

Dealing With Summer Heat in Free Range Poultry

F. Dustan Clark
Extension Veterinarian

Jonathan Moyle
Research Associate,
USDA, Agricultural
Research Service

As temperatures increase in the summer, special attention needs to be paid to birds maintained on pasture. In order to help birds cope with hot weather, it is important to understand how birds cool themselves. Because birds are homoeothermic, they need to maintain a constant body temperature and have mechanisms to get rid of excess heat. There are two general categories of heat loss, the first of which is **sensible heat loss**. Sensible heat loss increases the temperature of surrounding air or objects. There are three types of sensible heat loss: radiation, conduction or convection.

1. *Radiation* refers to heat flow that occurs without the aid of a material medium; in other words, it occurs when heat flows from the surface of the bird to the surrounding air. An example of this is when the sun heats a metal roof. The amount of heat lost by radiation decreases as air temperature increases and becomes closer to the body temperature. Heat radiating off other birds is one reason that they spread out when it is hot. Birds also hold their wings out away from their bodies to increase their surface area during hot weather to help increase radiant heat loss.
2. *Conduction* refers to contact heat exchange between two objects that differ in temperature. Conductive heat loss occurs when animals lie on a cool surface, which is why birds will lay in shady areas during the heat of the day. Breeders sometimes put frozen bottles of water into pens with birds so they can cool themselves during hot weather.

3. *Convection* is the third mechanism of sensible heat loss and involves the movement of heat by streams of particles. Convection occurs when moving air (wind) comes in contact with the skin and carries heat away. Another example of convection is how heat is transported by the blood, which flows in particles from the core of the body to the outer surface. This is why modern commercial poultry houses have so many fans to move the air quickly over the birds to help cool them.

The second general category of heat loss is **latent heat loss**, which refers to heat loss that does not result in an increase in the temperature of the surrounding air. In poultry, insensible heat loss occurs in the respiratory tract, where heat is used to vaporize water that is then exhaled. Large amounts of heat are removed when water is vaporized in the respiratory tract when poultry pant during hot weather. Because water vapor is lost instead of heat, the temperature of the surrounding air is not increased. Because latent heat loss is dependent on the evaporation of water, increases in humidity decrease the amount of latent heat loss.

In order to help birds deal with the heat, management practices need to maximize the bird's ability to dispense heat. Some important things that growers can do to help are:

- **Water**

Birds need to be provided with water at all times in order to prevent dehydration. Remember, birds cool themselves by panting

*Arkansas Is
Our Campus*

Visit our web site at:
<https://www.uaex.uada.edu>

which works because of moisture evaporating in the lungs. Without water, poultry can die very quickly. Cool water can help birds keep cool and increase water consumption, while hot water can lower water consumption. Keep waterers out of direct sunlight and replace water often to help keep the water cooler.

- **Feed**

Eating and digesting feed also produces heat. Therefore, feeding birds during the cooler hours of the day will help keep them from overheating.

- **Shade**

Shade provides a place for birds to get out of direct sunlight in order to lessen the amount of heat the birds receive by radiation from the sun. Additionally, shady areas are cooler and provide birds with some relief from the heat. Be careful though, as birds held in confinement will sometimes move to the darkest location even if it is hotter than less shaded areas. If the darkest area is enclosed and does not have good ventilation, the heat radiating off birds can cause the temperature to increase rapidly resulting in the death of the birds.

- **Ventilation**

The movement of air (convection) over the birds is one of the best ways to help birds maintain their body temperature during hot weather. Orienting poultry housing to take advantage of prevailing winds can help increase air movement. Removing brush and low-hanging tree limbs can help increase air movement around birds. Also, make sure the wire on pens is clean and free of debris so that air can move easily. Additionally, fans can be used to help cool birds during times of excessive heat.

- **Humidity**

High humidity can cause a lot of problems for birds. As the humidity increases, latent heat loss becomes more difficult for birds. Therefore, when humidity is high, ventilation needs to be increased to help birds cope with the heat.

- **Wetting Birds**

Many growers spray water on their birds or dunk them in water to wet them down during hot weather. This method can quickly lower the body temperature, but if the birds are housed in an enclosed area with little ventilation, this can lead to an increase in humidity which can make it difficult for birds to continue to cool themselves.

- **Ground Cover**

The type of pasture can also have an effect on how much heat is radiated back onto the birds. Green vegetation is cooler than dried dead vegetation and barren ground. If possible, maintain birds on good pasture by watering the area where they are going to be maintained during dry weather.

- **Density of Birds**

Lowering the number of birds in pens during hot weather can also help birds deal with high temperatures by allowing them to spread out more. Also, for birds maintained indoors, fewer birds generate less heat which allows birds to cool themselves easier.

- **Type and Size of Birds**

Meat-type birds have a harder time cooling themselves than smaller egg-type birds because of their larger size. Broilers (Cornish X Rock hybrids) in particular can have difficulty cooling themselves due to the large amount of muscle mass that they possess. This difficulty in cooling themselves during hot weather increases as the birds grow. Therefore, harvesting broilers at a smaller size during hot weather can help reduce mortality associated with heat. Selecting breeds that are appropriate for the climate in which you reside and avoiding the growing of large meat birds in the summer can help reduce mortality due to heat.

Printed by University of Arkansas Cooperative Extension Service Printing Services.

DR. F. DUSTAN CLARK, DVM, is associate Poultry Center director and Extension veterinarian with the University of Arkansas Division of Agriculture at the Center of Excellence for Poultry Science, University of Arkansas, Fayetteville. **JONATHAN MOYLE** is research associate with the USDA-Agricultural Research Service, Poultry Production and Product Safety Research Unit, at the University of Arkansas, Fayetteville.

FSA8010-PD-1-13N

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director, Cooperative Extension Service, University of Arkansas. The Arkansas Cooperative Extension Service offers its programs to all eligible persons regardless of race, color, national origin, religion, gender, age, disability, marital or veteran status, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer.