



Technical Article

*Assessment of Novel Water Applied Prebiotic (**GAMAXINE**®) to Evaluate Gut Barrier Failure and Performance in Two Commercial Trials in Brazil. A Pilot Study With an Economic Perspective*

Igor Praxedes-Campagnoni¹, **Bruno Vecchi**^{1,2}, **Emanuel Gumina**¹, **Xochitl Hernandez-Velasco**³, **Jeffrey W. Hall**^{2,4*} and **Sherry Layton**^{1,2,4*}

¹ Vetanco S.A., Villa Martelli, Argentina, ² BV Science, Lenexa, KS, United States, ³ Departamento de Medicina y Zootecnia de Aves, Facultad de Medicina Veterinaria y Zootecnia, Universidad Nacional Autonoma de Mexico, Ciudad de Mexico, Mexico, ⁴ Vetanco USA, Saint Paul, MN, United States.

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SUMMARY

The present study evaluated the effect of administration of a water applied prebiotic on gut barrier failure (Experiment 1) and performance in broiler chickens under commercial conditions (Experiment 2). Experiment 1, one thousand four hundred and forty day-of-hatch Ross broiler chickens were assigned to one of two experimental groups (n = 30 replicate pens/treatment; n = 24 chicks/pen). Birds in the treated group received the prebiotic orally in the drinking water (0.2ml/bird) on days 3 and 17 of age. The second group served as the untreated control group. On d 18, intestinal samples were analyzed by qRT-PCR to determine the expression of MUC2, IL-8, TGF- β 4, and ZO-1. On d 17, d 28, and d 35 blood samples were collected to determine circulating endotoxin levels. On d 28, mucosal intestinal scrapping was collected to measure relative total sIgA levels. At d 42, liver samples were collected to evaluate liver bacterial translocation. In Experiment 2, the prebiotic was evaluated in two commercial trials. Chickens were raised under normal production conditions and fed a 3-phase commercial basal diet with enramycin (7 g/ton). In Trial 1, 8,974,237 broiler chickens were treated with the prebiotic. The prebiotic was administered in the drinking water (0.2 mL/bird) following the manufacture label instructions at day three and seventeen of life. Production parameters were compared to historical information from the company over the same broiler operation and production cycles. For trial 2, 921,411 broiler chickens were treated with the prebiotic as in Trial 1. In Experiment 1, treated chickens showed a significant ($P < 0.05$) increase in mRNA expression of MUC2, TGF- β 4, IL-8, ZO-1, and sIgA, but a significant reduction of serum endotoxin levels and incidence of liver lactose positive bacterial translocation when compared to non-treated chickens. In both trials of Experiment 2, a significant reduction in total mortality was

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observed in the treated chickens when compared with the historical farm data. Economic analysis utilizing the total percent of mortality revealed a \$1: \$2.50 USD and \$1: \$4.17 USD return for Trial 1 and Trial 2, respectively. The results suggest that the prebiotic positively influences gastrointestinal integrity and performance.