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## Convective Hot-air Drying of Banana in Uganda

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### Abstract

Uganda produces annually 615 000 ton of fresh bananas according to FAOSTAT 2007. It is estimated that more than 70 % of the population of Bushenyi district in western Uganda, lives from agriculture and out of this, approximately 60 % of the agricultural activities are dedicated to Matooke banana production and processing. Low and fluctuating prices as well as no added value account more than 50 % of the factors affecting banana marketing. The Presidential Initiative on Banana Industrial Development (PIBID) in Uganda intends to enhance the marketability of banana through processing and value addition, including high quality banana figs production. For the design and optimisation of the current drying applications in Uganda, fundamental research performing laboratory tests in a high precision thin layer laboratory dryer in the Institute of Agricultural Engineering at the University of Hohenheim was conducted. In this work the effect of drying parameters, namely air temperature (40, 50, 60 and 70°C), air velocity (0.5, 0.75 and 1.0 m s<sup>-1</sup>), air humidity (10, 20 and 30 g kg<sup>-1</sup>) and slice thickness (3, 6 and 9 mm) on the drying behaviour and quality of banana were investigated. Prior to drying, bananas were immersed in solution of potassium metabisulfite, or soaked in citric acid solution and compared with the untreated samples. The colour of the dried banana slices was used as quality criterion for the evaluation and determination of the optimum conditions. The individual colour parameters were measured by a CR-400 colorimeter and expressed as L\*a\*b\* and L\*C\*h° colour systems. Statistical analysis of ANOVA was performed using the OriginPro 8 software to determine any significant differences among the experimental data sets. Considering drying time and quality of the dried bananas, a combination of a drying air temperature of 60°C, air velocity of 1.0 m s<sup>-1</sup> and humidity ratio of 10 g kg<sup>-1</sup> seems to be appropriate for obtaining a good dried product. Also, the use of potassium metabisulfite dip helped in reduction of darkening of banana slices during drying.

**Keywords:** Banana, hot-air drying, Uganda