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Influence of prestorage incubation on embryonic development, hatchability, and chick quality.

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Abstract

Egg storage beyond 7 d is associated with a delay in hatch time and a decline in hatchability and chick quality. Prestorage incubation is suggested as a method to reduce the negative effects of prolonged egg storage by altering the developmental stage of the embryo, but earlier research has shown that prestorage incubation can both be detrimental and beneficial for hatchability. The reason for these ambiguous results is not clear and the effect of prestorage incubation on chick quality is not studied extensively. The objective of this study was to investigate changes in developmental stage of embryos during prestorage incubation and the effect of prestorage incubation on hatchability and chick quality.

Two experiments were conducted. In experiment I, eggs were stored for 3, 5, 8 or 12 d. In experiment II, eggs were stored for 5 or 11 d. Half of the eggs was stored immediately at 16 to 18°C and the other half was exposed to prestorage incubation for 6 h in experiment I and for 4.5 h in experiment II. According to the classification table of Eyal-Giladi and Kochav (EG), embryonic development was advanced by prestorage incubation from developmental stage EG11.67 to developmental stage EG13.26 in experiment I ($P=0.02$) and from developmental stage EG9.22 to developmental stage EG12.63 in experiment II ($P<0.0001$). In experiment I, prestorage incubation reduced hatchability of

set eggs from 59.3% to 51.5% when storage time was 12 d but did not reduce hatchability when storage time was 3, 5, or 8 d (interaction $P=0.02$). Prestorage incubation increased chick length ($P=0.004$). In experiment II, prestorage incubation increased hatchability of fertile eggs from 80.6% to 85.9% when storage time was 11 d but did not increase hatchability when storage time was 5 d (interaction $P=0.0009$). Prestorage incubation increased percentage of second grade chicks ($P=0.0007$). It seems that storage time, embryonic development at egg collection, and pre-storage incubation duration determine the effect of pre-storage incubation on hatchability and chick quality.

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