The Indian Journal of Veterinary Sciences & Biotechnology ***(2017) Volume 13, Issue 2, 43-46***
ISSN (Print) : 2394-0247 : ISSN (Print and online) : 2395-1176, abbreviated as IJVSBT
http://dx.doi.org/10.21887/ijvsbt.v13i2.10049

Submitted : 00-00-2017 ***Accepted : 00-00-2017*** ***Published : 15-11-2017***

Effect of Replacement of Maize with Dry Bakery Waste in Broiler Diet

V. Epao, B.N. Ramteke and G.M. Gadegaonkar

Department of Animal Nutrition,

Bombay Veterinary College, Parel, Mumbai- 00 012

MAFSU, Nagpur- , Maharashtra

Corresponding Author: drgmgadegaonkar@gmail.com

Abstract

An experiment was conducted on 240 day-old broiler chicks for a period of six weeks in which the chicks were randomly divided into four equal groups viz Control (C), T_1, T_2 and T_3 comprising of 60 birds each with three replicates of 20 birds in each group.The birds from group C received Corn-Soybean meal based diet, the birds from group T_1, T_2 and T_3 received diet in which maize was replaced with dry bakery waste (DBW) at 20, 40 and 60% level, respectively. The final live body weight, total gain in weight, feed consumption, feed conversion ratio, average dressing percentage, giblet weight, serum albumin, globulin, cholesterol, triglycerides, LDL and VLDL values for group C, T_1, T_2 and T_3were comparable, however, average serum HDL values were significantly lower in T_1 and T_2 than Control. Highest net profit per kg of bird were recorded in Group T3 .

Keywords: Poultry, broiler, dry bakery waste, growth, carcass, blood biochemical parametres.

Introduction

The use of Agro-industrial by-products (AIBPs) in animal feed holds tremendous potential in alleviating the existing critical situation of high cost and inadequate supply of feed. Considerable efforts have been made to improve the utilization of these AIBPs in monogastric nutrition. Among AIBs bakery waste has shown promising results as a source of energy. Dry Bakery Waste (DBW) an unconventional energy source is rejected product found in substantial quantities in Bakeries located at different industrial areas. It is a palatable, high energy feed produced from wheat flour, skimmed milk powder, vegetable fat, sugar, salt and flavour materials. DBW has no anti-nutritional factor and could make a good replacement for maize and other cereal grains in feeding broilers. The cost of biscuit waste is relatively low compared to that of maize because it is considered as a waste product. Biscuit waste has been included in the diets of rams which has resulted in the reduction of feed cost without any adverse effect on their performance (Apata, 2010). Bakery waste stands out for its high concentration of non-fibrous carbohydrates, which are characterized as energetic food (Arosemena *et al*., 1995). Due to its high energetic value it can partially replace cereal grains used in feeding farm animals. Bakery waste is a potential substitute of cereal grains in animal diets as cereals becomes costly during certain periods of year. Therefore, the present study was proposed to evaluate the feasibility of using Dry Bakery waste in feed of poultry and

assess the optimum level of replacement of maize by DBW in broiler diet.

Materials and Methods

The experiment was conducted on 240 day-old 'Cobb-400' broiler chicks for a period of six weeks. The day old broiler chicks were randomly divided into four equal groups viz C, T_1, T_2 and T_3 comprising of 60 birds each with three replicates of 20 birds in each group. The birds from group C received Control diet using Corn-Soybean meal based diet and the birds from group T_1, T_2 and T_3 received diet in which maize was replaced with dry bakery waste by 20, 40 and 60%, respectively. Pre-starter, starter and finisher mashes for various experimental groups were prepared as per BIS (2007) standard, which were iso-caloric and iso-nitrogenous. The chicks were reared under standard managemental conditions on deep litter system. Feed and fresh water was offered *ad libitum*. The feeding trial of 42 days was divided in to three phase viz. prestarter, starter and finisher. Body weights and feed intake were recorded weekly during the study. Weekly feed conversion ratio was calculated after dividing the weekly feed consumption by weekly weight gain.

The carcass characteristics were studied on 6 birds from each group i.e 2 birds from each replicate slaughtered at the end of feeding trial.The proximate analysis of the experimental mashes was undertaken in the laboratory of Department of Animal Nutrition, Bombay Veterinary College, Parel, Mumbai, as per A.O.A.C. (1995). Haemo-biochemical profile estimation like serum protein (Johnson *et al.,* 1999) and lipid profile (Tietz, 1998 and McGowan *et al.,* 1983) of six birds from each group was also carried out at the end of six week by employing chemistry auto-analyzing kit. The economics of broiler production was calculated taking into consideration of input output ratio. All the data obtained were subjected to statistical analysis as per Snedecor and Cochran (1998), by using completely randomized design.

Results and Discussion

The bakery waste used for trial contained CP 10.23%, EE 10.26%, CF 1.14%, NFE 72.03% and total ash 6.32% (DM basis). All the experimental diets were prepared as per BIS (2007).The overall performance of the birds from various experimental groups is presented in Table 1. From the Table it is revealed that, the final live body weight and total gain in weight for groups C, T_1, T_2 and T_3 were comparable. The replacement of maize with DBW in the broiler diet in present study showed no adverse effect on body weight, instead recorded numerically higher body weight. The result of the present study are in agreement with Saleh *et al*. (1996) and Al-Riquaie *et al.* (2011) who reported no adverse effect on the body weight when dry biscuit waste were used in place of maize, though in both the studies no significant increase in body weight was recorded. Adeyemo *et al*. (2013) reported non significant differences in average weight gain in broilers on replacement of maize with biscuit waste @ 25, 50, 75 and 100%. The numerically higher body weights in DBW fed group in present trial may be due to higher fat % in the diet resulting better utilization of nutrients for body weight gain.

The average feed consumption of birds from various experimental groups (Table 1.) revealed non-significant effect of feed treatments. The findings of the present study are in agreement with Saleh *et al.* (1996) who reported non-significant effect on feed consumption of broilers when dry bakery waste was used @ 5, 10, 15, 20, 25 and 30 % in starter and finisher diets. The feed conversion ratio was relatively similar in all the treatment groups indicating no adverse effect of replacement of maize up to 60% on feed conversion ratio. Al-Tulaihan *et al*. (2004) reported non significant effect on FCR by increased level of Dried Bakery Waste in the diet at 0, 5, 10, 20 and 30 %, respectively.

The results of the carcass evaluation studies showed that average dressing percentage and giblet weight of birds from various experimental groups were comparable with control. The results of the present study are in agreement with the findings of Oke and Samson (2013) who reported non significant effect of bread waste meal on dressing percentage of broilers. The average serum albumin, globulin, cholesterol, triglycerides, LDL and VLDL values for group C, T_1, T_2 and T_3 were

comparable, however, the average serum HDL values were significantly (P<0.01) higher in T_1 and T_2 than Control, but T_3 group was at par with control.

It is noticed that net cost of production per bird for groups C, T_1, T_2 and T_3 were Rs. 123.43, 119.79, 124.40 and 123.66, respectively. The sale price of birds was considered as Rs. 88/kg. The corresponding net profits per kg body weight were Rs. 24.04, 26.25, 26.71 and 27.67 for group C, T_1, T_2 and T_3, respectively. The group T_3 recorded highest net profit per kg of bird. Adeyemo *et al*. (2013) also reported higher profit margins when maize was replaced with dry bakery waste in broiler diet.

Thus, the overall performance of birds during trial revealed that the replacement of maize with DBW proved to be suitable alternative feed resources in the broiler diets. It is also indicated that inclusion level of DBW up to 60% showed similar performance as that of control feed, where standard broiler diet without bakery waste was used. The use of DBW did not affect the performance of birds in terms of live weight, gain in weight, feed consumption and feed conversion ratio.

Table1: Overall performance of birds during six weeks

Parameters	Groups				
	Control	T_1	T_2	T_3	Level of Sign.
Initial weight (g)	40.79	40.97	40.74	40.94	--
Final weight (kg)	1.93	1.94	2.03	2.05	NS
Total gain in weight (kg)	1.89	1.90	1.99	2.01	NS
Total feed consumption (kg)	3.26	3.27	3.49	3.51	NS
Average feed conversion ratio	1.72	1.72	1.75	1.74	NS
Dressing %	71.53	69.96	70.91	70.69	NS
Giblet (%)					
Liver weight	1.99	2.06	2.01	2.05	NS
Gizzard weight	1.98	2.02	1.97	1.85	NS
Heart weight	0.52	0.51	0.53	0.50	NS
Protein Profile (g/dl)					
Albumin	1.90	1.80	1.76	1.66	NS
Globulin	1.46	1.50	1.50	1.76	NS
Lipid Profile (mg/dl)					
Total Cholesterol	131.83	134.66	133.16	127.5	NS
Triglycerides	85.50	116.16	101.00	102.33	NS
HDL	81.91^a	93.11^b	92.81^b	79.75^a	**
LDL	32.81	18.31	20.15	26.20	NS
VLDL	17.10	23.23	20.26	20.63	NS
Economics					
Net profit per bird (Rs.**)**	46.40	50.92	54.23	56.73	
Net profit per kg (Rs.**)**	24.04	26.25	26.71	27.67	

Note: Means with different superscript in a row differ significantly.

NS: Non- significant **- Significant at 1% level

Conclusion

Thus, it is concluded that dry bakery waste can be used as an alternate feed to maize up to 60% level in broiler diet, to obtain comparable growth performance and higher profit from the birds.

Acknowledgement

We thank Professor and Head of the Department, Poultry Science Department, Bombay Veterinary College, Parel, Mumbai- 400012 and their staff for kind permission, help and co-operation extended for taking up this research work.

Conflict of interest: All authors declare no conflict of interest.

References:

A. O. A. C. (1995) Association of Official Analytical Chemists, Official Method of Analysis, 15th Ed. Collegiate Press, Washington D. C., U. S. A. **4**: 957.

Adeyemo G. O., Oni O. R. and Longe O. G. (2013) Effect of dietary biscuit waste on performance and carcass characteristics of broilers. *Food Sci. and Quality Management*, **12**: 2224-6088.

Al-Riquaie I. M., Swillam S. A., Al-Batshan H. A. and Shafey T. M. (2011) Performance, nutrient utilization and carcass characteristics and economic impact of broiler chickens fed extruded bakery waste. *J. of Anim. and Vet.Advances.***10(16):** 2061-2066.

Al-Tulaihan A. A., Najib H. and Al-Eid S. M. (2004) The nutritional evaluation of locally produced dried bakery waste (DBW) in the broiler diets. *Pak. J. of Nutri.***3(5):** 294-299.

Apata, E. S., Akinduro, V. O. and Laseinde, E. A. O. (2010) Effect of feeding graded levels of biscuit waste based diet on non-carcass components of Yankasa rams. *Afr. J. Biotechnol.***9:** 4499-4502.

Arosemena A. E,.DePetersJ.andFadel J. G. (1995) Extent of variability in nutrient composition within selected by product feedstuffs. *Animal Feed Science and Technology*, **54**:103-120.

B. I. S. (2007) Indian standards poultry feeds, specifications (5th Revision) 1374 ManakBhavan, New Delhi, India.

Johnson, A.M., Rohifs, E.M. and Silverman, L.M. (1999). Protein In: *The text book of Clinical Chemistry.* W.B. Saunder's Company, Philadelphia. Pp 477-540.

McGowan, M.W., Artiss, J. D., Strandbergh, D.R. and Zak, B. (1983).A peroxidase-coupled method for the colorimetric determination of serum triglycerides.*Clin. Chem*. **29**: 538-542.

Oke, O. A. and Samson O. (2013) Utilization of bread waste meal as replacement for maize in diets for broiler chickens. *J. of Poverty, Investment and Development* - An Open Access International J. **1**.

Saleh, E. A., Watkins S. E. and Waldroup P. W. (1996) High level –usage of dried bakery by-product in broiler diets. *J. Appl. Poultry.***5**:33-38.

Snedecor and Cochran (1998) Statistical Methods.8thedn.Affiliated East-West press Pvt. Ltd. New Delhi, India.

Tietz, N.W. (1998). Fundamentals of Clinical Biochemistry. 3rd edn.W.B.Saunders Company, U.S.A.

❑