

650 Riverbend Drive, Suite C
Kitchener, Ontario, Canada N2K 3S2

Phone +1-519-578-2740

Fax +1-519-578-1870

www.hybridturkeys.com

Minimizing the Effects of Heat Stress

Heat stress in poultry is a serious problem. Mortality and production losses during extremely hot weather can be significant. Heat stress normally occurs anytime the barn temperature is more than 80°F (27°C). The additive effect of humidity must also be considered. Follow weather reports which will advise if the heat/humidity will be a danger to humans. If humans are at risk, so are turkeys.

Above 80°F (27°C), egg weight can be negatively affected as a result of reduced feed consumption and the resulting shortage of protein and energy intake. In addition to decreased feed intake, smaller egg size, and poorer shell quality, egg production itself tends to fall during heat stress for the same reasons. A hen's body temperature varies from about 105°F to 107°F (41°C to 42°C). So, if the environmental temperature meets or exceeds this, the turkey's ability to lose heat could totally stop or even reverse, increasing the hen's body temperature. At a body temperature of about 117°F (46°C), death occurs in turkeys.

While it is impossible to prevent all detrimental effects of heat stress, there are a number of management tools that can be used to improve conditions for turkeys.

Helping Birds Cope With Heat Stress

- House Surroundings
- Keep grass and weeds cut short around the barn- they restrict airflow into the buildings.

- Tall shade trees can dramatically reduce radiant heat, but should be positioned so they do not reduce airflow.
- Build barns that will avoid direct sunlight on the birds (i.e., build barns so that the ridge line runs east and west).
- A 4-foot canopy or shade cloth can be hung from the eaves of the barn to restrict direct sunlight without limiting airflow.

Ventilation

Air movement must be at bird level. This will help to remove body heat and cool the bird. A light breeze of 4 miles (2.4 km)/hour (350 ft./min.) reduces the effective temperature sensed by the bird by 10 F° to 15 F° (5 C° to 8 C°).

- Curtain sided barns should have at least one 36-inch fan (1/2 hp, 11,000 cfm) inside the barn for every 40 to 50 feet (12m-15m) of length.
- Position circulation fans inside the barn so they blow with prevailing winds.
- Turn fan thermostats down to 74°F (23°C) during the day to ensure that the fans will run long enough into the evening to give the birds a chance to cool off.
- Plastic or wooden baffles should be used to force the moving air downward to ensure that the birds receive the maximum advantage.
- Make sure fan belts are tight. A loose belt can reduce fan efficiency by 30 percent or more.

- Replace old fan belts. If the sides of the fan belt are worn, the belt will tend to ride lower in the fan and motor pulleys, decreasing the speed at which the fan rotates. A reduction in fan speed of 10 percent will decrease the airflow by 10 percent.

Shutters and/or screens on air inlets need to be cleaned daily or as required to allow maximum flow of air.

Ensure alarm systems are working. Keep margins between the high and low temperatures close enough to get full use of the equipment, as it was intended.

Water

- Water is critical during hot weather. Inspect the watering system frequently to ensure that water flow is constant and unrestricted.
- Replace all water filters and have replacements on hand. During the summer, water consumption can be two to three times as much as during the winter. As a result, filters become clogged much faster. Water meters are very useful to monitor water consumption.
- Use vitamins or electrolytes in the water during the summer to help hens recover the loss of vitamins due to reduced feed intake.
- Ensure adequate drinkers throughout the barn. For bell type drinkers, 100 birds per drinker is recommended. The depth of water in the drinkers should be increased so that birds have easy access to water. Heat stressed birds may not walk that extra distance to get to a drinker.
- Bacteria grow much more rapidly in the water lines during hot weather. It is very important to do whatever possible to guarantee water sanitation (i.e. oxidation reduction potential of greater than 650 mv).

- Dump drinkers and flush water lines as often as possible during hot weather to ensure water is consistently as cool as possible.

Feed

- Birds that have recently eaten generate heat during the digestion process which they need to dissipate. During heat stress, the objective is to have birds eat and empty as much of their digestive tract as possible before the heat of the day occurs.
- In some cases, managers have been known to provide a “midnight snack”. This means a 1-2 hour feeding period during the cooler hours of the night to stimulate the birds to eat and drink.
- The use of ascorbic acid (vitamin C) in the feed and/or in the drinking water has become a common practice during the summer months.

Evaporative Cooling

- This can be done through the use of simple roof sprinklers. Pads can be placed in any of several possible arrangements in the barn. High pressure/low volume-type foggers may also be used.
- Ensure all equipment has been checked, cleaned and is operational before heat becomes a factor.

Note: The extent of cooling achieved through passive evaporative cooling depends on the relative humidity of the incoming air. The drier the air, the more evaporation can occur and the greater the cooling effect.

Services

- Bird handling (such as selection, AI, loading, moving, vaccination, etc.) must be done with extreme caution and in the cooler hours of the day.
- Avoid any type of bird handling that can be postponed.

Space

- Increase floor space per bird during hot weather in barns with marginal ventilation and evaporative cooling systems. Reducing bird numbers reduces the amount of heat the ventilation system must remove from the barn. Increasing floor space also increases watering space and availability.
- Studies have concluded that increasing bird numbers in properly designed and operated evaporatively cooled, tunnel-ventilated barns during the summer months can be economically justified. Breeding Stock

Breeding Stock

Lighting

Coordinate the lights “on” period during dark-out stages to match the heat of the day (conditioning breeders).

Hours of Light	Lights “On” Period
8	9am - 5pm
7	10am - 5pm
6	10am - 4pm

Egg Production

- In some barn types it is possible to help summer production by gathering eggs more often. This forces the hens to spend less time sitting on a hot nest.
- If possible, provide additional air circulation over the nesting area.
- Make sure that the bedding around the drinkers and the area in front of the nests are kept as dry as possible (Hens tend to nest in the wet areas because it is cooler).
- Reduce storage period of hatching eggs on the farm if hatchability is affected in any way.
- Make sure that the egg cooler and the air conditioner in the holding area, are providing the correct temperature.

Broody Control

- Ensure that pen size can house more than the normal amount of broody hens (minimum 0.05 m² (0.5 ft²)/hen).
- Provide change in litter type from main pen.
- Provide good air movement.
- Provide fresh feed and water.

Under extreme conditions, avoid or postpone broody control.

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