Partial Placement of Maize with Cocoa Husk Meals in Layers Mash: An on-farm experience.

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Abstract

The partial replacement value of cocoa husk meals for maize in laying hen diets were assessed under an on-farm condition, Urea-treated and untreated cocoa husk meals were each incorporated into the farmer's layer mash (FLM) to replace 25% of the maize portion. FLM contained 40% maize. Six groups of 15 laying hens which were in the fifth month of lay were randomly allotted to the 3 dietary treatments including the control (FLM), cocoa husk-based mash (CHM) and urea-treated cocoa husk-based mash (UCHM). The diets were fed for 12 weeks. Egg production and egg mass were higher ($p<0.05$) on CHM and UCHM. Egg weight and feed conversion (feed intake: egg mass) were not affected ($p>0.05$) by dietary treatments. Feed cost was 9% lower on the test diets relative to FLM while feed cost/kg egg was 18% and 13% lower respectively on CHM and UCHM. These results indicate that cocoa husk meal could replace maize up to 25% in layers mash with the possibility of a higher profit margin.

Key words: Cocoa husk meal, layers mash, production performance.

Introduction

Feed accounts for 60-65% of layer production costs under small farm conditins, and income minus feed cost is a factor of extraordinary importance for the economic success of an egg producer (Ravindran, 1995, Hagger, 1994). Therefore, the most appropriate technology for tropical developing countries like Nigeria and Ghana with escalating ingredient prices is likely to be the development of dietary formulations which would allow locally available non-conventional feeding-stuffs (NCF) to be used.

The application of NCF to poultry nutrition has received considerable attention recently in West Africa (Teguia, 1995; Fanimo *et al*, 1996; Odunsi, *et al*, 1999; Sobamiwa and Akinwale, 1999; Olubamiwa, *et al*, 2000), but the investigations have generally been confined to research farms. Such results are virtually lost in publications without getting to the small farms, which have been identified as the most appropriate clients of agricultural research in the developing countries (Anon, 1997).

Million tons of cocoa husks are thrown away on West African Coca farms yearly, Nigeria for instance discards 1 million ton of cocoa husk on dry weight basis annually, and several potentialities of the husk as a poultry NCF in the sub-region have been reviewed (Sobamiwa 1997). As a means of arousing the interest of the small-scale farmers about this field-proven NCF, a modified trial, sequel to Sobamiwa (1998), was conducted under a small farm condition within a farm settlement inhabiting several farmers. The objective of the investigation was to study the effect of partial (25%) replacement of maize with urea-treated and untreated cocoa husk meals on productive performance of laying hens.

Materials and Methods

Ninety Lowman Brown laying hens in the fifth month of lay were housed in battery cages and fed the experimental diets shown in **Table 1**. Urea treated and untreated cocoa husk meals were

Table 1: Experimental Diets (%)

Ingredient	FLM	CHM/UCHM*
Cocoa husk meal	-	10.00
Maize	40.00	30.00
Soybean meal	18.00	18.00
Groundnut cake	7.00	7.00
Fish Meal	3.00	3.00
Maize bran	19.00	19.00
Oyster shell	10.00	10.00
Bone meal	2.15	2.15
Salt (Nacl)	0.40	0.40
Vit/Min Premix**	0.25	0.25
Methionine	0.10	0.10
Lysine	0.10	0.10
Total	100.00	100.00
Calculated Analyses (%)		
Crude protein	19.30	18.90
ME(kcal/kg)	2425	2295
Calcium	5.14	5.17
Phosphorus	0.71	0.70
Methionine	0.40	0.39
Lysine	0.97	0.98

FLM - Farmer's layers mash
CHM - Cocoa husk based layers mash
UCHM - Urea-treated cocoa huslbased layers mash
*CHM/UCHM - UCHM was taken as a close equivalent of CHM
** Premix-Agricare mix pfizer Products PLC. Ikeja, Lagos, Nigeria.

incorporated to different treatments to replace 25% of the maize in the layers mash used on the small commercial farm where the experiment was conducted. The farm was located among others within a farm settlement in Ikenne, Ogun State, Nigeria.

Cocoa husk processing, and urea treatment followed the procedures of Sobamiwa and Akinwale (1995). Each diet was tested with 2 replicates of 15 layers with diets and water available *ad libitum* during a trial period of 12 weeks.

Parameters assessed include % egg production (EP), egg weight (EW), egg mass (EM) and feed intake (FI). Others were feed conversion (FC), feed cost/25kg pack (FCP) and feed cost/kg egg (FCE). To measure EP and EW, eggs were collected daily per replicate, counted and weighed. FI was measured weekly, EM was calculated from EP and EW, while FC was taken as the ratio FI:EM.

Results were evaluated using the anlysis of variance (ANOVA) procedure (Steel and Torrie, 1980). Differences among means were detected by Duncan Multiple Range Test (Gomez and Gomez, 1985).

Results and Discussion

The data on productive and economic performace of the experimental layers are shown in **Table 2.** EP and EM were higher ($p<0.05$) on CHM and UCHM in comparison to FLM - the control diet. EW and FC were not affected ($P>0.05$) by dietary treatments. FCP was 9% lower on both test diets relative to the control, and FCE was 18 and 13% lower respectively on CHM and UCHM.

It was apparent from the FC data that the test diets were biologically utilised to the same extent as thecontrol. However, it is well known that feed conversion is only one, though with no doubt, a major part of the profitability of egg production as a whole (Hagger, 1994). The economic indicators, FCP and particularly FCE, apparently indicated higher profit margins from CHM and UCHM. This reasoning is butressed by the fact that income minus cost is a critical trait in the econoomic success of an egg producer (Hagger, op. cit.).

The result in this trial corroborate those of Sobamiwa (1998) which was conducted on a research station. In the trial, dietary cocoa husk levels of 10 and 20% (equivalent to approximately 20 and 40% maize replacement respectively) had no effect on intensity of egg peoduction, egg mass and feed efficiency (reciprocal of FC).

Despite the obvious potential, the use of non-conventional feeding-stuffs in developing countries has been negligible partly from a lack of studies under small farm conditions (Ravidran, 1995). In fact, the small farms have been identified as the best clients of agricultural research in the developingcountires (Anon, 1997). The present study was conducted partly with these points in mind, and partly to confirm the repeatability of our on-station results.

The result of the present study have confirmed the suitability of the replcement of maize with cocoa husk meal in layers mash, and the tendency towards enhanced profitability by replacing up to 25% maize with cocoa husk.

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Table 2. Production performance of layers on diets incorporating cocoa husk meals.

Parameter	FLM	CHM	UCHM	SEM
Egg production (%)	71.9^b	75.0^a	75.9^a	0.45
Egg weight: (g)	62.9	64.4	64.1	1.22
Egg Mass (g/b/d)	44.9^b	48.3^a	47.7^a	0.98
Feed intake (g/b/d)	108.5^b	106.0^b	112.8^a	1.62
Feed Conversion (Feed intake: egg mass)	2.4	2.2	2.4	0.03
Feed cost/25kg bag (N)	611.3	555.0	557.5	-
Feed cost/kg egg (N)	59.1	48.7	51.6	-

FLM - Farmer's layers mash
CHM - Cocoa husk-based layer's mash
UCHM - Urea-treated cocoa husk-based layer's mash
Sem - Standard error of means
ab - Means in the same row with different supercripts differ significantly ($P<0.05$).
N 100 = 1 USD (N stands for Naira)

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