

## Detection of Frying Oil Rancidity Levels Using a Mobile Application

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One of the most popular ways to prepare meals is deep-fat frying. In the catering industry, oil is heated repeatedly up to a specified point while maintaining customer safety and profit margins. If the threshold is crossed, rancidity may form. Test kits are used to make sure the safe margin of frying oil. These test kits are quite costly. In this research, a test kit and a mobile app that can be used to evaluate the rancidity levels of frying oil have been developed. The study was done by two methods (direct, chemical). In the direct method, A digital colorimeter was used to analyse the samples' colors, and a Vito oil tester was used to measure the samples' total polar materials (TPM%). The TPM (%), L\* a\* b\* values, and acid values all had substantial positive relationships that were greater than 0.90 in linear regression ( $R^2$ ). The chemical method was developed as an advanced version of the direct method and used a chemical solution which is sensitive to the free fatty acid percentage in frying oil. The Mobile application was developed using the *React Native* software. It was compatible with the android operating system. The mobile application was validated using randomly selected oil samples and determined TPM (%) values by both mobile application and Vito oil tester. Results were analyzed using *R* statistical software. Based on the results, there was not a significant difference ( $p>0.05$ ) between the TPM (%) values which were obtained by the mobile application and Vito oil tester. The outcomes also showed that the suggested technique can be used as an alternate method to accurately determine the rancidity levels of frying oil.

**Keywords:** deep frying, reheating, rancidity, test kit, mobile application

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