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# EFFECT OF WET ("MOIST") FEED ON NUTRIENT DIGESTIBILITY AND APPARENT METABOLIZABLE ENERGY CONTENTS OF COCKEREL CHICK DIETS

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**Target Audience:** Research scientists, poultry farmers, feed millers

## ABSTRACT

**An experiment was conducted with 66 day-old Hyperco cockerel chicks. Cassava *(Manihot esculenta)* peels of mixed varieties, harvested at between 9 10 months of age, were used for this study which lasted for 8 weeks. The chicks were randomly allotted to the 2 dietary treatments A (dry mash) and B (wet, "moist" mash). Significant differences (P<0.05) existed between treatments on crude protein and ether extract digestibilities. No significant differences (P<0.05) existed between treatments on the apparent metabolizable energy (AME) contents of the diets. Considering the ease of producing wet ("moist") feeds, their use in poultry nutrition offers considerable commercial benefit if suitable equipment are developed for mixing and delivering them to the birds. Wet ("moist") feeding has no adverse effects on nutrient digestibility and AME of the diets.**

**Key words:** Cassava peel meals, wet mash, dry mash, nutrient digestibility, AME contents, cockerel chicks.

## DESCRIPTION OF THE PROBLEM

Wet ("moist") mash feeding involves the addition of water to dry poultry mash before feeding. Wetting the mash by mixing with twice the weight of water to give a porridge-like consistency increased feed intake and weight gain, resulting in an improvement in conversion efficiency (1). According to the authors, providing wet feeds to growing ducks significantly improved dry matter (DM) intake with body weight gain. The wet fed birds drank much less than the dry-fed and by the end of the study, the wet-fed groups were significantly (P<0.05) heavier than the dry-fed.

In Nigeria, poultry diets are routinely fed as dry mash. The conventional dietary sources of energy in poultry nutrition (Cereals) are scarce and too expensive to be used. Studies have, however, shown that the energy and fibre requirements of poultry can be adequately met through the use of processed cassava *(Manihot esculenta)* peel meals (CPM) without adverse effects on the performance of the birds (2, 3, 4).

Cassava peels constitute the major by-products of cassava processing operations which take place in various parts of the country. These agro-industrial wastes

account for at least one million tonnes/year in Nigeria (5). If properly processed and supplemented with a good source of the sulfur containing amino acids, particularly lysine and methionine, protein, minerals and vitamins, these wastes can be used as good dietary sources of energy and fibre for poulty. However, despite the economic use of processed CPM as a potential replacement for the cereals in poultry nutrition, it has been observed (4, 6) that these meals are dusty and fluffy and, therefore, likely to cause respiratory infection to the birds.

This study was, therefore, designed to determine the effect of wet ("moist") CPM-based cockerel chick mash on nutrient digestibility and AME contents of the mash.

## MATERIALS AND METHODS

Sixty-six day-old Hyperco cockerels were used for this study which lasted for 8 weeks. The cassava peels used were obtained locally from the "gari" processing centres. They were of mixed varieties and harvested at between 9 - 10 months of age. They were sun-dried on clean cement floors for 4 days to a moisture level of 15 - 18%, after which they were ground in a hammer mill machine, packed in polythene bags and stored at room temperature. A sample was taken for proximate analysis (7), and the remainder was used to formulate the experimental diet (Table I). The level of hydrocyanic acid (HCN) content of the CPM was determined by the methods of (8).

**Table 1: Ration and Calculated Chemical Composition of Experimental Diet**

| Ingredients | (%) |
|---|---|
| Cassava peel meal (CPM) | 45.0 |
| Maize offal | 2.0 |
| Wheat offal | 18.0 |
| Groundnut cake | 14..45 |
| Soyabean meal | 10.0 |
| Fish meal | 3.0 |
| Palm Kernel cake | 3.0 |
| Bone meal | 2.0 |
| Vit. Min. Premix* | 1.0 |
| Oyster shell | 1.0 |
| Salt | 0.25 |
| Methionine | 0.25 |
| Lysine | 0.10 |
| **Calculated Analysis:** | |
| Crude Protein (%) | 17.77 |
| Methbolizable energy (Kcal/g) | 2.63 |
| Crude Fibre (%) | 5.63 |

*Vitamin trace mineral mix manufactured by Prizer Feed Company, Lagos, for starting chickens to supply/kg feed the following Vit. A (I.U), 10,000; Vit. D (I.U), 2,000; Vit. E (I.U), 2.5; Vit. K (mg), 20; riboflavin (mg), 4.2; pantothenic acid (mg). 0.5; nicotinic acid (mg), 20; chlorine (mg), 300.0; folic acid (mg), 0.5; methionine (mg), 0.225 Mn (mg), 56.0; I (mg), 1.0; Fe (mg), 20.0; Cu (mg), 10.0; Zn (mg), 50; Co. (mg), 1.25.

The study was carried out at the Bora Poultry Farm of this Institute. The chicks were fed the commercial dry chicks starter mash for 7 days, after which they were weighed individually and then randomly allotted to the two dietary treatments A (dry mash) and B (wet, "moist" mash). The wet mash was obtained by daily mixing the air-dry mash with twice the weight of water. Each treatment consisted of 3 replicates with 11 chicks making up a replicate. Feed and water were supplied *ad libitum* to the chicks.

### Digestibility and AME Studies

These studies commenced at the 4th and 7th weeks of the study. Three experimental chicks/replicate/treatment were transferred to the metabolic cages for a 7-day adaptation period, followed by 5 days of total faecal collection. The droppings, free of feathers and feeds, were dried in a forced-air circulation oven at a temperature of 105°C for 12 hours. The dried faecal samples were subsequently milled in a hammer mill machine. The feed and the dry, ground faeces were packed in polythene bags and stored at room temperature for proximate analysis and digestibility and AME studies.

### Statistical Analysis

The data obtained were subjected to analysis of variance using the completely Randomised Design and the Least Significant Difference (LSD) was used to assess the means.

## RESULTS AND DISCUSSION

The proximate chemical composition of the experimental diet and the test ingredient (sun-dried CPM) expressed as a % DM were, respectively, crude protein 21.46 and 5.10, crude fibre 10.69 and 16.70, nitrogen-free extract 17.30 and 67.50, gross energy (kcal/g) 2.68 and 3.21, hydrocyanic acid (mg/kg) 2.12 and 99.50, dry matter 94.54 and 86.20.

Information is scarce on the effect of wet ("moist") CPM based cockerel chick mash on nutrient digestibility and AME contents of the diets. However, the results of the nutrient digestibilities (%) in the present study appear in Table 2.

**Table 2: Apperent Nutrient Digestibility (%)**

| Parameters | TREATMENT A | | | | | TREATMENT B | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CP | CF | EE | NFE | GE | CP | CF | EE | NFE | GE |
| Daily Feed Intake (g/bird) | 71.82 | 35.78 | 20.58 | 158.30 | 3.185 | 71.82 | 35.78 | 20.58 | 158.30 | 3.185 |
| Daily faecal Output (g/bird) | 28.14 | 27.32 | 3.18 | 17.91 | 2.345 | 26.09 | 27.40 | 3.40 | 0.63 | 2.321 |
| Digested (%) | 43.68 | 8.46 | 16.7 | 86.39 | 0.84 | 45.73 | 8.38 | 17.18 | 87.67 | 0.864 |
| Digestibility (%) | 60.82$^{b}$ | 23.64 | 81.49$^{b}$ | 54.57 | 26.37 | 63.67$^{a}$ | 23.42 | 83.48$^{a}$ | 55.38 | 27.13 |

$^{ab}$ means with different superscripts on the same row differ significantly ($P<0.05$).

**Table 3. Apparent Metabolizable Energy**

| PARAMETERS | TREATMENT A | TREATMENT B |
|---|---|---|
| Feed Intake (g) DM | 1062.0 | 1063.0 |
| Gross Energy of feed Intake (Kcal/g) | 2.68 | 2.68 |
| Excreta Output (g) DM | 191 | 178 |
| Gross Energy of Excreta (Kcal/g) | 2.345 | 2.321 |
| AME | 2.258[a] | 2.291[a] |

[aa] Means are not-significantly different (P>0.05)

Significant differences (P<0.05) existed between treatments on crude protein and ether extract digestibilities. In both treatments, the digestibility (%) of these nutrients was better (P<0.05) in treatment B than A. However, no significant differences (P>0.05) existed between treatments in the digestibility of the other nutrients. No significant differences (P>0.05) existed between treatments on the AME contents of the diets (Table 3), though treatment B had a numerical higher AME value (2.291) than A (2.258).

## CONCLUSION AND APPLICATION

The appealing results in the present study notwithstanding, the use of processed CPM in poultry nutrition is not without its problems of dustiness and fluffiness with the attendant likelihood of causing respiratory infection to the birds.

Hence, CPM-based poultry diets should be given in the form of pellets and chips. However, considering the ease of producing wet ("moist") feeds, their use in poultry nutrition offers considerable commercial benefits if suitable equipment are developed for mixing and delivering them to the birds. Wet ("moist") feeding has no adverse effects on nutrient digestibility or AME contents of CPM-based cockerel chick diets.

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