

Effect of a precision biotic on the growth performance, welfare indicators, and environmental footprint in broiler chickens

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Introduction

Precision biotics (PB) are carbohydrates with glycosidic linkages and size distributions designed specifically for their ability to modulate microbiome pathways such as short-chain fatty acid production and amino acid metabolism. Such effects may improve energy utilization, reduce intestinal ammonia production, improve welfare, and consequently growth performance of animals and the sustainability of poultry production.

The objective of this study was to evaluate the effect of a precision biotic (PB) on the growth performance, welfare indicators, and environmental footprint in broiler chickens.

Material & Methods

- 1,560 Day-old Ross 308 broiler chickens were used.
- Completely randomized design: 2 treatments x 26 replicates/treatment, and 30 birds/replicate.
- Control or supplemented with PB at 500 ppm dry glycans (1.43 kg/MT).
- Feed was based on wheat and soybean meal with 1,000 FYT/kg of Phytase.
- Feed Intake (FI), body weight gain (BWG), and corrected feed conversion ratio (cFCR) evaluated on d 35.
- Litter characteristics, footpad lesion score, and gait score were evaluated at d 35.
- Environmental footprint was assessed by using Sustell™ which considers aspects of carbon footprint, including emissions, and measures, among others, eutrophication and climate change.
- The data were analyzed by using JMP (16.0).



Results

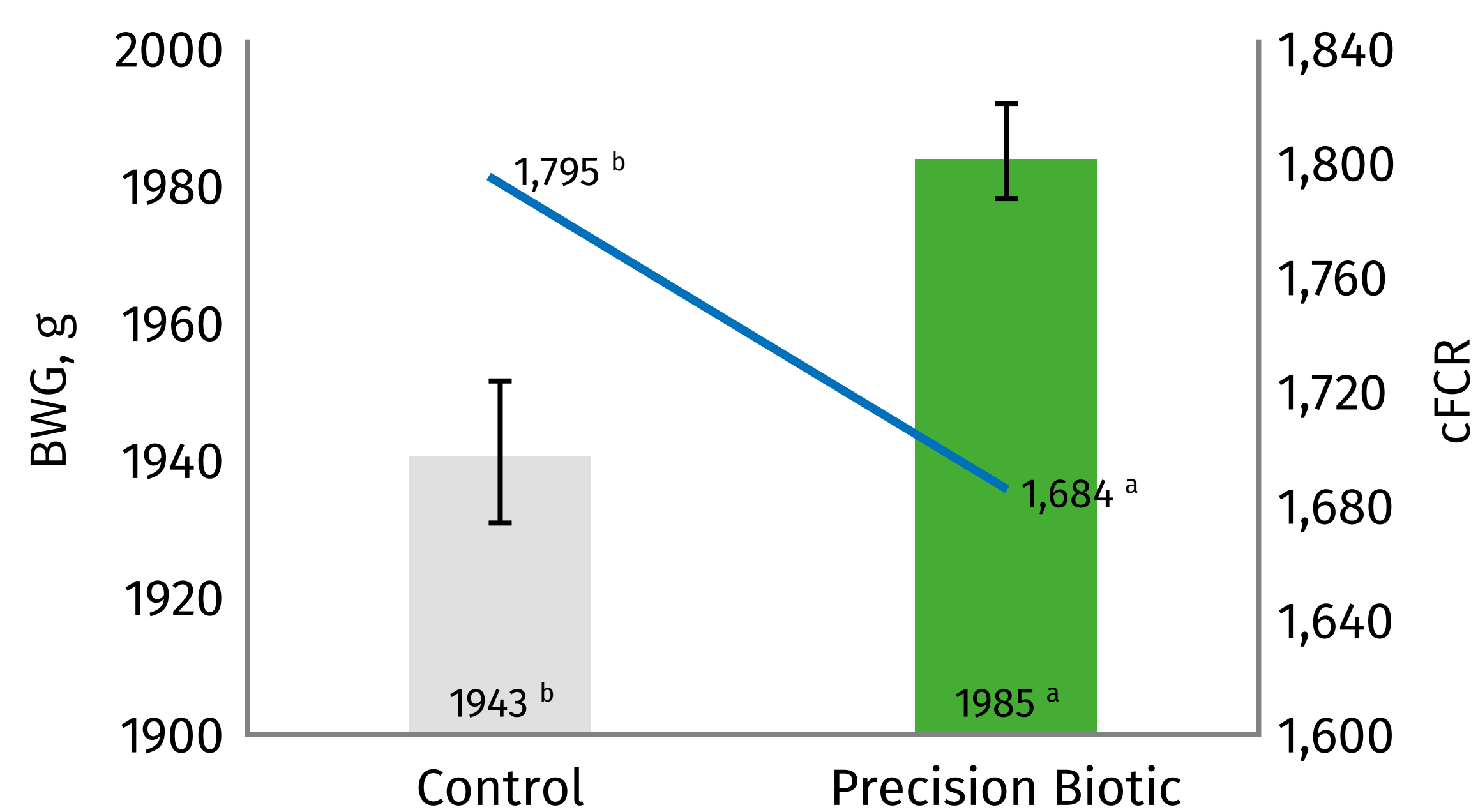


Fig. 1 BWG and cFCR from 1 to 35 d according to the experimental groups.

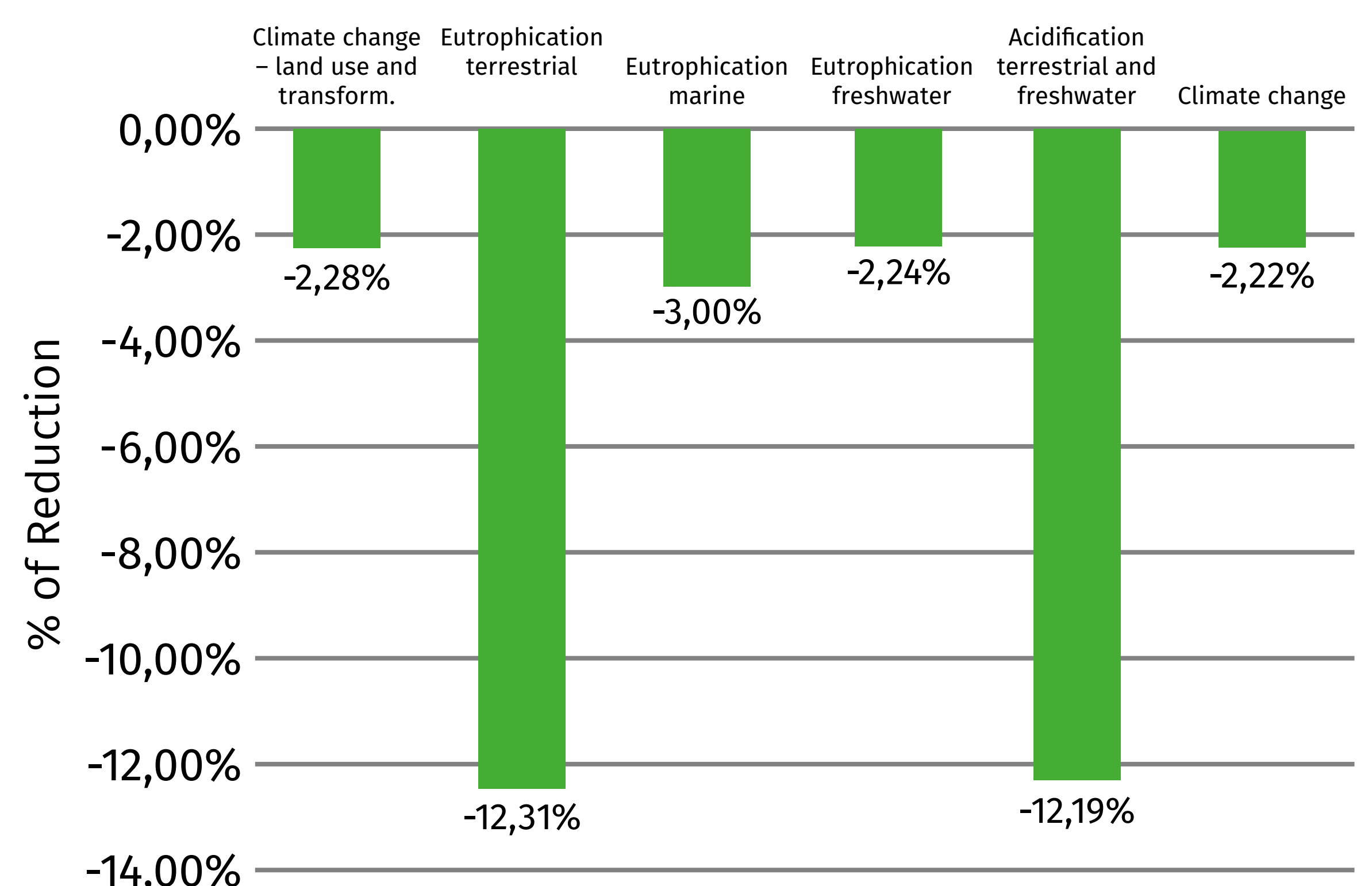


Fig. 2 Environmental footprint (% of reduction) per kg live weight of broilers supplemented with Precision Biotic vs control

- PB improved the final BWG by 2% ($P < 0.0001$), and cFCR by 6% from 1-35 d ($P < 0.0001$; Fig. 1). Ammonia concentration in the litter ($P = 0.002$), litter score ($P = 0.05$), Foot pad lesion score ($P = 0.001$) and gait score ($P = 0.03$) were reduced by 16, 11, 38 and 59%, respectively, in PB supplemented birds.
- The Sustell™ assessment showed that with the PB supplementation, the terrestrial eutrophication potential was reduced by 12.3%, and climate change by 2.2%, which corresponds to about 230 tons of CO₂ equivalent when considering a broiler operation that processes 1 million birds per day.

Summary and conclusions

- Overall, PB improved the growth performance of the birds, which may be explained by the improvement in litter characteristics and welfare indicators.
- Due to the performance improvements, PB led to significant reductions in the environmental footprint of broilers as measured by several indicators that can have a great impact in the overall sustainability of poultry production.