Title Physical Properties of Filbert Nut and Kernel

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Abstract

Various physical properties of filbert (*Corylus maxima* cv. Istrian long) nuts and kernels were determined as a function of moisture content. The average length, width, thickness, equivalent diameter, unit mass, volume and sphericity of nuts were 25·32, 20·54, 17·93, 20·96 mm, 3·88 g, 4·88 cm^3 and 82·86%, while corresponding values for kernels were 20·20, 14·52, 12·64, 15·41 mm, 1·70 g, 1·94 cm^3 and 77·02%, respectively, at a moisture content of 6·19% wet basis (w.b.). In the moisture range from 6·19 to 28·71% w.b., studies on the rewetted nut showed that the bulk density of nut and kernel decreased from 530 to 454 kg m^{-3} and 649 to 569 kg m^{-3}, respectively. The true density of nut decreased from 907 to 829 kg m^{-3}, while for kernel, it decreased from 1016 to 937 kg m^{-3}. The porosity of nut increased from 41·53% to 45·24%, while porosity of kernel increased from 36·18% to 39·44%. The projected area for nut and kernel increased from 423 to 497 mm^2 and from 246 to 283 mm^2, respectively. In the same moisture range, the static coefficient of friction for nuts on three different material surfaces varied from 0·233 to 0·450 on aluminium, from 0·319 to 0·531 on plywood and from 0·406 to 0·623 on rubber; the corresponding values for kernels were 0·317–0·484, 0·401–0·581 and 0·561–0·731. The maximum force for nut cracking occurred in the longitudinal direction and the minimum force in the transverse direction. For all compression directions, the force required to crack the nut decreased with increasing moisture content.