

Parameters for mechanical preparation of clear banana juice

Brassio Mugisha Bagoka

M.Sc. (Chemical and Process Engineering)

University of Dar es Salaam, College of Natural and Applied Science, 2017

The value of banana and its products especially banana juice is largely unknown and still requires a great deal of research in Tanzania. The main aim of this study was to investigate on the parameters for mechanical preparation of clear banana juice by using heavy duty variable speed industrial blender (Robot Coupe Blixer 4 V.V) and finally to come up with optimal preparation parameters, physical and chemical characteristics and sensory properties of banana juice of selected varieties. In this study, *Pisang awak*, ABB genotype and *Mbile*, AAA-EA genotype varieties were used. Degree of ripeness was evaluated in terms of fruit softness. Juice was produced within a fruit hardness range of $1.3-0.7 \times 10^5$ N/m² and $0.4-0 \times 10^5$ N/m² for *Pisang awak* and *Mbile* respectively. Juice yield increased with degree of ripeness to a maximum of 60 and 78% (w/w) for *Pisang awak* and *Mbile* respectively. In overripe bananas, which correspond with fruit hardness below 0.7×10^5 N/m² for *Pisang awak* and 0.2×10^5 N/m² for *Mbile*, juice production failed. Mashing time decreased with mashing speed required to attain maximum juice yield from 10min at 1,500 rpm to 2min at 3,500 rpm for *Pisang awak*, and 1.8 min at 1,500 rpm to 0.4min at 3,500 rpm for *Mbile*. Pulp viscosity on mashing process at juice release was studied at different levels of ripeness. For *Pisang awak* and *Mbile* was 5×10^5 and 1.2×10^5 cP respectively and juice viscosity was 1.74 cP. Juice had TSS of 24-28°Brix for *Pisang awak* and 20-24°Brix for *Mbile*. Juice average density and pH was 1018-1100 kg/m³ and 4.1-4.8 respectively. Organic acids (malic, citric and succinic), sugars (fructose, glucose and sucrose) and Minerals (Ca, Mg, Fe, Mn, K, Na, Zn) in prepared juice, were quantified in all varieties in this study. In all varieties, Potassium and Malic acid up to 3110.5 ml/l and 36.7 g/l respectively was dominant.