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Effects of selenium supplementation on the expression of genes encoding selected selenoproteins in longissimus dorsi muscle and liver of lambs

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Selenium (Se) is an essential dietary microelement with proved pro-health properties. Se modulates the expression level of genes with key importance in metabolic pathways connected with antioxidative processes and homeostasis. This study was conducted to verify influence of Se supplementation on the expression level of selected selenoproteins (GPX1, GPX2, GPX4, SEPP1, SEPM, SEPN1, SEPW1, SELO, SEP15, SEPHS2, TXNRD1, MSRB). 72 Polish Merino lambs divided in three groups (n=24): With mean daily Se intake of 0.159 ppm Se for group fed with basal diet (BD), 0.659 ppm for group fed with BD supplemented with 0.5ppm Se (Na₂SeO₄) and 0.090 ppm for group grazed on pasture. After 60 days of fattening lambs were slaughtered, liver and longissimus dorsi samples were harvested, frozen and stored at -80°C. Total RNA was isolated, reverse transcribed into cDNA and qPCR was performed. Compared with lambs fed BD those supplemented with 0.5 ppm Se had significantly higher ($P \leq 0.05$) relative expression level of GPX1, SEPP1, SEPN1, SEPW1, SELO, SEP15 and MSRB in the longissimus dorsi and GPX1, SEPW1, SEP15 and TXNRD1 in the liver. Lambs grazed on pasture compared with lambs fed with BD had significantly higher relative expression level of SEPP1, SEPN1, SEP15, SEPHS2 and MSRB in the longissimus dorsi and SEPW1 in the liver. SEPP1, GPX4, GPX1 and SEPW1 proved to have the higher expression in the muscle and SEPP1, GPX4, GPX1 and SEPM in the liver. Expression level of selected selenoproteins was significantly higher in the liver compared with the muscle.

Biography

Kamila Bujko has completed her Master's degree in 2014 from University of Wroclaw, Poland specializing in Medical Biotechnology. At the moment, she is carrying out her doctoral studies from Institute of Genetics and Animal Breeding in Jastrzebiec, Poland. Her research interests focus on the role of selenium supplementation in regulation of metabolic pathways and redox homeostasis in sheep.

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