

Title Moisture-dependent engineering properties of sunflower seeds with different structural characteristics

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Citation Journal of Food Engineering, Volume 102, Issue 1, January 2011, Pages 58-65

Keywords Sunflower; Engineering properties; Dehulling ability

Abstract

The present study was carried out to investigate the effect of the moisture content of the seeds on engineering properties of sunflower hybrids with different structural characteristics. The properties were evaluated at seven levels of moisture from 2.0% to 20.1% (dry basis) for three selected sunflower hybrids. For both black-hull oilseed hybrid and confectionary hybrid, the variation in moisture content showed a statistically significant effect on dehulling ability, percentage of fines (broken grains with a diameter smaller than 2 mm) and all the physical properties studied (size, true density, bulk density, porosity, volume and weight, volumetric expansion coefficient, equivalent diameter and sphericity), except seed length in the confectionary hybrid and seed length and thickness in the black-hull oilseed hybrid. For the striped-hull oilseed hybrid, moisture content showed a significant effect only on dehulling ability, percentage of fines, seed width and thickness, bulk density and porosity. Of the oilseed hybrids, the striped hull genotype (higher hull content and both lower oil content and seed size) presented a higher dehulling ability. Nevertheless, the black hull hybrid resulted more sensitive to seed moisture changes. Although the confectionary hybrid showed a higher seed size, hull thickness and hull content, and lower oil content than the oilseed hybrids, the dehulling ability resulted fairly similar in the striped hull sunflower hybrids. The results suggest that sunflower seeds with different structural characteristics need to be conditioned with different moisture content before being subjected to the dehulling process.