Book of Abstracts of the 74th Annual Meeting of the European Federation of Animal Science

Book of abstracts No. 29 (2023)
Lyon, France
26 August – 1 September, 2023

Training during rearing: effect on body reserves' flexibility & long-term reproduction in rabbit doe

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Animals' flexibility to mobilize and recover body reserves increases with age or parities. As most breeds are selected for early productive criteria, training the body reserves flexibility of young breeds could improve their future reproduction and survival. This work evaluated the effect of a rearing training strategy for young rabbit does, based on 0 to 3 feed restriction schemes, on their body reserves flexibility and long-term reproduction. Each restriction was addressed to simulate the mobilization of reserves around parturition, 6 days of progressive reduction from *ad libitum* to zero and 3 days of progressive recovery until *ad libitum* feeding. At 63 days of age, 120 rabbit females were divided into 4 groups (30 each): A, fed *ad libitum*; 1R, fed *ad libitum* with one restriction scheme from 92 to 101 days of age; 2R, fed *ad libitum* with two restriction schemes from 70 to 79 and 114 to 123 days of age; 3R, fed *ad libitum* with three restriction schemes from 70 to 79, 92 to 101 and 114 to 123 days of age. Females were artificially inseminated (AI) at 137 days of age and at 11 days postpartum thereafter. Live weight (LW), perirenal fat thickness (PFT) and feed intake of females were controlled until the 2nd parturition. Alive and total litter size at birth was controlled until the 9th reproductive cycle. A few days before the first AI, does were challenged with isoproterenol to determine their lipolytic potential. Young rabbit does from the R groups showed clear losses of LW and PFT during the application of restriction schemes but recovered the A group values some weeks after refeeding. At first AI, R females had lower basal blood concentration of non-esterified fatty acids with respect to A females (on av. -13.9±4.5 uEq NEFA/l; P=0.002), but no differences were observed between groups in the increase of NEFA after challenge. There was a linear increase of total born and born alive during 9 reproductive cycles with the number of restrictions applied during rearing (+0.47±0.20 and +0.42±0.19 per restriction, respectively; P<0.05). The restrictions applied during rearing did not affect body reserves' flexibility but improved the prolificacy of the females.

Replacement of poultry by-product meal by black soldier fly larvae meal in diets for dogs

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The study evaluated the use of black soldier fly larvae (BSFL) meal in diets for dogs on digestibility, intestinal fermentation end-products and faecal microbiota. Two kibble iso-nutrient diets were developed using either poultry by-product (PBP) meal or BSFL meal as main protein. Eight beagle dogs were assigned in a cross-over design, with 2 treatments (diets) and 2 periods of 50 days each (with 7 days of wash-out between periods). In the first period, 4 dogs received either the PBP diet or the BSFL diet, while in the second period the diets were inverted. At day 15 of each period, dry matter, organic matter, crude protein and fat digestibility; and metabolizable energy (ME) were determined by total faeces collection method for 5 days. Volatile fatty acids and ammonia were analysed in fresh faecal samples collected on days 21 to 24 of each period. After each period (50 d) fresh faeces were collected for metagenomic analysis using bacterial 16s rRNA marker gene sequence. Nutrients digestibility was similar between the food treatments, except for fat digestibility and diet ME, which was higher when dogs were fed BSFL food (P=0.01). Faecal ammonia was lower (151 vs 94 mmol/g faeces) when dogs were fed BSFL in comparison to PBP (P=0.004). BSFL diet promoted changes in faecal microbiota, with a significant difference in beta diversity, with taxa dissimilarity by Unifrac (P=0.036). BSFL diet promoted a higher relative abundance of *Bacteroides* (P=0.040), responsible to contributes to intestinal permeability; and *Phocaeciola* (P=0.028), considered a biomarker of human health. On the other hand, BSFL reduced the abundance of *Lachnospira* (P=0.003), positively correlated with intestinal butyrate production, despite no diet differences found for volatile fatty acid in faeces. In conclusion, the use of BSFL meal in dog diet didn't affect the use of nutrients, but increased diet fat digestibility and ME; reduced faecal ammonia, and positively modified the faecal microbiome of dogs, favouring some beneficial bacteria genera.