of the future sport horse. The metabolic profile of selected metabolites could be helpful in interpreting growth homeostasis and some of these could be used as indicators of energy balance state and liver health. Against this background, the literature on circulating indicators of homeostasis perturbation during the growth of foals is poor. We hypothesised that metabolites indicating the energy balance like non-esterified fatty acids (NEFA), β-hydroxy-butyric acid (BHBa) and liver enzyme like γ-glutamyl-transferase (γ-GT) [interpreted in the light of circulating total bilirubin (TBIL) and aspartate aminotransferase (AST)] may be used to monitor the growing foals from weaning to 18 months of age. For this purpose, a total of 12 Anglo-Arab (AA) foals from the same stable were enrolled in this trial. All foals were serially weighed on a digital scale and sampled for total blood at weaning, at 12- and 18-months of age. Feeding and rearing conditions were adopted simultaneously equal for all the foals used. All data were processed by a repeated measure ANOVA.

The foals involved appeared outwardly healthy and no signs of poor growth performance were pointed out as to body and size gain for the breed. However, the study of the metabolic profile gave rise to interesting patterns of parameters investigated. In fact, NEFA turned out to increase sharply in 12-months-old foals, when animals were sent to spring pasture, but BHBa displayed to increase when foals were aged 18 months and NEFA concomitantly decreased to reach similar levels to those found when foals were stabled during weaning. In addition, γ-GT and BHBa levels turned out to positively correlate ($p = 0.051$). While at 6- and 12-months, γ-GT dropped in the physiological reference range for the horse, at 18-months of age γ-GT levels exceeded the upper limit, when also BHBa tested to increase.

In conclusion, the liver enzyme increase could be associated with ketone bodies production for energy purposes when energy balance appears negative, following the drop of NEFA from body depots.

P095

Effect of fibre length, and amount on growth and behaviour of buffalo calves

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The objective of this study was to determine the effect of two different physical forms of forage, long and chopped, on the performance and feeding behaviour of young buffalo calves. Twenty-four Mediterranean buffalo calves were randomly assigned to 3 feeding treatments (2 males and 6 females/group). All the calves received daily 4 L of milk replacer (MR: 0.18 kg/L). From the 15th day of life, calves from Group LH received long hay (20 cm) and commercial pelleted starter *ad libitum*; calves from Group OS received only commercial pelleted starter *ad libitum* and calves from Group CH received chopped hay (3–4 cm) and commercial pelleted starter *ad libitum*. Food and water intake were recorded weekly while the calves were weighted twice a month. At weaning (91 days of age), 2 males of each group were slaughtered and the stomachs were removed and measured. Samples of feed were taken and analysed for chemical composition. The remaining calves were weighed again 85 days after weaning (173 days of age). Calves' behaviour was recorded in sessions of 1 min/animal, for 1 h/day (totally 3 min/day), 2 times per week during the last 2 weeks of pre-weaning. The total observation time per animal was of 12 min. Starter intake was higher in group OS ($p<.05$), whereas the hay intake was higher in group CH ($p<.05$) as compared with the other two groups. Body weight gain was not different between treatments at the weaning, whereas the weight of rumen, reticulum, omasum and abomasum was higher in group CH than in groups LH and OS ($p<.05$). Unexpectedly, 85 days after weaning the body weight of calves from Group CH was lower than the body weight of calves from Group OS ($p<.001$). Calves fed CH spent more time eating chopped hay ($p<.001$) and consequently ate less starter ($p<.05$) than the other two groups. Group CH spent and tended to spend less time performing non-nutritive oral behaviours than calves from Group LH ($p<.05$) and Group OS, respectively. Calves from Group OS spent more time standing than animals from Groups LH and CH ($p<.05$). In conclusion, the provision of chopped hay to young buffalo calves increased the stomach dimension and reduced non-nutritive oral behaviours as compared with offering long hay or only starter. On the other hand, calves from Group CH had a reduced growth as a possible consequence of the higher amount of time spent eating chopped hay than the starter. Conversely, the best growth performances were observed in Group OS where the calves only ate starter.

ANIMAL PRODUCTS

P096

Donkey cheese production using pure milk or in mixture with goat or cow milk: preliminary results

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Compared to conventional dairy species, the processing of donkey milk into cheese is very difficult due to its intrinsic chemical characteristics related to low contents in caseins and fat that

determine poor clotting activity, and only a few researches have been made on cheese production. The aim of this study was to examine some cheesemaking parameters of cheese elaborated via appropriate technology using donkey milk alone or fortified with goat or cow milk. Three cheesemaking sessions on different days were performed in mini-vat heated by thermostatic water bath using fresh milk. In each trial, donkey milk and two mixtures (70/30, v/v) of donkey and goat milk, and donkey and cow milk were processed. After cooling, calcium chloride was added in milk and commercial starter cultures were inoculated. When the milk, maintained in a thermostatic water bath, reached the pH 6.3, liquid microbial rennet was added. The milk was then allowed to coagulate, and the coagulation behaviour was monitored by observation of milk clotting. After gel formation, the curd was cut, the whey was drained, and the obtained curds were placed into cheese moulds. The weight of cheeses was assessed, and the yields were calculated. Cheesemaking parameters were affected by the kind of milk, as pure donkey milk or in mixtures. Compared with the two mixtures, pure donkey milk exhibited longer time for gel formation (20 min) and for total in-vat working (170 min), and showed a visive weaker gel, highlighting a specific behaviour during cheesemaking. The cheese yield was 7.2% for donkey milk, 10.2% for the mixture of donkey and goat milk, and 11.4% for the mixture of donkey and cow milk. On the basis of visive evaluation, the cheese from pure donkey milk showed a more soluble texture and grainy structure compared to the cheeses from the milk mixtures. This preliminary study may be useful for further studies and potential industrial applications for the development of innovative kind of cheeses.

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P097

Effect of two sous-vide cooking methods on fatty acid composition and oxidative stability of longissimus thoracis muscle from pigs receiving a diet containing or not extruded linseed

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To verify the effects of two different sous-vide cooking conditions on lipid oxidation and fatty acid (FA) composition of longissimus thoracis (LT) muscle, 24 pigs, evenly divided into two groups of 12 subjects each, were used. One group received a barley-soya bean meal diet (C) and the second was given the same feed where 5% of extruded linseed partly replaced barley, to obtain a n-3 FA enriched diet (L). At slaughter, from each left half carcase, two samples of LT muscle were collected, packed under vacuum and stored at −18 °C until analysis. The samples were cooked in water bath according to two different methods: at high temperature (80 °C) and short-time i.e. samples left until the core temperature reached 70 °C (A); at low temperature (60 °C) and long-time (15 h) (B). After cooking, the samples were refrigerated (2 °C) for 24 h. Oxidative stability was measured by a dosage of the 2-thiobarbituric acid reactive substances (TBARS) content, expressed as milligrams of malondialdehyde (MDA)/kg of meat, and FA composition was determined by capillary gas chromatography. The content of each fatty acid is expressed as a percentage of the total FAs detected. The statistical analysis was performed by means of ANOVA, using the GLM procedure of SAS. Dietary treatment (C vs. L) and cooking condition (A vs. B) were used as independent variables. The different sous-vide cooking conditions affected neither lipid oxidation nor FAs percentage of LT muscle. Extruded linseed feeding brought about an increase of the percentage of total n–3 FA (2.67 vs. 0.98; $p<.01$) and also of polyunsaturated fatty acids (12.02 vs. 9.68; $p<.01$) in intramuscular fat but did not affect lipid oxidation. This enabled to obtain pork with a more favourable n–6/n–3 ratio (3.68 vs. 10.42 in L and C group, respectively; $p<.01$), according to the global health guidelines. Thus, an enriched linseed diet ameliorates the FA composition of pork. The effect of the two different sous-vide cooking methods on lipid composition and oxidative stability of pork does not differ, irrespective of dietary treatments.

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P098

Dietary tomato pomace: effects on pork quality

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