



Thermal manipulation during incubation: a tool to improve resilience in slow-growing broiler chickens

Adjusting the incubation temperature profile can program chickens during the embryonic phase to cope better with extreme temperatures in later life. This method is called thermal manipulation (TM) and is mainly studied in fast-growing broiler chickens. There is less known about consequences of TM for slow-growing broiler chickens. TM could be especially beneficial to them, as they are often reared in farming systems with outdoor access and are therefore exposed to more variable temperatures. Therefore, the effects of TM in early life as well as later life of slow-growing broiler chickens were investigated in two separate studies.



In study 1, slow-growing broiler chicken eggs were exposed to one of 3 eggshell temperature (EST) profiles: 1) constant EST of 37.8°C; 2) TM with 12 h/d high temperatures of 38.9°C between embryonic day (ED) 9 and 16 (high); 3) TM with 12 h/d high or low temperatures (38.9°C versus 36.7°C respectively) between ED9 and 16 (high/low).

In study 2, the control treatment (1) was compared with the high/low TM profile (3).

Results of study 1 showed that heat production was affected by both TM treatments, but survival rate, developmental and physiological characteristics were not affected. In study 2, it was shown that TM treatment had a positive effect on chick weight at hatch, but did not affect other chick quality parameters, body weight or the feed conversion ratio (FCR) later in life. There were some indications for positive effects of the TM treatment on behaviour in an unfamiliar environment and during a thermal challenge. The chosen high/low TM application induced limited, but promising improvements in resilience of slower-growing broiler chickens, and needs further exploration before implementation in hatcheries.



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