

SUMMARY

The Effect of Iodine on Thyroid Gland Histology of Chick at Post-Hatching Period

This study aimed to investigate the effects of the iodine on the body weight, TSH, FT3, FT4, thyroid follicular diameter, amount of colloid and epithelium height of the follicular epithelium on chickens from first week to sixth week of age which were given 2 mg/L iodine in their water throughout the six weeks beginning at the hatching.

A sum of 100 broiler chicken, 50 as controls and 50 as experimental animals, were used in this study. Iodine with 98-99% purity was added in amounts of 2 mg/L to the drinking water of animals in experimental group from hatching day up while controls received no supplementation. Food and water were given to the animals *ad libitum*. Ten chickens from each control and supplement groups were weighted at the days 1, 2, 3, 4 and 6 of the experiment. Blood samples were collected to determine the concentrations of the serum TSH, FT3 and FT4. Thereafter, animals were decapitated and thyroid glands were taken.

From prepared paraffin blocks of the thyroid gland 3 serial sections of 5 μm thickness were taken with 5 μm distances. For evaluation of the general histology of the sections triple staining method, and for colloid demonstration the Periodic Acid Schiff (PAS) reaction were applied. The diameter of the thyroid follicles, their colloid content and epithelium height were measured by using the image analyzer system (Leica Q Win Standard).

The evaluation of the gathered data suggested that the body weights of animals in control and supplemental groups increased with the age, and there was no confirmed difference between these groups.

In control group TSH concentration increased at the second week and caused primarily an increase in FT4 concentrations, but from the third week up FT3 concentrations were increased while FT4 concentrations showed a decrease. While FT4 concentrations continued to decrease the FT3 concentrations showed a decrease at the sixth week related to a decrease in TSH.

It was seen that the supplementation of the iodine affected the production order of the TSH, FT4 and FT3, prevented the increase of the TSH concentrations at the second week and its decrease at the sixth week. However, no statistically confirmed difference occurred between both groups at all. It was determined that the FT3 concentration increased one week earlier in the supplemented group and its decrease was also earlier in this group than the controls. It was remarkable that with iodine supplementation the increase in FT4 concentration was seen also one week earlier, its decrease delayed and its decrease was more profound at the sixth week of the experiment.

When the thyroid follicles were investigated it was seen that the cubic and flat cells were assembled in both groups. Follicle diameters and the area covered by the colloid increased with age in both groups. Epithelium height of the thyroid continued to be higher for a longer time period in iodine supplemented group, and it was seen that follicle diameters increased at the 1st and 2nd weeks and the area colloid cover within the follicles increased at the 1st, 3rd and 4th weeks.

Key words: Thyroid, FT3, FT4, TSH, follicle, colloid, iodine, broiler chicken.