

Background

Seasonal variability in feed supply is one of the major limitations to smallholder dairy production among certified organic pineapple farmers. Despite the current reliance on natural pastures and on farm crop residues to ensure sustainable and closed nutrient cycle, there is need for compliance to standards of organic livestock production that exploits the available wide range of feed resources at the farm. However, inadequate knowledge on technologies for processing and preservation of crop residues and the negative perception held by farmers about feeding pineapple waste limit their utilisation as feed among smallholder dairy farmers.

Why conserve the pineapple by-products?

Large quantities of the pineapple by-products are available during the dry season coinciding with peak season for scarcity of feed resources under smallholder conditions. This is because during the dry season, many farmers process their organic pineapples into high value products for export, which process yields a lot of by-products like peels and crowns.

Why conserve pineapple by-products in form of silage rather than hay?

- Cost of drying of the pineapple by-product if it is to be preserved in form of hay at 15% moisture content is higher and often prohibitive. Yet pineapple by-products have high moisture content of 83.7%.
- At the same time, pineapple by-products contain high levels of water-soluble carbohydrate (13.2%), which are fermented to lactic acid for preservation of the feed materials after minimal wilting to 70% moisture content.
- Therefore, larger quantities of materials can be stored in form of silage without need for excessive drying compared to hay
- Silage can be made at any time of the year.
- Well prepared silage has an inviting lactic acid fermentation smell and therefore better palatability compared to hay



Step 7: Storage

The silos should be stored preferably under shade. The silos should be protected from damage by vermin like rats. The silage should be kept for a minimum of about 30 days after ensiling before offloading for feeding to dairy cattle.

Partners
Makerere University, Uganda
University of Nairobi, Kenya
Sokoine University of Agriculture, Tanzania
Aarhus University, Denmark
University of Copenhagen, Denmark
International Centre for Research in Organic Food Systems (ICROFS), Denmark

Associated partners
National Organic Movement of Uganda (NOGAMU)
Kenya Organic Agriculture Network (KOAN)
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Further reading:
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For more information visit:
<http://icrofs.dk/en/research/international-research/pro-grov/>

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Productivity and Growth in Organic Value Chains (ProGroV)

GUIDE FOR MAKING SILAGE FROM PINEAPPLE BY-PRODUCTS

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Intended users of this manual:

- Farmer(s) and farmer groups
- Extension staff
- Graduates and under graduate students

Forward

This manual is intended to be a step-by-step guide to farmers, extension staff and scholars in conserving pineapple by-products into quality silage.

Collection and storage of pineapple by-products

The 7 step-by-step procedures were successfully used to produce high quality silage from processing by-products of pineapple and should be used as a guide.

First, the pineapple by-products should be collected fresh from the processing centres before the materials undergo fermentation when they are dumped in heaps at the processing centres.

Materials and equipment needed:

1. Panga/ machete/ chaff cutter
2. Tarpaulin
3. Polyethylene tube
4. Sisal thread
5. Knife



Step 1: Collection and storage of pineapple by-products:

The pineapple by-products should be collected fresh from the processing centres before the materials undergo fermentation when they are dumped in heap at the processing centres.



Step 2: Chopping the pineapple by-products into materials of short length of about 5 to 10 cm

To ensure effective removal of air through compaction, it is necessary to chop the pineapple by-products into small pieces of about 5 to 10 cm long. Both the pineapple crowns and the peels should be chopped. Chopping also increases the surface area available for activity of the lactic acid bacteria (LAB)



Step 3: Wilting the pineapple by-products to 30% dry matter (DM) using either in direct sun or a solar drier.

The objective of wilting is to achieve an adequate dry matter of about 300 g/kg DM (30% DM). Dry matter contents lower than 30% usually result into loss of nutrients through leaching of effluent. The appropriate dry matter content can be estimated by squeezing a material between the palm and fingers so as to have no liquid flow

Step 4: Chopped legume (jack bean foliage) added to wilted by-products at inclusion levels of between 10 to 17% DM.

Legumes contain very high crude protein. The



inclusion of legume improves crude protein of the pineapple by-product silage.



Step 5: Filling and Compaction

To ensure airtight conditions, the silo should be compacted very fast layer-by-layer. Compaction should be done.



Step 6: Sealing the silo

After compaction, the silo should be sealed as quickly as possible. This ensures that no additional oxygen enters the silos