

Effects of 25-hydroxycolecalciferol supplementation on the gene expression of feedlot cattle



T.E. Martins², T.S. Acedo¹; V. N. Gouvea¹; G.S.F.M. Vasconcellos¹; M.D.B. Arrigoni²; C.L. Martins²; D.D. Millen³; M.D. Pai²; A. Perdigão¹; G.F. Melo²; R.A. Rizzieri²; L.M. Rosolen²; C.F. Costa²; A.B.D. Sartor²



¹DSM Produtos Nutricionais Brasil S.A., São Paulo-SP, Brazil

²São Paulo State University – UNESP, Botucatu-SP, Brazil

³São Paulo State University – UNESP, Dracena-SP, Brazil

INTRODUCTION

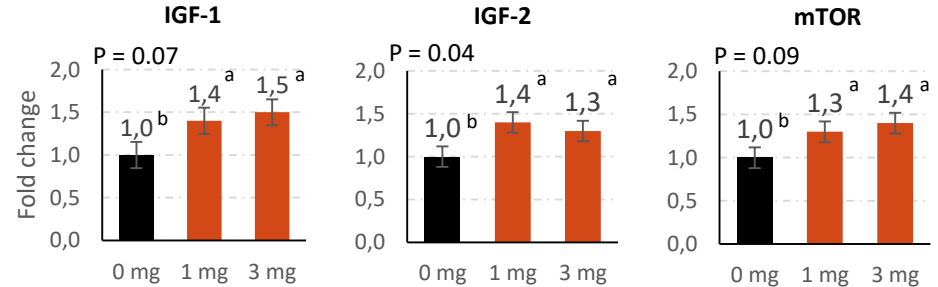
- 25-hydroxy-vitamin-D3 (HyD[®], DSM) is the first metabolite in the sequential transformation of vitamin D3 into active hormone 1,25-dihydroxycholecalciferol (Celi et al., 2018)
- In feedlot cattle, HyD[®] can increase carcass yield and production (Acedo et al., 2018), but the mode of action needs confirmation.
- Thus, the objective was to evaluate the effects of HyD[®] in expression of genes related to anabolism and catabolism of feedlot cattle.

MATERIAL & METHODS

- Complete randomized block design;
- 120 Nellore bulls (IBW 370±20 kg) distributed in 24 pens (5 animals/pen) to receive one treatment for 100 days: **T1**) control, no HyD; **T2**) 1 mg of HyD[®]/bull/day; **T3**) 3 mg of HyD[®]/bull/day;
- Longissimus dorsi samples were collected immediately after slaughter for quantitative evaluation of gene expression using RT-qPCR method.
- Genes: SOD1 (antioxidant marker), IGF1, IGF2 MTOR (anabolism), FOXO1, MURF1, Atrogin-1 and MSTN (catabolism);
- Statistical analysis was performed using PROC MIXED of SAS[®]. Pen was experimental unit (8 pens/treatment).

RESULTS

- Feeding HyD[®] increased IGF-2 and tended to increase IGF-1 and mTOR gene expression. These genes are related to protein synthesis, which may contribute to hypertrophy of muscular fibers and mass.
- HyD[®] also enhanced expression of MSTN, a gene that controls muscular growth and protein turnover.
- No statistical difference ($P>0.10$) was observed in gene expression of SOD1 (antioxidant marker) and on genes related do muscular catabolism (FOXO1, MURF1, Atrogin-1).



CONCLUSIONS

- HyD[®] supplementation increased expression of genes correlated to muscular growth and protein synthesis, being a viable technology for beef cattle finished in feedlot systems.

References: Acedo et al., 2018. Effect of 25-hydroxy-vitamin-D3 on feedlot cattle. J Anim Sci, 96 (suppl 3): 447-448; Celi et al., 2018. Safety evaluation of dietary levels of 25-hydroxyvitamin-D3 in growing calves. Food and Chemical Toxicology, 111: 641-649.