O050

Spatio-temporal analysis of the Nrf2 activation in transgenic reporter mouse fed with high dosage of saturated or unsaturated fatty acids using *in vivo* bioluminescent imaging

Elena Mariani[1], Nicoletta Rizzi[2], Guido Invernizzi[1], Alessandro Agazzi[1], Adriana Maggi[2], Giovanni Savoini[1]

[1]*Dipartimento di Scienze Veterinarie per la Salute, la Produzione Animale e la Sicurezza Alimentare, University of Milano, Italy*

[2]*Dipartimento di Scienze Farmacologiche e Biomolecolari, University of Milano, Italy*

Contact: elena.mariani1@unimi.it

Nuclear factor-E2 related factor 2 (Nrf2) induces the transcription of genes coding for antioxidant enzymes by binding to the Antioxidant Response Element (ARE) to contrast oxidative stress in organisms. The aim of the study was to evaluate the activation of Nrf2 in transgenic reporter mice fed saturated or polyunsaturated fatty acids and the anti-inflammatory effect of estrogens on organism. Forty-eight ARE CRE OMO reporter mice were divided into 3 groups, consisting of 16 animals, based on presence/absence of estrogens (ovariectomized female, OVX; sham female, SH; male, MA). Each group was further split in 4 subgroups of 4 animals each and fed different diets (7.5% lard, 7.5% tuna oil, 20.0% lard and 20.0% tuna oil). All diets were isonitrogenous; low fat diets were mutually isocaloric, as well as high fat diets. Twice weekly animals were injected i.p. with 100μL luciferin 15 min before the imaging session (5 min., Charge Couple Device Camera, CCD) and kept under anaesthesia while performing ventral acquisition. Photon emission in selected body areas was measured using the Living Image Software. On day 70, experimental mice were subjected to a challenge with Sodium Arsenite and subsequently sacrificed. Specific organs (i.e. brain, muscle, heart, abdominal adipose tissue, urinary bladder, stomach, liver, lung, kidney, intestine, seminal vesicles, testis, spleen, bone, ovary and uterus) were dissected and immediately subjected to *ex vivo* imaging session. Data were analysed by MIXED and GLM procedures of SAS software and significant differences were declared for $p<.05$. The results showed that dietary treatments did not affect body weight and feed intake as well as Nrf2 expression in both pre- and post-challenge phases, excepting for the abdominal region ($p=.031$ pre-challenge); in this area, during the pre-challenge phase, OVX showed lower Nrf2 activation ($p<.001$). Ex vivo results outlined a significant effect of the challenge on all the considered organs ($p<.001$), while OVX subjects had higher Nrf2 expression on urinary bladder and kidney ($p<.05$) and high fat diet increased Nrf2 in urinary bladder ($p<.05$). Based on our findings, there is not any difference between addition of saturated or n-3 polyunsaturated fatty acids on oxidative stress. This study confirmed the protective role of estrogens under physiological condition.

O051

Circulating levels of nutrient-related and intermediate metabolites in healthy Anglo-Arab foals from weaning to 18 months of age

Maria G. Cappai[1], Maurizio Picciau[2], Maria G. A. Lunesu[1], Corrado Dimauro[1], Raffaele Cherchi[2], Walter Pinna[1]

[1]*Dipartimento di Agraria, University of Sassari, Italy*

[2]*Servizio di Ricerca per le Produzioni Equine e Riproduzione, Autonomous Region of Sardegna, Ozieri (SS), Italy*

Contact: mgcappai@uniss.it

A comparative trial was developed to assess the metabolic profile over growth stages of 12 Anglo-Arab foals, from weaning up to the age of 18 months. Two colts and 10 fillies were weaned at the age of six months and stabled in individual boxes: all animals were fed for one month (T_1) with a conventional diet based on concentrate (commercial pellet and oat grains, 50:50) and good-quality hay (oat, rye-grass, clover). All foals were then given access to a ryegrass pasture during the day and stabled at night with feed supplementation as in T_1 (adjusted to daily DM intake capacity) for five months (T_2) until yearling. During summer (T_3) the same protocol was followed. Blood sampling was carried once at each phase, at 8:00 a.m. in the morning between hay and concentrate administration. Laboratory analyses were carried out to check blood serum concentration of nutrient related and intermediate metabolites, with the determination of circulating enzyme concentration for organ function assessment and electrolytes. All analyses were carried out with an automated biochemical analyzer (Alcyon, Mindray BS 200). Variations in metabolite concentrations across growth stages were observed, except for serum protein (7.30 ± 0.62 g/dl) and total serum triglycerides (28.7 ± 5.20 mg/dl). Calcium to phosphorus ratio turned out to be constant throughout the trial (2.38 ± 0.04) but lower ($p<.001$) than own reference values for mature Anglo-Arabians. Blood serum urea showed to be constantly close to the upper limit of the physiological range for the horse (36.8 ± 5.51 mg/dl) [1]. Total serum cholesterol showed peaks ($p<.001$) at weaning (137 ± 28.6 mg/dl), to decrease at 18 months of age (84.8 ± 8.96 mg/dl). A similar trend was observed as to alkaline phosphatase (ALP) blood serum concentration, which differed between weanlings and 18 month-old foals ($p<.001$). Non-esterified fatty acids at 12 months (0.86 ± 0.42 mmol/dL) differed ($p<.001$) from values recorded at 6 and 18 months (0.17 ± 0.12 and