



Tikrit University
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Nutritional disorders

Subject name: Poultry diseases

Subject year: 2025-2026

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Lecturers link

Nutritional disorders

Nutritional disorders and deficiency, which may occur in several way:-

- a) Inhibition of absorption or utilization.
- b) Metabolic abnormality.

Vitamin E:

Vitamin E is a very effective antioxidant. It is required for normal embryonic development in chickens, turkeys, and probably ducks.

Vitamin E deficiency produces: Encephalomalacia, exudative diathesis, and nutritional myopathy (muscular dystrophy) in chicks, enlarged hocks and dystrophy of the ventricular musculature in turkeys, and nutritional myopathy in ducks. Encephalomalacia in Chicks.

1-Encephalomalacia is a nervous (Crazy- chick diseases):-

This disease is seen for birds in good conditions in age 2- 5 weeks old.

Clinical signs:

- 1-Muscular weakness.
- 2-The head sometimes lateral twisting (torticollis).
- 3-Incoordination, rapid contraction and relaxation of the legs and finally complete prostration and death.

P.M. lesions:

- 1-In chicks after the appearance of signs of encephalomalacia, the cerebellum is softened and swollen, and the meninges are edematous.
- 2-Minute hemorrhages are often visible on the surface of the cerebellum.
- 3-The convolutions for cerebellum are flattened.
- 4- The greater portion of both hemispheres may be destroyed.

Histologically lesions:

- 1-Circulatory disturbances , demyelination, and neuronal degeneration .
- 2-Meningeal, cerebellar, and cerebral vessels are markedly hyperemic, with present severe edema .
- 3-Capillary thrombosis often results in necrosis of varying degree.
- 4-Chromatolysis with packed of the Nissl bodies periphery of the cell nucleus is commonly.

2-Exudative Diathesis in Chicks:

It's an edema characterized by accumulation of fluid under the ventral skin which consist from green-blue viscous fluid with some blood components that appear throughout the breast and leg musculature .

3-Nutritional Myopathy (Muscular Dystrophy):

Exudative diathesis is accompanied by sulfur-containing amino acid (methionine and cysteine) deficiency in Chicks, Turkeys, Poult and Ducklings. Its characterized by light-colored streaks of easily distinguished affected bundles of muscle fibers in the breast and thigh.

The histological changes:

- 1-Microthrombosis of arterioles and smaller capillaries causes occlusion .
- 2-Degeneration and necrosis of muscle fibers.

Treatment:

Exudative diathesis and nutritional myopathy in chicks are may respond to administration of vitamin E and selenium by injection, by oral , or feed dosing. Encephalomalacia may not respond to treatment with vitamin E, because the respond is depending on the degree of damage to the cerebellum.

Vitamin D3 (Cholecalciferol) deficiency:

Vitamin D is required by poultry for proper metabolism of Calcium and phosphorus in the formation of normal skeleton, hard beaks and claws, and strong egg shells.

Clinical Signs:

- 1-The first sign is a marked increase in the number of thin-shelled and soft-shelled eggs.
- 2-Leg weakness, hens show a characteristic posture that has been described as a “penguin-type squat.”
- 3-Beak, claws, and keel become very soft and pliable.

P.M. lesions:

- 1- Bones are soft and break easily and parathyroid glands become enlarged .
- 2-Well-defined knobs are present on the inner surface of the ribs at the costochondral junction.

Treatment :

Feeding a single massive dose of 15,000 IU vitamin D3 cured rachitic chicks were added to feed.

Vitamin K

Vitamin K is required for synthesis of prothrombin. Because prothrombin is an important part of the blood-clotting mechanism.

Clinical Signs:

- 1-We can be shown an anemia that may result from loss of blood from any part of body spontaneously or because of an injury or bruise.
- 2-Prolonged blood-clotting time.
- 3-Dead embryos appear hemorrhagic.

P.M. Lesions:-

- 1-Paleness of the internal viscera like liver, air sacs and kidney.
- 2-Hypoplastic bone marrow

Treatment :

- 1- Vit. K 0.6- 1mg / kg for 5-6 days.
- 2- Increase dose to 6mg/ kg feed in case of giving sulfa drugs.

Thiamin (Vitamin B1) deficiency:

Thiamin is an important cofactor in metabolism pyruvic acid and carbohydrate .

Clinical Signs:

- 1-Anorexia is followed by loss of weight, ruffled feathers, leg weakness, and an unsteady gait.
- 2-The chicken characteristically sits on its flexed legs and draws back the head in a “stargazing” position due to paralysis of the anterior muscles of the neck .

P.M. lesions:

- 1-Adrenal glands hypertrophy more markedly in females than males.
- 2-Atrophy of genital organs is more pronounced in males than females.
- 3-Polyneuritis is observed in mature chickens.

Treatment :

Vit B1 2- 6 mg / kg of feed.

Riboflavin or (Vitamin B2) or (Curly Toe Disease):

Riboflavin is necessary for oxidation – reduction reactions in the cell respiration.

Clinical Signs:

- 1-Weakness and emaciation.
- 2- Chicks walk on their hocks with the aid of their wings.
- 3- Curled-toe paralysis .
- 4- An increased embryonic mortality

Riboflavin deficiency in young turkeys is characterized by:

- 1- Poor growth, feathering and leg paralysis.
- 2- Grayish scab – like deposited at corners of the mouth or eyelid.

P.M. lesions :

- 1- Swelling and softening of sciatic and brachial nerves Sciatic nerves.
- 2- An increase in size and fat content on the liver.

Histological lesions:

- 1-We can showed in the affected nerves degenerative changes in myelin sheaths of the main peripheral nerve trunks.
- 2-Schwann cell proliferation, myelin changes, gliosis, and chromatolysis occur in the spinal cord.

Treatment:

Should be sufficient 100- μ g doses of riboflavin for treatment of riboflavin-deficient chicks or poults, followed by incorporation of an adequate level in the ration.

Pantothenic Acid (Vit. B5) or Chick anti-dermatitis factor:

Pantothenic acid is a component of coenzyme A, which is involved in the formation of citric acid in the Krebs cycle, synthesis and oxidation of fatty acids.

Clinical Signs:

- 1-Dermatitis, broken feathers, chondrodystrophy, poor growth, and mortality.
- 2-Chicks are emaciated and present inflammatory changes in the corners of the beak and eyelids, vent and feet.

P.M. lesions:

- 1-We can be showed the presence of a pasty substance in the mouth and an opaque gray-white exudates in the proventriculus.
- 2-The liver is hypertrophied and may vary in color from a faint to dirty yellow.
- 3-The spleen is atrophied slightly with enlargement the Kidneys.

Histopathological changes

- 1-The degeneration appeared the Nerves and myelinated fibers of the spinal cord also in the myelin sheath
- 2-Lymphocytic necrosis and lymphoid cells depletion in the bursa of Fabricius, Thymus, and Spleen .

Treatment :

Adding the pantothenic acid 10- 20 mg / kg feed prevents its deficiency.

Folic Acid ((Vitamin B9 or Folacin):

Folic acid is a part of the enzyme system involved in single carbon metabolism.

Clinical Signs:

1-Chicks is characterized by poor growth, very poor feathering, anemia, and chondrodystrophy.

2-A deficiency in the breeding diet of chickens or turkeys causes a marked increase in embryonic mortality.

3-Poults show a characteristic cervical paralysis and die within 2 days after the onset of these signs.

Hematology changes :

1- Megaloblastic stop of erythrocyte formation in bone marrow.

2- Sever macrocytic anemia.

3- Decreased WBC formation.

4- An agrenulocytosis.

Treatment :

Addition of 500 µg folic acid/100 g feed caused recovery comparable to that obtained with injection of the vitamin.