

ISAE_{Benelux}

Proceedings of the ISAE Benelux conference 2024

5th December 2024

Epic Alpaca Farm, Hoogstraten, Belgium



About the International Society for Applied Ethology

ISAE provides a forum for the presentation and discussion of advances in applied animal behaviour science and education and inspires further innovations through an annual international scientific congress and regional meetings. *Applied Animal Behaviour Science* is the official journal of ISAE.

The study of applied animal behaviour contributes to a greater understanding of the interactions between humans and other animals and helps to create a better balance between animal welfare and the requirements that humans have of other animals.

ISAE members work on a wide variety of animal species and topics such as the management and welfare of livestock, the interactions between humans and companion animals, and the impacts of housing on the behaviour and welfare of zoo and laboratory animals.

ISAE provides a pool of independent experts for governments, international bodies, industry organisations, and NGOs.

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Regional secretaries



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Programme ISAE Benelux regional meeting 2024

Epic Alpaca Farm - Bredaseweg 32, 2322 Minderhout (Hoogstraten)

09h00 - 09h30 **Walk-in and registration**

09h30 - 09h40 **Welcome**

09h40 - 10h10 Keynote lecture. *Chair: Bas Rodenburg*

Applying learning theory when doing research on captive animals – training and other helpful procedures. *Christel Moons.*

Session 1

10h10 - 10h15 Information ISAE 2025 (Utrecht). *Bas Rodenburg*

10h15 - 10h50 Surprise activity. *Moderator: Saskia Kliphuis*

10h50 - 11h20 Coffee break

Session 2 - Husbandry methodology and animal welfare. *Chair: Hilde Vervaecke*

11h20 - 11h40 The effect of replacing cereals with former food products in pig diet on diet preference, clinical welfare indicators, behaviour and performance. *Fleur Veldkamp.*

11h40 - 12h00 Comparison of different methods for catching broiler chickens with regards to animal welfare, catchers' well-being, and economics. *Femke Delanglez.*

12h00 - 12h20 Post-work stress in Dogs Involved in Animal-Assisted Interventions: A Behavioural Study. *Leen Verbist.*

12h20 - 13h20 Lunch

13h20 - 15h20 Alpaca tour

15h20 - 15h35 Short coffee break

Session 3 - Focus on the animals. Chair: *Machteld van Dierendonck*

15h35 - 15h55 Calf Morbidity and Mortality in Ethiopian Smallholder Dairy Farms.
Yeshwas Ferede Alemu.

15h55 - 16h15 Scoring Tear Staining in Pigs: Similarity, Consistency, Accuracy, and Level of Experience. *Kenny van Langeveld.*

16h15 - 16h35 Horse Sense: Exploring Sniffing Patterns and Lateralization in Response to Predator and Neutral Scents. *Hilde Vervaecke.*

16h35 - 16h55 Closing

17h30 - 20h00 Dinner at Pizzahoek (Gelmelstraat 80, 2320 Hoogstraten)



KEYNOTE LECTURE

Applying learning theory when doing research on captive animals – training and other helpful procedures.

Moons, Christel^{1,}*

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See attached presentation.

SESSION 2 – HUSBANDRY METHODOLOGY AND ANIMAL WELFARE

The effect of replacing cereals with former food products in pig diet on diet preference, clinical welfare indicators, behaviour and performance.

Fleur Veldkamp^{1,2}, Herman Vermeer¹, Jamie Kater¹, Annemarie Rebel^{1,2,0}, Ingrid de Jong¹*

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Using former food products (FFPs) to replace cereals in pig diets can reduce the negative impact of pig production on the environment. This study aimed to partially substitute cereals with FFPs in sow and weaned piglet diets (44.9% and 33.5-36.0%, respectively) and determine piglet diet preference and effects on welfare, behaviour and performance. Therefore, a preference test, where pigs could choose between a circular (PC) or standard (PS) diet, and comparison test, in which pigs received either PC or PS, were conducted. Pigs were born from sows with a standard (SS) or circular (SC) diet and already received PC or PS in the farrowing pen (FPC or FPS). Pigs consumed more PC than PS in the first three weeks after weaning, regardless of sow or farrowing pen diet. Hardly any effects of sow or pig diet on welfare indicators were found. Behaviour was measured through manual measurements where effects of sow and pig diet were found on performed agonistic behaviour with pigs from SS sows and PS pigs performing more agonistic behaviour than pigs from SC sows and PC pigs. Next to manual measurements, sensor technologies (passive infrared detectors, tri-axial accelerometers and video algorithms) were used to measure behavioural aspects. Results are not yet known but further analysis will determine if behaviour differs between treatments. Average daily gain and average daily feed intake were higher for PC pigs but feed conversion ratio did not differ between treatments. To conclude, replacing cereals in pig diets with large amounts of FFPs may be used as viable strategy to enhance early feed intake without negative effects on welfare, behaviour and production performance which not only improves the circularity of pig husbandry practices but also offers a sustainable way to utilize food industry by-products.

Comparison of different methods for catching broiler chickens with regards to animal welfare, catchers' well-being, and economics.

Femke Delanglez^{1,6,}, Anneleen Watteyn¹, Bart Ampe¹, Veerle Segers², An Garmyn³, Evelyne Delezie¹, Nathalie Sleeckx⁴, Ine Kempen⁴, Niels Demaître⁴, Hilde Van Meirhaeghe⁵, Gunther Antonissen³, Frank A.M. Tuytens^{1,6}*

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The pre-slaughter phase (e.g. catching, crating, and loading) is a stressful and critical period preceding the transportation and slaughter of broiler chickens. This study compared two manual catching methods (inverted versus upright) and mechanical catching using a cost/benefit analysis focused on animal welfare, the ergonomics of the catchers, and economic aspects. In total, 15 commercial farms were investigated during catching, crating, and loading of approximately 5,000 broiler chickens per catching method per flock (upright vs. inverted vs. mechanical: n=3; upright vs. inverted: n=9; inverted vs. mechanical: n=3 flocks). On-farm measurements were conducted during depopulation to collect data on key economic (person-hours per 1,000 chickens), ergonomic (catcher survey), and animal welfare (wing flapping frequency, catcher bird-interaction) indicators. Additional animal welfare data (incidence of catch damage and dead-on-arrival prevalence) were gathered at the slaughterhouse. Furthermore, an expert assessed video recordings of simulated manual catching movements (e.g. inverted and upright) to collect additional ergonomic information. Concerning animal welfare, compared to inverted catching, upright catching led to a lower wing flapping frequency (2.0 ± 0.1 vs. 5.4 ± 0.1 , $P < 0.001$) and a more positive catcher-bird interaction (3.7 ± 0.2 vs. 4.4 ± 0.2 , $P < 0.01$), both on a 7-point Likert scale. The incidence of catch damage was lower for upright versus mechanical catching ($15.5 \pm 1.3\%$ vs. $17.7 \pm 1.4\%$, $P = 0.046$). In addition, more person-hours per 1,000 broiler chickens were needed for upright catching compared to inverted catching as well as mechanical catching (1.6 ± 0.1 h vs. 1.0 ± 0.1 h vs. 0.6 ± 0.3 h, $P < 0.001$). Furthermore, upright catching was 1.5 and 1.2 times more expensive than inverted and mechanical catching, respectively. This results in an increased cost of €0.012 (upright) and €0.006 (mechanical) per kg of live weight compared to inverted catching. Concerning ergonomics, manual catching was indicated as very demanding by the expert, and catchers didn't favor upright catching because they scored it as more labor-intensive than inverted catching. In conclusion, this study revealed some animal welfare advantages of upright compared to inverted and mechanical catching. On the other hand, mechanical catching is more beneficial according to the well-being of the catchers. Challenges to adopting upright catching to

the benefit of animal welfare include compensating additional labor costs, dealing with the negative opinion of catchers, and preventing longer loading times.

Post-work stress in Dogs Involved in Animal-Assisted Interventions: A Behavioural Study.

Ans Van Haute¹, Leen Verbist^{1,}*

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While the benefits of Animal-Assisted Interventions (AAI) for humans are well-documented, limited research has explored the impact of AAI on the welfare of the animals involved, particularly in relation to stress. This study examines whether dogs experience work-related stress during AAI and explores two stress-management approaches used by handlers: reactive (problem-solving) and proactive (preventive). Twenty dogs were observed for stress-related behaviours on both a rest day and a workday, with stress behaviours scored using a welfare assessment tool adapted from Fine et al. (2013). Dogs without stress indicators scored zero across all categories; minimal stress was identified if dogs scored 1 in no more than two categories, while higher stress was indicated by a score of 1 in more than two categories or a 2 in any category. Handlers were also interviewed about their methods for managing stress. Results showed that on rest days, 15 dogs exhibited no stress, while 5 displayed minimal stress. After a workday, all 13 dogs of handlers who used a reactive approach showed signs of stress, with 8 dogs displaying signs of high stress, such as withdrawal, avoidance of interaction, and anxiety-related behaviours (e.g., lip licking, yawning, restlessness, or showing “whale eyes”). In contrast, 6 out of 7 dogs with handlers who used a proactive approach to mitigate potential stressors showed no signs of stress after the workday, and 1 dog showed only minimal stress. Notably, all 4 dogs that worked across multiple settings (e.g., therapy sessions, education, and behavioural therapy for other dogs) displayed signs of high stress, with 2 showing signs of minimal stress even on rest days. This study highlights the potential effectiveness of proactive strategies for reducing stress in dogs involved in AAI and underscores the need for further research into animal welfare within therapeutic environments.

SESSION 3 – FOCUS ON THE ANIMALS

Calf Morbidity and Mortality in Ethiopian Smallholder Dairy Farms.

Yeshwas Ferede Alemu^{1,}, Wudu. T. Jemberu^{2,3}, Zeleke Mekuriaw², Frank Tuytens^{4,5}Reta Duguma Abdi⁶*

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Calf mortality and morbidity are important indicators of dairy cattle welfare. Although the Ethiopian government has initiatives for expanding the commercial and smallholder market oriented urban and peri-urban dairy production systems to meet the demands for dairy products, there have been only limited on-farm studies on the health and welfare status of commercial dairy breeds. Therefore, this study was carried out to explore and estimate the incidence of calf morbidity and mortality, identify and quantify causes and predictors of calf morbidity and mortality from birth to six months in urban and peri-urban dairy farms in North-western Ethiopia. The aim of this study was to quantify the incidence and identify predictors of calf morbidity and mortality from birth to 6 months of age in (peri-) urban dairy farms of Northwest Ethiopia. A total of 439 calves aged below 6 months from 174 dairy farms were included in the study. Kaplan Meir survival curve and Cox proportional hazard regression model were employed to summarize the cumulative survival and to identify and quantify predictors associated with time to morbidity and mortality. Among 439 calves enrolled and monitored for 6 months, a total of 141 morbidities and 54 mortality events were recorded. Overall morbidity and mortality incidence rates were 64 per 100-calf 6-months at risk (risk rate of 47.3%) and 19 per 100-calf 6-months at risk (risk rate of 17.9%), respectively. Diarrhoea was the most frequent calf health problem (25.2% risk rate) and primary cause of death (33.3%). Pneumonia was ranked second with a risk rate of 8.6% and was responsible for the death of 12.9% of all 54 calf deaths. Among 35 potential risk factors, calf age, vigor status at birth, calf breed, colostrum ingestion, and herd size were significant ($p < 0.05$) predictors of calf morbidity and mortality. In conclusion, the magnitude of calf morbidity and mortality was higher and above economically tolerable level (>5%) in the study areas. Besides, calf management practices of farmers were not up to the standard as 32% of respondents denied calves from taking colostrum on the erroneous belief that it causes calf diarrhea. This situation carries significant implications for both herd health and welfare in these areas. Therefore, educating farmers on improved calf health and welfare management practices could reduce calf morbidity and mortality in the study areas.

Scoring Tear Staining in Pigs: Similarity, Consistency, Accuracy, and Level of Experience.

van Langeveld, K.^{1,2}, Van Noten, N.¹, Vanden Hole, C.¹, van Staaveren N.^{4,5}, Vandekerckhove, Z.³, and Tuytens F.^{1,2}.

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Tear stains, porphyrin-based marks secreted by the Harderian gland, appear around the inner corner and below the pig's eye. Tear stains have been historically linked to atrophic rhinitis and poor barn conditions. Still, tear staining has recently been proposed as a potential welfare indicator in pigs, particularly related to (social) stressors. This study aimed to evaluate whether tear stains in pigs can be reliably and accurately scored by naïve raters.

An inter- and intra-observer reliability study was conducted with 18 raters of varying experience in pig welfare assessment. Participants scored the tear stains under the left and right eye of 38 pigs (26 unique pigs and 12 repeats; 76 scores in total) using a tagged Visual Analog Scale (tVAS, continuous 0-100 scale) from short videos. Videos were collected from the slaughter line before scalding/dehairing and preselected by three trained experts to provide a "silver standard". The final 38 videos had scores ranging from 1 to 55 for left-eye stains and 1 to 63 for right-eye stains. Data was analyzed on the left and right data sets separately. Reliability was assessed using intra class correlation coefficients (ICC) for inter- and intra-rater aspects. Accuracy was estimated by linear mixed-effect modeling. Lastly, the effect of familiarity with pig welfare and tVAS scoring, as well as time to complete the scoring, was evaluated for all three aspects.

Preliminary results are presented.

Inter-rater reliability (single-rating, absolute-measurement, two-way random effects ICC) was *poor to moderate* (Left ICC [95% CI]: 0.434 [0.304, 0.605]; Right ICC: 0.360 [0.241, 0.531]). *Whereas, intra-rater reliability* (two-way mixed effects ICC per rater) showed *moderate to good* reliability (Left average ICC: 0.754 [0.676, 0.832]; Right average ICC: 0.677 [0.595, 0.758]). Further exploration showed that greater familiarity, experience, or time spent on scoring was associated with potential higher inter- and intra-rater reliability for both.

Accuracy, assessed using mixed-effects modeling, showed *moderate to high agreement* with the Silver Standard (Left: $\beta=0.78 \pm 0.10$, $p<0.001$; Right: $\beta=0.60 \pm 0.09$, $p<0.001$). Familiarity with scoring welfare in pigs, tVAS experience, and scoring time did not have a significant effect on the model. Bias analysis (bias = Score – Silver standard score) showed that raters on average tended to overestimate scores (Left bias = 1.80 [SD = 16.44]; Right bias = 2.74 [SD = 17.78]), with overestimation for low scores and underestimation for high scores as seen in bias plots.

Tear stain scoring results show poor to moderate reliability and relatively good accuracy, with intra-rater reliability outperforming inter-rater reliability, indicating that raters scored more consistently with themselves than with others. This, together with biases in extreme values, suggests the need for more in-depth training of the raters to enhance its potential as a welfare indicator in pigs.

Horse Sense: Exploring Sniffing Patterns and Lateralization in Response to Predator and Neutral Scents.

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Olfactory stimuli can provide crucial fitness-related information in the lives of horses (*Equus caballus*). We hypothesized that horses would show increased interest in predator odours given their specific biological significance. Additionally, we explored differential nostril lateralization in response to odours with expected differences in emotional valence, aiming to better understand how horses experience the emotional quality of these stimuli. Thirteen horses were exposed to different olfactory stimuli, including neutral odours and predator scent (wolf). We quantified sniffing duration, sniffing frequency, behaviour, and lateralization. The odours were presented individually on odour carriers, placed in glass jars, one by one, in random order. A mixed linear model was used, with 'odour' as the fixed effect and 'horse' as the random effect. The results showed that horses distinguished between a predator scent and other odours. They sniffed the predator scent significantly more often and for longer durations, and demonstrated more frequent nostril shifts. However, no significant differences in other behavioural responses were observed across the various scents. Most horses initiated and completed more sniffing episodes with their right nostril across all odours, though more left-nostril final sniffs were observed for the predator odour. The study suggests that sniffing duration and frequency are valuable measures for assessing differential olfactory interest, with nostril shifts providing supplementary insight. However, results regarding nostril lateralization remain inconclusive, highlighting the sensory complexity of olfaction and the need for further validation of laterality as a proxy for emotional valence.

ATTENDEES

Aletta den Boer - My name is Aletta den Boer and I am a third year master student of Veterinary Medicine in Utrecht. At the university, I am working on my master thesis, about whether people can correctly interpret rabbit behaviour. At home, I live with my partner Jesse, our cat and our rabbit, for whom we're trying to find a new friend.

Bas Rodenburg - Professor in animal welfare, advocating to put the animal first in livestock husbandry. Keeps a small herd of Dutch Zwartbles sheep as a hobby.

Christel Moons - I am Associate Professor in Applied Ethology and Animal Welfare at Ghent University. My research focuses on behaviour and welfare of companion and research animals. At the moment, I am involved in research on social behaviour in cats (Morgane Van Belle) and sociability of dogs towards people (the latter is a collaboration with VIVES University of Applied Sciences).

Femke Delanglez - I'm Femke Delanglez and I'm a PhD student at Ghent University (Ethology and Animal Welfare Research Group, Department of Veterinary and Biosciences, Faculty of Veterinary Medicine, Ghent University), and ILVO (Flanders Research Institute for Agriculture, Fisheries and Food). I'm 27 years old and I live in Belgium. I have a Bachelor of Science in Bioscience Engineering Technology and a Master of Science in Bioscience Engineering Technology: Agriculture and Horticulture — Main Subject Plant and Animal Production. My PhD is about optimizing the selection, catching, crating, and loading of spent laying hens and broiler chickens.

Fleur Veldkamp - My name is Fleur Veldkamp. Currently in the last year of my PhD so busy with data analysis and writing manuscripts. My PhD focused on validating sensor technologies and applying them in feed studies with weaned piglets where we replaced cereals with former feed products and tested the effects on welfare, health, behavior, performance and pigs diet preference.

Frank Tuytens - An aging disillusioned animal welfare scientist who realizes that his research is not having the hoped-for impact on the welfare of farmed animals, and therefore increasingly uses his reputation and position as an expert scientist to denounce injustice against animals.

Heleen van de Weerd - Dr Heleen van de Weerd is owner and Director of Cerebrus Advies B.V., an Agri-food consultancy business who bridge the gap between scientific research and industry application. She is an internationally recognised expert on farm animal behaviour and welfare with more than 30 years' experience. Heleen engages with food businesses on farm animal welfare and works with corporate, government and NGO clients, applying animal-welfare knowledge.

Hilde Vervaecke - I am a biological anthropologist & behavioural biologist with broad interests - welfare in general, wildlife, detection dogs - and a soft spot for bison. I teach behavioural biology & animal welfare at Bachelors Agro- & Biotechnology in Odisee, Sint-Niklaas. Together with the students we do modest and fun research projects on welfare and behaviour.

Jon Day - Jon is the founder and co-owner of Cerebrus Associates (UK) and Cerebrus Advies BV (NL). His research interests include the regulation of feeding behaviour and developing methodologies and frameworks that offer insights into the behavioural nutrition of humans and

other animals. He currently works with food businesses to improve standards of farm animal welfare in their supply chains.

Kenny van Langeveld - I'm a 27-year-old PhD student working on the aWISH project since November 2022. I hold master's degrees in industrial engineering biotechnology, and aquaculture. In my PhD studies, I focus on assessing if an automated welfare monitoring and feedback tool promotes incentives for farmers, transporters, and slaughterhouses to enhance the welfare of pigs, and what the added benefits are in the E.U.

Leen Verbist - Lecturer in Agro-Biotechnology at Odisee University of Applied Sciences, with a specialization in animal welfare. Holding an MSc in Animal Welfare and Ethics, I focus on improving the care and understanding of animals, with a particular interest in horses.

Liesbeth Van Damme - I'm a post-doc currently working as a scientific researcher at the Flanders Research Institute for Agriculture, Fisheries and Food (ILVO). I have a PhD in rabbit welfare and behaviour and work on various other welfare topics, including laying hen housing and tailbiting in pigs.

Machteld van Dierendonck - I am an (equine) clinical ethologist and welfare assessment expert. I teach basic ethology, species specific ethology (key species for vet students and equine practitioners mainly in Europe), equine clinical ethology, basic welfare and welfare assessments. My research is concentrating on above subjects and pain assessment. I run the Equine behaviour clinic in Utrecht and in my own clinic.

Maëva Manet - Maëva did a PhD on laying hen welfare, and her thesis just got approved by the committee. The specific topic is the effects of the incubation environment and of hybrid on laying hen welfare, with a strong focus on the rearing phase. Alongside that, she is secretary of the ISAE Benelux region.

Monique Bestmand - I work as a researcher on applied farm animal welfare, mainly on commercial farms or a research farm. My topics include welfare aspects of free-ranges for laying hens and health of dairy cows on grass dominated feed ratios in the Dutch peat area.

Saskia Kliphuis - I'm a behavioural biologist with a drive to make an impact on animal welfare. Whether through research, teaching, policy or public engagement, I'm not yet sure. Perhaps all of the above? Defending my PhD on laying hen welfare next month!

Yeshwas Alemu - I am Yeshwas Ferede Alemu from Ethiopia. Currently working at Ghent University and ILVO as a visiting researcher.