



BUTYRIC ACID SUPPLEMENTATION EXHIBITS POSITIVE IMPACT ON PRODUCTION PERFORMANCE OF BROILERS¹

Abstract

An experiment was conducted with male Cobb 500 broilers to determine the effect of feeding an encapsulated source of butyric acid (ButiPEARL™) in broiler diets from 1 to 42 d of age. Diets were corn-soybean meal based with 8% corn dried distillers grains with solubles. Treatments were replicated with 12 floor pens with 45 broilers per pen. The treatments were as follows: 1) Positive control (PC) diet formulated to provide adequate nutrition to meet the broiler requirements across all three feeding phases; 2) PC + 100 g/ton ButiPEARL (100 g/t); 3) PC + 200 g/ton ButiPEARL (200 g/t); and 4) PC + 300 g/ton ButiPEARL (300 g/t). All ButiPEARL inclusions were added “on top as a feed additive” for mixing prior to pelleting. Body weight gain and feed consumption were not significantly different ($P > 0.05$) across treatments at 21 d of age, but all three levels of ButiPEARL addition (100, 200, or 300 g/t) elicited an improved feed conversion response compared with the PC ($P < 0.05$). At 35 d of age, BW gain was increased ($P < 0.05$) for broilers fed 300 g/t compared with broilers fed the PC. Body weight gain for broilers fed 100 or 200 g/t were not significantly different ($P > 0.05$) from broilers fed the PC or 300 g/t. At 35 d of age, broilers fed 200 or 300 g/t had improved feed conversion response ($P < 0.05$) compared with broilers fed the PC or 100 g/t; furthermore, broilers fed 100 g/t had improved feed conversion compared with broilers fed the PC. At 42 d of age, BW gain was significantly increased ($P < 0.05$) for broilers fed 300 g/t compared with broilers fed either PC or 100 g/t. Body weight gain for broilers fed 200 g/t were not significantly different ($P > 0.05$) from broilers fed the PC, 100 g/t, or 300 g/t. At 42 d of age, feed conversion results were the same as those noted for 35 d data across all treatments. Based on the results of this experiment, butyric acid added to poultry diets in the form of ButiPEARL had a positive effect on performance. The recommended inclusion level for ButiPEARL in broilers reared to 42 d of age is 300 g/t based on BW gain and feed conversion¹.

Introduction

Short chain fatty acids (SCFA) promote the growth of tissues lining the gastrointestinal (GI) tract in monogastrics². Of these, butyric acid is considered the most efficient. The intestinal tract of the bird contains numerous finger-like projections called villi, which have different types of epithelial cells. Enterocytes are specific absorptive epithelial cells found on the villi. Butyric acid is known as a preferred energy source for enterocytes and seems to be a stimulant for villi growth³. Butyrate is quickly absorbed in the upper digestive tract such as the crop, which makes it a less than ideal feed additive⁴. However, the efficacy of butyrate has been shown to increase when fed in a protected form such as encapsulation⁵. Researchers have shown butyrate is necessary for normal development of epithelial cells; therefore, if the butyrate could bypass degradation in the crop and proventriculus, the epithelial cells in the small intestine could utilize the butyrate⁶.



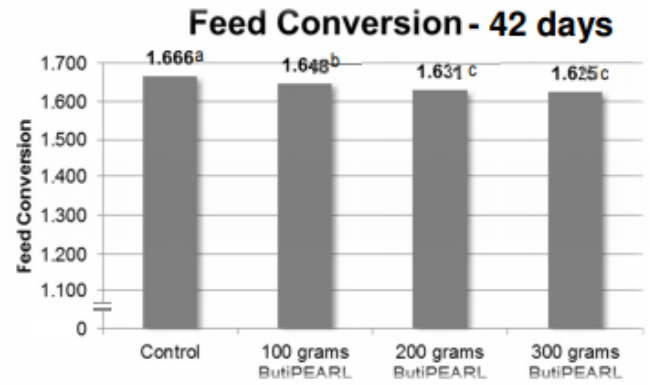
Materials and Methods

A trial was conducted with male Cobb × Cobb 500 broilers at the University of Georgia Poultry Research Center. The data presented is from a trial in which ButiPEARL was fed at 100, 200, or 300 g/t inclusion. Broilers were allotted on day 1 post-hatch to the control or treatment groups. Each group consisted of 12 replications per treatment with 45 broilers per replicate pen. The experiment was conducted for 42 days. Broilers were weighed on days 1 and 42 for determination of body weight gain, feed consumption and feed conversion.

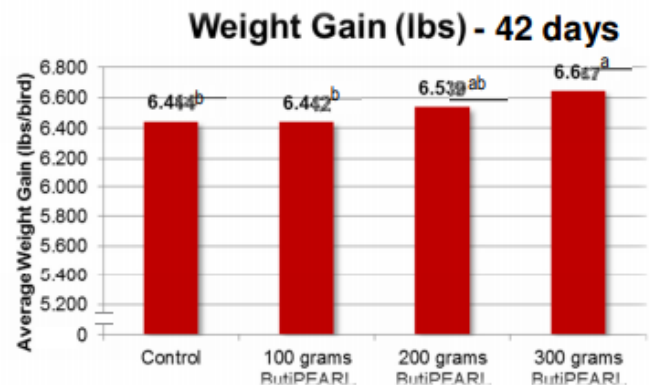
Feed was fed as crumbles in the starter phase and as pellets during the grower and finisher phases. All diets were provided ad libitum in one tubfeeder per pen. The broilers were fed a corn and soybean meal based diet with 60 g/t Bio-Cox and 50 g/t BMD added in the starter and grower phases. All diets were formulated to meet or exceed the nutritional requirements suggested for 1 to 42 day old broilers. The treatments consisted of a control diet and a treatment diet that consisted of the control diet plus ButiPEARL added on top for mixing prior to pelleting.

Results

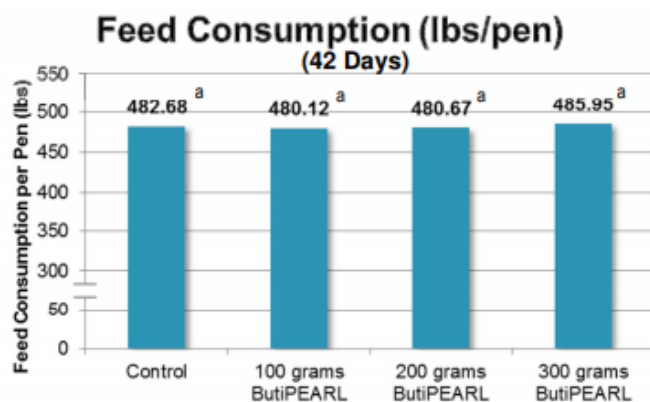
At 42 d of age, BW gain was significantly increased ($P < 0.05$) for broilers fed 300 g/t compared with broilers fed either PC or 100 g/t. Feed conversion for broilers fed 200 or 300 g/t ButiPEARL had an improvement in feed conversion compared with broilers fed either the control or 100 g/t ButiPEARL diet. The overall results suggest that commercial broilers fed 300 g/t had an improvement in overall growth performance.



Values with different superscripts are significantly different ($P < 0.05$).



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Conclusion

Broilers supplemented with ButiPEARL at an inclusion rate of 300 g/t showed a 0.20 lbs increase in body weight gain at the end of 42 days. Additionally, the broilers that were fed ButiPEARL in their diet exhibited a 4.1 point improvement in feed conversion as compared to the control group, 1.625 vs. 1.666, respectively. The 300 g/t level of ButiPEARL is the recommended inclusion level based on both body weight and feed conversion responses.

References

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