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HATCHERY/BREEDER TIP. . .

EGG HOLDING: DON'T SWEAT IT

Hatching eggs are generally held in storage between 1 and 4 days prior to being transported to the hatchery. Because it may be 5 to 10 days before the eggs are incubated, embryonic development has to be suspended during the holding period between lay and incubation to ensure embryo survival. In order to suspend embryo development the egg temperature needs to be decreased to physiological zero which is commonly accepted to be 68 to 70°F. Research indicates that the longer storage times require lower temperatures (Table 1.).

Table 1. Example of holding temperatures for hatching eggs

Egg storage time	Holding temperature
Less than 4 days	65-69 °F
4 to 7 days	60-65 °F
7 days or longer	55-60 °F

When eggs are transported from the farm to the hatchery, they can be exposed to a wide range of temperatures. Ideally, the temperature would be held constant and the eggs would not be allowed to warm up until they are ready to be incubated. When eggs are exposed to temperatures greater than the storage temperature they can begin to sweat. Eggs sweat because the warm air that encounters the egg contains moisture. As the air comes in contact with the egg it is cooled and the water holding capacity is reduced. Condensation then forms on the cooler eggshell surface. Egg sweating can be detrimental to embryo survival because the condensation can facilitate the penetration of contaminants through the shell pores. Egg sweating has been considered a potential source of contamination of eggs from different farms when in transport or stored in the hatchery. One way that sweating could be avoided is by holding hatching eggs at higher temperatures. Exposure to varying temperatures is a stress on the embryo and any stresses have the potential to reduce hatchability. As a result, all efforts should be taken to ensure that temperature remains constant.

Recent Work

A paper published recently in the Journal of Applied Poultry Research investigated the possibility of holding eggs at higher temperatures (Bourassa et al, 2003). Eggs (5,632) were collected over a 4 day period and were divided into two treatments where the holding temperature was either 66 ± 2 °F or 74 ± 2 °F. On Day 5 eggs were then driven 10 miles in an unrefridgerated truck to simulate transport and were stored overnight at 66 °F. On Day 6 the eggs were warmed at room temperature for 4 hours and then incubated at 99.5 °F and 55% RH.

The results of the study indicated that holding broiler hatching eggs in the farm egg cooler for 1 to 4 days at a temperature of 74 °F was not detrimental to hatchability or incidence of embryo or chick abnormalities (Table 2).

Table 2. Hatchability and abnormality data for eggs held at either 74 °F or 66 °F for 1 to 4 days prior to incubation

Holding Temperature	Percent Infertile of all eggs set	Hatch of all eggs set	Hatch of fertile eggs	Embryo & Chick Abnormalities
66 °F	8.6	82.1	90.1	38.8
74 °F	7.8	83.1	90.2	27.4
P	0.65	0.54	0.94	0.19

Increasing hatching egg holding temperature on the farm could reduce the temperature fluctuations that some embryos may experience during transport. For example, if eggs were transported in a truck with an interior temperature of 80 °F, those stored at 74 °F would experience a 6 degree difference in temperature. Eggs stored at 66 °F would be exposed to a 14 degree difference. When eggs are transported between 10 and 50 miles in this environment, this exposure could be significant. The smaller temperature difference would also help reduce egg sweating during transport and reduce the possibility of surface bacterial contamination.

This research is a good starting point, but as with any management decisions, care should be taken before making radical changes to any hatching egg program. It is crucial that egg coolers operate correctly and that eggs be held at a constant temperature to ensure embryo survival. These data were collected under controlled conditions and commercial facilities may perform differently and should be carefully evaluated before any large scale changes are initiated.

References:

Bourassa, D. V., R. J. Buhr, and J. L. Wilson, 2003. Elevated egg holding-room temperature of 74°F (23°C) does not depress hatchability or chick quality. J. Appl. Poult. Res. 12:1-6.

Brian D. Fairchild
Extension Poultry Scientist

Extension County Coordinator/Agent

Consult with your poultry company representative before making management changes

"Your local County Extension Agent is a source of more information on this subject."