



Campbell Centre for the Study of Animal Welfare
8th Annual Research Symposium
Wednesday, 13 May, 2015

Thank you to our sponsor:



ORAL PRESENTATIONS

Welcome

9:00 Derek Haley & Lee Niel

Session #1: Dairy Cattle (Guest Chair: Dr. Anne Marie de Passillé)

- 9:05 Disbudding and dehorning practices in dairy calves among Ontario bovine veterinarians**
Charlotte Winder*, Stephen LeBlanc, Derek Haley, Kerry Lissemore, Ann Godkin, Todd Duffield
- 9:18 Comparison of different flooring types with anti-slip properties to improve dairy cattle ease of movement**
Nancy Franco-Gendron*, Renée Bergeron, Walt Curilla, Sabine Conte, Trevor DeVries, Elsa Vasseur
- 9:25 Can live stall lameness scoring be used to score lameness in tie-stall dairies?**
Santiago Palacio*, Lou Peignier, Steve Adam, Renée Bergeron, Doris Pellerin, Anne Marie de Passillé, Jeff Rushen, Derek Haley, Trevor DeVries, Elsa Vasseur
- 9:38 Effect of feed type and presentation on feeding behaviour, intake, and growth of dairy calves fed a high level of milk**
Morgan Overvest*, Renee Bergeron, Derek Haley, Trevor DeVries
- 9:51 A survey of management and feeding practices of dairy calves: manual and automated milk feeding systems**
Catalina Medrano-Galarza*, Jeff Rushen, Anne Marie de Passillé, Andria Jones-Bitton, Trevor DeVries, Stephen LeBlanc, Derek Haley

- 9:58** **Could individual calf hutches be used for outdoor group-housing of dairy calves?**
Lisa Wormsbecher*, Renée Bergeron, Derek Haley, Anne Marie de Passillé, Jeff Rushen, Elsa Vasseur

Poster Introductions (Chair: Dr. Derek Haley)

- 10:15** Posters will be available for viewing during breaks

10:25 **COFFEE BREAK – 30 min**

Plenary Lecture #1 (Chair: Dr. Alexandra Harlander)

- 10:55** **What science has taught us about best practices for handling dairy cattle**
Jeff Rushen

Session 2: Laboratory and Zoo Animals, and Ethics (Chair: Dr. Pat Turner)

- 11:25** **Stereotypic mice are aggressed by their cagemates, and tend to be poor demonstrators in social learning tasks**
Laura Harper, Elena Choleris, Kelsy Ervin, Carole Fureix, Kathryn Reynolds, Michael Walker, Georgia Mason*

- 11:38** **Does stereotypic behaviour cause impaired social interaction in mice?**
Stephen Pond*, Mike Walker, Georgia Mason

- 11:45** **Species comparison of continuous behaviour assessment and thermal imaging of large felids with focus on thermal comfort, core body temperature detection, and zoo exhibit microclimatic design**
Judith Stryker*, Jim Atkinson, Esther Finegan

- 11:58** **Virtue ethics as an approach to animal ethics**
Michael Furac*

- 12:05** **The constraints of language in conceiving ethical relationships with nonhuman animals**
Brady Patterson*

- 12:12** **Language as the eyes of being**
Taylor Sanderson*

12:20 **LUNCH – 60 min**

Session #3: Poultry (Chair: Dr. Michele Guerin)

- 1:20** **An evaluation of beak shape variation in domestic turkeys and its application to welfare research**
Hillary Dalton*, Benjamin Wood, Tina Widowski, Michele Guerin, Stephanie Torrey

- 1:33** **Designing alternatives: Assessing how hens perceive nesting spaces in large furnished cages**
Michelle Hunniford*, Gregoy Bédécarrats, Ian Duncan, Georgia Mason, Stephanie Torrey, Tina Widowski

- 1:46 Are chicks motivated to use elevated horizontal and vertical space?**
Madison Kozak*, Bret Tobalske, Candace Martins, Hanno Wuerbel , Alexandra Harlander-Matauschek
- 1:59 Do chicks master inclined slopes?**
Chantal LeBlanc*, Bret Tobalske, Hanno Wuerbel, Alexandra Harlander-Matauschek
- 2:12 Assessing the space utilization of three breeds of laying pullets during the rearing period**
Andrea Habinski*, Michelle Hunniford, Linda Caston, Teresa Casey-Trott, Tina Widowski
- 2:19 Effect of keel status on activity patterns of laying hens in large furnished cages**
Teresa Casey-Trott*, Michele Guerin, Victoria Sandilands, Stephanie Torrey, Tina Widowski

Plenary Lecture #2 (Chair: Dr. Alexandra Harlander)

- 2:35 Play behaviour, positive emotions and the assessment of animal welfare**
Jeff Rushen

Tribute to Dr. Elizabeth Stone

- 3:05** Dr. Tina Widowski. Director of the Campbell Centre for the Study of Animal Welfare

3:10 COFFEE BREAK – 25 min

Session #4: Companion Animals (Chair: Dr. Janet Cutler)

- 3:35 Current usage and perceptions of artificial aids by horse enthusiasts in Canada**
Lindsay Nakonechny*, Cordelie Dubois, Katrina Merkies
- 3:42 Effects of early social stimuli on adult aggression in dogs (Canis familiaris)**
Lucinda Glenny *, Janet Higginson Cutler, Lee Niel, Tina Widowski, Jason Coe
- 3:55 Assessment of fear-related behaviour displayed by companion dogs (Canis familiaris) in response to social and non-social stimuli**
Anastasia Stellato*, Tina Widowski, Lee Niel
- 4:02 Teaching old owners new tricks: assessment of dog owner identification of canine resource guarding behaviour**
Jacquelyn Jacobs*, Jason Coe, David Pearl, Lee Niel
- 4:15 Risk factors associated with stranger-directed aggression in dogs**
Hannah Flint*, Jason Coe, James Serpell, David Pearl, Lee Niel
- 4:28 Validation of a behavioural paradigm to assess various feline handling techniques used in veterinary clinics**
Carly Moody*, Cate Dewey, Georgia Mason, Lee Niel

4:35 Veterinarian communication about companion animal behaviour and training is reactive rather than proactive

Lauren Dawson*, Cate Dewey, Elizabeth Stone, Michele Guerin, Lee Niel

Closing Remarks & Student Awards

4:50 Derek Haley & Lee Niel

5:00 End

POSTER PRESENTATIONS

1. Using animal based measures in on-farm animal welfare assessment programs

Melissa Atkinson, Kathleen Dicker, Nancy Franco-Gendron, Pollyana Galdamez, Andrea Habinski*, Gillan Hatch, Bethia Kok, Geisa Mainardes, Elyse Mosco, Lindsay Nakonechny, Stephen Pond, Julia Robertson, Amanda Saunders, Tania Sendel, Joanna Smich, Melissa Speirs*, Anastasia Stellato*, Morgan Trotter, Jessica Walsh

2. Influence of the use of environmental enrichment on the sexual behaviour and performance of breeding pigs

Ariane Cristina de Castro*, Iran José Oliveira Da Silva

3. The effect of alternative feeding strategies during rearing on the physiology of broiler breeders

Elyse Mosco*, Aitor Arrazola, Tina Widowski, Alexandra Harlander-Matauschek, James Squires, Victoria Sandilands, Henry Classen, Michele Guerin, Stephanie Torrey

4. Landscape architectural design for an animal shelter

Nathan Perkins*, Anna Chow

(Design posters by MLA students Erika Bullock, Julia Taucer and Junyi Zhang)

5. Productive analysis of different housing systems for sows during gestation

Patrycia Sato, Iran José Oliveira da Silva

6. Use of mirrors on the feeding behavior of dairy cattle

Marcos Silva*, Marcelo Rosa, Iran José Oliveira Da Silva

7. Stockpersons training and its effects on human behavior towards animal welfare

Fernanda Victor Vieira, Iran José Oliveira da Silva*, Guilherme Amorim Franchi

ABSTRACTS

Using animal-based measures in on-farm animal welfare assessment programs

Melissa Atkinson¹, Kathleen Dicker¹, Nancy Franco-Gendron², Pollyana Galdamez¹, Andrea Habinski^{1*}, Gillan Hatch¹, Bethia Kok¹, Geisa Mainardes¹, Elyse Mosco¹, Lindsay Nakonechny¹, Stephen Pond¹, Julia Robertson¹, Amanda Saunders¹, Tania Sendel¹, Joanna Smich¹, Melissa Speirs^{1*}, Anastasia Stellato^{1*}, Morgan Trotter¹, Jessica Walsh¹, Penny Lawlis³

¹Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

²Dept of Animal & Poultry Science, University of Guelph, Alfred, ON, Canada

³Ministry of Agriculture, Food & Rural Affairs, Animal Health & Welfare Branch, Woodstock, ON, Canada

On-farm animal welfare assessment programs are becoming standard practice in the livestock industry as retailers and consumers ask for evidence that animal welfare standards are being followed. Animal welfare assessment programs should include animal based (AB) measures since they are direct measures of the welfare status of the animals. Any measure used in an assessment program must also be reliable - a primary concern with using AB measures is that they require substantial training and practice to achieve acceptable levels of inter-observer reliability (IOR). This project investigated the potential use of four AB measures for lactating dairy cows in on-farm animal welfare assessments. Seventeen graduate students from the University of Guelph were trained to score the four AB measures (body condition score (BCS), hock, neck, and knee injuries) of dairy cows in two, one-hour in-class training sessions using still photos and videos. Only six of the seventeen students had previous experience with dairy cows. Students and an “expert” collected data using the four AB measures on thirty-one lactating dairy cows at the Elora Research Station in Guelph, Ontario in March 2015. All students assessed the same animals and had access to reference material to aid in scoring. Data was analyzed from the seventeen student observers using the Fleiss’s Kappa coefficient, using the statistical program R. Students had slight agreement for neck (0.264), right knee (0.205) and left knee (0.338) injuries, but only poor agreement for BCS (0.165) and left and right hock injuries (0.0325 and 0.099 respectively). Percent agreements with the expert were as follows: 67% (BCS), 78% (left hock), 79% (right hock), 82% (left knee), 81% (right knee) and 88% (neck). When comparing IOR amongst students, no measure had more than slight agreement, suggesting that the in-class training was not sufficient. However, there were acceptable levels of percent agreement with the expert. Results suggest that in order for animal based measures to be included in an on-farm animal welfare assessment program, auditors would require in-barn practice.

Effect of keel status on activity patterns of laying hens in large furnished cages

Teresa Casey-Trott^{1*}, Michele Guerin², Victoria Sandilands³, Stephanie Torrey¹,
Tina Widowski¹

¹Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

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

³SRUC Avian Science Research Centre, Auchincruive, Ayr, Scotland

Selection for high egg production in laying hens has led to a high prevalence of osteoporosis, increasing the risk of bone fractures. Keel fractures in laying hens are commonly reported in all housing systems, with severe keel damage noted in non-cage and furnished cage systems. Keel fractures are associated with pain and restricted motion, leading to reduced hen mobility. The objective was to determine whether keel fractures affect the activity of hens housed in large furnished cages. Twenty four pairs of LSL Lite hens (71 wk) were observed in 24 furnished cages, housing either 30 or 60 hens, both with 750 cm²/hen space allowance. Based on palpation, a fractured and a non-fractured pair of hens were selected within each cage for observation, with observers blinded to keel status. Location within cage and behavioural activity of each hen was continuously recorded using focal animal sampling for 10 min within a sample period in the morning (08:00-10:00), afternoon (12:00-14:00), and evening (17:00-19:00). All hens were observed during each sample period for three days and the data for each hen was summed for analysis. Hens were euthanized, dissected, and classified by keel status 1 wk after observation: F0 (no fracture, N=15); F1 (single fracture without deviation, N=10); F2 (multiple fractures with deviation, N=23). The percentages of time hens spent performing each behaviour were analyzed using mixed procedure in SAS with keel status, body weight, cage size, and tier in the model. Keel status had an effect on the location (floor vs perch) of total rest time. Non-fractured hens spent 81 ± 7% of total resting time on the floor whereas fractured hens spent only 57 ± 6% of total resting time on the floor ($P=0.03$). Fractured hens perched for a longer percentage of time than non-fractured hens ($P=0.03$). F0 and F1 hens did not differ in perching time (10.6 ± 2%; 15.1 ± 4%; $P=0.71$); however, F2 hens perched longer than F0 hens (23.0 ± 3%; $P=0.01$). Differences in perching duration may provide insight into the possible cause of the keel damage, or alternatively, may indicate a pain relief strategy for hens with keel damage.

Use of mirrors on the feeding behavior of dairy cattle

Marcos Donizete da Silva ^{1*}, Marcelo Simão da Rosa², Iran José Oliveira da Silva³

¹Veterinarian

²Federal Institute of Education, Science and Technology, South of Minas Gerais, Brazil

³Dept of Biosystems Engineering, University of Sao Paulo, Piracicaba, SP, Brazil

Animal behavior involves both submissive and dominant animals. Often the presence of dominant animals inhibits the behavior of the submissive animals. The feeding behavior can be influenced by the presence of animals in the trough competition, simulated to the greatest number of animals in the trough, with the use of mirrors but without the competition between them. The main hypothesis was that the presence of mirrors could simulate an increased competitiveness without the presence of a social hierarchy and modify the residence time of animals ingesting food. The objective of this research was to evaluate the feeding behavior of dairy cattle, and the influence in the social hierarchy of these individuals at feeding time with the presence of mirrors. The mirrors were placed in front of the feed trough. The research was conducted in the city of Muzambinho, Brazil. Were used 16 animals in two treatments, with the presence of mirrors, and without the presence of mirrors. The animals were randomly divided into three observation groups, two groups of five animals, and the third group with six animals. Data was recorded during the two daily milkings, morning, and afternoon, on consecutive days. The behavior study was assessed by means of focal animal methodology, with observations every five minutes. The observations were initiated at the time of arrival of the animals in the trough and ended with the departure of the last animal. An ethogram, with a spatial distribution of animals in the feed room, was adopted. This included AF (outside the room), AS (animals in the room, but not eating) and AL (animals in the room and feeding). During the research, the food intake of each group was recorded. A completely randomized design was used, with a factorial of 2 x 2 (with and without the mirror, and two milkings), with a repeat of 32 animals. A generalized linear model was adopted that allows a model of this measurement, assuming the Poisson distribution, and for the link function a logarithmic was used. For the food intake evaluation a completely randomized design was also considered, with two treatments and six replicates, adopting the generalized linear model (GLM). The results showed a statistically significant differences ($P < 0.05$) in the use of mirrors, increasing the time of the animals in front of the trough (AL), and the time the animals were in the feed room (AS). However, these results were not significantly different ($P > 0.05$) for food intake.

An evaluation of beak shape variation in domestic turkeys and its application to welfare research

Hillary Dalton^{1*}, Benjamin Wood^{1,2}, Tina Widowski¹, Michele Guerin³, Stephanie Torrey¹

¹Dept of Animal & Poultry Science, University of Guelph, ON, Canada

²Hybrid Turkeys, Suite C, 650 Riverbend Drive, Kitchener, ON, Canada

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

Diversity in beak shape has been traditionally quantified using linear measurements of length and width. However, these univariate measures do not provide geometric information on shape independent of size. Geometric morphometrics have overcome this limitation by employing landmarks to examine shape variability that remains unchanged after scaling. The knowledge gained through morphometric analyses has been successfully adapted for a number of taxonomic and genetic applications, including the estimation of genetic variation in the shape of physical traits in several species. The objective of this study was to assess beak shape variation within a line of domestic turkeys using geometric morphometrics. Right lateral images were taken of 595 un-trimmed turkeys at 4-wk of age with a background ruler for scaling. Eighteen landmarks were digitized along the upper mandible in each image using tpsDig. The landmark coordinates from each turkey were aligned in tpsRelw using a Procrustes superimposition with sliding semilandmarks. The superimposed landmarks data were then subjected to a principal components analysis with MorphoJ. Six principal components (PCs) cumulatively explained 85.02% of the total variation in beak shape. These components captured shape variability in the depth of the upper mandible, particularly at the beak base, as well as variability in the point of maximum curvature of the upper beak. In particular, PC1 showed a posterior shift in the cutting edge of the mandible accompanied by the downward curve of the beak tip. The variation explained by these PCs shows the beak shape morphs ranged from straight and shallow to deep and highly curved upper mandibles. A multivariate regression indicated that beak size only accounted for 1.96% of the total beak shape variation ($P < 0.0001$). Future applications of beak shape variability could have a genetic and welfare value, such as incorporating beak shape variation into breeding criteria to select for blunter beaks to prevent damage from injurious pecking.

Veterinarian communication about companion animal behaviour and training is reactive rather than proactive

Lauren Dawson^{1*}, Cate Dewey¹, Elizabeth Stone², Michele Guerin¹, Lee Niel¹

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

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

Veterinarians serve as a source of information for all aspects of pet care and welfare. Behaviour problems and use of inappropriate training methods are likely to have a significant impact on companion animal welfare, so it is important that a holistic approach to veterinary care includes regular inquiries about behaviour concerns. Our objective was to investigate the provision of behaviour and training advice by veterinarians during routine preventive ('wellness') appointments. Thirty veterinary clinics in southern Ontario were visited, and at each clinic, a senior veterinarian completed a written questionnaire and verbal interview to assess communication regarding behaviour problems and training methods. Video cameras were installed in exam rooms to capture veterinary appointments; up to six randomly selected wellness appointments per clinic (81 appointments total) were analysed on a five-point scale for discussion of relevant topics. During the interview, although 93% of veterinarians responded that they feel confident in their ability to offer advice regarding behaviour and training, only 21% of all participants discuss these topics proactively, whereas 66% discuss them only if a concern is presented or if a behavioural issue arises during the appointment itself. Through the questionnaire, 63% of veterinarians indicated that they routinely ask about new or ongoing behaviour issues during wellness appointments. While only 30% of veterinarians indicated they routinely discuss appropriate training methods during appointments, 93% claim to provide training advice to at least a subset of their patients (i.e. dogs, young animals). Videos of appointments, however, revealed that behaviour problems were mentioned in only 20% of wellness appointments. Furthermore, advice regarding training was offered in 20% of wellness appointments, including 23% of canine appointments and 33% of appointments with patients under two years of age. Results suggest that veterinarians recognize the importance of educating their clients and intend to do so, but in practice these conversations happen less often than they believe they do. Veterinarians also appear to take a reactive approach to discussions on behaviour, and thus, may miss the opportunity to prevent, identify and treat many behaviour issues. Further research is needed to understand how these veterinary conversations influence behaviour outcomes.

Influence of the use of environmental enrichment on the sexual behaviour and performance of breeding pigs

Ariane Cristina de Castro*, Iran José Oliveira Da Silva

Dept of Biosystems Engineering, University of Sao Paulo, Piracicaba, SP, Brazil

Breeding pigs are selected mainly according to their ability to mount the mannequin, libido and production of an ejaculate that can result in high rates of fertilization and pregnancy in females. If the animal does not mount the mannequin or the animal training is inefficient, the animal is discarded and the company can lose quality genetic material. Many studies report that environmental enrichment helps cognitive development of pigs and improves the welfare of farm animals. This tool could therefore be important in raising male pigs with the aim to facilitate training for mounting, cooperating with learning of the animals, improving animals' sexual performance and consequently avoiding the monotony of the containment atmosphere. This research seeks to determine whether the use of environmental enrichment during the growth phase influences sexual performance and the selection rate of pure line and crossbred male breeding pigs. The research was conducted in partnership with Agroceres Pic and we used 128 animals. Male breeders from pure and commercial lines were exposed to two styles of raising (with and without environmental enrichment) during the growth phase. We used three different types of environmental enrichments, in order to maintain the interest of the animals in the objects throughout the evaluation period. The objects chosen were: chains, a hanging jug, and a loose jug on the floor. Each object was placed in the pen for a period of 30 days. Initial measurements included: weight gain, injury score and animal behaviour. After the growth phase 32 animals were evaluated during the training. The training occurred over six consecutive days, with each animal trained three times on alternate days, for a total of 96 trainings. During training for semen collection, animal behaviour and human-animal relations, sperm volume and motility, testosterone and cortisol levels, were measured. Currently the data are being analyzed and preliminary results indicate that environmental enrichment influenced animal behavioral measures (learning and ease for mounting the mannequin), weight gain and lesions score. Under enriched conditions, the animals were more active and there was no incidence of cannibalism, among other lesions, positively interfering in the selection rate and in the animal welfare.

Comparison of different flooring types with anti-slip properties to improve dairy cattle ease of movement

Nancy Franco-Gendron^{1*}, Renée Bergeron¹, Walt Curilla², Sabine Conte³, Trevor DeVries⁴, Elsa Vasseur¹

¹Organic Dairy Research Center, University of Guelph, Alfred, ON, Canada

²AB Silikal Hygienic Floors, Diamond Hard Surfaces (Calgary) Inc., Calgary, AB, Canada

³Centre de Recherche et de Développement sur le Bovin Laitier et le Porc, Agriculture and Agri-Food Canada, Lennoxville, QC, Canada

⁴Dept of Animal & Poultry Science, University of Guelph, Kemptville, ON, Canada

Free-stall dairy farms commonly present issues with cattle slips and falls caused by smooth flooring and manure slurry. Better flooring may improve ease of movement and decrease the occurrence of injuries, thus reducing the prevalence of lameness. This study examined the effect of 6 different flooring types on ease of movement of 18 Holstein dairy cows, hypothesizing that flooring with more adequate anti-slip properties improves ease of movement. Longer strides or faster pace indicates comfort on a particular floor. Over a 6-wk period, cows were randomly assigned to walk once on all flooring options including 2 controls, rubber mat and grooved concrete, versus 4 different coating treatments: red (0.7-1.2mm quartz size, 1 seal coat), green (0.7-1.2mm, 2 seal coats), yellow (0.4-0.8mm, 1 seal coat) and orange (0.4-0.8mm, 2 seal coats). A thin layer of manure was applied to all flooring to better represent farm conditions. Cows were filmed walking a straight corridor and a corridor with a turn. Two accelerometers attached on their rear legs measured the average acceleration of a passage. Reflective markers placed on their right hooves before walking the straight corridor measured stride length, foot height, swing and stance time via kinematics. Number of steps taken, passage time and time/step were recorded for the curved corridor. Strides were longer for rubber (1.54 ± 0.026 m; mean \pm SE) than the other treatments on the straight corridor: 1.44 ± 0.041 m for Red (Wilcoxon signed rank test: $S = 54$; $P = 0.003$), 1.38 ± 0.027 m for Green ($S = 68$; $P < 0.0001$), 1.48 ± 0.031 m for Yellow ($S = 43$; $P = 0.02$), and 1.46 ± 0.033 m for Orange ($S = 47$; $P = 0.01$). Strides were shorter on groove concrete (1.41 ± 0.034 m) compared to Yellow ($S = -52$; $P = 0.02$), but no other differences were found between treatments. The time taken per step in the curved corridor was not different among flooring types (Kruskal-Wallis test: $X^2 = 0.9$; $P > 0.1$). Cows walked more comfortably on rubber versus coating treatments yet were more comfortable on the Yellow coating treatment versus concrete flooring. Further analysis will determine if acceleration and gait support this conclusion.

Risk factors associated with stranger-directed aggression in dogs

Hannah Flint^{1*}, Jason Coe¹, James Serpell², David Pearl¹, Lee Niel¹

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

²School of Veterinary Medicine, University of Pennsylvania, Philadelphia, PA, USA

Aggression in canines is a safety concern both for humans and animals, and can lead to decreased animal welfare in affected dogs due to abuse, neglect, relinquishment or euthanasia. Our objective was to explore risk-factors for stranger-directed aggression in dogs using a previously validated, owner-completed canine behaviour questionnaire (C-BARQ). Scores for stranger-directed aggression, stranger-directed fear, non-social fear and touch sensitivity were calculated using factors developed by Hsu & Serpell (2003) and were then dichotomized. Data were analyzed using multivariable logistic regression models, with household and country as random effects (n=15,911 dogs). Dogs were more likely to be aggressive if they were touch sensitive (OR=1.30; p<0.001) or fearful of strangers (OR=5.08; p<0.001). There was a significant interaction between sex and neuter status, with neutered males being more likely to be aggressive than any other group (OR=1.44; p=0.001). There was also an association with breed group (p<0.001), where the dog was acquired (p<0.001) and the dogs role (p<0.001). Dogs were less likely to be aggressive with increased age at acquisition (OR=0.863/yr; p<0.001). The random effect for household was significant (p<0.001) indicating that there was some correlation in behaviour among dogs within the same household; suggesting household effects may need to be examined further. When looking only at dogs categorized as aggressive towards strangers (n=12,603), dogs were more likely to be categorized as having severe aggression (biting or attempting to bite) if they had non-social fear (OR=1.37; p=0.004) or stranger-directed fear (OR=1.35; p=0.006). Dogs were less likely to have severe aggression if they were a working breed (OR=0.652; p=0.039) when compared to mixed breed dogs. There were significant interactions between the dog's role and neuter status (p=0.038) and between where the owner acquired the dog and whether this was their first dog (p=0.012). In this model, there was no significant effect of household. These results suggest that variables related to the environment, owner experience and the dog's level of fearfulness are associated with aggressive behaviours in dogs, and therefore it may be possible to identify dogs at risk of developing aggression and implement plans to prevent issues from occurring.

Virtue ethics as an approach to animal ethics

Michael Furac*

Dept of Philosophy, University of Guelph, Guelph, ON, Canada

In the animal ethics debate that occurs in the western world there are two leading views of the moral outlook we should adopt: the Utilitarian view (Peter Singer, *Animal Liberation*), and the Deontological view (Tome Regan, *The Case for Animal Rights*). However, both suffer from a repressed view of anthropocentric speciesism, and, both rely too heavily on animal sentience in their consideration of moral relevance. Such issues lead to inconsistencies within the ethics themselves as they attempt to guide moral action of particular circumstances with generalizations and sweeping ought's'. In their stead I propose that the virtue ethic approach is a significant improvement on either the Utilitarian or the Deontological in matters of both philosophic grounding and prescription of actions. The virtue approach was conceived of by Aristotle in his *Nicomachean Ethics*, and is continued in modern times by philosophers such as, Philipa Foot, and Rosalind Hursthouse. I will be drawing on the work of Rosalind Hursthouse, specifically, *Applying Virtue Ethics to Our Treatment of the Other Animals*, in order to explore the questions of animal ethics from the virtue perspective.

In *The Nicomachean Ethics* Aristotle describes the proper manner of action as that which is the "mean" in each circumstance, this mean is the action that is most in accord with the virtues. Hursthouse discusses the application of this system to two practical realms of human-animal interaction, the use of animals for food and the use of animals for scientific research. What we will see is that the virtue approach clearly describes how an individual should act without falling into inconsistencies with itself because it plots a course for human action within the individual's own life, referencing the actions an individual takes to the virtues of the human soul; and in so doing taking into account individualities and uniqueness of circumstance. I will discuss how it is the virtue approach and its prescription of mean action in reference to the virtues is a superior ethical outlook in the complex field of animal ethics.

Effects of early social stimuli on adult aggression in dogs (*Canis familiaris*)

Lucinda Glenny^{1*}, Janet Higginson Cutler¹, Lee Niel¹, Tina Widowski², Jason Coe¹

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

²Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

One of the primary reasons given by owners when surrendering dogs to humane societies is behavioral issues, particularly aggression. The objective of this study was to determine whether increased socialization to humans, dogs and environmental stimulus, between 8 and 16 weeks of age, had an effect on the subject animal's aggression between 1 and 6 years of age, with the hypothesis that increased socialization would result in fewer cases of aggression. Incidents and severity of aggressive behaviours were chosen as the measurement of temperament due to the negative implications that these behaviours can have on relations with humans and conspecifics. Data was gathered through an online survey, with participants (N=300) recruited through convenience sampling at local venues, and email contact of clients from the database of a local dog business, Canine Campus. Subject animals were designated part of either the positive exposure or the control group based on the two primary variables of interest: 1. Joining training classes under the age of 16 weeks, or 2. Achieving above the calculated group mean for the level of social exposure, under the age of 16 weeks. Subjects were scored on their level of aggression to strangers, owners, and dogs, based on owner responses in the validated Canine Behaviour Assessment and Research Questionnaire. ANOVA was used to determine if dogs differed based on class attendance, while t-tests were used to analyze results for social exposure. Stranger-directed aggression was lower in dogs that attended classes ($p=0.007$), while no difference was found in owner- or dog-directed-aggression ($p >0.05$). The dogs that were deemed well socialized also showed significantly lower stranger-directed ($p = 0.002$) and owner-directed ($p = 0.023$) aggression. No effect was found when analyzing dog-directed aggression by the level of socialization achieved ($p >0.05$). These data suggest that early socialization affects the responses of dogs to social situations at a later stage of development, with low socialization potentially predisposing dogs to the development of aggression. Further research in this area is warranted to more clearly define best socialization protocols for puppies.

Assessing the space utilization of three breeds of laying pullets during the rearing period

Andrea Habinski*, Michelle Hunniford, Linda Caston, Teresa Casey-Trott, Tina Widowski

Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

There is currently little information available on the spacing behaviour of laying pullets (young laying hens from chick to sexual maturity) as they grow throughout the rearing phase. Insufficient space allowance can impede a bird's ability to move comfortably and access resources in her environment as well as prevent her from retreating from aggressors to avoid injury. Presently, only minimal and basic space requirements are outlined in the codes of practice worldwide and it is unclear if these requirements are sufficient to ensure the welfare of the birds. The objective of this study is to observe several breeds of pullets throughout the rearing phase to gain insight into their spacing behaviour as they grow. To achieve this, 3 breeds of laying pullets (Columbian Rock, White Leghorn and Rhode Island Red) will be housed in Farmer Automatic pullet Combi-cages. These cages contain feeders and drinkers as well as an elevated platform and multi-level perches. Grids marked on solid panels will be attached to the back and side walls of the cage. Twelve cages will be stocked with 100 pullets from 1 day until 6 weeks of age and then group sizes will be reduced to 50/cage as per standard practice. Observations will be conducted one day per week from 1-14 weeks of age. Cameras will be placed on mounts on the roof of the cages, and after an acclimatization period, photos will be taken remotely as to not disturb the birds. An image of each cage will be taken once in the morning and in the afternoon. The grid will be used to determine the spatial distribution of the birds and to quantify the number of birds occupying different sections. From this, the clustering behaviour and spatial distributions of birds on the floor, perches, platform, and at the feeder will be determined and will be compared among breeds and across ages. This will be the first study to investigate pullet behaviour in furnished rearing cages. It is anticipated that this information can then be used to inform recommendations for space allowances and stocking densities for laying pullets throughout the rearing period.

Designing alternatives: Assessing how hens perceive nesting spaces in large furnished cages

Michelle Hunniford, Gregory Bédécarrats, Ian Duncan, Georgia Mason, Stephanie Torrey, Tina Widowski

Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

Furnished cages (FC) are designed so hens can perform highly motivated behaviour, like nesting. However, how hens perceive the design of FC nests is not fully understood. Our previous research indicated that more hens laid eggs in the scratch area in FCs with a wire partition dividing the area. The objective of this study was to observe naïve hens' egg laying behaviour when offered a choice between a curtained nest (plastic mesh floor), and a scratch area (smooth plastic floor) with (W) or without (NW) a wire partition. We predicted that most hens would prefer the curtained nest area regardless of treatment, however W hens would lay more eggs and search more in the scratch area and be less aggressive than NW hens. LSL-Lite hens were reared in conventional cages in groups of six and transferred into one of 12 FC (3 tiers, 2 rooms) for 5d at 20-23 wks of age. Treatments (W, NW) alternated within cage each week for 4 wks (N=48 groups; 288 hens). Hens in top cages (N=16 groups, 96 hens) were individually identified and video recorded for 3d. Egg location was logged for 5d. Behaviour performed in both the nest and scratch areas during 1h pre-lay was scored for hens with visible ovipositions (N=15 groups, 55 hens). Egg location and hen behaviour were analyzed using SAS Proc Mixed; the model included cage size, treatment, room, tier and week (fixed effects) with random group. Significantly more eggs were laid in the scratch area with a wire partition (W) than without (NW; $18.3 \pm 1.8\%$ vs. $7.3 \pm 1.3\%$; $F_{1,126}=18.98$, $p < 0.0001$). No other factor affected egg location ($p > 0.05$). W treatment hens searched the scratch area more (15.2 ± 1.6 vs. 6.1 ± 1.2 min; $F_{1,57.7}=12.2$, $p=0.0009$), entered the scratch mat area more frequently (38.7 ± 5.0 vs. 19.5 ± 3.1 bouts; $F_{1,59}=13.31$, $p=0.0006$) and entered the nest less frequently (18.6 ± 1.7 vs. 26.1 ± 1.6 bouts; $F_{1,72}=7.4$, $p=0.0082$) than NW hens. There was no difference in the frequency of nesting behaviour ($p=0.53$) or aggression ($p=0.18$) between treatments. These results show that hens perceive the scratch area as a suitable alternate nest site when a wire partition is added, offering some degree of enclosure.

Teaching old owners new tricks: Assessment of dog owner identification of canine resource guarding behaviour

Jacquelyn Jacobs*, Jason Coe, David Pearl, Lee Niel

Dept of Population Medicine, University of Guelph, Guelph, ON, Canada

Canine aggression (AG) can impair the pet-owner bond and is the top behavioural reason for relinquishment to shelters. Welfare may be negatively impacted in either scenario through mistreatment or long-term confinement. Canine resource guarding (RG) often includes AG and is described as the behaviour patterns used by a dog to maintain primary access to a perceived valuable item. Three distinct behavioural strategies for RG have been proposed: AG, rapid ingestion (RI), and avoidance (AV). RI and AV may be precursors to AG and as such are important for dog owners to recognize in order to apply prevention techniques. A two-stage survey method was used to assess accuracy of owner identification of RG strategies. In the first stage, four veterinary behaviourists categorized videos of dogs during standardized assessments for RG. Videos with 100% agreement on RG strategy were retained for use in the second stage (n=16 videos). Dog owners (n=1438) were recruited through social media sources and asked to categorize behaviour in seven semi-random video examples. Data were analyzed using pairwise comparisons and logistic regression in SAS 9.4. Owners reporting advanced knowledge of dog behaviour were slightly better at identifying categories (85.5 v. 84.2 % probability of correct response; $P<0.05$), but effects of employment type were not observed. Owners varied in their success at identifying between all categories ($P<0.001$). The mean proportion and 95% confidence intervals were: no RG: 0.86 (0.84-0.88); AG: 0.83 (0.82-0.85); AV: 0.82 (0.81-0.85); subtle aggression (threats, no bites): 0.70 (0.69-0.72); RI: 0.64 (0.62-0.65)). Differences were seen between videos within some categories, particularly AG. In the most extreme example, owners were 24 times more likely to correctly identify AG in one example compared to another (95% CI: 11.44-50.76 ($P<0.001$)). In contrast, videos in the no RG category were identified correctly with consistency. The results suggest owners are good at distinguishing between no RG and RG behaviour, but successful identification of separate RG strategies is less consistent and may be partly influenced by individual differences in morphology and behaviour between dogs. Future studies should aim to determine if successful identification of RI and AV can help prevent AG.

Are chicks motivated to use elevated horizontal and vertical space?

Madison Kozak^{1*}, Bret Tobalske², Candace Martins¹, Hanno Wuerbel³,
Alexandra Harlander-Matauschek¹

¹Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

²Division of Biological Sciences, University of Montana, Missoula, MT, USA

³Division of Animal Welfare, University of Bern, Bern, Switzerland

Aviaries (3D, multilayer environments with horizontal platforms connected via vertical features) are becoming an increasingly popular method of housing laying hens due offering more freedom of locomotion. However, most navigational studies of chicks have taken place in constrained environments, which are characterized by being planar (2D) and horizontal. Currently, little is known about how chicks develop the necessary locomotor abilities to successfully navigate multitier environments. We hypothesize that chicks in aviaries will use elevated horizontal and vertical space more with increasing age and development.

One hundred and twenty chicks (LSL-lite [LSL], Hyline Brown [HB], Dekalb White [DW], Lohmann Brown [LB]) were sorted by line (10 birds/pen) and placed into 12 aviaries (182X243X280cm), which had 4 platforms at two different heights (70 and 160cm) and a ramp and ladder to vertically connect them. The chick's spatial use and locomotive behaviour (walking, flapping, etc) were measured (30 min video/pen/1-9WOA). To analyze all occurrences of motor patterns and location, pens were visually divided into 4 layers: ground (L1), low perch to first platform (L2;15-69cm), in-between first and second platform (L3; 70-159cm), and the second platforms and high perch (L4;160cm+). The data were analyzed using Glimmix (SAS) to determine main (line, age) and interaction effects.

From 1-9WOA, locomotor behavior performed by chicks on the ground declined ($P < 0.001$). A line*age interaction ($P < 0.02$) showed that HB chicks employed a high number of ground motor (L1) patterns at 1WOA. L2 was first utilized at 2WOA ($P < 0.01$). In L2, LSL chicks performed a high number of locomotor behaviours compared to the other lines ($P < 0.01$). There was a line*age interaction ($P < 0.001$), which could be attributed to LSL chicks employing a high number of motor patterns in L3 at 6 and 9WOA. L4 was not utilized throughout 1-9WOA. The use of vertical ramps ($P < 0.004$) and ladders ($P < 0.001$) was higher in at 2-3WOA than in the other WOA.

Overall, it appears that chicks, especially LSL chicks, are motivated to use the vertical and raised horizontal space as early as 2 WOA. Additional research will conclude whether our perceived age-dependent use of horizontal and vertical features in a multilayer aviary is paralleled by age-dependent changes in locomotor abilities.

Do chicks master inclined slopes?

Chantal LeBlanc^{1*}, Bret Tobalske², Hanno Wuerbel³, Alexandra Harlander-Matauschek¹

¹Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

²Division of Biological Sciences, University of Montana, Missoula, MT, USA

³Division of Animal Welfare, University of Bern, Bern, Switzerland

The non-cage environment for chicks is three-dimensional, including both horizontal and vertical features. However, variations in the terrain that are easily negotiated by mature laying hens might challenge the locomotion skills of chicks. This experiment investigated for the first time whether chicks master inclined walkways and whether chicks with more experience (age and experience are interrelated variables) can walk up steeper slopes. We investigated whether 20 two-week-old chicks of different strains (Hyline Brown, Lohmann Brown, Dekalb White, LSL lite) succeeded or failed to walk up sandpaper covered ramps (0, 20, 30, 40, 50, 60, 70°) when given one minute, with failure defined as falling or not initiating ascent. Flat starting (37 cm length on the ground) and landing (41 cm length, 70 cm height) platforms flanked the ramp sections. Motivation to climb was provided by having 5 same-age chicks in a crate on the top platform. Subjects were presented with inclines in random increments/decrements weekly (2, 3, 4, 5 weeks) and were video recorded for each test. Data were analyzed using the Glimmix procedure via Laplace's method (SAS) to determine main (strain, week and incline) and interaction effects (incline*week, incline*strain, strain*week). The 70° incline was excluded from the analysis due to bird's unwillingness to climb. The significant ($P < 0.0001$) incline effect could be attributed to a decrease in successes as the inclines increased. There was no effect of incline*week or incline*strain. However, there was a significant ($P < 0.0001$) strain*week effect which could be attributed to Lohmann Brown, Dekalb White, and LSL lite birds having a higher number of successes in week 2 compared to Hyline Brown birds and a decreasing number of successes for weeks 3 and 4, while Hyline Brown birds improved in performance for weeks 3 and 4. All strains consistently decreased in the number of successes for week 5. Overall, chicks in their 2nd week of life are willing to walk up and master various inclines, and chicks with more experience are not necessarily willing to walk up steeper slopes.

Stereotypic mice are aggressed by their cagemates, and tend to be poor demonstrators in social learning tasks

Laura Harper¹, Elena Choleris², Kelsy Ervin², Carole Fureix^{1,4}, Kathryn Reynolds³, Michael Walker¹, Georgia Mason¹

¹Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

²Dept of Psychology, University of Guelph, Guelph, ON, Canada

³Dept of Molecular & Cellular Biology, University of Guelph, Guelph, ON, Canada

⁴Dept of Animal Husbandry, University of Bristol, Langford, UK

Stereotypic behaviours (SBs) in captive animals resemble symptoms of autism. Furthermore, they are often associated with behavioural inflexibility (e.g. impaired reversal/extinction learning), just as they are in this human condition. This suggests that stereotypic animals may have autistic-like social impairments too. Consistent with this, stereotypic male mink were less successful with females in mate choice tasks (Diez-Leon et al. 2013). Since SBs are common in caged rodents, we ran three experiments to test this hypothesis further using C57BL/6 and DBA/2 mice. In two experiments, we investigated whether SB compromises social interactions within the home cage, predicting that highly stereotypic individuals would give and receive more aggression. Experiment One used 15 non-enriched cages and 15 enriched (3 mice/cage); Experiment Two, used 6 non-enriched cages and 44 enriched (3 mice/cage). Across both, enrichment reduced the time spent in SB ($F_{1,75} = 36.28$, $P < 0.0001$) and aggression ($F_{1,78} = 4.27$, $P = 0.042$). These effects appeared to be related: enrichment effects on aggression vanished if SB was statistically controlled for ($F_{1,85} = 0.42$, $P = 0.51$), and, at least in enriched cages, SB covaried with receiving aggression ($F_{1,121} = 8.79$, $P = 0.004$). In Experiment Three, we investigated whether stereotypic mice would be poor demonstrators in social learning tasks. 20 DBAs varying in SB acted as demonstrators in ‘social transmission of food preferences’ tests. They were fed a novel flavour (shatavari), then each mingled with a familiar, flavour-naïve C57 observer in a food-free cage. These observers were subsequently removed, and offered a choice between two novel flavours of food (shatavari or marjoram). Those choosing to eat more shatavari ($n = 10$) tended to have had less stereotypic demonstrators than the other 10 observers ($F_{1,16} = 3.58$, $P = 0.077$), suggesting that mice are relatively unlikely to copy new diets from high SB conspecifics. Thus overall, highly stereotypic mice received more aggression -- an effect with obvious welfare implications -- and seemed potentially poorer at transmitting flavour preferences to conspecifics: results all consistent with social impairment. These findings now need replicating (see Pond et al. this meeting) to investigate their robustness, and the causality of the link between SB and receiving aggression.

A survey of management and feeding practices of dairy calves: Manual and automated milk feeding systems

Catalina Medrano-Galarza^{1*}, Jeff Rushen², Anne Marie de Passillé², Andria Jones-Bitton¹, Trevor DeVries³, Stephen LeBlanc¹, Derek Haley¹

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

²Faculty of Land & Food Systems, University of British Columbia, Vancouver, BC, Canada

³Dept of Animal & Poultry Science, University of Guelph, Kemptville, ON, Canada

Traditionally, dairy calves are individually housed and manually fed milk using a bucket or bottle, twice a day. The effects of limited milk feeding and lack of socialization with other calves are confounded, but traditional management may limit calves' expression of natural behaviours, and constrain their welfare, health and growth. Computer technology allows producers to automate on-farm procedures, leading to more precise dairy farming, and improvement of working conditions. Automated milk feeders (AMF) allow for more natural milk feeding frequency and volume while calves are housed in groups, which can enhance calf welfare. An on-line questionnaire on calf management and feeding practices was sent in February-2015 to dairy producers across Canada. The questionnaire consisted of closed (multiple-choice, ranking and Likert scale) and open-ended questions. It was divided into five main sections: general description of the farm, personnel in charge of calves, factors associated with, and perceptions of calf feeding systems, management and care during calves' first days of life, and management and care of calves during the whole milk-fed period. Producers with AMF were given two extra sections including questions related to AMF set-up at the farm and the training of the calves to use the AMF. The objective of this research is to gather information about factors that influenced producers to continue using traditional calf feeding methods or to switch to AMF, the advantages and disadvantages that producers have faced or are currently facing regarding calf feeding practices, and information about management practices associated with each type of feeding system. Statistical analysis will be performed using descriptive statistics: for qualitative questions, percentage of producers giving a particular response will be calculated; as well as the median and quartiles for continuous variables. To date, 599 producers have responded (5% of all dairy farms in Canada); 514 (85.8%) are currently using manual feeding, and 85 (14.2%) are using AMF. Benchmarking will allow for a comparison between dairy farms with automated and conventional calf feeding systems; and for a better understanding of producers' motivations, and the practices we need to focus on to improve calf welfare. Additionally, this survey is being used as a recruitment tool for a more in-depth study regarding AMF in Ontario.

Validation of a behavioural paradigm to assess various feline handling techniques used in veterinary clinics

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

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

²Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

Although the pet cat population has been increasing, feline veterinary visits have been in decline over the past 10 years. One reason that cat owners do not seek appropriate veterinary care for their pets, particularly preventive care, is because of the perceived animal stress associated with veterinary visits. However, there is a lack of science-based research to improve veterinary handling techniques. Our current research is aimed at determining which handling techniques minimize stress during routine examinations and procedures. One barrier to future research is the lack of validated tools for the assessment of feline responses to handling and restraint. Therefore, the objective of this project is to develop and validate an aversion-testing paradigm to assess feline responses to different handling techniques. Cats will be habituated to a straight runway, and then trained to walk down it using food rewards to increase their motivation to approach a handler at the end. Each cat will repeat this procedure until the task can be consistently completed three times in a row. During aversion testing, cats will undergo either a positive (n=15) or a negative (n=15) handling technique at the end of the runway, and latency to approach the handler at the end will be assessed during follow-up trials. Positive handling will involve gentle, passive interactions, and negative handling will involve secure restraint, with the a priori assumption that the latter handling method is associated with increased stress and aversion based on restraint studies in various species. We predict that cats will show an increased latency to approach handlers after negative handling methods. The methodologies deemed to be valid will then be used to assess feline responses to a variety of handling techniques currently used in veterinary clinics.

The effect of alternative feeding strategies during rearing on the physiology of broiler breeders

Elyse Mosco^{*1}, Aitor Arrazola¹, Tina Widowski¹, Alexandra Harlander-Matauschek¹, James Squires¹, Victoria Sandilands², Henry Classen³, Michele Guerin⁴, Stephanie Torrey¹

¹Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

²Avian Science Research Centre, SRUC, Auchincruive Campus, Ayr, United Kingdom

³Dept of Animal & Poultry Science, University of Saskatchewan, Saskatoon, SK, Canada

⁴Dept of Population Medicine, University of Guelph, Guelph, ON, Canada

Broiler breeders are genetically predisposed for fast growth. In order to maintain good health and reproductive capabilities, they are severely feed restricted during rearing. This restriction leads to chronic hunger and frustration of feeding motivation, which has a negative impact on bird welfare. In Canada, non-daily feeding regimens are commonly used. Although this practice is banned in some countries, there is little empirical evidence of the welfare implications of this practice under commercial conditions. This study will investigate the use of 2 diets in combination with 3 feeding frequencies on stress-related physiological indicators (corticosterone, heterophil/lymphocyte ratio) and metabolism (glucose and non-esterified fatty acids), in female broiler breeders reared at commercial density. The treatments include: 1) a commercial diet fed on a daily basis (control), 2) a commercial diet fed non-consecutively for 4 days out of 7, 3) a commercial diet fed on a graduated schedule (gradually increasing the number of off-feed days to three), and 4) an alternative diet composed of soybean hull and calcium propionate (appetite suppressant) fed daily. Each treatment group is composed of 6 pens of 70 to 72 birds each. Blood samples will be taken during on- and off-feed days from 5 birds/pen at 5, 11, 18 and 21 weeks of age. We predict increased corticosterone levels in concordance with off-feed days, as this hormone plays an important role in regulating blood glucose levels. However, the heterophil/lymphocyte ratio will indicate whether this is an acute or chronic stress response. This study will help identify feeding strategies that can improve both the welfare and economic implications of feeding management in the poultry industry.

Current usage and perceptions of artificial aids by horse enthusiasts in Canada

Lindsay Nakonechny*, Cordelie Dubois, Katrina Merkies

Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

Empirical data examining usage of artificial aids within the Canadian horse industry is unavailable. Comparing perceptions of reasons for using artificial aids to actual usage may provide insight about the transparency of riding and training methods. An online survey was circulated to horse enthusiasts in Canada. Respondents (n=644) who reported working directly with horses (RH, n=558) were asked about when they utilize devices that modify a horse's head or neck position, whips, and spurs. Respondents who reported not working directly with horses (R, n=86) were asked about when they believe riders or trainers utilize such aids. RH use devices to modify a horse's head or neck position while lunging a horse (32.5%), when a horse exhibits undesirable behaviour (15.8%), or when a horse does not respond to cues (10%). Furthermore, 43.2% reported never using these devices during riding or training. However, only 8.9% of R believe these devices are never used during riding or training, and 43% believe they are utilized when horses exhibit undesirable behaviour. Similar responses on whip use were seen between RH and R: when a horse does not respond to cues (58.2% vs. 63.1% respectively), as a cue for a horse to move forward or laterally (36.3% vs. 45.2% respectively), or when a horse exhibits undesirable behaviour (18% vs. 23.8% respectively). RH reported using spurs when a horse does not respond to cues (45.9%), or as a cue for a horse to move forward or laterally (28%), though many reported never using spurs (37.3%). Only 4.5% of RH utilize spurs when a horse exhibits undesirable behaviour whereas 12.1% of R believe spurs are used for this reason. Perceptions were similar to actual use of whips and spurs during riding or training. Perceived usage of devices that modify head or neck position was much higher than reported use. R perceive these devices to be used largely as corrective measures for equine behavioural issues. However, these devices are primarily used during lunging or never used. Misperceptions about artificial aid usage may be indicative of reduced transparency, and may lead to misinterpretation about horse welfare.

Effect of feed type and presentation on feeding behaviour, intake, and growth of dairy calves fed a high level of milk

Morgan Overvest^{1*}, Renée Bergeron², Derek Haley³, Trevor DeVries¹

¹Dept of Animal & Poultry Science, University of Guelph, Kemptville, ON, Canada

²Dept of Animal & Poultry Science, University of Guelph, Alfred, ON, Canada

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

The goal of this project was to improve welfare of dairy calves through the milk-weaning phase and post-weaning stage of life by providing different types of solid feed. The objective was to assess the effect of feed types and method of feed presentation on the feeding behaviour, intake and growth of calves fed a high milk level. Forty-eight neonatal Holstein calves were individually housed and randomly assigned to 1 of 4 treatments: silage-based total mixed ration (TMR), concentrate (CON), and chopped hay and concentrate presented in two manners: mixed (MIX) or separate (SEP). It was hypothesized that calves fed TMR diets would experience no negative impact on growth and would exhibit faster rumen development for a more successful weaning period. All calves were offered 12L/d of acidified milk replacer until d 38 at which time step-down weaning began. Post-weaning SEP and CON calves were offered the MIX diet until the end of the trial while TMR and MIX calves did not change feeds. Feed intakes were recorded daily and calves were weighed 2/week. Video recordings were analyzed for feeding time. Data were summarized by week and analyzed in a repeated measures general linear mixed model. In the pre-weaning stage (d 1–37) ADG was similar (1.1 kg/d; SE=0.07; P=0.16). TMR calves had lower ADG than all other calves during both the weaning (d 38-49; 0.2 vs 0.5 kg/d; SE=0.09; P<0.01) and post-weaning (d 50-84; 0.7 vs 1.2 kg/d; SE=0.09; P<0.01) stages. This result is related to the lower DMI of calves fed TMR in comparison to MIX, SEP and CON calves during weaning (0.2 vs 0.5 kg/d; SE=0.09; P<0.01) and post-weaning (1.8 vs 2.7 kg/d; SE=0.24; P<0.01). Given DM content of the feeds (TMR = 52%, other = 89%), the as-fed intake of the calves was similar (P≥0.40) across treatments in all 3 stages. Interestingly, TMR calves spent more time feeding during the post-weaning stage than all other calves (308 vs 194 min/d; SE=16.0; P<0.01). It appears that during weaning and post-weaning, calves fed TMR attempted to maximize their nutrient intake, but were unable to match that of those in other treatments due to the high moisture content of their feed, and thus were unable to perform at a similar level.

Can live stall lameness scoring be used to score lameness in tie-stall dairies?

Santiago Palacio^{1*}, Lou Peignier¹, Steve Adam², Renée Bergeron¹, Doris Pellerin³, Anne Marie de Passillé⁴, Jeff Rushen⁴, Derek Haley⁵, Trevor DeVries⁶, Elsa Vasseur¹

¹Dept of Animal & Poultry Science, University of Guelph, Alfred, ON, Canada

²Valacta, Montreal, QC, Canada

³Département des Sciences Animales, Université Laval, Laval, QC, Canada

⁴Faculty of Land & Food Systems, University of British Columbia, Vancouver, BC, Canada

⁵Dept of Population Medicine, University of Guelph, Guelph, ON, Canada

⁶Dept of Animal & Poultry Science, University of Guelph, Kemptville, ON, Canada

Assessing lameness in cows kept in tie-stalls is a challenge because the most common method is a visual evaluation of locomotion. Hence, a proper method of stall lameness scoring (SLS) is needed. An SLS method has been previously developed and validated using video recordings, which were compared with locomotion scoring of the same animals. The SLS method evaluates 4 behaviour indicators while cows are still tied in their stall: standing at the edge of the stall (edge), shifting weight between 2 limbs (shift), resting on 1 of the limbs (rest), or uneven movement when moving from side to side (uneven) and flags a cow as lame when 2 or more behaviours are observed. In our current study we compared live SLS scoring to the video SLS scoring used as the gold standard. One observer live-scored 194 cows across 10 herds, and later video scored (an average of 27 days after live scoring) the same cows and compared the live and video scores. Video scoring was altered between farms every 4 videos to prevent scorers from remembering specific farms. For live vs. video scoring, respectively, the prevalence for shift was 0.0 vs. 0.5%, edge was 10.2 vs. 7.2%, rest was 30.7 vs. 36.6%, uneven was 26.9 vs. 30.0%, and lameness was 14.1 vs. 14.1%. Agreement between live and video scoring at the cow level was 99.5% for shift, 96.4% for edge, 90.6% for rest, 74.1% for uneven, and 90.5% for lameness. “Rest“ was observed in 85% of the cows classified as lame according to both scoring methods, while uneven was observed in 93 and 100% of the cows found lame with live and video methods, respectively. Edge was only observed in 26% of the lame cows according to both scoring methods and shift was observed in 0 and 4 % of lame cows assessed with live and video methods, respectively. Live scoring of the SLS method has shown similar results to the validated video SLS scoring method, making it a promising, reliable, and more practical method for scoring lameness for cows in tie-stalls. Rest and uneven behaviours were more commonly observed than shift and edge, possibly indicating that a further simplification of the SLS method could be done for producers and advisors.

The constraints of language in conceiving ethical relationships with nonhuman animals

Brady Patterson*

Dept of Philosophy, University of Guelph, Guelph, ON, Canada

When attempting to construct an ethical framework to guide our interactions with nonhuman animals, we are working within a language that reflects and perpetuates certain prejudices and assumptions. In order to improve animal welfare, we must establish a critical awareness of this paradox and trace the limits of our ability to conceive different ways of forming ethical relationships with nonhuman animals. An ethic of care is characterized by an epistemological shift from humans theorizing about animals to the nonhuman animals themselves. This shift puts us in a position that allows for sensitivity and attentiveness to the ways in which our practices effect nonhuman animals. Improvements may be made in animal welfare through analyzing the language used in industrialized societies and recognizing how it reflects a disembodiment of nonhuman animal's individual characteristics, and a distance between human beings and the actual physical encounter. These factors will be examined contextually within the home through the contrast between our relationships to animals as 'food' and as 'companions'. This will be accomplished through analyzing speech and vocabulary that is involved in the process of transforming cows into 'Filet Mignon', and dogs and cats into 'Max' or 'Belle'.

Landscape architectural design for an animal shelter

Nathan H. Perkins*, Anna Chow

(Design posters by MLA students Erika Bullock, Julia Taucer and Junyi Zhang)

Landscape Architecture, School of Environmental Design and Rural Development,
University of Guelph, Guelph, ON, Canada

Although there is an extensive body of research on the affects of housing and environment on the welfare of animals, *designing for* animal welfare is still a rare topic for training and practice within the design professions. While landscape architecture in particular is well suited to address many welfare design issues-from enriched environments to sustainable animal operations-the lack of built work suggests that a widespread and valuable collaboration is missing.

In late 2014, the authors met with directors of the Guelph Humane Society (GHS) to discuss a class project in developing design concepts for a new shelter facility. While the goal of the classroom design project was to develop the myriad techniques and skills necessary for professional practice, the project itself focused on creating an environment conducive to the many operations necessary in managing a shelter ranging from waste collection to canine enclosures fostering positive human interaction. While designers are familiar with the process of design for humans, the added complexity of designing for humans *and* animals was challenging.

The posters on display represent a sample of design concepts that first year MLA students produced in the GHS project. A shelter design literature review and initial client meetings were used to develop a design program followed by a classic design process of problem identification, site inventory, analysis, synthesis and proposal. The process led to design alternatives being generated for the 'new' shelter and based on feedback final conceptual proposals were refined. What these concepts represent is an approach that landscape architects follow in design.

Designing for animal welfare is an area of practice that requires collaboration and shows promise. As demonstrated by these posters, landscape architects in particular have the tools to develop conceptual designs that can create salutatory environments for animals and those that care for them with behavior and welfare expertise. Of note in these design concepts is the emphasis on accommodating 'human-centered' animal handling program elements. As this area is explored further a teaching focus in future projects will be the addition of specific welfare issues and will hopefully involve CCSAW expertise and designers collaborating.

Does stereotypic behaviour cause impaired social interaction in mice?

Stephen Pond*, Mike Walker, Georgia Mason

Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

Stereotypic behaviour (SB) is common in laboratory rodents, a reliable indicator of poor welfare, and tends to correlate with behavioural inflexibility (e.g. perseverative errors). Both SB and perseveration are common in autistic humans, so it seems possible that stereotypic animals may exhibit other autism-related traits such as impaired social interaction, a characteristic feature of this disorder. Harper, et al. (this meeting; also in press, *Animal Welfare*) tested for associations between SB and impaired social communication in mice, and found correlations between SB and the receipt of aggression, as well as a trend towards more stereotypic mice being poorer 'demonstrators' in a food-related social learning task. The present study will build on this to (a) re-examine whether mice who display SB are *significantly* poorer demonstrators in social learning tasks, and (b) test whether high SB *causes* mice to receive more aggression (rather than the other way around). Over two week of observation, fifteen DBA/2 mice were found to perform SB. (a) They, together with non-stereotypic controls, will each be temporarily isolated and fed food with a novel flavour (Flavour A). They will then be mingled with their cagemates (without food being present) for one hour, and videoed. Mice are naturally neophobic, but may treat new food as familiar after interacting with a conspecific 'demonstrator' who has just eaten it. These cagemates will therefore then be presented with two flavours never previously eaten by them (Flavour A, as just eaten by the demonstrator, and Flavour B), to see which they prefer. It is predicted that observers paired with stereotypic demonstrators will eat significantly less Flavour A than observers paired with non-stereotypic demonstrators. perhaps because they interact less. (b) Former demonstrators will then subsequently be moved to new home cages, and their social interactions monitored here to test the prediction that the most stereotypic DBAs will attract the most aggression from their new cagemates. If stereotypic animals do prove socially impaired, this suggests that SB may cause as well as indicate poor welfare. It also suggests that techniques for reducing SB (such as environmental enrichment) might be practically effective tools for promoting more harmonious intra-specific relationships.

Language as the eyes of being

Taylor Sanderson*

Dept of Philosophy University of Guelph, Guelph, ON, Canada

This talk examines the role that language plays in the personhood of non-human beings. Also, how language changes one's relationship to these non-human beings. This will be done through examining common terminology built around beings throughout animal ethics. Ideas by Martin Heidegger (1889 – 1976) a German philosopher from his famous pieces *Being And Time* and *Letters On Humanism* are examined. Here Heidegger's idea of being is attributed to non-human beings rather than merely human beings and with this, how terminology imposed on these non-human beings affects the ways one is able to recognize and associate with the being under discussion. For this, common terminology such as "animal", "human", "meat", and "necessity" are examined. It discusses how a non-human being's relationship to humans in zoos, homes and the wild further affects one's access to terminology about non-human beings and therefore how one interacts with them. That it is through careful consideration about the terminology one imparts on these beings that the way people understand and associate with them can be changed. This piece therefore recommends that one takes a step back to re-evaluate the terminology on imposes towards non-human beings if one seeks to change how these beings are seen and interacted with.

Productive analysis of different housing systems for sows during gestation

Patrycia Sato, Iran José Oliveira da Silva*

Dept of Biosystems Engineering, University of Sao Paulo, Piracicaba, SP, Brazil

Currently one of the most controversial issues related to farm animal welfare is the housing of sows. As well as in many developing countries where animal production is an important economic activity, Brazil has been pressured to convert from individual stalls to group pens in order to provide better living conditions for these animals. However, no research on differences of investment or productivity between both systems was carried out to date, so most farmers are skeptical that this adaptation is economically viable. Thus, expecting that group housing presents better results, the objective of this case study is to compare two swine production systems with different gestation facilities. In System 1 (conventional housing in Brazil), gilts were inseminated in individual stalls, and after 42 days they were sent to pens (3,0 X 3,4 m), distributed in groups of four. Sows were only housed in individual stalls, from insemination until the end of gestation. There were approximately 2700 animals. System 2 consisted of group pens, each containing about 80 animals and one Electronic Sow Feeder (ESF) totaling approximately 1500 animals. From January 2011 to April 2014, monthly production data were registered during gestation (failure to conceive percentage, abortion rate) and farrowing (farrowing rate, total born per litter, liveborn per litter, mummified, stillborn, birth weight, weaned per sow per year, deaths at weaning, births per sow per year and weaning weight). If we achieve the expected results, this study will become scientific foundation to encourage Brazilian farmers to invest in housing conversion, promoting the welfare of sows.

Assessment of fear-related behaviour displayed by companion dogs (*Canis familiaris*) in response to social and non-social stimuli

Anastasia Stellato^{1*}, Tina Widowski¹, Lee Niel²

¹Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

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

Dogs that experience high levels of fear in response to everyday stimuli are likely to have reduced welfare, and are at a higher risk for the development of behaviour problems. To properly investigate the causes and consequences of canine fear it is important to correctly identify affected individuals. The aim of this particular study is to objectively assess which behaviours are associated with known fear-eliciting stimuli in dogs. Testing will take place at the Kitchener-Waterloo animal shelter and will involve 30 companion dogs. During testing, each dog will be exposed to both a masked approaching stranger and a noisy falling object. The stranger will suddenly appear from behind a building at a distance of 15 ft from the dog. The dog's responses will be recorded with the stranger's appearance, the dog approaching the stopped stranger, and when the human and dog interact. The noisy object involves dropping a garbage bag full of crumpled newspaper from 3-4 ft high, at a distance of 10 ft from the dog. The dog's responses will be recorded following the drop, and when the dog is encouraged to investigate the bag. Sessions will be video-recorded and the Noldus Observer XT program will be used to code behaviour. The dogs will be categorized as fearful if they show known fearful responses including retreat (escape/avoidance), and/or a reduced bodily posture (body and ears down, tail tucked). Other potential indicators of fear that have been discussed previously in the literature, such as freezing, lip licking, yawning, vocalizing, body shaking, and hiding, will also be assessed for validation. It is hypothesized that, following presentation of the fear-eliciting stimuli, behaviours that are associated with fear will be increased in dogs that are deemed fearful on retreat and reduced posture. Fear behaviours identified in this current study will inform the development of a draft canine fear assessment tool in order to ensure accurate owner identification of fear. Future studies will thus assess which of these behaviours owners are able to reliably detect for development of the final tool.

Species comparison of continuous behaviour assessment and thermal imaging of large felids with focus on thermal comfort, core body temperature detection, and zoo exhibit microclimatic design

Judith A. Stryker*, Jim Atkinson, Esther Finegan

Dept of Animal & Poultry Science, University of Guelph, Guelph, ON, Canada

Many species are kept in zoos located in climates that differ from their typical home range. No comparative behavioural repertoire or thermoregulation studies have been conducted with *Panthera* species to date and thermal comfort and welfare has been largely overlooked in zoo exhibit design. Thermoregulatory behaviour employed by all homeotherms can be used to investigate thermal neutral zone differences among species, which can inform exhibit design. Using descriptive statistics and a case study approach, daily maintenance and thermoregulatory behaviours will be investigated via continuous behaviour observation with infrared thermography images taken every 15 minutes in relation to measurements of ambient air temperature, relative humidity, wind speed and solar radiation also recorded in 15 minute intervals. Data has been collected at Lowry Park Zoo, Tampa, Florida where Malayan tigers (*Panthera tigris jacksoni*) and cougars, a subpopulation of *Puma concolor* isolated to southern Florida, are housed. In addition, work has been done at Toronto Zoo in Ontario, Canada where lions (*Panthera leo*), jaguars (*P. onca*), tigers (*P. tigris summatrae* and *P. tigris altaica*), cougars (*Puma concolor*) and snow leopards (*P. uncia*) have been studied. In addition, using the house cat as a model, thermographs compared to rectal temperature readings will be used to validate the use of infrared thermography for non-invasive, core temperature assessment. Some behavioural and thermoregulatory needs differences have been indicated which relate to habitat of origin. For example, Amur tigers and snow leopards pant at -5°C when compared to other species. Time budget assessments show potential gender differences and a potential influence of dominance hierarchy within groups and the willingness of subordinates to perform certain thermoregulatory behaviours which place an individual in a vulnerable position, i.e. loin exposure. Thus far, house cats seem to be a suitable model for validating thermography for core temperature assessment. This study has the potential to immediately impact the thermal welfare of the research subjects involved, and has the potential to provide a new diagnostic health tool for zoo veterinarians. There is an immediate need for the development of a non-invasive method of core body temperature in dangerous carnivores since this fundamental information is often lacking from routine health examinations.

Stockperson training and its effects on human behaviour towards dairy cows

Fernanda Victor R. Vieira, Iran José Oliveira da Silva*, Guilherme Amorim Franchi

Dept of Biosystems Engineering, University of Sao Paulo, Piracicaba, SP, Brazil

Animal welfare science is a growing discipline, however little is discussed about the human issue involved in this matter. It is known that for animals to reach a satisfactory welfare level, human issues should be addressed with the same importance in the rural environment. In this scenario, training is a key aspect because the employees are primarily responsible for the management and maintenance of animals' physical and psychological health. The aim of this research was to evaluate the effects of human capacity training, addressing animal welfare, on the employees' behaviour towards dairy cows. The research was conducted on ten dairy farms in the state of Sao Paulo (Brazil), and divided into three visits: the first and the last visit were used to assess human behaviour at different times of milking (input handling, positioning, liners coupling, and output handling). Two persons equally trained to observe different employees' behaviours at the parlor made the observations. Thereby these behaviours were ranked into two groups: 1) Positive behaviours towards cows (hand resting on the cow, petting the cow, talking to the cows, and executing slow and deliberate movement), and 2) Negative behaviours towards cows (slapping, hitting, tail twists, shouting, making loud noises, fast speed of movement, and executing unexpected movement). Training was conducted on the second visit with all farm's employees in the office of each respective farm. Regarding the training, one instructor, who was a PhD student focused on farm animal welfare, lectured briefly for about one hour to employees about physiology, behaviour, and dairy cattle welfare. In addition, they watched a video on how to handle farm animals properly. After descriptive analyses was done, there was a higher percentage of positive behaviour on the third visit, or the day after training compared to the previous day (66.3% and 59.9%, respectively), and there was a higher percentage of negative behaviour on the first visit, the day before the training, when compared with the day after (40.1% and 33.7%, respectively). In conclusion, the training seemed very positive in improving the human behaviour towards dairy cows at the parlor, meaning, it was observed more behaviours that are positive and less negative behaviours towards cows after the training. Although it was a short training, we realized the need to promote the view that stockpeople are professional animal handlers and they have responsibility on the productivity and animal welfare.

Disbudding and Dehorning Practices in Dairy Calves Among Ontario Bovine Veterinarians

Charlotte Winder*¹, Stephen LeBlanc¹, Derek Haley¹, Kerry Lissemore¹, Ann Godkin², Todd Duffield¹

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

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

The disbudding or dehorning (DD) of dairy calves is routine, as horned cattle may injure personnel or herd mates. Dairy producers commonly either perform DD themselves, or have this done by their veterinarian or veterinary technician. The Code of Practice for the Care and Handling of Dairy Cattle (2009) recommends disbudding occur before three weeks of age, and calves given a combination of sedative, local anaesthetic and analgesic. The veterinarian plays a key role in encouraging and training producers in the appropriate use of such medication. An online survey was conducted in the fall of 2014 to explore current DD practices by veterinarians in Ontario. Members of the Ontario Association of Bovine Practitioners (n=238) were invited to participate. Ninety-three veterinarians (39%) from 51 clinics (63%) responded, which was considered an acceptable response rate. Ninety-four percent of clinics performed DD for a mean of 29% (SD=20) of their dairy clients. Of veterinarians disbudding calves <4 weeks of age, 99% used local anesthetic, 56% used a sedative, and 50% used an NSAID. Of veterinarians disbudding calves 4-8 weeks of age, 99% used a local anaesthetic, 61% used a sedative, and 54% used an NSAID. Of veterinarians performing DD in calves >8 weeks of age, 97% used a local anaesthetic, 66% used a sedative, and 59% used an NSAID. Injectable meloxicam accounted for 89% of all NSAIDs. Common reasons for NSAID use were: pain control, known withdrawal time, and reasonable cost. Common reasons for the lack of NSAID use were: objections to cost, and client requests excluding cost. Of veterinarians practicing >10 years, 72% reported changing DD practices over this time period. Common changes included: use/increased use of an NSAID (60%), use/increased use of sedation (34%), and use/increased use of local anaesthetic (29%). Reasons for changes included: concern for the welfare of the calf, information from continuing education, and improved calf handling. Use of NSAID in this survey was higher than previously reported, as was the proportion of calves disbudded <4 weeks of age. This indicates a trend towards improved analgesia and adoption of best practices for welfare in the DD of dairy calves.

Could individual calf hutches be used for outdoor group-housing of dairy calves?

Lisa Wormsbecher*¹, Renée Bergeron¹, Derek Haley², Anne Marie de Passillé³,
Jeff Rushen³, Elsa Vasseur¹

¹Dept of Animal & Poultry Science, University of Guelph, Alfred, ON, Canada

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

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

Housing dairy calves in groups allows for natural social interactions which increase welfare. Calves are typically housed individually and occasionally in outside hutches all year round. Calves are usually tethered to the hutch or have a small outdoor space. To evaluate potentially using calf hutches in a novel group-housing method, we compared individually- and pair-housed calves in hutches and examined differences in growth rate, activity level, and competition of paired calves at feeding. Individual calves were given a hutch with outdoor area (6.87 m²); two hutches were placed together with shared outdoor area for paired calves (13.74 m²). Eighteen Holstein calves were purchased and arrived on the experimental farm in Ontario at the average age of 8 d (± 4). Calves were assigned to treatment (pair) or control (individual) and balanced for age and weight within pairs and across treatment and control. Over 7 weeks, calves had free-access to milk (maximum 16 L/day/calf), calf starter, water, and hay. Activity loggers were used to record daily lying time and calves were weighed each week to monitor growth. To evaluate competition in pairs and use of space for all calves, behavioural observations were completed 1 d/wk (7 non-consecutive h/d) and included calf location within pen, and for paired calves: teat displacements (competition between calves), cross sucking (sucking on conspecific), and social grooming (licking conspecific). Over 7 weeks of milk feeding the average feed conversion was 0.10 ± 0.005 kg weight gain/kg milk intake (mean \pm SE) for paired and individual calves showing no detrimental effect of pair housing. Social interactions by paired calves did not change across weeks (Wilcoxon signed rank tests; $P > 0.1$): 5.5 ± 1.62 % social grooming, 1.4 ± 0.84 % cross sucking, and 6.5 ± 3.60 % displacements at the nipple. Percentage of cross sucking is lower than that of social grooming, which is a beneficial social behaviour. Analysis for growth, resting time, and space usage data is ongoing. Feed and competition data are undergoing further analysis. A 6-week winter replicate is in progress to determine whether the housing method can be utilised in various climatic conditions.