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# Effect of Feeding Whole Millet on the Performance of Layer Birds

M.L. ABUBAKAR*, M. MIKAILU**, and A.A SANI***
*Department of Science Laboratory Technology, Federal Polytechnic Kaura Namoda Zamfara State Nigeria. **Department of Animal Science Faculty of Agriculture Usmanu Danfodiyo University, Sokoto, Nigeria. ***Department of Animal Health and Production Technology, College of Agriculture and Animal Science Wurno, Sokoto State Nigeria.

**Abstract:-This research was conducted to determine the effect of feeding whole millet on the diet of Isa brown layers breed. Four hundred and twenty birds aged 43 weeks were randomly assigned to the following dietary treatments: Treatment 1 contained ground maize with 18% C.P (Control). Treatment 2, 3 and 4 contained ground millet with 16, 18 and 20% C.P. Treatment 5, 6 and 7 contained whole millet with 16, 18 and 20% C.P. Feed intake did not differ significantly between the treatments. Egg productions were generally better with millet based diets. Egg production was significantly higher (P<0.05) for birds fed ground millet with 18% C.P compared to those fed the maize based diets. It was concluded that birds fed with the millet based diets have better performance as indicated in the study results.**

## I. INTRODUCTION

The term poultry refers to a rather wide variety of birds of several species. Thus, it applies to chickens, turkeys, ducks, geese, guinea fowls, pigeons, ostriches, quails, and other game birds.

Zoologically the fowl belongs to the family *phasianidae* and the genus Gallus. It is simply called Gallus domesticus. The ancestors of the domestic fowl originated from south East Asia and have been subjected to extensive breeding for size, colour pattern, conformation and egg laying ability (Payne, 1990). In Nigeria, daily protein intake is estimated at 53.8kg per day, with only 8.4g being of animal origin. This low intake of protein leads to high rate of infant mortality, low disease resistance, poor growth and development, mental retardation, kwashiorkor etc. all these could be prevented by consuming adequate quantities of high quality protein (Awosanmi, 1999). Poultry play a significant supportive role to various food productive systems by providing wastes and by products used in other agricultural systems. For example poultry droppings are used as manure that replenishes soil nutrients (Atteh, 2004). In order to meet the animal protein requirement, poultry have been singled out as animals of first choice. This is due to their high and quick turnover. Furthermore, they are easy to manage, highly productive, with short generation interval; and they adapt to a wide range of ecological conditions (Awosanmi, 1999). The utilization of this fibre could be improved with the use of exogenous enzymes (Singh and Perez-Maldonado, 1999). Svihus (2010) hypothesized that a more developed gizzard as a consequence of structural components may improve efficacy of exogenous enzymes. This could be due to increased retention time in the gizzard and the favorable pH there. Particle size influences retention time in the digestive tract. The larger the particle size, the longer feed is retained, the greater its exposure to endogenous and exogenous enzymes and subsequently the greater the nutrients utilization (Patrick, 2004).This research was aimed at determining the effect of feeding millet either whole or ground as the major source of energy in the diets of layers.

## II. MATERIALS AND METHODS

- *Location of Experiment:*

This study was conducted at the Teaching and Research Unit of Animal Science Department, Faculty of Agriculture, Usmanu Danfodiyo University Sokoto located at Veterinary Clinic, Aliyu Jodi Road, Sokoto. Sokoto is located in the Sudan Savannah Zone in the extreme North Western part of Nigeria, and lies between latitudes $12^0$N to $13^0$N and longitudes 40 and 60°E (Mamman *et al.,* 2000) Sokoto has low humidity and high solar radiation. Maximum and minimum temperature of $42^0$C and $13^0$C was reported in May and January respectively.

- *Experimental Procedure:*

A total of four hundred and twenty ISA Brown layers of 43 weeks of age were used in the experiment. The birds were randomly allocated to seven treatments. Each treatment contained ten replicates with six birds per replicate. Seven diets (representing treatments) were compounded as follows: Treatment 1 contained ground maize with 18% crude protein. Treatment 2 contained ground millet with 16% crude protein. Treatment 3 contained ground millet with 18% crude protein. Treatment 4 contained ground millet with 20% crude protein. Treatment 5 contained whole millet with 16% crude protein. Treatment 6 contained whole millet with 18% crude protein, and Treatment 7 contained whole millet with 20% crude protein. The gross and chemical compositions of the experimental diets are shown in tables 1 and 2 respectively. The experimental diets and water were given ad-libitum. Feed intake, egg production and mortality were monitored daily.

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| **Ingredients (%)** | **$T_1$ Maize (18%CP)** | **$T_2$ and $T_5$* Millet (16%CP)** | **$T_3$ and $T_6$** Millet (18%CP)** | **$T_4$ and $T_7$*** Millet (20%CP)** |
|---|---|---|---|---|
| Maize | 30.7 | 0.0 | 0.0 | 0.0 |
| Millet | 0.0 | 37.1 | 31.6 | 26.3 |
| GNC | 21.4 | 13.9 | 20.4 | 26.7 |
| Wheat offal | 36.8 | 37.8 | 36.9 | 36.0 |
| Limestone | 9.00 | 9.00 | 9.00 | 9.00 |
| Bone meal | 1.40 | 1.40 | 1.40 | 1.40 |
| Premix | 0.25 | 0.25 | 0.25 | 0.25 |
| Salt | 0.25 | 0.25 | 0.25 | 0.25 |
| Methionine | 0.11 | 0.13 | 0.12 | 0.10 |
| Lysine | 0.07 | 0.16 | 0.08 | 0.00 |
| **Total** | **100** | **100** | **100** | **100** |

*T2 ground millet and T5 whole millet, **T3 ground millet T6 whole millet, ***T4 ground millet and T7 whole millet.

Table 1:- Gross composition of the experimental diets

| | | | | |
|---|---|---|---|---|
| Energy (kcal/kg) | 2501 | 2501 | 2501 | 2501 |
| CP (%) | 18 | 16 | 18 | 20 |
| Lysine (%) | 0.8 | 0.8 | 0.8 | 0.8 |
| Methionine (%) | 0.4 | 0.4 | 0.4 | 0.4 |
| Calcium (%) | 3.6 | 3.6 | 3.6 | 3.6 |
| Phosphorous | 0.4 | 0.4 | 0.4 | 0.4 |
| Crude fibre (%) | 4.8 | 6.9 | 6.7 | 6.5 |
| Other extract | 4.0 | 4.0 | 4.0 | 4.0 |

Table 2:- Calculated chemical composition of the experimental diets.

## III. DATA ANALYSIS

The data collected was subjected to analysis of variance (AVOVA) using the STAT VIEW (SAS, 2002) Statistical package.

## IV. RESULTS AND DISCUSSION

The results showed that generally egg production was better with the millet based diets. however, the differences were significant only between T4 (whole millet, 20%CP) and T1 (ground maize, 18%CP). Feed intake did not differ significantly between the treatments. Mortality was significantly lower for T6 compared to T3. These results therefore indicate that neither substituting maize with ground or whole millet nor varying the protein levels in the millet containing diets had any effect on feed intake. These results confirm the observations of Dale (2006) which show that high levels of pearl millet can be fed in ungrounded form. It also agrees with the assertion of Biggs and Parsons (2009), that most studies reported that the laying capacity of chickens is unaffected by the inclusion of a whole grain. It is known that feed intake in poultry is governed by dietary energy concentration.

| Parameter | **T1 Ground Maize (18%CP)** | **T2 Ground Millet (16%CP)** | **T3 Ground Millet (18%CP)** | **T4 Whole Millet (20%CP)** | **T5 Whole Millet (16%CP)** | **T6 Whole Millet (18%CP)** | **T7 Whole Millet (20%CP)** | **SEM** |
|---|---|---|---|---|---|---|---|---|
| Feed intake (g/b/d) | 100.91 | 104.56 | 101.31 | 105.94 | 102.95 | 104.91 | 105.40 | 1.96 |
| Egg production (g/b/d) | $43.96^{a}$ | $48.75^{ab}$ | $51.88^{ab}$ | $52.50^{b}$ | $51.67^{ab}$ | $47.71^{ab}$ | $47.71^{ab}$ | 2.94 |
| | | | | | | | | |
| Mortality (%) | $3.33^{ab}$ | $1.66^{ab}$ | $6.66^{a}$ | $3.33^{ab}$ | $4.99^{ab}$ | $0.00^{b}$ | $3.70^{ab}$ | 2.11 |

Table 3:- Performance of layer birds fed whole and ground millet Standard Error of Means on the same row with different superscript are significantly different (P<0.05). SEM :- standard error of means.

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## V. CONCLUSION

The results of this study indicate that feeding either maize or millet (whole or ground) containing 16 – 20% CP did not significantly affect feed intake. Egg production was better with the millet based diets, with significant differences between those fed ground millet with 20% CP and those on ground maize with 18% CP.

## RECOMMENDATIONS

- In an area where the price of millet is lower than that of maize, millet can replace maize in the diets of layers.
- Whole millet can be fed to layer birds. iii. Further studies should be carried out to look at the effects of the feed particle sizes and systems of whole millet feeding on the performance of layers.

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