



ASPA 24th Congress Book of Abstract

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ASPA 24th Congress

Padova, September 21-24, 2021

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24th

Congress of the Animal Science and production Association

24° Congresso dell' Associazione per la Scienza e le Produzioni Animali

**Padova,
September 21-24, 2021**

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phenotypically similar, were investigated: Podenco Valenciano (PV), Podenco Ibicenco (PI), Podenco Canario (PC), Podenco Andalus (PA), Podenco Portugais (PP), Kelb tal-Fenek (KF), Egyptian Baladi dog (EG), and Cirneco dell'Etna (CI), with a total of 223 samples (ranged from 17 to 32 individuals per breed). The median-joining network defines four major haplogroups (Hg), with high prevalence of Hg A (55.2%) and B (40.8%). Four breeds (CI, KF, PI, and PC) showed only Hg A and B with almost homogeneous frequency. The other breeds (EG, PA, PP, and PV) showed the presence of Hg C with only one haplotype (Ht) per breed: EG and PP shared one Ht, while PA and PV both have unique Ht. EG was the only breed with Hg D, and only in one dog. Indeed, the principal component analysis showed the outlier position of EG breed. In order to verify possible genetic continuity since ancient times we compared our sequences to the ancient European dog mtDNAs and constructed the schematic phylogenetic tree encompassing modern (223 + one KF sequence from database) and ancient (56) mitogenomes. Even if ancient data showed an over-representation of Hg C and D, seven sequences fall in Hg A and one in Hg B and some Ht shared within ancient populations and extant dog breeds was also detected. Precisely, within Hg A one of EG sample shows identity with a sample from East France. Moreover, the Italian canid PIC-5 dated to the recent Bronze Age showed Ht identity with CI, PV and EG sequences. Finally, within Hg C, the shared clade was encompassed by EG, PV, PP, PA and eleven ancient sequences suggesting the conservation of ancient European mitotypes over several millennia in the Mediterranean native houndlike breeds. EG is the breed that shares more Ht and seems to be a stronger connection with the past mitogenomes.

SUSTAINABLE INTENSIFICATION

P031

Hemp cakes composition and ruminal degradability as influenced by the cold-pressing parameters

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The growing consumers interest in the oil has made available several hemp by-products for animal feeding. The main of them are the cakes resulting from mechanical extraction of oil which may contain remarkable levels of protein, but also varying amounts of fibre and fat in relation to both seeds' composition and extraction process. The aim of this study was to investigate

the influence of the pressure and the botanical variety on hemp cakes composition. Seeds from Futura75 and Uso31 cultivars with rather similar composition (respectively, in percent of dry matter, Crude protein, CP, 20.9 vs. 19.9, fat 23.6 vs. 23.3, NDF 48.8 vs. 49.6) were pressed in an experimental mechanical screw press powered by 2.2 kW electric motor and equipped with temperature sensors to control the oil extraction temperature. Each hemp variety was pressed at growing extraction pressures gained by fitting four different nozzle diameters on the screw press (14, 12, 8, 6 mm). For each pressure level, the seeds were pressed twice for a total of 16 cake samples which were analysed for chemical composition and in vitro digestibility of DM (IVDMD) and NDF (IVNDFD), determined based on a 48-h incubation in a Daisy II system. A two-way analysis of variance (proc GLM) was performed with variety ($n=2$), pressure ($n=4$), and their interaction as factors. Statistical significance was attained only between the extreme values of pressure (14 vs. 6 mm) and resulted in an increment of the concentration of NDF, ADF and lignin ($p < .05$) as an effect of the reduction of the fat content ($p < .05$). Despite the small differences between the whole seed compositions, the Uso31 and Futura75 cakes diverged for the CP, ADF ($p < .05$), NDF and lignin ($p < .001$), whereas no differences were observed for fat. It is self-evident that the pressure worked differently on the two varieties, though no significant interactions pressure*variety were highlighted. The IVDMD and IVNDFD were affected by both pressure and variety ($p < .001$) with the higher values observed for pressure at 14 mm and the variety Uso31. Overall, the nutritional characteristics of hemp cakes can be strongly influenced by the botanical variety even regardless of the chemical composition whereas they can be significantly modified only by more than doubling the pressure applied to seeds.

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P032

Feed insects for aquaculture: use of *Hermetia illucens* L. meal for *Sparus aurata* L.: chemical and microbiological characterization of the diets

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The use of the *Hermetia illucens* meal (HIM), as an ingredient in feed, represents a way to achieve more sustainable production

of food. Under the current regulation in Europe (2017/893), the use of HIM is permitted mainly within aquaculture. The aim was to characterize the chemical and microbiological composition of diets for *Spaurus aurata* L. containing HIM in partial substitution of fishmeal (FM).

Four diets containing increasing levels of HIM (HIM0, HIM25, HIM35 and HIM50) with 0%, 25%, 35% and 50% of FM replacement, corresponding to an inclusion level of 0, 7.9%, 11% and 15.7% of HIM, respectively, were analyzed. Experimental diets, formulated to meet the *Spaurus aurata* requirements, were iso-energetic (22 MJ/kg gross energy) and isoproteic (42.7 g/100 g, as fed). Fatty acids composition was determined by gas chromatography. Mineral content, including the potentially toxic ones, was assessed via ICP-MS. Microbial flora was characterized following the ISO test methods. Data were analyzed using a one-factor ANOVA of XLSTAT statistical package.

No significant difference for fatty acid profile, Atherogenic, Thrombogenic and Peroxidation indices was observed among the diets. The hypocholesterolemic:hypercholesterolaemic fatty acid ratio (H/H) showed the best significant ($p < .05$) values in the diets containing HIM. Twenty-six minerals were identified, nine of these showed significant differences among the diets (Hg, Na, Mg, Al, K, Ti, Mn, Zn, Sr). Hg content showed significant ($p < .05$) lower values (0.04 ppm) in the HIM35 and HIM50 than those observed in HIM0 and HIM25 (0.1 ppm) diets; however, the Hg values were below the limit value provided by the EU regulation (2015/186). The microbiological analysis showed good microbiological quality and no significant difference of each microbiological parameter was observed among the diets. The counts of the aerobic colonies were lower than 70 CFU/g, Enterobacteriaceae and coliforms charges were <10 CFU/g, while <100 CFU/g for yeasts and moulds. No *Salmonella* spp., *L. monocytogenes* and *Clostridium* spp. were detected.

The HIM inclusion did not affect the fatty acid composition and the microbiological quality and positively influenced the H/H ratio and lowered the Hg content of the diets. Analyzes on the effect of dietary HIM inclusion on *S. aurata* performance and quality traits are carrying out.

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NON-CONVENTIONAL LIVESTOCK SYSTEMS

P033

Mealworm (*Tenebrio molitor*) as alternative feed ingredient for poultry production

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The use of insects in broilers farming may be a suitable alternative to conventional feed ingredients, such as soybean meal and oil, due to their high nutritional value as protein and fat sources. Insects rearing requires limited spaces and a small amount of water and can be fed with by-products and former foodstuff, decreasing the environmental impact. *Tenebrio molitor* (TM) is one of the most promising insect species for feed production. This review analyses all data from literature concerning the use of mealworm in broilers diet as partial or total substitution of conventional protein and fat sources. Broilers growth performance, in vivo parameters (blood parameters, digestibility and gut parameters), carcass traits and meat quality are evaluated to confirm the TM suitability as a feed ingredient. The body weight gain is positively affected by the TM inclusion, while the overcomes of feed intake and feed conversion ratio reported both positive and negative effects related to TM inclusion. Carcass and blood traits are slightly affected by the dietary treatments, with results comparable with the control groups and within the normal physiological ranges. Moreover, TM meal shows a high nutrients digestibility for broilers, such as dry matter and ether extract. Some authors report low digestibility value for crude protein, maybe due to the chitin content, but this does not influence broilers growth performance. Low amount of TM meal inclusion enhances broilers gut microbiota, improving the relative abundance of Firmicutes and Bacteroidetes, their ratio and the amount of short chain fatty acids such as butyrate and propionate produced by bacteria. Differently, the dietary treatments do not affect the mucin amount and the intestinal morphology.

The use of TM meal does not alter the physical parameters of meat quality, while it affects the chemical ones, as the fatty acids (FA) profile of broilers meat. Instead, the results highlight a correlation between broilers meat saturated (SFA), mono and polyunsaturated fatty acids (MUFA and PUFA) with the FA composition of the feeds. TM meal (rich in palmitic, stearic, oleic, linoleic and linolenic acids) inclusion leads to a decrease of SFA and an increase of MUFA and/or PUFA in broilers meat, especially in the liver, improving its nutritional value.

To sum up, the use of TM meal seems to positively influence broilers health status and productive performance, confirming its potential role as feed ingredient.