Use of a Bacillus licheniformis and its derived protease on subclinical necrotic enteritis in broilers

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To study the impact of dietary protein on ileal Clostridium perfringens and the intestinal barrier two diets were used, one with 22% crude protein (CP; basal diet) and 1.21% digestible lysine, and a second diet with 30% CP and 1.38% digestible lysine (High protein diet; HP). Each diet was tested with or without 0.05% of a Bacillus licheniformis and its derived protease (CIBENZA® EP150 : B+P) resulting in 4 groups in a 2x2 arrangement (9 replicates/8 birds each one for 28 days). All birds were orally gavaged with a coccidia vaccine (Advent®) at 3-times the dose on day 7th of the study. Ileal *Clostridium perfringens* counts were tested at 15d, serum α-1-acid glycoprotein (AGP) level at 22d and live performance at 28d.

The higher protein diet resulted in a reduced performance, measured as performance index. However, when *B. licheniformis* spores and its protease was added to the high protein diet birds increased growth which was similar to the normal protein diet (227.4, 246.1, 192.2 and 238.8 for Basal diet with and without B+P and for 30% CP diet (HP) with or without B+P , respectively (P>0.10). The ileal Clostridium perfringens counts for the 30% CP diet (HP) were increased in 2 log units compared to the normal protein diet (Basal; Figure 1; P<0.01) and although the addition of the protease to the normal protein diet had no impact on ileal Clostridium perfringens levels, it resulted in a 2 log reduction in Clostridium perfringens counts in the 30% CP diet. It also resulted in reductions of serum acute phase protein AGP levels (Figure 3; P<0.1) regardless of dietary protein level.

Minimizing the flow of digestible protein into the hindgut in the phase of cycling Eimeria will reduce Clostridium perfringens levels whether this is done with lower dietary protein or the addition of B+P to increase digestibility in the upper gastro intestinal tract. Furthermore, addition of B+P in this gut health challenge model improved intestinal barrier function. It can therefore be a helpful nutritional strategy to modulate intestinal inflammatory response and to promote an appropriate microbiota in the gastrointestinal tract of the chicken.

Figure 1: Ileal Clostridium perfringens counts

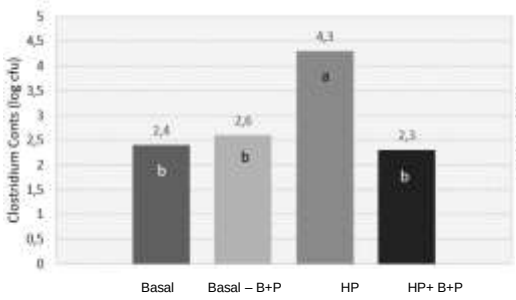
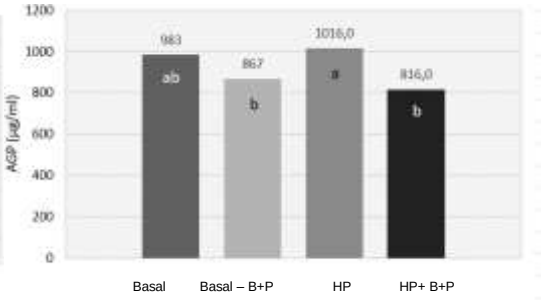


Figure 2: Concentration of α-1-acid glycoprotein (AGP) in serum



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