

Effect of Xenobiotic Bioactive Compounds from Grape Waste on Inflammation and Oxidative Stress in Pigs

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Abstract : In the last decade bioactive compounds from grape waste are investigated as new therapeutic agents for the inhibition of carcinogenesis and other diseases. The objective of this study was to characterize several bioactive compounds (polyphenols and polyunsaturated fatty acids) of a dried grape pomace (GP) derived from a Romanian winery and further to evaluate their effect on inflammation and oxidative markers in liver of pig used as animal model. The total polyphenol concentration of pomace was 36.2g gallic acid equiv /100g. The pomace was rich in polyphenols from the flavonoids group, the main class being flavanols (epicatechins, catechin, epigallocatechin, procyanidins) and anthocyanins (Malvidin 3-O-glucoside). The highest concentration was recorded for epicatechin (51.96g/100g) and procyanidin dimer (22.79g/100g). A high concentration of total polyunsaturated fatty acids (PUFA) especially ω -6 fatty acids (59.82 g/100g fat) was found in grape pomace. 20 crossbred TOPIG hybrid fattening pigs were randomly assigned (n = 10) to two experimental treatments: a normal diet (control group) and a diet included 5% grape pomace (GP group) for 24 days. The GP diet lowered the gene expression and protein concentration of IL-1 β , IL-8, TNF- α and IFN- γ cytokines in liver suggesting an anti-inflammatory effect of GP diet. Concentration of hepatic TBARS also decreased, but the total antioxidant capacity (liver TEAC) and activity and gene expression of antioxidant enzymes (superoxide dismutase, catalase and glutathione peroxidase) did not differ between the GP and control diet. The results showed that GP diet exerted an anti-inflammatory effect, but the 5% dietary inclusion modulated only partially the oxidative stress.

Keywords : animal model, inflammation, grape waste, immune organs

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