Journal of Harbin Engineering University
ISSN: 1006-7043

Vol 47 No. 03
March 2026

Broiler Feed Formulation and Relative Efficacy of Cynodondactylon in Poultry Development

Praveena A[1], Vaidhyanathan B[1], Karthickkumar. R[1], Dhasarathan P[1*]
1 - Dept. of Biotechnology, Prathyusha Engineering College, Tiruvallur- 602025
*Corresponding Author: pdhasarathan@gmail.com

ABSTRACT

Meat Products and notably eggs play a important role in our diet. For consumption of those products as a dietary source dietary products for the growth of those broiler is an very important factor for the constant growth of broilers as per the cycle and their growth depends on the level of a balanced protein along with other nutrients (Trace Elements).In Major Parts Broilers are allowed to graze for consumption of food apart from the regular diet followed, also it is said from research that Bermuda grass is said to improve the immunity of the broilers and also very significant effect that eggs layed by those broilers have high xanthophyll pigmented yolk than those of the broilers which consumed regular dietary source So, the main aim of this study include Bermuda grass (Cynodondactylon) as an constituent in the composition of the poultry feed .Broiler feeds are formulated starting from the chicks and their nutritional properties are analyzed which are essential for the growth of the broilers. Phytochemicals are extracted from Bermuda grass and analyzed using GC-MS analysis, for the comparative study of the regular dietary composition with the dietary composition which includes Bermuda grass chicks are reared and the feed which are formulated was given as a dietary source for the chicks and the chicks which consumed diet with Bermuda grass shows significant difference in their body mass than the chicks which consumed regular diet.

Keywords: Broiler Feed, Cynodon, Dactylon, Dietary Source, Immunity, Xanthophyll.

1. **INTRODUCTION**:

In poultry farming, feeding practices are crucial since they affect the health, output, and general welfare of the birds. Adding poultry feed supplements to the diet is an important component of these tactics. The nutritional value of the diet can be greatly increased by these supplements, which can result in increased growth rates, better egg production, and stronger immunity. Poultry feed supplements are carefully designed additives that offer vital vitamins, minerals, and other nutrients that are insufficiently present in a regular diet. These dietary supplements are essential for increasing Growth Rates: Amino acid and protein supplements help build muscle and promote general growth, enhancing Egg Production: For higher egg quality and quantity, vitamins like D3 and calcium, supplementat are, crucial, boosting Immunity (Ammar Altemimi *et al*., 2017).

Improving the feed efficiency would increase profitability for producers while also reducing the environmental footprint of livestock production. Significant loci and genes affecting the metabolizable efficiency traits were explored with an imputation-based, genome-wide association study. The traits measured or calculated comprised three growth traits, five feed efficiency related traits, and nine metabolizable efficiency traits (David Hallam *et al*., 2012)

In feed manufacturing, the need for an effective combination of ingredients to produce a complete feed for animals is well known. However, limited quantitative data illustrate the effect of low homogeneity on the performance of animals. This study was conducted to determine the coefficient of variation (CV) of feed mixtures produced with different mixing times and the effects of these feeds with varying homogeneity consumed by 1–40-day-old broilers on their feed intake, body

weight gain, feed conversion, mortality, and body weight uniformity. The mixing times used were 30, 60, 90, and 120 s, and the CV obtained from the feeds ranged from 49.5% to 5.4%. A linear decrease was observed in the feed CV with increasing mixing time, but sometimes, a longer mixing time did not present the lowest CV. The influence of the lack of feed homogeneity on the performance of broilers was mainly observed in body weight gain and, in some cases, in feed conversion. The effects on feed intake were more consistent for broilers older than 22 y. days, increasing body weight gain without affecting feed conversion. Our results suggest that feeds with CVs up to 22.6% had no adverse effects on the performance of broilers older than 12 days, and the lack of uniformity in broiler body weight was not influenced by feed homogeneity (Farsani *et al*., 2012)

MATERIALS AND METHODS

Materials Required for Broiler Feed Formulation 1)Soyabean, Meal,Corn,Toxin Binder(yeast) Oyster Shell ,Palm Kernel Cake are Purchased in departmental Stores In and around Madhavaram, Wheat offal fenugreek, Oats (Substitute for amino acids Lysine and Methionine) is Purchased in Mathur, MMDA 2)Four Different types of feed are Formulated Using the Composition Broiler's Starters Mash, Broiler's Growers Mash, Broiler's Finisher Mash and Broiler's Fattener Mash 3)Quantity of the ingredient used in the composition is calculated based upon the amount of feed prepared 4) Bermuda grass was collected from Prathyusha Engineering College, The grass was washed thoroughly with distilled water,and then it is allowed to shade dry for about two weeks. The dried grasses were grinded into small pieces.

Broiler Feed with and without Bermuda Grass: Feed A (Without Bermuda Grass) 11g Corn, 22g groundnut cake 11g sunflower seed was weighed, dried and grinded using a mixer Feed B (With Bermuda Grass) Bermuda Grass was shade dried before weighing 10g of corn, 21g of groundnut cake ,10g of Sunflower seed and 4g of shade dried bermuda grass was grinded using mixer and brought into powdered form (Szeitz *et al*., 2024).

Phytochemical, constitution of bermudagrass are Alkaloids, Saponins, Phenols, Flavonoid, Terpenoids, Tannins, Steroids.

RESULTS AND DISCUSSION

The Aqueous ethanol-Aqueous chloroform extract of Bermuda grass showed nine peaks from the chromatogram of the extract. Out of the 9 components methyl ester shows the highest peak (RT=22.45), estra-1-3,5(10)-trien-17a-ol,3 methoxy 17[2-methyl allyl] shows the second highest peak (RT=20.3), followed by 4-H-1- benzopyran-4-one,5,7-dihydroxy-2[4-hydroxy-3-methoxy phenyl (RT=19.07), coumarine (RT=18.27), phytol (RT=17.62), n-hexadecanoic acid (RT=16.68), flavone (RT=16.03), terpineol (RT= 14.9).The least peak value is shown by isoterpinolene (RT=11.72) (fig 1 & Table 1, 2).

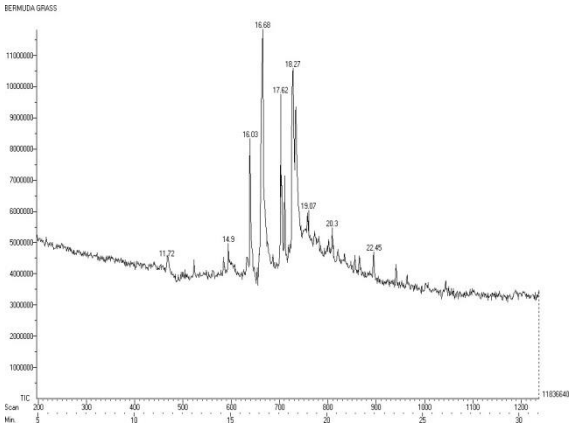


Fig 1. Chromatogram of Bermuda grass obtained by GC-MS analysis.

Table 1: List of compounds present in Bermuda grass obtained from GC-MS analysis

S.No	Compound	Retention Time
1	Methyl este	22.45
2	Estra-1-3,5(10)-trien-17a-ol, 3 methoxy 17-[2-methyl allyl]	20.3
3	4-H-1-Benzopyran-4-one,5,7- dihydroxy-2 [4-hydroxy-3-methoxy	19.07

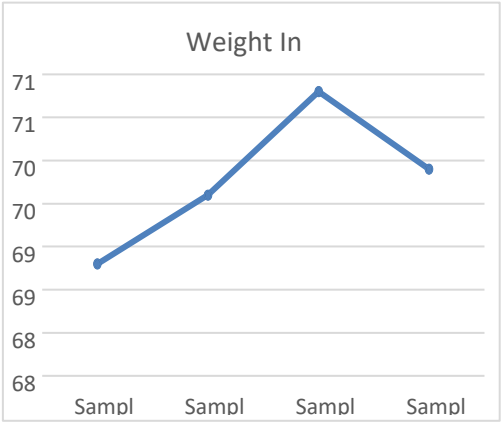
4	Coumarine	18.27
5	Phytol	17.62
6	N-Hexadecanoic acid	16.08
7	Flavone	16.03
8	Terpineol	14.9
9	Isoterpinolene	11.72

Table 2 : Results of Lipinski drug filters of Bermuda grass

Compound	H Bond Donor	H Bond Acceptor	Molecular Mass (g/mol)	Log P
Flavone	0	2	222.243	3.56
Terpineol	1	1	154.253	2.98
Isoterpinolene	0	0	136.23	3.5

FEED A – Nutritional Analysis, Percentage of Vitamins and Minerals Found as per analysis: Niacinamide : 4.8328 mg/gm, Vitamin B6 : 0.7460 mg/gm,Vitamin B2: 0.9863 mg/gm,Calcium : 1.7940mg/gm, Magnesium :3.8815 mg/gm,Sodium : 171.0 mg/gm,Potassium : 34.5 mg/gm, Phosphorus : 20.34 mg/gm Chloride: 229mg/gm .FEED B – Nutritional Analysis: Percentage of Vitamins and Minerals Found as per analysis: Niacinamide : 4.2618 mg/gm, Vitamin B6 : 0.6449 mg/gm,Calcium:4.8048mg/gm, Magnesium:3.3083 mg/gm, Sodium : 213.8 mg/gm, Potassium : 55.3 mg/gm, Phosphorus : 33. 5mg/gm, Chloride: 286.2 mg/gm

Comparative Graph on the weight gain of the chicks fed with FEED A and FEED B



In Bermuda Grass Xanthophyll a carotenoid Pigment shows high potential of nutrient growth for Chick Eggs (Ram et al.,2014). GC-MS analysis has been performed to find out the biologically active compounds present in the grasses (Layne , 1957 and Pehrsson *et al*., 2020). From the GC-MS analysis 9 components are found to be present in grass.

The Caretenoid Compound is found using Column Chromatography and HPLC Technique.Estrogen and Progesterone Harmones are responsible for the production of eggs (Szeitz *et al*., 2024). Thus the Secondary Metabolites Present in the Bermuda grass is screened using various Tests.

SUMMARY AND CONCLUSION

In conclusion, broiler feed formulation is an important aspect of poultry farming that requires careful attention to detail, knowledge of nutritional requirements, and awareness of industry trends and regulations. By understanding the needs of their birds and implementing best practices in feed management, farmers can ensure that their broiler production remains profitable, sustainable, and competitive in the fast-evolving poultry market.The annual production of eggs has registered a four-fold increase during the last 15 years. The government of India fixed targets for annual production of poultry with a view to ensure availability of eggs and broilers both to meet domestic consumption as well as export. With this projected development of the poultry industry, the demand for production of balanced poultry feed has become imperativeIn. Bermuda Grass Xanthophyll a carotenoid Pigment shows high potential of nutrient growth for Chick Eggs (Ram et al.,2014). GC-MS analysis has been performed to find out the biologically active compounds present in the grasses. From the GCMS analysis 9 components are found to be present in grass. TheCaretenoid Compound is found using Column Chromatography and HPLC Technique.

REFERENCES

1. Ammar Altemimi., Naoufal Lakhssassi., Azam Baharlouei., Dennis G. Watson., David A. Lightfoot. (September 2017). “Phytochemicals: Extraction, Isolation, and Identification of

Bioactive Compounds from Plant Extracts". Plants (Basel). 2017 Sep 22;6(4):42. doi: 10.3390/plants6040042. PMID: 28937585; PMCID: PMC5750618.

2. David Hallam., Frank Rose., Ann Berg. (May 2012). "Food Outlook –Global Market Analysis" (PDF), Food and Agriculture Organization of the United Nations, pp: 8, 51–54.

3.Farsani, T.M., Etemadi, N., Sayed-tabatabaei, B.E., Talebi, M. (2012). "Assessment of Genetic Diversity of Bermuda grass (Cynodondactylon) Using ISSR Markers", Int J Mol Sci, 13(1) pp: 383-392.

4. Szeitz A, Sutton AG, Hallam SJ. A matrix-centered view of mass spectrometry platform innovation for volatilome research. Front Mol Biosci. 2024 Oct 30;11:1421330. doi: 10.3389/fmolb.2024.1421330. PMID: 39539739; PMCID: PMC11557394.".

5.Pehrsson, P.R., Haytowitz, D.B., Holden, J.M., Perry, C.R., Beckler, D.G. (2000). "USDA's National Food and Nutrient Analysis Program: Food Sampling" (PDF). Journal of Food Composition and Analysis. pp: 379–389.

6. Penny M. Kris., Kari Hecker., Andrea Bonanome., Stacie M. Coval., Amy E. B compounds in foods: their role in the prevention of cardiovascular disease and cancer", pp: 71-88.

7. Layne E. Spectrophotometric and turbid-metric methods for measuring Proteins Methods in Enzymology 1957.10: 447-445.