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COMPARATIVE EVALUATION OF EASYGROW™ AND VITAMIN AD3EC ON PERFORMANCE PARAMETERS IN COMMERCIAL BROILERS

SCIENCE

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ABSTRACT

Aim: The present study was designed and conducted to evaluate the efficacy of liquid multivitamin, amino acid and phytochemical supplement EasyGrow™ in comparison with Vitamin AD3EC in Cobb 400 broiler performance through market age.

Material and Methods: Forty thousand (40000) day-old male chicks were randomly assigned into two groups containing 20000 birds each (Group I and Group II) and were supplemented with Vitamin AD3EC and EasyGrow™ respectively at the recommended doses (1ml/L) in drinking water for first 7 days of lifecycle. The experiment was conducted for 42 days. Chicks were observed for mortality on daily basis; body weight and feed consumption were recorded on day 42. The cumulative mortality, FCR and EPEF were calculated to compare the performance of EasyGrow™ in comparison with Vitamin AD3EC.

Results: EasyGrow™ supplementation at 1 ml/L drinking water for 7 days reduced the cumulative mortality (5.83 Vs 5.90 %) and improved the performance parameters like FCR (1.54 Vs 1.57) and EPEF (349.67 Vs 346.00) at slaughter (day 42) when compared to Vitamin AD3EC. EasyGrow™ supplementation for first 7 days has yielded a net profit of Rs. 1.50 per chick along with 1:8 return on investment as compared Vitamin AD3EC.

Conclusions: Based on aforesaid results, it is concluded that the supplementation of EasyGrow™ at 1 ml/L in drinking water for first 7 days of broiler's life cycle improved the performance of Cobb 400 broiler chickens which would add up a commercial value to the clients (ROI-1: 8).

KEYWORDS

EasyGrow™, Vitamin AD3EC, body weight, FCR, EPEF.

INTRODUCTION

The constant demand for larger chickens evokes the broiler researchers to target for specific traits which should have rapid growth, better feed efficiency and yield high meat during broiler production. Therefore, in order to advance the genetic potential and profitability of meat production, external stressors like morphological, physiological and functional for post-hatch chicks should be minimized by means of early nutritional supplements during the first few days. These stressors are mainly due to delayed access to feed during transportation and hatchery processing like sex determination, sorting, vaccinations, beak trimming and comb dubbing. There are also challenges at the broiler grow-out facility which includes changing yolk based diet to solid diet and changing well-ordered environmental conditions at the hatchery to a more self-regulating life with varied environmental conditions[1,2,3,4].

The internalized yolk sac is the principal source of nutrients which accounts approximately 16% of chick body weight through market age[5,6]. However, young chicks have a reduced yolk lipid mobilization and a reduced lipoprotein transfer to mobilize the energy for their development and at most yolk sac have attributed only a portion of the maintenance requirements for young chicks for first several days[7,8,1] and is also unable to support growth through market age. Similarly a rapid decline in vitamin E and carotenoid concentrations in the liver is a prominent feature of the early postnatal development of chicken9. Hence during the first week high levels of vitamins, amino acids and other nutrients are the prerequisite for stressed newly hatched chicks to improve the utilization of feed and metabolism, boost up the immune system and also to increase the body weight gain[10,11]. The proper balances of amino acids, which are building blocks of proteins are required to maintain the performance of chickens12. The interaction of intestinal growth, digestive functions and diet is critical during the post-hatch period and hence adequate nutrients availability in the first few days of life is essential to ensure the muscle development in later phases[13,14].

Pre-starter diets has been formulated by many researchers to mitigate the negative effect of delayed feeding yet there is a transient effects of pre-starter nutrition on growth performance and also research on nutritional requirements of broiler chicks for first week is very limited[15,16]. Early nutrition plays a vital role in survival of chicks during early age17 and there is a strong positive correlation between first week's live weight and slaughter weight at the end of production cycle that helps to identify the importance of a good start for ultimate better performance in commercial broilers[18]. Similarly Selvam et. al. who have reported that the liquid multivitamin and amino acid supplement EasyGrowTM at three dose levels (1 ml/L, 3 ml/L and 6 ml/L in drinking water) when supplemented for the first 7 days of broiler's life cycle were safe and improves the productivity of broilers[19,20]. Therefore, the present investigating trial was focused to evaluate the efficacy of liquid multivitamin and amino acid formulation EasyGrow™ in comparison with Vitamin AD3EC mixture on performance of Cobb 400 broilers under field conditions.

MATERIAL AND METHODS

Ethical approval

All procedures performed in studies involving animals were in accordance with the ethical standards of the institution or practice at which the studies were conducted. The study was conducted by authorized, qualified and trained veterinarian, scientists and technicians.

Study design

EasyGrow™ (M/s Natural Remedies Pvt. Ltd., Bangalore, Karnataka, India) is a combination of phytochemicals, essential amino acids and vitamins. A total of 40000 Cobb 400 broiler chicks purchased from local hatcheries, were divided into two groups containing 20000 chicks each. G1 and G2 were raised on normal commercial feed and concurrently supplemented with the liquid vitamin AD_3EC and EasyGrow™ respectively in drinking water at the recommended dose (1 ml/L water) for first 7 days of lifecycle.

Experimental setup

Field trial was conducted at commercial poultry farm, Madhya Pradesh India between November and December 2016. Each bird was provided with a floor space of approximately 1.3 square feet throughout the experiment till day 42. The birds were housed in a poultry farm having facilities for electrical brooder, drinkers and

feeders every 5 feet intervals. The electrical brooders were used to maintain warmth inside the farm during first 7 to 10 days of lifecycle and thereafter there was no measures followed to have control over temperature and relative humidity. During the trial period, temperature observed in the farm ranges between 28 to 36°C. Lighting was provided 24 hours during the first 3 days, 23 hours light and one hour darkness from day 4 to day 7 and thereafter 20 hours light and 4 hours darkness till day [42].

Chicks were vaccinated against Marek's disease immediately after hatching. The chlorinated potable drinking water and broiler mash feed (starter feed with Metabolizable Energy (ME) 3000 Kcal/kg and 20% Crude Protein (CP) from day 1 to day 21 and finisher feed with Metabolizable Energy (ME) 3150 Kcal/kg and 18% Crude Protein (CP) from day 22 to 42 were provided *ad libitum t*o chicks throughout the study period. The birds had free access to feed and drinking water round the clock throughout the experimental period. All chicks were vaccinated against Newcastle Disease (ND) vaccine (LaSota strain) and Infectious Bursal Disease (IBD) as eye drops on day 5 and day 14 respectively.

Observations and measurements

The chicks in both groups were observed for clinical signs and mortality once a day till day 42. Since the trial was conducted at commercial farm the body weight of all birds was recorded using a weighing scale on day 42. Feed consumption for both groups was calculated by deducting the quantity of left over feed from the total quantity of feed offered to that particular group and was measured on day [42]. On the basis of total body weight and feed consumption, the values of Feed Conversion Ratio (FCR) were calculated using the formula: Total quantity of feed consumed by all chicks in a group (kg) / Total body weight of all chicks (kg). Mortality was checked daily and weights of dead broilers were used to adjust FCR (mortality-corrected FCR). European Production Efficiency Factor (EPEF) was calculated as follows: Live weight in kg x Livability in % x 100 / Feed Conversion Ratio x Age in days. Return on investment (ROI) was calculated taking into consideration the feed cost for 42 days, cost of EasyGrow™ and Vitamin AD3EC and cost recovered through sale of broiler chickens on day 42. As there were equal number of chicks in all groups, cost incurred on purchase of chicks, vaccines, labors were not considered while calculating the ROI as these expenditures remained same for both groups.

Data collection method

All study parameters were assessed and recorded by farm supervisor using raw data sheets. Upon completion of the trial, these raw data were compiled, processed and expressed as Mean.

RESULTS AND DISCUSSIONS

In the present study the efficacy of EasyGrow™ was evaluated and assessed against Vitamin AD_3EC in day old Cobb 400 broiler chicks following oral supplementation at the dose of 1 ml per litre of drinking water for 7 consecutive days. The cumulative mortality, FCR and EPEF were calculated and assessed to evaluate the impact of EasyGrow™ in comparison to Vitamin AD_3EC on performance parameters.

The chicks were observed for mortality for 42 consecutive days and the cumulative mortality observed in EasyGrow™ treated group was lesser than Vitamin AD_3EC group (G1) over the six week period (5.83% Vs 5.90%). It indicates that survivability / liveability of birds raised on feed with concurrent supplementation of EasyGrow™ in drinking water was marginally better than Vitamin AD_3EC supplem ented birds.

On day 42, although there was not much change in mean body weight (g) and body weight gain (g) between two treatment groups (G1-Vitamin AD_3EC & G2-EasyGrow™), FCR was improved in EasyGrow™ treatment group birds as compared to Vitamin AD3EC group (1.54 Vs 1.57). This indicates that the birds in the EasyGrow™ group consumed 30 g less amount of feed per unit body weight gain compared to Vitamin AD_3EC group. The European Production Efficiency Factor (EPEF) exhibited by Vitamin AD_3EC group (G1) and EasyGrow™ treated group (G2) was 346.00 and 349.67 respectively on day 42. Return on investment (ROI) was calculated per bird and the ROI shown by EasyGrow™ treated group was 1: 8 (Table 1&2).

Table 1. Impact of EasyGrow™ Supplementation on Performance Parameters in Cobb 400 Broiler Chickens.

Parameters	G1 - Vitamin AD3EC	G2 - EasyGrow™
Mortality (%)	5.90	5.83
Average BW (KG)	2.64	2.63
Daily BWG (KG)	0.064	0.063
FCR	1.57	1.54
EPEF	346.00	349.67

Table 2. Economic Analysis of EasyGrow™ Supplementation in Cobb 400 Broiler Chickens.

Return on Investment (ROI)	G1 - Vitamin AD3EC Control	G2 - EasyGrow™
No. of birds	20000	20000
Live birds	18820	18834
Total weight (Kg)	49685	49458
Total feed (Kg)	78055	76314
Price of birds (Rs./Kg)	57	57
Cost of feed (Rs./Kg)	-25	-25
Live birds sold (Rs.)a	2832034	2819111
Cost of feed (Rs.)b	-1951375	-1907850
Cost of treatment (Rs.)c	-3146	-3846
Savings (Rs.)(a- (b+c))	877513	907415
#Net Savings (Rs.)	-	29902
Savings per Bird (Rs.)	-	1.50
ROI Ratio	-	1 : 8
#Net Savings = Savings of G2 – Savings of G1		

Sahin *et. al*.[21] and Downs *et. al*.[22] observed that vitamin ADE significantly increase body weight gain in broiler. Quentin et. al.14 reported a significant effect of starter diet with extra amount of amino acids on body weight, body weight gain and feed conversion ratio in the first week. Islam et. al.[23], Paul *et. al*.[24] and Rahman *et. al*.[25] also reported that vitamin supplementation along with normal feed increased the growth of broiler chickens by 3 to 12 % in terms of body weight gain and feed efficiency. Similarly body weight and breast muscle increased by 2-5 times in first 4 days7 and yolk provides up to 50% of energy requirement on the 1st day and only 2% on 4th day26. The above substantiations prove that an additional nutritional supplement (multivitamin and amino acids) is vital at the initial stage of broiler life cycle in order to obtain an improved productivity after six weeks duration. The present results also confirm that growth of chicks and their performance in terms of reduction in mortality and FCR could be enhanced by modifying the nutritional status during the first week of life through supplementation of liquid multivitamins and amino acid supplement EasyGrow™ in drinking water for 7 days in Cobb 400 broiler chicks.

CONCLUSIONS

In conclusion, the supplementation of EasyGrow™ at 1 ml/L in drinking water for first 7 days of broiler's life cycle produced an improvement in the performance of Cobb 400 broiler chickens in terms of Feed Conversion Ratio (FCR) and European Production Efficiency Factor (EPEF) with low mortality rate as compared to Vitamin AD3EC. The supplementation of EasyGrow™ would add commercial value to the poultry farmers as the return on investment is 1:8.

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