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Hitesh Singh

PhD Fellow, Department of Animal Husbandry, College of Veterinary and Animal Sciences, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, Uttar Pradesh, India

Nazim Ali

Professor, Department of Animal Husbandry, College of Veterinary and Animal Sciences, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, Uttar Pradesh, India

Rajbir Singh

Professor, Department of Animal Husbandry, College of Veterinary and Animal Sciences, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, Uttar Pradesh, India

Raj Kumar

Professor, Department of Animal Husbandry, College of Veterinary and Animal Sciences, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, Uttar Pradesh, India

DS Sahu

Assoc. Professor, Department of Animal Husbandry, College of Veterinary and Animal Sciences, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, Uttar Pradesh, India

RA Siddique

Assist. Professor, Department of Veterinary Physiology & Biochemistry, College of Veterinary and Animal Sciences, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, Uttar Pradesh, India

MK Bharti

Assist. Professor, Department of Veterinary Physiology & Biochemistry, College of Veterinary and Animal Sciences, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, Uttar Pradesh, India

Correspondence**Hitesh Singh**

PhD Fellow, Department of Animal Husbandry, College of Veterinary and Animal Sciences, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, Uttar Pradesh, India

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Effect of different herbal feed additives in live weight of broiler chicken

Hitesh Singh, Nazim Ali, Rajbir Singh, Raj Kumar, DS Sahu, RA Siddique and MK Bharti

Abstract

This study was conducted to find the effect of Ashwagandha, Ginger, Shatavari and Cardamom and their mixture on broiler growth performance. Three hundred and sixty one day old broiler (Cobb 400) chickens were allocated randomly to six dietary treatments from 0–42 day of age with three replicates (20birds/pen). The experimental diets were: control (T1), 0.5% Ashwagandha powder (T2), 0.5% ginger powder (T3), 0.5% Shatavari powder (T4), 0.5% Cardamom powder (T5), 0.25% Ashwagandha + 0.25% Ginger + 0.25% Shatavari and 0.25% Cardamom powder (T6). The broilers body weight was significantly, higher in 0, 1 and 3 week for all the treatment group (T2 to T6) compared to 2 week except 4, 5 and 6 week which was at less with all treatment group. It was concluded that the effect of addition of all mixture powder on live weight gain was significant ($P < 0.05$) compared to control group.

Keywords: different herbal feed, live weight, broiler chicken, broiler growth performance

Introduction

Feed additive are added in animal feed to improve their nutritive value, boost animal performance by increasing their growth rate, better feed conversion efficiency, greater livability and lowered mortality in poultry birds (Zomrawi *et al.*, 2013) [39]. Ginger (*Zingiber officinale*) has been widely used as a condiment and as a herbal medicine to treat a wide range of disorders (Ali *et al.*, 2008) [6].

Recently Ahn *et al.* (2002) [2] showed that, use of plants extracts as natural antioxidants has gained increasing interest because of the global trend of restriction in the use of synthetic substances Zhang *et al.* (2009) [38]. Many researches were conducted to document the benefits of plant feed additives (Kumar, 1991, Babu *et al.*, 1992, Deepak *et al.*, 2002, Jahan *et al.*, 2008) [9, 8, 17, 20]. Ginger is a medicinal herb that have been reported to possess body fat lowering effects (Agarwal 1996) [1] it is used for cocking purposes (Zomrawi *et al.*, 2013a) [39] or for its medical effects as it possesses antioxidants, antibacterial, anti-inflammatory, antiseptic, anti-parasitic and immunomodulatory properties (Akhtar *et al.*, 1984, Ali *et al.*, 2008) [6]. Incharoen and Yamauchi (2009) [19] reported that ginger stimulate gastric secretion, blood circulation and act as enterokinetic. The objectives of this study were to evaluate the possible improvement in overall performance, reduction in the final cost of feed and to find safe, cheap and efficient natural growth promoter for broiler chicks.

The beneficial effects of Shatavari may be attributed to its concentrations of saponins (active principle), known as Shatavarins and having properties like nutritive tonic, anti-stress (Kamat *et al.*, 2000) [21]. In a recent study by Sharma *et al.* (1986), shatavari have been shown to possess anabolic properties viz. growth promotion, laxative, antacid, appetizer, beneficial for eye sight. Indigenous plant like *Asparagus racemosus* is playing a role of antiseptic, anticancer, astringent, cooling (Dinabandhu Moharana, 2008) [13], immunomodulation (Seena and Kuttan 1993) [31].

Methods & Material

This experiment was conducted at the Poultry Research and Training Centre, at Sardar Vallabhbhai Patel University of Agriculture & Technology, Modipuram, Meerut- 250110 (Uttar Pradesh), India.

Day old chicks of Cobb 400 (n=360) chicks were purchased from Venky's India Limited. All the 360 chicks were provided with broilers starter feed formulated to provide 22% CP from

compounded feed ingredients purchased from local market *et al.* Meerut. The basal ration contains the ingredients i.e. Fish meal, Soyabean meal, Groundnut cake, Maize and Rice polish, Mineral mixture and common salt. The ingredients were analyzed in the Animal Nutrition laboratory of the Department of Animal Husbandry, Sardar Vallabhbhai Patel University of Agriculture and Technology for their nutrient composition. Fish meal, Soyabean meal, Groundnut cake was categorized as protein feeds, Maize and Rice polish, as Energy feeds. All the feed ingredients were purchased from local market. They were randomly and equally distributed in to six dietary treatments consisted of on basal control as Standard ration. (T1), Standard ration + 0.5% Ashwagandha powder (T2), Standard ration +0.5% Ginger powder (T3), Standard ration +0.5% Shatavari powder (T4) and Standard ration +0.5% Cardamom powder (T5), Standard ration +0.25

% Ashwagandha powder+0.25 % Ginger powder+0.25 % Shatavari powder+0.25 % Cardamom powder (T6). The diets were fed *ad-libitum* to experimental birds by adding Ashwagandha powder, Ginger powder, Shatavari powder and Cardamom powder as given above.

The vaccination programme of the experimental birds was scheduled weekly as described by Prasad (2013) [28]. Before arrival of Cobb 400 chicks the pens, waterer (Drinker), feeders, brooders floor were cleaned, washed, disinfected and fumigated. All the experimental chicks were reared on deep litter system of rearing with use of saw dust as a litter material in a well-ventilated house with identical management and environmental conditions. The experimental chicks were weighted individually at weekly interval upto the seven weeks using electronic balance.

Table 1: Composition of the mixed basal ration of 100 kg during the starter and growing stage

S. No	Ingredient	Starter mixed ration	Finisher mixed ration
		Kg/100kg feed	Kg/100kg feed
1	Fish Meal	10.346	8.98
2	Soya bean Meal	10.856	8.98
3	Ground nut cake	10.857	8.98
4	Maize	32.2155	35.03
5	Rice polish	32.7265	35.03
6	Mineral Mixture	2	2
7	Salt	1	1
Total		100	100

Result

Body weight

The mean body weight of different treatment groups of broiler chicks were studied on 1st day and at the end of 1st, 2nd, 3rd,

4th, 5th and 6th weeks. The average weight during the study period for the different experimental groups in gm is presented in Table No. 2.

Table 2: Initial and end of weeks' body weights (grams) of broiler chicks fed on different inclusion levels of herbal feed additives

Groups	Weekly body weight in gm						
	0	1	2	3	4	5	6
T1	39.21 ^a ±0.45	136.66 ^a ±0.76	234.11 ^a ±1.20	370.78 ^a ±1.95	604.89 ^a ±3.15	975.67 ^a ±5.10	1580.57 ^a ±8.27
T2	39.63 ^a ±0.67	138.46 ^{ab} ±0.34	249.28 ^c ±12.29	387.74 ^{bc} ±12.14	637.03 ^{bc} ±24.43	1024.78 ^{bc} ±36.57	1661.81 ^{bc} ±61.00
T3	39.81 ^a ±0.82	140.51 ^b ±0.41	241.40 ^b ±0.85	381.91 ^b ±1.11	623.32 ^b ±1.93	1005.24 ^b ±3.04	1628.47 ^b ±4.98
T4	39.78 ^a ±0.52	144.02 ^c ±1.35	248.26 ^{bc} ±2.19	392.28 ^{cd} ±3.55	640.54 ^c ±5.75	1032.82 ^{cd} ±9.30	1673.37 ^{cd} ±10.12
T5	41.15 ^b ±0.41	144.34 ^{cd} ±0.90	247.92 ^{bc} ±1.46	392.27 ^{cd} ±2.36	640.19 ^c ±3.82	1032.46 ^{cd} ±6.18	1672.56 ^{cd} ±10.00
T6	41.86 ^b ±0.06	146.91 ^d ±0.45	251.97 ^c ±0.90	398.89 ^d ±1.35	650.86 ^c ±2.26	1049.75 ^d ±3.62	1700.61 ^d ±5.88
C.D. (P<0.05)	1.705	2.459	N.S.	16.707	N.S.	N.S.	N.S.

Body weight of day old chicks

The average body weight of the day old chicks of the control and treatment groups were 39.210^a±0.457, 39.630^a±0.678, 39.813^a±0.823, 39.786^a±0.524, 41.150^b±0.416 and 41.860^b±0.061 gm for T₁, T₂, T₃, T₄, T₅ and T₆ respectively. The 1st day body weights recorded among the treatment groups did not differ significantly (p>0.05). Respective average values of body weight in broiler chicks at day old of age for all the treatment groups are presented in table No.2.

Discussion

Body Weight

The overall growth performance of broilers chicks fed with various level of ginger root powder is shown in table No. 2. Highest mean weekly body weight of broilers was recorded in T₆ (1700.616^d±5.886), followed-by T₄ (1673.370^{cd}±10.128), T₅ (1672.565^{cd}±10.009), T₂ (1661.813^{bc}±61.007), T₃ (1628.473^b±4.982) and T₁ (1580.573^a±8.270), 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 was significantly, higher in 0, 1 and 3 week for all the treatment group (T₂ to T₆) compared to 2 week except 4, 5 and 6 week which was at less with all treatment group. 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) [18].

The body weight of broiler birds at different age from day old to the 6th week were found to be significantly (P<0.05) different in all treatment group. The body weights of experimental broiler chickens increased with increase in the level of supplementation with Treatment: T₁ (control) = not supplemented; T₂= 0.5 percent Ashwagandha powder; T₃ = 0.5 percent Ginger powder; T₄= 0.5 percent Shatavari powder; T₅= 0.5 per cent Cardamom powder and T₆= 0.25 percent Ashwagandha powder+0.25 per cent Ginger powder+0.25 percent Shatavari powder+0.25 percent Cardamom powder. Through the experimental period the highest body weight were recorded for T₆ fed on diets supplemented with Basal

ration + 0.25 percent Ashwagandha powder+0.25 per cent Ginger powder+0.25 per cent Shatavari powder+0.25 per cent Cardamom powder (i.e. 10 g/kg of feed) powder and the lowest body weights were recorded for control T1 group (Reared on commercial ration). Similarity in body weight was only recorded at the beginning of the experiment among all experimental groups because there was no effect of diet. The results revealed that there was higher body weight in treatments groups fed with different herbal feed additives. Pedulwar *et al.* (2007) [26, 27] reported that the live body weight increased significantly in groups supplemented with 0.5 and 1% shatavari root powder compared to control group of broilers. Rekhate *et al.* (2010) [28] and Sharma *et al.* (2012) [33] reported that roots of *Asparagus racemosus* by the oral administration improved growth performance. Gujral *et al.* (2002) [17] reported better growth performance in the chicken, which received herbal growth promoter. Where Ashwagandha as one of the growth promoters herbal ingredients. The Ashwagandha based products can also be used as growth promoter and haematinic in children Venkataraghvan *et al.* (1980).

Rekhate *et al.* (2004) [30] observed that the body weights were better with increasing levels of Satavari root powder supplemented in feed of broilers. Khobragade (2003) [23] found better body weight gain on feeding of medicinal plants *Tinospora cordifolia* and *Leptadenia reticulata* in combination. Daisy (2006) [11] reported higher body weights on supplementation of *Emblica officinalis* and *Withania somnifera* root and leaf extracts in broilers. Akotkar *et al.* (2007) revealed significant effect on body weights in different treatments of Ashwagandha at six weeks of age in broilers. Kant *et al.* (2016) reported that body weight of boiler birds is higher in 1% shatavari + 200mg/kg Vit.E whereas highest body weight was reported in 1.5% shatavari + 200mg/kg vit.E in comparison to control group. In present study the highest body weight found in 0.5% shatavari powder due to the effects of curcumin on broiler growth performance causing enhanced secretions of amylase, trypsin, chymotrypsin and lipase enzymes.

The present results obtained are contrary to the findings of Fakhim *et al.*, (2013) who observed that addition of ginger powder in diet was not significant difference among the treatment groups. Al-Moramadhi (2010) also showed no significant effect of ginger root infusion on body weight.

Similar results were obtained by Narayanswamy *et al.* (2004) who fed Geriforte (Vet liquid) containing *Asparagus racemosus* with other herbal feed additives, at the rate of 2.5, 5 and 10 ml per 100 birds in drinking water.

However, Rekhate *et al.* (2004) [30], Pedulwar *et al.* (2007) [26, 27], Bhardwaj *et al.* (2008) reported increase in body weight with supplementation of *Asparagus racemosus* (Shatavari) root powder as a herbal growth promoter at higher level as 0.5, 1 and 1.5 per cent.

The present results of chemical composition of cardamom was similar to that obtained by Weiss (2002), Where for birds fed dietary cardamom, than the total feed intake were statistically increased compared with the control group, this may be related to the appetizing effect of the active ingredients compound such as Cineole present in cardamom and its stimulant properties Kamel, (2000); Giannenas *et al.*, (2003). A significant increase in body weight gain of broiler chicks feeding cardamom supplemented diet may be due to stimulant, essential oil content and anti-microbial activities of cardamom, this in agreement with findings of (Krittika *et al.*, 2007; Shervin and Imad 2009). The bird fed diets contained

0.0% and 0.3% cardamom. Also total body weight gain increased significantly ($P < 0.05$) for the bird fed the diet supplemented with 0.15% and 0.45% cardamom compared with the control group Elamin *et al.*, (2011).

The present results were however, could not confirm the reports by Akotkar *et al.* (2007) [7], who observed significant improvement in body weight in broilers supplemented with Ashwagandha (*Withania somnifera*) root powder.

Conclusion

This study concludes that herbal Ashwagandha powder in T2, 0.5% ginger powder in T3, 0.5% Shatavari powder in T4, 0.5% Cardamom powder in T5, 0.25% Ashwagandha + 0.25% Ginger + 0.25% Shatavari and 0.25% Cardamom powder in T6 as feed supplement was beneficial in improving the average weekly gain in body weight. The inclusion of all combination group in T6 at 0.25 per cent in broiler ration as a herbal feed supplement was found to be better in terms of overall performance of broiler as compared to control and other treatment groups (T1 to T5).

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