

Technical information

Heat production of chicks with and without access to feed and water during the hatchwindow

I.A.M. van Roovert-Reijrink¹, C.W. van der Pol¹, H. van den Brand², M.H. Priester^{1,2}, H.J. Wijnen^{1,2}

¹HatchTech B.V., P.O. Box 256, 3900 AG Veenendaal, the Netherlands.

²Adaptation Physiology Group, Wageningen University, P.O. Box 338, 6700 AH Wageningen, the Netherlands.

In current practice, chicks are provided with feed and water directly post-hatch more often. When feed and water is provided directly post-hatch, heat production of day-old chicks is expected to be increased in comparison to withheld chicks. To ensure a comfortable environment (combination of air temperature, relative humidity, and air velocity) for fed chicks post-hatch, it is crucial to know how the intake of feed and water affects heat production in the perinatal period. The aim of this trial was to investigate effect of feed and water access directly post-hatch on heat production between hatching and pulling.

Chicks had access to feed and water (early fed) or were withheld from feed and water (withheld) between hatching and pulling. In two consecutive batches, 120 eggs with a viable embryo were set in one of two climate respiration chambers (CRCs) at embryonic day (E) 18.5 (N=30 per batch per treatment). Eggs of a Ross 308 parent flock of 45 weeks of age were used. Between batches, treatment was switched between climate chambers to exclude the effect of CRC. The median of 5 eggshell temperatures (ESTs) sensors was maintained at 37.8°C until the first chick hatched, where after the air temperature was kept constant and EST was allowed to increase.

O₂ consumption and CO₂ production were measured per CRC with a 9 minute interval and were used to calculate heat production (mW/chick). Moment of hatch was determined through video observations. Chicks were removed from the CRC after 22 days of incubation (528 hours of incubation), and individual body weight and feed intake per CRC were measured.

From O₂ consumption and CO₂ production, heat production (mW/chick) was calculated.

O₂ consumption and CO₂ production did not differ between early fed and withheld chicks until E20.3. At that moment 80% of the chicks had hatched. Heat production increased for



all chicks as the hatching process progressed until E20.3. The early fed chicks continued increasing heat production, whilst the withheld chicks plateaued at approximately 340 mW/chick. Heat production of the early fed chicks was 390 mW/chick at E21, 521 mW/chick at E21.5, and 634 mW/chick at E22.

By pulling time at E22, body weight of the early fed chicks averaged 57.0 g, while it averaged 42.7 g for the withheld chicks.

In conclusion, heat production of early fed chicks increased with 86% at pulling in comparison to withheld chicks. The increased heat production of early fed chicks emphasizes that it is important to pay attention to environmental conditions in the hatcher, but also during chick handling, chick storage, transport, and after placement in the broiler house.

Keywords: broilers, early feeding, body weight, heat production