-clinic visits. Telehealth visits may be conducted by veterinarians or knowledgeable non-veterinarian staff for

providing advice and education to support and maintain high quality in-home cat care. Future research should examine specific in-home interventions commonly recommended for cats with chronic mobility issues such as elevated food and water dishes, and low-sided litterboxes, to evaluate effects on cat mobility and welfare.

Effect of personality traits of primiparous dairy cows on their adaptation and response to prepartum training to an automated milking system

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The objective of this study was to determine how the personality of a cow affects their adaptation to an automated milking system (AMS), and their response to being trained or not on the AMS pre-partum. Twenty-eight pregnant Holstein heifers were enrolled 21 d prior to their expected calving date and assigned to 1 of 2 treatments: control (CON; no training; n=16), and training (TRN; included exposure to AMS environment, concentrate, and mechanical arm and noises; n=12). TRN cows were trained on the AMS 14 d before calving for 3×/d for 4 d. All cows calved in singular maternity pens and were then moved to the AMS pen to be milked by the AMS. Ease of entry to the AMS (0=unassisted to 6=heavy assistance) was recorded for the first 6 milkings. Milking behavior and time spent in the fetch pen (min/d) were recorded for the first 21 d. Cows were assessed for personality after the 21-d period using a combined arena test comprised of 3 parts: a novel arena test, a novel object test, and a novel human test. Behavioral observations from personality testing were analyzed using principal component analysis (PCA) to determine personality traits and associated PCA factor scores for each cow for the identified personality traits. The PCA revealed 2 factors interpreted as the personality traits of active and bold-vocal (factor score range: –1.8 to 2.5). The effect of personality trait (factor score) and treatment were analyzed using mixed-effect linear regression models. During training, TRN cows that scored high for bold-vocal had a worse ease of entry score on training d 3 (ease of entry score=0.78×bold-vocal score + 3.8; P=0.04) and 4 (ease of entry score=0.92×bold-vocal score + 3.8; P=0.03) compared to less bold-vocal TRN cows. There were treatment × factor score interactions (P≤0.05) for milking outcomes. Specifically, no association with factor score was detected for TRN cows, but for CON cows, greater factor scores for active and bold-vocal tended to be associated with more fetching events (fetches (#/d)=0.13×active score+0.94; P=0.10) (fetches (#/d)=0.18×bold-vocal score + 0.95; P=0.09) and more time spent in the fetch pen (time (min/d)=1.95×active score+13.58; P=0.10). Overall, the results demonstrate that primiparous cows of certain personality types may require more training on the AMS to improve adaptation.

Effects of thermal efficiency index and electrolytes on pig responses to handling and mixing stressors

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The feed efficiency of pigs can be estimated using a thermal efficiency index (TEI), measured using infrared technology, and may also predict their stress response. In addition, an electrolyte solution, DSS500 (DSS) has been shown to mitigate stress in pigs. This study examined the effects of TEI and DSS on pigs' response to controlled handling and mixing stressors. We hypothesized that low TEI and provision of DSS would reduce handling stress and aggression at mixing.

A total of 176 pigs were enrolled over two replicates. At 8 weeks of age, pigs were scanned using an infrared camera to determine TEI (mean dorsal temperature/body weight 0.75). Per replicate, 44 High and 44 Low TEI category pigs were selected and housed at 11 pigs/pen. At 12 weeks, pigs received a handling stressor with TEI recorded before and 5 minutes after handling. Pigs were moved 90m in groups of 5-6. At 16 weeks, pigs were mixed into unfamiliar pens (6 residents, 5 intruders) for 2 hours with TEI recorded before and after. During each event, half of pens received DSS in water (3% solution for 48h period) and half received none (Control). During handling, the behaviour of all pigs was recorded at 10s intervals by one observer (%running, standing, walking). Body lesions were scored before and after mixing using a four-point scale (0 =none; 3 =≥11 lesions). Analysis was done using mixed models in SAS (9.4) with main effects of DSS, TEI category and their interaction.

During handling (12 weeks), DSS tended to affect ΔTEI, with pigs given DSS showing greater change (P=0.053). In the mixing stressor (16 weeks), DSS pigs had greater ΔTEI than Controls (DSS: 0.045 ±0.008 vs Control: 0.008 ±0.008; p=0.01), and no effect of TEI category. TEI category and DSS treatment did not affect behaviour during handling. DSS treatment affected lesion scores at mixing: Control animals received more head lesions (DSS: 1.54 ±0.15 vs Control: 2.29 ±0.15; p=0.01) and tended to have more mid-body lesions (p=0.08) compared to DSS. TEI category tended to influence hind-end lesions; with High TEI pigs less than Low (p=0.07).

Use of an electrolyte solution in water significantly reduced lesion scores at mixing compared to Controls and produced a greater change in TEI in response to handling and mixing stressors. TEI category tended to affect hind lesion scores after mixing, and further behavioural data may provide insights into this effect.

A mother knows: The influence of parity on maternal behavior in dairy cattle

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Producers have anecdotally reported skepticism regarding primiparous cow's degree of maternal care, and that selective breeding has weakened maternal traits. The objective of this study is to compare maternal behavior of multi- (n=4) and primiparous (n=4) Holstein dairy cows. Cow-calf-pairs were housed in individual box stalls. Calves (birth weight range: 29.0-42.6kg) were bottle-fed 4L of colostrum (Brix score>22) within 8h. Cows were milked twice daily. Video was recorded for 24h after cow-calf pairs entered the box stall, and sampling was performed continuously for 4 behaviors: touching duration (muzzle of cow in contact with calf), allogrooming duration (cow licking calf), number of calf checks (cow re-orientation towards calf followed by touching), and aggression occurrence (cow pushes or kicks calf). Touching, allogrooming and 'calf checks' were analyzed with a linear regression model (parity and birthweight as fixed effects), and aggression occurrence (binomial variable) with a Fisher Exact Test. Multiparous (vs. primiparous) cows tended to touch their calves more (13.2±1.9 min/24h, range: 6.4-18.2min/24h; vs. 7.4±2.1min/24/h, range: 6.3-8.6min/24h; respectively; P=0.1) with one extreme primiparous outlier removed from analysis (103.6min/24h). There was no difference in allogrooming between multi- and primiparous cows (65.2min/24h, range: 27.1-108.2min/24h; vs. 93.7±13.8 min/h, range: 40.1-133min/24h; respectively; P=0.2); however, lighter calves received more allogrooming (P=0.03). Number of 'calf checks' did not differ between multi- and primiparous cows (49checks/24h, range: 34-61checks/24h; vs. 64±8checks/24h, range: 35-86checks/24h; respectively; P=0.2); however, lighter (vs. heavier) calves tended to be 'checked' more frequently (P=0.09). There was no parity effect on aggression occurrence (P=0.5). Overall, measures of maternal behavior did not differ between multi- and primiparous cows, but our sample size is limited with large variation in maternal behavior expression. Some maternal behaviors were more directed at lighter vs. heavier calves, possibly to induce vigor, but this remains to be understood.

Does where you get your pet matter? Exploring relationships between pet attachment, pet source, and owner management

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Dog and cat owners acquire their pets from various sources (e.g., shelters, breeders); however, it is unknown how source relates to human-animal relationships. To explore this, we developed an online questionnaire targeting current dog (n=359) and cat owners (n=206) in the United States and Canada. Participants were asked to report their motivation for acquiring their pet (i.e., guardianship, teaching responsibility, emotional support, companionship), acquisition source (i.e., breeder, rescue, family/friend, stray), and attachment to their pet using the validated Lexington Attachment to Pets Scale (LAPS). We also asked questions about the owner (e.g., gender, urban classification), the pet (e.g., breed, outdoor access), and owner management (e.g., play time). Data were summarized using descriptive statistics, and linear regressions assessed relationships between pet attachment and pet acquisition method. Most participants were women (dog owners: 85.1%; cat owners: 86.3%), in the United States (dog owner: 98.6%; cat owner: 96.1%), with a mean (± SD) LAPS score of 79.3 (± 9.8) for dog owners and 77.1 (± 12.3) for cat owners. Most participants acquired their dog from breeders (32.7%, 83/254), while cats were acquired as strays (39.9%, 59/148). For cat owners, source was associated with reported improvements in the owner's life after acquisition (p=0.03), with more owners who acquired their cats from shelters reported stronger agreement with their life improving after acquisition compared to those that acquired from breeders. Results indicated that motivation to acquire their pet did not predict source; however, owners acquiring pets for emotional support reported higher LAPS scores, compared to those that did not adopt for emotional support (dog and cat p<0.0001). Cat owners had higher LAPS scores if they acquired their cat from shelters (p=0.010; vs. stray), and lower scores if they acquired their cat from pet stores compared to breeders (p=0.037) or shelters (p=0.01). Source did not influence reported LAPS score for dog owners (p=0.69). Lower LAPS scores were associated with their dog spending most of their time outdoors (p=0.03; vs. indoors) and living in suburban areas (p=0.02; vs. urban). Higher LAPS scores were associated with daily play time (dog p=0.0005; cat p<0.0001), being sole caregivers for their pet (dog: p=0.013; cat: p=0.015), and being a woman (dog p=0.001; cat p<0.001). Results can inform adoption marketing, retention strategies, and welfare efforts by identifying factors that promote stronger human-animal bonds. Future longitudinal research will explore causal relationships, particularly how acquisition source relates to pet-owner interactions and caregiving practices.

Impact of Heat Stress on Physiological Indicators and Growth Performance of Pre-Weaned Dairy Heifer Calves in a Humid Continental Climate

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In Canada's humid continental climate, dairy calves go through a wide range of thermal conditions throughout their production cycle, making them susceptible to heat stress. Our objective was to determine whether these conditions can trigger similar consequences typically associated with more chronic heat stress. Holstein heifer calves (n=138) were enrolled at birth from two Ontario, Canada commercial dairy farms between May and August 2024. Farms were visited 3x/wk and calves were weaned at ~10wk of age. Calves were weighed weekly until weaning to calculate average daily gain (ADG). Calf rectal temperature and respiratory rate were measured at each visit and averaged per week. Data loggers, placed within pen at calf level, recorded ambient temperature and relative humidity every 10-min. Temperature-humidity indices (THI) were calculated, including the average weekly THI, weekly maximum THI, and the average h/d/wk for which THI exceeded the thresholds of 65 and 69. Data were analyzed using mixed-effects linear regression models for repeated measures, with farm and calf within farm included as random effects. Weekly THI averaged 63.7±5.7 (mean±SD), ranging from 50.1 to 75.2. Weekly maximum THI averaged 76.8±4.4, ranging from 66.6 to 88.3. The average time per day (and range) above the THI thresholds of 65 and 69, were 12.8±5.7 h/d (0.5-23.2 h/d) and 7.4±4.8 h/d (0-20.4 h/d), respectively. Calf rectal temperature, respiratory rate, and ADG averaged 39.2±0.4°C, 54±12.4 breaths/min, and 0.75±0.56 kg/d respectively. For every 1-h increase in the time (h/d) THI exceeded 69, rectal temperature (±SE) increased by 0.01±0.004°C (P=0.02). For every 10-unit increase in the weekly average and maximum THI, respiratory rate increased by 5.4±1.5 breaths/min (P<0.01), and 14.1±1.9 breaths/min (P<0.01), respectively. For every 1-h increase in time (h/d) THI exceeded 65 and 69, respiratory rate increased by 0.7±0.1 breaths/min (P<0.01) and 1.0±0.1 breaths/min (P<0.01), respectively. For every 10-unit increase in the weekly average THI and maximum THI, ADG was reduced by 0.13±0.04 kg/d (P<0.01) and 0.21±0.05 kg/d (P<0.01), respectively. For every 1-h increase in the time (h/d) THI exceeded 69, ADG was reduced by 0.01±0.005 kg/d (P=0.03). The results demonstrate that intermittent exposure to high temperatures and humidity in a humid continental climate can lead to physiological changes and reduced ADG in dairy calves, highlighting the need to manage heat stress to optimize performance. Investigating heat stress thresholds in calves and understanding its impact on growth will encourage producers to implement better mitigation strategies, promoting both animal welfare and productivity.

Animal welfare risk assessment for horses and bulls in the holding pens at a large Canadian rodeo

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The Five Domains model for animal welfare risk assessment was applied to evaluate the condition and treatment of horses and cattle in the holding pens at a large Canadian rodeo. The objective was to identify potential risks to animal welfare specific to the period before competition events when animals are in holding pens using existing assessment methods. Environmental conditions, animal health and behaviour, and human-animal interactions (HAI) were recorded for 9 competition days. The hourly ambient temperature between 0900-1700 h in the holding pens was 26±4°C (mean±SD), with a range of 17-37°C. The temperature-humidity index (THI) averaged 71±5 (range: 62-81). Between 1000-1200h, heat stress was assessed for bulls by live observers who recorded the respiration rate (RR) and behavioural indicators, including sweating, panting with an open mouth and tongue out, and drooling. Since the schedule changes each day, with only some animals returning, this data collection method resulted in 111 assessments total for 85 bulls across 9 days. The average RR was 73±34 breaths per minute (bpm), with a range of 18-160 bpm. No bulls were observed to be sweating and only 1 bull was observed panting with an open mouth and tongue out. Thirty bulls were observed drooling at least once, resulting in 36 incidences of drooling total. While cattle tolerated the ambient temperature during the morning assessments, if temperatures continue to rise in the afternoon, bulls may be at increased risk of heat stress. To assess the handling of animals, 158 handling events were video recorded where rodeo staff moved 1 or more bulls or horses from the back pens to the loading chutes. Handlers were assessed using an established 6-point scale per event, with 0 being the least stressful handling and 6 being the greatest. Rodeo staff had an average handling score of 1±2, with a range of 0-5. During these handling events, the behaviour of individual horses and bulls was also recorded, resulting in 263 observations. The animals' willingness to be loaded into the chute was scored using an established 4-point scale, where 0 meant the animal moved easily and 4 meant they were challenging to move and resisted loading. The average behavioural score was 0±1, with a range of 0-3. These results demonstrate that rodeo-stock are well handled and behave calmly while being loaded into the chute. Future research will involve animal welfare risk assessment for horses and cattle in the holding pens after they compete in the afternoon.

Impact of Rider Levels and Horse Experience on Heart Rate Variability in Riding Lesson Horses

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Riding lesson horses experience unique stressors compared to other horses, including changing handlers with unpredictable skill levels and a high number of working hours, which have been identified as risk factors for conflict behaviours. Lesson facility operators believe that beginner lessons provide a less stressful experience for lesson horses than advanced lessons. However, little is known about what quantifies an appropriate workload for lesson horses. This study investigated the impact of rider level on heart rate variability (HRV) parameters (root mean square of successive differences (RMSSD) and low frequency/high frequency ratio (LF/HF)) in riding lesson horses. HRV parameters can be used to describe autonomic nervous system activity, providing a non-invasive measurement of stress and well-being. Data was collected from 26 riding lesson horses during 49 hunter/jumper riding lessons at eight Ontario lesson facilities. Of these lessons, 23 were "beginner" riders and 26 were "advanced". Heart rate data were collected for four time periods: 5min of baseline taken at rest (BL), grooming and tacking up (TACK), the first 5min of the ride following mounting (5MINS) and the full duration of the ride (RIDE). Heart rate data were downloaded and RMSSD and LF/HF were extracted in Kubios, normalized using log transformations and analyzed using Generalized Mixed Models. Multiple comparisons using Tukey-Kramer adjustments identified differences across rider levels and time periods. Rider level did not affect any heart rate parameters (all $p \geq .6021$). An increase in LF/HF was observed during 5MINS compared to the preceding period of TACK ($F(4,42)=4.29$; $p=.0053$), and RMSSD was lower during 5MINS and RIDE than BL and TACK ($F(4,42)=8.83$; $p<.0001$). A horse's years of experience working at the facility in question impacted RMSSD values, with horses with 7+ years of experience exhibiting higher RMSSD than those with <7 yrs ($F(2,42)=5.81$; $p=.0059$). While grooming and tacking up had minimal effect on HRV parameters, HRV data indicated increased activation of the sympathetic nervous system during the mounted portion of the lesson, particularly during the first five minutes of the ride. This may indicate that lesson horses understand the act of mounting signals that work or stressors are about to begin. These responses were not influenced by treatment, suggesting that contrary to industry belief, rider level may not meaningfully affect the horse's experience during work. However, long-term experience working at a consistent facility appeared to reduce levels of physiological stress in lesson horses, suggesting a predictable environment may be beneficial for equine welfare.

Where Do Dogs Prefer to Play? The Influence of Surface and Temperature on Dog Behavior

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Many pet dogs live in urban areas with limited access to open outdoor spaces. As a result, local agencies build community parks where dogs can play and socialize. Different surface materials can be used in these spaces, but the influence of these surfaces on dogs' behavior and preferences remains unclear. The aim of this study was to evaluate dogs' preference for natural or artificial grass surfaces in a play yard. A 12.2 × 12.2 m play yard was constructed and divided into nine plots (3.5 × 3.5 m). Each plot was randomly assigned one of three surface treatments: Bermuda grass (Control), Bermuda grass over a soil stabilizing grid (Honeycomb) to prevent soil compaction and provide cushioning, and artificial turf. Ten dogs received 10 play sessions, each consisting of three periods: a 5-minute acclimation period, 5 minutes of active play, and a 5-minute cool-down period. During the active play period, dogs participated in a fetch game involving toys and interaction with a familiar handler. Prior to each session, the environmental and plot surface temperatures were recorded. Sessions were video recorded, and dogs' behavior and location were coded using 10-second scan samples. Behaviors were grouped as active, passive, or elimination. The proportion of time spent on each surface was calculated relative to the total observation period. A generalized linear mixed model with a binary distribution was used to evaluate the effect of surface, session period, and their interaction on behavior. Treatment, period, and their interaction were statistically significant ($p < 0.001$) for active and passive behaviors but not for elimination. Dogs spent more time performing active behaviors during the acclimation period than during the cooldown period (0.28 ± 0.008 vs 0.13 ± 0.005), and more passive behaviors during the cooldown period than the acclimation period (0.11 ± 0.10 vs 0.01 ± 0.01). Regardless of behavior, dogs spent significantly more time on Honeycomb plots (0.46 ± 0.007) compared to Control (0.34 ± 0.006) or Turf plots (0.18 ± 0.005). When environmental temperatures exceeded 20°C, turf surfaces were more than 10°C hotter than natural grass. These findings suggest that surface type influences dog behavior in play areas, with dogs showing a clear preference for natural grass over artificial turf. Given the growing interest in designing safe and comfortable dog parks, understanding these preferences is important for promoting dog welfare, particularly in warmer climates where artificial turf may pose a risk of heat-related injuries.

Latching on: Early nursing behaviors in dairy cows and calves and the possible need for human assistance to suckle

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Primiparous cows are anecdotally thought to have poor mothering ability but there is no evidence to support this. We aimed to assess the early nursing behavior of dams, suckling behavior of their calves, and the possible need for human assistance to suckle between primi- and multiparous Holstein dairy cows. Cow-calf pairs (n=4 each primi- and multiparous) were housed in individual box stalls upon birth of the calf. Calves (body weight range: 29.0-42.6 kg) were bottle-fed colostrum (4L; ≥ 22 brix) after successful suckling (assisted or independent) within 8h of birth, and were assisted to suckle before milking (twice daily) if they did not suckle independently. Human assistance involved positioning the calf in inverse parallel and leading to the teat until independent suckling or diminished suckle reflex. Four behaviors were recorded and continuously analyzed over 24h: cow nursing avoidance (kick/move away from calf), successful suckling duration, teat-seeking attempts, and duration of human assist to suckle. Observer was not aware of parity status during video analysis. Linear regression models analyzed behavioral differences between primi- and multiparous cows (fixed effects: parity; calf BW). Parity did not affect nursing avoidance (primiparous:16.9±3.4 events/24h (range:14-26) vs. multiparous: 8.6±3.4 events/24h (range:4-17); P=0.15), nor suckling duration (primiparous:21.0±7.8 min/24 h (9.8-33.4) vs. multiparous:17.0±7.8 min/24h (0.37-36.1); P=0.73). Parity also did not affect teat-seeking attempts (primiparous: 29.0±4.4 attempts/24 h (17-42) vs. multiparous: 29.7±4.4 attempts/24 h (18-48); P=0.92), nor human assist to suckle duration (primiparous: 11.2±2.9 min/24 h (0-22.7) vs. Multiparous: 5.6±3.3 (0-16.2); P=0.28). One extreme outlier (multiparous: 47.2 min/24h) was excluded from analysis of human assist to suckle. Lighter (vs. heavier) calves tended to have fewer teat-seeking attempts (P=0.06) and required more human assistance to suckle (P=0.04). Our findings suggest that primiparous cows have similar mothering abilities compared to multiparous cows. Furthermore, it suggests calf body weight as a possible indicator of suckling success and the need for human assistance to suckle; this warrants further research if implementing extended cow-calf contact.

Preferences of growing pigs for various agri-food by-products and agricultural residues

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Feeding pigs with agri-food by-products and agricultural residues can reduce feed-food competition and improve nutrient circularity. Ten products (SS: downgraded spaghetti squash, CA: downgraded carrots, BB: barley brewer spent grains, BG: downgraded barley grains, BR: sprouted barley rootlets, OK: okara, AP: apple pulp, AC: downgraded almonds and chocolate, CS: corn silage, GS: grass silage) were tested for their palatability in growing pigs. The nutritional composition was also analyzed on a dry matter (DM) basis. Preference was tested using a repeated balanced incomplete block design, where 18 pigs (25.2±1.3 kg) were exposed to a different combination of 5 out of the 10 products. The products were ranked from 1 (most preferred) to 5 according to a Multiple Stimulus without Replacement (MSWO) preference assessment over a week. On Monday and Tuesday, a combination of 5 products was presented to each pig in a choice test for 3h (200 g/product). From Wednesday onward, the most preferred product from the previous day was removed, and the remaining products were tested again, until only two products were compared on Friday. Fresh intake and feeding behaviour (time spent with the head in the bowl) were measured on Tuesday. Comparisons were analyzed using ANOVA with the pig as a random factor and multiple comparisons were conducted using a Tukey adjustment.

Product	DM (%)	Protein (%)	Crude Fiber (%)	ME (Mcal/kg)	MWSO ranking*	Fresh intake (%)†	Feeding behaviour (sec)‡
AC	99	11	2.7	5.2	1.3[d]	93[abc]	734[ab]
SS	7	15	19.5	2.5	1.5[cd]	98[a]	923[a]
AP	20	5	12.1	3.4	1.7[cd]	87[ab]	675[ab]
OK	13	21	25.9	2.8	2.7[bc]	59[bcd]	446[bc]
BB	25	17	11.5	3.8	2.7[bc]	46[cd]	357[bc]
CA	10	12	11.0	2.6	3.3[b]	37[de]	620[abc]
CS	36	9	15.4	3.2	3.3[b]	16[def]	598[abc]
BG	87	12	5.6	4.0	3.8[ab]	8[e]	414[bc]
GS	39	16	27.0	2.0	4.8[a]	10[def]	372[bc]
BR	95	30	11.5	3.2	4.8[a]	0.4[f]	248[c]
Growing feed	90	21	3.3	3.7			

*SE=0.28; †back-transformed SE max=2.3; ‡SE=89; a,b,c: different superscripts mean difference with

P<0.05

Nutritional composition varied greatly, with most products being much more humid and richer in crude fiber than standard feed. However, only few were as rich in protein (OK, BR) or energy (AC, BB, BG). MWSO ranking, fresh intake, and feeding behaviour indicated that pigs showed a clear preference for sweet and humid products but not for silages or dry barley products. Replacing conventional feed with agri-food by-products requires balancing palatability and nutritional value.

Comparing continuous observation and subsampling for pain related behaviors after disbudding

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Disbudding is a painful management procedure that occurs on 94% of U.S. dairy farms. Pain-related behaviors can be used as indicators of dairy calf welfare in the weeks after disbudding, as wounds heal, however continuous sampling of these behaviors can be labor intensive. Our objective was to validate instantaneous sampling for measurement of known pain-related behaviors following caustic paste disbudding. A total of 33 dairy calves (24 Holsteins and 9 Jersey heifers) were video recorded at 6 wk of age. Of these, 18 calves were caustic paste disbudded at 3 d of age and 15 were non-disbudded controls who received a sham procedure. Video recordings were continuously sampled for 75 min beginning at 0630 h. Six pain-related behaviors that are commonly used in the disbudding literature were observed for their frequency. Continuous data were subsampled at 5 random start times (1-5 respectively: 00:00:00; 00:18:02, 00:07:00, 00:25:37, 00:02:28) for 5-, 10-, 15-, and 20-min intervals. All continuous and subsampled data were converted to a per min basis. Estimates obtained through subsampling were compared with true values via regression analysis. A subsample was considered an accurate representation if R2 ≥ 0.85, and if the slope and intercept were not significantly different from 1 and 0, respectively, as these values do not over- or underestimate true values. Continuous 75-min observation resulted in (mean ± SD) behaviors/min: 1.42 ± 1.70 ear flicks, 0.16 ± 0.14 head shakes, 0.07 ± 0.11 head rubs, 0.05 ± 0.05 head scratches, 1.18 ± 1.37 tail flicks, and 0.04 ± 0.03 transitions. No subsampling intervals of the continuous data produced consistently accurate representations of any of the pain-related behaviors analyzed. Of the 120 comparisons made across the 6 behaviors, 5 start times and 4 durations, only 2 subsamples for ear flick R2 values indicated a strong correlation (R2 ≥ 0.85), which may have occurred by chance. Some samples from the 20-min interval had R2 ≥ 0.80 but failed to meet the slope or intercept criteria (P < 0.05). Our approach to subsampling did not create consistent results with continuous observation indicating that this is likely not an appropriate way to save labor and time in the weeks following disbudding.

Dairy calf health and welfare in cow-calf contact systems on commercial farms in North America

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Limited research exists on dairy cow-calf contact systems in commercial farms, particularly regarding animal welfare and health. This observational study describes animal and resource-based measures of welfare and disease prevalence of calves reared by their dams on 12 commercial dairy farms in the USA (n = 10) and Canada (n = 2). Dairy farms practicing dam-calf contact as the primary calf rearing method were visited 3 times in 2024 (Spring, Summer, and Fall). All calves nursing their dams were assessed at each visit including body condition score, hygiene, and signs of respiratory disease (i.e., spontaneous cough, nasal discharge, eye discharge, ear score). Descriptive results are presented. A total of 431 calves (mean ± standard deviation: 36 ± 27 per farm) were assessed. Pre-weaned calves averaged 57.5 ± 56.6 days old at assessment (range: 1 day to 10 months). The majority of the calves (58%) were single dairy breeds, while the rest were either mixed dairy or dual-purpose breeds. Ten farms relied on maternal suckling for colostrum intake and all farms depended on the dam for nursing until weaning. All calves had access to cow feed and 7 farms also provided calf starter. Duration of daily contact varied between whole-day (6), part-time (less than 24h/d; 1), and a transition from whole-day to part-time as calves age (5). Seven farms keep part or all the male calves with the dam. Of the 8 farms that disbud calves, 6 provided pain mitigation. Male calves were castrated using rubber bands (8) and surgery (1; no castration: 3). Further, only 2 farms provided pain mitigation at castration. On average, weaning occurred for females at 3.6 months of age (range: 1.5 – 6 months) and 4.5 months of age (range: 2 – 6 months) for males. Health assessments showed 3% of calves were emaciated and 13% were over-conditioned. No calves were observed as lame and 1.6% were considered moderately dirty. Respiratory disease requiring monitoring or treatment affected 2.7% of calves. Results suggest that calf management with cows is variable between farms. Overall, calves raised with their dams showed good health.

Social hierarchy impacts response to reward downshift in sows

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Pigs are social, hierarchical animals. Frequent mixing and regrouping of unfamiliar animals are common production practices that result in disruption and re-establishment of hierarchies. Little research has focused on the emotional component of this experience. Reward downshift paradigms have been investigated as a promising method for evaluating the affective state of animals. Therefore, we sought to evaluate responses to reward downshift as a method for evaluating the affective states of high vs low ranking sows.

Pigs of either high (n = 8) or low (n = 9) social hierarchy (based on feed order in a group pen of approximately 115 animals) were enrolled. Experimental pigs were selected among three separate replicates, spanning a 6-months period.

Pigs were initially trained to approach and consume a sweet sports drink (Gatorade, 5.8% sugar). The reward was then downshifted to a 1:10 diluted solution (0.58% sugar), and the approach latency, volume consumed, and peak force applied on the reward container were measured for each subject over a 3 min test for four consecutive days.

We hypothesized that low-ranking sows would exhibit a stronger response to the downshift compared to higher ranking sows (i.e. higher approach latency, lower reward consumption and higher force applied). However, pigs of high social standing reacted to the downshift by decreasing their consumption both initially and over subsequent test days as well as slowing their approach to the reward over time. Low ranking sows also reduced their immediate consumption but failed to show any maintained changes over the remaining test days following the downshift.

The reward appears to be valuable to low-rank animals regardless of its quality, potentially reflecting a relative negative affective state. Our findings suggest that reward valuation can be promising tool for the assessment of an animal's affective states, but further research will be needed to fully understand its utility.

Anticipatory behavior prior to feed delivery of post-weaned sows

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Little attention has been paid to the impact of housing condition on the psychological health of post-weaned sows despite being an integral component of animal welfare. Anticipatory behavior (AB) is an increase in activity that occurs in the appetitive phase prior to receiving a known reward. This indicator of reward appraisal is thought to be influenced by an animal's underlying emotional state and may provide insight into their affective state. Thus, we investigated how two housing treatments impacted AB in response to the signaling of feed delivery.

Sows (n=24) were randomly assigned to housing in either an individual pen (4.09m2) or standard gestation stall (1.30m2) immediately post-weaning for seven days. Twice daily prior to the delivery of scheduled ~8 AM and ~1 PM feedings, pen-housed sows were moved into stalls adjacent to the stall-housed sows to control the environment where AB was observed. Behavior was video recorded and measured continuously for 15 minutes prior to feed delivery using an ethogram assessing posture, activity, and head placement. AB was defined as the total number of behavioral transitions during the 15-minute anticipation period. The impact of housing on AB was investigated using a linear mixed model with the number of behavioral transitions as the dependent variable, housing treatment, experimental day, and time of day as fixed effects, and sow ID as a random effect.

Contrary to our expectations, there was no impact of housing on AB, however, we found a significant effect of time of day ($p < 0.001$). This observation supports the relevance of our AB measure as the sows appear to anticipate feeding more after a longer wait between feedings (~5 vs ~19 h). To eliminate potential confounding effects of feeding time, analyses were repeated with AM measures only and yielded a significant effect of individual animal ($p < 0.001$). AB varied by over 5-fold across the study animals ranging from 7.2 to 35.7 behavioral transitions/min while quartile coefficient of dispersion was consistently between 0.09 and 0.24 except for 3 animals (QCD = 0.29, 0.36, 0.51).

Moving penned-sows to a crate prior to observation may have confounded AB responses and negated observation of any potential housing effects. Further investigation will be needed to elucidate the impacts of individual animal differences in anticipation prior to feed delivery. However, these results lay vital groundwork for the implementation of reward appraisal-based methods such as AB for assessing post-weaned sow welfare.

Current and novel approaches to selecting for improved maternal ability in pigs

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Maternal behavior has a significant impact on piglet well-being and survival during lactation. Maternal behavior traits are partially under genetic control and, therefore, can be improved via genetic selection. Objectives of this study were: 1.) to evaluate the impact of our current selection strategy for improved maternal ability; and 2.) to evaluate camera technology as a potential phenotyping tool for novel maternal traits.

The genetic trend for mothering ability (MAB) was constructed by averaging breeding values for MAB estimated for Topigs Norsvin Landrace x Large White (TN70) females from 2014 to 2023. Breeding values were estimated as the maternal effect on piglet survival using an animal model. Video data was collected using cameras mounted above free-farrowing pens (n = 40) at a Topigs Norsvin nucleus facility in Canada. Free-farrowing pens allow sows to move freely within their environment, enabling full expression of a sow's genetic potential for maternal behavior. Camera data captured from free-farrowing pens was analyzed using YOLO computer vision models. These models were used to detect sows and piglets, and to identify specific sow postures.

Results from this study show a favorable genetic trend for mothering ability from –2014 to 2023. Phenotypic trends, derived using data collected from commercial TN70 herds, support this finding. Phenotypic trends were constructed using data collected from farms with free-farrowing systems, indicating that our current selection strategy for improved maternal ability not only validates at the commercial level, but also for sows in alternative housing systems. Results of analyses of camera data show successful identification of sows, piglets, and various sow postures. The precision, recall, and mean average precision of detection for postures were 1/0.997/0.995 (lateral lying), 0.983/0.989/0.991 (semi-lateral lying), 0.969/0.968/0.980 (sternal lying), 0.969/0.992/0.985 (standing), 0.986/0.980/0.988 (sitting), and 0.984/0.934/0.969 (kneeling), respectively.

In conclusion, genetic trends show a consistent, favorable increase in genetic capacity for mothering ability throughout the last decade. Results also show that our current selection strategy for enhanced mothering ability validates at the commercial level, including commercial production in a free-farrowing environment. On-going data collection at our new (free-farrowing) nucleus farm in Canada, in which the full genetic potential of maternal behavior can be expressed, in combination with selection for novel behavior traits from camera data, are expected to increase the rate of genetic gain for maternal ability for future generations.

Play in Cage-Free Laying Hens: The Impact of Age and Aviary Design

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The poultry industry in the United States is undergoing a transition toward cage-free housing systems, but the impact of specific layout designs on hen welfare remains poorly understood. Play behavior is widely recognized as a positive welfare indicator in mammals but is rarely studied in laying hens. The goal of this study is to explore the effects of aviary design on play behavior in laying hens, as well as investigate whether play behavior is a suitable welfare indicator for adult hens. We hypothesize that aviary design and age will significantly influence the frequency of play. A total of 2,464 Hy-Line Brown laying hens were randomly assigned at 16 weeks of age (WOA) to two styles of multi-tiered aviary systems with litter area (N60 and STEP). Each aviary style was replicated in two rooms, with four pens per room: N60 housed 144 hens/pen × 8 pens and STEP housed 164 hens/pen × 8 pens. Video recordings of the litter area were conducted on the first day of each WOA at 17, 21, 27, and 32 WOA. A continuous 30-minute video segment was selected for analysis from 0605 to 0635 each day. Behavioral events were analyzed using BORIS with an ethogram developed within the software. After each play behavior, the number of birds in the litter area was recorded to calculate average space per bird, and whether the behavior was triggered by another bird in the same section playing or flying down the system was also noted. Generalized linear mixed models revealed a significant design × age interaction (p = 0.0003). Age significantly affected the likelihood of play behavior (p < 0.0001), while design showed no main effect (p = 1.0000). In both designs, frolicking and running decreased with age, while wing flapping increased; sparring did not differ across ages or designs. Fly and play by other birds triggered up to 48.2% of certain behaviors, with play being the most common trigger. Older birds exhibited reduced behavioral variability, leading to wider confidence intervals in some groups. Play behaviors were most frequent in both designs when individual litter space ranged from 1,400–2,200 cm^2, while wing flapping peaked in N60 when birds had 600–1,400 cm^2 of space. Behavioral patterns were primarily driven by age, while design alone had no effect, underscoring the importance of age-specific management in aviary environments.

Backyard duck keeping: Insights into reasons and needs

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Research on backyard poultry keeping has focused on chicken production, and little is known about backyard duck keeping. We conducted a US-wide survey of backyard duck keepers with the goal of benchmarking information about owner and flock demographics. An online questionnaire was distributed using snowball sampling through advertisements shared via social media, and duck hatchery Listservs and websites. Participants had to be at least 18 years old, live in the US, and own at least one flock of 1 to 100 ducks within the last 6 months. A total of 357 respondents met the inclusion criteria and completed the questionnaire. Respondents represented 46 of 50 US states. Most had 1-5 years of experience keeping ducks (56.0%). Some had over 10 years of experience (10.9%). Primary reasons for duck keeping included companionship (57.4%) and access to eggs (65.3%). Many viewed teaching children responsibility as a benefit of duck keeping (34.1%), and some kept ducks primarily for this reason (19.3%). The majority of respondents (58%) had other poultry before obtaining ducks. Respondents rated themselves as having moderate knowledge of proper duck housing (40.6%), nutrition (47%) and duck behavior (33.9%). Respondents reported slight (13.7%) to moderate (33.9%) ability to recognize sick ducks, and slight (29.7%) to moderate (38.4%) ability to treat sick ducks. While many participants indicated they did not have access to a veterinarian (40.0%), others indicated they had access to a general practice veterinarian (40.9%), and few had access to a veterinarian specializing in birds (18.2%). Respondents rated themselves as extremely unlikely (61.6%) to contact a veterinarian for bird housing or management advice, however were somewhat or extremely likely to contact a veterinarian if they had an injured (56.8%) or sick duck (63.7%). Most respondents ranked predation as moderate or major concern (80.8%). Other moderate to major concerns included leg problems/lameness (40.2%), diseases (25.5%) and aggressive behaviors (21.1%). This survey provides insight on backyard duck keeping, and can be used to develop informational materials to target duck keeper needs.

More than meets the beak: Factors affecting hens' use of pecking blocks in enriched colony systems

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Pecking blocks (PB) are a form of edible enrichment designed to encourage foraging behaviour in laying hens, but the effectiveness and practicality of their use in enriched colony (EC) systems, which vary in design, have not been studied. We aimed to determine how laying hens' use of PB differs over time between three styles of commercial EC, two genetic strains, and two types of commercially available PB. Laying hens of two strains (398 Dekalb White and 398 Bovans Brown) were housed in three styles of EC differing in layout, lighting and group size (30-bird (N=6), 32-bird (N=8), and 60-bird (N=6)). Each EC was provided with one mineral-based PB (MB) and one grain-based PB (GB) continuously in 4-week periods from 18 to 70 weeks of age (WoA). PB disappearance was determined by weighing each PB at the beginning and end of each period and evaluated on a per-bird-per-day basis. A generalized linear mixed model with repeated measures was used to analyze the fixed effects of strain, cage style, PB type and their interactions on PB disappearance. MB disappearance was greater (P=0.040) overall in the White strain (0.34 g/bird/day ± 0.046) than in the Brown (0.23 g/bird/day ± 0.031). Within strain, MB disappearance was greater than GB disappearance in both White (P<0.001) and Brown strains (P<0.001). There was also an interaction between PB type and EC style (P<0.001), in which MB disappearance in 30-bird EC was greater than 32-bird and 60-bird EC, and MB disappearance in 32-bird EC was also greater than in 60-bird EC. However, GB disappearance between three EC styles did not differ. Disappearance rates changed over time, which interacted with PB type (P<0.001) and EC style (P=0.042). MB disappearance was greater in most periods except those in summer months (43-59 WoA). Similarly, total PB disappearance was greater in 30-bird and 32-bird EC than 60-bird EC in summer months (47-63 WoA). This study showed that strain differences, differences in EC style, as well as variations resulting from the time of year and/or the age of the birds affect how they use different types of PB. Further research analyzing video footage of hens interacting with the PB would strengthen these conclusions.

Gradual vs. Abrupt Dry-Off in Dairy Cows: Evaluating Milking Motivation and Welfare in Automatic Milking Systems

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Dairy cows are commonly dried off abruptly; however, gradually reducing milking before dry-off can improve welfare by decreasing milk production, resulting in decreased udder engorgement. This ongoing study assesses how gradual vs. abrupt dry-off in an automatic milking system (AMS) affects cows' motivation to be milked. Holsteins were enrolled 74 ± 3 d before their expected calving date (n = 15/treatment). For cows in the gradual treatment, during the 2 weeks before dryoff, the amount of time between allowable milkings was incrementally increased based on cows' 10-d average milking frequency before enrollment. Cows in the abrupt treatment had no changes in management. Both treatments were dried off 60 ± 3 d before their expected calving date and remained in the lactating pen for 5 d post-dry-off. Milk yield and AMS entries and refusals (attempted entries before the allotted milking interval) were recorded. Additionally, udder sensitivity to palpation (behavioral signs present vs. not present) and udder firmness (classified as soft-normal vs. firm-very firm) were assessed on days 1, 3, and 5 following dry-off. Descriptive results are presented. The day before enrollment (d -15), cows in the abrupt and gradual treatments were milked (mean ± SD) 2.6 ± 0.63 vs. 2.5 ± 0.63 times/d, respectively, and refused from the AMS 1.4 ± 1.3 vs. 1.2 ± 2.17 times/d. From d -14 to -8, milk yield, milkings, and AMS refusals for the abrupt vs. gradual treatments, respectively, were 28.6 ± 4.8 vs. 28.6 ± 7.9 kg/d, 2.4 ± 0.6 vs. 2.0 ± 0.7 milkings/d, and 1.5 ± 2.1 vs. 2.1 ± 2.3 refusals/d. From d -7 to -1, milk yield, milkings, and AMS refusals for the abrupt vs. gradual treatments, respectively, were 27.5 ± 5.6 vs. 21.2 ± 7.6 kg/d, 2.3 ± 0.7 vs. 1.1 ± 0.5 milkings/d, and 1.1 ± 1.5 vs. 2.6 ± 2.9 refusals/d. After dry-off, cows in the abrupt vs. gradual treatments, respectively, attempted to enter the AMS 8 ± 8.2 vs. 3.75 ± 2.5 times on d 1, 3.9 ± 3.3 vs. 3 ± 1.9 on d 2, 2.4 ± 2.0 vs. 2.5 ± 2.0 on d 3, 1.6 ± 0.5 vs. 1.8 ± 0.4 on d 4, and 2.0 ± 1.2 vs. 2.0 ± 1.0 on d 5. Behavioral responses to udder palpation were observed in the abrupt vs. gradual treatment in 2 vs. 5 cows on day 1, 5 vs. 4 on day 3, and 5 vs. 0 on day 5. Firm or very firm udders were recorded in 11 vs. 9 cows in the abrupt vs. gradual treatments on day 1, 11 vs. 8 on day 3, and 7 vs. 4 on day 5. These results suggest cows subjected to abrupt dry-off may experience more discomfort due to greater milk yield at dry-off and remain more motivated to be milked for a longer period after dry-off than cows gradually dried-off. These findings highlight the benefits of gradual dry-off in AMS, enabling tailored dry-off management to support cow welfare.

Crossbred beef cow reactivity is related to cow and calf performance

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Cattle reactivity, defined as the ability to respond to various threatening situations, is a key temperament trait that could be related to productivity and handling efficiency in production systems. It potentially influences both cow and calf performance, highlighting the importance of understanding this relationship for improved beef herd productivity. This study aimed to evaluate the relationship of crossbred beef cow reactivity with cow and calf performance. Flight speed (FS) and chute responses assessed the reactivity of 150 crossbreed Angus and Simmental individuals (68 heifers, 82 cows, 2–3 parity) across four evaluations (E1– 4), spaced at least one month apart over one year. Evaluations were characterized by three procedures: i) scour vaccination the day of E1; ii) no treatment before/after E2 and E4; and iii) pregnancy check the day before E3. Flight speed (m/s) measures the speed at which each animal leaves the squeeze chute; faster animals are considered more reactive. The animal's reactivity within the chute was evaluated within the first 4 seconds of entering the squeeze chute, by assigning scores for: movement (1–5), tension (1–4), body posture (1–3), overall response (1–5), and occurrences of kicks and vocalizations. The sum of these indicators was used to determine the reactivity score (RS). Assessments were conducted by a trained observer using video recordings. Cow back fat thickness (BFT) and rump fat thickness (RFT) were evaluated at (E1). Reproductive performance was assessed based on the cow's conception probability within the first 21 days of the breeding season (CP). Calf average daily gain to weaning (ADG) was used to assess calf performance. Generalized linear models were fitted, including reactivity (FS and RS) and parity as fixed effects, for BFT, RFT, and CP models, and birth weight as a covariate in ADG model. An increase of 1 unit in cow FS was associated with an 81.8% reduction of BFT (β = -1.70, p = 0.02), but not with RFT, CP or calf ADG (p > 0.05). An increase of 1 unit in cow RS was associated with a 3.2% reduction in calf ADG (β = -0.032, p = 0.003), but not with BFT, RFT, or CP (p > 0.05). Negative impacts of cow reactivity on productive performance were observed, but not on cow reproductive performance. More reactive cows had lower BFT and reared calves with lower growth rates, reinforcing the importance of selecting beef cattle for calmer temperaments.

Exploring the relationship between dog handling and veterinary professional quality of life

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Veterinary staff regularly interact with fearful and aggressive dog patients, which can impact their well-being and handling decisions. While livestock research suggests poor stockperson well-being is associated with aversive handling, the relationship between well-being and handling remains unexplored in veterinary settings. To address this gap, we developed a cross-sectional online questionnaire for veterinarians and support staff in Canada and the United States, distributed using snowball sampling through veterinary organizations and social media. The questionnaire captured participant demographics, clinic factors (e.g., staff role, stress-reducing certification), handling methods (e.g., full-body restraint), and Professional Quality of Life (ProQOL) scores using a validated scale. ProQOL measures positive and negative aspects of work, including compassion satisfaction (CS; fulfillment from helping others), burnout (BO; workload-related exhaustion), and secondary traumatic stress (STS; stress from trauma exposure). Logistic regressions were developed to explore the relationship between ProQOL and handling methods. Most participants were women (429/687; 62.4%), technicians (376/671; 56.0%) from the United States (541/691; 78.4%), with moderate scores of CS (505/690; 73%), BO (484/691; 70%), and STS (488/691; 71%). When exploring whether ProQOL influences dog handling, results reveal higher odds of using full-body restraint among those with low (OR: 4.9; 95% CI: 1.37-16.33; p=0.014) or moderate STS (OR: 4.7; 95% CI: 1.36-17.89; p=0.015), compared to those with high STS. When exploring factors that influence ProQOL, handling methods were not of influence, instead participants were more likely to report high CS if they worked at mixed (OR: 5.3; 95% CI: 1.27-22.36; p=0.025) or small animal practice (OR: 6.5; 95% CI:1.7-23.95; p=0.006; vs. emergency), were previously bitten by a dog (OR: 4.5; 95% CI: 1.31-15.25; p=0.017; vs. no bite), or were veterinarians (OR: 16.7; 95% CI: 3.57-83.33; p<0.01; vs. support staff). High BO was more likely among support staff (OR: 2.0; 95% CI: 1.28-3.03; p=0.002, vs. veterinarian), or those with a stress-reducing certification (OR: 2.0; 95% CI: 1.10-3.56; p=0.023; vs. none). Results highlight the influence of clinic factors, staff role, and prior experience on ProQOL, suggesting that even adverse experiences, like dog bites, may reinforce a sense of professional purpose. Findings also indicate that individuals experiencing higher traumatic stress may avoid aversive handling, such as full-body restraint. This study shows that ProQOL can influence handling decisions and remains shaped by clinic factors, workloads, and exposure to distressing cases. Further research is needed to explore these dynamics and inform strategies to support professional well-being and dog welfare in veterinary settings.

To tuck or not to tuck: Are sleeping postures affected by roosting structures in laying hen pullets

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Sleep quality is considered to be important for animal welfare, and sleep postures can be used as indicators of sleep quality. Laying hens are motivated to roost on elevated structures during the night as an anti-predator response. Animal care guidelines require elevated structures such as perches be provided to hens, however, there has been little research that connects type of structure and its usage to sleep quality. The study explored the effects of different elevated structures on sleep status, with the hypothesis that platform usage would lead to improved sleeping status (e.g. more sleeping, less dozing). 120 Bovans Brown and 120 Dekalb White laying pullets were housed in 24 pens in groups of 10 of brown (n=8), white (n=8) and mixed strains (n=8). Each pen had two platforms and two perches. Birds were continuously recorded for 48 hours at 16 and 18 weeks of age. Instantaneous scan sampling was used to categorized the sleeping posture of every bird on a structure as dozing (motionless with closed eyes), sleep (resting with head tucked under wing), or wakeful (active movement). Sides were swapped and dividers added to prevent side and visual biases. Counts of birds on perches and platforms were used to determine roost preferences. To determine the effects of structure and strain on sleep status, the percentages of birds in each category were determined for each structure and strain. Data were analyzed in SAS using GLIMMIX to determine the effects of strain, location and their interaction on sleeping status. Results showed no effect of structure on sleep status (P=0.2214), with an average of 21.8±1.2% of birds sleeping on both the perch and platform, respectively. However, there was a significant difference in structure usage between strains (P=0.005), with fewer brown pullets observed on perch or platform (3.0±0.25) compared to mixed (4.0±0.25) and white pullets (4.2±0.25). Birds tended to prefer platforms over perches (P=0.0686), with an average of 4.8±0.56 birds on platforms and 2.7±0.56 on perches, and no interaction between structure usage and strain. There was a significant strain effect on sleep status with 11.7%±1.13 of brown pullets observed to be wakeful compared to 22.7%±4.6 and 21.8%±4.6 for mixed and white birds, respectively. Although birds preferred to roost on platforms, no clear relationship was found between sleep status and structure. More research is needed to determine effects of roosting structures in commercial housing systems, where bird populations are much larger and more crowded.

A comparison of nest use by young hens in four cage-free system designs

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In U.S. cage-free aviary systems, nests are categorized as dedicated resources for egg laying and excluded from space allowance calculations. However, some producers report hens using nests for non-laying behaviors. The objective of this study was to describe nest use by laying hens after placement in four rooms, each with one of the following cage-free system nest treatments: Fienhage with (FK) and without (FO) kickout nest function, and Big Dutchman Natura with (DK) and without (DO) kickout function. Dekalb White 19-week old pullets were placed in each of the Fienhage (n=1,000 hens/room) and Dutchman systems (2,160 hens/room) in accordance with certified cage-free guidelines space allowances. Direct behavior observations were performed twice weekly at four time points (TP) during the day at 20 and 22 weeks of age, corresponding with onset of egg laying. The ethogram included number of hens present in each nest location within the system and hen postures (standing or sitting). We hypothesized that: 1) hens preferentially use nests for nesting and egg laying whereas nest use outside these time periods is rare, 2) non-nesting/laying behaviors are less likely to occur in kickout nest systems relative to nests without this function, and 3) that nests used for non-laying behaviors would be associated with higher incidence of floor and system eggs. Data were analyzed using a generalized linear mixed model. Number of hens in the nests was converted to percentage of flock (PoF) due to hen population differences between systems. The PoF was square root transformed to achieve normality. Within treatment, nest use did not differ by week. Nest use did not differ between treatments at TP1. However, nest use was lower after TP1 for DO, DK, and FK treatments p<0.01), but not FO. At TP3 and TP4, FO had greater nest use than other treatments (p<0.05). During week 20, more hens were sitting in DO than KO (p<0.01). More hens were sitting in TP1 than TP3 in DO (p=0.02). Similarly, more hens were sitting in TP1 than TP3 and TP4 in KO (p<0.03). In conclusion, this data for three of the four treatments supports the hypothesis that hens use nests preferentially for egg laying. However, hens used FO nests throughout the day, likely due to differences in nest design. Analysis of floor and system eggs is pending and may inform impacts of non-nesting hens on settled nesting behavior in the early egg laying stage of production.

Increase in behavioral complexity by lactating sows after release from temporary crating reflected in Shannon Entropy measures.

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Farrowing crates were introduced as a husbandry tool to reduce mortality of piglets being laid on by their mothers. However, welfare concerns exist over the impact of this confinement on the lactating sow. Temporary crating offers a compromise between piglet survival and the needs of the sow. The crates are initially closed, confining sows for the first few days post-farrowing (when piglets are most susceptible to crushing), but are later opened, giving sows access to more space and movement. Yet questions remain about how the sudden release from confinement impacts sow behavior and ultimately their welfare. Do sows utilize the additional space to expand their behavioral repertoire and how well can it be quantified? To begin answering these questions, Shannon's Entropy was calculated for each sow's daily behavioral sequence. This metric is taken from information theory and quantifies the information content of a symbol sequence. Because entropy scales with richness or number of unique symbols, it can serve as a quantitative measure of behavioral diversity. To apply Shannon Entropy to swine behavior, we video recorded the behavior of 36 sows from day three to day eight post-farrowing. Sows were either continuously confined in closed temporary or hinged farrowing crates or released from crates (i.e., the crates were open) on day four or day seven. Focal sampling and instantaneous recording methods were used to code sow positions and activities at 2-minute intervals from 6am to 6pm daily. Bayesian inference techniques were used to model treatment effects and determine 95% credibility intervals for model parameters, including crate status, day, and individual sow means of outcome variables. We found that, irrespective of treatment, sows in open farrowing crates displayed greater diversity of positions. Entropy significantly increased from a mean value of 1.44 (0.97 – 1.93) to 2.79 (2.32 – 3.27) after crate opening. Further, individual differences in entropy values between sows were only observed in uncrated sows. Similar findings were observed when we analyzed sows' activity sequences, which comprised various maintenance and maternal behaviors. Taken together, these results show that when given access to a larger pen, sows use the extra space afforded to them and display increased behavioral diversity suggestive of improved welfare.

Evaluating the Effects of Olfactory Enrichment on Captive Binturong (Arctictis binturong) Behavior: A Comparative Study of Food-Based and Scent-Based Stimuli

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This pilot study examined the behavioral responses of two juvenile male binturongs (Arctictis binturong) at the Minnesota Zoo to three enrichment stimuli: lavender oil (olfactory), thawed fish (olfactory and dietary), and hard-boiled egg (olfactory and dietary). Stimuli were selected based on feasibility, dietary relevance, and approval by zoo staff. Behavioral observations were conducted using one-minute scan sampling, with behavior expressed as the proportion of observation time spent in foraging, locomotion, resting, or being out of view. A repeated-measures design compared baseline behavior to treatment conditions, with all other aspects of animal care remaining constant. Statistical analysis using one-way ANOVA ($F_{(3,26)}$ = 4.0, P = 0.01) indicated that enrichment type significantly influenced foraging behavior. Hard-boiled egg enrichment elicited the highest foraging activity (6.4% ± 1.1% of observations), compared to lavender oil (1.4% ± 0.5%) and thawed fish (0.43% ± 0.3%). Lavender oil exposure showed a trend toward increased resting behavior (P = 0.08) but did not significantly affect locomotion. No significant differences were observed for visibility or scent-marking behaviors. Descriptive comparisons suggest that food-based enrichment is more effective than olfactory stimuli in promoting natural foraging behaviors. These findings highlight the potential value of dietary enrichment in enhancing welfare for this species. Future research should incorporate larger sample sizes, additional scent stimuli, and long-term behavioral and physiological measures to build evidence-based enrichment strategies for binturongs.

Novel measure of behavioral sequencing applied to lactating sows after release from temporary crating

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Farrowing crates were introduced as a husbandry tool to reduce crushing deaths of piglets by their mothers. However, welfare concerns exist over the impact crate confinement has on the lactating sow. Temporary crating is an alternative to traditional farrowing crates, offering a compromise between piglet survival and the needs of the sow. Hinged crates are initially closed, confining sows when piglets are most susceptible to crushing, but are later opened, giving sows access to more space and freedom of movement. Yet questions remain as to how the sudden release from confinement impacts sow behavior and welfare. We used a data compression metric to analyze the complexity of sow behavioral sequences before and after release. Data compression algorithms take advantage of similar or redundant patterns within a sequence to reduce the overall sequence length (compression). The more homogenous the sequence, the more it can be compressed. When applied to sow behavioral sequences, the data compression ratio (the original sequence length divided by the compressed sequence length) provides a quantitative measure of sequence complexity. We video recorded the behavior of 36 sows from day 3 to day 8 post-farrowing. Sows were either continuously confined in closed temporary farrowing crates or were released from crates (i.e. the crates were open) on day 4 (T4) or day 7 (T7). Focal sampling was used to code sow positions and activities (maintenance and maternal behaviors) at 2-minute intervals from 6am to 6pm each day. Data compression ratios were calculated for each animal's daily behavioral sequence, and Bayesian inference techniques were used to compute posterior distributions of compression ratio scores for every sow given treatment and day. We found there was a greater than 95% probability that opening the farrowing crate lowered the positional compression ratio score for every sow. On average, compression ratio decreased by a median of 2.84 (95% CrI: 2.15–3.56) in T4 and a median of 2.72 (95% CrI: 2.07–3.36) in T7 after crate opening. Opening the farrowing crate also tended to lower compression ratio scores of sow activity for all sows in both experimental treatments, with a median decrease of 0.41 (95% CrI: 0.09–0.73) in T4 and 0.52 (95% CrI: 0.19–0.83) in T7, on average. Overall, when compared to crated sows, sows in open farrowing crates displayed more complex behavior that may indicate improved welfare. Further work on the link between behavioral complexity and welfare should be explored.

ProHand Dairy in action: a comprehensive approach to creating and pilot testing an educational program for dairy farm employees

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Human handling affects dairy cattle welfare, worker safety, consumer trust, and farm profitability. However, training is needed for handlers to learn to interact with cows safely and appropriately. Our objectives are to: (1) create an educational program focused on improving handlers' attitudes and behavior and (2) evaluate the program's clarity, usability, and satisfaction in a pilot test of Spanish- and English-speaking handlers. To address Objective 1, we adapted the educational program ProHand Dairy, based on earlier work in Australia (Breuer et al., 2000), for the US. This program provides science-based information, founded on cognitive-behavioral theory, to encourage appropriate cow handling practices. The adapted ProHand Dairy consists of 5 modules describing the research and practical impacts of good animal handling on human-animal relationships, cattle behavior, and welfare, with a focus on the feedback loop between human beliefs and actions and cattle responses. The modules include video clips and animations of appropriate vs. inappropriate handling, voiceover narration, knowledge check questions, and pauses for facilitated group discussions. The program also includes a questionnaire to evaluate attitudes toward cow handling, with semi-customized feedback presented to each learner. In objective 2, which is currently in progress, we created two phases of evaluation. In the first phase, we provided an online version of the program to internal UW-Madison staff and external project advisors (n=11). Internal staff included professional animal handling trainers and bilingual extensionists. External advisors included North American dairy industry professionals with veterinary training. We elicited and are currently incorporating feedback on content clarity, coherence, video selection, audio quality, and the accessibility of the Spanish- and English language text. In the second phase of evaluation, we will pilot test the program by visiting 2-4 Wisconsin dairy farms. We will recruit Spanish- and English- speaking handlers (n=10-15 for each language of preference) who work with adult cows. Participants will use mobile tablets to complete an offline version of the program. They will then answer a questionnaire to provide quantitative ratings on the course's usability and their overall satisfaction with it, as well as qualitative responses about any critical problems they encountered. The ratings from the pilot evaluations will help us calibrate whether the course shows promise for on-farm training, or whether

more extensive revision is needed. After finalizing the course, we plan to conduct another project to more extensively field-test the course's effectiveness as an educational tool to improve cow handler attitudes and behavior and ultimately safeguard dairy cow welfare.

Mom is calling! Sows nursing vocalization changes with the housing system

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Conspecific communication by gregarious species like pigs is used to share important information about environmental and social conditions. In particular, pig vocalizations change with age and can play a fundamental role in communicating emotions like fear, pain, curiosity, or excitement. We aimed to examine the effects of different farrowing systems on the nursing vocalizations of sows. One week before farrowing, pregnant gilts (Landrace x Large White) were weighed and allocated to either a barren (standard farrowing crate n = 11) or enriched (farrowing pens with straw, n = 13) farrowing system. Study sows shared the farrowing environment with as many as 9 other individually-housed and farrowing non-study sows. On the second or third day after farrowing, vocalizations from a single nursing bout were recorded using the ZOOM H4n Pro recorder and a Sennheiser MKE 600 Shotgun microphone at 0.8 - 1m from the sow's head. The nursing bout was defined by the sow calling her piglets to nurse. The initial one-minute sample was used for call labeling based on aural and visual inspections using Raven® Pro 1.6. The total number of vocalizations labeled was 898 yielding an average of 37.5 calls per minute per sow. However, 44% of the calls had to be excluded due to overlapping contaminant acoustic signals from neighboring sows and piglets. This left 494 calls for bioacoustics analysis. The data was divided by treatment: 212 calls from barren and 282 calls from enriched farrowing systems. The data was analyzed using generalized linear mixed models with acoustic parameters as the dependent variable, treatment and body weight as fixed effects, and subject as a random effect. Significance was considered when $p < 0.05$. Results showed no difference in body weight between the groups (Barren 219±14 SD Kg vs Enriched 218±16 SD Kg). However, the calls were longer in the sows housed in barren (0.29±0.14s) when compared to those of sows housed in enriched (0.22±0.09s) farrowing systems (p=0.045). No treatment differences were observed for low-frequency calls. However, the frequency of these calls did depend on body weight, as the dominant frequency of calls from heavier sows was lower (p=0.024). Previous work suggests that longer calls in pigs are often associated with stressful conditions and negative emotions, whereas short calls can reflect positive emotions and low stress. Our findings demonstrate that the farrow system can impact features of the nursing call and potentially influence a sow's communication with her piglets.

Gilts transitioning from pen to crates express an increase in abnormal behaviors

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Common husbandry practices on farms today have the potential to compromise animal welfare. Confinement can inhibit the expression of species-specific behaviors and challenge natural homeostatic activities. On pig farms, an animal's social and explorative behavior is often restricted as most breeding females are confined in crates for at least some part of their production cycle. Here, we study how the transition from group housing to the confinement of an individual stall impacts gilt behavior.

A within-subject repeated-measure study design was applied to 12 Landrace x Large White gilts that were group-housed in a collective pen for 3 weeks and then moved to individual crates for 4 weeks. Instantaneous scan sampling was performed every 5 minutes between 7:30 AM and 4:30 PM on video recorded three days per week. Observed behaviors were categorized as posture (lie, stand, sit, and kneel) or activity (drink, stretch, yawn, scratch, shake head, paw surfaces, oral stereotypies, surface interaction with the snout, bite surface, social behavior, and other). Coding was performed in the BORIS software by one trained researcher with an intraobserver coefficient of variance < 5%. The data was analyzed using linear mixed models with behaviors as the dependent variable, week as a fixed effect, and day and subject as random effects to account for repeated measures. Significance level was $p < 0.05$.

Lying was the most common behavior, as animals spent 94% of their time down across the study. However, gilts in the crates laid down significantly less than animals in the pen (6.4 versus 30.2 events; $p < 0.001$). Gilts also sat more in the crates than in the pen (4.3 versus 1.4 events; $p < 0.05$). Two activities were most prevalent over the seven weeks: oral stereotypies (30.4%) and surface interaction with the snout (52.1%). These behaviors were performed more when the gilts were housed in the crates than in the pen (oral stereotypies - 15.3 versus 2.4 events; and surface interaction with the snout - 6.1 versus 1.6 events; both $p < 0.05$).

Housing impacted gilts' behavior, mainly altering their posture and activity levels. Gilts appeared busier during crate housing, both standing and sitting more, and exhibiting noted increases in select behaviors. However, oral stereotypies and excessive interaction with surfaces are not part of the species-specific swine repertoire. Individual housing increases abnormal behaviors in gilts and seems to reduce resting behavior, suggesting negative consequences for their welfare.

Assessing positive affect in dairy cattle using QBA, behaviour tests, and physiological measures

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Validated measures of affect mainly relate to arousal and negative valence. Qualitative behaviour assessments (QBA) are promising for positive valence, and other measures are being explored. Our objective was to validate measures of positive affect in adult dairy cattle. Using a cross-over replicated Latin square design controlling for 'day' and 'animal' effects, 13 dry cows and 5 heifers were each subjected to 3 treatments: positive (POS; large pen, deep straw bedding, brush access, fence-line companion heifer), neutral (NEU; midsized pen, minimal bedding, visual of companion), and negative (NEG; small pen, no bedding, no visual contact with other animals, pail of inaccessible pellets). Animals moved from group-housed home pens to individual treatments pens, where treatments were applied in random order, with one treatment applied each day for 45 min and 1 washout day between treatments. During each treatment period, heart rate (HR) and vocalization data were collected. Animals then moved to a test pen, passing a thermal camera before completing a novel object (NO) test and attention bias (AB) test, with continuous RGB video recording. A single trained observer (blind to treatments) performed a QBA and assessed NO and AB reactivity scores. A discriminant analysis (CDA) followed by MANOVA was performed on all data described above, after normalizing, scaling and grouping by treatment. ANOVA and survival analysis were also performed, according to the outcome variable. The two CDA dimensions had explained variances of 81.82% (DF1) and 18.18% (DF2). The highest positive contributing variables in DF1 were "indifferent", "relaxed", "happy", "uneasy", and eye-area temperature, while "distressed" and reactivity to a NO were the highest negative contributing variables. The highest positive contributing variable in DF2 was "uneasy" whereas the highest negative contributing variables were "relaxed", "indifferent", "active", and "distressed". Based on treatment means along DF1, POS scored higher than both NEU and NEG (P=0.01), which did not differ. Eye-area temperature was also highest in POS (P=0.005), while NEU and NEG did not differ. Similarly, POS had the highest HR from min 15 to 45 (P=0.002) while, NEU and NEG did not differ until the final 15 min when NEU had the lowest (P=0.007). During the NO test, POS were 8.1 and 13.0 times less likely to approach the NO during the allotted time than NEU (P=0.06) and NEG (P=0.02), respectively. These results suggest that while HR indicates arousal, QBA, eye-area temperature, and NO tests may be sensitive to positive valence.

Genetic impact on laying hen keel bone fractures

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Keel bone fractures (KBF) are a major welfare concern for laying hens, impacting the production and well-being of the birds. The prevalence of KBF may vary across genetic strains, yet the existent data is limited. This study aimed to assess the prevalence of keel bone fractures in three different genetic lines of breeder laying hens housed in identical individual cage systems via radiographic images. We hypothesized that certain genetic lines would be more likely to develop fractures due to underlying genetic differences. Breeder hens were x-rayed at both 30 and 60 weeks of age (woa). We examined three genetic lines: one brown (30 woa: n = 985, 60 woa: n = 500), and two white (whiteA, 30 woa: n = 200, 60 woa: n = 484; whiteB, 30 woa: n = 1000; 60 woa: n = 537). Data was analyzed using chi-square and post-hoc tests that compare fracture presence across the three genetic lines. At 30 woa, all three genetic lines (brown = 1.1%, whiteA = 27%, whiteB = 4.4%) differed in the percentage of fracture presence ($X2 = 236.18$, df =2, $p < 0.05$). At 60 woa, whiteB fracture prevalence was ($X2 = 387.64$, df = 2, $p < 0.05$) lower (3.2%) than brown and whiteA, while brown (55.2%) and white A (53.1%) no longer differed from each other ($p = 1.00$). All hens in this study were reared in identical single-cage systems with limited behavioral opportunities, minimizing environmental variation. However, differences in body weight or size between the lines, as well as differences in temperament or reactivity could contribute to the results, although these were not measured in this study. The findings from this study provide insight into genetic predisposition to keel bone fractures, contributing to breed selection and management strategies aimed at mitigating keel bone fractures. Future studies should focus on how heritable keel bone fractures are, and how those genes flow into subsequent generations, which are frequently crosses of genetic lines.

To chew or not to chew? Exploring the influence of scented chew toys on puppy chewing behavior

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Chewing and mouthing are natural dog behaviors integral to feeding and exploration, particularly during puppyhood; however, these behaviors can be considered a nuisance to owners, particularly if it results in damage to household items. While providing appropriate enrichment items, like chew toys, is highly recommended to reduce undesirable dog behaviors and adding scent can increase toy engagement in dogs, the impact of scented chew toys on chewing and mouthing behavior in puppies remains unexplored. Thus, we measured and compared the level of engagement in owned puppies (N=29; 3-10 months of age) when interacting with peanut-butter scented and non-scented chew toys. Puppies were recruited based on having no prior exposure to scented chew toys but prior exposure to peanut butter was unknown. Each puppy interacted with both toy types during two individual 5-minute play sessions conducted in a laboratory setting. After completing both play sessions, dogs were randomly assigned to receive either the non-scented toy (N=15; control) or the scented toy (N=14) for one week. Before and after the 1-week period, owners completed an online questionnaire reporting the frequency (Never, Rarely, Occasionally, Regularly, Frequently, Very Frequently) of their dog's chewing and mouthing behavior at home. They also indicated their level of agreement on a 5-point Likert scale (Strongly Agree to Strongly Disagree) with statements regarding their dog's chewing behavior. Linear regression results reveal that puppies had the highest interaction time (in seconds; p = 0.02) and displayed more sniffing with the scented toy in comparison to non-scented (p < 0.0001). During the play sessions, owners had to prompt their puppy more frequently to engage with the non-scented toy compared to the scented (p < 0.0001). After the 1-week period, owners in the non-scented group agreed their dog's mouthing and nipping behavior was problematic (61.5%, 8/13), while owners in the scented group did not agree it was problematic (58.3%, 7/12). Also, owner reports of the frequency of chewing on off-limit items (scented: p=0.53; non-scented: p=0.51) and mouthing or nipping on body parts (scented: p=0.16; non-scented: p=0.30) did not change over the 1-week period of receiving either toy. Findings suggest that scent can enhance engagement with chew toys and future research should extend the intervention period for chew toy use and incorporate owner-implemented training strategies to further support current recommendations on mitigating unwanted chewing and mouthing in dogs.

Voluntary Intake and Sorting of Ten Forage Species by Dairy Cows

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Diversifying plant species may help maintain pasture quality and dairy cattle forage intake under variable climatic conditions. In this study, we tested the palatability of 10 harvested fresh forage species (AL: alfalfa, BT: birdsfoot trefoil, CH: chicory, FL: festulolium, MB: meadow brome, MF: meadow fescue, OG: orchardgrass, RC: red clover, TI: timothy, WC: white clover) and 8 mixes of these species (1: MF/WC, 2: MB/BT, 3: AL/TI, 4: CH/MF/WC, 5: AL/CH/TI, 6: MF/OG/BT/WC, 7: CH/MF/RC/WC, 8: CH/MB/MF/OG/BT/WC) by measuring voluntary intake and sorting within each mix. Ten lactating Holstein cows (216.3 ± 40.2 DIM; parity 2.2 ± 1.1) that had never consumed fresh forages were selected and randomly exposed to each forage 3 times during a 17-d adaptation period (2 forages/d). During a 10-d testing period, a 10×10 Latin square design was used to determine the voluntary dry matter (DM) intake of each forage provided ad libitum over 30 min. The freely accessible total mixed ration (TMR) was removed 2 h before the 30-min test period. The DM voluntary intake between forages was compared using a mixed linear regression model. Cows consumed more (P<0.05) BT (535.00 ± 104.00 g), WC (525.00 ± 98.00 g), and RC (385.00 ± 98.00 g) compared to TI (117.00 ± 36.00 g), FL (81.00 ± 20.00 g), MB (69.00 ± 20.00 g), OG (67.00 ± 20.00 g), CH (61.00 ± 36.00 g), and MF (60.00 ± 23.00 g). Voluntary intake of AL (288.00 ± 98.00 g) was intermediary and did not differ from BT, WC, RC and TI. Using the same methodology, 8 of the 10 cows were used in an 8×8 Latin square design to test 8 forage mixes. No difference in DM voluntary intake was detected between the 8 mixes. To evaluate sorting within each mix, a compositional data analysis was performed on the proportions of each forage species ingested. No sorting was observed within mixes 1, 2, 3, 4, 7 and 8. However, cows sorted in favor of AL in mix 5 (P<0.001) and tended to sort in favor of BT in mix 6 (P=0.05). Overall, dairy cows consumed more legumes than grass and forb species. Forage mixes were consumed equally, but some sorting was observed within 2 of the mixes. These results demonstrate that dairy cows will likely consume these forage mixes on pasture, but they may sort for specific legume species.

Risky business: Cross-sectional survey results for associations between owner and rabbit factors, and owners currently thinking about giving their companion rabbit away and letting the rabbit loose outside

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Why are some companion rabbits retained by their owners while others are surrendered or turned loose outside to fend for themselves? Using online data (n = 2093) collected with a broadly-recruited, cross-sectional survey, we explored potential risk factors for companion rabbit owners contemplating getting rid of their rabbits. We used descriptive statistics for owner characteristics and perceptions; rabbit demographics, husbandry, and behaviour; and yes/no responses to owners thinking about (i) giving the rabbit away and (ii) letting the rabbit loose outside at the time of survey completion. We used a series of univariable logistic regressions to explore associations between (owner and rabbit) factors and responses to the two contemplation outcomes. Results suggest numerous risk factors related to owners and rabbits (P < 0.05). Owner factors associated with increased odds of both outcomes were related to gender, experience, household size, and financial constraints (i.e., owners identifying as male; having < 1 year of rabbit care experience; having ≥ 3 household members vs. 2; financial difficulties buying day-to-day rabbit supplies or financial difficulties buying day-to-day supplies for themselves, respectively). Decreased odds, however, were seen for both outcomes with owners' increasing rabbit emotionality ratings. Rabbit factors associated with increased odds of both outcomes were related to ear type, litter training status, housing location, and health problems (i.e., having lop vs. erect ears; lack of litter training in rabbits with house access, being housed indoors and outdoors vs. only indoors or only outdoors, having recent health problems vs. chronic or no health problems, respectively). Owners who had never seen a rabbit with the zoomies, and owners who reported that they did not see their rabbit flop on their back or side at least weekly were at increased odds of both outcomes too. Rabbits who displayed moderate/severe problems (vs. mild/no problems) with urine spraying/inappropriate elimination, socialness/cuddliness, and aggression were also at increased risk of both outcomes. Increased odds were seen for one, but not both outcomes, for several other factors related to younger owners, additional measures of inexperience and financial constraint, never having seen some positive rabbit behaviours, having ≥ 3 rabbits, rabbits having too much or too little free-roaming time, and the presence of potential predators in the household. Based on results that suggest many challenges and a steep learning curve for new owners, we should provide education and practical supports related to rabbit health, housing, litter training, and positive and potentially problematic behaviours.

A descriptive survey on the early rearing environments of dairy goat kids in the US – Focus on environmental enrichment

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Dairy goat inventory reports estimate that nearly 300,000 kids are born yearly in the US, yet there remains a lack of knowledge on their early physical and social environments. Therefore, the objective of this study was to describe US dairy goat kid housing environments, experiences, and exposure to environmental enrichment (EE) from birth to weaning, through an online survey. Respondents had to be 18 years of age or older, operate a farm located in the United States, have and breed 5 or more adult dairy goats as a source of income, and raise their own kids on-farm from birth to weaning. A minimum sample size of 381 respondents was calculated using a 95% confidence level and 5% margin of error. Respondents were recruited from September 2023-March 2024 by emailing state and national level goat associations and US university small ruminant extension staff, and by attending local and national dairy goat conventions. The questionnaire consisted of sections for respondent demographics, general farm characteristics/management/husbandry, and details of each physical housing environment (PHE: the number a typical kid goes through until weaning) based on kid rearing strategy (SEP: separated immediately from dam; DAM: kept with dam any amount of time). In all, 436 responses passed inclusion criteria, and not all answered every question. Respondents represented key dairy production regions (e.g., CA: 14%, 57/396), with most overall utilizing the Nigerian Dwarf breed (42%, 168/400) and producing and raising 20-49 kids per year (42%, 167/397). SEP and DAM strategies were evenly represented (52% vs 48% of responses; n=395), and 2 PHEs were most common (SEP: 43%, 80/184; DAM: 52%, 100/194). Within those that specified an indoor barn/shed for PHE 1, majority of SEP operations house kids in boxes/tubs/bins (57%, 85/149) whereas DAM operations house dam-kid units in stalls/pens with 4 solid sides (42%, 57/136). Provision of social EE with humans was most frequently indicated, ranging between 85-90% of operations regardless of kid rearing strategy or PHE. SEP operations frequently indicated providing social EE with non-goat animals during PHE 1 (39%, 70/178) while items to climb on were frequently reported during PHE 2 (72%, 109/151), and climbing EE was most frequent for DAM operations (PHE 1: 65%, 121/186; PHE 2: 88%, 100/114). Results will inform future studies which examine potential effects of EE provision on neonate dairy goat kid health and welfare.

Elevated platforms for goats: usage increases after surgery

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Properly chosen environmental enrichment has the potential to improve animal welfare. We know that goats like to climb up onto elevated places. The purpose of this study was to evaluate whether hospitalized goats would use an elevated platform to perform species typical behaviors, which can be indicative of positive welfare. We designed a quasi-randomized, controlled trial with eight adult, male castrated goats that had been diagnosed with obstructive urolithiasis and received a tube cystostomy. Animals presented to the hospital randomly and were alternately assigned to either a platform or non-platform treatment group whenever a full-sized stall with a camera was available. The platform was always placed in the same location within the stall. Video recording started approximately 48 hours after surgery and continued for 3 days. Instantaneous sampling at 5-minute intervals was used to code for location in the stall, posture (standing or lying) and behavioral activity (eating, drinking, investigating, observing, ruminating, resting, sleeping, and walking). We analyzed whether goats were more likely to use the platform area with a logistic mixed-effects model. The model included treatment group, observation day, and their interaction as fixed effects, and animal was included as a random effect. All goats in the platform group used the platform. Usage varied by goat ranging from 7.6% to 54.5%. The behaviors most frequently performed on the platforms were observing, resting and ruminating. A significant interaction was found ($p<0.001$) between the presence of the platform and observation day: on average, the goats used the platform about 50% more every day post-surgery. This study showed that goats in a new and potentially stressful environment will use an elevated platform and that usage increases as the animals recover after surgery. These findings suggest the potential for improved patient welfare via a safe, easy-to-provide enrichment item at little additional cost or effort.

Smart Milking, Smarter Cows: Exploring voluntary dry-off from automatic milking systems

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Abrupt cessation of milking ('dry-off'), especially in high-yield dairy cows, can cause discomfort and stress from udder pressure and increase the risk of intramammary infections. Automatic milking systems (AMS) present the opportunity for cows to self-regulate milking visits and the potential for an alternative, cow-driven approach to the commonly adopted abrupt dry-off. The objective of this study was to characterize the behavior of dairy cows when allowed free (voluntary) access to an AMS without incentives (concentrate) or being brought to the AMS by humans (fetched). Data collection is ongoing, with four Holstein dairy cows completed (2 = primiparous, 2 = multiparous) and 15 total cows targeted. Eligibility criteria included a 10-d average of >2.2 voluntary daily milkings before enrollment and not considered a chronic fetch cow by the farm staff. Cows were enrolled 74 ± 3 d before their expected calving date. At enrollment, cows no longer received a feed incentive in the AMS and were no longer fetched. Cows were considered dry when they did not visit AMS for 72 h or produced <4.5 kg milk/d for 3 d consecutively. The number of days to self-dry off, daily milkings, refused milkings (visited within 3.6 h of previous milking), time between AMS visits (h), and daily milk yield (kg), were recorded by the AMS. To date, enrolled cows were 321 ± 31 d (mean ± SD) in milk at enrollment and took 22 ± 8 d to dry-off. At enrollment, cows produced 36.6 ± 6.8 kg of milk over 2.8 ± 0.5 milkings/d with an interval of 9.6 ± 2.9 h between milkings. On the last day cows were milked before being considered dry, cows produced 20.8 ± 13.6 kg milk over 1.0 ± 0.0 milkings per day, with an interval of 26.4 ± 0.3 h between milkings. Cows also decreased the number of refused AMS visits, suggesting reduced effort to be milked; cows had 0.8 ± 1.0 refusals on the day of enrollment, and 0.0 ± 0.0 refusals on the last day they were milked before drying off. This preliminary data illustrates that cows can naturally reduce their milking frequency and, consequently, milk yield to self-dry off. Daily milk yield at self-dry off may serve as a guideline to dry-off cows in other milking systems based on output. This study is a novel exploration into cow motivation to be milked and opportunities for cow agency in dairy production systems.

The maternal behavioral ecology of the domestic sow: opportunities to improve animal welfare through more informed legislative initiatives

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Swine production during the twentieth century transitioned from small extensive farms to large intensive systems leading to widespread confinement of commercial sows. This global intensification of pig production generated substantial welfare concerns, including questions about the expression of maternal behaviors. Ethologists often use the behavioral repertoire of wild animals to understand the ecological and welfare needs of their domestic counterparts. Thus, we hypothesized that the welfare of today's commercial sow will depend, at least in part, on 1) the domestic sow's motivation to perform those behaviors intrinsic to the wild sow, and 2) suppression of these behaviors resulting in measurable indicators of negative welfare. Using this conceptual framework, we compiled evidence from the available literature (n=275) investigating the maternal behavioral repertoire of the wild sow and the domestic sow's enduring motivation to perform these behaviors in commercial environments. The primary databases consulted were PubMed and Google Scholar using the fixed key terms (pig OR sow OR wild boar) AND (maternal behavior). Advanced searches were performed to target specific behaviors such as "foraging" and "nest building." Secondary sources, such as textbooks, literature reviews, and meta-analyses were consulted for information on pig behavior, international welfare standards, and commercial housing systems, and legal documents such as Supreme Court briefings and the California Code of Regulations were accessed to extract information about Proposition 12. Research studies referenced by primary and secondary sources were evaluated for inclusion in a citation mining approach. Study subjects were required to be gilts or sows, and they could be studied in commercial, wild, or semi-natural environments with no breed restrictions. There was no limitation based on publication date; however, more recent studies were targeted to corroborate older studies and ensure an updated review of swine behavior and welfare science. Our findings detail how the maternal behavioral repertoire of the wild sow survives within the modern-day domesticate, and these behaviors are frustrated or inhibited under most commercial housing conditions. Legislative initiatives like California's Proposition 12 were also examined through this ethological lens to better understand the impact of policy on animal welfare. Taken together, this work substantiates the use of wild sow behavior as a comparative framework to assess the welfare outcomes of commercial sow housing and helps to establish the role that animal behavior science should play in the development of legislative initiatives designed to enhance animal welfare.