Antioxidant enzyme activity of rabbits fed dietary bovine colostrum supplementation

Valentina Serra [(1)] - Marta Castrica [(1)] - Stella Agradi [(1)] - Giulio Curone [(1)] - Roberta De Bellis [(2)] - Grazia Pastorelli [(1)]

Department of Veterinary Medicine and Animal Sciences, University of Milano, Lodi, Italy [(1)] - Department of Biomolecular Sciences, University of Urbino, Urbino, Italy [(2)]

Bovine colostrum (BC) has a high nutritional value due to its content of macronutrients, micronutrients, and bioactive compounds which confer it anti-microbial, anti-inflammatory and antioxidant properties. The use of BC is not confined on humans, but its supplementation as a nutraceutical for both production and companion animals of all ages has been documented.
Although the antioxidant properties of BC are currently known in various animal species, to the best of our knowledge studies on BC effect related to antioxidant status in rabbits have not been performed.
The aim of this study was to investigate the effect of dietary supplementation with two different concentrations (2.5% and 5.0%) of BC on antioxidant status and gene expression of antioxidant enzymes in liver and *Longissimus dorsi* (LD) muscle of rabbits.
New Zealand White rabbits (n = 39) were divided into three groups (n = 13) and fed until slaughter (91 days of age) with a commercial diet (CON group), CON supplemented with 2.5% (BC-2.5 group) and 5% of BC (BC-5 group). Blood was collected at slaughter from 10 animals/group (n = 30) to determine the activity of antioxidant enzymes Catalase (CAT), Glutathione peroxidase (GPx) and Superoxide dismutase (SOD); liver and LD muscle were collected from 10 animals/group (n = 60) for RNA extraction and subsequent antioxidant enzymes gene expression analysis through Real Time PCR.
Despite the increase in oxygen radical absorbance capacity (ORAC) values found in complete feed (CON: 113.00 ± 3.8; BC-2.5: 136.3 ± 4.5; BC-5: 150.70 ± 5.8 μmol TE/g), no significant differences in plasma CAT, GPx and SOD concentrations were found. Similarly, there were no changes in gene expression of CAT, GPx and SOD in tissues of rabbits after BC supplementation compared to CON ($p > 0.05$). A significant tissue-related effect has been observed in mRNA level of SOD and GPx, which were significantly higher in LD ($p = 0.022$) and liver ($p = 0.001$), respectively.
We speculated that the lack of alteration in the investigated parameters may reflect the total phenol content (TPC) found in the three experimental diets, which was equal between groups (3.85 ± 0.15, 4.09 ± 0.27 and 3.84 ± 0.08 mg GAE/mg in CON, BC-2.5 and BC-5 groups respectively). Due to limited literature on the topic, further research is needed to evaluate the potential practical application of BC in rabbit rearing.