

Nattakarn Oungsirirawad 2014: Utilization of Roasted Coffee Residues as Fuel for Smoking Food Products: Effect of Breed and Smoking Temperature. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Associate Professor Wunwiboon Garnjanagoonchorn, Ph.D. 152 pages.

This study preliminary evaluate the feasibility to utilize fresh coffee residue to generate smoke during smoking food products. Since two coffee varieties, Robusta and Arabica are grown and consumed in Thailand both fresh coffee residues were used. Smoke was produced by smoldering coffee residues at 200, 250 and 300°C with limited oxygen, and trapped the smoke by propylene glycol to get liquid smoke. It was found that the higher burning temperature increased ( $p < 0.05$ ) the yellow color value and decreased ( $p < 0.05$ ) the pH of liquid smoke. Liquid smoke was extracted by hexane and analyzed the volatile components by using GC-MS. The results showed that the higher burning temperature increased the content of phenols, carbonyls, furans and polycyclic aromatic hydrocarbons (PAHs) in liquid smoke where Robusta composed of higher content than Arabica. This indicates that Robusta smoke has strong sweet flavor and smoky aroma. Meanwhile, volatile components were also analyzed from smoked sausages using the same smoldering conditions. The same group of volatile components as in liquid smoke were found, with higher in intensity except for PAHs. *o*-cresol and *p*-cresol were two phenolic compounds found only in smoked sausage extract which contribute to smoke-curing flavor. However, naphthalene and fluorine are PAHs listed as toxic compounds by EPA (The U.S. Environmental Protection Agency). In this study they were found in liquid smoke but in smoked sausages the intensity decreased. From the experimented conditions Robusta smoke at 300°C gave strong sweet flavor and smoky aroma but without BaP analysis (an indicator of carcinogenic substances of PAHs) it is uncertain for food safety issue.

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