

Title Chilli Rotary Dryer
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Abstract

The purposes of this study are to construct the rotary dryer and to determine the optimum drying conditions for chilli. The rotary dryer consists of a feeding unit, which is driven by a $\frac{1}{4}$ hp motor, gearbox, 0.4-m-diameter and 1.8 m-long cylinder, which is driven by a 1 hp motor, a bower and a heater. Fresh chilli with the initial moisture content of 78-84% wb were fed into the cylinder, while hot air was blew through the heater by the blower to decrease the moisture content of the chilli. The chillies were fed into the cylinder, until the moisture content decreased to 15% wb. The study was divided into two parts, including the determination of the residual time and the investigation of optimum drying conditions. The former were conducted under different feed rates, rotating rates, tilt angles and air velocity. The experimental results indicated that the residual time decreased when the feed rates, rotating rates, tilt angles and wind speeds were increased. However, the results were not taking into account the effects of moisture content and the size of chilli on the residual time. Regarding the optimum drying conditions, the results showed that the drying rate varied with many factors including drying temperature, rotating rate, air velocity, feed rate and tilt angle. It was found that the optimum drying conditions were at an air temperature of 140°C, cylinder of 1 m/s, rotating rate of 6 rpm, feed rate of 0.5 kg/min. and tilt angle of 0.3°. The moisture content of 78-84% wb of 9-kgchilli can be decreased to 15% wb within 4.30 hours with these drying conditions. The energy consumption for drying chilli under the conditions as mentioned above was 6.7 kJ/kg_{water}.