

Dept. of Microbiology and Animal Hygiene,
 Fac. of Vet. Med., Alex. Univ.
 Head of Dept. Prof. Dr. M.M. El-Nimr.

CORRELATION BETWEEN CHLORIDE CONTENT IN DRINKING WATER AND ASCITIS IN POULTRY (With 3 Tables)

By

H. SAMAHA and A. EL-BASSIOUNY
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العلاقة بين نسبة الكلوريد في مياه الشرب وحالات الاستسقاء في الدجاج

حامد سماعة ، أحمد البصري

تم فحص ٢٧ عينة من مياه مزارع الدواجن كيميائياً، وجد أن ثمانية عينات منها تحتوي على نسبة عالية من الكلوريد. ولدراسة مدى ارتباط هذه الزيادة في الكلوريد وحالات الاستسقاء في الدواجن تم اجراء التجربة على مجموعتين من الدجاج تناولت الأولى مياه محبة تمام والآخرى تناولت مياه بها نسبة عالية من الكلوريد لمدة ٢٨ يوماً. وقد وجد ان زيادة نسبة الكلوريد في مياه الشرب تؤدي الى حدوث الاستسقاء في الدجاج. تم عزل البكتيريا القولونية من كل عينات الاستسقاء مما يشكل خطراً على صحة الدجاج وبالتالي الانسان، لذلك ننصح باجراء فحص مياه مزارع الدواجن يومياً.

SUMMARY

Chemical examination of 27 water samples collected from poultry farms at Alexandria Province were done, 8 samples exceeded the permissible limits of chloride content.

Chicks from one day old until 28 days of age were allowed to receive various levels of chloride in water. The results indicated that excessive chloride levels leads to ascitis in poultry as a predisposing factor.

14 ascitic fluid were examined bacteriologically for the presence of *E. coli* and revealed the percentage of *E. coli* at a rate of 100%. Only 4 isolates proved to be pathogenic and belonging to 0:114 (one) and 0:18 (Three). So, water of poultry farms must be examined periodically.

INTRODUCTION

Ascitis in poultry is caused by bacteria, nutritional deficiency or environmental conditions (EL-BASSIOUNY *et al.*, 1986). HEGAZY (1986) isolated *E. coli* in high rate from ascitic fluid of chickens. Mineralized water is a direct cause of kidney dysfunction (HOE & OISHEA, 1965 and YOUSEF *et al.*, 1990). In Egypt, numerous investigations have shown that chemical contents of the examined water samples make it unfit for consumption (FAHMY, 1964; EL-RAHEDY, 1980; ABDEL-KADER, 1983 and EL-OLEMY, *et al.*, 1989a). So; the present study was planned to study the correlation between the chloride content in drinking water and ascitis in poultry.

MATERIAL and METHODS**1. Collection of water samples**

27 water samples were collected from different localities at Alexandria Province, Collection and transportation of samples were carried out according to APHA (1975).

2. Chemical examination of water samples

Ammonia, phosphate, nitrite, nitrate, hardness sulphate and chloride were detected according to FAHMY (1964).

3. Experimental study:

Two groups of both sex of commercial broilers (Each group contained 30 chicks) were grown during the one day old to 28 days brooding period. All chicks were kept in a clean disinfected and separated batteries, fed on balanced ration with a perfect management. The first group was drank water obtained from a driven well of a high chloride level and the second one drank a fresh hygienic tap water. Both types of water were disinfected with iodocor (0.5 ml/L) according to EL-OLEMY *et al.* (1989b) to insure that water free from any pathogens. Clinical observation were recorded daily to detect health, diseased and dead chicks.

4. Detection of *E.coli*

Ascitic fluids were streaked on Macconkey agar and incubated at 37°C for 24 hours (HEGAZY, 1986). Suspected *E. coli* were identified morphologically, biochemically and animal inoculation according to EDWARD and EWING (1972). Serological identification of *E. coli* isolates were carried out according to EL-SHENAWY *et al.*, 1976).

RESULTS

Results are presented in (Tables 1, 2 & 3).

Table (1) : Showing Chemical examination of the examined water samples.

| Varuble | Ammonia mg/L | Nitrite mg/L | Nitrate mg/L | Sulphate mg/L | Phosphate mg/L | Chloride mg/L | Hardness mg/L |
|---------------------------------------|-----------------|-----------------|-----------------|------------------|-------------------|------------------|------------------|
| Permissible | - | - | 50 | 200 | - | 200 | 100 |
| Excessive | - | - | 100 | 400 | - | 600 | 500 |
| Higher than the excessive level | 27 | 20 | - | - | 20 | 8 | 2 |

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Table (2): Showing the relation between chloride and ascitis

| Variable | Group I | Group II |
|-----------------------------|---------|----------|
| <u>Chemical examination</u> | | |
| PH | 6.8 | 7.2 |
| Ammonia (mg/L) | - | - |
| Nitrite (mg/L) | - | - |
| Nitrate (mg/L) | 0.3 | 0.23 |
| Chloride (mg/L) | 1940 | 122.7 |
| Sulphate (mg/L) | 100 | 82.6 |
| Hardness (mg/L) | 60 | 49.0 |
| <u>Ascitis cases:</u> | 14 | - |

Table (3): Incidence of E.Coli in ascitic fluid.

| No. of Samples | <u>E.Coli</u> | | <u>Pathogenic strains</u> | | <u>Serotypes</u> | |
|----------------|---------------|-----|---------------------------|------|------------------|-------|
| | +Ve | % | +Ve | % | 0/18 | 0/114 |
| 14 | 14 | 100 | 4 | 28.5 | 3 | 1 |

DISCUSSION

As shown in Table (1) the chemical examination of the examined water samples revealed a high variations which might be due to the difference in the nature of the ground state (ZALATA, 1971). Similar results were obtained by FAHMY (1984), EL-ROSHDEY (1980), ABDEL-KADER (1983) and EL-OLEMY *et al.* (1989a).

The results presented in Table (2) point out the effect of chloride drinking water on chicken wellbeing was most significant in the first group as it showed a marked increase in the occurrence of ascitis. Similar results were reported by MARRISON *et al.* (1975) using a high level of sodium chloride on turkey feeding. Moreover, high concentration of chloride in drinking water of chicks may render it unpalatable for livestock and has a toxic effect (BLOOD and HENDERSON, 1974).

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From the bacteriological examination of the ascitic fluid, E. coli were only isolated from such fluid in all ascitic chicks (Table, 3). A nearly similar finding substantiates reported by HEGAZY (1986). Enteropathogenic serotype of E. coli (28.5%) has been of public health importance. In addition, the identified serotypes 0/18 and 0/114 agree with the finding of EL-BASSIOUNY (1985) who isolated the some serotypes from faecal samples of chickens denoting that these serotypes of E. coli were predominated in chickens.

Generally, from the abovementioning results and discussion it can concluded that high level of chloride in drinking water may be a cause of ascitis in chickens which predisposing the spreading of E.coli in chickens so; periodical chemical examination of drinking water must be done regularly and the water of over permissable limit of chloride must be excluded or treated.

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