

Study of drying conditions of whole organic green banana in pulsed fluidized bed dryer.

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Green bananas are rich in resistant starch and other compounds recognized for their benefits to human health. According to data published by FAO, the world production of *Musa* in 2020 was 131.7 million tons. However, approximately one-fifth of production is wasted due to inappropriate transport and storage conditions. This research aimed to study the drying conditions of organic green banana (*Musa cavendishii*) with peel in a pulsed fluidized bed dryer (PFB) to obtain whole flour (WGBF) to enable better use of the fruit and preserve its nutritional characteristics. The green bananas at their first stage of maturation were previously crushed and treated with citric acid and then dried in a PFB with four sections. The influence of the inlet air temperature ($T = 55\text{ }^{\circ}\text{C}$ and $75\text{ }^{\circ}\text{C}$) and air pulsation frequency ($PF = 300\text{ rpm}$ and 500 rpm) on the drying time was evaluated using a 2^2 factorial design with three replicates at the central point condition ($T = 65\text{ }^{\circ}\text{C}$ and $PF = 400\text{ rpm}$). The WGBF obtained from the particulate in each drying condition was evaluated for resistant starch content (36 to 43 g/100 g, d.b.), total starch content (70 to 78 g/100 g, d.b.), moisture content (3.3 to 8.1 g/100 g, w.b.), water activity (0.105 to 0.299), pH (4.25 to 4.36), and instrumental color ($L^* = 80.6$ to 83.6 , $a^* = 1.31$ to 2.93 , $b^* = 13.20$ to 14.66). The drying time was only influenced by the T ($p < 0.05$). The time to reach a reference moisture content of 10 g/100 g (w.b.) ranged from 53 min ($75\text{ }^{\circ}\text{C}$ and 500 rpm) to 130 min ($55\text{ }^{\circ}\text{C}$ and 300 rpm). The WGBF scanning electron microscopy images identified starch granules with rounded and elongated shapes with regular contours in the conditions studied. Drying unpeeled green bananas in PFB proved feasible, and the drying conditions studied preserved the high level of resistant starch (above 35 g/100 g, d.b.).