



IMPLICATIONS FOR SUPPLEMENTATION OF DIETARY ENZYMES IN POULTRY FEED: A REVIEW

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ABSTRACT

The present review highlights the effect of dietary enzyme supplementation on different body growth parameters of poultry birds at their various growing stages. The article stresses on the effect of dietary enzymes on various physiological parameters of the poultry birds along with their application as growth promoters in commercial poultry feed.

Key words: feed, prebiotics, poultry

INTRODUCTION

Xylanase is the name given to a class of enzymes which degrades the linear polysaccharide beta-1, 4 xylan to xylose, thus breaking down hemicelluloses which are a major component of the cell wall of the plants. Xylanases are known to increase protein digestibility of wheat and this is attributed particularly to release of protein from the xylan enriched aleurone layer. Xylanase supplementation improves conjugated bile acid function in intestinal contents and increase villus size of small intestine wall in broiler. Supplementing broiler diets with combination of xylanase and β -glucanase improves the nutritive value of the diet¹. The addition of xylanase improves weight gain, feed intake, feed efficiency, AME and decreased water intake² and Vitamin E content of liver in broiler was significantly improved by addition of xylanase³. Nutri-xylanase is a bacterial xylanase processed from *Bacillus subtilis* and produced by a micro-filtration advanced fermentation technique.

Effect on body weight gain and feed efficiency

Bar et al.⁴ conducted an experiment to study the effect of xylanase enzyme on body parameters of broiler birds. The experimental birds were distributed into five equal groups including control. Studies on body weight gain revealed that at the end of 4th week of experiment, significant difference in body weight gain among the birds of the control and various treatment group was noticed ($P < 0.05$) though there was subtle difference among the birds of control and various treatment groups (T₁-T₄). Birds of T₃ group revealed the highest body weight gain followed by the birds of T₁, T₂ and T₄ groups respectively. Birds of the control group revealed the lowest body weight gain. At the end of 5th and 6th week of experiment there was significant difference ($P < 0.05$) in the body weight gain among the birds of the control and various treatment group. Birds of T₃ group revealed the highest body weight gain and the lowest body weight gain were observed in the birds of control group.

Establishment of fact through research and investigations

Mannion⁵ reported that the body weight gain was improved by 12-25% and feed consumption was increased by 3-21% when chicks at 4 weeks of age fed diets supplemented with

enzyme like xylanase. Veldman and Vahl¹ noticed xylanase supplementation improved food conversion ratio by 2.2-2.9% and body weight gain by 0.2-2.5%. Silverslides and Bedford⁶ showed xylanase supplementation had a positive body weight gain and the feed to gain ration. Danicke et al.³ found addition of xylanase significantly increased the weight gain up to 21 days of age and decreased the feed to gain ratio slightly. Mathlouthi et al.⁷ showed feed efficacy and body weight gain was improved with the supplementation of xylanase.

Wu et al.² (2004) observed that the xylanase supplementation significantly improved weight gain, feed efficiency and AME. Wu et al.² observed that addition of xylanase and phytase reduced the relative weight gain of the small intestine by 15.5% and 11.4% respectively. Yubo et al.⁸ reported body weight and feed per gain ratio was improved ($P < 0.05$) by xylanase supplementation in the first 2-3 weeks in broilers. Ahmad et al.⁹ noticed xylanase supplementation increased body weight, feed intake and feed gain ratio. Liu et al.¹⁰ observed xylanase supplementation increased body weight gain from 0-21 days of age of broilers. Gao et al.¹¹ found that the supplementation of xylanase enzyme improved ($P < 0.05$) growth performance and feed conversion efficiency (FCE).

SUMMARY

It can therefore be summarized that supplementation of poultry feed with dietary enzymes in proper combinations can enhance the feed efficiency of the host by showing increased body weight gain.

Supplementation of poultry feed with dietary supplements such as acids, pre- and probiotics can enhance the immune system of the host by providing increased resistance to infections. This, in turn, can promote gut development and nutrient absorption, leading to better performance.^{12,13,14}

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