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# AN OUTBREAK OF UROLITHIASIS (GOUT) IN A COMMERCIAL LAYERS FLOCK: DIAGNOSIS AND CONTROL

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## SUMMARY

This study was conducted during an outbreak of urolithiasis of (gout) in a flock of caged layers. The clinical findings of the condition were depression, emaciation, dehydration and decrease in egg production 13%. Mortality rate was 15%. The necropsy findings of dead birds showed white chalk-like deposits covering the surface of various abdominal organs as well as the pericardium, kidney tissues swollen and covered with white urate. Diagnosis was made by feed analysis which showed excess of calcium 4.27%, characteristic necropsy findings, and response to the treatment.

## INTRODUCTION

Poultry industry is one of the major branches of animal sectors in Palestine MoA (2000). Specification and formulation of feed stuff are very important for birds (layers and broilers).

Urolithiasis in domestic fowl is a syndrome characterized by focal renal mineralization, obstructive urolith formation and atrophy of mineralized or obstructed kidneys combined with compensatory hypertrophy by undamaged kidneys Mallinsoon, et al. (1984). The condition is primarily seen in pullets and caged laying hens and causes increased mortality (up to 56 % in one case) and a decrease in egg production Wideman, et al. (1983). Urolithisis is characterized by sever atrophy of one or both kidneys, distended ureters often containing uroliths and varying degrees of renal and visceral gout Siller (2003) .Four possible factors have been identified with the etiology and pathogenesis of urolithiasis: (a) Water deprivatiom, (b) Excess dietary calcium, (c) Infectious bronchitis virus infection and dietary electrolyte

imbalances Cowen, et al. (1987).

This study describes an outbreak of urolithiasis in a flock of hyline hens encountered recently north Palestine where clinico-pathological diagnosis and control studies were conducted.

**2. Materials and methods:**

An outbreak of urolithiasis in a private farm of hyline layers breed 24 weeks of the age production in Tulkarm Governorate-North Palestine .

Complete clinical examination was performed on the flock and the dead birds were subjected to through post-mortem examination. Feed samples from that used in each one kilogram were investigated at Birzeit University Laborites for feed analysis to estimate the level of proteins, phosphorous, calcium and aflatoxin.

Fowl feed was adjusted with the normal level of calcium 3.5% following results of feed analysis.

This study was conducted on a flock of caged laying hens with a total number 3500. Birds were debeaked at day-old and given a commercial ration and supplied with the same source of water (tap water). Chickens were spray vaccinated at day-old (in the hatchery) for Newcastle disease an fections bronchitis as well as injected, ma disease vaccine. Infectious bursal disease w 11-13 days old .

At 8 weeks of age, chickens were boostec Newcastle disease and infectious bronchitis.

**RESULTS**

**3.1. Clinical signs :**

Clinical signs of the condition were depres extreme emaciation, dehydration, affected l had a tendency to hide and marked decreas egg production 13% and the mortality rate u 15%.

**3.2. Gross pathology:**

The post-mortem examination showed distin lesions characterized by white chalk-like dep covering the serosal surface of various, abdor organs as well as the heart (Fig.1). The kid are showing various types of the formity in ing atrophied or missing portions of kidney l kidney and ureter stones while the remaining ney tissue that is swollen and white with u (Fig.2).



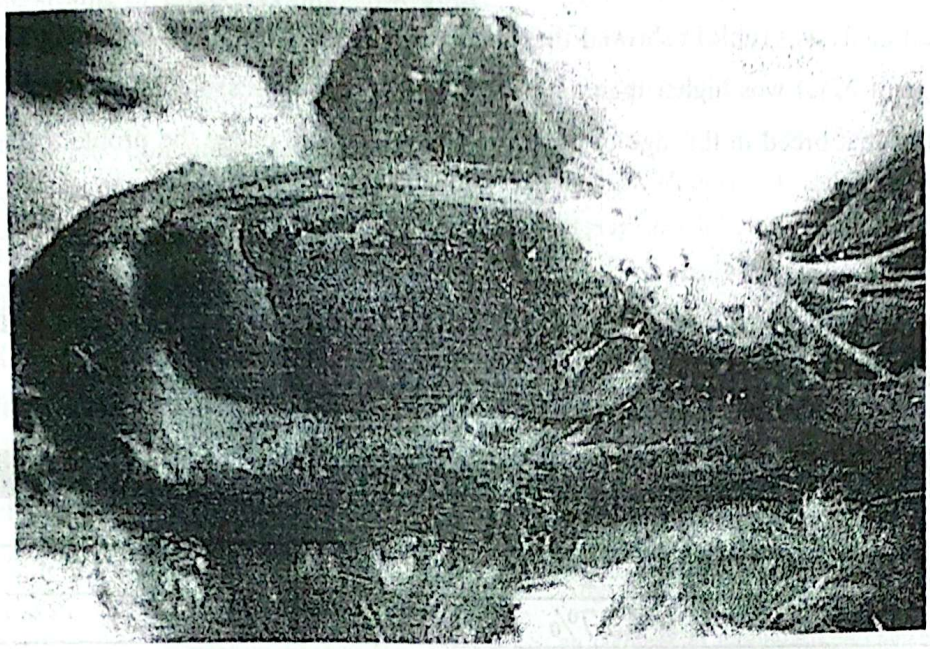

Fig.1: White-chalky deposits over the heart, liver, and abdominal cavity.

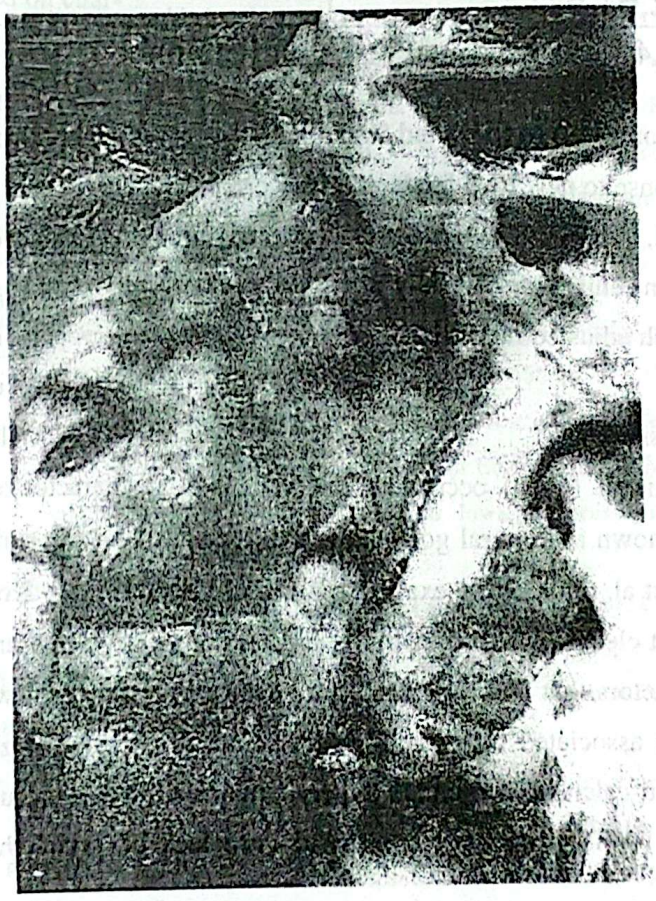

Fig.2: Kidney degeneration, leaving swollen ureter on the right side.

### 3.3. Feed analysis:

The results of feed analysis (Table1) showed the calcium percentage (4.27%) was higher than normal requirements of that breed in this age of production which is 24 weeks.

**Table1: Composition of the feed introduced to the caged layer hens suffering from urolithiasis .**

| Test | Result | Method |
|---|---|---|
| Protein | 18.05% | AOAC |
| Phosphorus | 0.52% | AOAC |
| Calcium | 4.27% | AOAC |
| Aflatoxin G1,G2,B1,B2) | not detected | AOAC |

### 3.4. Response to the adjusted feed

3.4. Response to the adjusted feed

The response to new fowl feed with 3.5% calcium was good, mortalities were stopped and the egg production return normally after two weeks from use of such adjusted ration.

### 4. Discussion:

Urolithiasis of (Gout) occurs as 2 distinct syndromes known as visceral gout and articular gout (Cowen, et al. (1987). The exact cause of visceral gout is not clear but it appears that there are a variety of factors that might cause a predisposition, it is often associated with high levels of dietary protein and calcium, vit.D3 hypervitaminosis, insufficient levels of vitamin A and even lack of sufficient water supply other factors such as toxins, viruses ,bacteria ,other infections or metabolic disorders and stressors can interfere with kidney function and cause the problem Kirk (1998). Visceral gout is most often seen during a necropsy and is difficult to diagnose in living specimen because the symptoms are vague and non-specific (Cowen, et al. (1987) 20% of mortality was due to kidney lesions tentatively called urolithiasis Blaxlangl et al. (1980).The encountered clinical and necropsy findings were characterized by depression, emaciation, marked decrease egg production and mortality rate 15% while necropsy findings characterized by white chalk like deposits covering the surface of various abdominal organs and kidney. Kidney damage swolling and deposition of white urates, all of these findings were in accordance with results reported by ( Brown et al. (1987; Fitz-coy, et al., 1988; Siller, 2003;). Spontaneous outbreak of urolithiasis have been associated with excess calcium intake or exposure to

nephrotropic strains of infectious bronchitis virus Nizink et al. (1987) the syndrome can be reproduced experimentally by feeding immature domestic fowl diets containing level of calcium higher than 3.5% calcium and less than 0.6% available phosphorus, a module that has been used to evaluate mechanisms involved in urolith formation (Widemann, et al., 1985; Shane, et al., (1969); Glahn et al., 1988) such diets cause hypercalciuria, hypophosphaturia and the excretion of relatively alkaline urine (Wideman,, et al. (1985); Glahn, et al. (1988) and these conditions were identical in composition to uroliths seen during spontaneons outbreak in caged layer flock used in this study. Our diagnosis is based on characteristics necropsy findings and feed analysis results which showed an excess of calcium 4.27% as well as the obtained improvement after two weeks of adjusted ration.

In conclusion calcium paercentage must be adjusted to percent such caces in layer flocks.

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