

INTEGRATED FEEDING AND HOUSING STRATEGIES TO MITIGATE SUMMER STRESS IN LAYER CHICKENS

Akshaya P¹, Kumaravel V^{2*} and Vasanthakumar P³

¹PG Diploma Scholar, ³Professor and Head, Department of Animal Nutrition,
Veterinary College and Research Institute, Namakkal – 637 002, Tamil Nadu, India.

²Assistant Professor, Veterinary Clinical Complex,
Veterinary College and Research Institute, Orathanadu – 614 625
Tamil Nadu Veterinary and Animal Sciences University
E-mail: drkumaravelv@gmail.com (*Corresponding Author)

Abstract: This study investigated feeding and housing strategies adopted by commercial layer farms in Namakkal district, Tamil Nadu, to mitigate summer stress. Data were collected from ten farms (BV-300 strain, 1.0 to 1.5 lakh birds each) during 2023–2024 using questionnaires, farm records and interviews. Summer conditions led to 12–18 % reduction in feed intake, 7 to 10 % decline in Hen Day Egg Production (HDEP), 4 to 6 % reduction in egg weight and 15 % increase in broken eggs. To counter these effects, farms adopted cooler hours feeding (89%), wet feeding (60%), increased feeding frequency (97%) and feed withdrawal during hot hours (95%). Crumble feed for chicks (98%) and mash feed for growers and layers (100%) were common. Supplementation included electrolytes (90%), sodium bicarbonate (95%), Vitamin C (85%) and Vitamin E (70%). Water management included flushing pipelines (80%) and tank/pipe insulation (90%), while housing interventions involved roof whitewashing (100%), sprinklers/foggers (90%) and fans (80%). Lighting practices such as extended photoperiod (60%) and midnight lighting (45%) were moderately adopted. These findings highlight the effectiveness of integrated feeding, nutritional, water and housing measures in sustaining productivity during summer stress.

Keywords: Layer chickens, heat stress, feeding strategies, nutritional supplementation, housing management.

INTRODUCTION

The poultry industry in India is among the fastest-growing sectors, producing 138.38 billion eggs in 2022–23 with an annual growth rate of 6.77% [3]. Tamil Nadu contributes 15.58% of the national total, with Namakkal recognized as the ‘egg capital of India.’ Approximately 45 million layers are maintained in this district under commercial cage systems.

Summer in Namakkal often reaches 42°C, imposing severe heat stress on layer chickens [5]. Heat stress reduces feed intake, egg production, egg weight and eggshell quality while increasing mortality [7]. Feeding management, including feed form, feeding schedules, nutrient adjustments and supplementation with electrolytes and vitamins plays a central role in alleviating these impacts [2, 9]. This study documented the adoption rates of feeding and

environmental strategies in commercial layer farms during summer and evaluated their contribution to sustaining production.

MATERIALS AND METHODS

The study was conducted in Namakkal district, Tamil Nadu, during the peak summer season of 2023–2024. Ten commercial farms were randomly selected, including three from Mallasamudram block and seven from Rasipuram block. Each farm housed 1.0 to 1.5 lakh BV-300 strain layers in elevated cage systems.

Data collection involved: (a) pre-structured questionnaire to farm managers, covering feeding schedules, feed form, nutrient supplementation, water management and housing interventions; (b) examination of farm records for feed intake, Hen Day Egg Production (HDEP), egg weight, broken egg incidence and livability; and (c) interviews with farmers to verify practices and understand their rationale. Adoption percentages for each practice were calculated based on the proportion of farms implementing them. The effects of summer stress were quantified using farm records and compared against seasonal averages.

RESULTS AND DISCUSSION

Impact of Summer on Production Performance across farms: Summer caused 12 to 18 % decline in feed intake, 7 to 10 % reduction in HDEP and 4 to 6 % fall in egg weight. Broken egg incidence increased by 15 %, while livability decreased by 2 to 3 %. These production losses stem largely from hyperventilation and respiratory alkalosis, which reduce blood CO₂ and limit calcium carbonate deposition for eggshell formation [4]. Similar seasonal declines in laying performance have been reported under tropical conditions [7]. Farmers noted that consecutive hot days compounded the negative impacts.

Feeding and Nutritional Strategies: Feeding adjustments were widely adopted (Fig. 1). Wet feeding was practised in 60% of farms, while 89% shifted feeding to cooler morning and evening hours. Almost all farms (97%) increased feeding frequency to 3 to 4 times/day. Additionally, 95% implemented feed withdrawal during peak hot hours to reduce metabolic heat production. Feed form adjustments were common, with crumble feed provided for chicks in 98% of farms and mash feed used for growers and layers in 100%.

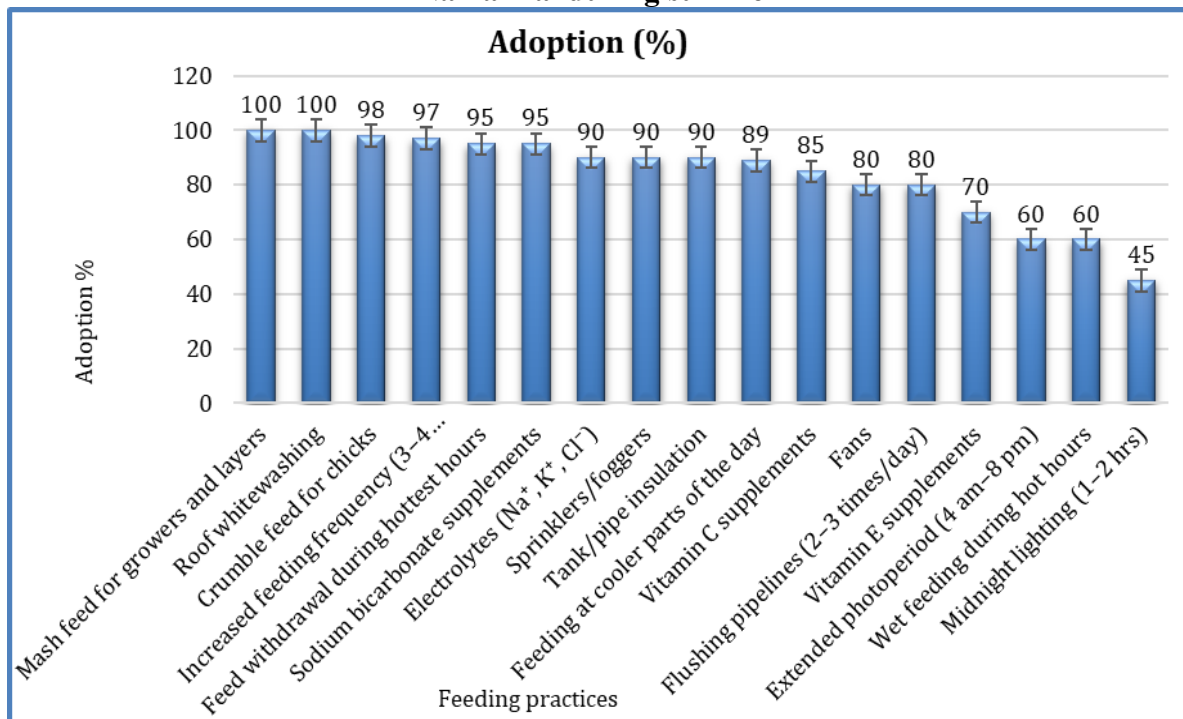
Nutritional supplementation also played a critical role. Electrolytes were administered in 90% of farms, sodium bicarbonate in 95%, Vitamin C in 85%, and Vitamin E in 70%. These interventions help maintain acid–base balance, enhance antioxidant defence and minimize oxidative damage during thermal stress [2].

Water Management Practices: Water related interventions were also important. Flushing pipelines 2–3 times/day was practised in 80% of farms, while 90% insulated overhead tanks and pipelines to maintain cool water temperatures. Ensuring access to cool and clean water is critical under hot conditions, as water intake increases considerably with rising ambient temperatures.

Housing and Environmental Modifications: Housing modifications were widely adopted to reduce heat load. Roof whitewashing was practised in all farms (100%), sprinklers or foggers in 90% and fans in 80%. These measures are cost-effective and simple to implement. Lighting interventions such as extended photoperiod (60%) and midnight lighting (45%) were moderately adopted. Farmers who implemented night lighting reported improved feed intake during cooler hours, consistent with previous findings [8].

Overall Adoption: The results indicate that farmers in the Namakkal region rely heavily on simple, practical measures to mitigate summer stress. While advanced mechanized cooling systems were less common, the integration of feeding, supplementation, water and housing strategies provided substantial resilience. Similar reliance on integrated approaches has been reported in other tropical poultry producing regions [6].

Figure 1. Adoption (%) of feeding and housing practices in commercial layer farms of Namakkal during summer



CONCLUSION

Summer heat imposes significant challenges in commercial layer farms of Namakkal region, leading to 10 to 15 % decline in feed intake, 5 to 8 % reduction in hen-day egg production and 2 to 3 g decrease in average egg weight, along with higher incidence of broken eggs. To counter these losses, farmers adopted several key interventions at high levels: increased feeding frequency (97%), feed withdrawal during peak heat (95%), sodium bicarbonate supplementation (95%), electrolyte use (90%), roof whitewashing (100%) and sprinklers/foggers (90%). These practices highlight the reliance on simple, low-cost and effective measures. However, comparatively lower adoption of lighting strategies, such as extended photoperiod (60%) and midnight lighting (45%), suggests potential areas for improvement. Overall, integrated nutritional and housing modifications play a pivotal role in sustaining egg production and flock resilience during prolonged heat stress.

RECOMMENDATIONS

- Structural modifications such as roof whitewashing, sprinklers and foggers to reduce thermal load effectively.
- Nutritional management with electrolytes, sodium bicarbonate and antioxidants, vitamins to maintain physiological balance.
- Lighting strategies, including extended photoperiod and midnight lighting, are used to encourage feed intake during cooler hours.
- Affordable mechanized cooling systems to complement low-cost interventions for long-term sustainability.

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