

Investigation of aspects of drying cooking bananas (*Musa ssp.*) for flour production

Bachelor thesis at the Department of Agricultural Engineering

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Abstract

In the tropical countries of Africa a lot of plantain and cooking bananas are grown on small scale farms and home gardens. Due to the high susceptibility to spoilage after harvest and lack of access to markets, the harvest and post-harvest losses are tremendous. Facing the increasing prices for wheat-imports, the production of flour made of dried green cooking bananas could be a way to utilise this valuable resources to become less dependent on imports of cereals and create income for the rural population. The drying and processing of cooking bananas was of interest to a lot of scientist already. Object of this work is the influence of temperatures of 50°, 70° and 90° and thickness of cooking banana samples on the drying behaviour. Furthermore the influence of shape to the drying behaviour at constant temperatures was examined using a special cutting tool to increase the surface of the cut about 40 % and a tool to perforate the slices. Also the effect on drying behaviour, colour change and milling behaviour of chopping cooking banana pulp with a meat grinder and a rasper was examined.

The results show, that the maximum temperature to be recommended for drying cooking Bananas was at 70°. Higher temperatures at 90° result in unfavourable colour changes. With a thickness of 8 mm and a temperature of 70° the pulp slices could be dried to a moisture content of 10 % in 3,8 hours. The use of a tool to increase the cutting surface about 40 % was found to be recommendable at a thickness of 8 mm, the drying time at 70° could be accelerated about 10-20%, whereas the surface enlargement had no effect on slices cut to 4 mm thickness. The pulp chopped with a meat grinder showed a significant faster drying performance at higher mass per m² compared with 12 mm slices and the pulp chopped with a rasper. Furthermore the grinded pulp featured more fine particles after ten seconds of milling in an impact mill; whereof less energy consumption for milling could be derived.

The grinded and rasped pulp showed a browning soon after processing, the dried samples were found to be darker in colour compared to slices, which could be avoided through pretreatment.