

The Effects of Moisture Loss during Incubation on the Chicken Embryo and IL-1

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Moisture loss from chicken eggs during incubation is a natural process. It occurs when H₂O passes through the pores of the egg's shell as a result of embryonic metabolism. If an egg is compromised during the incubation process, i.e. if holes are drilled into the air sac to facilitate and subsequently increase the rate of moisture loss, metabolic and immunological changes can occur within the embryo. Two experiments were conducted. In each, fertile eggs were individually weighed and placed in the same incubator. Fifty eggs had two holes drilled in the air sac (treatment) and fifty eggs were left along with no holes (control). In each experiment, eighteen embryos from each group were euthanized. The spleen, cecal tonsils and thymus were removed and pooled into 6 sample groups for each treatment. In each experiment, 96 Well plates of control and treatment cells were plated and incubated for 48 hours, stimulated with MTT and incubated for an additional 3 hours. Also, for each experiment, RNA was extracted from the spleen and cecal tonsils and Real Time (RT) PCR was performed to measure DNA amplification and detect IL-1 expression. The average cell proliferation was used to measure the difference between the non-stimulated and stimulated thymocytes from the control and treatment pools. The non-stimulated treatment cells showed some degree of proliferation in addition to both the control and treatment cells stimulated with MTT. The treatment cells had increased proliferation when compared with the control cells in all cases. The results of the RT-PCR assay showed increased values of IL-1 in the cecal tonsils and spleens of the treatment embryos when compared with the control embryos in the first experiment. The second experiment differed, showing increased IL-1 values of the spleen in the control embryos when compared to the treatment embryos.