

THE EFFECTS OF VACUUM AND ATMOSPHERIC DEEP-FAT FRYING PROCESS ON TOTAL FRYING-USE TIME OF SUNFLOWER OIL AND ON FRENCH FRIES QUALITY

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ABSTRACT

Deep-fat frying, which is one of the oldest and popular food preparation methods, is a process of immersing food in hot oil at a high temperature. In this study a vacuum cooking equipment prototype which could work both atmospheric pressure and under vacuum was developed for deep-fat frying process. The effect of vacuum and atmospheric frying temperature and number of frying in the same sunflower oil on the quality of French fries and sunflower oil was evaluated. Potato pieces were fried in ratio 1:6 (potato:oil) at atmospheric pressure and under vacuum at 135 and 180°C, respectively, for 10 min in every frying interval for a total of 7 (atmospheric pressure) and 15 (under vacuum) times of frying in the same oil.

The free fatty acid content of the frying oil at atmospheric condition was determined to be excessively high compared to that of vacuum frying oil. TPM of oil at the atmospheric frying after the 3th frying rapidly reached to TPM content of the 15th vacuum frying oil. It was observed that peroxide value of the oil at atmospheric frying was higher than that of vacuum frying oil. Viscosity of the oil at atmospheric condition increased rapidly with an increase in exposure time compared to that of vacuum frying oil. The color values of vacuum and atmospheric fried French fries were not significantly different from each other. No significant changes in texture of French fries were determined with oil utilization time in the both of frying process.

Key Words : Deep-fat frying, vacuum frying, oil utilization time, sunflower oil, oxidation