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Effect of herbal lean meat formulation on hematological profile in commercial broilers

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Abstract

The study was conducted for six weeks in commercial broiler birds to evaluate the effect of herbal lean meat formulation viz., AV/HLP/16 and AV/LMP/10 (M/S Ayurvet Ltd India). One hundred and eighty (180) broiler birds were randomly allocated into three groups, i.e., Control, Treatment (1) and Treatment (2) having four replicates in each. Control group was fed a standard basal diet without any supplementation and group T1 and T2 were supplemented with AV/HLP/16@500g/tonne of feed and AV/LMP/10 @500g/tonne of feed respectively. At the end of the trial period (42day) it was found that Hb% was significantly higher in T1 group (10.29 ± 0.274^b) followed by T2 group (9.62 ± 0.100^{ab}) in comparison to control group (8.99 ± 0.249^a). Lymphocyte count was also slightly higher in T1 group (59.98 ± 0.76) as compared to T2 (59.74 ± 0.23) and control group (58.57 ± 0.61). Also, H:L ratio was slightly lower in T1 group in comparison to T2 and control. However, no significant changes were observed in TEC, TLC, PCV and leucocytes count among all the groups. Thus, it was concluded that AV/HLP/16 group has a better effect in terms of haemoglobin % and lymphocyte count followed by AV/LMP/10 in comparison to control group.

Keywords: Broiler, Hb%, lymphocyte count, AV/HLP/16, AV/LMP/10

Introduction

The importance of feed in the poultry production system represents about 70-75% of the total cost of production. The feeding cost of poultry can be reduced by supplying precise nutrients. Various feed additives are being included in the diet of poultry to improve the growth rate, meat by product quality, feed efficiency and to improve the cost of production. The use of antibiotics in feed of poultry acts as an antimicrobial growth promoter and has been proved for the improvement in growth performance and prevention of diseases Huyghebaert *et al.* (2011) [6].

The use of various traditional herbs and their by-products have been used as a source of medicine in the indigenous poultry system Thakur *et al.* (1985) [16]. European union has banned the use of antibiotics as a feed additive, growth promoters because of its residual property in animal tissues can lead to antimicrobial resistance in human beings Griggs and Jacob *et al.* (2005) [5]. Various alternatives for antibiotics, growth promoters are probiotics, prebiotics and essential oils etc. Essential oils are derived from various plants called as phytobiotics. Various phyto-genic supplements play an important role for many decades in poultry farming such as *Ocimum sanctum*, *Embllica officianalis*, *Withania somnifera*, *Spirulina platensis* Gopi *et al.* (2014) [4]. They have an antimicrobial and antioxidant properties which have the ability to increase the feed intake and improve the FCR. They also influence lipid metabolism which lead to hypocholesterolemic effects Saravanan *et al.* (2015) [15].

Prasad *et al.* (2009) [14] reported that inclusion of garlic resulted in decrease value of haemoglobin (Hb) and Total erythrocyte count (TEC), it was also reported that there was a slight increase in the lymphocyte and heterophil counts due to the immunostimulatory activity of garlic. Amla (*Embllica officianalis*) is being also used against a variety of conditions like liver infections, diabetes, CHD, and it possess a very good hypocholesterolemic effect Kumar *et al.* (2014) [10].

Recent studies were conducted by Fadlalla *et al.* (2010) [3] that supplementation of graded garlic level (0, .15, .45, .3 and 0.6%) in the basal diet of broiler chickens observed that garlic inclusion @.3% had no effect on total blood serum, globulin, albumin and total protein level.

Elagib *et al.* (2013) [2] also studied that addition of garlic (0,1,3 and 5%) in the basal diet of broiler chickens had no significant effect on Hb, TEC, TLC, Packed cell volume (PCV) and differential leukocyte count of White blood cell (WBC).

Materials and Method

A total of 180day old vencobb broiler strain birds were randomly allocated into three groups *viz.*, Control, Treatment1 (T1) and Treatment 2 (T2) at the experimental animal house of College of Veterinary and Animal Sciences, GBPUA&T, Pantnagar, Uttarakhand. The herbal supplements for treatment 1 and treatment 2 were given in the basal diet of broiler birds *viz.*, AV/HLP/16 @500g/tonne of feed and AV/LMP/10 were given @ 500g/tonne of feed provided by the M/S Ayurved Limited, Baddi, Himachal Pradesh. Control group was fed simple basal ration and T1 and T2 were given along with basal ration at the same dose rate explain as above.

Different growth parameters were recorded at weekly interval. The blood was collected at the end of the trial period to evaluate the Hb%, PCV, TLC, TEC and DLC count by the standard procedure. Therefore, the objective of the present study was to evaluate the effect of herbal lean meat formulations on haematological attributes.

Blood collection and analysis

The blood samples were collected aseptically from the wing vein of broiler birds at the end of trial period (42nd day) into well labelled blood collecting tubes.

Statistical analysis

All data were statistically analysed using SPSS software package version 26.0 to determine analysis of variance between groups. Variables having unequal observations were analysed following least square design method and the Duncan's multiple range test Duncan *et al.* (1955) [1] with level of significance ($P<0.05$).

Results and Discussion

Table 1: Shows the parameters Groups

parameters	(Mean ± SE)		
	Group I (Control)	Group II(T1)	Group III(T2)
Hb (g/dl)	8.99±0.249 ^a	10.29±0.274 ^b	9.62±0.100 ^{ab}
PCV (%)	28.30±0.437 ^a	28.62±0.112 ^a	29.01±0.201 ^a
TLC(×10 ³ /mm ³)	31.30±0.472 ^a	30.65±0.607 ^a	30.75±1.51 ^a
TEC(×10 ⁶ /mm ³)	4.00±0.016 ^a	4.04±0.025 ^a	4.00±0.014 ^a
H: L	0.51±0.008 ^a	0.48±0.013 ^a	0.49±0.009 ^a
Lymphocyte (%)	58.57±0.61 ^a	59.98±0.76 ^a	59.74±0.23 ^a
Heterophil (%)	30.13±0.23 ^a	29.31±0.47 ^a	29.73±0.35 ^a
Monocyte (%)	3.11±0.14 ^a	3.10±0.027 ^a	3.01±0.09 ^a
Eosinophil (%)	6.29±0.44 ^a	5.83±0.19 ^a	5.69±0.17 ^a
Basophil (%)	1.81±0.24 ^a	1.71±0.13 ^a	1.75±0.15 ^a

*Values bearing different superscripts in a row differ significantly ($P<0.05$)

In the present study it was found that haemoglobin % was significantly higher in T1 group (AV/HLP/16) followed by T2 group (AV/LMP/10) in comparison to control as shown in (Table1). Similar results are also in agreement with the Li *et al.* (2002) [11] that supplementation of amla and aloe vera in the diet of broilers improves Haemoglobin %. Aloe vera and Amla consists of thiamine, riboflavin, folic acid and other essential amino acids which might trigger the erythropoietic system to produce red blood cells. Also, it plays a better role

in immunomodulation and stimulation of various organs related to blood cell formation, such as thymus, spleen and bone marrow.

Similar investigations are also in agreement with Iranloye *et al.* (2002) [7] that supplementation of garlic extracts in rats caused significant increased ($P>0.05$) in mean Hb value. It is due to the oxygen scavenging activity of garlic extract that competes with Hb in the RBC for oxygen, resulting in hypoxia which then stimulates haemoglobin synthesis and RBC production.

Similar results were supported by Jamil *et al.* (2015) [9] and Lokapirnasari *et al.* (2016) [12] which showed that supplementation of *S. platensis* increased Hb%, leukocytes count and number of erythrocytes. However, in contrast, feeding of *S. platensis* for a long term has a negative effect on the liver, where erythrocytes and haemoglobin are partly produced due to the presence of hepatotoxin in spirulina Iwasa *et al.* (2002) [8]. Kumar *et al.* (2014) [10] also studied that stress was indicated by increased H:L ratio, but by supplementation of antistressor products such as Vit. C and Ayucee liquid significantly lowered the H/L ratio in broiler chicken. Vit C plays an important role in reducing the stress hormone i.e., Plasma corticosterone and H/L ratio.

However, there were no significant changes observed in TEC, TLC and PCV parameters among all the groups. Also, it was found that there were no significant differences in lymphocyte, Heterophil, Basophil, Monocytes and Eosinophil in birds fed with herbal supplements i.e., AV/HLP/16 and AV/LMP/10 in comparison to control. The monocyte value was found slightly lower in T1 group in comparison to T2 group and Control. However, mean value of Eosinophil was decreased in T1 and T2 group in comparison to control group due to anthelmintic activity of garlic contents. Nagaich *et al.* (2000) [13].

It was also found in the present study that there was a slight rise in lymphocyte count in T1 and T2 groups in comparison to control. The present study was in agreement with the findings of Prasad *et al.* (2009) [14], that slight rise in lymphocyte count was observed in garlic supplemented groups which may be due to the immunomodulatory action of garlic.

Conclusion

It could be concluded from the present study that supplementation of AV/HLP/16 group has better effect on mean haemoglobin value, lymphocyte count and lowering of H:L ratio due to antioxidant activity.

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