



poultry diseases 1 fourth stage



chapter one – lecture 2

Vitamin E, Vitamin D, Deficiency: Signs , Lesions, Diagnosis. Differential Diagnosis, Treatment.

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Vitamin E

- ▶ Vitamin E is a powerful antioxidant that protects body cells from damage. It strengthens the immune system, improves fertility and hatchability, and maintains muscle and nerve integrity. It also promotes healthy growth, enhances disease resistance, and improves meat quality in chickens. Deficiency causes encephalomalacia (crazy chick disease), exudative diathesis, and muscular dystrophy.

Vitamin E Deficiency

Symptoms:

1-In Adult (Mature)

- a-Early embryo mortality.
- b-Testicular degeneration in males.

2- In Chicks (Young) :

There are 3 disease conditions can be seen in chicks due to vitamin E deficiency .

a-Encephalomalacia(Crazy Chick Disease).

- ▶ Encephalomalacia is a nervous syndrome characterized by
- ▶ 1-Ataxia, backward or downward retraction of the head, sometimes with lateral twisting .
Increasing incoordination, rapid contraction and relaxation of the legs and finally complete prostration and death.
- ▶ 2- The deficiency usually manifests itself between day 15 and 30 of the chick's life.

Complete prostration.



Downward retraction of the head



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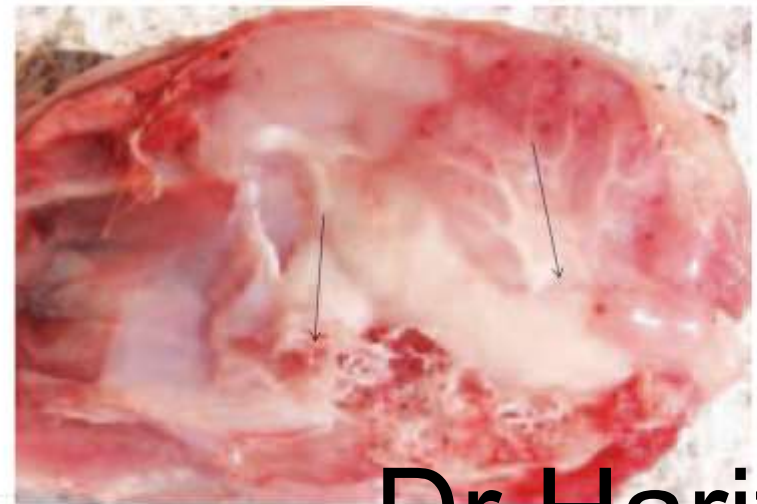
Post-mortem lesions :

- 1-Soft and swollen brain.
- 2-Minute hemorrhages on the surface of the brain.
- 3-Greenish-yellow necrotic areas.

hemorrhages on the surface of the brain

Microscopically :

- 1-Edema.
- 2-Capillary hemorrhages.
- 3-Thrombosis.
- 4-Necrosis.



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b- Exudative Diathesis :

- 1-Edema of the subcutaneous tissue associated with abnormal permeability of the capillary walls, produces greenish blue and viscous fluid under the skin of the abdomen (due to specific gravity).
- 2-Anemia.
- 3- In severe cases, chicks stand with their legs far apart as a result of accumulation of fluid under the ventral skin.

Exudative Diathesis: Greenish fluid under the skin



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C- *Nutritional Myopathy (Muscular Dystrophy)*

- ▶ When vitamin E deficiency is accompanied by a sulfur amino acid deficiency, chicks show signs of nutritional myopathy :
- ▶ Light colored streaks of muscle fibers in the breast.

Histological examination:

- 1- Edema.
- 2- Hyaline degeneration.



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Treatment of vitamin E deficiency:

Exudative diathesis and muscular dystrophy , if not too advanced , are treated by administration of vitamin E.

Encephalomalacia may or may not respond to treatment.

Character	Vitamin E Deficiency	Avian Encephalomyelitis	Newcastle Disease
Head Tremor	Slight	+	+
		+	-
Respiratory signs	—	—	+
Swollen brain	+	—	—
Air sac infection	—	—	+



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Vitamin D

- ▶ Vitamin D is essential for maintaining proper calcium and phosphorus balance in the body. It promotes strong bone and eggshell formation by enhancing calcium absorption from the intestine and its retention in bones. It also supports normal muscle function and growth. Deficiency results in rickets in young chicks, osteomalacia in adult birds, and poor eggshell quality in laying hens.

- ▶ Functions of vitamin D:
- ▶ Vitamin D is required by poultry for
 - ▶ 1. Proper metabolism of calcium and phosphorus.
 - ▶ 2. Formation of the normal bony skeletal.
 - ▶ 3. Hard beaks and claws .
 - ▶ 4. Strong egg shells.
- ▶ Types: Vitamin D Deficiency
 - ▶ 1-Rickets : In young .
 - ▶ 2-Osteomalacia : In adult.

Symptoms

- ▶ 1-Symptoms start about 2-3 months, after the birds were deprived of vitamin D (in adult).
- ▶ 2-Marked increase in the numbers of thin- shelled and soft-shelled eggs followed by decrease in egg production.
- ▶ Hatchability is also decrease (In adult).
- ▶ 3- Leg weakness * Penguin type squat *
- ▶ The beak , claws and keel bone become very soft and pliable (In young and adult).
- ▶ 4-Inward curve of the ribs (In young and adult).
- ▶ 5- Feathering is usually poor, and an abnormal banding of feathers may be seen in colored breeds.

Post –mortem lesions :

▶ A- In Adult:

- ▶ 1-Bones are soft and break easily.
- ▶ 2-Well defined knobs are seen on the inner surface of the ribs.
- ▶ 3-Swollen hocks.

▶ B-In Chicks(Young):

- ▶ Beading of the ribs at their juncture with the spinal column and bending of the ribs downward and posteriorly .

Treatment:

- ▶ Feeding of a single massive dose of
- ▶ vitamin D3.

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