Effect of soaked/boiled false yam (*Icacina oliviformis*) tuber on performance of finisher broiler chickens

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An experiment was conducted using finishing broilers to determine the effect of processed false yam tuber (soaked/boiled) meal on their performance. One hundred and twenty chicks (Cobb strain) were selected and randomly divided into 12 groups of 10 birds each. False yam tuber chips were soaked for 12 days, boiled for 2 h and sun-dried. Four dietary treatments containing false yam tuber meal at 0, 80, 100 and 120 g/kg in grower diets were tested using a completely randomized design and each treatment replicated thrice. Birds were fed from 4 to 8 weeks of age. Feed and water were provided *ad libitum*. Data were analysed by ANOVA using “GENSTAT”. Birds fed the false yam tuber meal at 100 and 120 g/kg diet consumed less (P<0.05) feed than their counterparts fed the control and 80 g/kg diets. All birds exhibited similar (P>0.05) live weight gains, feed efficiencies and carcass yields. It was concluded that the combined methods of soaking and boiling false yam tuber improved its feed value and could be fed up to 120 g/kg without adverse effect on performance of broiler finishers.

Keywords: false yam tuber, soaking/boiling, growth performance, broiler chickens

INTRODUCTION

False yam (*Icacina oliviformis* (Poiret) J. Raynal or *Icacina senegalensis* A. Juss.) is a perennial shrub with a large tuber commonly found in the Savanna regions of West and Central Africa. Although the tuber is high in starch (FAY, 1991), its feed value for poultry is low due to the presence of anti-nutritional factors such as gum resins (NATIONAL RESEARCH INSTITUTE, 1987). The major effect of the anti-nutritional factors is the reduction in feed intake of birds with consequent reduction in growth performance. However, processing of the tubers by either soaking (DEI et al., 2010) or boiling (DEI et al., 2011) in water improves its nutritional value for broiler chickens when fed up to 90 g/kg in grower diet. Therefore, there is a need for further processing of the tuber such as combining soaking and boiling of the tuber to enhance its feed value for poultry.

The objective of this study was to determine the effects of varying moderate levels (80, 100 and 120 g/kg) of soaked/boiled false yam tuber meal in the diets of finisher broiler chickens.

MATERIALS AND METHODS

The freshly harvested false yam tubers were peeled with knife and chopped into small pieces (~2 cm). The diced tubers were first soaked in water for 12 d with the water being changed every 3 d, and then boiled in water (i.e. 1 part tuber to 2 parts of water) for 2 h, sun-dried for 5 d and milled into a gritty meal. The processed tuber sample was not analysed at the time of the study due to logistical constraints.
The study was conducted between August and October at Nyankpala in the Northern Region of Ghana, which is located in the Guinea Savanna Zone. The Zone is characterized by a wide diurnal temperature variation (28-45°C) with low day-time humidity (17-42%) during the dry season from November to April (KASEI, 1988).

A total of 120 chicks (Cobb strain) at 4 weeks of age were selected and randomly divided into 12 groups. Ten birds (6 males, 4 females) were in each group with mean initial live weight of 760 g per bird. They were housed in a raised wire-mesh floor pens with a floor space of 0.16 m² per bird per pen. Four treatments comprising a control (no tuber meal) and diets containing soaked/boiled false yam tuber meal (SBFYTM) as substitute for maize at 80, 100 and 120 g/kg in maize-fishmeal based diets were tested. A completely randomized design was used and each treatment was replicated three times. The Control diet contained 200 g/kg CP and 12.4 MJ/kg ME. The experimental diets were fed in mash form from 4 to 8 weeks of age. Feed and water were provided for ad libitum consumption. Light was provided 24 h daily. Both the feed and birds were weighed weekly to determine feed intake and live weight gain, respectively. Feed conversion ratio was defined as live weight gain per unit feed consumed. Mortality was recorded. At 8 weeks of age, 2 birds (male, female) per replicate were randomly selected, starved for 8 h, weighed, slaughtered, defeathered, eviscerated, and carcasses weighed. Carcass yield was calculated as a percentage of the carcass dress weight over live weight. Feed cost per bird was calculated as unit cost of feed multiplied by mean total feed intake. Data were analysed by ANOVA using “GENSTAT (version 8)” (LAWES AGRICULTURAL TRUST, 2005).

RESULTS AND DISCUSSION

The results are shown in Table 1.

Table 1: Effect of SBFYTM on growth performance, carcass characteristics, mortality and feed cost of broiler chickens (4-8 wk of age)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control (0)</th>
<th>80</th>
<th>100</th>
<th>120</th>
<th>±SED</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final live-weight (kg/bird)</td>
<td>2.52</td>
<td>2.51</td>
<td>2.39</td>
<td>2.18</td>
<td>0.143</td>
<td>0.131</td>
</tr>
<tr>
<td>Feed intake (g/bird/day)</td>
<td>133.5b</td>
<td>131a</td>
<td>118.9a</td>
<td>119.1a</td>
<td>3.57</td>
<td>0.005</td>
</tr>
<tr>
<td>Weight gain (g/bird/day)</td>
<td>62.9</td>
<td>62.6</td>
<td>58.1</td>
<td>50.7</td>
<td>5.10</td>
<td>0.134</td>
</tr>
<tr>
<td>Gain: Feed Ratio</td>
<td>0.47</td>
<td>0.48</td>
<td>0.49</td>
<td>0.43</td>
<td>0.033</td>
<td>0.336</td>
</tr>
<tr>
<td>Carcass dress weight (kg/bird)</td>
<td>1.90</td>
<td>1.82</td>
<td>1.65</td>
<td>1.75</td>
<td>0.136</td>
<td>0.359</td>
</tr>
<tr>
<td>Carcass yield (%)</td>
<td>78.7</td>
<td>77.9</td>
<td>76.0</td>
<td>77.2</td>
<td>1.52</td>
<td>0.404</td>
</tr>
<tr>
<td>Mortality (%)</td>
<td>1.67</td>
<td>1.67</td>
<td>1.00</td>
<td>1.00</td>
<td>1.000</td>
<td>0.878</td>
</tr>
<tr>
<td>Total feed cost ($/bird)</td>
<td>1.92</td>
<td>1.90</td>
<td>2.11</td>
<td>1.98</td>
<td>0.066</td>
<td>0.053</td>
</tr>
<tr>
<td>Feed cost per kg gain ($/bird)</td>
<td>1.10</td>
<td>1.08</td>
<td>1.31</td>
<td>1.41</td>
<td>0.118</td>
<td>0.065</td>
</tr>
</tbody>
</table>

SED-standard error difference, P-probability, Means with different superscripts are significantly different (P<0.05), US$1.00=GHS1.90

Feed intake of the Control birds was similar to that of birds fed 80 g/kg SBFYTM diet, and both groups consumed more (P<0.01) feed than their counterparts fed 100 and 120 g/kg SBFYTM diets (Table 1). Also, the feed intakes of the latter two groups were similar. However, live weight gains or live weights at 8 wk of age of all the birds were not significantly (P>0.05) different between the Control group and SBFYTM based diet groups (Table 1). Similarly, other variables such as gain/feed ratios, carcass yields, mortality and feeding costs were not significantly different between all treatment groups (Table 1).
The reduction in feed consumption observed at higher dietary levels beyond 80 g/kg diets, suggests the presence of residual concentrations of anti-nutritional factors. DEI et al. (2011) attributed reduction in feed consumption of birds fed false yam tuber meal to the gum resins which could depress feed acceptability. Nevertheless, feed intake of all the experimental birds was high enough to ensure good growth performance (Table 1). The similarity in performance of all the birds suggests improvement in the nutritional value of the tuber when soaked prior to boiling. In previous studies, feeding broilers with diets containing either soaked or boiled false yam tuber meal at 120 g/kg diet had adverse effects on their growth performance (ALAGMA, 2012; OSEI, 2011).

Generally, growth performance of the experimental population was lower than expected, probably due to the high ambient day-time temperatures (29-38°C) prevalent during the study period. The Guinea Savanna zone is known to be characterized by high environmental temperatures (KASEI, 1988).

Economic analysis of feeding costs (Table 1) suggests that SBFYTM can be used as an alternative feed ingredient for partial replacement of maize in the diets, which is often scarce and expensive. This material at present has no economic value apart from processing cost. Besides, sparing up to 12% of maize in poultry diets would lessen the stiff competition between humans and animals for this commodity in the sub-Saharan region.

CONCLUSION
Processing of false yam tuber by soaking and boiling improved its nutritional value for broiler chickens. It can be incorporated in broiler finisher diets up to 120 g/kg without adverse effects on their performance.

REFERENCES


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