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Guest Editors

**D'Alessandro Angela Gabriella, De Palo Pasquale, Maggiolino Aristide,
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P545**Does an insect-based feed formulation in laying hens affect the antioxidant potential and fatty acid profile of the eggs?**

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Since eggs are one of the main dietary lipid sources, lipid composition of eggs has become an area of current scientific interest. It has been shown that hens are able to deposit dietary lipids in to eggs yolk, so that is possible to modify the fatty acid composition of an eggs by modifying diet.

The aim of this study was to investigate the effect of dietary substitution of soybean meal with partially defatted meal of *H. illucens* on yolk fatty acid composition and oxidative status of eggs production.

The trial lasted 56 days and involved 108 laying hens (Lohmann Brown) 18-week-old. They were divided into 27 groups (4 hens each) and randomly assigned (nine replicates of four hens each) to one of the three experimental diets isoenergetic, iso-proteic and balanced for amino acids: the fraction of soybean meal was replaced by *Hermetia illucens* meal at 50% (T50%) or 100% (T100%) and at 0% in the Control group.

Eggs were sampled at week 1 (W1), 4 (W4), 8 (W8) and evaluated for fatty acid composition and antioxidant capacity.

Fatty acid analysis was carried out on yolk with a gas-chromatograph on FAME following an extraction with chloroform/methanol and the fatty acid methyl esterification.

Antioxidant capacity was measured on yolk and albumen ethanol extracts spectrophotometrically. Radical probes ABTS and DPPH were employed along with the FRAP method. Results were expressed as mmol of Trolox equivalent.

The antioxidant capacity of eggs showed no differences between treated and control groups

Kruskal–Wallis non-parametric test was applied to test for differences between controls and treatments. Significance is confirmed with p -value <0.05 . The test was performed after the verification of homoskedasticity (variance equality between

groups). A post hoc test with Dunnett's correction was then applied to highlight the differences in detail

The differences in the following 7 fatty acids were significant: C12:0 ($p = 0.005$); C14:0- ($p = 0.002$); C14:1 ($p = 0.002$); C15:0 ($p = 0.005$); C17:0 ($p = 0.005$); C17:1 ($p = 0.026$); C18:4n-3 ($p = 0.004$).

For the following parameters: C12:0; C17:0; C17:1; C18:4n-3 the differences were significant only between T100% and Control but not between T50% and Control. For parameters C14:0; C14:1 and C15:0 there were significant differences both between T100% and Control and between T50% and Control.

The integration of insect meal in the diet did not negatively impact on fatty acid composition.

P311**Evaluation of fiber digestibility in mares during the peripartum**

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Horses are herbivorous and hindgut fermenters adapted to eat a fiber-based diet. The adequate digestion of fiber in the hindgut is crucial to satisfy the energy requirements of the horse as well as to reduce particle retention in the intestine – which represents a risk of large colon impaction. Therefore, the aim of this study was to evaluate the fiber digestion (expressed as undigestible neutral detergent fiber content of feces, uNDF) in mares during the *peripartum* period. Eleven healthy Standardbred mares (565 ± 40 kg) were enrolled in the study, and they were monitored from the admission at the Veterinary Teaching Hospital of the University of Bologna (15 ± 6 d before parturition) until discharge (6 ± 2 d after parturition). The daily ration (3 meals) was based on meadow hay (2% of BW) and concentrates (1.6 kg *prepartum*, 2.6 kg *postpartum*). Feed intake (forage and concentrate) was daily recorded and feces were collected 3 d before parturition (T-3), just after parturition (T0), 3 d *postpartum* (T3), 6 d *postpartum* (T6). Feeds and feces were analyzed for chemical composition. Statistical analysis was assessed using a mixed model procedure (fix effect the time, random effect each mare). Results showed variation in fiber fractions in the *peripartum*. The uNDF content (%DM) was at T-3: 47.59 ± 2.4^{AB}, at T0: 46.93 ± 3.08^B, at T3: 49.35 ± 2.01^A, at T6: 49.22 ± 1.89^A, $p < 0.05$. The lowest digestibility was recorded on the day of parturition and increased in the following days (+3%). This result could be related to an increase in gut motility due to hormonal changes and parturition, characterized by uterine and abdominal contractions and increase

in catecholamines. After parturition, an increase in fiber digestibility was recorded, probably due to an enhancement of fermentation processes carried by the increase in requirements due to lactation. Moreover, the increase in concentrates in the *postpartum* did not have negative effects on fiber digestibility, confirming that the quantity of starch was adequate (<1 g/meal/day) and the feed quality was high. Indeed, an adequate proportion between rapid fermentable carbohydrates and fiber is well known and associated with an adequate rate of degradation. In conclusion, it could be speculated that fiber digestion in mares is not only related to the quality of the delivered feeds but is also driven by physiological status. Further studies must be done to elucidate the mechanisms that lead to this phase.

P319

Evaluation of objective measurement of coat colors in horses

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During domestication, thanks also to human selection, horses have developed different coat colors. Horse coat color are classified from dark to light as black, dark bay, bay, chestnut, gray and white. This phenotypic trait is often used for breed differentiation indeed horse studbook normally allowed specific coat colors only. Traditionally, evaluation of coat color is performed by trained judges, but this method is sensitive to human error. Nowadays, new technologies such as colorimeter are available to characterize horses coat color. Thanks to those tools we can detect accurately all the shades and the differences between colors. The aim of this study is to evaluate coat color detected with an objective measurement, in three different Italian horse breeds, Bardigiano, Murgese and Tolfetano. In Bardigiano and Tolfetano, all the colors from black to bay are allowed in the studbook, instead for Murgese, only black or roan horses can be included. A total of 272 horses were analyzed with a colorimeter (Minolta Chromameter Reflectance CR-300). Four anatomic areas have been tested with this device; neck, shoulder, stifle to detect the coat color, and lip to identify skin color. Outcomes were in L^* a^* and b^* format, where L^* describes lightness, a^* describes colour saturation from red to green, and b^* describes colour saturation from yellow to blue. From those values, hue $[\arctan(b^*/a^*)]$ that describes real colour, and chroma $(a^{*2}+b^{*2})^{0.5}$ that describes saturation, were obtained. A total of 6 different coat colours were detected by colorimeter in Bardigiano horse (4 shades of bay and 2 of black), 2 for Tolfetano (bay and black), and 2 for Murgese (black and roan). A high correlation between neck and shoulder ($r=0.70$) and between stifle and shoulder ($r=0.66$) was found. Principal

component analysis was carried on to detect whether breeds differ to each other, based on colorimeter data. From the PCA, the differentiation between Murgese and the other two breeds was clearly measurable, whereas the split between Bardigiano and Tolfetano was not clear. Innovative tools to determine accurately the coat color in horses is therefore essential, especially in cases where there are specific constraints for the registration of animals to the studbook.

P567

Evolution of colostrum characteristics in murgese mares during the first 48 hours after foaling

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The conservation and reintroduction of autochthonous livestock breeds has been increasingly recommended as an effective biodiversity conservation strategy. Over the centuries, they have contributed greatly to the shaping of most traditional Mediterranean landscapes, such as Murgese, the oldest surviving Italian horse breed. More recently, horse breeding has also gained importance for colostrum, with its characteristic properties and the possibilities of its use on a pharmaceutical, but also on a veterinary level. The colostrum of mares is characterised by a unique chemical composition: high percentage of dry matter (30%), a large amount of proteins (10% on average) and immunoglobulin. The foal should ingest the colostrum within the first hours after birth, as the absorption of macromolecules and immunoglobulins is highest in the first hours of its life. Therefore, the administration of colostrum to the foal is essential for its survival in all cases where the mother is unable to do so. In this study, the physicochemical composition and antioxidant activity of colostrum from Murgese mares were analyzed. Colostrum samples from 25 lactating mares were collected in the first 48 h after foaling in six different farms specialized in breeding Murgese horses in the Apulia region, Italy. The collections took place between February/2021 and April/2021. Colostrum samples were collected by manual milking after cleaning the udder and stored in previously sterilized plastic bottles (6–12–24–48 h after birth). The immunoglobulin content was measured with a refractometer at each sampling. The results showed that the values of most chemical parameters in colostrum were highest 6 h after foaling, especially fat, protein and brix content. In contrast, an increase in pH and lactose content was observed 48 h after birth. The