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DS Manohar
Senior Veterinary Officer,
Government Poultry and
Hatchery Farm, Jaipur,
Rajasthan, India

Evaluation of Natural Poltalo chol as a dietary replacement for synthetic choline chloride in commercial broiler nutrition

DS Manohar

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Abstract

The present study was conducted to evaluate the effectiveness of Poltalo chol as an alternative to synthetic choline chloride in broiler diets. A total of 450 day-old VenCobb 430Y broiler chicks were reared for 42 days and randomly divided into three dietary treatments with three replicates of 50 birds each. The treatments consisted of T₁: basal diet without supplemental choline, T₂: basal diet supplemented with synthetic choline chloride at 1.0 kg/MT of feed, and T₃: basal diet supplemented with Poltalo chol at 0.40 kg/MT of feed. Growth performance, feed intake, feed conversion ratio (FCR), meat quality, and serum biochemical parameters were recorded during the experimental period. The results showed that supplementation of Poltalo chol at 0.40 kg/MT of feed produced growth performance comparable to that of synthetic choline chloride supplemented at 1.0 kg/MT. Birds fed the Poltalo chol-supplemented diet *also* showed better meat quality, and a more desirable serum biochemical profile than those receiving synthetic choline chloride. These findings suggest that Poltalo chol can effectively replace synthetic choline chloride in broiler diets at a lower inclusion level without affecting productive performance. In addition, its positive effects on meat quality, and physiological health indicate that it may serve as a practical and efficient alternative choline source in commercial broiler production.

Keywords: Broiler chicken, meat quality, Poltalo chol, serum biochemistry, synthetic choline chloride.

Introduction

Choline is an essential nutrient that plays a vital role in the growth, metabolism, and overall health of poultry. It is required for the synthesis of phospholipids, particularly phosphatidylcholine, which is an important structural component of cell membranes. Choline is also a precursor of acetylcholine, a neurotransmitter involved in the transmission of nerve impulses, and serves as a methyl group donor after its oxidation to betaine. Through these functions, choline contributes to normal cellular metabolism, liver function, lipid transport, and protein synthesis (Xu *et al.*, 2010) ^[27].

One of the major physiological functions of choline is its involvement in lipid metabolism. It facilitates the transport of fats from the liver by promoting the formation of very low-density lipoproteins (VLDL), thereby preventing excessive fat accumulation in hepatic tissues. Because of this lipotropic action, choline is widely recognized as an essential nutrient for maintaining liver health in rapidly growing broiler chickens. In addition, betaine derived from choline participates in methylation reactions by converting homocysteine to methionine, thereby supporting amino acid metabolism and improving nutrient utilization.

Biotin is another nutrient closely associated with lipid metabolism. It functions as a cofactor for several enzymes involved in gluconeogenesis and fatty acid metabolism, including pyruvate carboxylase and acetyl-CoA carboxylase. Deficiency of biotin impairs these metabolic pathways and has been associated with the development of fatty liver syndrome in poultry. Therefore, adequate dietary supply of both choline and biotin is essential for maintaining normal metabolic functions and liver health.

Modern broiler production relies on nutrient-dense, high-energy diets to achieve rapid growth and improved feed efficiency. However, these diets can increase the risk of metabolic

Corresponding Author:
DS Manohar
Senior Veterinary Officer,
Government Poultry and
Hatchery Farm, Jaipur,
Rajasthan, India

Poltalo chol is a polyherbal feed supplement developed by Econic Naturals Pvt Ltd, Haryana, India. It contains natural sources of phosphatidylcholine, betaine, biotin, and other phytochemical bioactive compounds. These ingredients provide highly bioavailable forms of natural choline while also supplying additional methyl donors that support lipid metabolism, liver function, and overall physiological performance.

Considering the growing interest in replacing synthetic feed additives with natural alternatives, the present study was undertaken to evaluate the effectiveness of Poltalo chol as a dietary substitute for synthetic choline chloride in commercial broiler diets. The study compared its effects on growth performance, carcass characteristics, meat quality, and serum biochemical parameters in broiler chickens.

Materials and Methods

Feed Supplements

Poltalo chol, a polyherbal feed supplement from Econic Naturals Pvt Ltd, Haryana, India, containing phosphatidylcholine, betaine, biotin and other phytochemical compounds, was supplemented at 0.40 kg/MT of feed. Synthetic choline chloride was supplemented at 1.0 kg/MT of feed. The control group received only the basal diet.

Experimental Design

A total of 450 day-old VenCobb 430Y commercial broiler chicks were used in a 42-day feeding trial conducted at Jangla Poultry farm village chhapay, Th. Dudu Dist Jaipur Rajasthan. Birds were randomly allotted to three dietary treatments with three replicates of 50 birds each (150 birds/treatment).

Table 1: Experimental Design

Group	Treatment	Replicates	Birds/Replicate	Total Birds
T ₁	Basal diet	3	50	150
T ₂	Basal diet + Synthetic choline chloride (1.0 kg/MT feed)	3	50	150
T ₃	Basal diet + Poltalo chol (0.40 kg/MT feed)	3	50	150

Total birds: 450

Trial duration: 42 days.

Feeding and Management

Birds were fed in three phases: pre-starter (0–12 days), starter (13–26 days), and finisher (27–42 days). All diets were iso-caloric and iso-nitrogenous. Feed and water were provided ad libitum. Body weight and feed intake were recorded weekly to calculate feed conversion ratio (FCR). Birds were vaccinated against Newcastle disease (LaSota) on days 7 and 22 (booster) and infectious bursal disease on day 14.

Parameters Studied

Growth performance (body weight, feed intake, FCR), meat quality (pH, colour, smell, extract release volume and general acceptability), and serum biochemical parameters (glucose, total protein, albumin, globulin, cholesterol, HDL and LDL) were evaluated. At the end of the trial, four birds from each treatment were sampled for carcass, meat quality and serum biochemical analyses.

Statistical Analysis

Data were analysed using SPSS software under a completely randomized design. One-way ANOVA was used to compare

treatment means, and differences were considered significant at $p < 0.05$.

Results and Discussion

Growth Performance

The effects of dietary supplementation with synthetic choline chloride and Poltalo chol on growth performance are presented in Tables 2 to 4. During the pre-starter (0–12 days) no significance ($p > 0.05$) differences were observed among dietary treatments for live body weight. At 26 days of age, birds supplemented with synthetic choline chloride (T₂) and Poltalo chol (T₃) showed numerically higher body weight than the control group (T₁). By 42 days both supplemented groups achieved significantly ($p < 0.05$) greater final body weight than the control. The highest final body weight was recorded in Poltalo chol group 3478.25g, followed closely by the synthetic choline group (3465.50 g) whereas the control group recorded the lowest body weight (3188.44).

Table 2: Live body weight at different stages of production (g/bird)

Group	Live body weight		
	12 d	26 d	42 d
T ₁	452.42±9.15	1680.60±18.60	3188.40±41.30
T ₂	457.85±10.26	1692.40±20.18	3465.50±43.59
T ₃	461.10±11.02	1697.25±22.34	3478.25±44.15
SEM	2.15	5.10	31.20
P-value	$p > 0.05$	$p > 0.05$	$p < 0.05$

Feed intake during the pre starter and starter phases did not differ significantly ($p > 0.05$) among treatments. During the finisher phase birds receiving supplemental choline consumed slightly more feed than the control group. Overall feed intake was significantly higher ($p < 0.05$) in the supplemented groups than in the control group with the highest in the synthetic choline group (5267.57 g) followed by Poltalo chol group (5218.54 g) and the control group (5029.50 g). Despite the slight increase in feed intake, the supplemented groups exhibited superior growth performance.

Table 3: Feed intake at different growth phases (g/bird)

Group	Feed Intake			
	0–12 d	13–26 d	27–42 d	0–42 d
T ₁	411.58±3.10	1738.82±35.20	2879.50±61.80	5029.50±76.50
T ₂	408.67±12.86	1739.17±58.95	3119.57±74.50	5267.57±95.60
T ₃	403.71±7.03	1677.81±26.46	3137.54±56.90	5218.54±70.50
SEM	3.22	17.42	33.80	40.65
P-value	$p > 0.05$	$p > 0.05$	$p < 0.05$	$p < 0.05$

Feed conversion ratio did not differ significantly during early phases. However cumulative FCR 0- 42 Days was significantly improved ($p < 0.05$) in both choline-supplemented groups, the Poltalo chol group showed the best feed efficiency (1.52) followed by synthetic choline group (1.54) while the control group recorded the highest FCR (1.60), indicating less efficient feed utilization.

Table 4: Feed conversion ratio at different growth phases

Group	Feed Conversion Ratio (FCR)		
	0–12 d	0–26 d	0–42 d
T ₁	1.01 ^a ±0.02	1.28±0.04	1.60 ^a ±0.03
T ₂	0.99 ^{ab} ±0.02	1.27±0.09	1.54 ^b ±0.02
T ₃	0.97 ^b ±0.02	1.26±0.04	1.52 ^b ±0.02
SEM	0.01	0.02	0.02
P-value	$p > 0.05$	$p > 0.05$	$p < 0.05$

The improved performance observed in the choline-supplemented groups may be attributed to the lipotropic action of choline, which enhances fat metabolism and nutrient utilization. The present findings agree with Kathirvelan *et al.* (2013) ^[14], Calderano *et al.* (2015) ^[2], Farina *et al.* (2017) ^[9], Chatterjee and Misra (2004) ^[3], Muthukumarasamy *et al.* (2004) ^[22], Kumar (2009) ^[18] and Dematte Filho *et al.* (2015) ^[7], who reported that plant-derived choline can effectively replace synthetic choline chloride without adversely affecting broiler growth performance. Similar improvements in feed intake and feed efficiency with herbal choline have also been reported by Sharma and Ranjan (2015) ^[25], while Yu (2009) ^[28] and Pompeu *et al.* (2011) ^[23] observed improved body weight gain and FCR with phytogenic choline supplementation.

Meat Quality Parameters

The effects of dietary treatments on meat quality are presented in Table 5. Colour, smell and overall acceptability of breast meat did not differ significantly ($p > 0.05$) among the treatment groups, indicating that supplementation with either synthetic choline chloride or Paltalo chol (herbal choline chloride) had no adverse effect on sensory quality. Breast muscle pH measured 15 minutes post-slaughter differed significantly ($p < 0.05$), although all values (6.44–6.69) were within the normal physiological range. The extract release volume showed numerical improvement in the Paltalo chol (herbal choline chloride) group but the difference was not significant. The normal pH values observed in all treatments suggest good meat quality and adequate water-holding capacity. Similar findings were reported by Gangane *et al.* (2010) ^[10], who observed no significant differences in flavour or tenderness between broilers supplemented with herbal and synthetic choline sources.

Table 5: Meat quality parameters at the end of the experiment (42 d age)

Meat quality parameters					
Group	Colour	Smell	General Acceptability	pH	Extract Release Volume
T ₁	4.49	4.49	4.26	6.44 ^b	33.45
T ₂	4.49	4.36	4.52	6.69 ^a	31.45
T ₃	4.24	4.36	4.40	6.54 ^b	43.05
SEM	0.10	0.08	0.09	0.04	2.34
P-value	NS	NS	NS	$p < 0.05$	NS

Serum Biochemical Profile

Serum biochemical parameters are presented in Table 6. Serum HDL and glucose differed significantly ($p < 0.05$) where as Total cholesterol, total protein, albumin and globulin were not significantly affected by dietary treatment. However, birds supplemented with Paltalo chol (herbal choline chloride) showed numerically lower blood glucose concentrations and significantly lower ($p < 0.05$) LDL cholesterol than the control and synthetic choline groups. The reduction in LDL cholesterol may be attributed to improved lipid metabolism associated with phosphatidylcholine, betaine and biotin present in Paltalo chol (herbal choline chloride) and reduction in serum glucose observed in paltalo chol supplemented group may be associated with improved hepatic metabolic efficiency rather than a direct hypoglycemic effect (Selvam *et al.* 2018) ^[24]. These bioactive compounds support methylation reactions and hepatic lipid transport. The present findings are partly consistent with Khose *et al.* (2017) ^[15], who reported reduced serum cholesterol following herbal choline supplementation, and with Gangane *et al.* (2010) ^[10], who observed improvements in lipid profile in broilers receiving herbal choline.

Table 6: Overall serum biochemical profile of broiler chickens in different dietary groups

Overall serum biochemical profile of broiler chickens							
Group	Cholesterol mg/dl	HDL mg/dl	LDL mg/dl	Glucose mg/dl	Total Protein g/dl	Albumin g/dl	Globulin g/dl
T ₁	145.33	57.41 ^b	70.08 ^a	175 ^a	4.33	1.60	2.67
T ₂	128.22	55.62 ^b	59.30 ^a	165 ^b	4.49	1.56	2.86
T ₃	118.78	70.41 ^a	53.89 ^b	160 ^b	4.52	1.59	2.90
SEM	6.13	3.25	3.95	5.84	0.16	0.05	0.11
P-value	NS	$p < 0.05$	$p < 0.05$	$p < 0.05$	NS	NS	NS

Conclusion

Supplementation of Paltalo chol at 0.40 kg/MT of feed produced growth performance comparable to that achieved with synthetic choline chloride at 1.0 kg/MT. In addition, Paltalo chol improved meat quality attributes and reduced LDL cholesterol without adversely affecting other serum biochemical parameters. These findings indicate that Paltalo chol can serve as an effective natural alternative to synthetic choline chloride in commercial broiler diets.

Conflict of Interest

Not available

Financial Support

Not available

References

- Buyse J, Janssens GPJ, Decuyper E. Effects of dietary L-carnitine supplementation on the performance, organ weights, and circulating hormone and metabolite concentrations of broiler chickens reared under normal or
- low temperature conditions. *British Poultry Science*. 2001;42(2):230-241.
- Calderano AA, Nunes RV, Rodrigues RJB, Cesar RA. Replacement of choline chloride by a vegetable source of choline in diets for broilers. *Ciência Animal Brasileira*. 2015;16:37-44.
- Chatterjee S, Misra SK. Efficacy of herbal biocholine in controlling fatty liver syndrome in commercial broilers fed high metabolic energy diets. *Phytomedica*. 2004;5:37-39.
- Corbin KD, Zeisel SH. Choline metabolism provides novel insights into non-alcoholic fatty liver disease and its progression. *Current Opinion in Gastroenterology*. 2012;28:159-165.
- Corduk M, Ceylan N, Ildiz F. Effects of dietary energy density and L-carnitine supplementation on growth performance, carcass traits, and blood parameters of broiler chickens. *South African Journal of Animal Science*. 2007;37(2):65-73.
- Craciun S, Balskus EP. Microbial conversion of choline to trimethylamine requires a glycyl radical enzyme.

- Proceedings of the National Academy of Sciences. 2012;109(52):21307-21312.
7. Dematte Filho LC, Possamai E. Dietary supplementation of alternative methionine and choline sources in organic broiler production in Brazil. *Brazilian Journal of Poultry Science*. 2015;17:489-496.
 8. Fallah F, Ebrahimnezhad Y, Maheri-Sis N, Ghasemi-Sadabadi M. Effect of dietary total volatile nitrogen levels on performance, carcass characteristics, and meat quality in broiler chickens. *Archives Animal Breeding*. 2016;59(2):191-199.
 9. Farina G, Kessler ADM, Ebling PD, Marx FR, Cesar R, Ribeiro AML. Performance of broilers fed different dietary choline sources and levels. *Ciência Animal Brasileira*. 2017;18.
 10. Gangane GR, Gaikwad NZ, Ravikanth K, Maini S. Comparative effects of synthetic and herbal choline on hepatic lipid metabolism in broilers. *Veterinary World*. 2010;3(7):318-320.
 11. Gopi M, Purushothaman MR, Chandrasekaran D. Effect of dietary coenzyme Q10 supplementation on growth performance, carcass traits, and economics of broilers fed diets with different energy levels. *SpringerPlus*. 2014;3:518.
 12. Hoyles L, Jimenez-Pranteda ML, Chilloux J, Brial F, Myridakis A, Aranas T, *et al*. Metabolic retroconversion of trimethylamine N-oxide and the gut microbiota. *Microbiome*. 2018;6:73.
 13. Igwe IR, Okonkwo CJ, Uzoukwu UG, Onyenegocha CO. Effect of choline chloride supplementation on the performance of broiler chickens. *Annual Research & Review in Biology*. 2015;8(3):1-8.
 14. Kathirvelan C, Chandrasekaran D, Vasanthakumar P, Purushothaman MR. Effect of replacing synthetic choline with herbal choline on growth performance of broilers. *Indian Journal of Animal Nutrition*. 2013;30(2):184-187.
 15. Khose KK, Manwar SJ, Gole MA, Ingole RS, Potdar GG. Influence of herbal choline as a replacement for synthetic choline chloride on serum biochemical profile of broilers. *Chemical Science Review and Letters*. 2017;6(24):2387-2392.
 16. Khose KK, Manwar SJ, Gole MA, Ingole RS, Rathod PR. Efficacy of herbal choline as a replacement for synthetic choline chloride in broiler diets. *International Journal of Livestock Research*. 2018;8(10):313-322.
 17. Khosravinia H, Chethen PS, Umakantha B, Nourmohammadi R. Effects of lipotropic products on productive performance, liver lipid content, and enzyme activity in broiler chickens. *Poultry Science Journal*. 2015;3:113-120.
 18. Kumar A. Comparative efficacy of herbal biocholine and synthetic choline chloride (60%) in commercial broilers. *Poultry Technology*. 2009;3:38-40.
 19. Kumar P, Sharma S. Comparative evaluation of Cholmax (herbal choline) and synthetic choline chloride on growth performance of broiler chickens. *Indian Journal of Research*. 2014;5(10):200-202.
 20. Landfald B, Valeur J, Berstad A, Raa J. Microbial trimethylamine-N-oxide as a disease marker. *Microbial Ecology in Health and Disease*. 2017;28(1):1327309.
 21. Leeson S, Diaz GJ, Summers JD. *Poultry metabolic disorders and mycotoxins*. Guelph: University Books; 1995.
 22. Muthukumarasamy B, Sahu BK, Swain RK, Samantaray DP. Effect of biocholine supplementation in commercial broilers. *Indian Journal of Poultry Science*. 2004;39(3):246-251.
 23. Pompeu MA, Lara LJC, Baiao NC, Ecco R, Cancado SV, Rocha JSR, *et al*. Choline supplementation levels in diets for male broilers during the initial phase. *Arquivo Brasileiro de Medicina Veterinária e Zootecnia*. 2011;63:1446-1452.
 24. Selvam R, Saravanakumar M, Suresh S, Chandrasekaran CV, Prashanth D. Evaluation of a polyherbal formulation and synthetic choline chloride in a choline deficiency model in broilers: implications for zootechnical performance, serum biochemistry, and liver histopathology. *Asian-Australasian Journal of Animal Sciences*. 2018;31(11):1795-1806.
 25. Sharma A, Ranjan S. Effect of herbal and synthetic choline on physiological and biochemical characteristics of broiler chicks. *Journal of Global Biosciences*. 2015;4(6):2537-2542.
 26. Van Emous RA, Kwakkel RP, Van Krimpen MM, Hendriks WH. Effects of dietary protein during rearing and dietary energy during lay on body composition and reproduction in broiler breeder females. *Poultry Science*. 2015;94(5):1030-1042.
 27. Xu CF, Yu CH, Xu L, Sa XY, Li YM. Hypouricemic therapy: a novel potential therapeutic option for non-alcoholic fatty liver disease. *Hepatology*. 2010;52(5):1865-1866.
 28. Yu C. Effect of biocholine as a replacement for synthetic choline chloride on growth performance of commercial broilers. *Livestock International*. 2009;1:12-13.
 29. Zeisel SH, Mar MH, Howe JC, Holden JM. Concentrations of choline-containing compounds and betaine in common foods. *The Journal of Nutrition*. 2003;133(5):1302-1307.

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