

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/275854208>

# A LIQUID MULTIVITAMIN AND AMINOACID SUPPLEMENT, EASYGROW™ ON GROWTH PERFORMANCE IN VENCobb 400 BROILER CHICKENS

Article · April 2015

CITATIONS

2

READS

2,920

4 authors, including:



**Selvam Ramasamy**

Natural Remedies Pvt Ltd

23 PUBLICATIONS 164 CITATIONS

[SEE PROFILE](#)



**Saravana Marimuthu**

Natural Remedies Pvt Ltd

18 PUBLICATIONS 31 CITATIONS

[SEE PROFILE](#)



**Sureshabu Ganapa**

7 PUBLICATIONS 14 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



Indo Pak politics as clash of two super egoists Mr Jinnah and Mr Nehru [View project](#)



Management of Mastitis [View project](#)

## A LIQUID MULTIVITAMIN AND AMINOACID SUPPLEMENT, EASYGROW™ ON GROWTH PERFORMANCE IN VENCobb 400 BROILER CHICKENS

RamasamySelvam<sup>#1\*</sup>, Marimuthu SaravanaKumar<sup>#2</sup>, Ganapa Sureshbabu<sup>#3</sup> and D'Souza Prashanth<sup>#4</sup>

#1 Animal Health Science, R & D Centre, Natural Remedies Private Limited, Bangalore 560100, Karnataka, India, Mobile no. +91 9972734387

#2 Animal Health Science, R & D Centre, Natural Remedies Private Limited, Bangalore 560100, Karnataka, India, Mobile no. +91 9740216048

#3 Animal Health Science, R & D Centre, Natural Remedies Private Limited, Bangalore 560100, Karnataka, India, Mobile no. +91 9663101566

#4 Formulation Development, R & D Centre, Natural Remedies Private Limited, Bangalore 560100, Karnataka, India, Mobile no.+91 9945232108

### ABSTRACT

The present study was designed and conducted to evaluate the liquid multivitamin and amino acid supplement EasyGrow™ following oral supplementation in drinking water for first 7 days of life in Vencobb 400 broiler chicks. Ten thousand (10000) day-old male chicks were randomly assigned to two groups and chicks were observed for mortality on daily basis; body weight was recorded on day 1, 7, 21 and 42. The cumulative mortality, body weight gain, FCR and EPEF were calculated and assessed to evaluate EasyGrow™ supplementation on performance parameters. EasyGrow™ supplementation at 1 ml/L drinking water for 7 days improved the broiler performance which was evident in terms of better body weight, weight gain, FCR and EPEF on day 42 along with 14% higher return on investment than normal control.

**Key words:** EasyGrow™, Vencobb 400 broiler chicken, Body Weight, FCR, EPEF

**\*Corresponding Author:** Dr SelvamRamasamy

## INTRODUCTION

The constant improvement in the genetic potential of broiler chickens and associated upsurge in daily growth rate renders the length of marketing period shorter and to achieve this, early nutritional management of chicks during the first few days of life are more important because this is the period when the foundation is laid out to maximize their opportunity for optimum health and growth. The first week post-hatch is the very critical period in the life of broiler chickens as its digestive and immune system are still immature and is not well prepared to face environmental challenges [1].

The morphological, physiological and functional changes happening immediately after hatching implies that there is more stress on the chicks as they are continuously exposed to stressors like switching from yolk based diet to solid diet, very conditioned life with controlled environmental conditions at the hatchery to a more independent life with varied environmental conditions at the broiler farms, sterile and immature gastro-intestinal and immune system and thermoregulatory system. Besides, the logistics within the hatchery as well as procedures such as sex determination, sorting, vaccinations, beak trimming, comb dubbing and transport to the farm increase the holding period and stress making the chicks more vulnerable to weight loss, due in part to moisture loss as well as yolk and pectoral muscle utilization[2-5].

The yolk sac is the primary source of nutrients in first few days of life of broiler chicks [1] and is high in fat and protein and low in carbohydrate, which is a direct source of energy. However, young chicks have a reduced yolk lipid mobilization and a reduced lipoprotein transfer to mobilize the energy for their development and are usually associated with reduced viability of the chicks during the first week [6]. A rapid decrease in vitamin E and carotenoid concentrations in the liver [7] is a striking feature of the early postnatal development of chicken. The birds under stress require higher level of vitamins [8-9], amino acids and other nutrients in order to improve the feed utilization and metabolism, boost up the immune system and also to increase the body weight gain during the first week. Amino acids are the building blocks of proteins and their proper balance is required to maintain the performance of chicken [10].

The first week of a broiler's lifecycle is of primary importance to determine their future growth and performances. The essential nutrients level in the feed higher than 115% of NRC specifications might be needed to achieve optimal growth, feed conversion, and body composition in broilers. The chemical composition of diets, the content of crude protein, amino acids and energy values are the factors that determine the bird's development in early period of life. 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 increase muscle development in later phases [11-12].

In the past only starter and finisher diets were available for broiler producers. With the advent of early nutrition, farmers from developed countries started demanding pre-starter diets for more efficient start of their broiler production yet it is far from reality in developing countries as the pre-starter diets are very expensive as compared to starter and grower diets. Though, some commercial feed suppliers are offering broiler pre-starter diets but research on nutritional requirements of broiler chicks for first week is very limited. Early nutrition plays a vital role in survival of chicks during early age and productivity of broilers [13] and there is a strong positive correlation exists between first week live weight

and finishing weight at the end of production cycle that intensify the importance of a good start for ultimate better performance in commercial broilers [14]. Early chick nutrition is less studied, and most studies of nutritional requirements start at 7 d of age [15]. We hypothesized that early nutrition in the form of liquid feed supplement containing essential amino acids and vitamins would stimulate broiler growth which eventually affects bird's performance at marketable age. Therefore, experiment was conducted to assess the supplementation of liquid multivitamin and amino acid mixture EasyGrow™ in drinking water for first 7 days of life in Vencobb 400 broiler chicks.

## MATERIALS AND METHODS

### Ethical Approval

The study was conducted by authorized, qualified and trained veterinarian, scientists and technicians in compliance with the guidelines laid down by the Institutional Animal Ethics Committee. All applicable international, national, and/or institutional guidelines for the care and use of animals were followed. 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.

### Study Design

EasyGrow™ (M/s Natural Remedies Pvt Ltd., Bangalore, Karnataka, India) is a combination of essential amino acids and vitamins. A total of 10000 Vencobb 400 broiler chicks purchased from M/s. Bright Hatcheries, Bhopal were divided into two groups comprising 5000 chicks each. G1 served as a normal control and was fed with normal commercial feed; G2 was raised on normal commercial feed along with liquid supplement EasyGrow™ in drinking water at 1 ml/L water for first 7 days of lifecycle. The feed ingredients and composition of starter and finisher feed is detailed in Table 2.

### Experimental Setup

Field trial was conducted at Narmada Poultry Farm, Kherwadi, Nasik, Maharashtra, India between August, 2014 and September, 2014. Each bird was provided with a floor space of approximately 0.4 square feet throughout experiment till day 42. 5000 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 between day 4 and 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 poultry mash feed (starter feed with Metabolized Energy 3000 Kcal/kg and 20% crude protein from day 1 to day 21 and finisher feed with Metabolized Energy 3150 Kcal/kg and 18% crude protein from day 22 to 42) were provided *ad libitum* to chicks throughout the study period. The birds had free access (*ad libitum*) to feed and drinking water round the clock throughout the experimental period. The composition and specifications of feeds are provided in Table 1. 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.

Table 1. Feed ingredients and composition (as-fed-basis)

Ingredients	Starter Feed (g/kg)	Finisher Feed (g/kg)
Maize	643.84	658.00
Soya	255.00	228.10
Mustard Oil Cake	30.00	40.00
Meat and Bone Meal	32.89	10.00
Oil	16.31	36.20
Lime Stone Powder	3.40	9.52
Salt	1.95	2.23
Sheabutter cake	0.75	0.75
Methionine Hydroxy Analog	3.34	2.91
Lysine	3.38	3.21
Threonine	1.05	1.00
Vitamin Premix	0.50	0.50
Trace Minerals	1.00	1.00
Curatox-FS <sup>®</sup>	1.00	1.00
Choline Chloride	1.50	1.50
Biotronic <sup>®</sup>	1.00	10.00
Zigbir <sup>®</sup>	0.50	0.50
Coxistac <sup>®</sup> 12 %	0.60	0.60
R Sone <sup>®</sup> 20%	0.25	0.25
Ronozyme <sup>®</sup> WX	0.10	0.10
Ronozyme <sup>®</sup> NP	0.10	0.10
Lincomix <sup>®</sup> 20	0.08	0.08
Oxifin <sup>®</sup>	0.10	0.10
Dicalcium Phosphate	1.36	1.35
<b>Total</b>	<b>1000.00</b>	<b>1000.00</b>

### Observations and Measurements

The chicks in both groups were observed for clinical signs and mortality twice a day till day 42. Since the group size is very big (5000 birds per group), the body weight of 20% of total birds (1000 birds per group) was recorded using a weighing scale on day 1 and thereafter on day 7, 21 and 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 7, 21 and 42. On the basis of total body weight and feed consumption, the values of feed consumption to body weight ratio were calculated. 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<sup>™</sup> 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

All study parameters were assessed and recorded by farm supervisor using raw data sheets, verified by veterinarian and controlled by Principal Investigator. Upon completion of the trial, these raw data were compiled, processed and expressed as Mean  $\pm$  S.E.M.

## RESULTS AND DISCUSSION

In the present study the efficacy of EasyGrow™ was evaluated and assessed in male Vencobb 400 broiler chicks following oral supplementation at the dose of 1 ml per litre of drinking water for 7 consecutive days. The cumulative mortality, body weight gain, FCR and EPEF were calculated and assessed to evaluate the impact of EasyGrow™ 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 normal control over the six week period of chick's life cycle. It indicates that survivability / liveability of birds raised on feed along with supplementation of EasyGrow™ in water was better than normal control birds. Visual observation by a veterinarian revealed that the birds supplemented with EasyGrow™ at 1 ml/L water was found more active and plumage was shinier than normal control birds. It was also noticed that the technicians involved in the trial had to put in extra effort to catch the birds for weighing as birds in EasyGrow™ treated group was more active than control birds.

The mean body weight (g) of chicks prior to initiation of treatment was similar in both groups, but on day 42 EasyGrow™ 1 ml/L water treated birds showed an increase in body weight and body weight gain as compared to G1 (Normal control). FCR was decreased in EasyGrow™ 1 ml/L water treated birds as compared to normal control group on day 42 but it was not statistically significant. It indicates the birds treated with EasyGrow™ 1 ml/L water consumed 140 g less amount of feed per unit body weight gain compared to normal control. The European Production Efficiency Factor (EPEF) exhibited by normal control and EasyGrow™ 1 ml/L water treated birds was 259.27 and 287.01 respectively at slaughter. Return on investment was calculated per bird and the ratio of ROI showed by EasyGrow™ 1 ml/L water treated group was 1:24 (Table 2).

The above observation resembles the findings of Quentin *et al.* (2005) who 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.* (2004), Paul *et al.* (2010) and Rahman *et al.* (2012) also reported that vitamin supplementation along with normal feed increased the growth of broiler chickens by 3 to 12 % reflected in terms of body weight gain and feed efficiency.

Similarly body weight and breast muscle increased by 2-5 times in first 4 days [19] and yolk provides up to 50% of energy requirement on the 1st day and only 2% on 4th day [20]. The above evidence proves that an additional nutritional supplement (multivitamin and amino acids) is essential at the initial stage of broiler life cycle in order to get better output after six weeks duration. Hence in the present study, EasyGrow™ at 1 ml/L supplemented for first 7 days revealed a consistently gradual increment of body weight throughout six weeks life cycle and has shown a 2.6% more body weight gain when compared to normal control. The present results also confirm that growth of chicks and their performance in terms of reduction in mortality, body weight and FCR could be

enhanced by modifying the nutritional status during the first week of life through supplementation of liquid multivitamin and amino acid supplement EasyGrow™ in drinking water in Vencobb 400 broiler chicks.

Table 2. Impact of Easy Grow™ supplementation on performance parameters in Vencobb 400 broiler chickens

Parameter		G1 - Normal Control	G2 - EasyGrow™ 1 ml/L water
Mortality	Day 1-7	35	22
	Day 8-21	14	25
	Day 22-42	52	49
	Total Mortality	101	96
	Percentage	2.02	1.92
Body weight (gm)	Day 1	45	45
	Day 7	160	160
	Day 21	1000	1020
	Day 42	2145	2200
Body weight gain on day 42 (gm)		2100	2155
FCR	Day 1-7	1.05	1.05
	Day 8-21	1.55	1.52
	Day 22-42	1.93	1.79
Return on Investment (ROI)		G1 - Normal Control	G2 - EasyGrow™ 1 ml/L water
No. of birds		5000	5000
Live birds		4899	4904
Total weight (Kg)		10508	10789
Total feed (Kg)		19856	18917
Price of birds (Rs./Kg)		76	76
Cost of feed (Rs./Kg)		-25	-25
Live birds sold (Rs.) <sup>a</sup>		798635	819949
Total cost of feed (Rs.) <sup>b</sup>		-496391	-472923
Cost of EasyGrow™ (Rs.) <sup>c</sup>		0	-1820
Savings (Rs.) <sup>a-(b+c)</sup>		302244	345205
#Net savings (Rs.)		-	42961
Savings per bird (Rs.)		-	8.59
ROI ratio		-	1:24
#Net savings= Savings from G2 – Savings from G1			

## 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 Vencobb 400 broiler chickens in terms of body weight, weight gain and FCR which was evident through higher EPEF with low mortality rate and higher return on investment.

## ACKNOWLEDGEMENTS

The authors are thankful to the Managing Director, M/s. Natural Remedies Private Limited, Bangalore, India for providing the fund and resources to carry out the study. The support provided by Vinayak J Surve, Product Manager - Poultry through coordination with poultry farm and farm supervisor and his inputs while drafting the manuscript is also acknowledged.

## REFERENCE

1. D.V. Thomas and V. Ravindran. Mineral Retention in Young Broiler Chicks Fed Diets Based on Wheat, Sorghum or Maize. *Asian-Australasian Journal of Animal Sciences*, Vol.1, pp.68-73, 2010.
2. Y. Noy and D. Sklan. Yolk utilization in the newly hatched poultry. *British Poultry Science*, Vol.39, pp. 446-451, 1998.
3. O. Halevy, Y. Nadel, M. Barak, I. Rozenboim and D. Sklan. Early post-hatch feeding stimulates satellite cell proliferation and skeletal muscle growth in turkey poults. *Journal of Nutrition*, Vol.133, pp. 1376-1382, 2003.
4. K. F. Tona, B. Barnelis, V. De Kettelaere, V. Bruggeman, B. M. Moraes, J. Buyse, O. Onagbesan and E. Decuyper. Effects of egg storage time on spread of hatch, chick quality and chick juvenile growth. *Poultry Science*, Vol.82, pp. 736-741, 2003.
5. C. Careghi, K. Tona, O. Onagbesan, J. Buyse, E. Decuyper and V. Bruggeman. The effects of the spread of hatch and interaction with delayed feed access after hatch on broiler performance until seven days of age. *Poultry Science*, Vol.84, pp. 1314-1320, 2005.
6. M. A. Latour, E. D. Peebles, S. M. Doyle, T. Pansky, T. W. Smith and C. R. Boyle. Broiler breeder age and dietary fat influence the yolk fatty acid profiles of fresh egg and newly hatched chicks. *Poultry Science*, Vol.77, pp. 47-53, 1998.
7. P. F. Surai. Chick—models of the antioxidant processes. *Feed Mix. International Journal on Feed, Nutrition and Technology*, Vol.6, pp. 25-28, 1998.
8. G. Miltenburg. *Aviculturamoderna. AviculturaProfesional*, Vol.17(9), pp. 33-35, 1999.
9. K. Sahin, M. Onderci, N. Sahin, M. F. Gursuand O. Kucuk. Dietary Vitamin C and Folic Acid Supplementation Ameliorates the Detrimental Effects of Heat Stress in Japanese Quail. *The Journal of Nutrition*, Vol.133(6),pp. 1882-1886, 2003.
10. D. H. Baker. Advances in protein-amino acid nutrition of poultry. *Amino Acids*, Vol.37(1),pp. 29-41, 2009.
11. P. H. Hargis and C. R. Creger. Effects of varying dietary protein and energy levels on growth rate and body fat in broilers. *Poultry Science*, Vol.59, pp. 1499-1504, 1980.
12. M. Quentin, I. Bouvarel and M. Picard. Effects of starter diet, light intensity and

- essential amino acids level on growth and carcass composition of broilers. *Journal of Applied Poultry Research*, Vol.14, pp. 69-76, 2005.
13. C. D. Knight and J. J. Dibner. Nutritional programming in hatchling poultry: Why a good start is important. *Poultry Digest*, pp. 20- 26, 1998.
  14. I. Nir, Z. Nitsan and M. Mahagna. Comparative growth and development of the digestive organs and some enzymes in broiler and egg-type chickens after hatching. *British Poultry Science*, Vol.34, pp. 523- 532, 1993.
  15. Baker D H and HanY (1994). Ideal amino acid profilefor chicks during the first three weeks posthatching. *Poultry Science*, Vol. 73, pp. 1441–1447.
  16. M. S. Islam, M. E. R. Bhuiyan, M. I. A. Begum, M. A. Miah and M. Myenuddin. Effects of vitamin-mineral premix supplementation on body weight and certain haemato-biochemical values in broiler chickens. *Bangladesh Journal of Veterinary Medicine*, Vol.2(1),pp. 45-48, 2004.
  17. R. C. Paul, N. Ahmad, M. A. Moinuddin and N. Hasan. Effects of administration of multivitamins and enzymes for broilers either singly or in combination on body weight and haematobiochemical parameters *Journal of the Bangladesh Agricultural University*, Vol.8(1),pp. 39-44, 2010.
  18. M. A. Rahman, M. S. Parvin, R. R. Sarker and M. T. Islam. Effects of growth promoter and multivitamin-mineral premix supplementation on body weight gain in broiler chickens. *Journal of the Bangladesh Agricultural University*, Vol.10(2),pp. 245-248, 2012.
  19. K. Bigot, S. Tesseraud, M. Taouis and M. Picard. Alimentation neonatale et developpement precoce du poulet de chair. *INRA Productions Animales*, Vol.14,pp. 219-230, 2001.
  20. Z. Nitsan, G. Ben-Avraham, Z. Zoref and I. Nir. Growth and development of the digestive organs and some enzymes in broiler chicks after hatching. *Brazilian Journal of Poultry Science*, Vol.32, pp. 515-523, 1991.