

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). Specifi-

cation 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 Mallinson, 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). Urolithiasis is characterized by severe 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 deprivation, (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 de-beaked 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 and infections bronchitis as well as injected, marek's disease vaccine. Infectious bursal disease was at 11-13 days old .

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

RESULTS

3.1. Clinical signs :

Clinical signs of the condition were depression, extreme emaciation, dehydration, affected birds had a tendency to hide and marked decrease of egg production 13% and the mortality rate up to 15%.

3.2. Gross pathology:

The post-mortem examination showed distinctive lesions characterized by white chalk-like deposits covering the serosal surface of various, abdominal organs as well as the heart (Fig.1). The kidneys are showing various types of the formity including atrophied or missing portions of kidney lobes, kidney and ureter stones while the remaining kidney tissue that is swollen and white with urates (Fig.2).

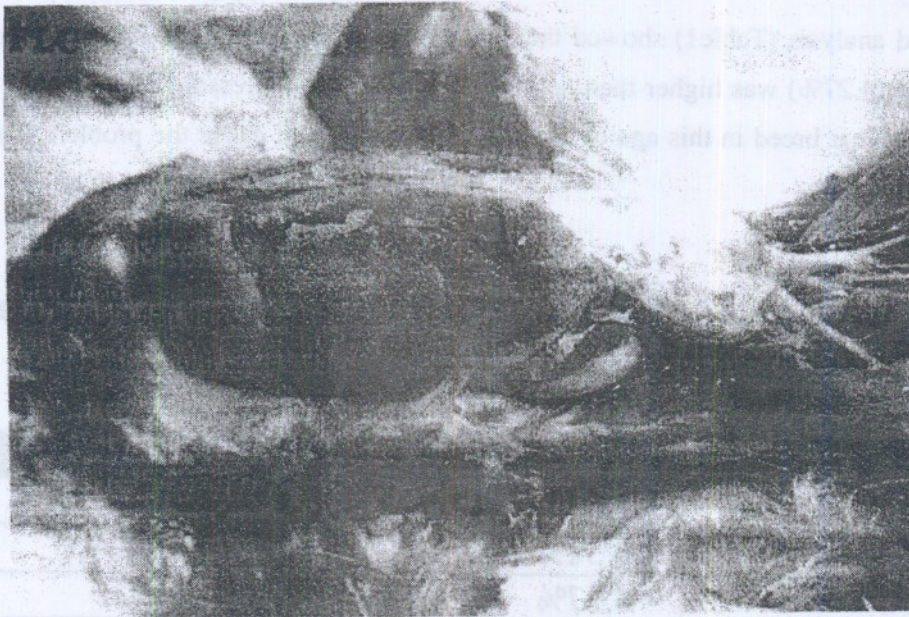


Fig.1: White-chalky deposits over the heart, liver, and abdominal cavity.



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.

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

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

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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.

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 swelling 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

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

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 spontaneous 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 percentage must be adjusted to percent such cases in layer flocks.

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تفشي الحصى الكلوي (النفرس) في قطع دجاج بياض تجاري:

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*الدراسات الإكلينيكية كلية الطب البيطري جامع النجاة الأهلية ص ب ٧ نابلس
** قسم الإنتاج الحيواني كلية الزراعة جامعة النجاة الأهلية ص ب ٧ نابلس فلسطين

أجريت هذه الدراسة على تفشي الحصى (النفرس) في قطع للدجاج البياض حبيس الأقاص. لقد تميزت العلامات السريرية بالخمول، النحول، الجفاف وانخفاض إنتاج البيض ١٣%. نسبة الوفيات وصلت إلى ١٥%. وبإجراء الصفة التشريحية للطيور الناقة أظهر ترسب مادة تشبه الطباشير تغطي سطح أعضاء التجويف البطني وكذلك طية القلب، أما نسيج الكلية متورم ومغطى باليوريا البيضاء. تم إجراء تشخيص الحالة من خلال تحليل العلف المقدم للطيور الذي أظهر زيادة في مستوى الكالسيوم ٤,٢٧% الذي كان له الأثر الرئيس لحدوث هذه الحالة، وكذلك للتشريح المرضي للطيور الناقة والاستجابة للعلاج.