

Iron Status of the Late Term Broiler (*Gallus gallus*) Embryo and Hatchling

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Abstract :

Our objective was to investigate and elucidate the iron status of the late term broiler (*Gallus gallus*) embryo and young chick. This would be vital for better understanding of the transition period that the hatchling experience immediately after hatch. For that, blood, liver and small intestinal samples from broiler embryos were taken on embryonic days 12 (12E), 14E, 17E, 19E, day of hatch and 3 days post hatch. Expression of transporters and enzyme involved in Fe uptake and transfer, ie. Divalent metal transporter-1 (DMT1; iron uptake transporter), ferroportin (iron transport across the enterocyte) and duodenal cytochrome-B reductase (DcytB; reduces iron at brush border membrane) were determined. In addition, liver tissue samples were analyzed for iron and ferritin (cellular iron storage protein) contents. Samples were also collected from the intestinal contents, yolk sac, amniotic fluid and intestinal content for iron concentration analysis. The intestinal mRNA abundance of DMT1 and DcytB were shown to increase as from day 12E until day 17E, whereas ferroportin expression was unchanged. As from 19E a graduate decrease in relative expression occurred. Liver iron and ferritin concentrations were shown to decrease as from day 12E and as day of hatch approaches. In addition, yolk iron concentrations decreased while iron concentrations in amniotic fluid have increased (days 12E through 17E). This was followed by iron concentrations increase in the intestinal content (day 17E trough day of hatch). In this study, we first document the late term broiler embryo iron related enzyme and transporters gene expression as well as the changes in liver ferritin and liver iron contents.

Key Word :

Broiler, embryo, iron, ferritin, brush border membrane, DMT1

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