HatchTech
INCUBATION TECHNOLOGY

Technical Information

Heat stress: a matter of life and death importance?

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In practice, high incubation temperatures at the end of incubation are often observed. Embryos experience high temperatures due to cooling and air velocity problems in the incubator, especially during the second half of incubation when heat production increases. Heat production of high yielding breeds has been increased over the years and increases the risk of overheating even more. Is this a matter of life and death importance?

The first signs of overheating can be observed when the hatcher is opened for processing and birds pant and are noisy. An other indication of overheating is small chicks with large residual yolks. The igh incubation temperature reduces incubation time and, therefore, time to develop. When process time is fixed, birds spend more time in the hatcher and loose more water due to evaporation. Other signs of overheating are red hocks and red beaks, because birds struggle to emerge from the eggshell due to a higher incidence of malpositions in the egg. Heat stressed birds often have unhealed navels, as a result of the reduced incubation time and the large residual yolk that needs to be retracted in the body cavity during the final stages of incubation.

Different studies have shown that high incubation temperatures during the last part of incubation decrease embryo development, in terms of a lower yolk free body mass and a lower chick length. In addition, relative organ weights were found to be reduced during heat stress in both layer and broiler hatchlings. The decrease in relative heart weight due to high temperatures is significant and varies between 17-31% (Table 1).

An experiment performed by HatchTech also found a reduction in lung weight of 3% and in bursa of Fabricius weight of 20% during heat stress.

In summary, consequences of heat stress are not only restricted to a decreased body development and growth of the bird, but development of the cardiovascular and perhaps the immune system is impaired as well. We know from practical studies that performance and livability reduce when birds experience heat stress during incubation. Health problems such as sudden death syndrome and ascites, which are related to cardiovascular problems, might be increased as well. Within HatchTech, a research program is conducted to investigate the consequence of suboptimal incubation on metabolism and development.

Controlling your incubation temperature is necessary, as heat stress is a matter of life and death importance.

Article	Strain	Difference
Wineland et al., 2000	Broilers	31%
Lekrisompong et al., 2008	Broilers	17%
Lourens et al., 2008	Broilers	18%
Molenaar et al., unpublished	Broilers	17%
Molenaar et al., unpublished	Layers	22%

Table 1: *Relative heart weight reduction of embryos experiencing heat stress during incubation*

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