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An Assessment of the Performance and Carcass Yield of Broilers Fed Indomie Waste® in the Humid Tropics

Research Article

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ABSTRACT

This study was conducted using one hundred and eighty (180) day-old broiler chicks, of Anak strain to assess the levels of inclusion of indomie waste meal as a substitute for maize at 0, 25, 50, 75 and 100%. The birds were randomly assigned to dietary treatments using completely randomized design (CRD). Each treatment contained 3 replicates and each replicate had 6 birds. The study lasted for eight weeks (56 days). The inclusion of indomie waste significantly ($P<0.05$) influenced final weight, weight gain, feed conversion ratio, breast, thigh and back weights. Significant ($P>0.05$) differences were not indicated in feed intake, neck, shank, wing and drum stick weights. Based on the observation from this study, it was concluded that broilers in the humid tropical region of Nigeria can tolerate indomie waste in the diets up to 100% level as substitute for maize without adverse effect on the performance and carcass yield, but the 25% indomie waste inclusion which yielded the best result is recommended for best broiler performance in the humid tropics.

KEY WORDS broiler, carcass, humid tropics, indomie waste, performance.

INTRODUCTION

Broiler is a type of chicken raised specifically for meat production. It matures early at 6-8 weeks. Broiler production is very important in Nigeria because it provides employment opportunity for the teeming population. It serves as a source of local and foreign earning, thus complementing the earning from crude oil which is the main source of foreign earning in the country. Broiler plays an important role in human nutrition because of the protein it contains. But the scarcity and high cost of the conventional feed ingredients (maize, sorghum, millet and rice meal and groundnut and soya beans) have slowed down the growth of the broiler industry in Nigeria. The rising demand for maize for alternative uses had already raised its cost (Good, 2006). Thus the search for cheaper feedstuff continues to be foremost to the research efforts of animal nutritionists (Dafwang and Damang, 1995). The use of unconventional locally produced and cheap feedstuff had been recommended (Adeola and Olukosi, 2008).

Indomie waste® is a by-product obtained from the production of indomie produced by Dufil Prima Foods Limited, Choba, Port Harcourt. They constitute the broken particles that drop off during the production process and are usually milled before discarding by the company. Indomie waste® contains wheat flour, vegetable oil, iodized salt, sodium polyphosphate, sodium carbonate, guargum, tartrazine Cl 19140 and tertiary butyl hydroquinone (TBHQ) antioxidant. Tertiary butyl hydroquinone (TBHQ) was developed for stabilizing various vegetable oils, fats and foods against oxidative deterioration, thus extending the storage life of foods (http://www.tbhq.org/tbhq.htm).

It is a suitable energy source containing 3464 metabolizable energy (ME) kcal/kg, 94.7% dry matter, 8.75% crude protein (CP), 1.5% crude fibre (CF), 16.35% fat and 13.6% ash (Eniolorunda *et al*. 2007) while that of maize according to Aduku (1993) is 3432 ME kcal/kg, 8.9% CP, 2.7% CF, 45 fat and 1.3% ash. The availability of indomie waste® in the study area coupled with its nutrient profile which is comparable with that of maize prompted this study which was designed to investigate the effect of the by-product on performance and carcass yield of broilers.

MATERIALS AND METHODS

The research work was conducted at the Poultry Unit of the Department of Animal Science, Rivers State University of Science and Technology Teaching and Research Farm, Oroworukwo, Port Harcourt. Indomie noodles waste was obtained from Dufil Prima Food Limited located in Choba, Port Harcourt. The already milled waste (usually milled by the company to avoid illegal re-packaging) was incorporated into broiler starter and finisher diets at: 0%, 25%, 50%, 75% and 100% to replace maize which was 43% in the control of the starter diet and 46.70% in the control of the finisher diet. Diets were isocaloric and isonitrogenous with the starter diets having 2600 kcal/kg ME and 20.5% CP while the finisher diets had 2900 kcal/kg ME and 19% CP. A total of one hundred and eighty (180) day old broilers were used for the study which lasted for 8 weeks (56 days). They were assigned randomly to 5 treatments in a completely randomized design (CRD). The broilers consisted of both sexes. Each treatment consisted of 3 replicates with twelve (12) birds per replicate. Feed and water were provided for the broilers *ad libitum* throughout the experimental period. All routine vaccination and management practices were duly followed.

On arrival of the birds, they were weighed and randomly assigned into the treatments. Birds were fed the starter diet for 4 weeks and the finisher diet for 4 weeks. The initial weight per bird was recorded while subsequent weight records were taken weekly. The feed left-over was subtracted from the quantity offered to determine the daily feed intake, while feed conversion ratio was computed at the end of the experiment. Mortality record was kept daily. The feed cost per treatment was computed from the cost of feed and feed intake. At the end of the experiment, 2 birds were randomly selected per replicate for carcass evaluation after fasting them for 8 hours (that is 6 birds per treatment). The birds were weighed, slaughtered and allowed to bleed completely. Thereafter, they were scalded, de-feathered, eviscerated and dissected to obtain the carcass weights. The weights of the standard cuts obtained from the carcass were determined on fresh basis using a sensitive scale. The averages obtained from the weight of carcass in each treatment were expressed as percentage of live weight. Data collected were subjected to statistical analysis system (SAS, 2002) and errors were presented as standard errors of means (SEM).

RESULTS AND DISCUSSION

The performance of broilers fed with the various levels of indomie waste throughout the 8 weeks of the experiment is presented in Table 1. The initial body weight of birds did not differ significantly in the various treatments. This may have resulted because of effective randomization when the birds were assigned to the treatments. The final weight of birds which was significantly higher in birds fed with the 25% indomie waste® compared to the others may be an indication that this level of indomie waste® is most suitable for broilers in the humid tropical environment. This varied from the recommended optimum level of 50% indomie inclusion in layers feed reported by Eniolorunda *et al.* (2007).

The weight gain which had similar pattern with the final weight confirmed that 25% indomie waste feed was more appropriate for broilers than the control diet. The observed similarity in feed intake across the treatments which did not differ significantly ($P>0.05$) may imply that broilers undergoing the birds in the various treatments had equal ability to consume the same quantity of feed since the ME of the treatments were similar.

This confirmed the finding by Pesti and Smith, (1984) who stated that broilers are believed to consume feed to meet their energy requirement.The feed conversion ratio of birds which was significantly lower in birds fed with the 25% indomie waste compared to others implied that the 25% indomie waste diet was a better diet, thus, birds utilized it more efficiently, leading to the increased body weight of birds in T 2. This result was in agreement with the findings of Ogbonna *et al*. (2000) and Akinmutimi (2004) who reported that the lower the feed to gain ratio, the better the diet.

All the mortalities recorded occurred in the first and second day of the experiment and were due to stress of transporting the birds. The dietary treatments therefore had no effect on mortality rate. Similar finding was reported by Hussein *et al.* (1996) and Elmansy (2006) who found that mortality was not affected by the different energy fed to the birds during the first 4 weeks of age. The numerical value of the feed cost / treatments showed that the control diet was the most expensive feed while the 100% indomie waste inclusion was the least expensive. This could be attributed to the cheaper cost of indomie waste compared to maize.

The carcass yield of broilers fed with the various levels of indomie waste throughout the 8 weeks of the experiment is presented in Table 2.

Table 1 Effect of dietary treatments on performance of broilers

Parameters (g/bird)	T_1 (0% indomie waste)	T_2 (25% indomie waste)	T_3 (50% indomie waste)	T_4 (75% indomie waste)	T_5 (100% indomie waste)	SEM
Initial weight (g)	40	41	40	41	40	0.06
Final weight (kg)	2260^b	2610^a	2260^b	2300^b	2340^b	54.0
Total weight gain (g)	2220^b	2569^a	2220^b	2259^b	2300^b	60.1
Average daily weight gain (g)	39.64^b	45.83^a	39.64^b	40.34^b	41.07^b	1.28
Total feed conversion	5174.4	5236.0	5135.2	5157.6	5146.4	84.2
Average daily feed intake	92.4	93.5	91.7	92.1	91.9	1.10
Feed conversion ratio	2.33^a	2.04^b	2.31^a	2.28^a	2.28^a	0.67
Mortality (%)	0	5.55	0	0	5	
Feed cost / treatment (N)	7767	7370	7251	7195	6821	

The means within the same row with at least one common letter, do not have significant difference (P>0.05).
SEM: standard error of mean.

Table 2 Effect of indomie waste on mean values for carcass weight of broilers fed graded levels of indomie waste

Parameters (% LW)	T_1 (0% indomie waste)	T_2 (25% indomie waste)	T_3 (50% indomie waste)	T_4 (75% indomie waste)	T_5 (100% indomie waste)	SEM
Dressed weight	73.70^b	79.80^a	73.60^b	72.90^b	73.40^b	2.43
Breast weight (BRW)	22.43^b	26.71^a	23.14^b	22.54^b	22.61^b	0.40
Thigh (T)	14.60^{ab}	15.92^a	13.82^b	14.40^{ab}	14.51^{ab}	0.19
Back weight (BW)	17.86^b	19.93^a	17.62^b	17.80^b	17.81^a	0.39
Neck weight (NW)	5.32	6.41	5.37	5.40	5.52	0.29
Shank weight (SW)	5.12	5.43	5.08	5.09	5.17	0.21
Drum stick weight (DSW)	13.48	14.23	13.32	13.43	13.61	0.20
Wing weight (WW)	10.86	11.34	10.69	10.77	10.85	0.10
Heart weight	0.76	0.82	0.81	0.80	0.81	0.10
Gizzard weight	4.30	4.32	4.29	4.30	4.20	0.10
Liver weight	2.51	2.56	2.58	2.56	2.57	0.07

The means within the same row with at least one common letter, do not have significant difference (P>0.05).
SEM: standard error of mean.
LW: live weight.

There were significant differences (P<0.05) in the percentage dressed weight, breast weight, thigh, shank weight and back weight. The birds which were fed with the 25% indomie waste had the highest weights. This may be attributed to the better feed utilization implying that there would be higher profit from the birds fed the 25% indomie waste. The percentage of some cut parts (neck weight, shank weight, drumstick weight, wing weight and wing length) obtained from the carcass of birds fed with indomie waste which were not significantly different from those of the control indicated that the birds fed the indomie waste competed favourably with the control. The result obtained from the organs (heart, gizzard and liver) which showed no significant difference confirmed that the diets had equal ability to support the normal development of these organs and the bird.

CONCLUSION

The birds fed the 50%, 75% and 100% indomie waste diets had similar final weight compared with birds that were fed the control diet. Those fed the 25% indomie waste had better performance, carcass and organ parameters with excellent feed conversion ratio and the diet was less expensive-compared with the control. Although the cost of production was cheaper in all the diets containing indomie waste compared with 0% (the control), it was obvious that the diet which contained the 25% indomie waste gave a tremendous opportunity to reduce input cost, while achieving a higher final weight. The 25% indomie waste inclusion is therefore recommended for broiler chicken production in the humid tropical environment.

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