

# **Grinding characteristics of Asian originated peanuts (*Arachis hypogaea* 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,  $E_{sc}$  with respect to its grinding time and mean particle size. The  $E_{sc}$  increased with grinding time with China peanuts having higher  $E_{sc}$  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,  $W_i$ , 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