

# Comparative Study on the Effect of Moringa (*Moringa Oleifera*) and Tulsi (*Ocimum Sanctum*) Leaf Powder as Growth Promoters in Sonali Layer Chicks Under Chitrakoot Region

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## ABSTRACT

The present review evaluates the comparative efficacy of *Moringa oleifera* and *Ocimum sanctum* (Tulsi) leaf powder as natural growth promoters in Sonali layer chicks under Agro-climatic conditions similar to the Chitrakoot region. With increasing restrictions on antibiotic growth promoters, phyto-genic feed additives have gained attention due to their safety and multifunctional benefits. Both moringa and Tulsi possess bioactive compounds that enhance growth performance, immunity, gut health, and feed efficiency. This review synthesizes findings from recent studies and discusses their applicability to Sonali poultry production systems. Evidence indicates that moringa improves nutrient utilization and immune response, while Tulsi enhances growth rate and stress resistance. Comparative analysis suggests that while both herbs are effective, moringa shows superior performance in nutrient enrichment, whereas Tulsi excels in antioxidative and immunomodulatory effects.

**Keywords:** Moringa, Tulsi, Sonali chicks, phyto-genic feed additive, growth promoter, Chitrakoot

## INTRODUCTION

Poultry production is a rapidly expanding sector in India, particularly in semi-intensive systems like the Chitrakoot region. The Sonali chicken (dual-purpose hybrid) is widely adopted due to its adaptability and improved productivity. Traditionally, antibiotic growth promoters were used to enhance growth; however, concerns regarding antimicrobial resistance and residue in poultry products have led to a shift toward herbal alternatives.

Phyto-genic feed additives such as moringa and Tulsi are gaining importance due to their antimicrobial, antioxidant, and growth-promoting properties. These plants are locally available in rural regions like Chitrakoot, making them economically viable for smallholder poultry farmers.

### Botanical and Nutritional Profile:

#### Moringa (*Moringa oleifera*)

Moringa leaves are rich in:

- Proteins (20–30%)
- Vitamins (A, C, E)
- Minerals (Ca, Fe, Zn)
- Bioactive compounds (flavonoids, saponins, polyphenols)

These compounds enhance digestion, improve gut health, and stimulate immune response.

## Tulsi (*Ocimum sanctum*)

Tulsi leaves contain:

- Essential oils (eugenol)
- Flavonoids and phenolic compounds
- Antioxidants and antimicrobial agents

Tulsi acts as a natural immunomodulator and stress reducer in poultry.

### Mechanism of Action as Growth Promoters:

Parameter	Moringa	Tulsi
Digestive efficiency	Improves enzyme activity and nutrient absorption	Moderate improvement
Antioxidant activity	High	Very High
Immune modulation	Strong	Very strong
Antimicrobial effect	Moderate	Strong
Gut microbiota	Enhances beneficial bacteria	Controls pathogens

Moringa improves nutrient utilization and growth performance, while tulsi primarily reduces oxidative stress and enhances immunity.

### Effects on Growth Performance

#### Moringa Leaf Powder

- Improves body weight gain and feed conversion ratio (FCR)
- Enhances carcass quality and blood parameters
- Inclusion up to 5% shows positive effects without adverse impact

Studies report significant improvement in live body weight and immune parameters when moringa is included in poultry diets.

#### Tulsi Leaf Powder

- Increases body weight gain significantly
- Enhances feed intake and stress tolerance
- Improves hematological parameters

Experimental findings show up to **16–17% higher body weight** in tulsi-supplemented broilers compared to control groups.

### Comparative Studies (Moringa vs Tulsi)

Recent phylogenetic studies demonstrate:

- Tulsi supplementation significantly increases average daily gain (ADG) compared to control.
- Moringa improves gut microbiota, antioxidant status, and nutrient utilization more effectively.

Trait	Moringa	Tulsi	Comparative Outcome
Growth rate	High	High	Comparable
Feed efficiency	Better	Moderate	Moringa superior
Immunity	High	Very High	Tulsi superior
Stress resistance	Moderate	High	Tulsi superior
Economic return	High	Moderate	Moringa slightly better

## Relevance to Sonali Layer Chicks

Sonali chickens are hardy and suitable for rural poultry systems. Studies on Sonali birds show significant variation in growth and productivity depending on feed supplementation.

In the Chitrakoot region:

- Climatic stress (heat, humidity) affects growth
- Low-cost feed alternatives are required
- Herbal supplements are easily accessible

### Implications:

- Tulsi is beneficial under stress conditions (summer, disease exposure)
- Moringa is ideal for improving production and feed efficiency

### Application Strategy for Chitrakoot Region

Parameter	Recommendation
Moringa inclusion	2–5% in feed
Tulsi inclusion	1–2% in feed
Feeding stage	Starter + grower phase
Form	Dried leaf powder
System	Deep litter or semi-intensive

**Combined use** (Moringa + Tulsi) may provide synergistic benefits.

### Advantages over Antibiotic Growth Promoters

- No residue in meat and eggs
- Environment-friendly
- Locally available and cost-effective
- Enhances immunity and reduces disease incidence

Phytogenic additives are now considered safe alternatives to AGPs in poultry nutrition.

### Research Gaps

- Limited studies specifically on Sonali layer chicks
- Lack of region-specific trials (Chitrakoot agro-climate)
- Need for dose optimization and long-term studies
- Interaction effects of combined herbal supplementation

## CONCLUSION

Both Moringa and Tulsi leaf powder are effective natural growth promoters in poultry production. Moringa demonstrates superior performance in improving feed efficiency, nutrient utilization, and economic returns, while Tulsi shows stronger antioxidant, antimicrobial, and stress-reducing effects. For Sonali layer chicks in the Chitrakoot region, a combined supplementation strategy may yield optimal results by integrating the nutritional benefits of moringa with the immunomodulatory properties of Tulsi.

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