



P-ISSN: 2349-8528
 E-ISSN: 2321-4902
 IJCS 2018; 6(1): 1315-1317
 © 2018 IJCS
 Received: 08-11-2017
 Accepted: 09-12-2017

Premavalli K
 Department of Poultry Science,
 Madras Veterinary College,
 Tamil Nadu Veterinary and
 Animal Sciences University,
 Chennai, Tamil Nadu, India

Influence of pectinase enzyme supplementation on growth performance of pearl guinea fowl keets (*Numida meleagris*)

Premavalli K

Abstract

A study was conducted to find out the influence of pectinase enzyme supplementation on growth performance of pearl guinea fowl keets. A total of 60 numbers of day old straight run pearl guinea fowl keets were randomly allotted to three different treatment groups with two replicates of ten chicks each. Pectinase enzyme was supplemented @ 0/Kg (T1), 750 u/Kg (T2) and 1500 u/Kg (T3) with corn soya basal ration without including regular feed antibiotics. Numerically higher mean live body weight at eight weeks of age (626.57 ± 17.99 , 624.26 ± 25.52) better feed conversion ratio (3.35, 3.25) and higher mean percent livability (92.86, 92.86) was recorded in guinea fowls fed with pectinase enzyme supplemented groups than control (602.64 ± 24.39 , 3.39, 92.86%) groups. It is concluded that the dietary incorporation of pectinase enzyme @ 0/Kg, 750 u/Kg and 1500 u/Kg did not have significant ($P > 0.05$) influence on growth performance of guinea fowl keets.

Keywords: Pectinase enzyme, growth performance, guinea fowl

Introduction

Guinea fowls are commonly reared for meat production in India. Poultry diets are formulated mainly with corn and soya in India. In general, poultry diets contain variable levels of non starch polysaccharides (NSPs) including arabinoxylans, glucons and pectin and are responsible for high digesta viscosity, which can lead to reduced feed intake, slower digesta passage rate and impaired nutrient digestion. It has been argued that endogenous enzyme addition to the cereal-based diets helps nutrients digestion via digesta viscosity reduction (Bedford *et al.* 1991; Bedford and Classen, 1992) [1, 2]. Supplementing the basal diet with specific enzyme improves not only the nutritional value of feed ingredients but also increasing the efficiency of digestion. Feed enzymes also help in breakdown of anti-nutritional factors (e.g. fibre, phytate) that are present in many feed ingredients. There are large numbers of non-phytase enzymes (xylanase, glucanase, amylase, mannanase, lipase, protease, pectinase and galactosidase) available for maize based diets in either singly or multi-enzyme combinations as carbohydrase enzymes deliver a less value in a diet which has been improved with phytase (Cowieson, 2010) [3]. Exogenous enzymes namely Pectinase, cellulase, β -mannanase, xylanase, α -amylase, and β -glucanase, are utilized in diets containing soybean meal to potentially alleviate anti-nutrients by hydrolyzing NSP and maximizing nutrient utilization (Kocher *et al.*, 2003) [4]. Maize is the commonly used energy source in broiler diet in India and it is important to know whether feed enzyme is beneficial in improving performance in diets with low soluble non-starch polysaccharide (NSP) concentrations. Hence, the present study was conducted to find out the influence of pectinase enzyme supplementation on growth performance of pearl guinea fowl keets.

Materials and Methods

The study was undertaken in poultry research station, Chennai, Tamil Nadu. A total of 60 numbers of day old straight run pearl guinea fowl keets were randomly allotted to three different treatment groups with two replicates of ten chicks each. Guinea fowls were fed with corn soya based pre-brooder ration for 0-4 weeks of age and guinea fowl brooder ration for 5-8 weeks of age. Pectinase enzyme was supplemented @ 0/Kg (T1), 750 u/Kg (T2) and 1500 u/Kg (T3) with basal ration without including regular feed antibiotics. Experimental birds were maintained under cage system with identical managemental conditions. Performance of birds was assessed based on biweekly bodyweight, feed efficiency and livability biweekly from 0 day to 8 weeks of age and analyzed as per Snedecor and Cochran (1994) [5].

Correspondence
Premavalli K
 Department of Poultry Science,
 Madras Veterinary College,
 Tamil Nadu Veterinary and
 Animal Sciences University,
 Chennai, Tamil Nadu, India

Table 1: Percent ingredient composition of experimental rations

S. No	Ingredients (kg)	Percent Inclusion Level	
		Guinea fowl pre brooder Feed (0-4 weeks)	Guinea fowl brooder Feed (5-8 weeks)
1	Yellow Maize	44.00	40.00
2	Cumbu/Bajra	10.75	12.00
3	Deoiled rice bran	-	17.50
4	Soybean meal	36.25	21.50
5	Sunflower meal	-	-
6	Dry fish	7.50	8.00
7	Mineral mixture*	0.50	0.50
8	Dicalcium phosphate	1.00	0.50
9	Shell grit	-	-
	Total	100	100

Table 2: Percent nutrient composition of experimental rations

S. No	Nutrients	Percent Inclusion Level	
		Guinea fowl pre brooder Feed (0-4 weeks)	Guinea fowl brooder Feed (5-8 weeks)
1	Crude protein (%)	24.75	20.25
2	Metabolizable Energy (kcal/kg)	2852	2801
3	Crude fibre (%)	4.48	7.10
4	Ether extract	3.52	3.29
5	Calcium (%)	1.18	1.08
6	Available phosphorus (%)	0.52	0.45
7	Lysine (%)	1.45	1.15
8	Methionine (%)	0.42	0.38
9	Moisture	13.61	12.91

Results and Discussion

The results revealed that there was a non-significant difference on the brooder growth performance of keets between pectinase enzyme supplemented groups and control groups. Numerically higher mean live body weight at eight

weeks of age (626.57 ± 17.99 , 624.26 ± 25.52) better feed conversion ratio (3.35, 3.25) and higher mean percent livability (92.86, 92.86) was recorded in guinea fowls fed with pectinase enzyme supplemented groups than control (602.64 ± 24.39 , 3.39, 92.86%) groups but it was not statistically significant ($P > 0.05$).

There are conflicting reports in the literature on the ability of pectinase enzyme on growth performance of broilers. Similar insignificant effects on broiler performances due to supplementation of either individual or multi-enzymes with corn soya basal diet were also reported by several workers (Choct, 2006; Fatemeh *et al.* 2012) [6, 7]. However, improved ileal amino acid digestibility, body weight gain, and feed conversion were observed when birds were fed corn-soybean meal based diets supplemented with exogenous enzymes (Saleh *et al.*, 2005; Meng *et al.*, 2005) [8, 9]. The multi-enzyme preparation that improves the nutritive value of ration may complement the genetic exploitation of the poultry birds. The insignificant effect of pectinase enzyme supplementation on growth performance may be related to the low availability of their substrate, as corn has low pectin levels (Malathi and Devegowda, 2001) [10], variations in the concentration and composition of NSP in the diet, source and/or activity of the enzymes supplemented, incomplete hydrolysis of the NSP and consequent increased viscosity of intestinal digesta which in turn might have inhibited proper digestion and subsequent absorption of nutrients from the feed.

Summary

The results revealed that the dietary incorporation of pectinase enzyme @ 0/Kg, 750 u/Kg and 1500 u/Kg did not have significant ($P > 0.05$) influence on growth performance of guinea fowl keets. The addition of a mixture of exogenous enzymes or multi-enzyme preparations, considering the composition of NSP in a given diet may improve the nutritive value of ration and yield better growth promoting response compared to supplementation of individual enzyme.

Table 3: Influence of pectinase enzyme supplementation on growth performance of pearl guinea fowl keets

Parameters	T1 Control	T2 (750u/Kg)	T3 (1500u/Kg)
Hatch weight(g) ^{NS}	26.36±0.35	25.61±0.25	25.84±0.34
2 nd week body weight(g) ^{NS}	86.71±3.92	90.57±2.81	88.68±3.21
4 th week body weight(g) ^{NS}	240.14±11.27	243.50±7.26	252.04±7.18
6 th week body weight (g) ^{NS}	453.64±21.59	440.21±12.92	448.30±16.68
8 th week body weight (g) ^{NS}	602.64±24.39	626.57±17.99	624.26±25.52
Feed Conversion Ratio ^{NS}	3.39	3.35	3.25
Livability (%) ^{NS}	85.71	92.86	92.86

Mean values having the same superscript in a row do not differ significantly ($p < 0.05$)

Acknowledgments

The author expresses many thanks to the Professor and Head, Poultry research station, Chennai and the Director, Centre for animal production studies, TANUVAS, Chennai for providing necessary facilities for the conduct of this research.

References

1. Bedford MR, Classen H, Campbell GL. The effect of pelleting, salt and pentosane on the viscosity of intestinal contents and the performance of broilers fed rye. *Poult Sci.* 1991; 70:1571–1577.
2. Bedford MR, Classen HL. Reduction of intestinal viscosity through manipulation of dietary rye and pentosanase concentration is effected through changes in the carbohydrate composition of the intestinal aqueous

phase and results in improved growth rate and food conversion efficiency of broiler chicks. *J Nutr.* 1992; 122:560-569.

3. Cowieson AJ. Strategic selection of exogenous enzymes for corn/soy-based poultry diets. *Journal of Poultry Science.* 2010; 47:1-7.
4. Kocher A, Choct M, Ross G, Broz J, Chung TK. Effects of enzyme combinations on apparent metabolizable energy of corn-soybean meal-based diets in broilers. *J. Appl. Poult. Res.* 2003; 12:275-283.
5. Snedecor GW, Cochran WG. *Statistical Methods*, 9th ed, USA, Iowa State University Press, USA. 1994.
6. Choct M. Enzymes for the feed industry: past, present and future. *World's Poult. Sci. Journal.* 2006; 62(2):5-15.

7. Fatemeh Alemi, Ali Mahdavi, Sirous Eidivandi, Seyed Abdullah Hosseini, Ali Mostafa Tehrani, Vahid Ghasemloo. Effect of pectinase, cellulase and hemicellulase on performance and digestibility of diets in broilers. *Poult. Sci.*, 2012, 91 (Suppl.1).
8. Saleh F, Tahir M, Ohtsuka A. Hayashi K. A mixture of pure cellulase, hemicellulase and pectinase improves broiler performance. *Br. Poult. Sci.* 2005; 10:46(5):602-606.
9. Meng XF, Slominski BA, Nyachoti M, Campbell LD, Guenter W. Degradation of cell wall polysaccharides by combinations of carbohydrase enzymes and their effect on nutrient utilization and broiler chicken performance. *Poult. Sci.* 2005; 84:37-47.
10. Malathi V, Devegowda G. In vitro evaluation of non-starch polysaccharide digestibility of feed ingredients by enzymes. *Poult. Sci.* 2001; 80(3):302-305.