

# Gas concentrations during storage do not affect hatchability and chick quality

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**Egg storage longer than 7 d is associated with a delay in hatch time, and a decline in hatchability and chick quality. During egg storage, embryo viability declines due to an increase in cell death. Albumen quality, which affects the micro environment of the embryo, declines as well due to a rise in albumen pH and a decline in albumen viscosity. Whether the change in albumen quality affects embryo viability is unknown. An experiment was conducted to investigate the effect of high CO<sub>2</sub> concentrations or high N<sub>2</sub> concentration during storage on albumen quality, hatchability and chick quality.**

A high CO<sub>2</sub> concentration reduces CO<sub>2</sub> loss from the egg and therefore maintains albumen quality. A high N<sub>2</sub> concentration reduces the availability of oxygen. Eggs were stored for 14 d in 4 different storage conditions: normal air (control), 0.75% CO<sub>2</sub>, 1.5% CO<sub>2</sub>, and 95.8% N<sub>2</sub>. Storage temperature was 16°C and relative humidity was 75%. During incubation, eggshell temperature was maintained at 37.8°C, relative humidity

varied between 45-60%, and carbon dioxide level was held below 0.35%. Albumen quality was measured at oviposition and at the end of storage. Hatchability of fertile eggs was calculated and chick quality was measured 12 h after the chick emerged from the eggshell. At the end of storage, the control and N<sub>2</sub> groups had a higher albumen pH (9.43 and 9.59, respectively) than the 0.75% and 1.5% CO<sub>2</sub> groups (8.70 and 8.48, respectively; P<0.001).

Both CO<sub>2</sub> groups had a higher albumen height than the control and N<sub>2</sub> groups (P<0.001). Hatchability and chick quality did not differ among the treatment groups. Although high CO<sub>2</sub> concentrations during

storage affect albumen quality and a high N<sub>2</sub> concentration during storage affects oxygen availability, hatchability and chick quality are not affected by these storage conditions when storage time is 14 days.