

Influence of Combined Effect of Temperature Stimulation during the Last Days of Incubation and of Nutrient Iodine in the Feed on Growing Performance with Broilers and Ducks

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Recent research shows that incubation climate may have a long-lasting influence on poultry. The most important climatic incubation factor is the incubation temperature. After the hatch and the beginning of the feed intake an optimal nutrient supply is the most important point for a successful development of the growing birds. Iodine (I) is an essential trace element for humans and animals, being required for the synthesis of the thyroid hormones. Therefore the objective of these studies was to determine the influence of combined effect of temperature stimulation during the last days of incubation and of nutrient iodine in the feed on growing performance with broilers and ducks. Trial 1 eggs (ROSS 308) were incubated from days 1 to 17 under normal incubation temperature (37°C). From day 18 until hatching the eggs were sorted in hatch incubators with different temperature programs: 37°C (control) and 10°C over standard for 2 hours daily (38°C: short-term warm stimulation). The one-day-old chicks were sorted by sex. Trial 2 eggs (Pekin ducks) were incubated (days 1 to 22) under normal incubation conditions (37.6°C) and then sorted into two hatch incubators (37°C: control; 36°C, 2 h daily: short-term cold stimulation). From every incubator were randomly distributed a total of 216 male chicks in 3 treatments with 12 chicks/pen and 6 pens/group and of 144 Pekin ducks with 6 ducks/pen and 12 pens/group. The duration of the trials was 35/49 days. The basal pelleted diet was supplemented with 0/1/5 mg iodine/kg feed. Data from the two trials were analyzed by a two-way ANOVA (SAS), multiple comparisons of means were carried out using the Student-Newman-Keuls Test ($P < 0.05$). All male chicks from the hatch incubator with short-term warm stimulation reached a final weight of 2321g and a feed to gain ratio of 1.49 kg/kg compare to the control group with 2318g and 1.51 kg/kg. The interaction (temperature stimulation x iodine) was significant ($P = 0.03$) for the final body weight indicating that the temperature stimulation acted differently for the iodine supplementation. In trial 2 the trend shows that the mean daily feed intake of Pekin ducks in the short cold stimulated group was higher from the first day. As a result these ducks reached a significantly ($P = 0.02$) higher body weight gain (3668g) compare to the control (3580g) and the feed to gain ratio was decreased by 2%.

Keywords: Broiler, Pekin duck, incubation temperature; iodine; growing performance

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Influence of Incubation Temperature on Live Weight and Slaughter Performance of Male and Female 35 Days Old Broiler

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The in-ovo development in poultry permits a defined modulation of various environmental parameters during the embryonic development. Different endogenous factors with an impact on the avian embryogenesis have been investigated including the incubation temperature. During embryonic day (ED) 3 to 8 embryonic muscle development is characterized by the formation of primary myotubes. An increase of muscle mass would be interesting for the meat industry since the trend in the poultry market changes from whole birds to further processed meat products. For this reason the aim of the present study was the investigation of influence of a higher (38.8°C) or a lower (36.8°C) incubation temperature during ED7-10 and ED10-ED13 on the weight of one-day-chicken and the weight performance of 35 days old broiler. In the experiment brooding eggs of a commercial broiler line were incubated at 37.8°C in a commercial incubator up to ED7 and ED10. On both days the eggs were transferred to a second incubator and incubated at a higher (38.8°C, Group H) and lower (36.8°C, Group L) temperature, respectively. After 3 days of incubation (on ED10 (group 1) and ED13 (group 2), respectively) at high/low temperature the eggs were transferred back to the incubator with normal (37.8°C) temperature and incubated until hatching. The control eggs were incubated for the whole period at 37.8°C. After hatch one third of one-day-chicken of the treatment and control group were dissected and the body weight was determined. Sixty one-day-chicken per group (50 % male, 50 % female) were fed with a conventional diet ad libitum until day 35 and then slaughtered. For this study the carcass weight and the weight of breast and leg were determined. The data were analyzed with the software Statistica 10.1 using the GLM procedure. Depending on incubation and temperature group the data didn't show significant differences between male and female one-day-chicken. But independent of gender, the live weight of one-day-chicken was significantly higher after incubation at a lower temperature. Independent of treatment, the live weight of 35 days old male broiler was significantly higher compared to the female. But also animals from group H had a higher live weight. The carcass and leg weight of male broilers were comparable between the treatments, but the carcass weight of female broilers were significant and the MPS weight tendentially lower after incubation at a lower temperature. On the other hand, the MPS weight of male broiler was higher after incubation between ED7-10 at 36.8°C.

Keywords: one-day-chicken, incubation temperature, weight, breast meat

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