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Vitamin B1

Vitamin B1 is also known as thiamin and its active form is thiamin pyrophosphate. It is an important cofactor in several key reactions in the body, including decarboxylation, dehydrogenase and transketolase reactions, whose enzymes are important for the metabolism of carbohydrates, lipids and certain amino acids. Deficiency of thiamin in poultry diets leads to severe anorexia, polyneuritis and death. Adequate dietary provision of this mineral can be ascertained by its level in the blood. Thiamin that is not utilised by the bird is quickly excreted – it is not stored. Therefore, the importance of continuity of supply of this vitamin via the feed can not be underestimated.

Vitamin B1 deficiency

The first sign of deficiency is anorexia, which can become severe quite quickly. In this situation birds lose weight and develop leg weakness. In mature birds a polyneuritis is often seen three weeks after the introduction of a thiamin deficient diet. The onset of the polyneuritis can be sudden but it is much more gradual in older birds. Adult chickens often have blue combs. As this deficiency progresses a muscle paralysis occurs commencing with digital (toe) flexor muscles and slowly progressing through the whole body to the neck and head. Typically affected birds sit on their flexed legs and draw back their heads. Such birds are often referred to as star gazers. Soon the affected bird topples over, often with its neck still extended.

Post mortem findings

Post mortem findings include adrenal gland hypertrophy, which is often more pronounced in females, subcutaneous oedema and atrophy of the genital organs, which is more pronounced in males. Slight cardiac atrophy, sometimes with right hand side ventricular dilation, and atrophy of the stomach and intestinal walls is seen. Histopathologically the duodenal crypts of Lieberkühn are dilated and exocrine cells in the pancreas show cytoplasmic vacuolation with the formation of hyaline bodies.

Treatment

Birds typically respond to oral thiamin administration via the water within hours. Remember, deficiency of this vitamin causes severe anorexia and so sole reliance on the feed to supply the thiamin early in the treatment phase is ill advised.

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