Grinding characteristics of Asian originated peanuts (Arachishypogaea L.) and specific energy consumption during ultra-high speed grinding for natural peanut butter production

ABSTRACT

Roasted peanuts of China and India origin were ground in a commercial ultra-high speed grinder operated at 20,000 rpm for 2.0–5.0 min for natural peanut butter production. Grinding characteristics of both peanuts were evaluated in terms of specific energy consumption, Esc with respect to its grinding time and mean particle size. The Esc increased with grinding time with China peanuts having higher Esc than India peanuts. The specific energy consumption modeled to the size reduction ratio of China and India peanuts was predicted more accurately using a linear and exponential model respectively compared to the classical models by Bond, Rittinger and Kick. From the comparison of Bond's working index, Wi, the ultra-high speed grinder is said to be more energy efficient than other comminutors in terms of its capability to produce finer particle size in shorter time than the rest.

Keyword: Roasted peanuts; Ultra-high speed grinding; Grinding energy; Specific energy consumption; Particle size analysis