

# Physiological benefits of copper methionine hydroxy analogue chelate added to broiler diets measured against an antibiotic growth promotor

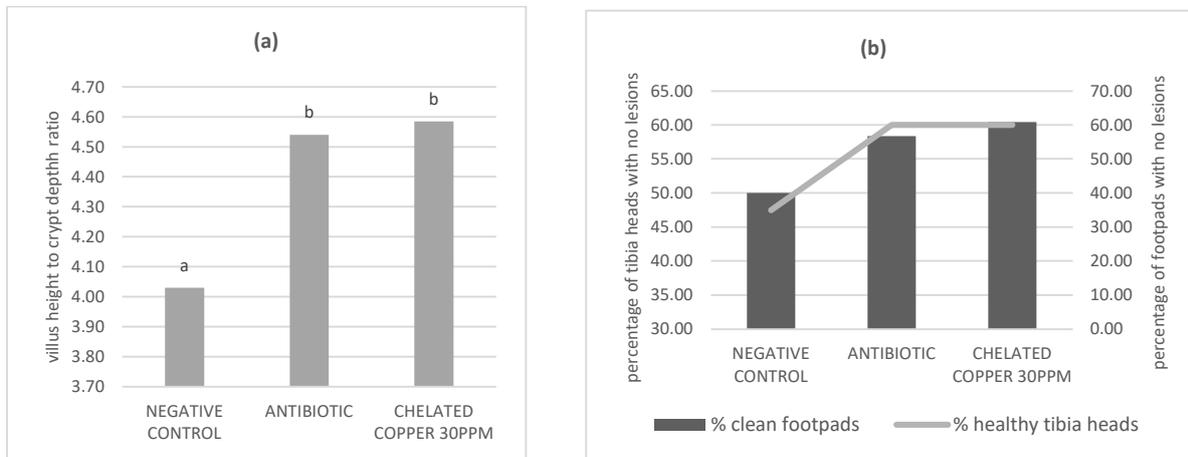
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The animal agriculture sector is reducing reliance on routine antimicrobial application. Whether through legislation, industry leadership or consumer preference, greater antimicrobial stewardship is being rapidly adopted. This study looked at the effect of a highly bio-available copper chelate on broiler birds when added to feed using antibiotic treated and non-treated birds as positive and negative controls. Previous studies showed that high doses of copper salts, used as a growth promotor, could be replaced by low levels of a chelated copper (Arbe and Bekker 2017). A total of 504 male Arbor Acres Plus broilers were randomly assigned to one of three treatments with 168 birds in each treatment in eight pens containing 21 birds each. These birds were fed for 35 days and then processed. Birds were housed on re-used litter. Diets were based on corn and soybean meal containing maximum 7% corn DDGS with 3.4% meat and bone meal. All diets were identical in composition except the copper methionine hydroxy analogue chelate (cuMHAC) treatment which was balanced for methionine content and contained no supplemental inorganic copper. Treatment one contained no antibiotic or other additive. Treatment two contained the antibiotic zinc bacitracin as positive control. Treatment three included copper in the form of cuMHAC at 30ppm. Treatment three, cuMHAC trended lower feed required to reach equivalent bodyweight to other treatments in the first 10 days of growth ( $P=0.14$ ). Performance by day 35 was equal across all treatments. No treatments had significant deviation from antibiotic control in flock uniformity, antibody titer response, intestinal bacterial enteritis score, carcass weight and dressing percentage, salmonella counts in litter or litter score in this study. Significant differences in intestinal architecture were found between negative control which had a lower villus to crypt ratio ( $P<0.01$  figure a) compared to treatments two and three. Foot pad lesions were least evident in the antibiotic treatment and cuMHAC treatments one and two ( $P=0.1$ ). Tibial head lesions were also higher for the negative control with treatments one and two displaying fewer lesions ( $P<0.08$  figure b).



**Figure 1, Villus height to crypt depth ratio (a) and incidences of foot ad dermatitis and tibia head lesions (b) among treatments.**

The hypothesis that copper may assist in supporting intestinal health in the absence of antibiotic growth promotor was supported by this study. No birds in this study were under any significant disease pressure as indicated by equivalent performance between treatments, however the carcass integrity markers showed that the absence of AGP's in this study resulted in untreated birds having greater footpad lesions and tibia head lesions. This failure in critical carcass integrity markers is further pronounced in situations where disease enters a broiler population. In situations where antibiotics are removed from broiler diets, copper MHAC may assist in supporting the native microflora (data not shown), improve villous architecture and absorption function.

## Reference

Arbe XU and Bekker MS (2017) *Proceedings, 28th Australian Poultry Science Symposium*. Page 186.