

# Silage-based diets for local and crossbred pigs in Uganda

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## Who this brief is for

This brief is for extension workers who are supporting smallholder pig development in East Africa. It provides information on how to make silage from locally available ingredients and how to feed this to pigs. It also gives information on the nutrient content of the silage-based diet and the expected growth rate of pigs fed the silage-based diet.

## Introduction

Smallholder pig farmers in Uganda report that feed scarcity, high cost and seasonal variations in feed quality and availability are key constraints to pig production.

Silage is a method of preserving plant materials by compacting and storing them in airtight conditions so that they ferment and can be used as animal feed in any season. Ensiling sweet potato vines and tubers during the wet season converts surplus highly perishable materials with low marketability into a much-needed pig feedstuff available throughout the year.

When mixed with other ingredients in a balanced diet, sweet potato vine and tuber silage can improve pig growth and farmers' incomes.<sup>1,2</sup>

## Methodology

### Making silage

- Use mixed varieties of sweet potato vines and tubers. Wilt the vines for three days in partial shade then chop them into 5–10 cm long pieces. Chop the tubers into 2.5 cm<sup>3</sup> pieces (Pictures 1-3).
- Make a bunk using local bricks and cement and line it with heavy black polythene.
- Place vines, tubers and salt in alternating layers (70% vines, 30% tubers and 0.05% salt) using pitch forks (vines), buckets (tubers) and one-kg bags (salt). Firmly compact each layer by rolling a heavy log over it by hand and stomping on edges to remove as much air as possible (Pictures 4-7).
- Cover the pile tightly with heavy black polythene to keep air and water out. Put some rocks, broken bricks and soil on top to help keep the polythene in place. Cut four 10-cm knife slits on the outer bottom edge to enable effluent drainage (Picture 8).
- Keep the pile tightly covered/sealed for at least 30 days before using the silage to prepare the silage-based diet. Only open the bunk for a very brief time when removing silage then tightly cover it again. Remove and discard any spoiled silage.



Picture 1: Wilted sweet potato vines



Picture 2: Chopped sweet potato vines



Picture 3: Chopped sweet potato tubers



Picture 4: Adding vines and tubers



Picture 5: Adding salt



Picture 6: Using a log to compact a layer



Picture 7: Adding more vines and tubers



Picture 8: Bricks keeping the polythene in place. Knife slits on the bottom edge to let effluent drain.

### Making silage-based diet

Ingredients and amount of each to make 5 kg of silage-based diet

Ingredient	Amount (grams) to make 5 kg of silage-based diet
Sweet potato vine and tuber silage	2929
Cottonseed meal	81
Maize bran	310
Human-grade sun-dried fish (mukene; <i>Rastrineobola argentea</i> )	127
Papaya leaf	136
Jackfruit (entire fruit with seeds and peel)	1408
Iodized table salt	6
Mineral vitamin premix	3



1. Grind sun-dried fish into tiny pieces using a mortar and pestle or grinding machine.



2. Thoroughly mix sun-dried fish, cotton seed meal, maize bran, salt and premix together in a dry container.



3. Chop papaya leaf and jackfruit into 1 cm pieces using a panga, knife or chopping machine.



4. Get silage from the bunk and tightly re-close the plastic so no air can enter.



5. Thoroughly mix all ingredients together in a large pail or on a tarpaulin.



6. Three times per day, feed pigs as much silage-based diet as they want to eat. Be sure pigs have fresh, clean water (i.e. water with no dirt, no soap, no salt etc. in it) at all times. They will eat more and grow faster.

#### Nutritional content of silage-based diet

Analyzed nutritional content	% of dry matter
Crude protein	18.4
Ether extract	7.0
Neutral detergent fibre	34.9
Ash	11.4
Total calcium	1.29
Total phosphorus	1.32
Estimated digestible energy (kcal/kg of dry matter)	2499

#### Pig growth rate (grams per day) when fed silage-based diet versus commercial diet (Ugachick sow and weaner ration)

Pig age	Diet	
	Commercial	Silage-based
9 to 15 weeks	294	52
16 to 19 weeks	329	212
20 to 24 weeks	574	362
28 to 32 weeks	636	514

While a silage-based diet is unsuitable for small newly-weaned pigs, it is useful for heavier pigs (i.e. > 9.2 kg bodyweight).

## References

1. Peters, D. 2008. *Assessment of the potential of sweet potato as livestock feed in East Africa: Rwanda, Uganda and Kenya*. A report presented to the International Potato Center (CIP), Nairobi. [http://www.fao.org/fileadmin/templates/agphome/images/iclsl/documents/wk1\\_c13\\_claessens.pdf](http://www.fao.org/fileadmin/templates/agphome/images/iclsl/documents/wk1_c13_claessens.pdf).
2. Cargill, C.F., Mahalaya, I.S., Tjintokohadi, I., Syahputra, T.A. and Gray, D. 2009. *Poverty alleviation and food security through improving the sweetpotato-pig systems in Papua, Indonesia*. Canberra, Australia: Australian Centre for International Agricultural Research.

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