

## Effect of Lead Toxicity In Broiler Chicken

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### ABSTRACT

*The present study was undertaken to evaluate the toxic effect of lead in broiler chicken. The birds were divided into two groups, A and B. Group-A served as healthy control where as group-B received lead acetate @ 200 mg/kg in basal diet for 42 days. Study showed various clinical sign viz. regurgitation, anorexia, prostration, weight loss, lethargy, wing droop, leg paresis, greenish diarrhea and gross change (necrotic foci and congestion of liver, kidney and spleen, haemorrhages on muscles, gizzard lining and intestinal wall, splenomegaly, hepatomegaly, enlarged kidney and bile stasis) in lead exposed bird as compared to normal.*

*Keywords: Lead; toxicity; clinical sign; gross changes*

Received 12/01/2017

Revised 28/02/2017

Accepted 09/03/2017

### Citation of this article

R Jaiswal, S.L. Ali, O.P Dinani, S Kumar Jaiswal . Effect of Lead Toxicity In Broiler Chicken. Int. Arch. App. Sci. Technol; Vol 8 [1] March 2017. 08-11.

### INTRODUCTION

Today commercial poultry farmers using inorganic materials in poultry feed for augmented health and production but mostly those reared in backyard, are exposed to a host of pollutant through environmental contamination, the potential of egg and meat as a source of lead to human diet cannot be denied completely. Report on poultry eggs in India were found to contain higher lead level that had been detected in other countries including Germany, Canada, Taiwan, Finland, Hungary and China[1], However insufficient literature is available on lead burden due to environmental pollution of lead on poultry particularly in meat type, This study emphasized to toxic effect of lead in many of the visceral organs in broiler chicken.

### MATERIALS AND METHODS

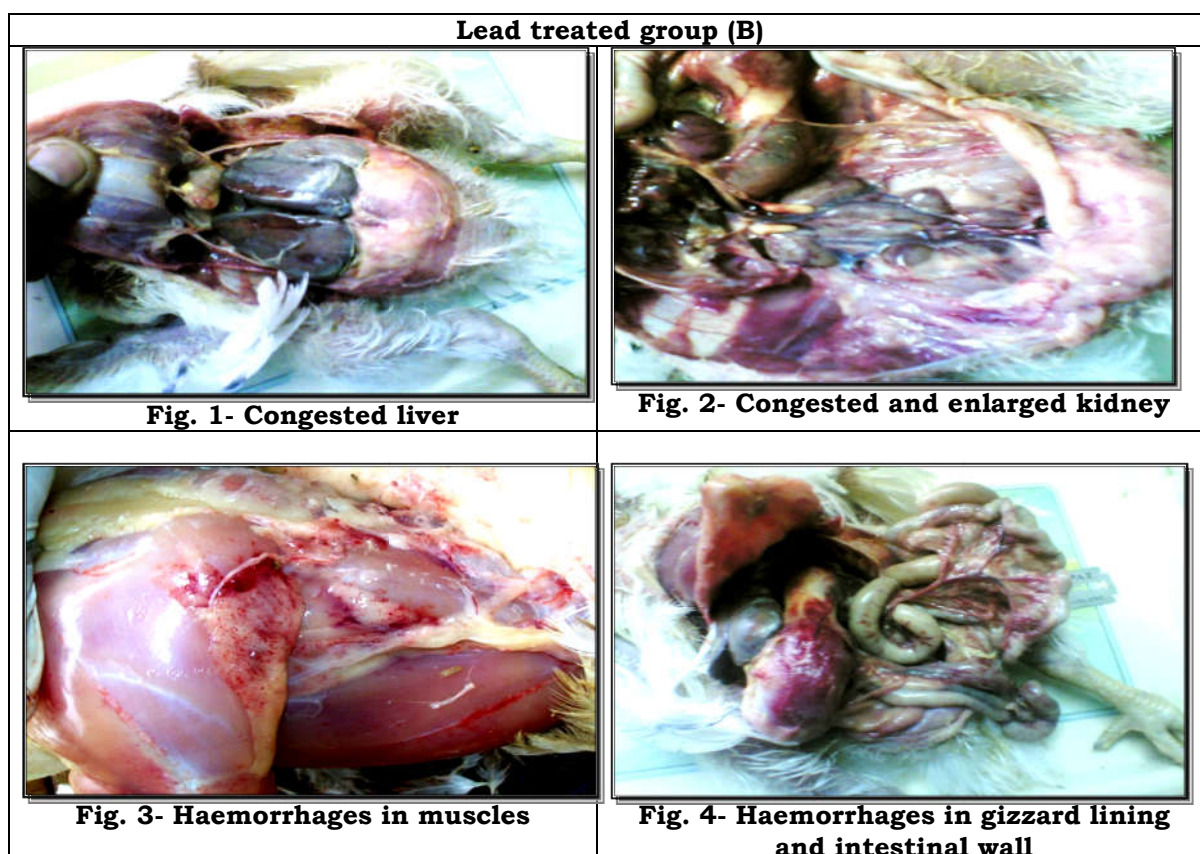
In this study fifty day old broiler chicks (Ven-Cobb strain) were divided into two groups A and B (25 chicks in each group). The birds of group-A were kept as healthy control received only basal diet, birds of group- B received lead acetate alone @ 200 mg/kg. Continuous monitoring and observation had been made throughout the experimental period from day one to 42 days to observe the clinical symptoms and behaviors shown by birds due to lead toxicity. At the end of experiment (42<sup>nd</sup> day), 10 birds were randomly chosen from both the group and sacrificed by cervical dislocation and find the gross changes of many organs.

### RESULTS AND DISCUSSION

**Clinical manifestation:** Throughout the experimental period, clinical observation of various birds of both the group revealed that after 21 days few birds of group-B showed clinical signs like regurgitation, anorexia, progressive muscular weakness, prostration and weight loss, signs related to nervous system like impairment, lethargy, wing droop, leg paresis or paralysis, GI signs such as greenish diarrhoea that stained feathers around the

vent, while birds of group A showed absence of any clinical sign. The clinical signs of lead intoxication were primarily related to the effects of lead on the nervous, GI, hematopoietic and renal systems. The signs varied depending on whether the intoxication was acute or chronic, which in turn, depended on the amount and form of lead ingested over time[2]. The above findings were similar to other workers as[3]and[4] also observed anorexia, impaction and greenish diarrhoea, which stained feathers around the vent in lead poisoning that might be due to regurgitation and decreased motility of the upper GI tract (esophagus, proventriculus, and ventriculus) and signs related to hematopoietic impairment can include weakness.

**Gross changes:** Gross changes observed in lead treated group-B and control group-A were showing in Fig.1-9. At the end of experiment postmortem examination of birds of lead treated (group-B) group grossly showed necrotic foci at some places of liver along with congestion (Fig. 1), diffuse congestion of kidney (Fig. 2), lung (Fig. 5) and spleen were also seen, haemorrhage on muscles (Fig. 3), gizzard lining (Fig. 4) and intestinal wall (Fig. 4) were observed in lead treated birds. Group-B also showed splenomegaly, hepatomegaly (Fig. 1), enlarged kidney (Fig. 2) and bile stasis (Fig. 6) which were associated with engorged gallbladder and viscous, dark-green bile. Gross examination of control group (group A) revealed normal liver (Fig. 7), muscles (Fig. 7), kidney, lung (Fig. 8), heart and spleen (Fig.9). Similar changes were also observed by [5] in their study of chronic lead poisoning in chickens in which lead acetate was given at a dose level of 400 ppm in drinking water for 6 weeks. The findings were comprised of necrotic foci at some places along with congestion in liver whereas intestine, spleen and kidneys showed only congestion. Splenomegaly, necrosis of gizzard, enteritis, edema of head and neck have also been reported by [6].The gross finding in the present study was in accordance with [7] that showed gastroenteritis, diffuses congestion of lung, epicardial hemorrhages and degeneration of liver and kidney, lead encephalopathy and degeneration of peripheral nerve, varying in their severity with tissue levels of lead attained. The possible reasons for occurrence of gross changes in liver, bile duct and kidney are their involvement in lead metabolism and excretion because they are the primary target organs for lead fate. Splenomegaly may occur secondary to increased removal of lead damaged erythrocyte[6].



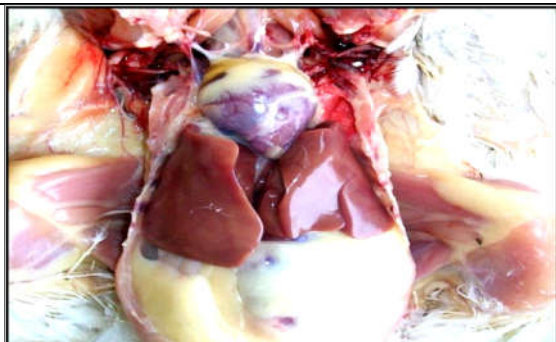


**Fig. 5- Congested lung**

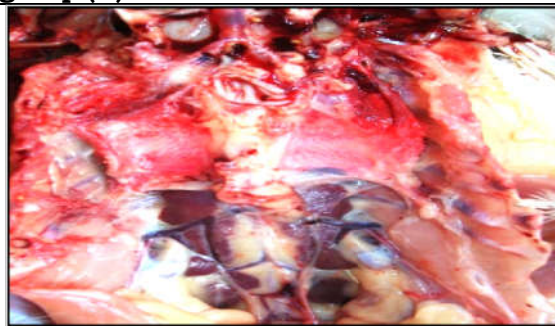


**Fig. 6- Bile stasis**

**Control group (A)**



**Fig. 7- Normal liver and muscles**



**Fig. 8- Normal kidney and lungs**



**Fig. 9- Normal heart and spleen**

**CONCLUSION**

From the results of the present investigation, it can be concluded that the supplementation of lead in diet showed alteration in clinical signs (like regurgitation, anorexia, prostration, weight loss, lethargy, wing drooping and greenish diarrhoea) and normal structure of various tissues like, necrotic foci on liver along with congestion, diffuse congestion of kidney, lung and spleen was observed. Histopathological changes of variable degree in various organs viz. liver, kidney, muscles, lungs and spleen were also evident.

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