The Effect of the Drying Method on the Quality of Dried Kiwi Slices

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Abstract— **Drying is known as a food preservation method which increases the food's storage time by water reduction. Traditional drying consisted of open sun-drying, but different industrial dryers have been widely used in recent times. The new dryers consist of convective, infrared, ultrasound, freeze fluidized bed and freeze dryers. All of these dryers reduce the water content but under different mechanisms which leads to the end products with different qualities. In this study we aim to compare the difference in quality of kiwi fruit slices dried by three different dryers: 1. Convective tray dryer, 2. Microwave dryer and 3. Freeze dryer. The tray dryer experiments were conducted in two air temperatures of 60 and 80°C in the constant air velocity of 0.8 m/s. The microwave dryer operated in 3 output powers of 180, 270 and 360 W. The condenser temperature and pressure in the freeze dryer reduced to -50°C and 0.1 mbar, respectively. The operating conditions and time were regulated so that the moisture content of all dried samples reduced to nearly 10% in the wet basis. The three parameters of color change, ascorbic acid and antioxidant reduction were selected as the measuring criteria for the comparison of the product qualities. The experiments show that the freeze drying caused the minimum color change while the microwave drying in the maximum power of 360W caused the maximum amount of color change. The concentration of ascorbic acid was measured in the fresh fruits and dried samples by standard methods. The measurements proved that the ascorbic acid content of the freeze dried samples was 80% of the fresh fruits. The ascorbic acid content of other samples was much lower. The antioxidant activity of the dried samples and the fresh fruits was also measured by standard methods and the experimental data also showed that the freeze drying causes the minimum reduction in the antioxidant activity.**

Index Terms: **Drying method, kiwi fruit, drying quality, convective dryer, microwave dryer, freeze dryer.**

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