

Early nutrition of methionine provides a better start for broilers

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ABSTRACT:

Specific amino acids have a key role in gut health of poultry by supporting the development and maturity of the intestine and the immune system. A study with different early nutrition methods was carried out in order to examine the effects of methionine (Met) supplementation on some non-specific innate immune variables and performance of broiler chicken. Hatching protocol of 1120 Ross 308 eggs was performed at MATE Kaposvár Campus by the recommendations of Aviagen (2019). The applied treatments included control groups (A, B) of which group „A” was intact (no *in ovo* intervention) and group „B” was *in ovo* treated with 0.5 ml 0.9% NaCl solution- for studying the effects of the needle puncture- and five experimental groups. Control groups had immediate feed access after hatching, while birds in experimental groups received the feed 48 hours post-hatch. Eggs in treatment „C” were not intervened, group „D” was *in ovo* treated by 0,5 ml 0.9% NaCl solution and „E” by 0.5 ml 1% Met solution. The *in-ovo* procedure was performed at day 17 of the incubation according to the protocol of Uni and Ferket (2003). Eggs in groups „G” and „F” were not intervened, the hatched chicks received a commercially available gel supplement without or with methionine fortification, respectively. All chicks were collected on day 22 of hatching and kept for 35 days in the purpose of recording performance data. Blood samples were collected in the fattening period on day 21 and 35 with intention to check the number of granulocytes, lymphocytes and thrombocytes. The *in-ovo* Met treatment had a positive effect on live weight and average daily gain ($P<0.001$) during the fattening period in comparison with the non supplemented counterparts, however, *in-ovo* treated chicks had somewhat lower feed intake from day 1 to day 21 than the non-treated groups ($P<0.05$). There was no significant difference between experimental groups regarding feed conversion ratio. The number of thrombocytes only differed at day 21 in treatments with delayed feeding. This fact could be explained by the 48 hour post-hatch stress caused by immune suppression. Gel supplementation irrespective its Met content had a positive impact on post-hatch weightloss. Met supplementation (*in-ovo* and gel) had a positive effect on the amount of breast meat at slaughter. In conclusion, alternative nutrition strategies may enhance overall health and some carcass traits of broilers. Methionine supplementation at early phase improves the growth performance and the valuable meat part in broilers. On the other hand, further studies needed to elucidate the underlying mechanisms in order to optimize poultry production.

Keywords: *broiler, early nutrition, methionine, growth performance, immune function (4-5 Words)*

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