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HOW TO MANAGE HEAT STRESS ?

The comfortable ambient temperature for poultry is between 18 and 24°C (64 / 75°F). Above this, birds fail to maintain their normal internal body temperature (41.6°C / 107°F), due to the absence of sweat glands and complete feather coverage of their body. When the ambient temperature rises above the ideal, a chicken's internal body temperature also rises, leading to a drop in feed consumption (> 28°C / 82°F), heat stress (> 30°C / 86°F), panting, prostration (> 38°C / 100°F) and death (> 42°C / 108°F). Failing to manage heat stress results in poor layer production.

GENETIC POINT OF VIEW

At Novogen, we focus on selecting birds with the highest efficiency and the best Feed Conversion Ratio (FCR) across all conditions. This means selecting pullets and layers that are highly adaptable to all production systems, climates, and types of feed. Our presence in many countries where heat stress is common or recurring makes this adaptability essential.

HEAT REGULATION IN LAYERS

How birds release excess heat in hot conditions ?

If temperature exceed 24°C (75°F), the bird has a number of possibilities to release excessive body heat:

- **Radiation.** Heat loss is proportional to the temperature difference between the body surface and the surrounding air. Poorly insulated, hot roofs will increase temperature and heat stress.
- **Convection.** The hen's hot body will release hot air into the surrounding environment. Increasing airspeed will be useful.
- **Conduction.** Heat may flow from surface to surface, such as when the birds stand or sit on cool litter, but this is relatively unimportant.
- **Evaporation.** Since the bird's skin has no sweat glands, evaporation takes place through panting. In order to lose 1 ml of water, the chicken uses 540 kcal, and this energy loss may result in a significant drop in production. Above 38°C (100°F), the bird can only get rid of body heat through severe panting, which produces respiratory alkalosis. This physiological response is characterized by an increase in blood pH (more basic) along with a decrease in blood CO_2 concentration. It disturbs the acid-base balance and produces a decrease in blood calcium and bicarbonate, which are necessary for the production of strong eggshell. As a result, more thin-shelled eggs will be produced. From 42°C (108°F), the risk of death is high and emergency measures have to be taken. A temperature of 47°C (117°F) is always lethal.
- **Excretion.** Through excretion of feces and urine (gathered in droppings) & egg. Nevertheless, impossible to adjust or change.

⚠ **Hot & humid conditions are therefore much more stressful than hot & dry conditions.**

MEASURES TO BE DONE

Equipment, house. Before building any house in areas with a risk of heat stress. You must consider the following in the design.

- Building orientation vs, the dominant winds.
- Insulation of roof, walls, water system ...
- Fan number & capacity.
- Specific system to fight against heat stress = Pad cooling, fog, cold water...

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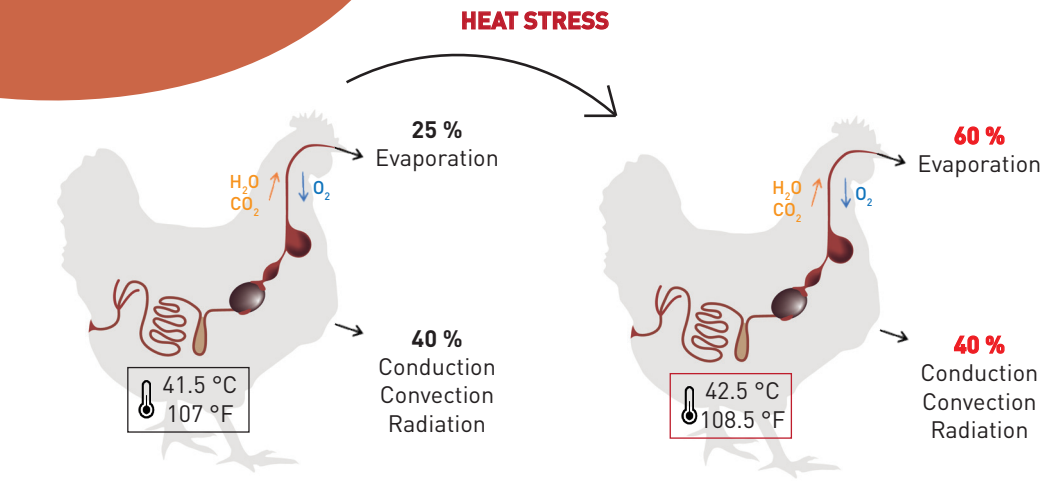
Physiology of layers



< 24°C (<80% RH) = *thermal confort zone*

Stocking density. Heat loss often depends on the difference between the body temperature of birds and the ambient temperature. If stocking density is high, the radiant heat between the birds accumulates and the temperature increases. Therefore, the birds cannot lose enough body temperature = acute heat stress.

- Reduce the stocking density (Cf. our Management Guides).
- Use equipment design with more «air space» => height between two tiers, to allow a better release of excessive heat.

Lighting program.

- During the light stimulation, add more light in the morning than in the evening (to encourage a higher feed intake).
- Reduce light intensity in the hottest hours to reduce bird's activity.

Bird handling. During the hotter periods of the day, any additional stress on the birds should be avoided.

- Vaccination, beak trimming, transfer, or any other kind of handling should be done during the coolest period of the day (or at night).
- Use personal as calmly & gently as possible.

Drinking water. Birds can reduce body temperature by drinking cool water.

- Flush the water pipes at least one a day during the hottest hours (to provide cool water in the best timing).
- Water tank should be insulated or painted white or under the shadow.

Feed distribution. During late afternoon a significant rise in body temperature can be observed, which, in severe cases, can cause bird mortality. This is not the hottest time of the day, but it is the peak time of digestion if the birds have been fed in the morning.

- One third of the daily feed ration should be given in the morning and two-thirds in the late afternoon.
- Turn on lighting for one to two hours at midnight is a good tool to give hens extra feeding / drinking time in the cooler part of the night.
- In pullet rearing, before 5 weeks of age, a crumble feed & eventually a pre-starter feed are recommended.

Feed stimulation. There are some simple strategies to stimulate feed intake:

- Run the feeders more frequently.
- Feeders should run empty at least once a day to enhance the appetite (if possible, never at the same timing).
- Follow strictly the empty feeder practice, to ensure that all the fine particles of the feed are consumed.

Ventilation. Proper ventilation is critical to prevent heat stress in layers during hot weather. Total exhaust fan capacity should be at least 3.5 meters per second per laying hen.

- Make sure your fans work well, that blades & louvers are clean, and belts are properly adjusted for both tension and alignment. Poorly maintained fans will operate at 50 percent reduced efficiency.
- Air inlets should be adjusted to achieve uniform airflow throughout the building.
- Add additional fans is an extreme solution (when it's possible) to increase the air speed.

Litter. We recommend in our management guides to use as less as possible of litter in case of floor area (breeders or alternative systems). Because a deep litter could be hot (and too hot sometimes) with only disadvantages.

- Use the minimum height of litter, especially in hot period.

Delay vaccination. It is best to postpone vaccination during heat stress when it is possible. Otherwise, applied vaccination in the coolest part of the day.

- Since the impact of heat stress on the immune system can result in a less than optimal vaccine take.

CONCLUSION

Exposure to seasonally high environmental temperatures is a major concern more and more frequent for the poultry industry. Proper housing and management practices are the keys to prevent the consequences of heat stress. In addition, there are also numerous nutritional strategies that may be employed to assist in reducing this issue.

For more details, you can consult our website with the nutrition guide & all the management guides, and our NovoCenter.

novocenter.novogen-layers.com

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