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Changes in physico-chemical properties of coffee due to hot air assisted microwave drying

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SUMMARY :

Coffee is one of the most popular beverages in the world. One of the principle technological processes is drying; giving rise to the formation of the characteristic colour, flavour and taste of coffee brew. Conventionally there are two types of drying techniques used in the coffee processing, (sun drying and mechanical drying). The initial moisture content of harvested coffee is about 55-60 per cent and after drying lowers the moisture content to around 12 per cent (w.b). Drying should be uniform to obtain acceptable colour, size along with the removal of pests for a longer safe storage. Since coffee production is seasonal, traditional sun drying is quite tough. In recent years, microwave drying has gained popularity as an alternative drying method for a wide variety of food and agricultural products. With the fixed hot air temperature of 45°C, three different microwave output powers ranging from 0.5 to 1.5 kW and three different belt speed ranging from 5mm/s to 15mm/s were used in the drying experiments. Increasing the microwave output power resulted in a significant decrease in drying time within 5 per cent significance level. While the belt speed had no significant effect on the total drying time but had a significant effect on the physico-chemical properties.

KEY WORDS : Microwave, Coffee, Drying, Physico-chemical properties

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Coffee is one of the most popular beverages in the world. Nearly 25 million farmers in 50 countries around the world depend on coffee for a significant part of their livelihoods (Cague *et al.*, 2009). The genus coffee belongs to the botanical family of Rubiaceae and comprises more than 90 different species (Davis, 2001). The characteristic, rich and pleasant aroma and colour of coffee brews is a result of complex processes leading from green coffee beans to the cup of coffee. One of the principal postharvest processes is drying that gives rise to the formation of the characteristic colour, flavour and taste of coffee brews. In 2010-11 according to U.S. Department of Agriculture 12 million tonnes of green coffee is produced.

Brazil is by far the largest grower and exporter of green coffee beans in the world followed by Vietnam, Colombia, Indonesia, Ethiopia and India – producing nearly 2.5 million tonnes of green coffee beans per year (Franca