EFFECT OF APPLE POMACE DIET ON BIOCHEMICAL AND ANTIOXIDANT PARAMETERS IN PLASMA OF LPS CHALLENGED WEANED PIGLETS

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Abstract

The valorization of agro-industrial by-products is increasingly recognized as a key strategy for advancing the circular economy and fostering more sustainable agri-food systems. Apple pomace, one of the main by-products generated by the fruit processing industry, contains substantial amounts of dietary fiber and bioactive compounds, particularly polyphenols, making it a promising ingredient for use in animal nutrition. This study aimed to evaluate the effects of dietary apple pomace inclusion on biochemical and antioxidant parameters in plasma of LPS (bacterial lipopolysaccharides) challenged weaned piglets. 26 weaned piglets (6-7 piglets/group) were assigned to four experimental groups: control, LPS-challenged, 5% apple pomace and LPS + 5% apple pomace. After 21 days, markers of the metabolism of proteins (total protein, albumin, bilirubin, creatinine, urea), lipids (cholesterol, triglycerides), sugars (glucose), mineral profile (phosphorus, calcium, magnesium, iron), liver enzymes (ALAT, ASAT, Alkaline Phosphatase and GammaGT), antioxidant enzyme activities (catalase- CAT, glutathione peroxidase- GPx, superoxide dismutase-SOD), total antioxidant capacity (TAC), and biomarkers of lipid oxidation (TBARS) were assessed in plasma of the animals. LPS challenge significantly increased cholesterol, triglycerides, glucose, albumin, bilirubin and creatinine in plasma of LPS challenged piglets group. The activities of hepatic enzymes ALAT, ASAT, Alkaline Phosphatase and GammaGT were increase by LPS challenge, as well as the lipid oxidation (TBARS), while antioxidant enzymes activity (catalase and superoxide dismutase) activities were significantly decreased. Administration of apple pomace in the diet has improved some plasma biochemical parameters as cholesterol, glucose, triglycerides, bilirubin, lipid oxidation, as well as the activities of hepatic enzymes ALAT and gamma GT, and the activities of antioxidant enzymes CAT and SOD. In conclusion, a diet containing 5% apple pomace can improve biochemical parameters and oxidative stress in weaned piglets exposed to bacterial lipopolysaccharide LPS. These findings highlight the potential of apple pomace as a functional feed ingredient with promising applications in animal nutrition.

Key words: *weaned piglets, oxidative stress, apple pomace, biochemical markers*