

9th Annual CCSAW Research Symposium – 2016

Date: May 11th, 2016 9:00am – 5:00pm (registration at 8:30am)

Location: LLC 1714, Ontario Veterinary College, University of Guelph

ORAL PRESENTATIONS

Welcome

9:00 Dr. Jeffrey Wichtel, OVC Dean

Session #1: Dairy Cattle, Pigs & Rabbits

9:10 **Variability in feeding behaviour between individual dairy cows fed under differing levels of competition**

Robin E. Crossley*, Alexandra Harlander-Matauschek, Trevor J. DeVries

9:22 **Associations of hygiene and lying behaviour with the risk of elevated somatic cell count and lameness**

Ivelisse Robles*, David F. Kelton, Herman W. Barkema, Greg P. Keefe Jean-Philippe Roy, Marina A. G. von Keyserlingk, Trevor J. DeVries

9:34 **Dairy cow behaviour and welfare in herds with automated milking systems**

Meagan T. M. King*, Ed A. Pajor, Stephen J. Leblanc, Trevor J. DeVries

9:46 **Exploring the design features of automated feeding stalls and commonly used training methods for rearing calves**

Tanya R. Wilson*, Stephen J. LeBlanc, Trevor J. DeVries, Derek B. Haley

9:51 **A focus farms approach to motivating dairy farmers to improve animal welfare**

Amanda Armstrong*, Steven Roche, Elsa Vasseur, Ann Godkin, David Kelton, Derek B. Haley

9:56 **Utility of an online learning module to teach cauterization technique for dairy calves, including cornual nerve block application**

Charlotte B. Winder*, Stephen J. LeBlanc, Derek B. Haley, M. Ann Godkin, Todd F. Duffield

10:08 **Do umbilical hernias reduce play behaviour, a welfare indicator in growing pigs?**

Melissa Atkinson, Rocio Amezcua*, Robert Friendship, Radu Zorzolan, Tina M. Widowski

10:20 **Validating on-farm euthanasia methods for commercial meat rabbits**

Jessica L. Walsh*, Aaron Percival, Lucia Costanzo, Penny Lawlis, Patricia V. Turner

10:35 **COFFEE BREAK – 30 min**

Plenary Lecture

11:05 **Can animal welfare science resolve the paradox of animal consciousness?**

Dr. Marian Dawkins, Professor of Animal Behaviour, University of Oxford

Poster Introductions

12:05 Posters will be available for viewing during breaks

12:10 **LUNCH – 50 min**

Session #2: Poultry

- 1:00 The effect of alternative feeding strategies during rearing for broiler breeders**
Aitor Arrazola*, Elyse Mosco, Tina M. Widowski, Michele T. Guerin, Stephanie Torrey
- 1:12 Using animal protein and extra enrichments to reduce injurious pecking in furnished cage housed laying hens**
Krysta Morrissey*, Sarah Brocklehurst, Tina M. Widowski, Victoria Sandilands
- 1:24 Acute Tryptophan Depletion increases motor-response in laying hens**
Patrick Birkel*, Joergen B. Kjaer, Peter McBride, Jacqueline Chow, Alexandra Harlander-Matauschek
- 1:36 Do domestic birds differentiate between artificially and naturally sourced ammonia gas mixtures?**
Bishwo Pokharel*, Vinicius Machado dos Santos, David Wood, Bill van Heyst, Alexandra Harlander-Matauschek
- 1:48 Do domestic birds prepare themselves to initiate ascent?**
Chantal LeBlanc*, Bret Tobalske, Stephen Bowley, Bill Szkotnicki, Alexandra Harlander-Matauschek
- 2:00 Use of an accelerometer data logger to identify body motion in domestic bird's behavioural repertoire**
Madison Kozak*, Bret Tobalske, Dwight Springethorpe, Bill Szkotnicki, Alexandra Harlander-Matauschek
- 2:12 The devil is in the detail: How a simple design feature might affect laying hens' perception of nest sites in furnished cages**
Michelle E. Hunniford*, Janice Siegford, Tina M. Widowski
- 2:24 Epigenetic transfer of behaviour and stress susceptibility in the laying hen: Influence of rearing and housing of different strains of parent stock on behavioural development of offspring**
Mariana R. L. V. Peixoto*, Leanne Cooley, Tina M. Widowski
- 2:29 Evaluating the efficiency of non-penetrating captive bolt and mechanical cervical dislocation for on-farm euthanasia of compromised turkeys**
Caitlin Woolcott*, Patricia V. Turner, Stephanie Torrey, Tina M. Widowski
- 2:34 Examination of the efficacy of two non-penetrating captive bolt devices on a commercial level**
Lilia Serpa*, Tina M. Widowski, Penny Lawlis, Stephanie Torrey
- 2:40 COFFEE BREAK – 30 min**

Session #3: Ethics, Companion, Zoo and Fur Animals

- 3:10 The implementation of species-specific music to improve the welfare of nonhuman animals in agriculture**
Brady Patterson*
- 3:15 The moral experience of seeing with an animal**
Michael Furac*
- 3:20 An assessment of handling techniques used with dogs and cats during veterinary appointments**
Lauren C. Dawson*, Cate E. Dewey, Elizabeth A. Stone, Michele T. Guerin, Lee Niel

- 3:32 Assessment of feline behavioural and physiological parameters in response to handling during a mock veterinary examination: a validation study**
Carly M. Moody*, Georgia J. Mason, Cate E. Dewey, Lee Niel
- 3:44 Affect in cats: Do facial expressions covary with affective state?**
Jenna L. Cheal*, Georgia J. Mason, Lee Niel
- 3:49 Equine industry expert perception of critical issues in horse welfare in Canada**
Cordelie DuBois *, Derek B. Haley, Katrina Merkies
- 4:01 Visual appeal of horses may be linked to human personality**
Emily Zakrajsek*, Katrina Merkies
- 4:06 Neighbour effects confirm that stereotypic behaviours in farmed mink are heterogeneous**
Andrea Polanco*, María Díez-León, Georgia Mason
- 4:18 Farmed American mink (Neovison vison) do not prefer taller cages**
María Díez-León*, Margaret Quinton, Georgia Mason
- 4:30 Investigating the relationship between ambient conditions and thermoregulatory responses in polar bears (*Ursus maritimus*)**
Janel Kuska*, Esther Finegan, Laura H. Graham
- 4:35 Large home ranges and hunting styles involving prolonged chase predict stereotypic route-tracing across the Carnivora**
Jeanette Kroshko, Ros Clubb, Laura Harper, Emma Mellor, Axel Moehrenschrager, Georgia Mason*
- 4:40 Investigating the use of the pheromone Feliway © to reduce relocation stress in tigers (*Panthera tigris*)**
Laura H. Graham*

Closing Remarks & Student Awards

4:52 Derek Haley & Lee Niel

5:00 End

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POSTER PRESENTATIONS

- 1. Effect of three distinct visitor variables on the behaviour of zoo-housed Japanese macaques (*Macaca fuscata*)**
Emily Anderson*, Robert Weladji, Patrick Paré
- 2. EEG alterations in poultry undergoing physical methods of euthanasia**
Elein Hernandez*, Fiona James, Stephanie Torrey, Tina M. Widowski, Patricia V. Turner
- 3. How do group-housed dairy calves use automated grain feeders?**
Catalina Medrano-Galarza*, Alison Vaughan, Anne Marie de Passillé, Derek B. Haley, Jeffrey Rushen
- 4. Rethinking the human-dog relationship in Indigenous communities: A conceptual framework for veterinary practitioners**
Anita L. Tucker*, Maria Shallard, Cate E. Dewey
- 5. Topical anesthetic evaluation for reducing pain in piglets undergoing surgical castration**
Abbie Viscardi*, Lily Hu, Taylor Braden and Patricia V. Turner

ABSTRACTS

Do umbilical hernias reduce play behaviour, a welfare indicator in growing pigs?

Melissa Atkinson¹, Rocio Amezcua^{1*}, Robert Friendship¹, Radu Zorzolan², Tina M. Widowski³

¹Department of Population Medicine, University of Guelph, Guelph, ON, Canada

²Agribands Purina, Woodstock, ON, Canada

³Department of Animal Biosciences, University of Guelph, ON, Canada

Umbilical hernias (UH) are common in pigs and are an animal welfare concern. Play behaviours may provide a useful tool to assess the well-being of pigs. This study examined the effect of UH on the demonstration of positive play behaviours. Twenty-one grower pigs with UH (53 kg SD=13.2 kg) and 17 without hernias (WUH) (54.3 kg SD=11.1 kg) were assigned based on weight to 16 playing groups (PG) of 3 or 2 pigs (with at least one WUH pig per PG). Each PG was videotaped in a play area to determine the frequency of locomotor play behaviours (scamper, pivot, head-toss, lever and pushover), barks and tail wagging in one 7-minute session per week for 3 weeks. In their home pen, the same PG were videotaped to determine the frequency of bite and shake of a large knotted rope toy in one 5-minute session per week for 2 weeks. Prior to the trial, the pigs were familiarized with the playing area and the toy in 3 and 2 sessions, respectively. The time each animal was engaged in any of the defined playing behaviours for the locomotor or the toy play behaviours was recorded. At the end of the trial pigs were slaughtered and the hernia sacs were collected and a gross post-mortem examination was conducted. Mixed Poisson or negative binomial and linear models were used to determine the effect of UH and day of session, accounting for the cluster of pigs within groups, on the frequency of each play behaviour and playing times. Pigs with UH had the same frequency of most play behaviours and playing times as pigs WUH. The rate of pivot and head toss were 1.62 ($P<.004$) and 1.83 ($P=.03$) times more frequent in pigs with UH than pigs WUH. Most of the variation of the locomotor and toy play times was explained at the pig level 35% and 52.1%, respectively. The post-mortem examination found no evidence of inflammation, abscesses or incarcerated bowel. In summary, there was no indication that the presence of UH affected play behaviour in pigs. Playing behaviours may be impacted for non-welfare related factors.

Effect of three distinct visitor variables on the behaviour of zoo-housed Japanese macaques (*Macaca fuscata*)

Emily Anderson^{1*}, Robert Weladji¹, Patrick Paré²

¹Department of Biology, Concordia University, Montreal, QC, Canada

²Conservation and Research Department, Zoo de Granby, Granby, QC, Canada

The presence of numerous humans is one of the main factors that set the zoo environment apart from the field and laboratory. Many studies suggest that visitor presence is stressful to zoo animal, and results in increases in stress hormone levels and in behaviours such as aggression and stereotypies. In this study, we examined the effects of three visitor variables (sound level, crowd size and attendance) on the behaviour of the Japanese macaques at the Zoo de Granby, Granby, QC. It was hypothesized that visitor presence would decrease their welfare, as indicated by increases in vigilance, aggression and abnormal behaviour and decreases in positive affect indicators and inactivity as the visitor variables increased. Data was collected through focal animal sampling from July to early October in 2014, when the macaques were housed as two groups of seven in an old enclosure (group one and two). In 2015, group three was formed using five individuals from each of the two original groups and transferred to a new enclosure; this group was observed from July to late September in 2015. Crowd size was ranked as small, medium or large throughout every focal and sound level (dB) was recorded before each focal. Daily attendance was provided by the Zoo de Granby. The data was analyzed for each group using generalized linear mixed models. A total of 1,512 focals were used in the analyses. Many of the trends observed were not consistent with what was predicted. For example, vigilance behaviour actually decreased with increased daily attendance in group two ($-4.0 \times 10^{-5} \pm 1.1 \times 10^{-5}$; $F_{(1,604)}=12.42$, $p<0.001$) and group three ($-4.0 \times 10^{-5} \pm 1.4 \times 10^{-5}$; $F_{(1,843.4)}=7.33$, $p=0.007$). In group one, the rate of agonistic behaviours decreased with sound level (-0.102 ± 0.029 ; $F_{(1,467)}=12.75$, $p<0.001$). Hence, there was no substantial evidence for a decrease in welfare based on the indicators measured. It is likely that some animals housed in zoos may habituate to visitors and are not greatly affected by their presence. However, it is clear from this study that different groups may be impacted differently by the same stressor; therefore we cannot necessarily draw conclusions for a species as a whole from a single study.

A focus farms approach to motivating dairy farmers to improve animal welfare

Amanda Armstrong^{1,2*}, Steven Roche³, Elsa Vasseur^{2,4}, Ann Godkin⁵, David Kelton^{2,6}, Derek B. Haley⁶

¹Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

²Campbell Centre for the Study of Animal Welfare, University of Guelph, Guelph, ON, Canada.

³ACER Consulting, Guelph, ON, Canada

⁴Department of Animal Science, University of McGill, Ste. Anne de Bellevue, QC, Canada

⁵Ontario Ministry of Agriculture, Food and Rural Affairs, Elora, ON, Canada

⁶Department of Population Medicine, University of Guelph, Guelph, ON, Canada

Veterinarians regularly advise their clients about making changes to ensure the health and well-being of their animals, with varying degrees of success. In order to effect change we must understand how farmers learn and what kinds of things motivate them to change. This topic is especially important because starting in 2017 Animal Care Assessments will be done on all dairy farms across Canada. We are studying the use of a focus farm approach by dairy veterinarians to engage and motivate their clients to continuously improve the well-being of their animals. A focus farm approach uses peer-to-peer learning where farmers interact and will learn from each other based on their own knowledge and past experiences. For this research, 8 veterinarians were specially trained by the project team, about Animal Care Assessments, and how to facilitate focus farm meetings. Each veterinarian then recruited 12 dairy clients, 6 of which were assigned to the focus farm treatment group and attended the focus farm meetings, while the remaining 6 were put into the control group that did not attend focus farm meetings. In total there were 8 veterinarians and 96 farmers. Before the study began all veterinarians and participating farmers completed questionnaires, and Animal Care Assessments were done on all 96 farms. Over the course of 12 months the focus farm group attended 3 focus farm meetings while the control group did not attend any focus farm meetings but still had access to normal consultations with their veterinarian. At the end of 12 months both the veterinarians and farmers were surveyed again and Animal Care Assessments were done on all farms. The hypothesis is that focus farm farmers will make more changes and improve their Animal Care Assessment scores significantly more than the control group. The importance of this research is not only for improving the animal care, and the scores that farmers receive, but also for more effective knowledge, translation, and transfer and improving our understanding how farmer's learn, and what motivates them to change. This later information should hopefully be transferrable to effecting change in other areas where change is needed.

The effect of alternative feeding strategies during rearing for broiler breeders

Aitor Arrazola^{1,2*}, Elyse Mosco^{1,2}, Tina M. Widowski^{1,2}, Michele T. Guerin^{2,3} and Stephanie Torrey^{1,2}

¹ Department of Animal Biosciences, University of Guelph, ON, Canada

² Campbell Centre for the Study of Animal Welfare, University of Guelph, ON, Canada

³ Department of Population Medicine, University of Guelph, ON, Canada

Because broiler breeders have the same genetic potential for fast growth as broilers, they are feed restricted to reduce obesity related problems in fertility. This chronic feed restriction leads to welfare concerns over the birds' lack of satiety. The objective was to examine the effect of alternative feeding strategies for broiler breeders under simulated commercial conditions during rearing. At 3 weeks of age, 1,680 Ross 308 pullets were allocated into 24 pens, balanced by body weight, fed with one of four isocaloric treatments: (1) daily commercial diet (control); (2) daily alternative diet; (3) skip-a-day commercial diet; or (4) graduated commercial diet with varying on-feed days per week. Alternative diet had an inclusion of 40% soybean hulls and 1-5% calcium propionate, increasing with time. Random subsamples of 25 pullets per pen were weighed at 6, 10, 14, and 17 weeks, and scored for maturity at 23 weeks. Other subsample of 10 pullets per pen was scored biweekly for feather coverage, as an indirect measure of feather pecking, and foot lesion and hock burn prevalence. Litter moisture was determined weekly. Data were analyzed with a mixed model, with week as a repeated measure and pen and room as a random variable. Birds fed on skip-a-day and graduated schedules were lighter than control birds ($P<0.0001$), $67.2\pm 1.0\text{g}$ and $56.2\pm 1.0\text{g}$ respectively. There was also a lower percentage of mature birds in the skip-a-day vs. control treatments ($P<0.05$). While there was no overall effect of treatment on body weight uniformity ($P=0.34$), treatments differed in body weight uniformity over time ($P=0.007$). Feather coverage for all treatments worsened significantly with time, yet decreased faster for birds fed on daily compared to non-daily schedules ($P=0.03$). Litter moisture was higher in pens fed with alternative diet compared to control ($P<0.001$), although differences disappeared after week 14. The prevalence of foot lesions was higher in birds receiving the alternative diet compared to control ($P<0.01$); however, these differences were only significant in weeks 5 and 7. Results from this research suggest that non-daily feeding schedules used with commercial stocking densities slow feather loss, reduce body weight but did not increase flock uniformity.

Acute Tryptophan Depletion increases motor-response in laying hens

Patrick Birkl^{1*}, Joergen B. Kjaer², Peter McBride¹, Jacqueline Chow¹, Alexandra Harlander-Matauschek¹

¹Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

²Friedrich-Loeffler Institute, Celle, Germany

Feather pecking (FP) in laying hens, a motor behaviour which involves pecking at, or pulling out of feathers from conspecifics and thereby damaging the victim, is a major welfare problem in egg production. It has been suggested that FP is underpinned by deficits of motor control. The biological basis may include differences in the modulatory role of serotonin, which are implicated in FP. However, this has never been tested directly. We therefore assessed the modifying role of amino acids in an acute tryptophan depletion (ATD) test where plasma tryptophan is lowered and therefore central serotonin synthesis is compromised.

The current experiment aimed to test differences in motor responses in birds selected for high (HFP) and low (LFP) levels of FP activity and an unselected control line (C) that were either subjected to an acute tryptophan depletion (ATD) or a control treatment. After reaching the training criteria (at least 15 rewards obtained per trial) on a fixed ratio (FR=1) reward schedule, we tested 30 birds (three lines: HFP, LFP and C) in a delayed reward task, where birds obtained access to a food reward 5 seconds after pecking an illuminated pecking key. Three hours before testing, half of the birds of each line ($n_{\text{total}} = 15$) received a control treatment, the other half ($n_{\text{total}} = 15$) received an ATD treatment. We analysed data using a GLIMMIX model with pecks as the response variable and line and treatment as fixed effects. Number of obtained rewards per trial did not differ across genotypes and treatments but number of unrewarded pecks at the key (after trigger=illumination) differed between treatments, with more pecks in ATD treated birds; 4.1 ± 0.2 than controls; 3.6 ± 0.2 , $P < 0.001$. HFP birds performed more unrewarded pecks; 4.04 ± 0.2 than LFP; 3.7 ± 0.2 and C birds; 3.8 ± 0.2 , $P < 0.01$. ATD further resulted in the highest number of unrewarded pecks in HFP birds; 4.5 ± 0.2 when compared to HFP birds receiving control treatment; 3.6 ± 0.3 , $P < 0.001$ or ATD-treated LFP; 3.8 ± 0.2 , $P < 0.001$ or C birds; 4.1 ± 0.2 , $P < 0.001$. These results provide valuable information on the spectrum of behaviour that is affected by ATD and help to better understand the behavioural pathology of feather pecking.

Affect in cats: Do facial expressions covary with affective state?

Jenna L. Cheal^{1*}, Georgia J. Mason¹, Lee Niel²

¹Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

²Department of Population Medicine, University of Guelph, Guelph, ON, Canada

Cats' facial expressions change during fear and pain (Holden, et al., 2014; Mills, in prep), but little is known about whether they also display expressions during other emotions, such as the positive and negative emotional states associated with play, satiety, contentment, anxiety or sickness. This knowledge could be used to train owners and veterinarians to better evaluate cats' welfare, potentially enhancing both the owner-cat bond and care in the clinic. Our pilot data from cellphone photos and YouTube video screenshots (all cropping the ears), show that people can distinguish facial expressions in cats in positive and negative situations, using cues from the eyes, mouth and muzzle. We presented stills from YouTube videos of 20 cats in positive or negative situations (10 of each). Our 17 scorers generally found categorization difficult (average no. correct: 12.6/20), but performed significantly above chance ($t_{16} = 5.027$, 1-tailed $p < 0.001$). Furthermore, 8 people scored 14/20 or better (1-tailed binomial tests: $p < 0.057$; with two scoring 16/20 [$p < 0.01$]). Seven images (3 positive, 4 negative) were also consistently interpreted correctly (by at least 13/17 scorers; $p < 0.03$). Building on this preliminary work, we collected a greater number (40) of better quality video clips, selected from cats in more diverse, precisely categorized states (high activity positive, low activity positive, high activity negative, and low activity negative). In this ongoing project we ask participants to assess short video clips of cats' faces reducing the risk of: 1) non-blind cherry-picking of images and 2) missing something transient or key to the expression. We aim to increase the number of participants (>200), whose background and experience we will quantify. We hypothesize at least a subset of scorers will correctly identify whether each clip is from a cat in a positive or negative state and successful scorers will have more past experience (e.g. in years of cat exposure) than unsuccessful scorers. From this study, we will ascertain whether people reliably interpret some facial expressions as positive or negative; whether they tend to be correct; what cues they use; and, when successful, what past experience promotes this.

Variability in feeding behaviour between individual dairy cows fed under differing levels of competition

Robin E. Crossley*, Alexandra Harlander-Matauschek, Trevor J. DeVries

Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

Competition for feed access can negatively affect dairy cattle welfare by creating social pressure, leading to altered feeding patterns that may negatively affect their health. The study objective was to investigate the effects of differing levels of competition for feed access on group-housed dairy cows. We hypothesized that as competition increases, cows will consume feed faster, in larger meals, and individuals within the group will experience greater variability in feeding patterns. Eighteen lactating Holstein dairy cows with average DIM of 77 ± 20 d, and producing 46 ± 7 kg/d at study commencement, were divided into groups of 3 and fed 3 times/d. Groups were exposed to each of 3 competition levels: High (3 cows:1 feed bin), Moderate (3:2), and Low (3:3). Treatments were assigned according to a modified Latin-square and applied for 10 d. DMI and feeding behaviour (feeding time, feeding rate, and meal patterns) for each cow were recorded using an automated feed intake system on d 6-10 of each period. Data were summarized by group and treatment period, and analyzed in a general linear mixed model. DMI (29.1 kg/d) was found to be similar ($P=0.63$) across treatments. Increased competition resulted in reduced feeding time (Low=202.6; Moderate=194.9; High=83.6 min/d; SED=4.49; $P=0.015$), especially following fresh feed delivery and milking. Rate of feed intake increased with greater competition (Low=0.16; Moderate=0.18; High=0.20 kgDM/min; SED=0.01; $P=0.01$). Meal frequency (8 meals/d) and size (4.0 kgDM/meal) were unaffected by treatment ($P>0.40$), while meal length increased under high competition (Low=37.0; Moderate=36.6; High=47.3 min/meal; SED=3.7; $P=0.046$). This was due to greater within-meal non-feeding time, which at the High competition level, was approximately double that of other treatments (Low=10.0; Moderate=10.8; High=20.3 min/meal; SED=2.3; $P=0.008$). Analysis of individual within-group variability (daily SD of each group averaged across d 6-10) revealed treatment differences in variability of meal length (Low=12.0; Moderate=13.9; High=29.0 min/meal; SED=5.56; $P=0.04$) and within-meal non-feeding time (Low=6.4; Moderate=8.3; High=21.5 min/meal; SED=4.57; $P=0.03$). Results suggest that at elevated competition levels, cows modify their feeding behaviour to consume more feed in a shorter period of time and devote a large portion of their meal time towards waiting for feed access. Further, there is greater variability in meal patterns within groups at higher levels of competition for feed access.

An assessment of handling techniques used with dogs and cats during veterinary appointments

Lauren C. Dawson^{1*}, Cate E. Dewey¹, Elizabeth A. Stone², Michele T. Guerin¹, Lee Niel¹

¹Department of Population Medicine, University of Guelph, Guelph, ON, Canada

²Department of Clinical Studies, University of Guelph, Guelph, ON, Canada

Veterinary care is important to ensuring animal welfare, yet it can cause stress and fear in many dogs and cats. As such, veterinary behaviourists recommend the use of low-stress handling techniques to mitigate fear and improve patient welfare. With the goal of assessing companion animal welfare during veterinary care, a welfare assessment scheme was developed for use in veterinary clinics. This tool included an assessment of handling by veterinarians and technicians during appointments. It was tested for feasibility and reliability in 30 companion and mixed animal veterinary clinics, and baseline measures were collected for benchmarking. In each clinic, video cameras were unobtrusively installed in each examination room. Up to six randomly selected appointments per clinic (152 appointments total: 90 canine, 62 feline) were analyzed for the use of recommended and discouraged handling techniques. During a single day visit, it was only possible to record sufficient appointments to meet our criteria (3 canine, 3 feline) in 10 veterinary clinics. Based on weighted kappa statistics for overall tool performance, scoring showed substantial inter-observer agreement ($K_w=0.74$ and 0.70 ; experienced vs. two trained observers) and almost perfect intra-observer agreement ($K_w=0.84$; experienced observer only). Fear-reducing techniques, such as providing positive reinforcement (observed in 36% of all appointments), increasing surface traction (25%), and using pheromones (2%), were infrequently employed. Techniques for handling aroused patients, like using towel or blanket wraps (8%), were also infrequently observed. Despite recommendations to allow cats to independently exit their carriers, cats were tipped, lifted, or pulled out of their carriers in 74% of cat appointments. Discouraged and potentially aversive methods, such as the use of heavy manual restraint (8%) and scruffing of cats (7% of all feline appointments) were also rarely observed. Overall, tool feasibility was poor because few appointments were recorded in some clinics; however, inter- and intra-observer reliability were reasonable. Although aversive techniques were rarely observed, limited use of recommended handling techniques suggests there is room for improvement with regard to reducing animal stress and improving patients' experience. Further research is necessary to assess whether feedback on performance leads to improvement during future assessments.

Farmed American mink (*Neovison vison*) do not prefer taller cages

María Díez-León^{*}, Margaret Quinton, Georgia Mason

Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

Regulations assume taller cages are better for mink, since providing more space should permit more diverse behaviours and postures (e.g. standing upright). New Canadian regulations therefore recommend mink cages to be ≥ 30 cm tall. In Europe, however, cages must be ≥ 45 cm tall. Because food is delivered onto the cage top, young mink must climb, and adults stand on their rear legs, to feed: both unnatural feeding postures for mink. Some Canadian cages also have 'drop-in' nest boxes that, while reducing internal ceiling height, also provide hiding opportunities. We therefore tested the hypotheses that mink prefer lower ceiling heights for feeding (Exp.1) and hiding (Exp.2), but higher ones for other behaviours (e.g. interacting with enrichments, Exp.2). Exp.1 involved 64 2.5 month-old male-female pairs (in cages 75Lx61Wcm). Cage height was 46cm, except for a modified feeding strip (15Lx61Wcm) accommodating four different heights: 25, 38, 46 or 53cm (spanning the range used in Canada and Europe). Mink habituated to feeding from each height for 4wks. Food was then delivered onto all heights and feeding observed, a procedure repeated monthly until animals were adult body length (7mo). Exp.2 gave 32 mink (16 females : 16 males, 11mo) free access to a compartment whose ceiling was set to 13cm for 16 animals, and 52cm for the other 16. Every mesh ceiling also had a section covered with plastic (37x37cm) to mimic drop-in nest boxes. Every 3wks, this ceiling was progressively lowered/raised by c.13cm, and the proportion of time spent in this compartment was assessed. Exp.1 showed that preferences to feed from each height varied with age and sex ($F_{3,490}=3.80$; $p<0.0001$): females always preferred to feed from the lowest height, as did males once 5 months old or older ($p<0.01$ for all significant contrasts). Food was also eaten faster from the lowest heights ($p<0.01$ for all significant contrasts). Exp.2 revealed no consistent preferences for any height, whether covered or not (females seemingly preferring the lowest [$F_{3,42.07}=7.98$; $p<0.001$], covered [$F_{1,36}=6.72$; $p<0.05$] heights but only if presented last). Overall, mink thus do not prefer taller cages: results with implications for future revisions of the mink NFACC Codes of Practice.

Equine industry expert perception of critical issues in horse welfare in Canada

Cordelie DuBois^{1*}, Derek B. Haley², Katrina Merkies¹

¹Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

²Department of Population Medicine, University of Guelph, Guelph, ON, Canada

The diverse range of equine disciplines makes reaching a consensus on welfare issues a challenge. One approach used in other livestock species, the Delphi method, is a survey technique employing multiple, iterative “rounds” to amalgamate viewpoints. In this study, equine professionals (n=32; 15 male, 17 female) chosen to represent various sectors from across Canada were surveyed through an online questionnaire using a modified Delphi, with the objective of gathering and consolidating information regarding areas of welfare concern. In the first round, participants were asked to identify examples of welfare issues they felt were experienced by horses in Canada and their opinion on how to best determine if a horse was experiencing a state of negative well-being. Content analysis was used to sort and group answers based on their similarities. Participants identified 12 welfare issues best addressed at the individual horse level (e.g. poor training practices) and an additional 12 issues (with little overlap) best addressed at the industry level (e.g. poor biosecurity practices). Additionally, participants indicated 32 potential methods to assess the degree to which a horse could be experiencing a state of compromised well-being (e.g. lameness scoring). In the second round (currently ongoing), participants will rank the identified welfare issues based on their perceived importance, as well as judge the sensitivity, reliability, and feasibility of the 32 measures listed in round one for use in an on-farm assessment. These responses will shape the third round, which will focus on motivators behind the indicated welfare issues (e.g. tradition) and the effectiveness of different methods of addressing these. A graphical analysis and Spearman’s rank correlations of ranking data gathered in rounds 2 and 3 will be used to determine if a consensus was reached among equine professionals. Results from this survey will assist in identifying the most important welfare concerns in the Canadian equine industry and offer insight into the perception of equine welfare at the professional level. Once major areas of concern for horse welfare are identified, feasible and effective solutions can be developed in order to improve horse welfare in Canada.

The moral experience of seeing with an animal

Michael Furac

Department of Philosophy, University of Guelph, Guelph, ON, Canada

Humans ought to act towards animals in a virtuous manner, and in doing so we will perforce act in accord with their wellbeing. Virtuous actions express values of character, identified in accord with the moral theory of virtue ethics. The paradigm virtue that is concerned with wellbeing is the virtue of charity. To act charitably is to act towards another by fulfilling their specific needs. Towards animals we understand, to a degree, their need for physiological necessities: food, water, space to move; as well as some psychological needs: company, puzzles, etc. However, these are all formed through a general study of a categorical group of animals, and are then applied to particular animals. Understanding the needs of an actual individual requires a relationship with that individual that will produce a deeper understanding of their needs. This process is seen in human relationships all the time; only by realizing an individual as an individual do you truly attend to their needs in a sufficiently caring manner.

For example, it may seem justifiable to say that concern over a lab rat's welfare has been properly attended to because it has x amount of space, y amount of food, and z amount of water. What is not considered is any unique quality about the rat that may lead to the rat having a better or worse psychological or physical life. The rat in question may be fine with less food than the average rat but needs more space in which to exercise. Further, it may be more social than the average rat, and concern for its welfare ought to include this. Each of these particular points of concern cannot be uncovered without attending to the rat in a relationship, understanding the world as the rat might. In this way of understanding the rat the human's perspective shifts, with new points of concern revealing themselves to the agent.

Only by establishing particular relationships with the animals to which we are directing our care will we be able to truly act in a manner that actualizes the concern for welfare that is expressed in the contemporary sciences.

Investigating the use of the pheromone Feliway® to reduce relocation stress in tigers (*Panthera tigris*)

Laura H Graham^{1,2*}

¹Dept Animal Biosciences, University of Guelph, ON, Canada

²WRG Conservation Foundation

The relocation of animals is a common practice that can cause changes in their behaviour and physiology. Zoo species such as tigers that are part of conservation programs are relocated from one facility to another for breeding purposes, sometimes more than once in their lifetime. Relocation has been reported to cause stress in captive tigers and this stress may possibly lead to a decrease in breeding success. Recently, investigations have looked at the use of pheromones as a non-pharmacological way of reducing stress and increasing animal welfare. Domestic cats release pheromones during facial rubbing when they feel comfortable with their environment and this facial rubbing behaviour is also observed in non-domestic cats such as tigers. The synthetic analogue of this feline facial pheromone (Feliway®; CEVA Animal Health) has been demonstrated to decrease changes in behaviour and physiology associated with stressful situations such as a reduction in stress-associated urine spraying and other behaviours associated with relocation stress. Although facial pheromones from non-domestic felids have not been chemically characterized, it is possible that non-domestic felids can respond to the domestic cat facial pheromone analogue. For our study we used non-invasive fecal glucocorticoid metabolite analyses in tigers being shipped between zoos to investigate the hypothesis that the application of Feliway to the new enclosure mitigates the elevation in adrenal activity associated with relocation. Fecal samples were collected from individually housed tigers (N=20; 3 species) for 3 weeks after being shipped between zoos for management purposes. Upon arrival at the receiving institution, the enclosure housing the relocated tiger was untreated (control N = 8), treated with Feliway spray for 1 week (N = 5) or treated with Feliway for 2 weeks (N = 7) following arrival. The results indicated that treatment with Feliway for 2 weeks lowered fecal cortisol metabolites compared to the control and 1 week treatment (P<0.05).

EEG Alterations in Poultry Undergoing Physical Methods of Euthanasia

Elein Hernandez^{1*}, Fiona James³, Stephanie Torrey², Tina M. Widowski², Patricia V. Turner¹

¹Department of Pathobiology, University of Guelph, Guelph, ON, Canada

²Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

³Department of Clinical Studies, University of Guelph, Guelph, ON, Canada

On-farm poultry culling is required for a variety of reasons, including control of disease and to prevent or end suffering of sick or injured birds. It is estimated that over 17 million birds are euthanized annually on-farm in Canada, yet information is still lacking as to the best methods of euthanasia. According to CVMA, preferred methods of euthanasia should affect the brain first, resulting in rapid loss of consciousness, followed by cessation of cardiac and respiratory activity. Manual and mechanical cervical dislocation (CD) techniques are widely considered humane euthanasia methods and are commonly used for on-farm euthanasia; however, there are several concerns about the use of these techniques, including the potential for prolonged time to loss of consciousness following application, particularly in larger birds. Consciousness indicators, such as time to onset of specific behavioural signs and physiological indicators, may not be consistent in all poultry species and do not define the precise time to loss of consciousness and death after using CD. In poultry, loss of consciousness correlates with significant changes in brain activity. Therefore, specific changes in frequency and amplitude of an electroencephalogram (EEG) can be used as neurophysiologic indicators for objectively determining time to loss of consciousness and death. The objectives of this research are: 1) to determine time to loss of consciousness through use of EEG recording for manual and mechanical CD in different classes of chickens and turkeys (n=6/group) and 2) to compare and contrast time to loss of brain stem reflexes by EEG with other behavioural and physiological indicators to determine the validity of these other measures in predicting time to brain death. Cull animals will be used for these studies, including end-of-lay hens, broiler chickens, and turkeys. EEG recording will be done using birds that are surgically instrumented with a telemetry transmitter to record EEG, ECG, body temperature and general activity. This research should provide specific information about the utility of different physical euthanasia methods for humane killing of chickens and turkeys of differing age and weight classes.

The devil is in the detail: How a simple design feature might affect laying hens' perception of nest sites in furnished cages

Michelle E. Hunniford^{1*}, Janice Siegford², Tina M. Widowski¹

¹Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

²Department of Animal Science, Michigan State University, East Lansing, MI, United States

All furnished cage (FC) designs for laying hens include nests; however, how hens perceive other potential nest sites and how they affect pre-laying behaviour is unknown. Our previous research suggested a wire partition affected egg location; therefore, two experiments were conducted to investigate how modifying the design of the scratch area would affect pre-laying behaviour. Hens were offered a choice between a curtained nest and a scratch area with (W) or without (NW) a wire partition. The first experiment used LSL-Lite hens housed in conventional cages (CC) in groups of 6. From 20–23 weeks of age, 48 groups of hens (12 groups/wk, 6 hens/group) were transferred into one of 12 FC (Farmer Automatic[®]; $N_W=6$, $N_{NW}=6$). Egg location was recorded and hens in top cages (4 groups/wk, 96 hens) were video recorded. From video, behaviour patterns performed in the nest and scratch areas were scored for the hour pre-lay. Egg location and behaviour were analyzed using a mixed linear model. Hens laid more eggs in the W vs. NW scratch area ($18.3\pm 1.8\%$ vs. $7.3\pm 1.3\%$; $P<0.0001$). W hens searched ($P=0.006$) and spent more time in the scratch area ($P=0.0001$), and spent less time in the nest ($P=0.024$), than NW hens. Overall, nesting ($P=0.21$) and aggressive behaviour ($P=0.14$) did not differ. Therefore, hens appeared to perceive scratch areas with a wire partition as an alternate nest site. The second experiment used 1560 Hy-line W-36 hens in 24 Chore Time[®] FC (65 hens/FC). Hens were CC-reared and housed in FC in week 17; treatments were installed in week 21. Egg location was logged over 4 days; nest and scratch areas were instantaneously scan sampled every 20 minutes (0630h–1330h) to count sitting hens and eggs. Aggressive pecks, threats and displacements were counted during a 30-second interval scan (3 scans/period, 5 periods). Mixed model analyses were used. Treatment did not affect the number of eggs laid in scratch areas ($P=0.7$). Hens in W treatment scratch areas were more aggressive ($P=0.04$) with fewer bouts of sitting ($P=0.04$) than NW hens. A simple wire partition added to scratch areas affected behaviour in both experiments; however, it did not consistently change egg-laying patterns.

Dairy cow behaviour and welfare in herds with automated milking systems

Meagan T. M. King^{1*}, Ed A. Pajor², Stephen J. Leblanc³, Trevor J. DeVries¹

¹Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

²Faculty of Veterinary Medicine, University of Calgary, Calgary, AB, Canada

³Department of Population Medicine, University of Guelph, Guelph, ON, Canada

To identify better ways of using electronic data to earlier detect illness, we conducted two studies to evaluate associations of housing, management, lameness, and illness with productivity and behaviour in herds with automated milking systems (AMS): (#1) cross-sectional study of 41 farms, (#2) longitudinal study of 57 cows. Rumination and lying behaviour were recorded by data loggers, and milk data were recorded by the AMS. Data were analyzed in mixed-effect linear regression models. In study #1, details of housing and management were collected, sub-samples of cows were gait-scored (GS; 5-point scale), and behaviour was recorded for 6d. At the herd level, an increase of 1 percentage-point (p.p.) in the prevalence of severe lameness (GS \geq 4; mean=2.2%) reduced milk production by 0.6kg/cow/d ($P=0.05$) and 32kg/AMS/d ($P=0.03$); each +10p.p. in the prevalence of clinical lameness (GS \geq 3; mean=26.2%) was associated with 0.1 fewer milkings/cow/d ($P=0.05$). Lying bouts were 12 min longer in deep-bedding vs. mattresses ($P=0.003$) and 5 min longer with each +10p.p. in clinical lameness prevalence ($P=0.001$). In a cow-level comparison (30 cows/farm) of lame (GS \geq 3; n=353) and sound cows (GS $<$ 3; n=865), lame cows were fetched more often ($P=0.002$), produced 1.6kg/d less milk ($P=0.002$) in 0.3 fewer milkings/d ($P<0.001$) and spent more time lying down (+38min/d; $P<0.001$) in longer bouts (+3.5min/bout; $P=0.03$). In study #2, diagnoses/treatments (day 0) of illness were recorded. While controlling for DIM, days relative to diagnosis (from day -1 to -14) were analyzed for each illness separately: sub-clinical ketosis (SCK), hoof disorders, displaced abomasum (DA), and pneumonia. Milk yield (3-d rolling average) declined by 4kg/d from day -4 to diagnosis of DA ($P<0.001$) and pneumonia ($P=0.01$). From day -14 to diagnosis of hoof disorders, production steadily declined by 0.5kg/d ($P<0.001$). Respectively, rumination time declined by 41 and 51min/d from day -8 and -5 to diagnosis of DA ($P<0.001$) and pneumonia ($P=0.03$), and by 20 min/d from day -6 to SCK diagnosis ($P<0.05$). Lying behaviour was less predictive of illness; it did not vary until day 0. Results suggest that behaviour and productivity are useful indicators to earlier diagnose illness in AMS herds, but that certain indicators may be illness-specific.

Use of an accelerometer data logger to identify body motion in domestic bird's behavioural repertoire

Madison Kozak^{1*}, Bret Tobalske², Dwight Springethorpe³, Bill Szkotnicki¹, Alexandra Harlander-Matauschek¹

¹Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

²Division of Biological Sciences, University of Montana, Missoula, MT, United States

³Department of Integrative Biology, University of California Berkeley, Berkeley, CA, United States

Observing animals by direct observation is an ideal way to understand animal behaviour. However, this approach is challenging for domestic birds kept in complex environments that often spend considerable time out of view. The goal of the current study was to continuously and objectively measure differences in laying hen physical activity (PA) during development in a complex aviary with an accelerometer. In our study, we used 20 tri-axial accelerometers (sampling at 10 Hz) to measure the activity budgets of 120 laying hens of four different strains (LSL-Lite, Dekalb White, Lohmann Brown, Hyline Brown) in a three-dimensional aviary throughout three age classes [pullets (10-16 weeks of age), at the beginning of lay (17-24 weeks of age), and mature laying hens (25-37 weeks of age)]. Four thirty-minute daytime samples were taken per bird per week. A Random Forest (RF) prediction model was used to objectively categorize our raw X, Y and Z acceleration signals into three classes: low-intensity PA (no location change, small postural changes, quiet sitting/standing/perching); moderate-intensity PA (may involve small location change, preening, foraging, searching); and high-intensity PA (usually involves location change, walking, running, controlled aerial ascent/descent). Our RF model had a prediction accuracy rate of 98%. The data were analyzed using Glimmix (SAS) to determine main (line, age class) and interaction effects. Throughout all age classes, hens allocated their time, in descending order in moderate-, low-, and high-intensity PA. Brown-feathered birds allocated less time in low-intensity PA compared to white-feathered birds ($F_{3, 348}=7.22$, $P<0.0001$). Pullets expressed the highest level of high-intensity PA, which declined with increasing age ($F_{2, 232}=65.65$, $P<0.0001$). Furthermore, the minimum level of low-intensity PA was observed during the beginning of lay ($F_{2, 348}=4.92$, $P=0.007$). The results demonstrate that accelerometers at 10 Hz are useful tools to identify objectively and continuously activity levels in laying hens in a complex aviary. Information on laying hen physical activity levels may provide a starting point on how to properly prepare laying hens for and design non-caged, three-dimensional systems from a birds' welfare point of view.

Investigating the relationship between ambient conditions and thermoregulatory responses in polar bears (*Ursus maritimus*)

Janel Kuska^{1*}, Esther Finegan¹, Laura H. Graham^{1,2}

¹Department of Animal Biosciences, University of Guelph, ON, Canada

²WRG Conservation

The polar bear is one of the top Arctic predators and is considered to be a key indicator species for the state of the Arctic ecosystem. Polar bears face a variety of threats such as hunting, exposure to toxic pollutants and habitat disruption by human activities and there is an immediate threat to the polar bear population due to climate change causing longer ice-free periods in the Arctic. Studies on wild polar bears suggest that they are so well insulated they are prone to heat stress during moderate physical activity on land, even in normal arctic conditions. The effect of warmer arctic temperatures on polar bears' ability to thermoregulate is unknown. Polar bears in captivity are usually housed in latitudes far south of their natural range and are regularly exposed to high temperatures rarely observed in the arctic but, as with wild polar bears, the effect of these conditions on their ability to thermoregulate is unknown. Thus, it is important to increase our understanding of the thermoregulatory abilities of polar bears to optimize their welfare in captive situations as well as understand the threats they face in the wild. Our objective is to assess the relationship between macro and microclimatic variables (heat, radiation and humidity) and physiological (endocrine function and thermoregulation) and behavioural responses in captive polar bears housed in zoos at different latitudes exposed to different thermal environments. Our approach has two components: 1) Longitudinal non-invasive monitoring of endocrine function via fecal hormone analyses associated with changes in ambient conditions and 2) Mid-winter and mid-summer short duration 'thermal snapshots' using a variety of techniques to non-invasively assess physiological and behavioural thermoregulatory responses to microclimate variables. Fecal samples have been collected longitudinally from polar bears (N=24) housed in zoos (N = 10) in Canada and the US located at latitudes ranging from 50°N (northern Canada) to 30°N (southern US). Mid-winter thermal snapshots have been performed on all bears housed in Canada. The validation of the techniques and preliminary results will be presented. Funding provided by CCSAW.

Do domestic birds prepare themselves to initiate ascent?

Chantal LeBlanc^{1*}, Bret Tobalske², Stephen Bowley³, Bill Szkotnicki¹, Alexandra Harlander-Matauschek¹

¹Department of Animal Biosciences, University of Guelph, Guelph, ON Canada

²Division of Biological Sciences, University of Montana, Missoula, MT, United States

³Department of Plant Agriculture, University of Guelph, Guelph, ON, Canada

Preparation is hypothesized to be critical for effective (safe) navigation of locomotor challenges including uneven surfaces and inclines. Sensory input from a variety of sources is involved in the control of movement, especially when encountering uneven/inclined surfaces, to prevent falls and injuries. Mammals prepare themselves to initiate movements and to react to inclined surfaces by modification of temporal parameters (foot contact time) to maintain a safe transition, but presently there is a gap in our understanding of whether domestic birds prepare themselves a similar way. This is important because of the prevalence of injuries in domestic birds. The purpose of this study was to analyze modifications in temporal parameters (foot contact time on level ground) during level-incline (ramp) transition in domestic birds. We predicted that in comparison with level walking, the foot contact time would be longer and that with increasing age/experience birds foot contact time would decrease. Twenty domestic birds were tested every five weeks from 17 to 36 weeks of age on wire-ramp inclines of 0, 40 and 70 degrees (inclines birds could encounter in a commercial aviary). Foot contact time was measured on a force plate before the transition. Motivation to climb was provided by having 5 same-age birds in a crate and raisins on the top of the ramp. Foot contact time during level-incline transition was analyzed using the Glimmix procedure via SAS (version 9.4). The birds had longer foot contact times when transitioning to the 70 degree incline versus the control (-17.12 ± 4.60 , $t_{19,81} = -3.72$, $P = 0.0014$) (5.8 times longer than control). They also had longer foot contact times when transitioning to the 40 degree incline versus the control (-5.85 ± 1.99 , $t_{78,28} = -2.95$, $P = 0.0042$) (2.7 times longer). Age/experience did not have a significant effect upon foot contact time ($P = 0.0897$). These data reveal that domestic birds have the capacity to prepare for incline ascent in a manner similar to mammals, which can reduce the incidences of falls or injuries. Moreover, the time they require to integrate sensory information and initiate movement varies directly with the degree of the challenge before them.

Large home ranges and hunting styles involving prolonged chase predict stereotypic route-tracing across the Carnivora

Jeanette Kroshko¹, Ros Clubb², Laura Harper¹, Emma Mellor^{1,3}, Axel Moehrenschrager⁴, Georgia Mason^{1*}

¹ Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

² Royal Society for the Prevention of Cruelty to Animals (RSPCA), Southwater, West Sussex, United Kingdom

³ School of Veterinary Sciences, University of Bristol, Bristol, United Kingdom

⁴ Centre for Conservation Research, Calgary Zoological Society, Calgary, AB, Canada.

Evolved aspects of behavioural biology appear to pre-adapt some species to cope well with captivity, while others are intrinsically at high risk of stress from human proximity, enclosure, etc. Correspondingly, in zoos, some Carnivora tend to show little or no stereotypic behaviour (SB), while others are prone to being very stereotypic. SB indicates early, chronic or repeated exposure to aversive treatments (e.g. barren conditions), and may reflect abnormal brain function. We used phylogenetic comparative methods, which can reveal large scale patterns across taxa and so identify the fundamental origins of welfare problems, to identify species-level risk factors for SB. Candidate predictor variables were natural ranging behaviour, territoriality, specific aspects of natural foraging, wild activity levels, cranial volume, and IUCN Red List status; and previous research had already identified naturally long daily travel distances, and being large-bodied and wide-ranging, as SB risk factors. We nearly doubled the size of this original SB database, and then imposed stricter quality controls (e.g. on the minimum sample sizes for inclusion). We analysed the resulting 23-species dataset (whose medians for stereotypic time-budgets ranged from <1% to c.55% observations) using GLMs and regressions forced through the origin. These confirmed naturally large ranges ($T_{1,13}=3.42$, $P=0.002$) and long daily travel distances ($T_{1,10}=2.00$, $P=0.037$) as risk factors for stereotypic route-tracing. They also newly showed that the home range size effect is independent of body mass (although body mass and range size together predicted SB most strongly: $F_{2,13}=0.0001$, $P<0.0001$), and that it explains the apparent daily travel distance effect (which vanished when range size was controlled for). Furthermore, a new finding emerged: that naturally long chase distances during hunts also predict more severe route-tracing ($T_{1,3}=4.21$, $P=0.012$). Overall, naturally wide-ranging Carnivora with long chase distances are thus most prone to extensive stereotypic route-tracing in captivity. This suggests that aspects of being wide-ranging and a pursuit predator have evolved to be inflexible 'behavioural needs' that must be met even when a Carnivore's homeostatic requirements have all been accommodated. These results also suggest likely strategies for the effective environmental enrichment of enclosures, to help zoos reduce or eliminate SB and replace it with more naturalistic, variable activity.

How do group-housed dairy calves use automated grain feeders?

Catalina Medrano-Galarza^{1,2*}, Alison Vaughan³, Anne Marie de Passillé³, Derek B. Haley^{1,2}, Jeffrey Rushen³

¹Department of Population Medicine, University of Guelph, Guelph, ON, Canada

²Campbell Centre for the Study of Animal Welfare, University of Guelph, Guelph, ON, Canada

³Faculty of Land & Food Systems, University of British Columbia, Agassiz, BC, Canada

Dairy calves are typically weaned off milk at an early fixed age irrespectively of the daily amount of solid feed consumed at that stage. Calves weaned at an early age experience hunger and lose weight. An advantage of automated calf feeders is that solid feed intake can be monitored and milk allowance adjusted for each individual calf allowing better weaning. However, there is a lack of knowledge about solid feeding behaviour of group-housed calves fed with an automated grain feeder and how they interact with the feeder. Our objectives were to determine (1) calves' latency to the first grain feeder visit, and (2) pre- and post-weaning grain feeding patterns (meal size, total daily grain intake [TDGI] and duration of visits). A total of 188 calves housed in groups of 9 from 6d of age were allowed 12L/d/calf of whole milk, and grain ad libitum through automated feeders. Weaning started at a median of 51d-old, and lasted a median of 9d. The MIXED procedure of SAS was used to determine differences in TDGI and duration of visits to the grain feeder. Most calves (75%) visited the grain feeder within 48h of introduction to the group pen; 95% had visited by day 5. During calves' first visit, 82% only entered the feeding stall, 12% triggered a feed-drop, and 6% consumed grain. A large variation was found in the time between the first feeder visit and the first visit with grain intake (a median of 12d; range: 0–78d). During calves' first month in the group pen, TDGI occurred mainly in meals <50g (median: 100% of TDGI; 25th-75th percentile: 50-100). By the second month, meals <50g were still the most common (67%; 25th-75th percentile: 46-100), but meals of 50-99g had increased (24%, 25th-75th percentile: 0-40). After 11 wks, only 14% (25th-75th percentile: 4.5-22) of TDGI occurred in meals <50g, while 58% (25th-75th percentile: 30-69) occurred in meals of 100-299g. Only 25% of the calves had meals >300g, accounting for 16-47% of their TDGI. Variation between calves in meal size decreased during post-weaning. One wk post-weaning, TDGI was mainly consumed in meals of 100-299g (47%; 25th-75th percentile: 36-55) and 300-999g (33%; 25th-75th percentile: 15-49). By wk 8 post-weaning, the percentage of TDGI occurring in meals of 100-299g decreased to 26% (25th-75th percentile: 19-35), while meals of 300-999g increased to 61% TDGI (25th-75th percentile: 52-71). TDGI on wk 1 in the group pen was lower than wk 4 (median: 3g vs. 14g), and significantly increased by wk 11 (137g; $P<0.001$). TDGI increased ($P<0.003$) during the first 3 wks post-weaning (wk 1: 1686g vs. wk 2: 2290g vs. wk 3: 2776g); afterwards there were no differences. The duration of a grain feeder visit increased during the first 3 wks on the group pen from a median of 1.4 min to 2 min ($P<0.001$), then increased to 2.7 min by wk 11 and to 5 min one wk post-weaning ($P<0.001$), without differences thereafter. Meal size, total grain intake and duration of visits to the grain feeder increased with age. However, there were large differences between calves in how they interacted and consumed grain from an automated feeder, highlighting the individual variability of the adaptation to solid feed.

Assessment of feline behavioural and physiological parameters in response to handling during a mock veterinary examination: a validation study

Carly M. Moody^{1*}, Georgia Mason², Cate E. Dewey¹, Lee Niel¹

¹ Department of Population Medicine, University of Guelph, Guelph, ON, Canada

² Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

Many cat owners do not seek adequate veterinary care, due to perceived feline stress during veterinary visits. The current study aimed to determine which feline responses to handling differentiate between passive restraint (n=22), and full body restraint (n=25), during mock veterinary examinations. Based on current restraint stress literature, we made the *a priori* assumption that full body restraint is more negative for cats than passive restraint. Cats were initially assessed as either friendly or unfriendly during interactions with a stranger, and this was included as a covariate in analyses. Cats were then restrained according to treatment, and assessed for behavioural (tail lashing, lip licks/minute, negative vocalizations, ear position) and physiological (heart rate, respiratory rate, relative pupil size) responses during examination.

During full body restraint, cats showed an average (\pm SE) of 40.3 (\pm 1.79) breaths per minute (p=0.004; Wilcoxon two-sample test), an average (\pm CI) of 2.30 (1.82, 2.81) lip licks/ minute (p=0.02; Generalized linear mixed model with Poisson distribution) and were more likely to hold their ears in a back or flat position during the first 15 seconds of handling (p<0.0001; Mantel-Haenszel chi-square), compared to cats handled with the passive restraint method. Analysis of relative pupil size showed an interaction between treatment and friendliness; there was no effect of treatment on responses of friendly cats, but unfriendly cats handled using full body restraint showed a larger average (\pm SE) pupil ratio of 0.66 (\pm 0.042) compared to unfriendly cats handled with the passive restraint (p=0.0007; Mixed linear model). The following measures did not differ significantly between treatments: tail lashing (Mixed linear model), negative vocalizations (Binomial Fishers exact test) and heart rate (Mixed linear model).

The current results indicate that the feline responses which are valid indicators of negative responses to handling include respiratory rate, number of lip licks/minute, ear position, and pupil dilation ratio. In addition, pupillary responses during handling appear to be responsive to restraint in unfriendly cats. This is the first research to successfully identify and validate feline measures of acute handling stress.

Using animal protein and extra enrichments to reduce injurious pecking in furnished cage housed laying hens

Krysta Morrissey^{1,2,3*}, Sarah Brocklehurst⁴, Tina M. Widowski^{2,3}, Victoria Sandilands¹

¹ Monogastric Science Research Centre, SRUC, Auchincruive Estate, United Kingdom

² Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

³ CCSAW, University of Guelph, Guelph, ON, Canada

⁴ Biomathematics and Statistics Scotland, Edinburgh, United Kingdom

Currently, infra-red beak treatment (BT) is permitted in the UK, though recently this has been a contentious issue. Non-BT flocks have increased risk of feather damage and mortality due to injurious pecking (IP). As a multifactorial problem, IP is notoriously difficult to manage. Though BT reduces symptoms of IP, it does not alleviate the causal factors. Insufficient foraging opportunities increase IP, which is especially important for caged hens. Adding pecking enrichments or increasing time spent feeding (e.g. by increasing dietary fibre) may satisfy foraging motivation in cages. Other aspects of the diet (e.g. protein source) may also affect behaviour. For this experiment, we used a factorial design with three factors, each with two levels (dietary protein source: plant based control “P” or 5% animal protein inclusion “A”, dietary fibre: control “C” or 10% dilution with oat hulls “F”, and environment: control “N” or extra enrichment “E”) to assess their effects on hen behaviour and welfare from 16 to 35 weeks of age. A total of 1344 Hyline Brown hens were housed in 64 21-hen furnished cages. Focal hens were observed for beak related behaviours over three days every two weeks. Data were analysed in Genstat (16th Ed.) using linear and generalised mixed models with significance at $\alpha=0.05$. During behavioural focal sampling, there were no treatment effects on IP or pecks at the extra enrichments. At certain ages, F hens pecked at the feed more often than C hens (age \times fibre $P=0.002$). F hens also performed less spot pecking than C hens ($P=0.003$). E hens performed less spot pecking than N hens, but only at certain ages (age \times environment $P=0.039$). Neither protein source nor fibre inclusion affected feather cover, though there was a slight improvement for E hens over N hens ($P=0.022$). Though effects were slight, extra enrichments appeared to improve hen welfare by reducing feather damage and spot pecking, which may be indicative of reduced foraging frustration. Extra fibre reduced spot pecking as well, though overall the flock performed quite well and thus greater treatment differences may have been masked.

The implementation of species-specific music to improve the welfare of nonhuman animals in agriculture

Brady Patterson

Department of Philosophy, University of Guelph, Guelph, ON, Canada

Typically when determining relevant ethical criterion for the welfare of the nonhuman animal, we think in terms of food, space and behaviour particular to that species (e.g. a chicken's tendency to roost). However, in focusing on these needs we remain inattentive to other aspects of their experience, which may be just as essential to their overall wellbeing. This presentation will illustrate the potential impact music could have on the lives of animals, by arguing that music is a condition of an animal's environment that may reasonably be shown to improve their welfare.

Music not only has an impact on the emotional lives of human beings, but other species as well. An example of this is the work of David Teie, a cellist, who has created species-specific musical pieces. They have been tested in controlled settings and proven to elicit a strong positive response in the animals. Building on these findings, I propose that further research be directed towards studying the effects this species-specific music may have on agricultural animals, to ascertain whether this could be a viable method for comforting them and enriching their environment. If we are able to discover which sounds are preferential to each species, we could utilize these sounds to increase their well-being by providing a sense of comfort and familiarity. I believe that this method would prove beneficial. Possible benefits include providing a feeling of structure and routine, helping nonhuman animals adapt to a new environment, and reducing stress associated with aversive sounds in industrialized settings.

If music benefits the livelihood of these beings, then as advocates for the welfare of nonhuman animals we have an ethical imperative to provide it for them. The fact that animals have preferences and responses to certain sounds presents us with justification for the belief that they have a vested interest in their environment beyond what it provides them in basic physiological needs, which has been the main focus of animal welfare. Thus, our conception of what constitutes animal welfare must be expanded upon beyond a set of basic physiological needs. This presentation will address the ethical significance, feasibility, and implications of tailoring music specifically to the tastes of nonhuman animals.

Epigenetic transfer of behaviour and stress susceptibility in the laying hen: Influence of rearing and housing of different strains of parent stock on behavioural development of offspring

Mariana R. L. V. Peixoto^{1,2*}, Leanne Cooley^{1,2}, Tina M. Widowski^{1,2}

¹Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

²Campbell Centre for the Study of Animal Welfare, University of Guelph, Guelph, ON, Canada

Because of retailers' requirements and customer's expectations regarding the welfare of laying hens, many egg producers in North America are replacing conventional cages to cage-free systems. The economic success and improvements in bird welfare in these systems require that the animals housed in them are calm, that they adapt well to change and novelty, and that they have few behavioural problems. Based on the epigenetic hypothesis that maternal stress in different strains affect the behavioural development of the offspring to different degrees, the overall objective of this study is to investigate the transfer of behavioural traits and stress susceptibility among strains of breeder laying hens to their offspring, and to identify underlying mechanisms. Moreover, this research also aims to quantify differences in gene expression, characterize candidate genes, and correlate their biological pathways to phenotypical characteristics previously observed on the offspring through behavioural tests. In order to do so, parent stock from two pure bred and four commercial hybrid lines will be incubated, hatched and reared, to create small breeder flocks of 27 individuals per pen (N=4 pens per strain), with a male: female ratio of 1 male: 8 females. They will be equally separated in two groups; the Stress Group will be subjected to a series of acute stressors while the Control Group will only receive routine husbandry. Fertile eggs from all groups will be incubated and hatched together. Chicks will be subjected to series of standardized fear tests, and different phenotypes will be identified. Samples of brain tissue and adrenals will be collected to compare gene expression, histone modifications and DNA methylation patterns. Aware of the difficulties provided by behavioural problems in the egg industry, this research will try to clarify not only the occurrence of epigenetic transfer of behaviour, but also its influence and intensity on different strains, contributing to the field of poultry science by providing a new area to explore, and to the industry by increasing the welfare of the animals and reducing the losses of the producers.

Do domestic birds differentiate between artificially and naturally sourced ammonia gas mixtures?

Bishwo Pokharel^{1*}, Vinicius Machado dos Santos^{1,2}, David Wood³, Bill van Heyst³, Alexandra Harlander-Matauschek¹

¹Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

²Federal Institute of Brasilia, Federal District, Brazil

³School of Engineering, University of Guelph, Guelph, ON, Canada

Spending time in fresh air makes people feel more alive. Most of the commercial laying hens are kept indoors and chronically exposed to high levels of manure and manure gases such as ammonia. Previous studies demonstrated that birds prefer fresh air to ammonia (artificially sourced from cylinder) /air gas mixtures polluted environments. However, artificially sourced ammonia may not reflect barn conditions where a variety of gases emanate from manure. Our goal was to determine how the latency, time spent and interruptions of foraging (searching for raisins and dead mealworms in a feed mix) of adult laying hens to selected air/ammonia gas mixtures might differ in response to various gas mixtures. For this study, 20 laying hens (home pen ammonia concentration of 1.27 ppm), were exposed to artificially sourced [A] (air/ammonia from cylinder) and naturally sourced [N] (from conspecific laying hen feces) gas mixture. Hens were exposed to A and N mixtures with ammonia concentrations of 25 and 45 ppm, as well as fresh air [FA]. During the trial, all birds were exposed to each treatment 3 times (5 min/ testing session) in a purpose built Plexiglas chamber, equipped with a foraging area (raisins, mealworms, feed mix) and a gas delivery system. All sessions were video recorded, analyzed with INTERACT software and subjected to GLIMMIX procedure (SAS). Birds showed increased latency [means (min) \pm SE, A=0.38 \pm 0.021; N=0.37 \pm 0.021; FA=0.22 \pm 0.021; P<0.01] and reduced total time (percentage of total time) spent foraging [A=42.13 \pm 3.386; N=44.37 \pm 3.386; AF=55.60 \pm 3.986; P<0.001] in both A and N compared to FA treatments. Foraging bout lengths did not differ between FA and 25ppm N stimuli [means (min) \pm SE, FA=0.79 \pm 0.018; N (25ppm) =0.64 \pm 0.018]. Birds were more likely to forage longer [fewer interruptions of bouts] in 25 and 45ppm N treatments than in 25 and 45ppm A treatments [means (min) \pm SE, A=0.23 \pm 0.018; N=0.42 \pm 0.018; P<0.001]. The preference for domestic birds foraging/feeding in FA is consistent with other studies. Our study suggests that laying hens have a relative preference for spending time foraging in fresh air. Birds were able to discriminate between A and N sourced gas mixtures, and showed a relative preference for N gas mixtures likely due to the presence of other familiar gases from the feces samples.

Neighbour effects confirm that stereotypic behaviours in farmed mink are heterogeneous

Andrea Polanco*, María Díez-León, Georgia Mason

Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

Stereotypic behaviours (SBs) in mink involve route-tracing and “stationary” forms (e.g., head-twirling). Mink may also repeatedly scratch at cage walls (“scrabbling”), sometimes apparently directing this at neighbouring mink. We thus hypothesized that scrabbling (but not other SBs) represents frustrated attempts to reach neighbours. We housed 32 male mink in standard cages between two non-experimental animals of random sex. In Study 1 (conducted when mink were 7-12 months old) and Study 2 (conducted at 10 months old), we compared the proportion of SBs performed near the shared cage wall, when the neighbour was nearby in the adjacent cage, versus when the neighbour was distant. We predicted that scrabbling would be performed close to neighbours. Study 2 additionally compared SB time budgets before and after removing one of each subject’s neighbours, to test the prediction that this would reduce scrabbling. In Study 1, a Wilcoxon Test revealed that at 7 months, scrabbling by subjects with a male neighbour occurred more often on the shared cage wall when that neighbour was nearby ($mdn=0.46$) than when he was distant ($mdn=0.02$, $W=17$, $p<.05$), although this became non-significant at 10-12 months of age. The location of scrabbling was not affected by female neighbours’ proximity. Other SBs’ locations were also unaffected by neighbour proximity when subjects were 7 months old; but at 10-12 months, stationary SBs occurred *less* often near the shared cage wall when male neighbours were nearby ($mdn=0$) versus distant ($mdn=0.48$, $W=0$, $p<.05$), and the same held for route-tracing (although a trend) when neighbours of either sex were nearby ($mdn=0$) versus distant ($mdn=0.60$, $W=0$, $p=0.10$). Removing neighbours (Study 2) reduced scrabbling (*baseline* $mdn=0.07$; *treatment* $mdn=0.03$, $W=40$, $p<.05$) and stationary SBs (*baseline* $mdn=0.05$; *treatment* $mdn=0$, $W=8$, $p<.05$), regardless of neighbour sex (route-tracing being unaffected). Location data for Study 2 are under analysis and will be presented. Thus, scrabbling by male mink is directed towards male neighbours, and they scrabble less if neighbours are removed. Other SBs were performed in locations *away* from neighbours (although removing neighbours did not increase them). Overall, these data suggest that different SBs are heterogeneous in causation and that scrabbling may represent territoriality aggression (since mink are naturally solitary animals).

Associations of cow hygiene and lying behaviour with the risk of elevated somatic cell count and lameness

Ivelisse Robles^{1*}, David F. Kelton², Herman W. Barkema³, Greg P. Keefe⁴, Jean-Philippe Roy⁵, Marina A. G. von Keyserlingk⁶ and Trevor J. DeVries¹

¹Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

²Department of Population Medicine, University of Guelph, Guelph, ON, Canada

³Faculty of Veterinary Medicine, University of Calgary, Calgary, AB, Canada

⁴Atlantic Veterinary College, University of Prince Edward Island, Charlottetown, PEI, Canada

⁵Faculté de Médecine Vétérinaire, Université de Montréal, Montréal, QC, Canada

⁶Animal Welfare Program, University of British Columbia, Vancouver, BC, Canada

The study objective was to identify how cow-level factors and housing management affect the risk of elevated SCC (eSCC) and lameness, a painful condition and major welfare concern, in lactating dairy cows. Ten Holstein cows/herd from 6 commercial dairy herds in Ontario, were randomly selected for the study, based on DIM (<120d), no mastitis treatment in the last 3mo, and SCC (<100,000cells/mL). Data on SCC was collected through DHI-testing (~5-wk intervals). The study began within 7d after a DHI-milk test, until 3-tests were completed (~105d)=3-observation periods/cow. Elevated SCC was used as an indicator of subclinical mastitis. An incident of eSCC was defined as a cow having a SCC >200,000cells/mL at the end of a period when SCC was <100,000cells/mL at the beginning of that period. Lying behaviour was recorded 6d after each milk sampling, using data loggers. On d1 of each recording period a trained-observer scored cows for lameness (5-point scale;NRS≥3=lame) and for hygiene (4-point scale). Cows were categorized as ≤2=clean or 3≥=dirty. Stall cleanliness was assessed with a 1-m² metal grid (88-squares), centred between stall partitions of every 10th stall, and then counting the squares containing visible urine and/or fecal matter. Data were analyzed using multivariable logistic regression models. Cows averaged 627.0min/d lying time, 9.0lying bouts/d, at 72min/bout. Thirteen eSCC were detected, resulting in an incidence rate of 0.73 eSCC/cow-year at risk. The risk of experiencing an eSCC increased 1.4x($P<0.01$) with every 20,000cells/mL SCC increment at the beginning of the study. Mean proportion of soiled squares/stall was 27.0±18.8%SD. Each SD increment in proportion of dirty squares/stall increased the odds of having a dirty udder (DU) (OR=2.4; $P=0.02$) and lameness (NRS≥3;OR=1.5; $P=0.05$). Each SD (107.8min/d) increment in lying time/d increased the risk of having dirty upper legs and flank (DULF) (OR=2.1; $P<0.01$), and tended to increase the risk of having a DU (OR=1.44; $P<0.08$). For each 9.6% increase above mean (100%) cow/stall stocking density, the risk of having DULF by 1.7x($P=0.03$). These results indicate that lower stocking density and management practices that improve stall hygiene should be encouraged to reduce the risk of poor hygiene and clinical lameness in dairy cows housed in free-stall barns.

Examination of the efficacy of two non-penetrating captive bolt devices on a commercial level.

Lilia Serpa^{1,2*}, Tina M. Widowski^{1,2}, Penny Lawlis³, Stephanie Torrey^{1,2}

¹Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

²Campbell Centre for the Study of Animal Welfare, University of Guelph, Guelph, ON, Canada

³Ministry of Agriculture, Food and Rural Affairs, Guelph, ON, Canada

Euthanasia is an important part of any on-farm animal welfare program. Although methods of euthanasia vary widely between farms due to differing management practices, any technique being used should rapidly result in the irreversible loss of consciousness while minimizing the amount of distress to the animal. However, there is very little data on euthanasia methods, particularly for poultry species. The aim of this study is to investigate the efficacy of two Non-Penetrating Captive Bolt devices, the TED and the Zephyr-EXL, on a commercial level, for euthanasia of broiler breeders. To achieve this, a total of 100 hens, 100 roosters and 100 pullets from a minimum of 5 broiler breeder farms across Ontario will be initially assessed for morbidity and hydration levels. Thereafter, equal proportions of birds will be euthanized with the TED or the Zephyr EXL and the following measures will be assessed: time to absence of palpebral and nictitating eye reflex, durations of clonic and tonic convulsions, and time to cloacal relaxation. These measures will allow for the determination of time to insensibility and provide an estimate for the time of death. This study will help to refine on-farm euthanasia methods and while providing assurance to consumers that the most humane methods are being utilized.

Rethinking the human-dog relationship in Indigenous communities: A conceptual framework for veterinary practitioners

Anita L. Tucker^{1*}, Maria Shallard¹, Cate E. Dewey²

¹Department of Student Life, University of Guelph, Guelph, ON, Canada

²Department of Population Medicine, University of Guelph, Guelph, ON, Canada

Veterinary outreach programs provide students with the opportunity to gain hands-on clinical experience in communities where services are lacking or unavailable. An increasing number of outreach initiatives are being carried out in Aboriginal communities across Canada because there is a recognized need to address dog welfare concerns such as overpopulation, neglect, aggression, rabies and the transmission of canine-specific and zoonotic diseases. There is a long history of knowledge appropriation and a lack of meaningful engagement from western external practitioners visiting communities without being reflexive of the communities needs. Though people entering communities can easily understand and appreciate the traditional working role that dogs had for Aboriginal peoples, a large knowledge gap exists for the additional values, stories, customs and spiritual roles that dogs have in those communities. It is integral to understand how Aboriginal ways of knowing and being inform animal welfare in Aboriginal communities. Further, the contextual narrative of colonialism needs to be recognized by all practitioners that work for and within Aboriginal communities. Qualitative investigation will first be done using a discourse analysis of literature to investigate the existing gap between Aboriginal worldview on human-animal relationships and veterinary outreach programs. Utilizing a participatory action based research approach that places the needs of the people in relation to their animals is necessary in order to properly address not only animal welfare in communities, but the systematic regulations and barriers that impact ongoing veterinary care. Communities that already have an established veterinary outreach program will then be approached through their cultural gatekeepers. The use of semi-structured interviews and sharing circles with key informants (knowledge holders) will elucidate perceived barriers to knowledge exchange and perspectives on dog welfare. Data collection will be done through snowball sampling until saturation is achieved. All results will be analyzed using NVivo, a qualitative software analysis program. This research will create a conceptual framework for reciprocal exchange of information and knowledge between the Aboriginal community and the veterinary outreach practitioners, students, stakeholders and volunteers.

Topical anesthetic evaluation for reducing pain in piglets undergoing surgical castration

Abbie Viscardi*, Lily Hu, Taylor Braden and Patricia V. Turner

Department of Pathobiology, University of Guelph, Guelph, ON, Canada

In North America, over 100 million piglets are subject to painful procedures each year, including tail docking and surgical castration. While these practices are known to cause significant pain and distress, they are often performed without the use of appropriate analgesics or anesthetics. This is a serious animal welfare concern. The objective of this study was to assess the efficacy of four topical anesthetics (Cetacaine[®], Maxilene[®], Anbesol[®] and EMLA[®]) in reducing pain in castrated piglets, using validated behavioural scoring techniques and a novel Piglet Grimace Scale (PGS). Three litters of 5-day-old male piglets (n=24) were treated with a topical anesthetic (or non-medicated cream as a control), which was applied to their scrotum 20mins prior to surgical castration (n=4-5 piglets/treatment group). To obtain baseline behaviours, piglets were video recorded 24h pre-procedure for 8h. On the day of castration, piglets were video recorded for another 8h immediately following the procedure. 24h post-castration, piglets were recorded for 1h (total of 17h). 606 facial images of piglets were captured across all time points for PGS scoring. Four individuals, who were blinded to treatment and time of the images collected, used the PGS to score each photo based on three facial action units: orbital tightening, cheek tightening/nose bulge and ear position. The Intraclass Correlation Coefficient (ICC) for overall PGS score was 0.61, indicating good agreement between scorers. Data was analysed using an ANOVA and a post-hoc Tukey test. There was no effect of time on PGS score ($p=0.1702$), however there was a trend in treatment ($p=0.0607$) with Maxilene producing significantly lower PGS scores than Cetacaine ($p<0.05$), suggesting piglets grimaced less post-castration after being treated with Maxilene. Behavioural results (pending) will be used to confirm these findings. The lack of significant change in PGS between treatments suggests that topical anesthetics provide minimal to no pain relief for castration in piglets.

Validating on-farm euthanasia methods for commercial meat rabbits

Jessica L. Walsh^{1*}, Aaron Percival¹, Lucia Costanzo², Penny Lawlis³, Patricia V. Turner¹

¹Dept. of Pathobiology, University of Guelph, Guelph, ON, Canada

²Data Resource Centre, University of Guelph, Guelph, ON, Canada

³Ontario Ministry of Agriculture, Food and Rural Affairs, Woodstock, ON, Canada

The commercial meat rabbit industry is without validated euthanasia method guidelines to develop on-farm euthanasia plans. This research gap has resulted in inappropriate methods being used, and sick and injured animals being left to die on their own. The goal of our research was to evaluate blunt force trauma (BFT), assisted-manual cervical dislocation (AMCD) and a non-penetrating captive bolt device (NPCB) for efficacy in euthanizing pre-weaned kits, growing, and adult rabbits. After a technique was used, rabbits were assessed for immediate and sustained insensibility (n=58 BFT, n=49 AMCD, n=63 NPCB). If the method did not result in immediate insensibility or the rabbit regained consciousness the attempt was categorized as a failure. All successfully euthanized rabbits (n=45 BFT, n=46 AMCD, n=63 NPCB) were evaluated post mortem and scored for gross damage to the skull and brain. A Pearson's chi-square test was performed, demonstrating a moderate association between method used and chance of method failure ($p < 0.001$). BFT had a 22% overall chance of method failure, which increased to 43% when evaluating adult rabbits alone. NPCB caused immediate and sustained insensibility in 100% of trials and AMCD resulted in (3) 6% overall chance of method failure. A Kruskal-Wallis H test demonstrated a significant increase in gross brain hemorrhage scores for NPCB compared to the other methods for subcutaneous hemorrhage ($p < 0.001$) and for subdural hemorrhage ($p < 0.001$). These results indicate that BFT is not an effective or humane method of euthanasia for meat rabbits; having a high risk of method failure and inflicting inconsistent damage to the brain. NPCB was reliable and effective, causing marked, irreversible damage to the brain. With appropriate skill and training AMCD is highly effective. This research provides commercial rabbit producers with two validated methods for on-farm euthanasia.

Exploring the design features of automated feeding stalls and commonly used training methods for rearing calves

Tanya R. Wilson^{1*}, Stephen J. LeBlanc¹, Trevor J. DeVries², Derek B. Haley¹

¹Department of Population Medicine, University of Guelph, Guelph, ON, Canada

²Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

There is evidence that the health and welfare of young dairy calves can be improved through group housing, increasing milk allowance, and by providing milk through a teat. These aspects are easily incorporated into automatic milk feeding systems. These systems have the potential to be beneficial in many ways, however, little is known about how calves interact with them. We have developed a study that will investigate the effect of feeding stall design features on calves learning to use the feeder. For our experiment, Holstein calves of both sexes will be enrolled at 3 to 5 days of age and will be introduced to a group pen and feeder. Two different stall designs will be tested, one with gated (open) stall sides and the other with solid sides over the 3 days after initial introduction. Using a sample size calculated using statistical software set to a p-value of 0.05, and power of 0.8, 30 calves will be tested on each stall design, making a total sample size of 60. Calves will be moved from individual pens to the group pen based on their vigour, assessed at the previous meal time. Upon introduction to the group pen they will be directed to the automatic feeder, which will feature one of the two stall designs. Calves will be video recorded, and feeder data will be collected for a 72h period following introduction. Outcomes to be assessed include latency of first voluntary visit to the feeder, latency to first feeding, and exploratory behaviour such as sniffing and licking the feeder. The hypothesis for this study is that solid stalls will result in a longer latency to approach and feed from the feeder. Results from these experiments will be used to inform dairy producers and equipment manufacturers about how to best design stalls to facilitate the transition of calves to automatic feeders, decreasing the amount of time for them to approach, enter and feed from the feeder. We expect the results of this study to result in a more consistent milk intake throughout the introduction period, decreasing hunger and negative health associated affects.

Utility of an online learning module to teach cautery disbudding technique for dairy calves, including cornual nerve block application

Charlotte B. Winder^{1*}, Stephen J. LeBlanc¹, Derek B. Haley¹, M. Ann Godkin², Todd F. Duffield¹

¹Department of Population Medicine, University of Guelph, Guelph, ON, Canada

²Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, ON, Canada

Although disbudding or dehorning dairy heifers is necessary for the safety of humans and other cattle, these procedures are well documented to cause significant pain when done without appropriate analgesia. Three-quarters of disbudding or dehorning is done by dairy producers or on-farm staff, the remainder is done by veterinarian or veterinary technician. Reported use of pain control by dairy producers ranges from 15 to 60%. Cautery disbudding is the most commonly used method; best practices include administration of a non-steroidal anti-inflammatory drug (NSAID) and local anesthetic given as a cornual nerve block (CNB), which requires technical training. Teaching methods may involve one-on-one training with a veterinarian. As well, online training videos exist. To our knowledge, none of these methods have been studied for efficacy. Our objective was to determine if an interactive, online module for CNB application and cautery disbudding was as effective as hands-on training. Thirty-four student participants were randomly assigned to either hands-on training or to self-directed online training. Assessments were performed by a blinded evaluator who examined knowledge, handling, CNB technique, disbudding technique, time taken, and self-confidence. Success of CNB was defined as a lack of pain-related behaviours during the first five seconds of disbudding iron application. Univariate models were used to assess strength of association of training group with outcome, using linear regression for continuous variables and ordered logistic regression for ordinal (rubric score) outcomes. Association of CNB failure with training group was assessed using Fisher's exact. All statistical analysis was done in STATA13 (StataCorp, 2013. College Station, TX). The hands-on training group had no CNB failures, while online training had 25% CNB failures ($P = 0.13$). Online learners were significantly less confident ($P < 0.01$), had poorer handling ($P = 0.02$), CNB ($P = 0.05$), and disbudding ($P = 0.05$) technical skills, and took more time to perform all tasks ($P = 0.03$). Although online learning alone was surprisingly effective for a psycho-motor skill, best practices should include hands-on training. Online learning alone may be appropriate for hard to reach populations, or as a preliminary step to hands-on training.

Evaluating the efficiency of non-penetrating captive bolt and mechanical cervical dislocation for on-farm euthanasia of compromised turkeys

Caitlin Woolcott^{1*}, Patricia V. Turner², Stephanie Torrey¹, and Tina M. Widowski¹

¹Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

²Department of Pathobiology, University of Guelph, Guelph, ON, Canada

On-farm euthanasia is essential to prevent suffering of sick or injured birds. However, there is little research available that describes the best methods of euthanasia for turkeys of different ages and weights. New on-farm euthanasia methods are being developed, but with no peer reviewed literature published for these new methods, it is unclear whether they are effective for turkey euthanasia. The objective of this study is to determine the effectiveness of two non-penetrating captive bolt devices; the Zephyr-EXL and the Turkey Euthanasia Device, when compared to a novel mechanical cervical dislocation device, the Koechner Euthanasia Device for on-farm euthanasia of turkeys. To be considered effective, these devices must result in loss of consciousness and subsequent death without recovery. Birds will be grouped in five categories based on age and weight to ensure data is collected for each stage of production. These categories include neonates, rearing, growing, early/peak lay and end-of-lay, and will involve a minimum of 5 cull birds per device. Each device will be applied once to either the midway point of the head between the back of the eyes and the center of the ear for non-penetrating captive bolt devices, or at the base of the skull where it meets the vertebral column for mechanical cervical dislocation. Brainstem and spinal reflexes, such as pupillary light response, and nictitating eye reflex, will be used to monitor signs of consciousness. Additional measures such as clonic and tonic convulsions, cessation of breathing, neck tension and time to cloacal relaxation will also be monitored as indication of approximate time of death. Survey radiographs will be collected to determine if and where separation or fracture of vertebrae occurs (mechanical cervical dislocation only). Macroscopic and microscopic scoring will be conducted to assess damage of brain, spinal cord, brain stem, and surrounding tissues. Based on previous research, it is predicted that the Zephyr-EXL and the Turkey Euthanasia Device will result in immediate and irreversible loss of consciousness and death. As such, this project aims to develop science-based recommendations on the efficacy of these three devices for on-farm euthanasia of turkeys at all stages of production.

Visual appeal of horses may be linked to human personality

Emily Zakrajsek*, Katrina Merkies

Department of Animal Biosciences, University of Guelph, Guelph, ON, Canada

Equine-assisted therapy utilizes a horse as part of the therapy team, which may have welfare implications as horses are exposed to humans with mental health illnesses. This study was a preliminary look at possible connections between human personality type, mental health diagnosis, and preferred choice of horse regarding appearance and personality. Participants (n=37; 7 with a mental disability and 30 neurotypical) completed a survey consisting of basic demographic information, horse experience, a personality assessment, and picture-based questions to sequentially choose between sets of pictures to create their ideal horse (i.e. size, colour, speed, facial, leg and body markings). Participants also had the option not to create a horse, in which case they chose a pastoral scene instead. Human personality type (brave, friendly, shy) was assigned a point scale, and connections between human and horse personalities and visual horse preferences were analyzed using GLM and chi-squared. Humans with little prior experience with horses chose not to create an ideal horse whereas those with experience did ($p < 0.0022$). Of those who chose to create their horse (n=21), mental health diagnosis ($p > 0.3$), age ($p > 0.34$), gender ($p > 0.24$) and horse personality ($p > 0.31$) did not influence horse selection. In describing the ideal horse, horses were preferred over draft or ponies ($p < 0.008$). Roan or palomino horses were preferred over any other colour ($p < 0.006$), and fast horses were preferred over slow ($p < 0.007$). Blazes or stars were preferred over other or no face markings ($p < 0.022$). Large white body patches were preferred over no markings ($p < 0.03$), and no one chose appaloosa markings ($p < 0.0001$). Humans categorized as a friendly personality preferred a roan horse with a blaze and white body patches, whereas shy human personalities chose either roan, grey or palomino horses with blazes and white body patches ($p < 0.03$). Thus the preference humans may have for particular horses appears to be based on visual characteristics and by their past horse experience. Understanding visual preferences of humans interacting with horses may allow for a more informed selection of horses for use in a therapy program, and may allow a more tailored relationship for optimal outcomes to both horse and human.