

Optimization of process parameters of hot air drying of banana (*Musa paradisiaca L.*) slices

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The aim of this work is to optimize the process parameters for hot air drying of banana slices. As green banana is perishable and deteriorates after harvesting. Drying prolongs the shelf life of banana. The hot air drying characteristics of green banana slices were studied at drying temperature (40-80°C), air velocity (1.5-5.5 m/s) and slice thickness (2-6 mm) in the laboratory scale hot air dryer. To improve the quality of dried banana slices, the banana slices were pretreated with potassium meta-bisulphite (KMS): citric acid as 0.50:1.0%. The quality characteristics of dried banana slices including rehydration ratio, % shrinkage, hardness, colour and proximate composition, were evaluated. Drying was found to occur in the falling rate period only. Higher drying rate were observed with the higher temperature level and minimum level of slice thickness. Drying rate increases with increase in air velocity upto 3.5 m/s after that there was no profound effect on drying rate. The results revealed that, the temperature, air velocity, slice thickness had significant effect on various quality parameters of dried banana slices viz. rehydration ratio, hardness, shrinkage, ascorbic acid and color whereas carbohydrate and ash content had non-significant effect. The optimum level of independent variables for banana drying obtained by using numerical optimization of multiple responses viz. drying time, rehydration ratio, shrinkage, hardness, ascorbic acid and L and b value were at temperature 60°C, air velocity 3.5 m/s and slice thickness 2mm. These optimum values are recommended for hot air drying of banana.

Biography

Amita Vairat completed her M. Tech from G.B. Pant University of Agriculture and Technology, Pantnagar, U.S. Nagar, Uttarakhand, India in 2009. She is doing Ph.D at Indian Agriculture Research Institute, Pusa Campus, New Delhi, India.

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Temperature indicator and controller in the food processing industry

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Temperature indicators and controllers play a major role in the food processing industry. Many a time, the quality of the food product is directly linked with the maintenance of target temperature. In food industry, temperature controllers are used in number of processing applications such as cooking, baking, sterilisation, blending and brewing. In addition, the effect of temperature has an influence on the entire food processing chain such as manufacturing, packaging, transportation and storage. Here we present a temperature indicator and controller with high accuracy and precision. It is economical, user friendly and reliable. The system is designed to display the surrounding temperature and control the actuator(s) to maintain the temperature within the permissible limits of reference temperature. An additional user friendly feature is provided by including the wireless communication facility to update the end user about the status (changes) of the system.

The circuit consists of microcontroller, temperature sensor, LCD module, GSM modem and other necessary discrete components. The microcontroller is programmed to receive the temperature from the sensor section and displays it on the LCD module. Simultaneously, it compares this temperature with the reference value stored by the user. Accordingly, it operates the actuator (cooler / heater) to make the surrounding temperature equal to the reference temperature. A PID controller further facilitates the programming of ramp-up and ramp-down of temperature. A data logger and a remote control using GSM modem are added to facilitate the operation of the system for user convenience which intimates the change of the status when required.

Biography

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