

Popular Article

IMPACT OF HEAT STRESS ON GROWTH PERFORMANCE OF BROILERS AND ITS MANAGEMENT

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Introduction

Broiler chickens, the primary source of meat in the poultry industry, are highly sensitive to environmental changes, particularly heat stress. Heat stress is defined as a condition in which there is a rise in body temperature of birds above their normal thermal comfort zone. With rising global temperature, heat stress has become a major problem for poultry farmers. Effects of heat stress on broilers are examined under this article and strategies to mitigate its impact on growth.

Understanding Heat Stress in broilers

Like other warm-blooded animals, broilers keep their internal body temperature constant. Heat stress occurs in birds when they cannot dissipate excess heat efficiently, leading to a rise in core body temperature, cause dehydration, and affects their system. For broilers the most critical threshold is usually around 30-32°C (86-89.6°F). Above this temperature, broilers begin to show signs of heat stress such as panting, reduced feed intake and sluggish

movement. More serious effects such as higher death rates, weakened immune system and decreased production may occur if temperature continues to rise any further.

Effects of Heat Stress on growth performance

- Reduced feed intake: A reduction in feed intake in broilers is the earliest sign of heat stress. Broilers become less active and show a drop in feed intake when they are not able to regulate their body temperature. Growth rate and overall performance are greatly affected when feed intake reduces.
- Impaired digestion and absorption: The digestive system of broiler is severely affected by high temperatures. Heat stress decreased the efficiency of enzymatic digestion, resulting in improper nutrient absorption. Bird's ability to convert those nutrients into growth is decreased even if they are

consuming adequate amounts of feed.

- Increased water consumption: In order to regulate their body temperature, broilers increase their water intake during heat stress. It helps in maintaining their hydration level but also dilutes the nutrients in the digestive tract, further complicating nutrient absorption and growth.
- Reduced weight gain and feed conversion efficiency (FCR): Lower weight gain in broilers is caused by a combination of lower feed intake, poor digestion and increased water intake. The feed conversion ratio (FCR) of birds decreases in heat stress, which measures how efficiently birds convert feed into body mass. It means more feed is required to achieve the same growth rates, which raises the cost of production.
- Increased mortality rates: Death rates increase due to severe heat stress. Younger and weaker birds are more prone to heat stress which can result in organ failure, heat stroke, and even death.

Mechanisms behind Heat Stress in broilers

- Thermoregulatory mechanisms: To cool their bodies, broilers show panting by opening their beaks and increasing their respiratory rate. Panting helps in evaporative cooling, but it also results in the loss of electrolytes and water. It leads to dehydration, causing negative effects on growth.
- Alterations in hormones and metabolism: Heat stress elevates the level of cortisol, which is a stress hormone. It also activates other hormonal responses. This can result in low immunity, more susceptibility to diseases and decreased protein synthesis. In addition, birds become unable to gain weight and build muscles when metabolic processes such as fat and protein metabolism are altered.

Methods for reducing the effects of Heat Stress:

Heat stress severely affects the growth performance of broilers. Poultry farmers can reduce its effects in a number of ways.

- Environmental control: Heat stress is the main problem in poultry houses so to prevent it there should be ideal environmental conditions in poultry houses like temperature,

humidity, etc. For maintaining it, ensure proper ventilation by using fans and evaporative cooling systems to regulate temperature and humidity levels.

- **Nutritional modifications:** There should be proper nutrition for birds that are suffering from heat stress. It is necessary to adjust their diet to specific requirements. Energy utilization in birds can be increased when we reduce crude protein content and increase fat content in their diet. In addition, we can also reduce the negative effects of heat stress by supplementing the diet with phytogenic preparation. These phytogenic compounds have anti-inflammatory, antioxidant, gut health promoting and immunomodulatory properties.
- **Adequate water supply:** Provide a constant supply of clean, cool water for managing heat stress in broilers. Water not only helps in temperature regulation but also assists in the digestion and absorption of nutrients.
- **Developing strains resistant to heat:** By developing heat-resistant strains that are more heat-tolerant, including selective breeding for heat-resistant traits, such as

improved thermoregulation, helps in solving this issue.

- **Managing stocking density:** Overcrowding is the main reason for heat stress in poultry houses. It reduces air circulation and increases competition for resources like food and water among birds. So there should be proper stocking density that helps reduce some of the stress associated with high temperatures.

Conclusion

The growth performance of broilers is severely affected by heat stress which causes reduced feed intake, poor feed conversion ratio (FCR), slower weight gain and higher mortality rates. The effects of heat stress are complex and involve various physiological, hormonal, and metabolic changes. Although, with the efficient management strategies, such as environmental control, dietary adjustments and selective breeding, poultry farmers can control the effect of heat stress and enhance broiler performance. As climate change continues to affect global temperatures, managing heat stress in poultry farming will become even more difficult to ensure sustainable and efficient poultry production.