15.30
Slow cooling is beneficial for storage of frozen-thawed equine spermatozoa
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Background: Recently, researchers have reported acceptable motility and pregnancy results with frozen-thawed semen that has been cooled-stored for up to 24 h opening new opportunities for the use of cryopreserved semen. Objectives: To compare two cooled-storage protocols for frozen-thawed semen. Study design: Motility and viability of frozen-thawed semen stored at 4°C for 8 h or 24 h were compared between two storage protocols. Methods: Two straws of frozen-thawed semen from 31 stallions were diluted and divided in 5 aliquots that were either examined immediately (T0), placed immediately after warming in a semen shipping box, resulting in fast cooling to 4°C, and stored for 8 h or 24 h (T8-CB and T24-CB); or placed first in a refrigerator (4°C), resulting in slower cooling, for 30 minutes and subsequently transferred to semen shipping box (T8-REF and T24-REF). Median total and progressive motility were evaluated after 5 minutes (T0, T8, T24) and 30 minutes (T0.5, T8.5, and T24.5) incubation at 37.5°C. Results: After 8 h cooled storage, total and progressive motility remained unchanged in all REF-aliquots. Progressive motility remained unchanged in T8-CB but was lower in T8.5-CB (−8.52%) and T8.5-CB (−9.96%) (p < 0.05). After 24 h, total and progressive motility were lower in all CB and REF aliquots. Viability was lower at 8 h in CB (−11.87%), REF (−6.65%), and at 24 h in CB (−13.52%), and REF (−12.32%) (p < 0.05). The results demonstrate that sperm motility and viability decrease during cooled storage of frozen-thawed semen but a slow cooling rate before transferring to a semen shipping box reduces the effect of short-term cooled storage (8 h). Limitations: Motility and viability are not directly related to fertility. Conclusions: A slower cooling rate to 4°C after thawing/warming the semen to 37.5°C has a beneficial influence on motility after 8 h of cooled storage of frozen-thawed semen. Ethical animal research: Research ethics committee oversight not currently required by this conference: material was collected during clinical procedures. Informative consent: Horse owners consented to excess samples being used for research. Competing interests: None declared. Sources of funding: None.

15.45
Disease occurrence and medication usage in pregnant Thoroughbred broodmares and factors associated with early-life developmental orthopaedic disease in their offspring
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Background: Estimates of disease occurrence and medication usage in pregnant Thoroughbred broodmares are currently lacking. Developmental orthopaedic disease (DOD) is a common cause of early-life morbidity and mortality in Thoroughbreds and may be associated with mare- and pregnancy-related factors. Objectives: (i) To describe disease and medication usage in pregnant Thoroughbred broodmares; (ii) To investigate associations between mare- and pregnancy-related factors and early-life DOD in foals. Study design: Prospective cohort. Methods: Details of veterinary interventions for DOD in the first 6 months of life were recorded on a Thoroughbred birth cohort. Dams’ signalment, breeding history, details of veterinary-attended episodes of disease or injury and medication usage during pregnancy were retrieved from veterinary records. Associations between mare- and pregnancy-related factors and DOD in offspring were assessed using multivariable logistic regression. Results: Records were available for 275 pregnancies in 235 mares on seven farms over two breeding seasons, during which 34% (n = 70/203, 95% confidence interval (CI) 28.4-41) of mares (with complete veterinary records) suffered at least one veterinary-attended episode of disease or injury and 47% (n = 95/203, 55%CI 40-54) received at least one medication. Of the resultant 272 live foals, 22% (n = 59/272, 95%CI 17-27) required veterinary intervention for DOD in the first 6 months of life. Odds of DOD decreased by 4% per day increase in gestation length between 314 and 381 days (odds ratio 0.96, 95%CI 0.93-0.99, p = 0.01). Limitations: Self-selection of participants may affect generalisability of findings. Use of only veterinary-attended episodes likely underestimates disease occurrence. Conclusions: Disease occurrence and medication usage during pregnancy in Thoroughbred broodmares are common and warrant further investigation. Longer gestation length appears to reduce the odds of early-life DOD, however further work is required to elucidate biological mechanisms behind this association. Ethical animal research: Approved by the Royal College’s Clinical Research Ethical Review Board (URN: 2018.1843). Informative consent: Informed consent was obtained for inclusion of animals. Competing interests: None declared. Sources of funding: The Racing Foundation, Horserace Betting Levy Board and the Royal Veterinary College’s Mellon Fund for Equine Research.

16.00
Aneuploidy as a cause of pregnancy loss throughout gestation and into the neonatal period
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Background: Aneuploidy is a cause of early pregnancy loss (EPL), however, whether this contributes to later pregnancy failure or neonatal death is not known. Objectives: To determine the prevalence of aneuploidy in EPL abortion, stillbirth, neonatal death, and control pregnancies and adult horses. Study design: Mixed, retrospective and prospective study. Methods: Genomic DNA from pregnancy losses, non-infectious neonatal deaths, clinically normal pregnancies and live adults were assessed using low or high density genotyping arrays. Results: Autosomal aneuploidy was detected in 4/18 EPLs (22.2%, 95% confidence interval (CI) 6.4-47.6%), 1/102 abortions (1.0%, 95%CI 0.0-5.3%), 1/23
stillbirths (4.2% 95%CI 0.1-21.1%), 0/17 neonatal deaths (0.0%, 97.5% CI 0.0-19.5%), 0/24 control placentae (0.0%, 97.5% CI 0.0-14.3%) and 0/553 adults (0.0% 97.5% CI 0.0-0.7%). Additionally, two cases of abortion had trisomy X. Aneuploidy types were trisomy 4 (2 EPL), trisomy 20 (2 EPL), partial trisomy 6 (1 abortion) and partial monosomy 3/partial trisomy 16 (1 stillbirth). The abortion was a 282 day pregnancy exhibiting hydrops amnion, ventricular septal defect, scoliosis and mild flexural limb deformity. The stillbirth individual exhibited bilateral renal cortical cysts with ectopic right kidney, mandibular brachycnonthia and moderate funisitis and amnionitis. 

Main limitations: There was a lack of cases in the early abortion (70-125 days) and neonatal periods therefore it cannot be ruled out that aneuploidy is a cause of loss during these stages of gestation. 

Conclusions: Aneuploidy is a significant source of pregnancy loss in the early pregnancy period. Cases of autosomal aneuploidy later in gestation are uncommon. Aneuploidy of the autosomes is lethal in most instances, with scarce cases observed in neonates or live adults.

Ethical animal research: Approved by the Royal Veterinary College’s Clinical Research Ethical Review Board, URN: 2017 1660-3. 

Informed consent: Informed owner consent was obtained for cases’ inclusion. 

Competing interests: None declared. Sources of funding: None.

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Background: Early-life locomotor activity during turn out may alter susceptibility to musculoskeletal disease and injury via modulation of tissue development during growth. 

Objectives: To investigate associations between turn out practices and musculoskeletal disease and injury in young Thoroughbreds on UK stud farms. 

Study design: Prospective cohort. 

Methods: Daily records were kept on location and duration of turn out for 134 Thoroughbred foals on six stud farms, from birth until leaving the farm or study exit. Data on veterinary-attended episodes of musculoskeletal disease or injury were collated concurrently.

Average daily turn out times (hours) and areas (acres) were calculated for rolling 7- and 30-day periods of age. Multivariable Cox regression, including farm as a random effect, was used to calculate for rolling 7- and 30-day periods of age. Multivariable Cox regression, including farm as a random effect, was used to collate simultaneously.

Thoroughbred foals on six stud farms, from birth until leaving the farm and area. No interactions between turn out time and area were identified. 

Main limitations: Non-random sample of participants may affect generalisability of findings. Use of only veterinary-attended events likely underestimates disease/injury rates. 

Conclusions: Results suggest disruptions or alterations to turn out routines increase injury risk and should be avoided where possible. Turn out in larger paddocks, particularly prior to weaning, may confer protection against subsequent musculoskeletal disease and injury. 

Ethical animal research: Approved by Royal Veterinary College’s Clinical Research Ethical Review Board (URN: 2018 1843). 

Informed consent: Informed consent was obtained for inclusion of animals. 

Competing interests: None declared. 

Sources of funding: The Racing Foundation, Horserace Betting Levy Board and the Royal Veterinary College’s Mellon Fund for Equine Research.

16.30 Effect of injectable altrenogest on endogenous progesterone in recipient mares

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Background: Altrenogest is commonly utilised for hormonal support of early pregnancy in mares including embryo recipients, with undefined effects. 

Objectives: To evaluate effects of altrenogest intramuscular injection (Altrenogest injection 50mg/ml, BOVA Specials) on endogenous progesterone production when administered to embryo recipient mares (RM). 

Study design: Retrospective analysis of clinical records. 

Methods: Thirty RM receiving 150 mg altrenogest from transfer, at 7-day intervals, through to approximately 42 days (ALT). Progesterone (P4) was assayed at 7-day intervals starting 7 days after transfer, as part of routine pregnancy monitoring were compared to 10 untreated RM (CON), where P4 was routinely assayed at 7-day intervals. 

Spare serum was frozen at –20°C and all samples re-assayed for P4 on the same ampliﬁed enzyme-linked immunoassay. Data analysed by total and P4 corrected by number of corpora lutea. 

Results: Mean (SD) P4 in ng/ml was not different between ALT & CON at all time points (p > 0.05). In ALT, P4 at 14 total P4, 8.91 (5.84) was higher than days 21, 5.72 (3.88, p = 0.02) and 28, 5.46 (3.87, p = 0.01). Day 42 P4, 8.30 (4.73) was higher than days 21 (p = 0.03) and 28 (p = 0.01). No differences were observed for CON (p > 0.05). Three pregnant ALT mares and no CON mares had total P4 of 3 ng/ml or less at 42 days. Three ALT mares with corrected P4 at day 14, 4.42 (1.17) decreased by day 42, 1.88 (0.54, p = 0.0273) remaining pregnant. 

Main limitations: 

Mare inclusion was not random; smaller numbers in ALT than CON and no matching. 

Conclusions: Support of early pregnancy with weekly injections of 150 mg altrenogest led to 10% treated mares having P4 concentrations less than 3 ng/ml which did not occur in CON. Care must therefore be taken when considering withdrawal of altrenogest supplementation. 

Ethical animal research: Research ethics committee oversight not required by this congress: retrospective data collection. 

Informed consent: Informed consent was gained from horse owners. 

Competing interests: None declared. Sources of funding: None.

16.45 Voorjaarsdagen Award Winner 2022

Development of a new survival prognosticator model for hospitalized neonatal foals in a European Warmblood population

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Background: Several models to predict survival of foals admitted to a NICU have been developed. However, all current models have been developed in American foal populations consisting of predominantly Thoroughbreds. European Warmbloods might therefore require a different model. 

Objectives: We aimed to develop a new survival prognosticator model based on a European foal population. 

Methods: 158 foals (149 sick; 9 healthy), <4 days old, admitted to Utrecht University (UU) Equine Hospital between 1 January 2018 and 31 December 2021 were included in the study. 

Approval: The protocol was approved by the Ethics Committee of the Utrecht University (protocol number: VMD202119). 

Results: Median age at admission was 0.9 days (IQR 0.1-1.7). Median body weight at admission was 20 kg (IQR 12.4-25.6). Median Glasgow coma score was 3 (IQR 1.5-3.5). Median of P4 on admission was 8.8 ng/ml (IQR 7.5-10.5). 

Conclusion: This study provides a new survival model for hospitalized neonatal foals in a European Warmblood population.
2020 were included. Data were retrieved from digital patient records. In total 39 variables (including details of history, clinical examination and clinical pathology) were selected for further analysis. A general boosted model and general linear model were built to determine which variables should be retained in a new UU survival prognosticator model. **Results:** Six variables were included in the final model: WBC count, anion gap, rectal temperature, heart rate, IgG and PCV. Subsequently, a UU foal survival score ranging from 0 to 7 points was developed. Survival chances were ≤40% with a score of ≤1 point; 2pt = 55%; 3pt = 75%; 4pt = 82%; 5pt = 86%; and ≥ 6pt = 100%. **Main limitations:** The model was developed in a single centre. **Conclusions:** The UU foal survival score differs from previously reported scores and is more suitable for a European foal population. **Ethical animal research:** Research ethics committee oversight not required: retrospective review of medical records. **Informed consent:** Not stated. **Competing interests:** None declared. **Sources of funding:** Not applicable.