

The effect of low protein diet on adipose tissue transcriptome in Krškopolje pig breed

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Krškopolje pig is the only autochthonous breed in Slovenia, characterized by a lower muscle growth and higher fat deposition potential. As the genetic regulation for fat deposition can be affected by different diet, the present study aimed to evaluate the effect of low protein (LP) diet on transcriptome of Krškopolje pig's (n=2×12) reared in the outdoor system. Animals received ad libitum standard (i.e. 15, 12.5 and 10% crude protein (CP) from 20 to 80 kg, from 80 to 100 kg and from 100 kg to slaughter, respectively) or LP (i.e. 15% CP from 20 to 60 kg and 10% CP from 60 kg to slaughter) diet. At the average body weight of 167±12.6 kg, animals were slaughtered and backfat samples were collected. After RNA extraction, samples were sequenced with Illumina NovaSeq generating 150 bp paired-end reads. The sequencing yielded app. 82.9 M paired-end reads, from which more than 95.1% of reads uniquely mapped to reference genome. Differential expression analysis revealed 65 genes, among them 28 being upregulated and 37 being downregulated in the LP group. The upregulated genes were mainly involved in lipid metabolism (FASN, ACACA, ACSS2, MOGAT2, ACSM5). This was supported also by functional enrichment analysis with the significant enrichment of fatty acid and acetyl-CoA biosynthetic processes (GO:0006633, GO:0006085). The results of the present study provide the first insight into genetic regulation of Krškopolje pigs fed with low protein diet. Acknowledgement: Slovenian Agency of Research (P4-0133, P4-0053, J4-3094, V4-2201), GERO NIMO (EU H2020 GA no. 101000236). Keywords: local breed, feed stress, backfat, RNA-seq

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Poster 1

The effects of mycotoxin alternariol on cell growth, division and cell cycle in porcine peripheral blood morphonuclear cells

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Alternariol (AOH), is an *Alternaria* mycotoxin known as a common natural contaminant of fruits, vegetables, and grain products. AOH can induce the formation of reactive oxygen species causing DNA double strand breaks and oxidative damage, effects associated with the reduction of cell proliferation and cell cycle arrest. In farm animals there are no studies about the effect of AOH in pigs, as the most susceptible specie to the mycotoxins effect due to the high intake of grains in the diet. The aim of our study was to evaluate in vitro the effects of five concentrations of AOH (1-100µg/ml) on peripheral blood morphonuclear cells (PBMCs) of healthy piglets. The cells were stimulated or not with a phorbol 12-myristate 13-acetate-ionomycin (PMAI) mixture in order to analyse the toxin effect on cell proliferation, apoptosis, necrosis and on cell cycle by flow cytometry. Our results show that, in both cases of stimulated and unstimulated PBMCs, a decreasing of cellular viability, directly proportional to the increase in the concentration of the toxin was observed. Regarding the cell cycle, in the case of stimulated cells, the AOH treatments did not cause a significant change compared to stimulated control, but AOH induces an arrest in the G2 phase of the cell cycle of unstimulated PMBCs, starting with the concentration of 10 µg/mL. Taken together, our results have shown that AOH was able to interfere with cell proliferation, apoptosis, necrosis and with cell cycle of unstimulated peripheral blood morphonuclear cells, with important consequences for animal health.