ASPA 25th Congress

Monopoli (BARI – ITALY), June 13–16, 2023

Guest Editors

D'Alessandro Angela Gabriella, De Palo Pasquale, Maggiolino Aristide, Mele Marcello

Table of Contents

P262
Monitoring the behavior of purebred and crossbreed beef calves in a confined management system to improve their welfare

Alessandra Marzano, Maria Rita Mellino, Fabio Corredu, Anna Nudda and Giuseppe Pulina

SASSARI, Sassari, Italy

The goal of research in animal welfare is to find positive indicators of welfare through the study of species-specific behavior. A behavioral response can be described as the animal's answer to a challenge in its external and internal environment. The aim of this work was to monitor the behavior of purebred and crossbreed beef calves reared in the same optimal environmental conditions according to Classyfarm®.

Thirty beef calves were divided in 10 Limousine (LMS), 10 Bruno-Sarda (SRB) and 10 SRBxLMS crossbreed and by sex (5 males and 5 females for each genetic group) and confined in 6 pens of 45m² each. The general activities (resting, standing, position, walking, eating, drinking, and ruminating) and social behavior (displacement for food, water, and space, play fighting, self and allogrooming and stereotypes) in each pen were recorded by two observers for four months. Eating behavior was also observed by videocameras h24 addressed for each feeder. 'Concentrate' and 'Hay consumption', 'Competition for food', 'Resting', and 'Ruminating' were recorded as events, time of duration and frequency for each pen. The data were analyzed using procedure of SAS with repeated measurements by a general linear model with fixed effect of breeds, sex and time.

General activity records showed significant differences between genetic types: SRB calves showed lower percentage of animals for 'Sternal resting' ($p < 0.05$) and higher percentage of animals for 'Standing'($p < 0.01$) than other groups. Females showed higher percentage of animals for 'Ruminating', 'Central position' and 'Standing' than males ($p < 0.05$, $p < 0.01$ and $p < 0.05$). 'Self-grooming' and 'Allogrooming' were significantly higher in females than males ($p < 0.05$) and 'Play fighting' was higher in males than females ($p < 0.01$), because of normal behavior. No significant differences were observed between the genetic types for the parameters of feeding behavior. All the calves showed a higher frequency at the feeder in August than in the other months, linked to the increase in concentrate feeding events ($p < 0.01$). 'Competition for food' events at the feeder also increased in August ($p < 0.01$).

In conclusion, the optimal rearing conditions (Classyfarm®) have allowed the animals to adapt to the environment and to exhibit their own species-specific behavioral repertoire.

P305
Welfare assessment of horses on pasture: Catria breed as case study

Federica Raspa[a], Emanuela Valle[a], Alessandro Necci[b], Marta Paniccià[b], Lorenzo Bertocchi[b], Nicoletta D'Avino[b], Pasquale De Palo[c], Domenico Bergero[a], Clara Bordin[a], Martina Tarantola[a] and Claudio Forte[a]

[a]Department of Veterinary Sciences, University of Turin, Grugliasco, Italy
[b]Istituto Zooprofilattico Sperimentale dell'Umbria e delle Marche, Perugia, Italy
[c]Department of Veterinary Medicine, University of Bari, Bari, Italy

Welfare assessment involves the evaluation of a panel of welfare measures – resource-, management- and animal-based. Nowadays, there are no validated on-pasture welfare protocols for horses and – accordingly – there is the need to fill this gap as well as to support the official controls of veterinarians. The aim of the present study was to develop and test a welfare protocol for horses kept on pasture. The protocol was developed by a team of veterinarian expert in equine welfare (focus group) following the experience of the Italian National Reference Centre for Animal Welfare (CReNBA). The focus group selected 82 measures which were divided into 6 macro-areas named training, feeding, facilities, ABMs, biosecurity, and health management. Each measure had to be judged with a 3-point score – -1, inadequate; 0, adequate but improvable; +1, optimal. The welfare protocol was tested by one trained operator from June 2021 to August 2022 on 484 horses belonging to Catria breed – an Italian autochthonous breed – which were kept on 32 pastures of Monte Catria (central Apennines). A descriptive statistic was performed on each macro-area to evaluate the frequency (%) of scores for the selected welfare measures.

Here, the measures judged as inadequate to satisfy the welfare standard for horses are described. Considering the training macro-area, the worst scores were given to the daily number of inspections of the animals (55%) and the feeding management according to group composition (88%). This latter aspect was in line with the results obtained within the feeding macro-area in which it was shown an inadequate quality of the diet supplied (empirical for the 79%) in terms of both hay (70%) and feedstuffs (97%). Accordingly, the 52% of the body condition score (ABMs macro-area) resulted inadequate. The worst scores for facilities macro-area was related to the management and cleaning of the bedding of the partum area (91%). Moreover, the biosecurity measures resulted inadequate for the control of pests/wild animals (76%) and foreign visitors (82%). Major concerns for the health management macro-area resulted in vaccination programs (73%) and in the care of the dental board (61%).

The present study shows the usefulness of a specific welfare protocol to identify measures that need to be improved in field condition. Further researches are needed to validate the welfare protocol for horses kept on pasture as a tool to safeguard horse welfare.

P320

Effect of the season on oxidative response in the Mediterranean Buffalo

Roberto Steri, Vittoria Lucia Barile, David Meo Zilio, Emanuela Rossi, Maria Chiara La Mantia and Giovanna De Matteis

Centro di Ricerca Zootecnia e Acquacoltura, CREA, Monterotondo, Italy

Temperature is one of the most important ecological factors that directly affect livestock production. The Reactive Oxygen Metabolites derived compounds (d-ROMs) and the biological antioxidant potential (BAP) are simple and reliable tests for the measurement of reactive oxygen species (ROS) and the plasma biological antioxidant potential. These tests are considered suitable biomarkers for evaluating oxidative stress (OS). Bovine studies showed that elevated temperatures result in accelerated generation of ROS, causing an imbalance between ROS production and the ability of scavenging systems to detoxify and remove the reactive intermediates. Since such studies remain still limited in water buffalo, the effect of temperature on serum d-ROMs and BAP parameters was planned to assess the oxidative status in an Italian water buffalo population within the **Agridigit-PLF4Milk project**. In this study, only preliminary results on d-ROMs are presented. Blood samples (jugular) were collected 12 times in two years (2021–2022) from 40 buffaloes. One sample per month was taken from each head during hot season (July-September) and during cold/mild season (February-April). The amount of free oxygen radicals in serum samples was determined using d-ROMs test (Diacron, Italy) modified for a microplate procedure. The results are expressed in arbitrary Carratelli Units (UCARR), where 1U CARR is equivalent to the oxidizing power of $0.08 \, mg \, H_2O_2/dL$. Model included year, season, Temperature Humidity Index (THI), Body Condition Score (BCS) and individual rectal temperature. The minimum and maximum THI values recorded during the experimental phase were 29.6–74.5 and 54–85 for cold and hot season respectively in 2021 and 31.6–66.3 and 47.9–86.2 in 2022. The d-ROMs values ranged between 36.3 and 377 UCARR with a normal distribution (mean $=138.39 \pm 44.43$ U CARR). Statistical analysis showed that levels of d-ROMs were meaningfully affected by sampling year (159.67 *Vs.*118.45 UCARR, $p < 0.001$) and season (133.022 *Vs.* 145,09 in hot and cold/mild season respectively, $p < 0.05$). In our study,

buffaloes showed high levels of d-ROMs in cold season of year 2021 when the maximum values of THI, indicator of a heat load index, were recorded, compared to the same season of 2022. A more accurate assessment of OS will be obtained after the determination of BAP levels. Overall, this preliminary results provide, for the first time, insight into the ROS modulation in Italian water buffalo in field conditions.

P366

Influence of body lesion severity on oxidative status and gut microbiota of weaned pigs

Federico Correa[a], Diana Luise[a], Giorgia Palladino[b], Daniel Scicchitano[b], Patrizia Brigidi[c], Pier Luigi Martelli[b], Giulia Babbi[b], Silvia Turroni[b], Gilberto Litta[d], Marco Candela[b], Simone Rampelli[b] and Paolo Trevisi[a]

[a]*Department of Agro-Food Sciences and Technologies, University of Bologna, Bologna, Italy*
[b]*Department of Pharmacy and Biotechnology, University of Bologna, Bologna, Italy*
[c]*Department of Medical and Surgical Sciences, University of Bologna, Bologna, Italy*
[d]*DSM Nutritional Products/Animal Nutrition and Health, Kaiseraugst, Switzerland*

The objective of the study was to assess the physiological effects of body lesions caused by social stress in weaned pigs. On 45 tail-docked pigs, lesion score (LS) was assessed at 1 week (28 days of age, T1) and 7 weeks post-weaning, T2. Lesions were measured on pig skin, tail, ear, neck, middle trunk, and hindquarters, and scored on a scale of 0 to 2 in accordance with the guidelines provided by the Welfare Quality® (2009). At T1, pigs were categorized as High LS (H, $n = 15$) or Low LS (L, $n = 28$) when the LS was >1 in at least 2 of the locations considered. At T2, based on the previous observation, pigs were separated into 4 groups: High to Low LS (H-L, $n = 10$), High to High LS (H-H, $n = 5$), Low to Low LS (L-L, $n = 20$), and Low to High LS (L-H, $n = 8$). At T1 and T2, blood and stool samples were collected to quantify Biological Antioxidant Potential (BAP), Reactive Oxygen Metabolites (d-ROM), IgA, IgM and IgG and to characterize the faecal microbial profile. BAP was estimated using a FRAP assay and d-ROM where quantified using a d-ROMs test. IgA, IgM and IgG where quantified using an ELISA assay. When compared to the L group at T1, pigs of the H group exhibited a lower BAP ($p = 0.02$). At T2, the L-L group had a lower concentration of IgA compared to the H-H and L-H groups ($p = 0.02$ and $p = 0.04$, respectively), while the L-H group had a lower concentration of d-ROM than the H-H group ($p = 0.03$). At T1, microbial profile of H and L pigs was significantly different ($R^2 = 0.04$, $p < 0.01$) and L pigs were characterized by a higher abundance of Firmicutes,