

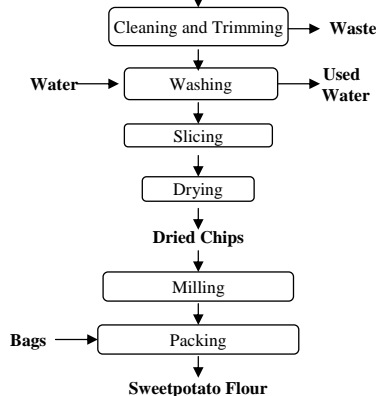
Processing Dried Sweetpotato Products

Introduction

Drying of sweetpotato roots is the cheapest method of preserving that food over a long period, in E. Africa, up to 6 months. Traditional drying of laying fresh chips in the sun on rocky surfaces and courtyards smeared with cow dung needs to be improved for the sanitation and the quality of the end product. The nutritive quality and taste of dried products will be improved. It is expected that products made using improved methods sell better. Women, who are traditionally in charge of processing activities are the first to benefit from the improvement. Cheap and simple improvements are suggested.



Fresh Sweetpotato Storage Roots



Drying

Different techniques exist to carry out the drying of food products. Traditional solar drying is quite suitable for sweetpotato. Chips are directly exposed to the rays of the sun on a drying surface (a clean rock or a mat), and water is capillary transported to the surface of the slice, where it vaporises. So, thin slices will dry very fast. However, thick slicers keeps better the beta-carotene in dried products. Sun drying presents certain difficulties such as: too much dependence on climatic conditions (it is sometimes necessary to gather up the produce in case of rain). There is a need for manual labour to move the product during the daytime, and there is difficulty in maintaining the product sanitation. Drying should preferably be done during the dry season to avoid moving of the product as much as possible for the first drying day. The second drying day, chips should be moved at least twice a day until they are completely dried. The approximate drying time of sweetpotato chips is from two to four days and the residual humidity should be between 10 and 12%. Dried chips should be breakable, with a whitish or yellowish colour. We recommended to pack the dried sweetpotato chips immediately after the drying to avoid any risk of rehydration.



Milling

Any hammer mill can be used for grinding. It is desirable to pass twice the dried material in the mill, should finer flour be desired. Over drying produces too much dust and a significant loss of material and yield during the milling. We recommend to store chips and grind them when needed. Flour from sweetpotato can have different colours depending on the flesh colour of the roots.



Packaging, Storage and Utilisation

After the grinding, pack and seal immediately to avoid rehydration and insect infestation. Materials with little permeability to water vapour, such as cellophane, polyethylene or polypropylene should be used. The choice of packaging material is based on transportation requirements and storage time. As soon as the produce is placed in its package, it should be sealed immediately, removing as much air as possible from inside the package. This is to avoid direct exposition of the product to the surrounding air and to minimise any insect attack. The packed products should be stored in a fresh, dry, and preferably dark place until the use. Different products can be made from sweetpotato flour.



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Cleaning and Trimming

The aim of these operations is to remove soil and other foreign material from the surface of sweetpotato roots, portions damaged by weevils or other pests, and any other unwanted part. Damaged portions tend to brown during the course of drying and flour processing. Cleaning and trimming are usually done manually with knives. Our experiments with sweetpotato roots have shown there is no need of peeling since the root skin is extremely thin and has a very minor influence on the colour and final composition of the product.



Washing and Brushing

Washing and brushing steps are the most critical in the production of high quality clean sweetpotato flour, and should be as exhaustive as possible. The quality of the end product -flour depends on how the washing has been conducted. The brushing reinforces the removal of the soil and important portion of the skin, especially when red skin coloured sweetpotato roots are being processed into flour. It has been noted that the skin has a protective effect on the diffusion of water from the roots towards the surface, and consequently slices having a portion of the skin take a long time to dry and their structure becomes harder and less breakable. Brushing weakens the protective role of the peel against capillary water diffusion to the surface.

At least, three batches of water are required to wash roots:

- The first for pre-washing when soil and other impurities are being removed.
- Roots are submerged in water to free up impurities adhering to the skin.
- The second is for cleaning and brushing concomitantly with removal of possible damaged portions of the roots escaped during the previous step.
- The third is for fine cleaning with clean water.

Pre-drying of wet and clean roots is desirable. This reduces the moisture at the surface of the roots and improves the quality and cleanliness of the end product.



Slicing

Slicing divides roots into small physical sizes and increases the drying surface.

Traditional slicing is done manually using knives, and is a very tedious exercise. The improved slicer is recommended. Slicing or chipping is better for the final colour of sweetpotato flour. Grating induces a lot of enzymatic browning reactions and fresh grated product is quickly subjected to undesirable spontaneous fermentation. Sweetpotato balanced chemical composition makes fresh sweetpotato a suitable medium for the growth of a wide range of micro-organisms and other agents involved in root deterioration.

