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EFFICACY OF HERBAL METHIONINE (NUTRI-METHIONINE) SUPPLEMENTATION WITH SYNTHETIC DL-METHIONINE ON GROWTH OF BROILER CHICKEN

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ABSTRACT

An experiment was conducted to evaluate the efficacy of herbal Methionine (Nutri-Methionine) and synthetic DL- Methionine supplementation on the performance of broiler chicken. One hundred thirty five day old broiler chicks were divided into three groups with three replicates having fifteen chicks in each replicate. T_1 group birds were fed with the control diet without any supplemental Methionine. T_2 group birds were fed diet supplemented with synthetic DL- Methionine and T_3 group were fed with diet supplemented with herbal Methionine. Results indicated that the body weight gain was significantly ($P<0.05$) improved in the herbal Methionine (Nutri-Methionine) supplemented groups. Feed intake was significantly ($P<0.05$) lower in the herbal in the herbal Methionine supplemented group when compared with the other two groups. Similarly feed conversion ratio was improved linearly with a significant ($P<0.05$) improvement. There was a significant ($P<0.05$) elevation in serum glucose levels with a notable reduction in the serum cholesterol levels in the herbal methionine (Nutri-Methionine) supplemented group. It was concluded that herbal Methionine (Nutri-Methionine) supplementation in the broiler diets enhanced the overall performance broiler birds.

Keywords : Broiler Chicken; Performance; Synthetic & Herbal Methionine.

DL-Methionine is the critical amino-acid for poultry. Supplementation of DL-Methionine in poultry ration is well established to improve growth and performance in broilers.[1] Methionine must be supplemented in the diet of chicken as the poultry birds are unable to synthesize it in the amounts necessary to sustain life and growth. Methionine is required at higher level than normal level to comply with the increased tissue demands when bird is predisposed to fast growth along with high production performance. The growth rate of birds is often inferior when regardless of amino acid balance, the ratio of crude protein with synthetic amino acid is much less than 16:1.[11] Methionine may act as a lipotropic agent through its role as a methyl donor and involvement in choline, betaine, folic acid and vitamin B_{12} metabolism.[12, 6] Methionine serves as an integral portion of body protein and is a precursor for cysteine and an important source of dietary sulphur. The increase

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in demand for cheap meat has given rise to the use of synthetic compounds in feed. Recently the safety of such practices has been questioned and their use is becoming restricted to many regions of the world. The DL-Methionine supplementation in growing chicken feeds is a common practice especially in cereal and vegetable protein based ration.[14] The synthetic Methionine is metabolized into highly toxic compounds such as methyl thiopropionate.[2] thereby adversely altering the performance of poultry birds. The synthetic Methionine is listed among the prohibited synthetic substances.[1]

Soaring prices, low availability and prohibition of use of DL-Methionine have forced the researchers to search an alternative to replace DL-Methionine in poultry diet. Keeping this in view an attempt was made to overcome the present crisis and to validate the claims made on the photogenic preparation manufactured by a number of companies.

The study was designed with an aim to evaluate comparative efficacy of synthetic DL-Methionine with Nutri-Methionine, herbal amino acid developed by M/s Nutricare Life Sciences Saharanpur, U.P on the performance of broiler chicken.

MATERIALS AND METHODS

One hundred and thirty five day old Vencobb Broiler Chicks were divided into three groups with one control and two treatments having 45 chicks in each group with three replicates of 15 chicks each reared on deep-litter system for a period of 42 days.

Three types of corn-soya bean meal based diets were offered to the birds i.e., pre-starter (for first 14 days), starter (from 15th to 28th day) and finisher diet (from 29th to 40th day) (Table 1). All the diets were formulated according to BIS. [3] Group I of birds were fed the basal diet without any supplemental Methionine. Group II of birds were fed the basal diet supplemented with synthetic DL-Methionine @ 100gm per quintal. Group III of birds were fed the basal diet supplemented with Nutri-Methionine @ 100gm per quintal feed in the diet III. All the groups were maintained under similar conditions of brooding, feeding and management. Feed was offered ad.libitum through the experimental period as mash. Weekly body weight and feed consumption were recorded and feed conversion ratio (unit feed intake/unit body weight gain) was calculated. The mortality of birds was recorded as and when it occurred. At the end of experimental period, blood was collected from two birds from each replicate group (6 birds per group) for blood biochemical analysis using commercially available diagnostic kits. Similarly two birds from each replicate group (6 birds per treatment) were selected randomly and slaughtered as per standard methods for determining the dressing percentage and carcass yield.

The data obtained were subjected to statistical analysis by the software SPSS.[15] Levels of significance were calculated as per the standard method[7] whenever any effect was found significant.

RESULTS AND DISCUSSION

The results of the comparative effect of feeding diets supplemented with synthetic and herbal Methionine on the performance of Broiler chicken is presented in the table 2. The body weight gain of birds fed herbal Methionine (Nutri-Methionine) was significantly ($P< 0.05$) highest when compared with the group of birds fed diets

supplemented with synthetic Methionine and negative control diets (without Methionine). This finding was in congruence of the earlier reports.[13]

These results are in accordance with the findings of a number of earlier workers[10, 8, 9, 13] who reported that, the live body weight gain of birds at 21 days increased significantly as the level of herbal Methionine was increased in the diet of broiler chicken. Similarly the chicks fed herbal Methionine showed a significant (P<0.05) gain in body weight when compared with control group.[13]

Cumulative fed intake was comparable between the group of birds fed diets supplemented with synthetic Methionine when compared with the group of diets fed control diet. However, the feed intake was significantly (P<0.05) lower in the group of birds fed diets supplemented with herbal Methionine (Nutri-Methionine). These results corroborate with the earlier reports of[5] in which higher feed intake was observed in the control birds than birds supplemented with Methionine (DL- or herbal). However, no significant effect of herbal or DL-Methionine supplementation was observed.[9]

The feed conversion ratio was improved linearly (P<0.05) among the different treatment groups and the group of birds fed diets supplemented with herbal Methionine (Nutri0methionine) showed the best feed conversion ratio. Similar results have been reported by earlier workers[4, 10]. It was observed that neither DL-Methionine nor herbal Methionine (Nutri-Methionine) supplementation had any effect on broiler mortality. The effect of supplementation of herbal Methionine (Nutri-Methionine) and synthetic Methionine revealed no significant (P<0.05) variation in the defeathered and eviscerated weight amongst the different treatment groups while the dressed weight was numerically higher in the group of birds fed diets supplemented with herbal Methionine (Nutri-Methionine). Similar results were recorded by earlier workers[4,10] in the broiler chicken supplemented with herbal and synthetic amino acids.

Broiler chicken fed diets supplemented with both synthetic DL-Methionine and herbal Methionine (Nutri-Methionine) showed significantly (P<0.05) higher serum total protein values than control group. However, non-significant (P<0.05) difference was observed between the groups fed diets supplemented with synthetic Methionine or herbal Methionine (Nutri-Methionine). Similar results have been observed by earlier workers.[10]

A significantly (P<0.05) higher blood glucose level was observed in the group of birds fed diets supplemented with herbal Methionine (Nutri-Methionine) when compared with the group of birds fed either synthetic Methionine or control group. Blood cholesterol level decreased significantly (P<0.05) with the supplementation of both types of Methionine and the most hypocholestrolemic effect observed with the supplementation of herbal Methionine (Nutri-Methionine).

The economic impact analysis also revealed that the birds fed diet supplemented with herbal Methionine (Nutri-Methionine) recorded higher net returns when compared with controlled as well as synthetic (DL-Methionine) supplementation (Table 3).

Table. 1. Ingredient composition and chemical composition of basal diet.

Ingredient	Pre-starter (1-14d)	Starter (15-28d)	Finisher (29-42d)
Maize (kg)	55.30	59.80	64.0
Soya bean meal (kg)	38.70	33.40	29.20
Vegetable oil (kg)	2.15	3.32	3.28
Common salt(kg)	0.40	0.40	0.40
Sodium bi-carbonate(kg)	0.10	0.10	0.10
Dicalcium phosphate(kg)	1.853	1.75	0.66
Shell grit(kg)	0.73	0.72	0.69
DL-Methionine(kg)	0.227	0.19	0.15
ABZ D5(kg)	0.015	0.015	0.015
B-complex(kg)	0.015	0.015	0.015
Trace mineral premix(kg)	0.120	0.120	0.120
Toxin binder(kg)	0.200	0.200	0.200
Vitamin E & Se(kg)	0.020	0.020	0.020
Antibiotic(kg)	0.05	0.05	0.05
Coccidiostat(kg)	0.05	0.05	0.05
Tylosin(kg)	0.05	0.05	0.05
Chemical composition			
ME (Kcal/kg)	2966	3082	3134
CP (%)	23.05	20.82	19.35
CF (%)	3.98	3.79	3.67
EE (%)	4.65	5.91	6.50
AA (%)	0.82	0.76	0.72
Ca (%)	0.86	0.80	0.49
Available P (%)	0.58	0.50	0.46

Table. 2. Comparative effect of feeding diets supplemented with synthetic and herbal Methionine on the performance of broiler chicken.

Attributes	Control (T1)	Synthetic Methionine (T2)	Herbal Methionine (T3)
Initial body weight (g)	45.00	45.37	45.50
Final body weight gain (g)	1460.91 ± ±8.56	1561.87 ± ±40.36	1590.32 ± ±3.84
Body weight gain (g)	1415.91 ± ±31.20	1516.5 ± ±22.38	1545.32 ± ±40.25 ±
Feed consumption (g)	3256±.08 ±	3241±.65 ±	3062±.31 ±
Feed conversion ratio	2.29±0.08 ±	2.13±0.01 ±	1.98±0.01 ±
Mortality	9.0±0.04	8.8±0.89	9.2±0.02
Feather weight (g)	88.05±0.59	88.34±0.32	88.48±0.54
Eviscerated weight (g)	68.65±0.42	68.35±0.84	68.35±0.84
Blood Biochemicals			
Protein (mg/dl)	4.24±0.05 ±	5.06±0.07 ±	5.36±.1.01 ±
Glucose (mg/dl)	196.16±5.77 ±	202.16±2.58 ±	212.40±3.51 ±
Cholesterol (mg/dl)	242.46±28.24 ±	231.16±2.83	211.50±35.50 ±

The figures bearing different superscript in a row differ significantly (P<0.05).

Table 3. Economic impact analysis for feeding of synthetic and herbal Methionine to broiler chicken.

Parameter	Control (T1)	Synthetic Methionine (T2)	Herbal Methionine (T3)
Average body weight (Kg)	1.46	1.56	1.59
FCR	-	2.13	1.98
Income from extra gain in weight @ Rs 75/kg live weight	-	7.6	9.90
Saving from extra gain in weight @ Rs 35/kg average feed cost	-	8.8	10.50
Net gain/bird (Rs)	-	13.1	20.25
Net gain as compared to synthetic Methionine (Rs)	-	-	7.15

CONCLUSION

On the basis of the present study it can be concluded that 1kg Nutri-Methionine per ton of feed can efficiently replace 1kg synthetic DL-Methionine per ton of feed to improve commercial Broiler performance.

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