



E-ISSN: 2320-7078

P-ISSN: 2349-6800

www.entomoljournal.com

JEZS 2020; 8(2): 1160-1162

© 2020 JEZS

Received: 22-01-2020

Accepted: 24-02-2020

DH Sawai

M.V.Sc Student-Post Graduate
Institute of Veterinary and
Animal Sciences, Akola,
Maharashtra, India

GM Jadhao

M.V.Sc Student-Post Graduate
Institute of Veterinary and
Animal Sciences, Akola,
Maharashtra, India

KG Pawar

M.V.Sc Student-Post Graduate
Institute of Veterinary and
Animal Sciences, Akola,
Maharashtra, India

AP Dhok

Assistant Professor-Nagpur
Veterinary College, Nagpur,
Maharashtra, India

RM Sarode

M.V.Sc Student- Indian
Veterinary Research Institute,
Bareilly, Uttar Pradesh, India

Corresponding Author:**DH Sawai**

M.V.Sc Student-Post Graduate
Institute of Veterinary and
Animal Sciences, Akola,
Maharashtra, India

Performance of broiler chicken supplemented with critical amino acids and multi-enzyme on low protein and energy diet

DH Sawai, GM Jadhao, KG Pawar, AP Dhok and RM Sarode

Abstract

Three hundred broiler chicks were allotted to five dietary treatments of three replications and 20 birds in each replication. The control (T₀) were standard diet, T₁ (5% low CP and energy than standard with balancing of lysine and methionine), T₂ (T₁ + Multienzyme), T₃ (10% low CP and energy than standard with balancing of lysine and methionine), T₄ (T₃ + Multienzyme). The body weight gain, feed consumption of feed conversion ratio revealed non-significant differences among the groups. The nitrogen retention was significantly more on low protein, low energy diet supplemented with critical amino acids and multi enzymes, however DM metabolizability did not vary significantly. Net profit (Rs/kg) was more in T₂ group, where 5 percent low CP and ME diet was supplemented with multi enzymes. It was concluded that 5 percent reduction in energy protein diet supplemented with multienzyme could be economical for broiler production.

Keywords: Amino acids, energy, protein, broilers, nitrogen retention

1. Introduction

Ensuring feed availability at affordable prices is the key concern for the poultry industry as 70% of production costs being in the form of feed. Maize and soy meal forms the major proportion of poultry feed with maize contributing 55-65% and out of the total feed volume soy meal forming 25-30%. There is increased competition between human and animals for these ingredients; moreover India is a net exporter of both these commodities. Therefore the gap between demand and supply is anticipated to broaden more in the coming years, creating a compelling intention to explore the convenience of locally accessible, unconventional feedstuffs in poultry diet formulation. The industry also uses feed additives such as vitamin pre-mixes, amino acids and exogenous enzymes which are largely procured from indigenous sources. Enzyme supplementation in ration break down fibrous cell wall, reduces digesta viscosity and increases availability of nutrients (Choct,1996) ^[6]. Enzyme addition to corn-SBM diets are frequently reported to increase ileal nutrient digestibility and feed efficiency (Cowieson and Ravindran, 2008) ^[7]. The positive effects of the enzymes are suggested to be due to enhancement of nutrient digestibility in young chicks as well as digestion of soluble and insoluble NSP in corn and SBM. Therefore, fulfilling dietary amino acid needs for optimum growth has been recognized to be of utmost importance in broiler chicken (Dozier *et al.*, 2007) ^[8]. Hence, the present study was planned to offer low protein and low energy diet supplemented with L-lysine, DL-methionine and multienzyme to meet adequate quantity of these amino acids as per BIS (2007) ^[5] to broiler chicken and to study its effect on their performance of broilers.

Material and Methods

The research work was undertaken at Poultry Research Centre, Post Graduate Institute of Veterinary and Animal Sciences, Akola (MAFSU, Nagpur) during the period from 15th March 2017 to 26th April 2017. Three hundred commercial, unsexed, straight run, day old Vencobb-400Y broiler chicks belonging to same hatch were procured from Venkateshwara Hatcheries Pvt. Ltd., Pune. On arrival, chicks were weighed individually and assigned randomly into five dietary treatments of three replications and 20 birds in each replication. The control (T₀) were standard diet as BIS (2007), T₁ (5% low CP and energy than standard with balancing of lysine and methionine), T₂ (T₁ + Multienzyme), T₃ (10% low CP and energy than standard with

balancing of lysine and methionine), T₄(T₃ + Multienzyme). The birds were reared on deep litter system for six weeks on standard managerial practices. The feed consumption was recorded daily and body weight gain at weekly intervals. The metabolic trial of 5 days collection period was conducted at

the end of experiment. Also economics of broiler production was determined.

Results and Discussion

Table 1: Percent ingredient composition of broiler diet

Ingredients	Pre-starter					Starter					Finisher				
	T ₀	T ₁	T ₂	T ₃	T ₄	T ₀	T ₁	T ₂	T ₃	T ₄	T ₀	T ₁	T ₂	T ₃	T ₄
Maize	46.53	48.70	48.70	50.87	50.87	49.41	51.35	51.35	52.51	52.51	54.05	55.60	55.60	57.15	57.15
Soybean Meal	40.10	35.54	35.54	30.98	30.98	37.80	33.41	33.41	29.70	29.70	32.45	28.40	28.40	24.35	24.35
DORB	5.00	9.50	9.50	14.00	14.00	3.50	8.00	8.00	12.50	12.50	3.50	8.00	8.00	12.50	12.50
Vegetable Oil	4.40	2.20	2.20	0.00	0.00	5.30	3.15	3.15	1.10	1.10	6.00	3.90	3.90	1.80	1.80
DCP	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
LSP	1.10	1.10	1.10	1.10	1.10	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Salt	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Trace Mineral Premix	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Vitamin Premix	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
DL-Methionine	0.15	0.16	0.16	0.17	0.17	0.10	0.12	0.12	0.14	0.14	0.14	0.16	0.16	0.18	0.18
L-Lysine	0.07	0.15	0.15	0.23	0.23	0.04	0.12	0.12	0.20	0.20	0.01	0.09	0.09	0.17	0.17
Choline Chloride 60%	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Toxin Binder	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Coccidiostats	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Sodium Bicarbonate	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Multienzyme (500 g/ton)	-	-	+	-	+	-	-	+	-	+	-	-	+	-	+

Table 2: Performance of broilers

Parameters	Treatments					SEM
	T ₀	T ₁	T ₂	T ₃	T ₄	
Avg. wkly BW gain, g	306.28	312.68	333.66	291.53	300.95	41.66
Avg. wkly feed cons., g	541.88	545.00	545.45	545.06	547.27	85.06
FCR	1.62	1.59	1.50	1.72	1.66	0.07
DM metabolizability, %	74.27	75.91	75.92	76.33	77.59	1.11
N-retention**, %	66.06 ^c	70.19 ^b	73.64 ^a	74.71 ^a	76.30 ^a	1.26
Net profit, Rs/bird	3.15	1.81	7.50	-9.35	-5.45	

Means bearing abc in a row differ significantly ** ($P < 0.01$)

The body weights gain, feed consumption and feed conversion efficiency did not reveal significant differences either due to low protein, energy diet or multi enzyme supplementation in broilers. The observations are consistent with Awad *et al.* (2016) ^[3], who concluded that crude protein of broiler starter (1-21d) diet can be reduced till 19.2% with essential amino acids fortification and without any adverse effect on growth performance under the hot, humid, tropics. Similar results were obtained by Iyayi *et al.* (2014) ^[9] and Yu *et al.* (2004) ^[10] fed low protein diet supplemented with methionine and lysine. The result of the present study indicated that low crude protein and low energy diet (5% less than BIS standards) fortified with critical amino acids L-lysine and DL-methionine supplemented with multienzyme improved the body weight indicating correlation between dietary crude protein and metabolizable energy and significance of critical amino acids and multienzyme. The dry matter metabolizability did not show significant difference, however nitrogen retention was better when protein was reduced in the diet. The results corroborates with Bregendahl *et al.* (2002) ^[4] who reported that chicks fed low protein diets with essential amino acids supplementation excreted less nitrogen than did chicks fed high protein diet. Zanella *et al.* (1999) ^[11] found improvement in overall CP digestibility by 2.9% when fed corn soybean based diet added with commercial cocktail enzymes. Similarly Ardekani *et al.* (2012) ^[1] observed that nitrogen excretion significantly reduced with reduction in CP in the diet supplemented with

essential amino acids, significantly higher nitrogen retention was observed in broiler fed 20% CP supplemented with lysine and methionine. The net profit (Rs/kg) was more in T₂ group, where 5 percent low CP and ME diet was supplemented with multi enzymes.

Conclusion

It was concluded that 5 percent reduction in energy protein diet supplemented with multienzyme could be economical for broiler production.

References

1. Ardekani HM, Chamani M, Vieira SL, Ward N. Fortify low protein diet with supplemented essential amino acids on performance, carcass characteristics and whole-body female broiler chickens. *Annals of Biological Research*. 2012; 3(5):2208-2212.
2. Awad AR, Sell JL, Zimmerman DR. Effect of low-protein diets on growth performance and body composition of broiler chicks. *Poultry Science*. 2014; 81:1156-1167.
3. Awad AR, Mendonca CX, Jensen LS. Broiler chick response to low protein diets supplemented with synthetic amino acids. *Poultry Science*. 2016; 69:1950-1955.
4. Bregendahl KJ, Zimmerman DR. Effect of low-protein diets on growth performance and body composition of broiler chicks. *Poultry Science*. 2002; 81:1156-1167.
5. Bureau of Indian Standards. Indian standard, poultry feed

- specifications 5th version IS. 2007; 1374:3-6.
6. Choct MA. A comparison of three xylanases on the nutritive value of two wheat for broiler chickens. *British Journal of Nutrition*. 1996; 92:53-61.
 7. Cowieson R. Recent advances in research on enzymes for poultry diets. *Poultry Science*. 2008; 90:2013-2023.
 8. Dozier LR, Sakomura NK, Barbosa NA, Bonato MA, Kawuuchi IM, Fernandes JB *et al*. Corn and soybean meal metabolizable energy with the addition of exogenous enzymes for poultry. *Brazilian Journal of Poultry Science*. 2007; 11(1):51-55.
 9. Iyayi EA, Aderemi FA, Ladele OO, Popoola AS. Effects of low protein diets supplemented with high amino acids (methionine or lysine) on performance of broilers. *American Journal of Experimental. Agriculture*. 2014; 4(5):525-531.
 10. Yu Bi, Chung TK. Effects of multiple-enzyme mixtures on growth performance of broilers fed corn-soybean meal diets. *Journal of Applied Poultry Research*. 2004; 13:178-182.
 11. Zanella I, Sakomura NK, Silversides FG, Figueirido A, Pack M. Effect of enzyme supplementation of broiler diets based on corn and soybeans. *Poultry Science*. 1999; 78:561-568.