

**COMPARISON OF GROWTH PERFORMENCES,
MEAT QUALITY PARAMETERS AND NECROTIC
ENTERITIS EXPOSURE IN BROILER CHICKENS
FED PRBIOTICS COMPARED TO ANTIBIOTICS
AS GROWTH PROMOTERS**

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**ILLIPPANGAMA PATHIRANNAHELAGE ASHINSHANA
UMAYANGANI NAYANA KUMARI ILLIPPANGAMA**

**Department of Animal Science
Faculty of Animal Science and Export Agriculture
Uva Wellassa University**

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ABSTRACT

Antibiotics are used in poultry industry as a growth promoter since late 1940s. However, due to public health concern on antimicrobial resistance, they were banned in the European Union devastating the European broiler industry. It was revealed later, necrotic enteritis caused by *Clostridium perfringence* is the cause of the economic damage. Thus, it is necessary to identify alternatives to antibiotics to withdraw them from animal feeds. Therefore, a study was conducted to determine the effects of *Bacillus* species as a probiotic on growth performance, meat quality traits and necrotic enteritis exposure in broiler chickens. *C.perfringence* inhibitory *Bacillus* species were identified in an *in vitro* study. Identified probiotics were then tested *in vivo*. Experimental diets were based on maize and soybean meal. Five dietary treatments were prepared by supplementing: i.no growth promoters ii.*Bacillus licheniformis* isolated from healthy poultry ($>10^{10}$ CFU/g) iii.commercial probiotic preparation containing *Bacillus* species ($>10^{10}$ CFU/g), iv.a combination of *Bacillus licheniformis*, commercial probiotic, *Lactobacillus* spp. ($>10^8$ CFU/g) and *Saccharomyces* spp. (10^5 CFU/g) v.antibiotic (Zinc Bacitracin) into basal diet. The inclusion rate of growth promoters were 0.1g/kg of basal diet. In fourth treatment all four probiotics combined at equal level: each at 0.025/0.1g of the combination. Each treatment replicated 6 times with 14 birds in each replicate pen. A total of 420, one-day-old broiler chicks (Cobb 500) were randomly assigned to the experimental design. The data were analysed with ANOVA and the Tukey's mean separation. Results revealed that when compare to birds fed without growth promoters, those fed with growth promoters, had higher ($P>0.05$) weight gain. Antibiotic and commercial probiotic fed ones had similar growth and feed conversion ratio: 2kg and 1.5, while the negative control had 1.8kg and 1.6 respectively. Antibody levels against alpha toxin were higher when fed without growth promoters compare to growth promoters supplemented indicating a aggravated *C.perfringence* infection. A better mouth feel, juiciness, texture and overall acceptance was identified in breast meat of broiler chickens fed the combination of probiotics compared to the breast meat from all other birds. In conclusion, *Bacillus* species incorporated probiotics can be used as an alternative to antibiotic growth promoters to gain similar growth performances and to better quality breast meat.

Key words: Antibiotic, *Bacillus* species, Growth performance, Meat quality traits, Necrotic enteritis