

HAEMATOLOGICAL STUDIES IN BROILER CHICKEN FED BUTYLATED HYDROXY TOLUENE*

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Butylated hydroxy toluene (BHT), a synthetic antioxidant reportedly protects the liver from the damage caused by aflatoxins (Larsen *et al.*, 1985). However, Takahashi and Hiraga (1978) incriminated BHT as the cause for haemorrhagic deaths in rats. The present work deals with haematological studies in broiler chicken fed BHT at different levels.

Materials and Methods

One hundred and five, one day old broiler chicks of either sex were

procured from a commercial source and were randomly distributed into seven groups, each with fifteen chicks. These were maintained in battery brooders, with *ad lib.* supply of feed and water. The birds were given treatments for a period of six weeks as shown in Table 1.

Broiler mash was obtained from poultry research station, Nandanam, Madras (without any added synthetic antioxidant). BHT (Sigma chemical corporation, USA) was dissolved in

Table 1. Treatment levels of BHT in Chicken

Group	Number of birds	Treatment
A	15	Basal feed (B.F.)
B	15	Basal feed and Dimethyl Sulphoxide (DMSO)
C	15	Basal feed + BHT @ 130 mg/kg in DMSO
D	15	Basal feed + BHT @ 260 mg/kg in DMSO
E	15	Basal feed + BHT @ 520 mg/kg in DMSO
F	15	Basal feed + BHT @ 1040 mg/kg in DMSO
G	15	Basal feed + BHT @ 2080 mg/kg in DMSO

*Part of the M.V.Sc., thesis of the first author

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0.2 ml of DMSO (Dimethyl sulfoxide) and given by gastric intubation. The level of BHT was so adjusted that the daily intake corresponded to the dietary level calculated for that particular group.

Blood samples were collected from the wing vein at weekly intervals in dried Heller and Paul's anticoagulant mixture.

The haematological parameters studied were:

- a) Packed cell volume (PCV) by the Wintrobe method (Wintrobe, 1974)
- b) Haemoglobin (Hb) by Sahli's acid haematin method (Benjamin, 1985).
- c) Total Erythrocyte count (TEC) by Nambiar's method (1960).

d) Total leucocyte count (TLC) by Nambiar's method (1960).

e) Total thrombocyte count (TTC) by Nambiar's method (1960)

Results and Discussion

The mean values of PCV, Hb, TEC, TLC and TTC are presented in Table 2.

Packed cell volume

The mean values of the packed cell volume did not show any significant variation in the treatment groups C, D, E and F. However, in the treatment group G it showed a highly significant ($P < 0.01$) elevation. This is in concurrence with the finding of Takahashi and Hiraga (1981) who recorded a significant increase in haematocrit during BHT feeding in rats.

Table 2 The mean values of PCV, Hb, TEC, TLC and TTC during BHT treatment in broiler chicken

Treatment	PCV(%)	Hb(g%)	TEC (million/ml)	TLC (thousand/ml)	TTC (per ml)
A	28.20 ^a	8.48 ^a	2.28 ^a	16880 ^a	38280 ^a
B	28.22 ^a	8.44 ^a	2.36 ^a	17220 ^a	38800 ^a
C	28.04 ^a	8.52 ^a	2.42 ^b	16260 ^a	37980 ^a
D	28.32 ^a	8.44 ^a	2.46 ^b	17180 ^a	38120 ^a
E	28.48 ^a	8.36 ^a	2.44 ^b	16240 ^a	37280 ^b
F	28.40 ^a	8.32 ^a	2.58 ^b	15280 ^b	32600 ^b
G	29.92 ^b	9.16 ^b	2.88 ^b	15180 ^b	29980 ^b

Means bearing the same superscript do not differ at one per cent level of significance.

Haemoglobin

The mean values of Haemoglobin did not show any significant variation in the treatment groups C, D, E and F. However, in the treatment group G it showed a highly significant ($P < 0.01$) elevation. Takahashi and Hiraga (1981) reported a significant increase in haemoglobin concentration during BHT treatment.

Total erythrocyte count

The mean values of the total erythrocyte count showed a highly significant ($P < 0.01$) elevation in all the BHT treated groups. Takahashi and Hiraga (1984) also reported a highly significant ($P < 0.01$) elevation in the total erythrocyte counts of rats preceding the occurrence of haemorrhage during BHT administration.

Total leucocyte count

The mean values of the total leucocyte count showed no significant variation in the treatment groups C, D and E. However, in the treatment groups F and G, it showed a highly significant ($P < 0.01$) decrease. Hirose *et al.* (1981) reported a significant decrease in the leucocyte count in low dose level BHT feeding in rats.

Total thrombocyte count

The mean values of the total thrombocyte count did not show any

significant variation in the treatment groups C and D. However, in the treatment groups E, F and G the count showed a highly significant decrease ($P < 0.01$). Takahashi and Hiraga, (1984) also reported a significant decrease in the platelet distribution width during BHT treatment in rats.

Summary

An experimental trial was conducted to study the effect of feeding Butylated hydroxy toluene (BHT) on various haematological parameters - PCV, Hb, TEC, TLC and TTC in broiler chicken. BHT was administered orally for six weeks at 130, 260, 520, 1040 and 2080 mg/kg levels. The mean values of PCV and Hb showed a highly significant ($P < 0.01$) elevation at 1040 mg/kg level. The mean values of TTC showed a highly significant ($P < 0.01$) decrease at 520, 1040 and 2080 mg/kg levels. The mean values of TLC showed a highly significant ($P < 0.01$) decrease at 1040 and 2080 mg/kg levels. The TEC showed a highly significant ($P < 0.01$) elevation in all the BHT treated groups.

Acknowledgement

The authors thank the Dean, Madras Veterinary College, Madras for the facilities provided to carryout this work.

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