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DIETARY SUPPLEMENTATION WITH GRAPE SEED EXTRACT: EFFECTS ON GROWTH PERFORMANCE AND GUT RESPONSE OF BROILER CHICKENS

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In recent years, dietary additives coming from plants are becoming attractive for keeping and improving gut health in broiler chickens. To this purpose, tannins can be supplemented in diets due to their anti-microbial, anti-oxidant, and anti-inflammatory activities, but their effects can differ according to their origin. Thus, the present study evaluated the effects of a grape seeds extract (GSE) containing tannins on growth performance, and gut morphology and immune response of broiler chickens. A total of 800 chickens (half females and half males) were housed in collective pens (25 birds/pen, 8 pens/group) and fed a control diet (C) or the same diet added with 0.1% (diet GSE01) or 0.2% (diet GSE02) or 0.4% GSE (diet GSE04) from 0 (hatching) to 41 d of age (commercial slaughter). At 14 d and 28 d of age, 8 chickens per dietary treatment were slaughtered to sample jejunum mucosa. Serial sections were stained with hematoxylin/eosin for morphometric evaluation and with antibodies against intraepithelial CD3+ T-cells and CD45+ leukocytes to evaluate the anti-inflammatory activity. Data were submitted to ANOVA using a mixed model with diet as the main effect and pen (growth data) or animal (gut mucosa data) as a random effect. Final live weight averaged 3,179 kg, which corresponded to a daily growth rate of 76.1 g/d and a feed intake of 113 g/d, for a feed conversion ratio at 1.49, without any significant difference due to the dietary GSE supplementation or level. As for the GSE supplementation, villi height tended to decrease when chickens were fed diet GSE02 compared to those fed diets C, GSE01 and GSE04 (965 μm vs. 1,046 μm , 1,059 μm and 1,058 μm , respectively; $P=0.07$), the density of CD45+ increased (2497 vs. 1867, 2067, and 1858 cells/10,000 μm^2 ; $P<0.05$). As for slaughtering age, villi height (968 to 1096 μm ; $P<0.01$), goblet cells density (18.4 to 20.1 cells/300 μm ; $P<0.05$) and CD3+ (1,812 to 2,193 cells/10,000 μm^2 ; $P<0.05$) increased from 14 to 28 d of age. In conclusion, under the condition of the present study, GSE dietary supplementation did not affect chicken performance, but somewhat impaired gut mucosa status (as for reduced villi height) which was associated to a pro-inflammatory gut response (as for the higher density of inflammation cells) when using intermediate supplementation level (0.2%).