FEBRUARY 2023 | VOL. 35

Poultry Extension Collaborative Newsletter

A collaboration between Purdue University, University of Arkansas, University of Georgia and Virginia Tech

Cold stress in poultry

- **Costs and consequences**
- **Behavioral signs**
- **Reducing risks**

Cold temperatures can have severe consequences for poultry health and welfare

Most people are very familiar with the severe consequences that heat stress can have on poultry (see our previous newsletter), but cold stress can have severe production and economic consequences as well, leading to reduced egg production, reduced survivability, suppressed development and death.

Cold stress can affect poultry in any housing system and during lairage and transportation.

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Costs and consequences of cold stress

The consequences of cold stress can be severe, leading to death in extreme cases. A chicken's susceptibility to cold stress depends on various factors, including the chicken's breed, age, body size, amount of feather coverage and condition of the feathers and nutritional status.

The combs and wattles are susceptible to frostbite

Consequences of cold stress

- Reduced egg production in egg-laying birds
- Reduced feed efficiency (consuming more but producing less)
- Potential weight loss
- Economic losses from reduced egg production and growth
- Reduced welfare due to stress
- Increased susceptibility to disease
- Depending on how poultry are housed, they can develop frostbite
  - Petroleum jelly can be applied to combs and wattles to reduce the risk of frostbite
- Changes in the quality of the meat from meat birds resulting in meat defects

The ideal environmental temperature range for most poultry lies between 15 and 24°C (60 and 75°F).

The ideal temperature depends on amount of feather cover, age, and body weight of the bird, as well as the stocking density (number of birds in a given amount of space), housing system and management.

Older birds and birds with poor feather cover are especially at risk of cold stress because their feathers do not provide as much insulation. Birds that are wet are at an increased risk of cold stress and can die sooner when exposed to cold.

Cold stress occurs when the bird's core body temperature drops below its thermoneutral zone (between 15 and 24°C (60 and 75°F) for most poultry, but this depends on the bird's age, body weight and feather cover). The thermoneutral zone is the range of ambient temperatures within which the animal can maintain its body temperature without needing any additional energy. When the body temperature drops below this thermoneutral zone, the bird needs more energy to increase its body temperature, and will adapt its behavior.

Behavioral indicators of cold stress

- Reduced activity level
- Changes in the noise levels of chicks
- Huddling together to conserve heat
- Ruffling the feathers to reduce heat loss
- Shivering
- Eating more to gain energy from food and generate heat from metabolism

Birds may huddle or consume more feed during cold stress

Reducing the risks of cold stress

- Ensure birds have access to feed. Higher fiber feeds can increase heat production but feed still needs to have appropriate energy levels. Feed also needs to have optimum methionine levels to maintain good feather condition.
- Provide fresh, clean water that is not frozen
- Provide supplemental heat (from heaters that are properly maintained and functioning) but be careful and heed safety precautions because some heat sources can be fire hazards
- Provide dry, clean bedding
- Ensure that there is adequate ventilation
- Providing perches helps reduce cold stress because chickens are not in contact with the cold ground

Sources used and further reading

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