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NRF2 OVEREXPRESSION AND REDUCED P65 EXPRESSION IN INTESTINAL MUCOSA OF PIGS EXPOSED TO BLACK GRAPE POMACE POWDER

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Grape and berry polyphenols have antioxidant effect through their ability to rapidly reduce reactive oxygen or nitrogen species (ROS/RNS), which are produced in high amounts during the inflammatory phase of chronic diseases. They also have protective effects against oxidative stress by inducing the activity of the enzyme glutathione S-transferase P1 (GSTP1) and the nuclear translocation of the transcription factor NF-erythroid 2-associated factor (Nrf2), which may actually be a more important antioxidant mechanism than direct ROS scavenging. Due to their well-known antioxidant effects and their high concentrations in many dietary components they have been increasingly studied for their effects on gut health. NRF2 is essential in the regulation of fundamental cellular, transcriptional and maturation events of cytokine storms. Thus, NRF2 is considered as a potential therapeutic target for various inflammation-related disorders.

The study was conducted on 20 male and female Pietrain pigs divided into 2 groups, control and experimental, reared from 120 to 180 days. The pigs in the experimental group received in their daily feed ration 1% polyphenol-rich black grape pomace powder. After slaughter at 180 days, samples were taken from the anterior third of the duodenum, jejunum, ileum, which were fixed with 4% buffered formalin, paraffin embedded, sectioned and stained with HE and immunohistochemically with Nrf2 and p65. Following IHC staining, increased expression of Nrf2 marker was found in the experimental group and reduced expression of p65. In the control group, p65 overexpression and Nrf2 reduction appeared. In conclusion, polyphenols in pomace powder from black grapes have a strong antioxidant effect activating the Nrf2 gene and reducing the proinflammatory activity of the p65 gene.

Keywords: antioxidants, grape pomace, intestinal mucosa, immunohistochemistry, pig.