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Effect of Supplementation of Ginger Root Powder in Ration on Performance of Broilers

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Abstract:

Present study was carried out on Broiler Production Unit of Sunderson School of Animal Husbandry and Dairying (SHIATS), 75 day old broiler chicks were divided randomly in to 5 groups of 15 chicks in each treatment. Chicks of each treatment were further divided into 3 sub groups of 5 chicks. Chicks of each sub group were housed comfortably in one chamber by providing 1 sq ft area per bird. Were conducted to evaluate the effect of ginger root powder as natural feed additives on growth performance,(body weight ,gain in weight), feed consumption & feed conversion ratio . Four dietary treatments were T_1, T_2,T_3, and T_4 formulated to meet the nutrient requirements of broiler chicks containing ginger root powder @ 0.75, 1.25, 1.75 and 2.25 g /1 kg feed respectively .Chicks were offered ration and water

ad lib. Birds were managed under similar managemental conditions. Data on weekly body weight, gain in weight, and feed efficiency of broilers up to five weeks of age, the data were collected and analyzed statistically to determine influence of treatments on performance of broiler. It was revealed that diets supplemented with ginger root powder had significant (P<0.05) effect on the body weights, gain in weight of broilers. There were non-significant differences (P>0.05) in feed conversion ratio among all dietary treatments for birds .Result showed that non-significant decreased (P>0.05) were observed in feed intake .Best body weight ,gain in weight of broilers was observed in diet supplemented with 0.75 g, followed by 1.75 g, 1.25 g ginger powder and diet as per NRC standard (control).treatments 0.75, 1.75 were economically better than control. Supplementation 0.75 g in ration was most economical followed by inclusion of 1.75 g ginger powder in ration. Compared to with control and other treatments proved better.

Key words: Ginger root powder, Broiler, growth performance

Introduction

The profit in broiler production depends on how quickly broilers can be grown to attain maximum gain in body weight in minimum period. For this fore most factors are chicks of good heterosis, feed quality, supplementation of growth promoters, good environment and management that can dictate he success in such as endeavour include the ability to utilize stock of high genetic potential, balanced nutrition and adequate health status. Thus there is a need to produce more quality meat and eggs in a shortest possible time and at the possible low cost. It is in this context the poultry producer began to make use of growth promoters like antibiotics to enhance growth of broilers for higher profit. Unfortunately in recent years there has been a growing concerns about the use of antibiotics and hormones as growth promoters especially in broilers production because of this residual ill effects like possible development of both drug

resistance, cross resistance, multiple resistance (Rangasamy *et al*. 2007; Mehala and Moorthy, 2008 and Abd Bl.Hakim *et al.,* 2009).Antimicrobials have been used in the poultry industry for growth promotion, disease prevention and treatment of infections for many years. However, evidence is mounting that resistant bacteria might be passed from animals to humans. The use of antimicrobials in poultry industry for growth promotion and treatment of infections for many years have caused microbiological and clinical evidence of resistant bacteria that might be passed from animals to humans resulting in infections that are more difficult to treat (Mojtaba 2007).Consequently attempts are being made to replace antibiotics and alternate growth promoters such as probiotics, prebiotics and additives of plant origin such as herbs, spices and various plant extracts. A search for such an alternative and possible growth promoters has prompted use of herbs as feed supplements in broilers diet. (Ernst *et al*., 2002) Ginger (Zingiber officinale Roscoe, Zingiberaceae) rhizome (ginger root) is widely used as a spice or condiment (Larsen *et al*., 1999) and medical treatment for certain diseases (Awang, 1992; Mohd-Yusof *et al*.,2002; Tapsell *et al*., 2006). Ginger contains several compounds such as gingerol, gingerdiol, and gingerdione that possess strong antioxidant activity (Kikuzaki and Nakatani, 1996). Information on the effect of ginger or its compounds on animal performance, antioxidant status, and serum metabolites (Chrubasik *et al*. 2005) suggested that the preparation method of ginger product affected its clinical efficacy. However, no research has been conducted to assess the effect of processing method on the efficacy of ginger as a feed additive. Reducing particle size by grinding is an effective method to increase the availability of nutrients and other compounds in the digestive tract and therefore may increase the efficacy of ginger compounds upon ingestion (Fastinger and Mahan, 2003)

Materials and Methods

The ginger root used in this experiment was obtained from the local market of the city of Allahabad, India. The ginger freshly dried in hot air oven ,and grinded in grinder to make powder .The experiment commenced on 8 March 2014 and continued till 11 April 2014 for period of five weeks .The birds were divided into 5 treatments (15 birds/treatment) with 3 replicates using completely randomized design (CRD) Broiler chicks of T_0 were fed ration as per NRC standard CP (22) and ME (2900) but broiler of T_1, T_2, T_3 and T_4 were fed standard ration with ginger root powder @ 0.75 ,1.25 ,1.75 , 2.25 per kg of feed, respectively. The birds were raised open sided field. Water and feed were provided A bulb of 100 watts was fitted in each chamber. And Broilers were given floor space 1 sq, fit to birds each. The chicks bred breeding ground on a litter of sawdust thickness (5.3 cm). Taking into account that no any sort of treatments has been used while conducting the experiment, and the percentage of mortality is null. Equipment's were properly cleaned disinfected and sterilized before use. Weekly feed intake and body weight was recorded. Throughout the period of the study as it occurred. Feed conversion ratio (FCR) was calculated. Initial weight of each chick was recorded on arrival and then weekly to obtain the growth rate. The feed consumption was also recorded weekly to determine the feed conversion ratio.

Table (1): Ingredients and nutrient composition of experimental diet

Ingredients (%)	**Broiler starter (0-21 days)**	**Broiler finisher (22-35 days)**
Maize	60.00	63.00
Ground nut cake	23.35	18.00
Fish meal	13.00	15.00
Mineral mixture	3.00	3.00
Common salt	0.05	0.38
Vitamin premix (vit. A, B2,D3)	0.05	0.02

Nutrient composition		
Moisture (%)	6.29	6.22
Crude fibers (%)	5.50	6.00
Total ash (%)	8.02	9.34
Crude protein (%)	22	19
ME (Kcal/kg)	2900	3000

Analysis of Experiment data:

The data on various parameters were recorded tabulated and statistically analyzed using analysis of variance (ANOVA) technique as per Snedecar & Cocharan (1994) in RBD consisting of four treatments, one control and three replications.

Results

The overall growth performance of broilers chicks fed the various levels of ginger root powder is shown in table (2). Feed intake were decreased non significantly ($P<0.05$) in treatment T_1 ,T_3 Respectively compare to other treatments, body weight , weight gain also were significantly ($P<0.05$) high in the treatment T_1 ,T_3 compared to other treatments. There were no significant differences in feed conversion efficiency among the treatments ($P>0.05$).

Table (2) Effect of dietary ginger root powder on growth performance of the broilers

Parameter	Levels of ginger root powder (g)					
	0	0.75	1.25	1.75	2.25	Sig
Live Body weight	1192.66 ^{b}	1385.8 ^{a}	1170.4 ^{b}	1264.2 ^{ab}	1176.86 ^{b}	S
gain in Weight	228.65 ^{bc}	253.90 ^{a}	223.88 ^{c}	242.81 ^{ab}	224.93 ^{bc}	S
Feed Consumption	806.68	782.46	882	768.26	766.93	NS
Feed Conversion	1.27	1.04	1.40	1.09	1.22	NS

Ratio						
a,b: mean with different superscripts along rows are significantly different (P<0.5). NS=Non-significantly difference (P>0.05)						

Discussion and Conclusion

The overall growth performance of broilers chicks fed the various levels of ginger root powder is shown in table (2).Highest mean weekly body weight of broilers was recorded in T_1 (673.42), followed-by T_3 (620.59),-T_0 (601.13), T_2 (578.93), and T_4 (578.47), however the differences in these values of weekly body weights were found significant indicating thereby a significant effect of treatments on weekly body weight of broilers. The broilers body weight were significantly, higher in T_1, T_3, compared to control (T_0) except (T_2) and (T_4) which was at less with control. As expected the body weight of broilers increased significantly weekly up to five weeks of experimental period. These results are similar or close to those reported by Herawati and Marjuki (2011). Feed intake were decreased non significantly (P<0.05) in treatment 0.75 g ,1.75 g compare to other treatments,This result could be compared with the work of Ademola *et al*. (2009) who reported higher feed intake of broilers on diet supplemented with ginger. The results were however in agreement with the report of Herawati, (2010) who stated that broilers fed 2% dried supplementary red ginger meal had significantly lower feed intake than those on the control diet. T_0, this result was contrary to that reported by Doley *et al*.(2009) who observed no differences in feed intake for broilers fed with ginger extract for 6 weeks period, while its agreed with the results from Herawati (2006) who mentioned that birds fed with 1.5-2% ginger consumed less amount of feed. weight gain also were significantly (P<0.05) in the treatment 0.75 g compared to other treatments. This indicates the cumulative effect of ginger on the birds live weight. These results are consistent with those reported by Ademola *et al.* (2009) and Onimisi *et al*. (2005) who found that ginger

supplementation to the diets can increase body weight when supplemented up to 2% level. This result didn't agreed those of Ghazaiah *et al*. (2007) and Tollba (2003). .There were non significant differences in feed conversion efficiency among the treatments (P>0.05), Feed conversion ratio were not significantly differ among all groups, this results disagreed with the work of Moorthy *et al*. (2009) and Onimisi *et al*. (2005) who reported significantly better feed conversion ratio in ginger fed groups of broilers compared to control. Note that Red ginger has potential as phytobiotic or stimulant which improve the efficiency of feed utilization by chickens. reported that red ginger contains active compounds such as atsiri oil (a-pinen, 3-felandren, borneol, kamfen, limonen, linalool, sitral, nonilaldehida, desilaldchida, metilhepte-non, sineol, hisaholen, 1-a kurkuinin, farnesen, humulen, zingiberen, zingiberol) and oleoresin (consist of the substance with hot taste, like: gingerol, zingeron, shogaol, tanin, gingerdiol, resin). All the compounds adding phytobiotic of red ginger causing an improvement in feed digestion. The adding of phytobiotic of red ginger in the poultry also assumed also causing the digestion process for the poultry can be stimulated, hence the poultry conversion become meat can optimal. Red ginger has characteristic as stimulant for feed digestion and conversion which increase body weight gain (Conley, 1997).

Conclusion

Based on results it was concluded that diets supplemented with ginger root powder had significant effect on the body weights, feed intake, gain in weight and feed efficiency of broilers. Based on feed efficiency best performance of broilers was observed in diet supplemented with 0.75 g for 1 kg ginger root powder, followed by 1.75 g for 1 kg, and diet as per NRC standard (control). Treatments' were T_1 0.75, T3 1.75 economically better than control. Supplementation of ginger root powder 0.75

in ration was most economical followed by inclusion of 1.75 in ration. Compared with other treatments.

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