

Identification and Significance of the Oil-point in Seed-oil Expression

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Abstract

The oil-point, which indicates the threshold pressure at which oil emerges from a seed kernel during mechanical seed-oil expression, is theoretically related to the kernel density of an oilseed thereby enabling its evaluation from initial bulk properties of a bed of seeds. A method for dynamically determining the applied pressure at the oil-point by precise sensing of the oil (pore) pressure is presented. This measurement permits experimental validation of the hypothesis that the oil-point generally occurs at the point where the bed density approaches the kernel density of the constituent seed or material particle. The effect of bulk compression on bulk density, volumetric strain, bed compressibility and specific energy of compression up to the oil-point was examined for rapeseed, soybean, groundnut, palm kernel, and cashew and melon seed before and after pretreatment by heating or size reduction. It was found that oil-seeds can be characterized objectively as hard or soft using bed compressibility and specific energy of compression at the oil-point. In addition the ratio of maximum pore pressure to applied pressure was positively correlated with seed oil content. The effect of particle size reduction and heating was generally to increase bed compressibility and lower the applied pressure at the oil point. The results show that the effect of pre-treatments on the mechanical properties of seed beds must be taken into account when considering the efficacy of mechanical expression of oil from oil-seeds. Copyright © 1996 Silsoe Research Institute. All rights reserved.

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