

RESPOND OF POULTRY BROILER CHICKS TO LOW DIETARY ENERGY LEVELS

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ABSTRACT

The experiment was conducted to investigate the effect of low dietary energy on growth performance of poultry broiler chicks. Two hundred and seventy day old Amok broiler chicks were weighed and randomly allotted to three dietary treatments containing 2 400 ME Kcal/Kg, 2 600 ME Kcal/Kg and 2 800 ME Kcal/Kg designated as A, B and C. Each treatment containing ninety birds was replicated three times with thirty birds per replicate. The experiment was laid in a completely Randomized designed. The differences between the results of the performance were tested for Analysis of Variance (ANOVA) using the General Linear Model Univariate Procedure of SPSS 16.0 and significant differences of means were compared using Least Significant Difference (LSD). Results showed that feed intake showed statistical difference ($p < 0.05$) between the three treatments. Birds fed least energy level (2 400 ME Kcal/Kg) showed highest final live weight (738.64g/b) and body weight gain (772.66g/b). There were no significant difference ($p < 0.05$) in final live weight, body weight gain and feed conversion ratio. The study recommended that low energy diets should be formulated for poultry starters so as to minimize the accumulation of cholesterol in between the muscle fibres and on visceral organs which can consequently affects the physiological and metabolic functions of the birds, organoleptic characteristics, marketability of the products and health status of the consumer.

Keywords: Broiler, diet, energy, performance and starter.

INTRODUCTION

Broiler chickens are given free choice feeding, therefore they tend to accumulate energy in excess of their maintenance and production requirement, hence deposit this excessive fat in between muscle fibres and on visceral organs (Summers and Spratt, 2000; Cuddington, 2004). Excessive fat has been describe as an uneconomical and undesirable product that not only increases the occurrence of metabolic diseases and skeletal deformities but also causes problems in feed efficiency, difficulty in meat processing and rejection of meat by consumers for health reasons (Urdaneta-Rincon and Lesson, 2002). Consumers' preferences for leaner meat have increase over the last two decades due to corollary between human consumption of certain fats and cardiovascular diseases. This has stimulated interest in developing management procedures to increase feed efficiency, reduced abdominal fat deposition in broiler chickens and tend towards leaner carcasses (Cabel and waldroup, 1990). The aim of this research is to evaluate the growth performance of broiler chicks fed different low dietary energy levels.

MATERIALS AND METHODS

A Four week feeding trial was conducted at the poultry training and research farm of the department of Animal Health and Production, Binyaminu Usman Polytechnic, Hadejia, Jigawa State. Two hundred and seventy day old Amok broiler chicks were weighed and randomly allotted to three dietary (table 1) treatments containing 2 400 ME Kcal/Kg, 2 600 ME Kcal/Kg and 2 800 ME Kcal/Kg designated as A, B, and C, respectively. Each treatment was replicated three times with thirty birds per replicate. Water was served freely to all the treatments. Necessary management practices were carried out and routine vaccinations and drugs were administered. The birds initial live weight was determined and the record on daily feed intake (known quantity of feed was offered in the morning and the left over measured the next morning, the differences were determined to compute daily feed intake), Body weight changes (this was measured daily per bird. The actual body weight was subtracted from the weight of the previous day) and feed conversion ratio (this was calculated as quantity of feed consumed to affect a unit weight gain) was also

be examined. The experiment was laid in a Completely Randomized Design. The differences between the results of the performance were tested for Analysis of Variance (ANOVA) using the General Linear Model Univariate Procedure of SPSS 16.0 and significant differences of means were compared using LSD.

RESULTS AND DISCUSSIONS

Table 2 shows the record of growth performance of broiler chickens (at starter phase) fed different energy levels. Feed intake showed statistical difference ($p < 0.05$) between the three treatments, similar result was reported by Kwari *et al* (2014). As the energy level increases, there was decrease in feed intake. This is in agreement with the report of Smith (2001) who stated that broiler chickens eat more to satisfy their energy need. Sundu *et al.* (2005) and Fatufe *et al.* (2007) reported that the voluntary feed intake of birds have been established to be a function of dietary fibre characteristics. Birds fed least energy level (2 400 ME Kcal/Kg) showed highest final live weight (738.64g/b) and body weight gain (772.66g/b). The higher values in final live weight and body weight gain of the birds fed on diet A indicated that the diet was better utilized. Initial live weight, final live weight and feed conversion ratio showed no statistical difference between the three treatments. The range for final live weight recorded in this study (686.38g/b to 738.64g/b) is in conformity with that reported (630.56g/b to 872.50g/b) by Nworgu and Egbunike (2013), the same authors recorded body weight gain of 590.96 to 830.59g/b which is within the range with that reported in this work (653.78 to 772.66g/b). The range for feed conversion ratio in this study (2.50 to 3.39) is similar with that published by Dairo *et al.* (2010), Nworgu *et al.* (2014), Olaiya *et al.* (2014), Teniola *et al.* (2014) and Teniola *et al.* (2016) as 2.51 to 3.56, 2.63 to 2.89, 2.35 to 3.25, 2.60 to 3.80 and 2.58 to 3.10 respectively. The result of this work shows no significant difference ($p < 0.05$) in final live weight, body weight gain and feed conversion ratio which is similar with that reported by Kwari *et al.* (2014). Ari *et al.* (2012) also reported non-significant difference in final live weight of broiler chicken when fed diet containing alkali treated soybeans.

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REFERENCES

- Ari, M.M., Ayanwale, B.A., Adama, T.Z. and Olatunji, E.A. (2012): Effect of diets containing alkali treated soybeans on performance traits, nutrients digestibility and cost benefits of broiler chickens. *Nigerian Journal of Animal Production*. 39 (1):125-134.
- Cabel, M.C. and Waldroup, P.W. (1990): Effect of different nutrient selection programs early in life on broiler performance and abdominal fat content. *Poultry Science* 69: 652-660
- Cuddington, S. (2004): High energy diets affects broiler chicken welfare. <http://www.facs.sk.ca/pdf/animalcare-care-awardarticles-2004/cuddington-chickens.pdf>.
- Dairo, F.A.S., Adeschinwa, A.O.K., Oluwasola, T.A. and Oluyemi, J.A. (2010). High and Low Dietary Energy and Protein Levels for Broiler Chickens. *African Journal of Agricultural Research*. 5(15); 2030-2038.
- Fatufe, A.A., Akanbi, I.O., Saba, G.A., Olowofeso, O.O. and Tewe, O.O. (2007): Growth performance and nutrient digestibility of growing pigs fed a mixture of Palm kernel meal and cassava peel meal. *Livestock Res. Rural Dev.* 19(180).
- Kwari, I.D., Igwebuike, J.U., Shuaibu, H., Titima, S.I. and Raji, A.O. (2014): Growth and carcass characteristics of broiler chickens fed maize, sorghum, millet and their combinations in the semi-arid zone of Nigeria. *International Journal of Science and Nature*. 5(2):240-245.
- Nworgu, F.C. and Egbunike, G.N. (2013): Water leaf (*Talinum triangulare*) meal as protein supplement for broiler chicks. *Proceedings of the 4th Nigerian International Poultry Summit* held at Federal University of Agriculture, Abeokuta. 17th-21st February. 68-73pp.
- Nworgu, F.C., Oduola, O.A., Nwufor, I.O., Akanbi, I.O., Olatunde, O.A., Afolabi, M.T. and Akande, J. (2014): Effect of wilted bitter leaf extract (*Veronia amygdalina*) on the growth rate of broiler stater. In: B.M. Oruwari, J.P. Alawa, U.I Oji, O.J. Owen and O.S. George (Eds). *Animal Agriculture: A*

- Tool for Sustainable Economic Transformation. Proceedings of the 39th Conference of Nigerian Society for Animal Production held at Babcock University Ilishan-Remo, Ogun State. Nigeria. 16-19 March. 185-188pp.
- Olaiya, O.D., Yisa, A.G., Adelowo, V.O., Payi, E., Udokainyang, A.D., Yenle, F.G. and Adeleke, M.A. (2014): Growth performance and haematological profile of growing broiler fed roasted sesame (*Sesame indicum* L.) seed meal. In: B.M. Oruwari, J.P. Alawa, U.I Oji, O.J. Owen and O.S. George (Eds). *Animal Agriculture: A Tool for Sustainable Economic Transformation. Proceedings of the 39th Conference of Nigerian Society for Animal Production held at Babcock University Ilishan-Remo, Ogun State. Nigeria. 16-19 March. 231-234pp.*
- Smith, A.J. (2001): *Poultry; Tropical; Agriculturalist 2nd Edition* Macmillian Education Ltd. United Kingdom. Pp 1-11.
- Summers, J.D. and Spratt, D. (2000): *Poultry: Compensatory growth*. <http://www.gov.on.ca.OMAFRA/english/live/stock/poultry/facts/compgrow.htm>
- Sundu, B., Kumar, A. and Dinger, J. (2005): Response of birds fed increasing level of palm kernel meal supplemented with enzymes. *Australian Poultry Science Symposium* 17: 228-278.
- Teniola, A.A., Fafiola, A.O., Omole, A.J., Odukoya, S.O., Olarotimi, I.D., Makanjuola, B.O. and Bola duro, B.A. (2014): Growth performance of broiler birds fed enzymes supplemented malted sorghum sprout based diets. In: B.M. Oruwari, J.P. Alawa, U.I Oji, O.J. Owen and O.S. George (Eds). *Animal Agriculture: A Tool for Sustainable Economic Transformation. Proceedings of the 39th Conference of Nigerian Society for Animal Production held at Babcock University Ilishan-Remo, Ogun State. Nigeria. 16-19 March. 276-279PP.*
- Teniola, A.A., Adejinmi, O.O., Odukoya, S.O., Fafiola, A.O., Olarotimi, I.D. and Alabi, J.O. (2016): Growth performance and carcass characteristics of broiler chickens fed soy sesame based diet supplemented with phytase. In: O.O. Oluwatosin, O.S. Sowande, O. Olowofeso, L.T. Egbeyale, O.O. Adeleye, C.P. Njoku, A. O. Osofowora and A.J. Sanda (eds). *New Technologies for Enhanced Animal Production in Nigeria. Proceedings of the 41st Annual Conference of Nigerian Society for Animal Production held at Federal University of Agriculture, Abeokuta, Nigeria. 20th 24th March. Pp 307-31.*
- Urdoneta-Rincon, M. and Lesson, S. (2002): Quantitative and Qualitative feed restriction on growth characteristics of male broiler chickens. *Poultry Science* 81: 679-688