

Effect of Dietary inclusion of Aloe vera (*Aloe barbadensis*) and Yeast (*Saccharomyces Cerevisiae*) powder on blood parameters of Broilers

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Abstract: Experiment was conducted on 72 - day old chicks of same hatch upto six weeks of age to investigate the effect of Aloe vera (*Aloe barbadensis*) and Yeast (*Saccharomyces Cerevisiae*) powder on the hematological parameters of broilers. Chicks were randomly divided into four groups 18 chicks in each. Control group received standard broilers diet. Chicks in second, third, fourth group received standard broilers diet supplemented with the Aloe vera (*Aloe barbadensis*) and Yeast (*Saccharomyces Cerevisiae*) powder @ 0.00% (control), 0.50% (Yeast), 0.50% (Aloe vera), and 0.50% Yeast + 0.50% Aloe vera were incorporated into the basal diet for six weeks. At the end of experiment nine broilers from each group should be selected, sacrificed and blood samples should be collected with the help of anticoagulant for determination of hematological parameters. Results revealed a significant effect of Aloe vera and Yeast powder in feeds on mean heterophil ($P < 0.05$) were significantly on feed supplemented with 0.50% Yeast + 0.50% Aloe vera powder. It was concluded from this study that 0.50% Yeast + 0.50% Aloe vera powder feed supplemented has a beneficial impact on the growth performance of broilers chicks.

Keywords: Broiler, Yeast, Aloe vera, hematology.

I. Introduction

Poultry sector in India has developed unprecedented growth during last three decades and now transformed itself into the status of an industry. Today, India ranks third largest producer in eggs (Watt Executive Guide, 2007) and fifth largest producer in broiler chicken (Watt Executive Guide, 2005) in the world. The poultry production as practiced today is a specialized one and concentrating more on the use of high performance birds. The major factors for successful poultry production are high genetic potential, balanced nutrition and health maintenance. On the other hand, there is a major demand to produce high quality poultry meat and egg at low price without rely on antibiotics and other medicines in poultry feed and water. Lutful Kabir (2009) noted that the mode of action of dry yeast in poultry includes: (i) maintaining normal intestinal microflora by competitive exclusion and antagonism: (ii) altering metabolism by increasing digestive enzyme activity and decreasing bacterial enzyme activity and ammonia production: (iii) improving digestion, and (iv) stimulating the immune system. From the previous interesting observation, and as it is well known that the performance of the bird is a reflection of its physiological activity, therefore, the objective of this study was to evaluate the effect of supplementing dry yeast in broiler diet as a natural feed additive on growth performance, carcass traits, some blood parameters and economical efficiency of broiler chicks from 1- 42 days of age. Aloe vera has been credited with several remedies such as its effect on dental health, healthy digestion, immune support, growth enhancement and repair of collagen and elastin (Ernst et al., 2002). However, only a little and limited documented data are available on the effects of these herbs on broiler performance when used as feed supplement in broiler diets. The present study was conducted to evaluate the effects of various levels of two component of live yeast of *Saccharomyces cerevisiae* (S.c) and leaf powder of aloe vera on blood parameters in broiler chicks.

II. Materials And Methods

A total of 72 DOC of same hatch were randomly distributed into four groups i.e. T₁ (Control), treatment T₂, T₃ and T₄ with six sub groups comprising of three birds in each. Broilers in T₁ were fed diet as per (NRC, 1994) standard (CP 22 and ME 2900) but broilers in T₂, T₃ and T₄ were fed standard ration supplemented with 0.50% (Yeast), 0.50% (Aloe vera), and 0.50% Yeast + 0.50% Aloe vera powder. All broilers were offered feed and water ad libitum throughout the experimental period. They were housed in metal type battery cages in small animal laboratory of S.S. and AH Dairying, SHIATS Allahabad. A bulb of 15 watt was left on in each cage. Initial weight of each chick was recorded on arrival and then weekly.

Table 1 Ingredient and nutrient composition of experimental diet (%DM)

Ingredients (%)	Broiler starter (0 – 21 days)	Broiler finisher (22 – 42 days)
Maize	60.00	63.00
Ground nut cake	23.11	18.00
Fish meal	12.60	14.60
Premix*	2.50	2.50
Salt	0.30	0.30
Methionine	0.10	0.01
lysine	0.10	0.01
Di-calcium phosphate	1.20	1.20
Total	100	100
Calculated Chemical analysis		
Moisture (%)	6.29	6.22
Crude Protein (%)	23.29	21.28
Total Ash (%)	8.02	9.34
CP	22.00	19.00
ME (Kcal/Kg)	2900	3000
Calcium (%)	0.69	0.52
Available phosphate(%)	0.74	0.69
Methionine(%)	0.33	0.31
Lysine(%)	1.19	1.08

***Premix (2.5%) Provided the following (Per Kg of complete diets). Vit A. 367500 IU,133500 IU Vit. D3, 1920 mg Vit.E, 84.42 Vit. K3, 50 mg Vit. B1, 150 mg Vit. B2, 500 mg Vit. B3, 177.5 mg Vit. B6, 0.8 mg Vit. B12, 600 mg Vit. PP, 24.5 mg folic acid, 27 mg biotin, 5767.5 mg choline, 2667 mg Fe, 333.75 mg Cu, 3334.06 mg Mn , 203 mg Co , 2334.38 mg Zn , 100.75 mg Ca , 10 mg Se, 65446.46 mg Ph, 36667.5 mg DL Mithionine, 200.02mg, Ethoxyquin,50mg Flavophospholipol, 30g Fish meal, 1800g wheat bran.**

Green Aloe vera leaves were dried for three to four days initially and then in oven at 60°C up to moisture content level below 10%. Then the leaves were crushed manually to make it fine. It was passed through fine meshed wire sieve to obtain uniform powder. Then it was mixed with standard feed mixture according to the ratio mentioned. Chicks were provided 0.8 sq.ft/bird space. Cages, feeders, waterers, and other equipments were properly cleaned disinfected and sterilized before use. The waterers were disinfected with 0.02%KMnO4 solution every day. The average live body weight, body weight gain, feed intake, mortality percent and feed conversion ratio were measured on weekly basis. At the end of experiment, nine birds were randomly selected from each experimental group blood samples are collected for haematological, serum biochemical parameters and haematological analysis. The blood samples were sent to the laboratory where the following parameters were Determined: - total leukocyte Count (TLC), total erythrocyte count (TEC), Haemoglobin content (Hb), Packed Cell Volume (PCV) and different leukocyte count (DLC) like heterophill, basophile, eosinophill, monocytes and lymphocytes. From these base parameters, the following parameters were calculated using the appropriate formulae:- Mean Corpuscular Haemoglobin (MCH), Mean Corpuscular Haemoglobin Concentration (MCHC) and Mean Corpuscular Volume (MCV). All the data collected were subjected to analysis of variance (ANOVA) using SAS (2002). Significant means were separated by means of Duncan's Multiple Range Test of the same package.

III. Results And Discussion

Results of blood constituents as affected levels of dry yeast and aloe vera powder are summarized in table 2. It is clear that chicks fed 0.5% yeast and 0.5 % aloe vera (T₄) had the significant heterophill compared to other blood constituents like total leukocyte count, total erythrocyte count, packed cell volume, hemoglobin, monocytes, basophile, eosinophill and lymphocyte. The obtained results confined the previous research as Subrata et al.,1997 and Abdel – Azeem, 2002. Who found that yeast supplementation had no adverse effects on blood componants or liver function. Our observations corroborated data published by some authors (Panda et al., 2000; Kannan et al., 2005; Gudev et al., 2008 and Paryad and Mahmoudi, 2008) who stated that there was a decrease in plasma cholesterol for chicks fed diets contain dry yeast.

Table 2: Haematological parameters of the experimental broilers

Parameters	Treatments			
	T ₁	T ₂	T ₃	T ₄
Haemoglobin (g/dl)	9.56±1.02	9.85±1.21	9.90±1.10	10.15±1.00
PCV (%)	30.34±2.32	29.86±2.54	29.93±2.29	28.72±2.46
TEC (million/mm ³)	3.06±0.76	3.18±0.86	3.24±0.32	3.29±0.76
TLC (th/mm ³)	25.86±2.05	26.37±1.21	26.49±2.56	27.04±2.07
DLC				
Heterophill (%)	19.12±1.42 ^a	19.47±1.15 ^{ab}	20.20±1.76 ^{ab}	21.04±1.23 ^b
Monocytes (%)	3.74±0.85	3.75±0.95	3.90±0.86	4.13±0.04
Eosinophill (%)	3.16±0.05	3.64±0.03	3.75±0.87	4.00±0.97
Basophile (%)	1.69±0.06	1.69±0.07	1.67±0.23	1.66±0.31
Lymphocyte (%)	71.49±2.05	70.95±2.13	69.46±2.17	68.64±2.17

Values (Mean± SE) with different superscripts in a row differ significantly (P<0.05); T₁=Control; T₂= 0.50% Yeast (Saccharomyces Cerevisiae) powder; T₃=0.50% Aloe vera (Aloe barbadensis) powder; T₄=0.50% Yeast + 0.50% Aloe vera powder in basal diet.

Gomez et al. (1998) concluded that the improvement in live body weight in broilers may be due to antibacterial related to flavonoids in Aloe barbadensis that led to maintaining normal intestine microflora by competitive exclusion and antagonism, altering metabolism and increased liver and muscle glycogen contents. In conclusion it can be said that 0.50% Yeast + 0.50% Aloe vera powder feed supplemented of drinking water produced positive results in broiler chicks. It may also decrease the market age of broilers and reduce their rearing cost.

Reference

- [1]. Abdel – Azeem, F. (2002). Digestion, neomycin and yeast supplementation in broiler diets under Egyptian summer conditions. Egypt. Poul. Sci., 22: 235- 257.
- [2]. Duncan, D.B. (1955). Multiple range and multiple F tests. Biometrics. 11:1-42.
- [3]. Ernst, E., M.H. Pitler and C. Stevenson, 2002. Complementary Alternative Medicine in Dermatology. Am. J. Clinical Dermatol., 3: 341-342.
- [4]. Gomez, M.P., Geetha, B., and Aasker, G. 1998. Antidiabetic effects of fenugreek extract (Trigonella foenum-graecum L.) on domestic animals with special reference to carbohydrate metabolism. Journal of Ecotoxicology and Environmental Monitoring, 8: 103-108.
- [5]. Lutful Kabir, S.M (2009). The role of probiotics in the poult industry. Int. J. Mol. Sci., 10: 3531-3546.
- [6]. NRC, National Research Council (1994). Nutrient requirements of poultry. 9th Ed. National Academic Press, Washington. DC.
- [7]. Gudev, D., Popova-Ralcheva1, S., Moneva1, P. and M. Ignatova (2008). Effect of the probiotic "Lactona" on some biological parameters and nonspecific resistance in neonatal pigs. Biotechnology in Anim. Husbandry 24 (1-2):87-96.
- [8]. Panda, A.K., M.R. Reddy, S.V. Rama Rao, M.V.L.N. Raju, and N.K. Paraharaj (2000). Growth, carcass characteristics, immune-componence and response to Escherichia coli of broiler fed diets with various levels of probiotics. Archive fur Geflugelkunde. 64:152- 156.
- [9]. Paryad. A and M. Mahmoudi (2008). Effect of different levels of supplemental yeast (Saccharomyces Cerevisiae) on performance, blood constituents and carcass characteristics of broilers chicks. African Journal of Agriculture Researsch, vol. 3 (12), 835- 842.
- [10]. Kannan, M., Karunakaran, R., Balakrishnan, V. and T.G. Prabhakar (2005). Influence of probiotics supplementation on lipid profile of broilers. International Journal of Poultry Sci. 4 (12): 994- 997.
- [11]. Watt Executive Guide, 2005. Watt Publishing Co., 122, S. Wesley, AVE, Mt. Morris, Illinois, 61054-1497. USA., pp: 18 and 32.
- [12]. Watt Executive Guide, 2007. Watt Publishing Co., 122, S. Wesley, AVE, Mt. Morris, Illinois, 61054-1497. USA., pp: 31-32.