

Development of balanced diets using local feeds for smallholder East African pigs: implications for livelihoods and food security

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BACKGROUND AND RATIONALE

Pork production has the potential to alleviate poverty in East Africa.¹ In Kenya and Uganda, 2.2 million pigs are raised in traditional systems by resource-poor, subsistence farmers.^{2,4} Women, particularly those widowed by the HIV/AIDS epidemic, may not have the resources required to raise cattle. Pigs require fewer resources so raising pigs is within their means. Farmers raise 1 to 4 pigs to generate income to pay for medicine, school, food, and seeds.^{2,5-7} However, pig productivity is low.⁸ Lack of feed may contribute to pigs' low average daily gain.⁷ Seasonal feed shortages, expensive commercially prepared feed, and human/pig food/feed competition are production constraints.^{6,8} Low-cost, nutritionally balanced pig diets (recipes) using seasonally available local feedstuffs are needed.

OBJECTIVES

The objectives of the study were to:

- 1) estimate the nutrient value and seasonal availability of locally available pig feedstuffs in Western Province, Kenya and Central Region, Uganda;
- 2) determine Kenyan and Ugandan pigs' nutrient requirements;
- 3) develop low-cost balanced diets using local feedstuffs;
- 4) conduct a feed trial to evaluate Ugandan pigs' performance when fed our diets;
- 5) conduct workshops to share the diets with pig farmers;
- 6) explore potential benefits and challenges of using the diets;
- 7) explore men and women pig farmers' experiences regarding decision making, empowerment, labour distribution, and pig sales income.

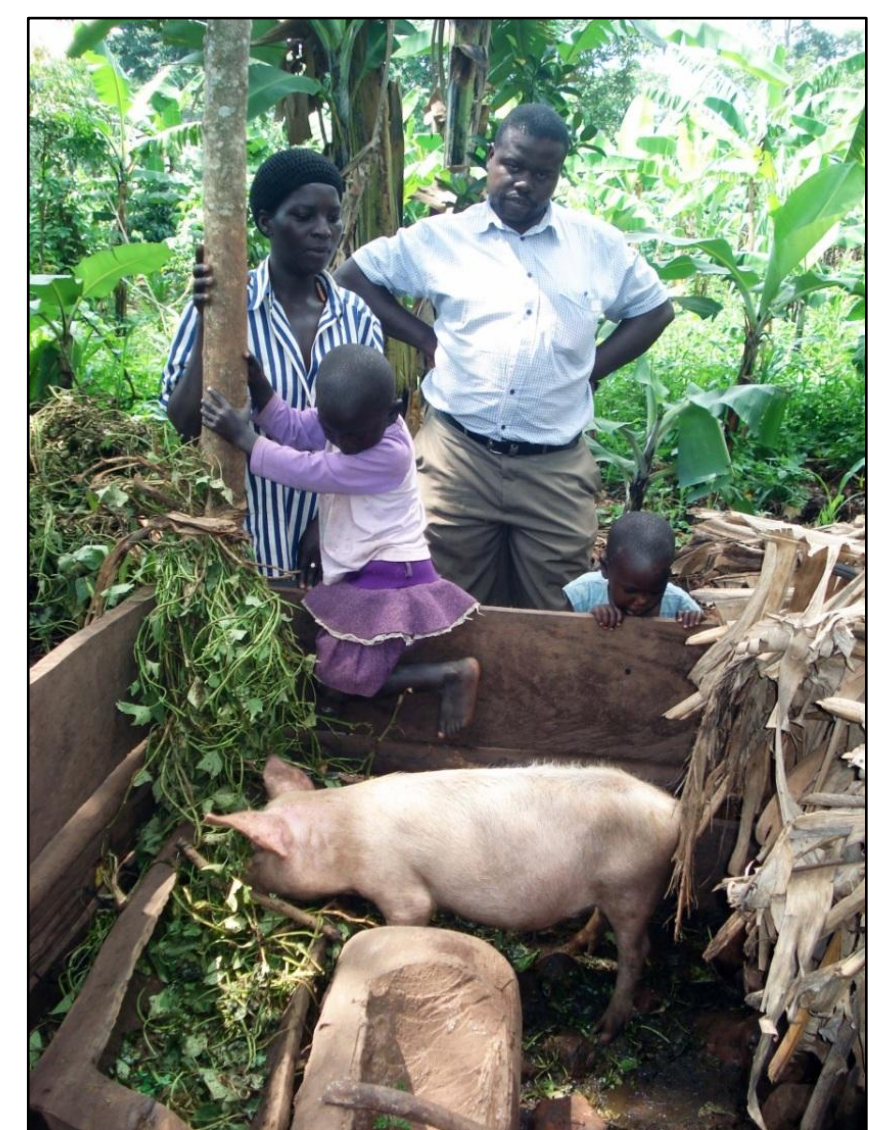


Figure 1. A pig-keeping family in Uganda

Photo: ILRI



Figure 2. A thin local breed pig fed only vines on a smallholder Ugandan farm

Photo: E. Smith

ACTIVITIES: DEVELOPED AND VALIDATED PIG DIETS

- Identified locally available pig feeds^{6,7}
- Conducted nutritional analysis on local feeds and reviewed literature
- Collected price of feeds at local markets
- Estimated seasonal availability (extension officers)
- Rated accessibility of ingredients to farmers
- Estimated nutritional needs and growth rate of East African pigs from 5 feeding trials⁹⁻¹³
- Formulated low-cost diets using a linear programming model¹⁴
- Considered seasonal availability, farmer access to ingredients, and human/pig food competition when formulating diets
- Conducted a randomized controlled feed trial in Uganda to evaluate pigs' average daily gain and feed efficiency when fed 1 of our diets (local diet or sweet potato vine and tuber silage based diet)

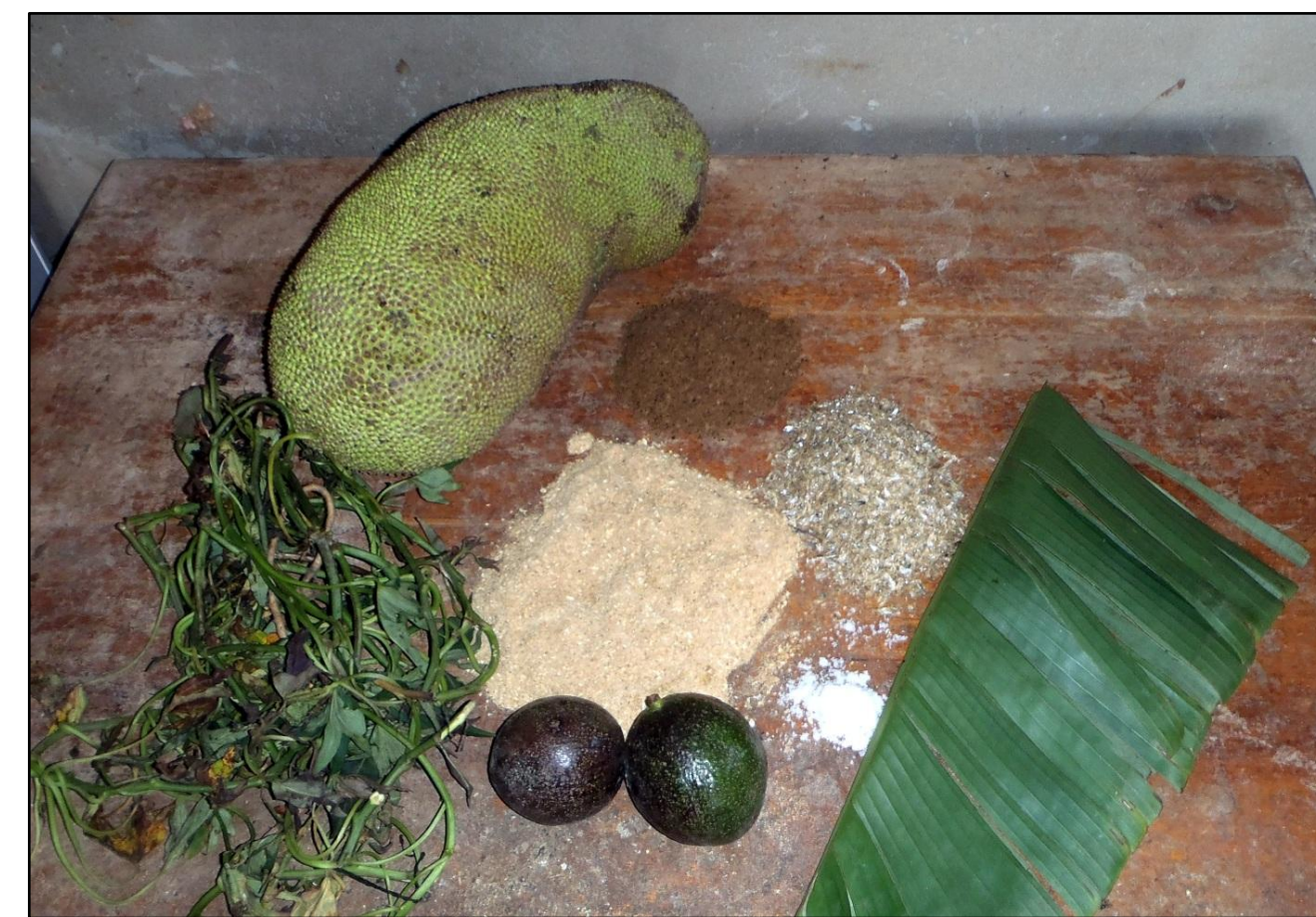


Figure 3. Feed ingredients for local pig diet Uganda

Photo: N. Carter

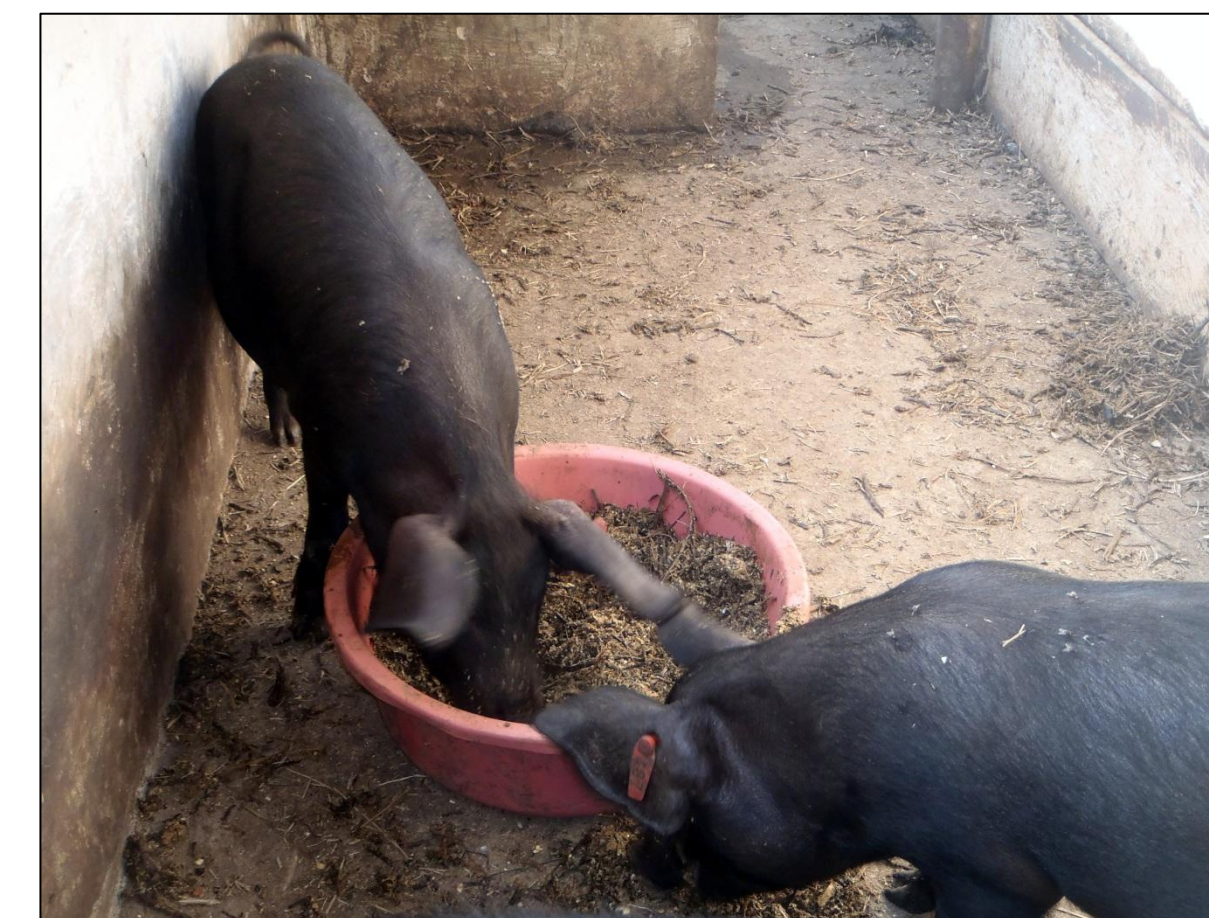


Figure 4. Feed trial local breed pigs eating silage-based pig diet Uganda

Photo: N. Carter

ACTIVITIES: FARMER TRAINING AND FEEDBACK

- In Uganda, conducted farmer training workshops about
 - locally available pig feedstuffs
 - how to make our pig diets
 - hands-on diet and silage making
 - pig farmers' opinions of the diets
 - likelihood and feasibility of farmers using our diets
 - potential benefits and constraints of using our diets
- Explored men and women pig farmers' experiences of
 - decision making and empowerment
 - labour distribution and cultural gender norms
 - use of and control over income from pig sales
- Participants were pig farmers from 15 villages
 - 24 women from female-headed households
 - 24 women from male-headed households
 - 24 men
 - some of whom belonged to farmer co-operatives
 - each raising 1-8 pigs to be sold and butchered for meat

OUTCOMES

- Local feedstuffs of sufficient nutritional value for pig diets are available seasonally but in very limited supply in some seasons
- Pigs fed our diets grew faster than pigs raised under typical smallholder conditions
- Pigs fed commercially prepared diet grew faster than pigs fed our diets but farmers can not afford commercial diets
- Our diets are best for older heavier pigs (not newly-weaned pigs)
- Farmers reported our diets
 - were within their financial means and ability to make
 - would be used on their farms
- Farmers requested more diets be developed for every season
- Analysis of men and women pig farmers' experiences is underway
- Feeding East African pigs low-cost balanced diets using local feedstuffs can improve pig performance resulting in
 - increased farmer income from selling faster-growing heavier pigs
 - increased farmer income to buy food and seeds
 - increased supply of pork, an important animal-source food
 - improved food security in East Africa
- An IDRC Scaling Up Food Security and Nutrition Innovations proposal will be submitted in March 2015 to scale-up this work
- We are seeking business, academic, and government partners with whom to collaborate when scaling-up



Figure 5: Pig farmers mixing local pig diet at farmer training workshop

Photo: N. Carter



Figure 6. Pork, an important animal-source food, being served in Uganda

Photo: N. Carter

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