

BENEFICIAL INFLUENCE OF SINGLE MEDICINAL PLANT SEEDS ON GROWTH PERFORMANCE OF BROILER CHICKS

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ABSTRACT

The experiment which lasted for 21 days was carried out to generate information on the uses of black pepper aqueous extract on growth performance of broiler starter chicks using average feed intake, average weight gain, and feed conversion ratio as parameters. Sixty-three one day old Ross 308 Broiler Chicks were randomly allotted to three groups coded as GA, GB, and GC. Each group was further subdivided into three replicates with seven birds per replicate in a complete randomized design. The aqueous extract was obtained by infusion 10g of the test ingredient in one liter of hot boiled water for two hours and the filtered were served to the birds; the birds were fed commercial starter diets throughout the experiment. Birds on GA (Control) received basal diet and water without black pepper those on GB, and GC were given basal diet and water with black pepper at 1.5ml, and 30ml per liter of water respectively. The ANOVA shows GA was statistically significant ($P < 0.05$) from other groups with value 212.40 ± 0.48 , but was not statistically different ($P > 0.05$) from GB and GC (208.91 ± 0.45 and 227.70 ± 1.12 respectively). Concerning average feed intake, a non-significant ($P > 0.05$) difference was observed amongst the groups. The results also showed that GC (30ml BPSP /liter of water) had the highest feed intake (422.66 ± 0.72), showed a better feed conversion ratio (1.86 ± 0.02) compared with GB (1.92 ± 0.03) and those in GA (1.94 ± 0.05). From the results of the study, it can be concluded that up to 30ml BPSP/liter of water could be incorporated in the drinking water of broiler chicks without adverse effect on growth performance of the birds. Further research should be conducted to ascertain the optimum dosage of BPSP in broiler drinking water.

Keywords: Herbs, Spices, Black pepper, Plants, Chicks.

INTRODUCTION

Herbs and spices play a significant role in human nutrition as flavor agent, food preservatives as well as medicine. These additives have also been effectively used in animal nutrition in the control of animal diseases as well as growth enhancer. There is evidence to suggest that some of the herbs and spices contain numerous active substances which can exert various effects such as bactericidal, immune-modulatory and antioxidant on animals (Krysztow, *et al.*, 2019). Similarly, many researchers have proved that the use of herbal and spices in broiler diet will increase body weight and better feed conversion ratio (Aikpitanyi and Egweh, 2020). The inclusion of black pepper (*Piper nigrum* L.) in a poultry diet for instance is reported to stimulate the absorption power, decrease material transit velocity and increase digestive enzymes activity and increase chick dietary and weight gain (Galib, *et al.*, 2011). Abou-Elkhair, *et al.* (2014) also noted that, black pepper in broiler chickens feed improve their health status through increasing the serum globulin concentration. Similarly, Ahmed, *et al.* (2013) explained that, black pepper has been proven to be rich in certain active enzymes (glutathione peroxidase and glucose-6-phosphate dehydrogenase) which manifest benefits for metabolism and the inhibition of oxidation. In addition, black pepper in a diet is reported to stimulate digestibility, energy metabolism and improve public health (Ahmadipour, *et al.*, 2018). It is also found that black pepper has anti-carcinogenic, anti-microbial factors and by removing multiple cardio-pulmonary disease. Therefore, the objective of this study was to generate more information on the uses of aqueous extract of black pepper on growth performance of broiler starter chicks using average feed intake, average body weight gain, and average feed conversion ratio as parameters.

MATERIALS AND METHODS

The black pepper seeds used was purchased from Paiko market in Paikoro Local Government Area of Niger State, Nigeria. The seeds were separated carefully from the twig and all other extraneous materials. Thereafter, the seeds were ground into powder to make black pepper seeds powder (BPSP) using mortar and pestle. The aqueous extract was prepared by adding one liter in a water bath to 10g of ground black pepper in a plastic container. The mixture was allowed to infuse and cool for two hours. The extract was obtained by filtering the infusion using cheese cloth and served to the birds for 12 hours/day. Fresh infusion was prepared daily. A total of Sixty-three one day-old unsexed Ross 308 Broiler chicks were used for the experiment at El-Nazir poultry farm (private farm). Upon purchased the chicks were kept for 2 days to acclimatized, within this period they were given commercial feed and water with anti-stress (VMultinor®) according to the manufacturers recommendations. On the 3rd day, the experimental birds were weighed and randomly assigned to three experimental groups comprising GA (control: basal diet + without BPSP), GB (basal diet + 15ml BPSP/liter of water), and GC (basal diet + 30ml BPSP/liter of water). Each treatment was replicated three times with seven birds per replication on a completely randomized design. The basal diets consisted of commercial starter diet (22% CP, 2950 Kcal/kg ME) was used throughout the

experiment. Feed and water were given at free choice. All routine management practice was strictly adhered and the trial lasted for 21 days. All data collected were subjected to One-Way analysis of variance (ANOVA) using 23.0 computer statistical package. Duncan Multiple Range Test of the same software was used for means comparison where significant difference existed at 5% level probability.

RESULTS AND DISCUSSION

The results of the effect of aqueous extract of black pepper on growth response of starter broiler chicks are shown in Table 1. The ANOVA showed that the birds have exit the acclimatization period with uniform body weight with no significant difference ($P>0.05$). This result collaborates with the findings of Ndelekute, *et al.* (2015); and Puvaca, *et al.* (2015). The result of the average weight gain showed that birds given 15ml BPSP/liter of water showed a slightly lower performance compared with 30ml BPSP and the negative. The slightly lower performance indices seen was in agreement with result obtained in previous finding of Jamroz, *et al.* (2003) who published lower body weight gain on older birds given feed antibiotic (10 ppm).

However, the birds on the black pepper extract (30mlBPSP/liter of water) had slightly higher average weight gain compared with other groups. Despite GA was statistically significant ($P<0.05$) from other groups with value 212.40 ± 0.48 , but was not statistically different ($P>0.05$) from GB and GC (208.91 ± 0.45 and 227.70 ± 1.12 respectively). This study has shown that the inclusion of BPSP up to 30ml/liter of water improved growth performance of broiler chicks. Improvement of broiler body weight as a result of supplementation of black pepper powder was observed and reported by Dragan, *et al.* (2014). Galib, *et al.* (2011) showed that, black pepper stimulates the absorption power, decreased material transit velocity and increase digestive enzymes acts and increased chick dietary and weight gain

Concerning average feed intake, a non-significant ($P>0.05$) difference was observed amongst the groups. The results also showed that, GC (30ml BPSP /liter of water) had the highest feed intake (422.66 ± 0.72), showed a better feed conversion ratio (1.86 ± 0.02) compared with GB (1.92 ± 0.03) and those in GA (1.94 ± 0.05). Investigation of Abu dabos, *et al.* (2016) stated that, the mechanism of action of herbs and spices with medicinal properties may be due to the enhanced feed intake, improved nutrient digestion, increased secretion of digestion enzymes and greater absorption in the intestine, which is also in agreement with the findings of Galib, *et al.* (2011) who concluded that, according to the level of black pepper used, the activity of *piperizine citrate* will influence the secretion of digestion juices across the stomach, and this would lead to better feed intake, and feed conversion ratio.

Table 1: Effect of aqueous extract of black pepper on growth response of starter broiler chicks

Parameters	GA	GB	GC
Average initial body weight (g)	54.00 ± 1.15	54.00 ± 1.00	54.00 ± 0.56
Average weight gain (g)	212.40 ± 0.48^a	208.91 ± 0.45^c	227.70 ± 1.12^a
Average feed intake (g)	411.21 ± 3.74^b	400.93 ± 3.14^b	422.66 ± 0.72^a
Feed conversion ratio	1.94 ± 0.05^b	1.92 ± 0.03^b	1.86 ± 0.02^a

a, b, bc = Means bearing different superscripts in a row differ significantly ($P>0.05$). GA: (Negative), GB: 15mls BPSP infusion, GC: 30mls BPSP infusion.

CONCLUSION

From the results of the study, it can be concluded that up to 30ml BPSP/liter of water could be incorporated in the drinking water of broiler chicks without adverse effect on growth performance of the birds. Further research should be conducted to ascertain the optimum dosage of BPSP in broiler drinking water.

REFERENCES

- Ahmadipour, B., Pat, S. and Khajal, F. (2018). The protective effect of pomegranate fed powder on pulmonary hypertension in broiler chicken. *JSM Biomarkers*, vol. 4(1): 1013.
- Ahmed, S.A., Abood, N.H. and Al-janabi, A.A. (2013). Anti-microbial Effect of Pomegranate peel Extract on some Pathogenic Micro-organisms. *Eng. Technol. J.*, 31: 316-324.
- Ahmed, N., Fazal, H., Abbasi, B.H., Farooq, S., Ali, M. and Khan, M.A. (2012). Biological Role of Piper nigrum L. (Black pepper): A review. *Asian Pacific Journal of Tropical Biomedicine*, S1945-S1953.
- Abou-Elkhar, R., Ahmed, H.R. and Selim, S. (2014). Effect of black pepper (*Piper nigrum*), turmeric powder (*Curcuma longa*) and coriander seeds (*Soriandrum satium*) and their combinations as feed additives on

growth performance, carcass traits, some blood parameters and humoral immune response of broiler chicken. *Asian Australian Journal of Animal Science*, 27: 847-854.

- Abu dabos, A.M., Alyemni, A.H., Dafallah, Y.M. and Khan, R.U. (2016). The Effect of Phytogetic Feed Additives to Substitute in-feed Antibiotics on Growth traits and Blood Biochemical Parameters in Broiler Chicks. *Environmental Science and Pollution Research*, 23, 24151-24157.
- Aikpitanyi, K.U. and Egweh, N.O. (2020). Haematological and Biochemical Profile of Broiler Chickens Fed Diets containing Ginger and Black pepper Additives. *Nigerian Journal of Animal Science*, 22(2): 114-125.
- Dragana, L., Dragomir, L. and Sanja, P. (2014). Influence of Black pepper (*Piper nigrum L.*) on Productive Performances and Blood lipid profile of Broiler Chickens. *Annals of Biological Research*, 5(2): 29-33.
- Galib, A.M.A., Mamdooh, A.M.A. and Saba, J.A. (2011). Use of black pepper (*Piper nigrum*) as feed additive in broilers diet. *Roavs*, 1(3): 169-173.
- Hosseini, N.M. (2011). Comparison of using different levels of Black Pepper with Probiotic on Performance and Serum Composition on Broilers Chickens. *J. Basic Appli. Sci. Res*, 1(11): 2425-2428.
- Iqbal, Z., Nadeem, Q.K., Khan, M.N., Akhtar, M.S. and Waraich, F.N. (2011). In vitro anthelmintic activity of *Allium sativum*, *Zingiber officinale*, *Curcubita Mexicana* and *Ficus religiosa*. *Int. J. Agric. Bio.* 3: 454-457.
- Jamroz, D., Orda, J., Kamel, C., Wiliczkiwicz, A., Wetelecki, T. and Skorupińska, J. (2003). The Influence of Phytogetic extracts on Performance, Nutrient Digestibility, Carcass characteristics, and Gut microbial status in Broiler Chickens. *Journal of Animal and Feed Sciences*, 12, 583-596.
- Krysztof, L., Zofia, A., Sylwia, K., Magdalena, M., Joanna, K. and Zbigniew, M. (2019). The effect of herbal feed additive on the growth performance, carcass characteristics and meat quality of broiler chickens fed low-energy diet. *Arch. Anim. Breed*, vol. 62(1): 33-40.
- Ndelekwute, E.K., Afolabi, K.D., Uzegbu, H.O., Unah, U.L. and Amaefule, K.U. (2015). Effect of Dietary Black pepper (*Piper nigrum*) on the Performance of Broiler. *Bangladesh Journal Animal Sciences*, 44: 120–127.
- Puvača, N.Ljubovic, D., Kostadinovic, L.J., Levic, J., Nikolova, N., Miscevic, B., Konyves, T., Lukac, . D. and Popovic, S. (2015). Spices and herbs in broiler nutrition: hot red pepper (*Capsicum annum L.*) and its mode of action. *World Poultry Science Journal*, 71, 683-688.
- Sameh, A. Mahmoud, A., Mahamed, E.A. Asmaa, M.S., Islam, M.S. and Ayman, A.S. (2018). Growth, Carcass traits, Blood Haematology, Serum metabolites, Immunity and Oxidative indices of Growing Rabbit Fed Diets Supplemented with Red or Black pepper Oils. *Animals*, 8, 168.