



ISSN: 2456-2912
VET 2019; 4(5): 32-34
© 2019 VET
www.veterinarypaper.com
Received: 22-07-2019
Accepted: 24-08-2019

Saravanakumar Marimuthu
Animal Health Science, R&D
Centre, Natural Remedies
Private Limited, Plot 5B,
Veerasandra Industrial Area,
Electronic City PO, Hosur Road,
Bengaluru, Karnataka, India

Prashanth D'Souza
Animal Health Science, R&D
Centre, Natural Remedies
Private Limited, Plot 5B,
Veerasandra Industrial Area,
Electronic City PO, Hosur Road,
Bengaluru, Karnataka, India

Field performance of Kolin Plus, a poly herbal formulation to replace synthetic choline chloride

Saravanakumar Marimuthu and Prashanth D'Souza

Abstract

The trial was conducted to evaluate the translatability and reproducibility of performance efficacy of Kolin Plus in broiler chickens under field conditions. Studies were conducted in eight different commercial broiler farms across India. Farms were randomly designated as synthetic choline chloride (SCC) and Kolin Plus (KP) groups were raised on commercial broiler feed supplemented with SCC at 1000 g/ton and KP at 400 g/ton of feed respectively. At the end of the trial, performance parameters *viz.* body weight and feed conversion ratio (FCR) were evaluated. Overall the outcomes of the eight commercial field trial depicted that the performance traits of KP (400 g/ton) supplemented farms was at par with that of SCC (1000 g/ton) supplemented farms. In conclusion, the results of this commercial trial on translatability and reproducibility of *in-vivo* performance efficacy of Kolin Plus under field conditions, further strengthen the confidence levels to replace the 1000 g/ton of SCC with 400 g/ton of Kolin Plus in the poultry farmer/clients.

Keywords: Kolin Plus, SCC, FCR, body weight, field trial, translatability

Introduction

Choline is a rediscovered critical amino acid for poultry. Addition of choline in commercial broiler feed plays a pivotal role in enhancement of growth, performance, and in regulation of lipid metabolism [1]. Choline has three vital metabolic roles *viz.* 1. It acts as a constituent of phospholipids; 2. It helps to prevent accumulation of fat in the liver; and 3. It acts as a precursor for acetylcholine synthesis. It also has two non-essential function *i.e.* labile methyl group donation, and prevention of perosis in broiler chicks. In poultry, choline's methyl group is available after the conversion to betaine in the liver, which can be exchanged with choline for methylation purpose in the grower broiler chickens; However, betaine can't be replaced with choline to prevent perosis [2].

It was observed that methylation of aminoethanol to methylamino ethanol seems to be the rate limiting step in choline biosynthesis for young birds. High levels of dietary methionine or other methyl donors, therefore, cannot completely spare the chick's requirement of dietary choline in contrast to observation in growing mammals such as the pig or the rat [3]. Blusztajn reported that animals have the ability to synthesize choline themselves by using other nutrients according to their body requirement [4]; However, in contrast to the old reports, recent literature survey reveals the need of supplementation of choline along with diets for the normal metabolic activities and growth of broiler chickens [5].

Supplementation of choline in broiler diets in the form of synthetic choline chloride has been the general practice. However, SCC has numerous disadvantages *viz.* hygroscopic, acceleration of oxidative loss of vitamins in the diet and the formation of trimethylamine (TMA) in the gastrointestinal tract of the birds [6]. TMA is a short-chain aliphatic amine formed from dietary choline in a reaction catalyzed by bacterial enzymes within the gut [7]. It is found in high concentrations in fish and is responsible for the characteristic odour of seafood [8]. These drawbacks can affect the production of organic poultry [9]. Moreover, the bioavailability of SCC is very less, which eventually drawn the attention of researchers to explore the alternative source of choline from natural herbs. Selvam *et al.* reported the poly herbal formulation "Kolin Plus" has the potential to mimic the biological activities of SCC *in-vivo* at the dose of 400 g/ton in broiler chickens [10]. With this regard, the present study was conducted to evaluate the

Correspondence

Saravanakumar Marimuthu
Animal Health Science, R&D
Centre, Natural Remedies
Private Limited, Plot 5B,
Veerasandra Industrial Area,
Electronic City PO, Hosur Road,
Bengaluru, Karnataka, India

translatability and reproducibility of *in-vivo* performance efficacy of Kolin Plus in broiler chickens under field conditions.

Materials and Methods

Poly herbal formulation

Kolin Plus is a proprietary poly herbal formulation developed by M/s. Natural Remedies Pvt. Ltd., Bengaluru, India, containing *Acacia nilotica* and *Curcuma longa* plant parts.

Study sites and general management practices

Studies were conducted in eight different commercial broiler production farms across India. The dust free rice husk was used as litter material and was topped-up with fresh litter as on need basis. A thin layer of newspaper was placed on top of the litter to prevent the feeders and fountains from getting filled with rice husk for the first five days of study period. Each farm selected for trial purpose was equipped with a brooder, a bell drinker, a chick feeder, and/or jumbo feeder. The optimum temperature was maintained with the help of brooding lamps, fiery charcoal fumes and water sprinklers installed on the roof of shed depending on the environmental temperature and time of the day. Farms were visited twice daily for regular monitoring purpose. The chicks were provided with feed and water *ad libitum* [11] and the space was allocated as per the industry standard. No birds were removed during the conduct of study unless they died. Dead birds were composted or incinerated.

Study design

Each trial consisted of paired growing farms that were of the same design, had the same types of equipment, used feed

from the same lots and in which identical management practices were used. Houses in each pair were randomly designated as SCC and KP groups, and both the groups were raised on commercial broiler feed supplemented with SCC at 1000 g/ton and KP at 400 g/ton respectively.

Assessment of study parameters

At the end of rearing period, the body weight of chicks was recorded. The quantity of feed consumed by birds was determined by deducting the quantity of remaining feed over the total quantity of feed offered. Feed conversion ratio (FCR) was calculated by the ratio between the total quantity of feed consumed and the total body weight gain.

Results and discussion

There is a need to replace SCC with herbal formulation due to various disadvantages of SCC addition in commercial broiler diets. Hence, we have chosen an herbal formulation “Kolin Plus” that has already demonstrated the choline like function such as improvement of performance traits like weight gain, feed intake, feed conversion ratio and viability of broiler chickens [10]. Therefore, in the present study translatability and reproducibility of *in-vivo* performance efficacy of Kolin Plus was studied in commercial broiler farms.

The performance parameters (FCR and body weight) in all the eight KP (400 g/ton) supplemented farms was at par with that of SCC (1000 g/ton) supplemented farms (Table 1). The results of the present study were in concurrence with Selvam *et al.* in which the production performance of broiler chickens was improved when birds supplemented with “Kolin Plus” at 400 g/ton of feed [10].

Table 1: Effect of Kolin Plus on Performance Parameters

Farm No.	Age	FCR		Body Weight (Kg)	
		SCC Group (1000 g/ton)	KP Group (400 g/ton)	SCC Group (1000 g/ton)	KP Group (400 g/ton)
1	40	1.600	1.600	1.859	1.891
2	44	1.650	1.600	2.311	2.218
3	42	1.670	1.650	2.102	2.150
4	43	1.720	1.710	2.066	2.061
5	43	1.820	1.770	2.112	2.010
6	45	1.700	1.640	2.260	2.365
7	43	1.790	1.760	2.174	2.166
8	34	1.560	1.550	1.590	1.640
Average of 8 Trials		1.690	1.678	2.068	2.069

FCR, feed conversion ratio; SCC, Synthetic choline chloride; KP, Kolin Plus

In another study conducted by Pande and Durape, reported that there was no difference in body weight gain and gross pathology of liver between phytogenic product “Natchol” supplemented group (300 g/ton) and SCC supplemented group. However, there was better FCR and lesser accumulation of liver fat in birds of Natchol supplemented group as compared to SCC group. Hence, Pande and Durape concluded that phytogenic product “Natchol” at the dose of 300 g/ton could replace the SCC at 1000 g/ton dose in poultry diet without affecting the performance of birds [12]. Similarly, the current field trial data revealed that the efficacy of KP at the dose of 400 g/ton could be translated and capitalized in commercial farms.

Kolin Plus is a blend of combination of herbs namely *Acacia nilotica* and *Curcuma longa*, which are rich sources of polyphenols and curcuminoids respectively. Substantial literature evidences were available for the hepatoprotective and lipotropic activities of individual ingredients of Kolin

Plus [13, 14, 15]. Hence the growth performance effects of Kolin Plus *in-vivo* and field conditions could be attributed to the choline like function of individual ingredients present in the poly herbal formulation.

Conclusion

In conclusion, this commercial field trial on translatability and reproducibility of *in-vivo* performance efficacy of Kolin Plus under field conditions, further strengthen the confidence levels to use 400 g/ton Kolin Plus in the place of 1000 g/ton SCC in the farmers/clients.

References

1. Attia WA, El-Ganzory EH, Hassan RA. Growth, carcass quality & serum constituents of slow growing chicks as affected by Betaine addition to and diet containing on different levels of choline. J Poult. Sci. 2005; 4(11):840-850.

2. Workel HA, Keller TH, Reeve A, Lauwaerts A. Choline-the rediscovered vitamin for poultry. <http://www.poultrysite.com/articles/271/choline-the-rediscovered-vitaminfor-poultry>. May, 2002.
3. Kroening GH, Pond WG. Methionine, choline and threonine interrelationships for growth and lipotropic action in the baby pig and rat. *J Anim Sci.* 1967; 26:352-7.
4. Blusztajn JK. Choline and human nutrition. *Annu Rev Nutr.* 1994; 14:269-96.
5. Pesti GM, Harper AE, Sunde ML. Choline/Methionine nutrition of starting broiler chicks. Three models for estimating the choline requirement with economic Considerations. *Poult Sci.* 1980; 59(5):1073-81.
6. Zeisel SH, daCosta KA, Youssef M, Hensey S. Conversion of dietary choline to trimethylamine and dimethylamine in rats: dose-response relationship. *The Journal of nutrition.* 1989; 119(5):800-4.
7. Zeisel SH, Wishnok JS, Blusztajn JK. Formation of methylamines from ingested choline and lecithin. *J Pharmacol Exp Ther.* 1983; 225:320-4.
8. Zeisel SH, Dacosta KA. Increase in human exposure to methylamine precursors of N-nitrosamines after eating fish. *Cancer Res.* 1986; 46:6136-8.
9. Bender DA. Amino acid metabolism. Great Britain: John Wiley and Sons Ltd, 1975.
10. Selvam R, Saravanakumar M, Suresh S, Chandrasekeran CV, Prashanth DS. Evaluation of polyherbal formulation and synthetic choline chloride on choline deficiency model in broilers: implications on zootechnical parameters, serum biochemistry and liver histopathology. *Asian-Australasian journal of animal sciences.* 2018; 31(11):1795.
11. NRC. Nutrient requirement of poultry. 9th rev. ed. Washington, DC, USA: National Academy Press, 1994.
12. Pande CB, Durape NM. Replacement of synthetic choline in Poultry Diet - The Phytogetic Way. <https://en.engormix.com/poultry-industry/articles/replacement-synthetic-choline-poultry-t34690.htm>. 20 Sep, 2010.
13. Kannan N, Sakthivel KM, Guruvayoorappan C. Protective effect of *Acacia nilotica* (L.) against acetaminophen-induced hepatocellular damage in wistar rats. *Advances in pharmacological sciences*, 2013.
14. Alli LA. Evaluation of root extract of *Acacia nilotica* on haematological and lipid profile in rats. *Eur J Med Plants.* 2016; 17:1-7.
15. Tranchida F, Shintu L, Rakotoniaina Z, Tchiakpe L, Deyris V, Hiol A *et al.* Metabolomic and lipidomic analysis of serum samples following *Curcuma longa* extract supplementation in high-fructose and saturated fat fed rats. *PLoS One.* 2015; 10(8):e0135948.