Development of balanced diets using local feeds for smallholder Kenyan pigs: Implications for livelihoods, human health and gender

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Outline

- Introduction
- Challenges
- Objectives and methods
- Results - diets
- Summary

Photo credit: ILRI and sendacow.org.uk
Study area

Photo credit: C. Dewey, N. Carter, and map Shoor Safaris
Photo credit: N. Carter and ILRI
## Smallholder pig sales

<table>
<thead>
<tr>
<th>Reasons pigs sold</th>
<th>Number of pigs sold</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2007</td>
</tr>
<tr>
<td>School fees</td>
<td>11</td>
</tr>
<tr>
<td>Medical fees</td>
<td>7</td>
</tr>
<tr>
<td>Family was hungry</td>
<td>2</td>
</tr>
<tr>
<td>Buy seeds for planting</td>
<td>3</td>
</tr>
<tr>
<td>Funeral costs</td>
<td>3</td>
</tr>
<tr>
<td>No feed for the pig</td>
<td>0</td>
</tr>
</tbody>
</table>

Dewey et al. 2011
Pig/pork industry challenges

- Lack of feed – seasonal
- Lack of knowledge
- Human/pig competition
- High cost
- Low average daily gain
- Small litters
- Sold at low weight
- Butchers need 30kg pigs
- Waste e.g. blood, overripe fruit
- Diets are needed

Photo credit: ILRI and C. Dewey
Objectives

- Local feedstuffs - nutrient value and availability
- Pigs’ nutritional needs
- Develop balanced least – cost diets

Photo credit: N. Carter
Feedstuffs’ nutritional value

- 58 samples - 17 feedstuffs
- Literature – 17 feedstuffs
- Dry matter, crude protein, fat, fibre, calcium, phosphorous
- Digestible energy estimated (NRC 2012)
- Lysine approximated from CP and Lysine: CP similar feed

Photo credit: N. Carter
Local feedstuffs

Photo credit: C. Dewey and N. Carter
Local feedstuffs

Photo credit: N. Carter
Pigs’ nutritional needs and diet formulation

- The National Research Council (NRC 2012) model
- Published indigenous pig growth performance data
- Growth observed in indigenous Kenyan pigs

- A least-cost diet formulation system
- Based on Skinner et al (2012)
- 34 ingredient choices with $/kg
- Seasonal availability – 3 seasons

Photo credit: C. Dewey
Dry season diet - least-cost (% of dry matter)

- Wilted cassava leaf: 17%
- Fresh cattle blood: 3.7%
- Sun-dried fish: 3.2%
- Salt: 0.3%
- Maize flour: 75.6%
Dry season diet - no human food (as % of dry matter)

- Wilted cassava leaf, 20%
- Fresh cattle blood, 38.4%
- Grist mill waste, 35.3%
- Maize brewers waste, 5.8%
- Salt, 0.3%
Wet season diet – least cost with SPV
(as % of dry matter)

- Maize flour: 45.0%
- Fresh cattle blood: 29.1%
- Sun-dried fish: 5.4%
- Sweet potato vine: 20.0%
- Salt: 0.3%
Wet season diet – no human food (as % of dry matter)

- Fresh cattle blood: 54.3%
- Wilted cassava leaf: 20%
- Sweet potato vine: 20%
- Salt: 0.3%
- Maize brewers waste: 2.3%
- Grist mill waste: 3.0%
References


Acknowledgements
Feedstuffs’ nutritional value continued

- Protein and lysine sources: blood, sun-dried fish, cassava leaf, sweet potato vine, and forages/weeds (Amaranthus sp., Bidens pilosa, Commelina africana L)
- Highest fat: avocado
- Highest digestible energy: avocado
- Highest calcium source: amaranth
- Highest fibre very high: cattle rumen contents, forages/weeds
<table>
<thead>
<tr>
<th></th>
<th>Mean body weight (kg)</th>
<th>ADG (g/day)</th>
<th>FCR</th>
<th>DE (kcal/kg dry matter)(^1)</th>
<th>Actual body protein deposition (g/day)(^3)</th>
<th>Body lipid deposition to body protein deposition ratio(^3)</th>
<th>% SID(^5) lysine requirement per kg dry matter(^5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated performance of local pigs</td>
<td>14 (8-20)</td>
<td>200</td>
<td>2.96</td>
<td>3700</td>
<td>24.9</td>
<td>2.86</td>
<td>0.72</td>
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<tr>
<td></td>
<td>27.5 (20-35)</td>
<td>311</td>
<td>2.92</td>
<td>3700</td>
<td>38.5</td>
<td>2.86</td>
<td>0.72</td>
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