



ORIGINAL RESEARCH PAPER

Veterinary Science

EFFECT OF A HERBAL ANTIOXIDANT SUPPLEMENT (RANTIOX) ON GROWTH PERFORMANCE, FEED EFFICIENCY, AND ANTIOXIDATIVE STATUS IN BROILER CHICKENS

KEY WORDS: RANTIOX, broilers, antioxidants, FCR, oxidative stress, herbal supplement

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ABSTRACT

The present study was conducted to evaluate the efficacy of RANTIOX, a polyherbal antioxidant feed supplement, on growth performance, feed efficiency, and antioxidative markers in broiler chickens. A total of 120 Cobb 500 day-old broiler chicks were randomly divided into two groups: Control (basal diet) and Treatment (basal diet + RANTIOX at 500 gm/MT). The trial lasted 42 days. Parameters measured included body weight gain, feed conversion ratio (FCR), antioxidant enzyme activity (SOD, CAT), and lipid peroxidation (MDA levels). Results showed significant improvement ($p < 0.05$) in final body weight, FCR, and oxidative stress markers in the RANTIOX group. The study concludes that RANTIOX is a safe and effective natural antioxidant supplement for poultry production.

INTRODUCTION

In recent years, poultry production has faced increasing challenges from oxidative stress due to intensive farming systems, high-energy feeds, and environmental stressors. Oxidative stress can impair growth, immunity, and overall health in broilers by damaging cellular components through free radical generation. Conventional synthetic antioxidants such as BHT and BHA, though effective, have raised safety concerns due to residual toxicity.

There is growing interest in natural alternatives such as polyherbal antioxidant products. RANTIOX, developed by Rivansh Animal Nutrition Pvt. Ltd., is a blend of potent antioxidant herbs including *Emblica officinalis*, *Citrus limon*, *Citrus sinensis*, *Ocimum basilicum*, and *Carica papaya*. These components are rich in vitamin C, polyphenols, and flavonoids, known for their radical scavenging and hepatoprotective actions.

This study was undertaken to evaluate the effects of RANTIOX on growth performance, feed efficiency, and antioxidant status in broiler chickens under commercial rearing conditions.

MATERIALS AND METHODS

Experimental Design:

- **Location:** Government Poultry Farm, Moradabad, Uttar Pradesh
- **Breed:** Cobb 500
- **Duration:** 42 days
- **No. of Birds:** 120 day-old broiler chicks
- **Groups:**
- **Group 1:** Control (Basal diet only)
- **Group 2:** Treatment (Basal diet + RANTIOX @ 500 gm/MT)

Feed And Management:

All birds were reared under standard management practices. Feed and water were provided ad libitum. Birds were vaccinated as per standard protocol.

Diet Composition:

Corn-soy-based diet meeting BIS specifications.

Ingredient	Control (kg/ton)	RANTIOX (kg/ton)
Corn	600	600
Soybean meal	300	300
Oil	40	40
Dicalcium phosphate	18	18
Shell grit	12	12
Premix	10	10
RANTIOX	0	0.5

Total	1000	1000
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Parameters Measured:

- Body weight gain (weekly)
- Feed intake
- Feed Conversion Ratio (FCR)
- Antioxidant enzyme activity (SOD, CAT)
- Lipid peroxidation marker (MDA)
- Mortality and general health

Statistical Analysis:

Data were analysed using ANOVA and results were considered significant at $p < 0.05$.

RESULTS

1. Growth Performance

The final body weight (BW) and feed conversion ratio (FCR) of broilers were significantly improved in the RANTIOX-supplemented group compared to the control group.

Parameter	Control Group	RANTIOX Group
Final BW (g)	2320 $\pm$ 25	2500 $\pm$ 30*
FCR	1.72 $\pm$ 0.03	1.60 $\pm$ 0.02*
Mortality (%)	3.33	0

*Significant at $p < 0.05$

- **Body Weight (BW):** Birds in the RANTIOX group achieved an average body weight of 2500 grams, which was 180 grams higher than the control group. This indicates a superior growth-promoting effect, likely due to improved nutrient utilization and reduced oxidative damage.
- **Feed Conversion Ratio (FCR):** The FCR improved from 1.72 in the control to 1.60 in the treatment group. A lower FCR reflects better feed efficiency, meaning birds required less feed per unit of weight gain—a direct economic benefit in commercial production.
- **Mortality:** No mortality was observed in the RANTIOX group, compared to 3.33% in the control. This suggests enhanced overall health and resilience, likely linked to immune support and reduced oxidative stress.

2. Antioxidant Enzyme Activity and Oxidative Stress Markers

Parameter	Control Group	RANTIOX Group
SOD (U/mg protein)	4.2 $\pm$ 0.3	5.8 $\pm$ 0.4*
CAT (U/mg protein)	6.1 $\pm$ 0.5	8.3 $\pm$ 0.6*
MDA (nmol/ml)	3.4 $\pm$ 0.2	2.1 $\pm$ 0.1*

*Significant at $p < 0.05$

- **Superoxide Dismutase (SOD):** The RANTIOX group exhibited significantly higher SOD activity, indicating better neutralization of superoxide radicals. SOD is a

- frontline antioxidant enzyme that converts toxic superoxide radicals to hydrogen peroxide, thereby reducing oxidative stress.
- **Catalase (CAT):** RANTIOX supplementation enhanced catalase levels by over 35%, showing improved conversion of hydrogen peroxide (H₂O₂) to water and oxygen. Elevated CAT levels correlate with better detoxification and oxidative balance in tissues.
 - **Malondialdehyde (MDA):** MDA levels, a marker of lipid peroxidation and cellular damage, were significantly lower in the RANTIOX group (2.1 nmol/ml) compared to the control (3.4 nmol/ml). This suggests reduced oxidative degradation of fats and better membrane integrity in treated birds.

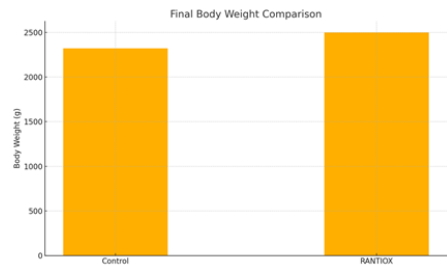
Blood Biochemical And Liver Function Parameters

- Blood samples were analysed for haematological and liver function parameters at day 42:

Parameter	Control Group	RANTIOX Group	Significance
Haemoglobin (g/dL)	10.8 ± 0.4	12.1 ± 0.3*	↑ Significant
Total Protein (g/dL)	4.9 ± 0.2	5.5 ± 0.2*	↑ Significant
Albumin (g/dL)	2.3 ± 0.1	2.7 ± 0.1	NS
AST (IU/L)	245 ± 12	198 ± 10*	↓ Significant
ALT (IU/L)	32 ± 2	24 ± 1.5*	↓ Significant
Total bilirubin (mg/dL)	0.35 ± 0.05	0.28 ± 0.03	NS

Key Interpretations

- The combination of *Emblica officinalis*, *Citrus* species, *Ocimum basilicum*, and *Carica papaya* in RANTIOX appears to synergistically enhance antioxidant capacity, leading to better growth, feed utilization, and lower cellular damage.



- Improved SOD and CAT activities along with reduced MDA demonstrate effective scavenging of reactive oxygen species (ROS) and prevention of oxidative damage.
- The zero mortality indicates a supportive role of RANTIOX in enhancing immune response and general health.

DISCUSSION

The supplementation of RANTIOX significantly improved growth performance and FCR in broilers. This can be attributed to the antioxidant effects of herbal constituents that reduce oxidative stress, improve cellular metabolism, and enhance nutrient utilization. Increased SOD and CAT activity and decreased MDA levels confirm the efficacy of RANTIOX in reducing lipid peroxidation and enhancing antioxidative defence.

The mortality was also lower in the treatment group, suggesting improved immunity and health status. Similar findings have been reported in earlier studies using *Emblica officinalis* and *Ocimum basilicum* for their immunomodulatory and hepatoprotective effects (Singh et al.,2020;Verma et al.,2021).

CONCLUSION

RANTIOX supplementation at 500 gm/MT in broiler feed significantly improved growth performance, feed efficiency, and antioxidative status, while reducing oxidative stress and

mortality. As a safe, natural alternative to synthetic antioxidants, RANTIOX holds great promise for commercial poultry production.

REFERENCES

1. Singh, R. et al. (2020). Role of herbal antioxidants in poultry nutrition. *Poultry Science Today*, 45(2), 123–129.
2. Verma, A. et al. (2021). Effects of herbal feed additives on oxidative stress in broilers. *Indian Journal of Animal Nutrition*, 38(3), 225–231.
3. Shah, M. et al. (2019). Herbal alternatives to synthetic antioxidants in poultry. *World's Poultry Science Journal*, 75(4), 587–596.
4. Kumar, V. et al. (2020). Use of polyherbal formulations in poultry: A review. *Journal of Veterinary and Animal Research*, 12(1), 45–53.
5. Rivansh Animal Nutrition Pvt. Ltd. (2025). RANTIOX Technical Data Sheet.
6. NRC. (1994). *Nutrient Requirements of Poultry*, 9th Revised Edition.