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Vitamin B2

Vitamin B2, or riboflavin, is a cofactor for over 50 enzymes in the chicken. Many of these enzymes are associated with oxidation-reduction reactions in cell respiration.

Clinical signs

Riboflavin deficient chicks grow very slowly and become emaciated and by the second week they invariably have scour/diarrhoea. They are often reluctant to walk and, when they do, they walk on their hocks often assisted by the wings. Leg paralysis is present more often than curled toe paralysis, in which the toes turn inwards while at rest or walking. The leg musculature is atrophied and flabby, while the skin is dry. In young turkey poulters riboflavin deficiency shows poor growth and feathering, leg paralysis and encrustations at the angle of the mouth and on the eyelids.

Post mortem findings

In the more severe cases of riboflavin deficiency, chicks show swelling and softening of the sciatic, cervical and lumbar spinal nerves. Typically the sciatic nerves show the most pronounced changes sometimes reaching five times their usual diameter. Histopathologically affected sciatic nerves show degenerative changes in their myelin sheaths and Schwann cell proliferation. Riboflavin is very likely essential for myelin metabolism in the main peripheral nerves. Chicks fed riboflavin deficient diets have pancreatic and duodenal lesions similar to those seen in thiamin deficiency. In the adult hen riboflavin deficiency results in a drop in egg production accompanied by an increased embryonic mortality in breeders. It is also associated with hepatomegaly (enlarged liver) and an increased hepatic fat content. Embryos which fail to hatch are dwarfed, oedematous and show clubbed down. The main metabolic effect of embryonic deficiency is a severe reduction in fatty acid metabolism.

Treatment

Normally chicks respond well to riboflavin replacement therapy but when the curled toe is of some standing treatment will not resolve the condition as the damage is irreversible.

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