

## COMBINED EFFECT OF CHLORPYRIPHOS AND T-2 TOXIN ON THE SERUM ELECTROLYTES IN BROILER CHICKEN\*

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Lack of information on combined effect of chlorpyrifos, an organophosphorus compound, and T-2 toxin, a mycotoxin, on the serum electrolytes in broiler chicken prompted us to undertake the present work.

### Materials and Methods

Twenty-four newly hatched unsexed broiler chicks were wing banded, weighed and randomly distributed into four groups of 6 birds each i.e., control, chlorpyrifos, T-2 and chlorpyrifos + T-2 group and housed in battery brooders with *ad libitum* supply of feed and water. Known amounts of chlorpyrifos and T-2 toxin containing powdered wheat substrate were incorporated into toxin free broiler starter mash either singly or in combination to yield 45 ppm chlorpyrifos and 0.5 ppm T-2 toxin respectively. Blood samples collected from each group on 28<sup>th</sup> day of trial were allowed to clot and centrifuged at 1500 rpm for 20 minutes to separate the sera. Serum calcium by O-cresolphthalein complexone method, phosphorus by modified metol method, sodium and potassium by colorimetric method, chloride by photometric test using thiocyanate and magnesium by photometric test using

xylydyl blue were estimated using semi auto analyzer, Biosystems (BTS 320). The data obtained were subjected to one-way analysis of variance (Snedecor and Cochran, 1989).

### Results and Discussion

The results of analysis are presented in the Table. There was significant ( $P < 0.05$ ) decrease in the serum calcium level in the treatment groups when compared to the control. No significant difference was observed between chlorpyrifos and chlorpyrifos + T-2 groups. However, increased calcium levels were reported in Japanese quails fed 4 ppm of T-2 toxin from 0 to 5 weeks of age (Madheswaran, 2002). There was significant ( $P < 0.05$ ) decrease in the Ca/P ratio in T-2 and chlorpyrifos + T-2 groups and increase in chlorpyrifos group when compared to the control group. The decrease in calcium could be attributed to the reduced feed intake and intestinal absorption as evidenced in this study in toxin fed birds. Significant ( $P < 0.01$ ) decrease in the chloride level was observed in the toxin fed bird when compared to the control. No significant difference was observed among the treatment groups. The decrease in the chloride level might be due

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Table - Mean $\pm$ Se Serum electrolyte values in broilers fed chlorpyrifos and T-2 toxin singly and in combination (n = 6)

Chlorpyrifos (ppm)	T-2 (ppm)	Calcium (mg/dl)	Phosphorus (mg/dl)	Ca/P ratio	Sodium (mmol/l)	Chloride (mmol/l)	Potassium (mmol/l)	Magnesium (mg/dl)
0	0	8.31 <sup>a</sup> $\pm$ 0.41	3.81 $\pm$ 0.19	2.22 <sup>b</sup>	133.08 $\pm$ 5.67	129.28 <sup>a</sup> $\pm$ 2.47	3.71 $\pm$ 0.07	3.85 $\pm$ 0.24
45	0	7.70 <sup>b</sup> $\pm$ 0.31	3.08 $\pm$ 0.28	2.59 <sup>a</sup>	138.10 $\pm$ 3.43	92.60 <sup>b</sup> $\pm$ 7.76	4.03 $\pm$ 0.13	3.50 $\pm$ 0.23
0	0.5	5.50 <sup>c</sup> $\pm$ 0.15	3.03 $\pm$ 0.32	1.93 <sup>c</sup>	147.78 $\pm$ 8.87	99.36 <sup>b</sup> $\pm$ 8.58	4.13 $\pm$ 0.27	3.95 $\pm$ 0.32
45	0.5	6.75 <sup>b</sup> $\pm$ 0.40	3.56 $\pm$ 0.20	1.91 <sup>c</sup>	141.78 $\pm$ 6.01	112.43 <sup>b</sup> $\pm$ 3.50	4.38 $\pm$ 0.14	3.86 $\pm$ 0.14

Mean with same superscript within a column do not differ significantly (P<0.01)

to decreased feed intake and enteritis observed in this study. There was no significant difference in the serum phosphorus, sodium, potassium and magnesium levels in the treatment groups when compared to the control birds. However, further studies are required to evaluate the effect of these toxins on the electrolyte balance in the broiler chicken.

### References

- Madheswaran, R. (2002)... Thesis submitted to Tamilnadu Veterinary and Animal Sciences University, Chennai-51, Tamilnadu.
- Snedecor, G.W. and Cochran, W.G. (1989)... Statistical Methods, 8<sup>th</sup> edn., Iowa State University Press, Ames.

### NEWS

**BAIF** and **INTERVET** have joined hands to work in close co-operation for rural development through animal healthcare. The alliance '**Sahayog**' formalised on 19-12-2005 at Pune, is aimed to help the farmers with a more sustainable livelihood and establish a more self-reliant and vibrant rural economy in India.