

Variation of Yield and Physical Characteristics of Peanut Crude Oil Different by Extraction

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[Introduction]

Peanut (*Arachis hypogaea* L.) is one of the rich sources of unsaturated fatty acids and protein. Among the fatty acids of peanut, oleic acid and linoleic acid take about 47% and 30% of total fatty acids, respectively. Since the high-oleic peanut varieties, which has the recessive mutation on delta-12-desaturase gene, has been developed, the accessibility of peanut processing has been expanded. 'K-OI', which contains 41.5g of oleic acid within 100g of grain, has been recognized as the novel material of functional oil market. In the present study, we evaluated the oil yield and characteristics varied by extraction conditions in two peanut cultivars.

[Materials and Methods]

Two peanut cultivars, 'Sinpalkwang' and 'K-OI' were used in this study. Three independent extraction conditions were investigated; the roasting time, extraction method, and the size of ingredients. By maintaining the temperature of the roaster to 180°C, peanut kernels were roasted for 15, 30, 45, and 60 minutes, then the oil was obtained by the hydraulic press and expeller extraction machine, respectively. Three different size of kernel materials were also evaluated, which is whole grain, and coarsely ground peanut, and peanut powder in the hydraulic press. For the oil sample, the oil yield and the amount of residue, color, turbidity were evaluated.

[Results and Discussions]

The oil yield varied from 41.2 to 49.2%, and 30-minute-roasted sample showed the highest oil yield in 'K-OI' (mean 47.9, CV 1.30) and 45-minute in 'Sinpalkwang' (mean 43.2, CV 1.86) when extracted by hydraulic press. There was no significant difference in yield differed by the roasting time. Both cultivars showed the higher oil yield when extracted in the form of whole grain, and followed by powdered peanut in hydraulic pressing. There was significant difference of the oil yield when extracted in expeller machine, and the oil yield was low when the sample was roasted over 45 minutes. About the Lab color space, both cultivars showed the significant difference of the lightness and the changes for the positive direction of a* and b* value when roasting time was extended. In the case of oil turbidity, the expeller-extracted sample showed the higher turbidity in absorbance(650-670nm) than the hydraulic press, whereas there was no tendency of roasting time or grain size for the turbidity. Based on the results, peanut crude oil also showed the diversity of their properties by the extraction condition, and these data would suggest the applicable screening condition for selecting the promising line which is adequate for crude oil production in breeding program.

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