

COMPARATIVE ANALYSIS OF PHYSIOCHEMICAL PROPERTIES OF TURMERIC (*Curcuma longa* L.) SUBJECTED TO CONVENTIONAL HOT-AIR DRYING AND HEAT PUMP DRYING TECHNIQUES

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Turmeric (*Curcuma longa* L.) is used as a spice, food preservative, colouring agent and an ingredient in Ayurvedic medicine. The quality and shelf life of turmeric is highly dependent on the processing technique. Sun drying results in poor quality due to contamination and prolonged exposure to heat. Conventional hot air drying is less effective. Hence, an alternative drying technique is vital to provide controlled and efficient drying. The present study compared Conventional Hot-Air Drying (CHAD) and Heat Pump Drying (HPD) operated at 45°C on the physicochemical properties of turmeric. The data were analysed by a two-sample *t*-test using STAR 2.0.1 statistical software. The results revealed a significant variation in the physicochemical properties of turmeric subjected to CHAD and HPD. A significantly lower moisture content was observed with HPD (8.49%) than CHAD (11.34%). Further, HPD recorded significantly higher ($p < 0.05$) volatile oil content (6.10%) and curcumin content (8.23%) than CHAD having oil and curcumin content of 4.41% and 7.37% respectively. The optimum colour profile (L, a, b) was observed with HPD (L:36.24, a:17.43, b:38.63) compared to CHAD (L:34.43, a:16.0, b:43.81). HPD resulted a significantly higher oleoresin (31.58%) and total polyphenol content (17.88%) compared to CHAD, which had 17.78% and 10.4% of oleoresin and polyphenol content respectively. Findings emphasized that HPD preserves the physicochemical properties of turmeric better than CHAD. Cost benefit analysis is suggested prior to recommendation.

Keywords: Conventional hot air drying, Curcumin, Heat pump drying, Oleoresin, Volatile oil