Early Feeding Affects Resistance Against Cold Exposure in Young Broiler Chickens

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Abstract
In field conditions, a fasting period of 24 to 72 h after hatch is common, which is associated with delayed gastrointestinal development and yolk utilization and retarded subsequent performance. Hardly any information is available about the influence of diet composition in the first days on later life and additionally, effects of early feeding on thermoregulatory development are also not known. The aim of this study was to investigate effects of diet composition in early fed broiler chickens on their (thermoregulatory) development. Shortly after hatch, 200 Hybro chickens (initial BW of 43.6 g) were assigned to 1 of 5 feed treatments: control, dextrose, albumen, prestarter, or prestarter plus fat. Water was available ad libitum. Measurements were done in 10 replicates of 4 chickens per treatment. At d 2 or 3, half of the chickens were exposed to 20°C for 30 min to determine resistance against cold exposure and rectal temperature was determined just before, immediately after, and 30 min after the end of this cold exposure. Thereafter, all chickens were killed to investigate body development. Chickens in both prestarter groups developed faster than in the other 3 groups, expressed by a higher BW, yolk-free body mass, heart and liver weight, and higher chick and intestine length. Between d 2 and 3, differences in these variables among chickens from both prestarter groups and other groups increased. Rectal temperature before cold exposure was higher in chickens from both prestarter groups (40.6 and 40.7°C, respectively) and decreased less (0.6 and 0.7°C, respectively) during cold exposure than in chickens from the control (39.5 and 1.2°C, respectively) and albumen group (39.8 and 2.1°C, respectively), whereas chickens from the dextrose group were in between (40.4 and 1.2°C, respectively). We conclude that early fed diet composition in broiler chickens is (besides general development) important for development of
both body temperature and resistance against cold exposure, probably as a reflection of a changed metabolic rate.

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