Open Archive TOULOUSE Archive Ouverte (OATAO)
OATAO is an open access repository that collects the work of Toulouse researchers and makes it freely available over the web where possible.

This is an author-deposited version published in: http://oatao.univ-toulouse.fr/
Eprints ID : 5195

To cite this version :

Any correspondance concerning this service should be sent to the repository administrator: staff-oatao@inp-toulouse.fr.
Digestive anatomy and impact of dietary fibre on performances of the growing grasscutter (*Thryonomys swinderianus*)

Y.M. Yapi¹, F. Enjalbert², T. Gidenne², D. Zongo¹

¹National Polytechnic Institute Houphouët-Boigny of Yamoussoukro, Ivory Coast; ²INRA, INPT-ENSAT, ENVT, UMR 1289 Tandem, France

f.enjalbert@envt.fr

Introduction
The grasscutter is a rodent herbivore recently domesticated in several countries of sub-Saharan Africa for meat production. However, the development of this production to a rational and more productive model needs a better knowledge of the digestive physiology of this animal. This work aimed to study the digestive anatomy of the growing grasscutter and determine the impact of dietary fibre on growth rate and health.

Material and methods
In a first trial, 80 grasscutters (37 ± 5 days and 330 ± 70 g) were allocated to 4 groups of 20 animals and submitted to 4 diets containing 8, 14, 22 and 26% acid detergent fiber (ADF) on dry matter (DM) basis (ADF8, ADF14, ADF22 and ADF26). Individual weight and mortality were recorded for three months. In a second trial, 60 grasscutters (40 ± 7 days and 446 ± 152 g) were allocated to 3 groups of 20 animals, submitted to 3 diets containing 12, 17 and 22% ADF (ADF12, ADF17 and ADF22). Weight was measured for two months and pH, DM content and fresh weight of contents of digestive compartments were measured on animals slaughtered at 40, 83 and 103 days of age.

Results and Discussion
In the first trial, 33% mortality was observed in ADF8 after 7 weeks due to hemorrhagic enteritis. No mortality was observed in the other groups. Growth was most rapid with diet ADF14 followed by diet ADF22 and diet ADF26 (P < 0.05) (figure 1). In the second trial, growth was most rapid with diet ADF22 followed by diet ADF17 (Figure 2). DM content, pH and relative importance of the compartments (Table 1) did not vary with age or diet (P > 0.05).

Table 1. Some parameters of the digestive tract

<table>
<thead>
<tr>
<th>Digestive compartments</th>
<th>Stomach</th>
<th>Small intestine</th>
<th>Caecum</th>
<th>Proximal colon</th>
<th>Distal colon</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>2.1 ± 0.7</td>
<td>6.5 ± 0.6</td>
<td>6.0 ± 0.3</td>
<td>6.4 ± 0.3</td>
<td>-</td>
</tr>
<tr>
<td>DM content of digestive compartments (%)</td>
<td>27.8 ± 7.3</td>
<td>19.0 ± 5.5</td>
<td>20.7 ± 8.9</td>
<td>23.2 ± 11.8</td>
<td>33.1 ± 14.1</td>
</tr>
<tr>
<td>% of total fresh digestive content</td>
<td>23.8 ± 1.7</td>
<td>16.8 ± 1.3</td>
<td>44.0 ± 9.0</td>
<td>10.5 ± 0.8</td>
<td>5.1 ± 0.2</td>
</tr>
</tbody>
</table>

Conclusion
The optimum dietary level of lignocellulose for the growing grasscutter would be between 14 and 22%. The caecum appears to play an important role in the digestive function of this animal with more than 40% of total contents of the digestive tract.