American Journal of Agriculture and Forestry
2015; 3(3): 105-108
Published online May 11, 2015 (http://www.sciencepublishinggroup.com/j/ajaf)
doi: 10.11648/j.ajaf.20150303.17
ISSN: 2330-8583 (Print); ISSN: 2330-8591 (Online)

Effect of Locally Produced Blood Meal on Growth Performance and Packed Cell Volume of Broiler Chicks

Ufele Angela Nwogor, Ogbu Anthonia Uche, Ebenebe Cordelia Ifeyinwa, Akunne Chidi Emmanuel

Zoology Department, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

Email address:
ufeleangel@yahoo.com (U. A. Nwogor)

To cite this article:
Ufele Angela Nwogor, Ogbu Anthonia Uche, Ebenebe Cordelia Ifeyinwa, Akunne Chidi Emmanuel. Effect of Locally Produced Blood Meal on Growth Performance and Packed Cell Volume of Broiler Chicks. *American Journal of Agriculture and Forestry*. Vol. 3, No. 3, 2015, pp. 105-108. doi: 10.11648/j.ajaf.20150303.17

Abstract: This research evaluated the effect of locally produced blood meal on growth performance of broiler chicks. Three experimental diets were formulated; diet one served as control without blood meal, diet 2 contained 100g of blood meal mixed in 500g of chick mash while diet 3 contained 300g of blood meal mixed with 500g of chick mash. Forty-five broiler chicks were randomly assigned to the three treatments having five birds per cage. Each treatment was replicated three times. The experimental diets and portable water were supplied ad libitium throughout the experimental period for 42 days. At the end of the experiment, birds fed diet 2 (100g blood meal and 500g chick mash) gained more weight having mean weight gain of 3.04g than birds fed with diet 3 (300g of blood meal mixed with 500g of chick mash) having mean weight gain of 2.95g and birds fed with diet 1 (control, no blood meal). Also there was significant difference ($P < 0.05$) between the packed cell volume of birds feed with diet 2 and those fed with diet 1 and 3. The result of the research indicated that diet 2 enhances growth and boosts the PCV in broiler chicks. Broilers fed with diet two had the highest mean packed cell volume of 41.40%, followed by those fed with diet 3 which had 40.20% while those fed with diet 1 had 37%.

Keywords: Blood Meal, Weight Gain, PCV and Broiler Chicks

1. Introduction

Poultry has a significant effect on national economy. Report by Agbede and Aletor (2007), showed that about 10% of Nigerian population is engaged in poultry production. Of all poultry business, broiler production is a fast growing agricultural business in developing countries, therefore profitable production of broiler becomes essential and profitable venture. Broiler production involves the keeping of chickens of heavy meat breeds for the purpose of getting good quality meat products usually sold live or processed at ten to twelve weeks of age. The meat is an important source of high quality protein, minerals and vitamins to balance the human diet due to their ability of quick growth and high feed conversion efficiency.

According to the Agriculturist and Nutritionist Ensminger (2002), it has generally agreed that developing the poultry industry in Nigeria is the fastest means of bridging the protein deficiency gap presently prevailing in the country. It is also the promising source of additional income and means of quick returns from investment. Brooks (2001), highlighted the importance of animal protein to human development, according to him animal protein contains high quality or complete protein in that they supply all the amino acids the body needs to perform body functions. Also protein from this, supply varying amount of other key nutrients including zinc, iron, magnesium, vitamin E and vitamin B. Poultry meat which belongs to a group of white meat has a low fat myoglobin content, which gives it, its color. This white meat produces glycogen, a polysaccharide which plays an important role in the glucose cycle. It is a source of lean protein for people with heart and cholesterol problems. White meat without side effects of extra fats is just the correct food that enhances immunity levels (Toor and Fahimullah 2002).

However, poultry feeds has remained a significant challenge to the poultry industry, this is because the productivity of poultry especially in the tropics has been limited by scarcity and consequent high prices of the conventional protein and energy sources, (Atawodi et al.,

2008). Hence there is need to search for locally available alternative sources of protein for use as feed supplement to poultry. One possible sources of cheap protein to poultry is the blood meal of various livestock species (Odunsi, 2004). According to Donald and Edward (2002), Blood meal is a by-product of the slaughtering industry, used as a protein source in the diets of ruminants and non ruminants. It is a dark chocolate colored powder with characteristic smell. It contains protein and it is one of the richest sources of lysine, a rich source of arginine, methionine, cystine and leucine. When compared with vegetable protein supplements for poultry it is quite high in biological value. Generally, vegetable protein supplements are deficient in two of the essential amino acids which are lysine and methionine whereas blood meal is rich in both of these amino acids. Blood meal improves performance, growth rate and feed intake of various animal productions (Fombad et al., 2004). Blood meal is also available worldwide, but like other animal products its sale and utilization are regulated in some countries for certain species for safety reasons (Fombad et al., 2004). Brookes (2002) reported that good quality feeds creates value by enhancing nutrients utilizing and improve animal conversion. Clearly, there are ways to improve the quality of feed such as the use of blood meal and selection of a reasonable good quality feed is important to the overall profitability of the producers and also gives the greatest opportunity for influencing animal performance beyond nutritional adequacy.

Thus, blood meal fits into the classical strategy for poverty alleviation and sustainable development. The hematological variables and protein levels of the blood of livestock are known to be positively correlated with protein quality and quality of diet (Adeyemi et al., 2000). In addition, different sources of protein may contain different toxic factor and affect differently the packed cell volume and thus the health status of animals (Diarra, 2008).

The various functions of blood are made possible by the individual and collective actions of its constituents- the biochemical and hematological components are influenced by the quality and quantity of feed and also the level of anti-nutritional elements or factors present in the feed (Adeyemi et al, 2000). Components of blood are also valuable in monitoring feed toxicity especially with feed constituent that affect the formation of blood (Oyawoye and Ogunkunle, 2008). Reduction in the concentration of PCV in the blood usually suggests the presence of a toxic factor e.g haemagglutin which has adverse effect on blood formation (Oyawoye and Ogunkunle, 2008). There is evidence in literature that hematological characteristics of livestock suggest their physiological disposition to the plane of nutrition (Madubuike and Ekenyem, 2006). Reduction in packed cell volume is indicative of low protein intake or mild anaemia. Blood chemistry constituents reflect the physiological responsiveness of the animal to its internal and external environments which include feed and feeding (Iheukwumere and Okoli, 2002). Broilers fed with good quality feed reach maturity with weight 2.2 kg in 8 weeks; but when feed is poor, it extends to 12 weeks with lower weight (Randy, 2002).

Blood parameters have been shown to be major indices of physiological, pathological and nutritional status of an organism. The level of the blood parameters along with the nutrients retention could be an effective method of evaluating the nutritive value of an ingredient. Therefore evaluating the PCV of the broiler chicks will indicate the effectiveness of the blood meal administered to them.

2. Materials and Methods

2.1. Procurement of Experimental Animal

A total of 45 broiler chicks at four weeks old, already vaccinated for New castle and Gumboro were used for the experiment. The birds were randomly selected into three (3) treatment groups of five birds each. Each group was replicated three times. The birds were allowed to acclimatize in their new environment for one week.

2.2. Experimental Treatments

Pelletized broiler finisher feed was used to mix blood meal. Blood meal diet was prepared using fresh blood from the slaughter of cattle livestock species. Diet 1 is the control which contained only the chick mash and this was used to feed birds in treatment 1 (T1). Diet 2 contained 100g of blood meal mixed with 500g of chick mash this is used to feed birds in treatment 2 (T2). Diet 3 contained 300g of blood meal mixed with 500g of chick mash, this was used to feed birds in treatment 3 (T3).

2.3. Data Analysis

The weight of the birds was taken weekly using a sensitive weighing balance. The PCV was determined using microhaematocrit centrifuge. The result of the experiment was analyzed using Analysis of variance (ANOVA). The comparison of mean was separated using a post Hoc test (Least Significant Difference), (William and George, 2008).

3. Result

Figure 1 shows that the broiler chicks fed with treatment 2 (100g blood meal and 500g of chick mash) had the highest mean weight gain (3.04g) than other treatments; treatment 1(control) had 2.78g while treatment 3(300g blood meal and 500g of chick mash) had 2.95g. Statistically there was a significant difference ($P < 0.05$) between the weight gain of the broiler chicks fed with treatment 2 and the ones fed with treatments 1 and 3 using LSD multiple comparison.

Figure 2 shows the mean values of Packed Cell Volume (PCV) of the broiler chicks, from the figure, it was observed that the chicks fed with treatment 2 had the highest PCV (41.40%) followed by broiler chicks fed with treatment 3 (40.20%), while the ones fed with treatment 1 (control) had the lowest PCV (37%).

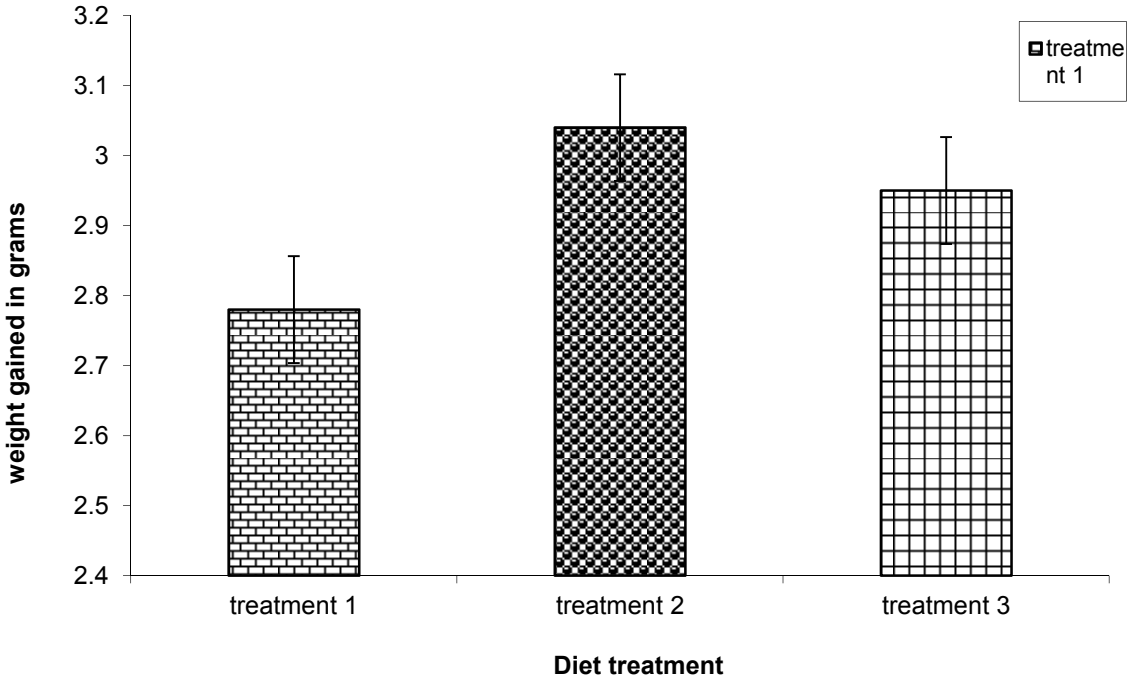

Figure 1. *Mean weight gain of Broiler chicks.*

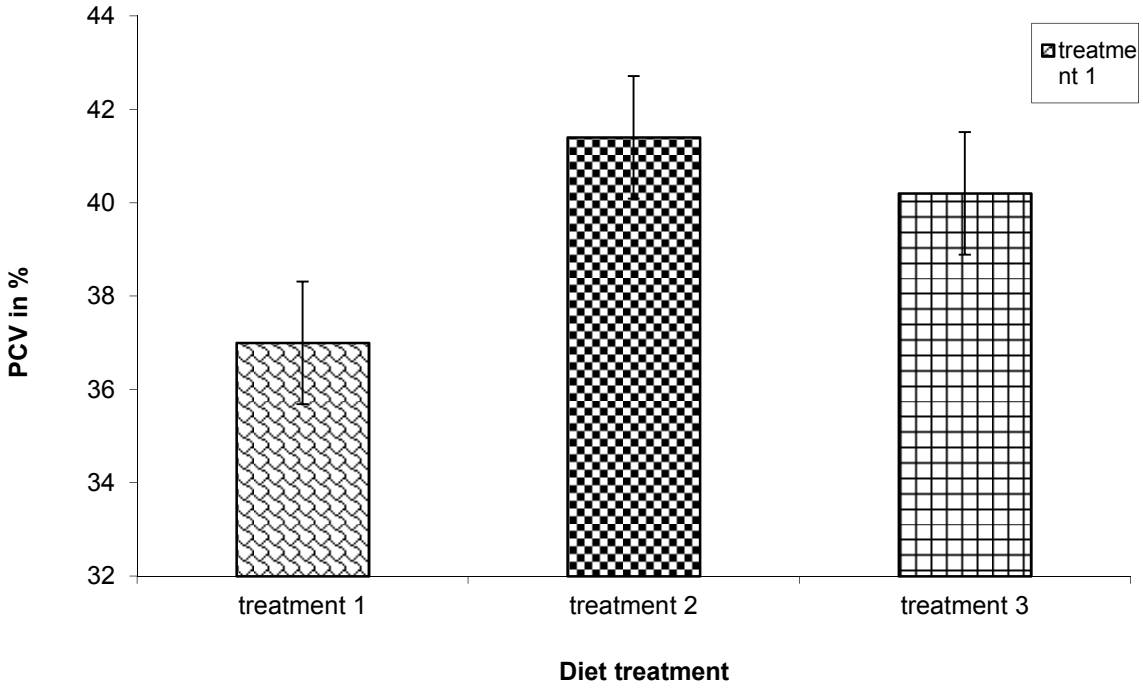

Figure 2. *Mean values of PCV of Broiler chicks.*

4. Discussion

From the result above, it was observed that there was a significant difference ($P < 0.05$) in weight gain in the broilers fed with blood meal and broilers fed with the control diet. These results are in agreement with those of Toor and Fahimullah (2002), who reported that addition of blood meal, resulted in significant improvement in growth rate and showed an increased weight gain. It was also observed that the packed cell volume of birds fed with blood meal had a

higher percentage (41.40% and 40.20%) than other birds fed with control diet (37%). These results are in agreement with those Gous and Morris, (2005), who reported that the higher values of the packed cell volume may be attributed to nutritional content of feed. Although the blood meal enhanced growth performance of the broiler chicks, it should be noted that the broilers fed with treatment 2 (100g of blood meal) had the best performance both in the growth, that is weight gain (3.04g) and Packed Cell Volume (41.40%). This shows that if the blood meal is too much, the feed will not be palatable for the broilers to feed on. Therefore the inclusion of blood meal should be in moderate amout so as to make the feed palatable to the birds and at the same time enhance their growth rate and weight gain as well.

5. Conclusion

The result obtained from the research shows that blood meal when given in moderate amount enhanced growth performance of the broilers and it also enhanced the PCV of the broilers. It is therefore recommended that farmers should include blood meal in their feed production for the broiler birds, at most 100g of blood meal in 500g of chick mash.

References

[1] Adeyemi, O.A., Fasina, O.E. and Balogun, M.O. (2000). Utilizating full fat of jatropha seed in broiler diets: Effects on Haematological Parameters and Blood Chemistry. Proceedings of the 25th Annual Conference Nigerian Society of Animal Production, Michael Okpara University of Agriculture, Umudike, Nigeria. 3:163-166.

[2] Agbede, J.O., and Aletor, V. (2007) The Performance, Nutrient Utilization and Cost Implications of Feeding Broiler Finisher Conventional or Underutilized Resources. Applied Tropical Agriculture. 2:57-62.

[3] Atawodi, S.E., Mari, D., Atawodi, J.C. and Yahaya, Y. (2008). Assessment of Leucaena and leucocephala leaves as feed supplement in laying hens. African Journal of Biotechnology. 7 (3): 317-321.

[4] Brooks, M.C. (2002). Nutrition research techniques for domestic and wild animals. Animal Science Department. Utah State University, Logaus, U.S.A. 2:44-50.

[5] Brooks, M.C. (2001). Effect of Protein on Human Growth and Development. International Journal of Nutrition. 25:46-55.

[6] Diarra, S.S. (2008). Utilization of Saseme (Sasemum indicum).Seed meal as a source of methionine by broilers and layers. Ph.D. Thesis. Abubakar Tafawa Balewa University, Bauchi State. Pp. 1-59.

[7] Donald, P. and Edward, F. (2002). Animal Nutrition. 4th Edn. Published in the United States with John Wiley and Sons. Inc. New York, 455-483.

[8] Ensminger, W.I. and Akubilo, C.O. (2002). Thermal Analysis and Evaluation of Protein Requirement of a Passive Solar Energy Poultry Chick Brooder in Nigeria. Journal of Renewal Energy. 9:1-7.

[9] Fombad, G.O., Michel, J., and Changneu, A.M. (2004). The effects of dietary protein independent of essential amino acids on growth and body composition in genetically lean and fat chickens. British Poultry Science. 41: 214-218.

[10] Gous, R. M. and Morris, T. R. (2005). Nutritional Intervention in Alleviating the Effects of high temperature in broiler production. World Poultry Science. 61: 463-475.

[11] Iheukwumere, F.C. and Okoli, I.C. (2002). Preliminary Studies on Raw Napoleana imperialis as feed ingredient. Performance and Blood Chemistry of Weaner Rabbits. Tropical Animal Production. 5:100-110.

[12] Madubuike, F.N and Ekenyem, B.U. (2006). Haematology and Serum Biochemistry Characteristics of Broiler Chicks fed varying dietary level of Ipomoea asarifolia Leaf Meal. International Journals of Poultry Science. 5:9-12.

[13] Odunsi, A. A. (2004). Blend of Bovine Blood and Rumen Digesta as a Replacement for Fishmeal and Groundnutcake in Layer Diets. International Journal of Poultry Science. 2 (1): 58-61.

[14] Oyawoye, E.O. and Ogunkunle, M. (2008). Physiological and biochemical effects of raw jack beans on broilers. Proceedings of Annual Conference of Nigerian Society of Animal Production, 23:141-142.

[15] Randy, N. (2002). Nutrient Requirements of Domestic Animals. Nutrient Requirements of Poultry, 8th ed., National Academy Press, Washington DC, USA. Pp. 231-338.

[16] Toor, A. and Fahimullah, A. (2002). Effects of Different Levels of Blood Meal on the Performance of Broiler Chick. M.Sc. Thesis. University of Agriculture Faisalabad, Pakistan. Pp. 1-52.

[17] William, A.C., and George, W.S. (2008). Statistical Methods, 6th Ed., The Iowa State University Press. Ames, Iowa, USA. Pp. 167-263.