

Impact of Milling Techniques on the Particle Size Distribution Pattern of Turmeric Powder

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Abstract

Turmeric (*Curcuma longa* Roxb) powder (TP) was prepared by milling turmeric rhizomes using pulverizer mill, burr mill and home grinder. The TP obtained from each machine was analyzed for particle size distribution using a particle size analyzer with laser distraction to study the effect of each milling technique on the particle size of TP. Standard percentile diameter $D(v, 0.5)$, $D(v, 0.1)$ and $D(v, 0.9)$ for samples obtained from the pulverizer mill, burr mill and home grinder were 270.41 μ m, 109.48 μ m and 511.67 μ m; 310.23 μ m, 121.74 μ m and 607.42 μ m; 391.56 μ m, 132.12 μ m, and 682.78 μ m, respectively. Volume mean diameter [$D(4, 3)$] was more (312.77 μ m) for home grinder milled TP sample compared to 216.42 μ m for burr milled and 199.71 μ m for pulverizer milled TP. Surface area mean diameter [$D(3, 2)$] was also higher (197.43 μ m) for home grinder milled TP samples compared to other milled samples. The specific surface area (A_w) for pulverizer milled TP sample was highest (0.0367 m²/g), followed by burr milled (0.0311 m²/g) and home grinder (0.0298 m²/g) TP sample. Pulverizer milled TP was finer compared to burr milled and home grinder as indicated by standard deviation value of pulverized mill (0.155), home grinder (0.054) and burr mill (0.086). There was significant difference ($p > 0.05$) in particle size distribution of TP prepared employing various milling techniques.

Keywords: Turmeric powder, Milling technique, Particle size distribution, Specific surface area, Volume moment mean, Surface area moment mean