Response of African Giant Snail (Archachatina Marginata) in Captivity to Different Feed Items

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Abstract
Thirty six (36) one-week old hatchling of giant snail were randomly selected and grouped into 4 batches on the basis of body weight. Each group was fed in captivity with either of the following feed items: water leaf, cocoyam leaf, potato leaf or compound feed (24.43% crude protein). Diets were fed ad libitum for 20 weeks. The result showed that snails raised on compounded feed had the highest body weight gain which was not significantly different (P>0.05) from those fed cocoyam and water leaves. Snail fed potato leaf had significantly lowest (P>0.05) body weight gain. Mean flesh weight of snails fed compounded diets and cocoyam leaf were 158±5.31 and 153±4.04g respectively, these were significantly different (P>0.05) from those fed water leaf (148±1.00g) and sweet potato leaf (139±1.10g). It was concluded that African giant snail can be raised successfully in captivity on cocoyam without any adversely response.

Keywords: Giant Land Snail, Cocoyam, Potato leaf, water leaf, compounded feed, captive rearing.

INTRODUCTION
Snail farming has a great potential for supplying the much required animal protein in human diet (Morkramer, 1992). African giant snail (Archachatina marginata) is rich in high quality protein and essential amino acid (arginine and lysine) which could be used as supplement for those found in the conventional livestock such as beef, pork, and poultry (Omole, 1998).

Snail meat is relatively abundant and could serve as a cheap source of protein and iron in the diet of school-age children and young mothers. It contributes in the fight against iron deficiency anemia, and a lack of protein in the diet of young mothers and their children in many developing countries (Ojebiyi et al, 2011).

Snail meat contains iron, calcium, magnesium, phosphorus, copper, zinc, vitamins A, B6, B12, K and healthy essential polyunsaturated fatty acids (Imevbore, 1990)

The high-protein, low-fat content of snail meat makes it a healthy alternative food for those suffering from cardiovascular diseases such as high blood pressure and artero-sclerosis (Omole, 1998).

Inadequacy and scarcity of information on the diet of giant land snails in captivity constitute one of the reasons for its short supply and difficulty in propagation among many snail farmers. This work was carried out to study the response of African giant snail in captivity to water leaf, cocoyam leaf, potato leaf and compounded diet.

MATERIALS AND METHODS
Thirty six African giant snail hatchlings, I week old, were randomly divided into 4 equal groups on the basis of body weight. There were 4 experimental diets namely: water leaf, cocoyam leaf, sweet potato leaf and compounded feed. The snails were fed ad libitum for 20 weeks. The following parameters were determined: feed intake, body weight gain, flesh weight, shell thickness, shell length and percentage mortality. The proximate analysis of the diets was carried out as per AOAC (1990). Data were subjected to analysis of variance and significant differences were determined following Duncan’s (1955) multiple range test.

RESULT AND DISCUSSION
The result are presented in table 1 and 2 the compound diet had the highest protein content (24.28%), followed by cocoyam leaf 924.10% waterleaf (20.25) and sweet potato had the least (18.22%). The fibre content of the feeds was in reverse order of the protein content of the feeds was in reverse order of the protein content. The significant difference (P<0.05) observed in growth performance between those snails raised on sweet potato leaf and compounded feed might be due to the relatively high amount of fibre and lower protein content in the former than the later which may affect digestibility and feed utilization. The similarity in the performance of snails fed compounded diet and cocoyam leaf might be as a result of the closeness in the nutritive value of the two (Stievenart, 1992). The significant difference (P<0.05) observed in the performance of snails raised on cocoyam leaf compared with sweet potato and cassava leaf might be an indication that cocoyam leaf is higher in crude protein and is more palatable (Adegbola and smith 1982). The shell thickness followed the same order in all the diets. The low percentage recorded in all the diets is an indication that they could all support snail production without any adverse effect (Ngonpayou, 1992).
CONCLUSION
African giant snail can be raised successfully in captivity on cocoym leaf without lowering growth performance and flesh weight.

Table 1: Proximate composition of the experimental feeds

<table>
<thead>
<tr>
<th>Nutrients</th>
<th>Compound feed</th>
<th>Cocoyam</th>
<th>Water leaf</th>
<th>Sweet potatoes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude protein</td>
<td>24.28</td>
<td>24.10</td>
<td>20.25</td>
<td>18.22</td>
</tr>
<tr>
<td>Fibre</td>
<td>7.34</td>
<td>16.51</td>
<td>18.93</td>
<td>19.44</td>
</tr>
<tr>
<td>Ether Extract</td>
<td>3.28</td>
<td>10.58</td>
<td>18.49</td>
<td>4.09</td>
</tr>
<tr>
<td>Ash</td>
<td>8.96</td>
<td>11.64</td>
<td>20.08</td>
<td>13.69</td>
</tr>
<tr>
<td>Nitrogen Extract</td>
<td>56.14</td>
<td>27.17</td>
<td>22.25</td>
<td>44.56</td>
</tr>
<tr>
<td>Moisture</td>
<td>9.34</td>
<td>18.54</td>
<td>22.43</td>
<td>22.58</td>
</tr>
</tbody>
</table>

Table 2: Performance of Snail fed different food items

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Feed Items</th>
<th>Compounded diet</th>
<th>Cocoyam</th>
<th>Waterleaf</th>
<th>Sweet potato leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed intake (g)</td>
<td>28.98 ± 4.10 a</td>
<td>23.54 ± 3.00 a</td>
<td>37.15 ± 2.1 b</td>
<td>36.88 ± 5.21 b</td>
<td></td>
</tr>
<tr>
<td>Body weight (g)</td>
<td>26.91 ± 5.01 a</td>
<td>21.02 ± 4.02 a</td>
<td>17.61 ± 1.31 a</td>
<td>14.40 ± 1.05 a</td>
<td></td>
</tr>
<tr>
<td>Feed conversion</td>
<td>0.89 ± 0.16 a</td>
<td>0.59 ± 0.24 b</td>
<td>0.47 ± 0.11 b</td>
<td>0.39 ± 0.10 c</td>
<td></td>
</tr>
<tr>
<td>Shell length (cm)</td>
<td>11.7 ± 0.40 a</td>
<td>11.3 ± 0.13 b</td>
<td>8.6 ± 0.13 b</td>
<td>7.91 ± 0.20 b</td>
<td></td>
</tr>
<tr>
<td>Flesh weight (g)</td>
<td>168 ± 5.31 a</td>
<td>153 ± 4.04 a</td>
<td>142 ± 1.00 b</td>
<td>139 ± 1.10 b</td>
<td></td>
</tr>
<tr>
<td>% mortality</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Means bearing different superscripts within the same row are significantly different (P<0.05)

REFERENCES
Kramer, M.E.R (1992), garden snail as food and feed. Proceeding of seminar on invertebrate ECC Philippines
Ngoupayou (1992). Guinea pig raising for meat production
Proceeding of Seminar on feed and feeding summary, 15-19
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