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NOREL ANIMAL NUTRITION

Improved broiler performance with a combination of sodium butyrate protected and zinc bacitracin

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INTRODUCTION

Antibiotics are still used in many places outside the EU as growth promoters at subtherapeutic doses. Butyrate has demonstrated to be effective in improving zootechnical parameters in broiler chickens. Chamba, 2014 evaluated the effect of partially protected sodium butyrate (PSB) and colistin in broilers performance and intestinal villi. Chicks fed PSB in grower and finisher phases had higher weight gain ($p<0.05$) (2090 g vs. 2035 g and 1984 g) and better feed conversion ratio ($p<0.05$) (1.73 vs. 1.76 and 1.80) than colistin and control without additive. Jejunal villi of birds fed PSB and colistin at 42 days were higher than those in birds fed the control diet (957 µm, 957 µm vs. 836 µm). It is of interest to evaluate whether there is any synergy between those two growth promoters on animal performance and gut health

OBJECTIVE

The objective of the present study was to evaluate the effect of the addition of zinc bacitracin, sodium butyrate protected with palm fatty acids distillated (PFAD) sodium salt (GUSTOR N'RGY), or their combination, to a control diet without any additive, on broiler productive parameters and gut health

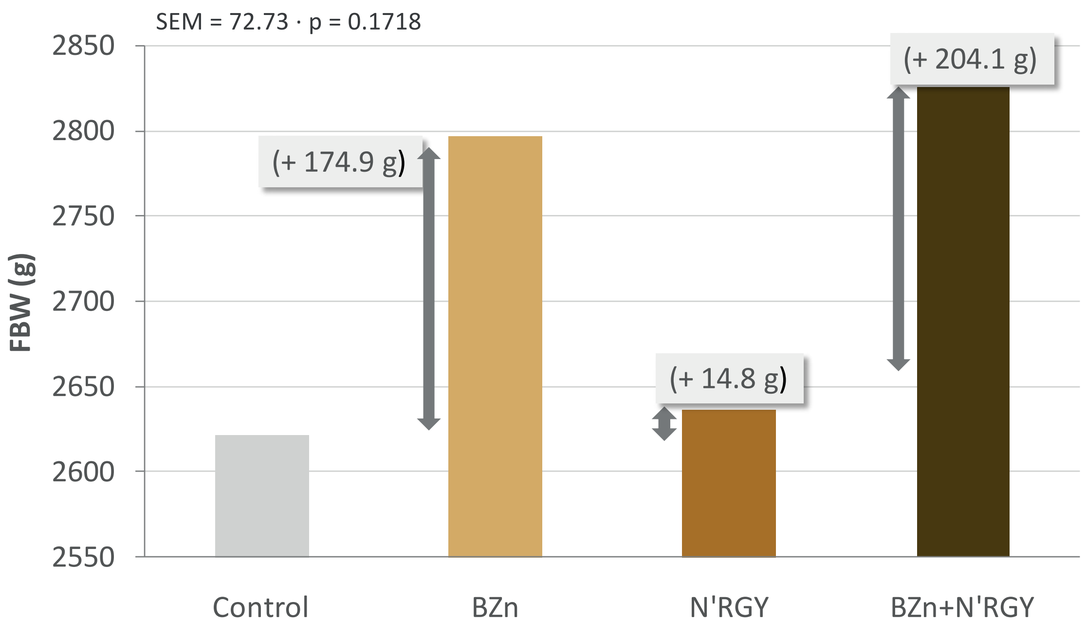
METHODOLOGY

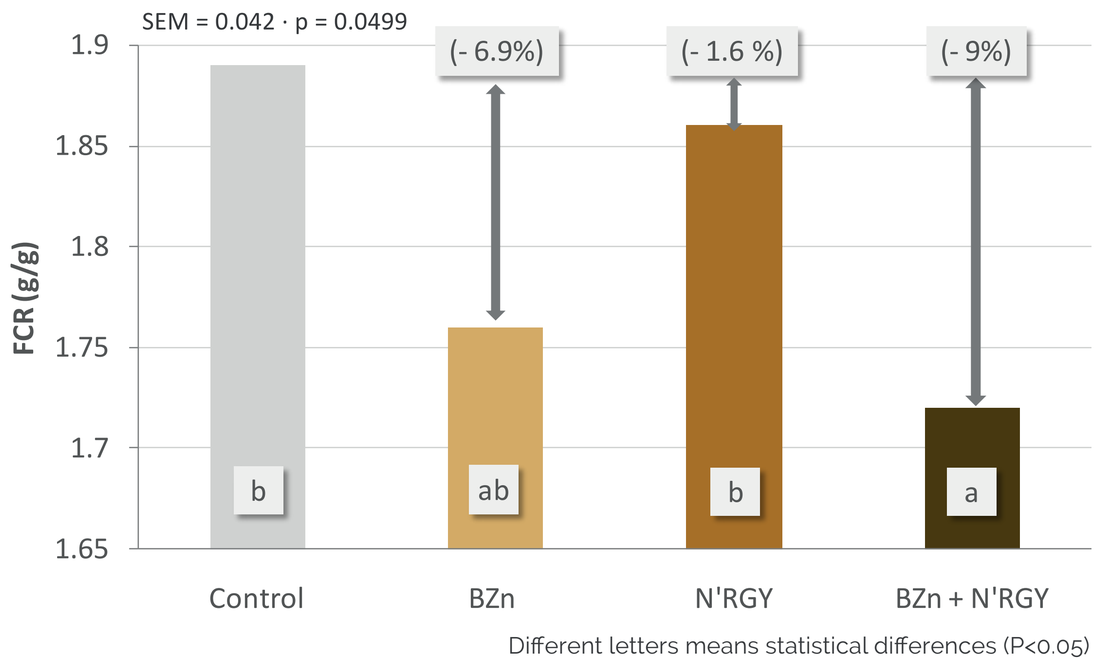
A total of 160 Cobb one day old chickens were randomly allocated to 4 treatments: Control (C), zinc bacitracin suplemented (BZn) 0.5 kg/t, sodium butyrate protected with PFAD sodium salt (N'RGY) 1 kg/t (0-21 d) and 0.5 kg/t (22-42 d), and BZn (0.5 kg/t) + N'RGY (1 kg/t (0-21 d) and 0.5 kg/t (22-42 d)). Every treatment was replicated 4 times and each replicate consisted of 10 chickens. Mash feeds and water were offered ad libitum. Body weight, average daily gain, daily feed intake and feed conversion ratio were recorded for the 0-42 days fattening period. At the end of each period (21 and 42 days) one chichen per replicate was euthanized and samples from de ileum and caecum were taken to analyze gut microflora. Besides, samples of duodenum, jejunum and ileum epitheliums were obtained in order to determine their development status. Data were analyzed by GLM of SPSS

RESULTS

The use of the combination of sodium butyrate protected with PFAD salt (GUSTOR N'RGY) and Zinc Bacitracin resulted in a statistical improvement in the FCR when compared to the control treatment. The final body weight was numerically higher for BZn but the animals that received the combination presented the highest FBW

Effects of dietary sodium butyrate protected with palm fatty acids salts and zinc bacitracin on performance of broilers





Different letters means statistical differences (P<0.05)

The use of butyrate (N'RGY) alone and in combination with BZn tended to reduce the count of *E. Coli* in ileum at 21 days (C=5.02x106 vs. N'RGY=4.63x105; p= 0.0932). Zinc bacitracin was also able to reduce the count of *E. Coli* but when evaluating the epithelium variables a thinner mucosa was observed both in jejunum and ileum at 42 days. This effect was not observed in the combination of BZn+N'RGY. Also the longest villi at ileum corresponded to the butyrate suplemented group (N'RGY)

Effects of dietary sodium butyrate protected with palm fatty acids salts and zinc bacitracin on histomorphology in jejunum and ileum of broilers

	Jejunum at 42 days		Ileum at 42 days	
	Mucosa thikness (µm)	Villi Lenght (µm)	Mucosa thikness (µm)	Villi Lenght (µm)
Control	760[ab]	546	670[b]	487[b]
BZn	683[b]	485	627[b]	464[b]
N'RGY	985[a]	717	922[a]	760[a]
BZn + N'RGY	959[ab]	753	809[ab]	589[ab]
SEM	83.3	78.8	60.4	57.1
p	***0.0813***	0.1057	**0.0182**	**0.0306**

CONCLUSIONS

It can be concluded that the use of the combination of Zinc Bacitracin (BZn) and sodium butyrate in protected form with PFAD sodium salt (N'RGY) is able to improve productive parameters in broiler chickens compared to the control treatment and numerically when compared to the antibiotic alone. Also, N'RGY is able to modify gut microflora and to improve GIT development

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