



The effect of frying oil on the fat content of fish fingers and potato croquettes and its stability

Josef Soukup, Lenka Kouřimská

Department of Microbiology, Nutrition and Dietetics., Czech University of Life Sciences Prague, Kamýcká 129, 165 00, Praha 6, Suchbát, Czech Republic

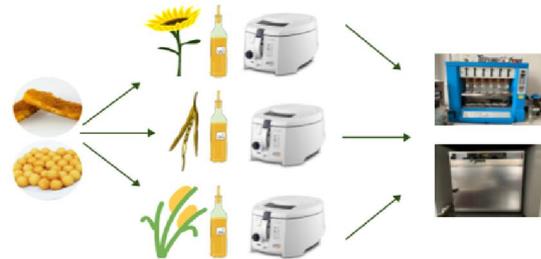


Background

Frying in a high layer of oil (deep frying) is a process of preparing foods that has been very popular for a long period of time. It is a process whereby the prepared food is immersed in an oil pre-heated to 150-200 °C. The food prepared this way has its characteristic aroma and golden brown colour, which is mainly a result of Maillard reaction, that is taking place mainly in the crust. There are many types of oils used for deep frying, the quality of which is important to take into account primarily because the oil used becomes a part of fried food and affects its organoleptic properties and nutritional value. The quality of frying oil is mostly influenced by its fatty acid composition, presence of unsaponifiable accompanying compounds and antioxidants in oil, oil freshness, fried food composition or frying technology etc.

Study Design

Three different types of oils were used as a frying medium, and pre-fried fish fingers and potato croquettes were prepared in them. All these items were purchased in the food store. Fish fingers and potato croquettes were fried at the temperatures recommended by the producer of the deep fat fryer for these products (170 or 180 °C respectively). Ten repetitions of frying for each kind of food were performed in order to be close to the continuous frying conditions in fast foods and restaurants. The dry matter, ash and fat content were determined. To determine the oil stability oils were stored in open 100mL beakers at 60 °C. The increase in mass reflects the degree of oxidation of the monitored oil.



Results

Though there were differences between oils before and after frying in some parameters, the results of individual samples after frying showed neither increasing nor decreasing tendencies in any of observed factors (no significant differences among individual samples from frying 1 to 10 were proved). During the storage, rice oil and rapeseed oil showed the highest stability, the sunflower oil was on the other hand really unstable and easily oxidised. Because the rice oil also soaked the least amount of fat in case of fish fingers, it seemed to be the best option. It was not shown in case of potato croquettes – sunflower oil soaked less.

Average of dry matter, ash and fat in fish fingers fried in different oils

Type of oil	Dry matter (g/100 g sample)	Ash (g/100 g dry matter)	Ash (g/100 g sample)	Fat (g/100 g dry matter)	Fat (g/100 g sample)
Rapeseed	39.03 ±1.18	2.97 ±0.48	1.16 ±0.20	15.81 ±0.72	6.17 ±0.29
Sunflower	39.99 ±1.79	3.40 ±1.69	1.37 ±0.76	15.55 ±0.40	6.22 ±0.29
Rice	38.69 ±0.77	1.22 ±0.64	0.47 ±0.24	15.64 ±0.41	6.05 ±0.21

Conclusions

- The difference between fat content in fried food before and after frying was not significant.
- The least amount of fat was soaked when sunflower and rice oils were used.
- There were no differences in fat content between samples throughout the experiment (repeated frying 1 to 10).
- Rice oil showed the highest oxidative stability during storage in increased temperature; sunflower oil was the least stable.

Average of dry matter, ash and fat in potato croquettes fried in different oils

Type of oil	Dry matter (g/100 g sample)	Ash (g/100 g dry matter)	Ash (g/100 g sample)	Fat (g/100 g dry matter)	Fat (g/100 g sample)
Rapeseed	47.84 ±0.77	2.46 ±0.15	1.18 ±0.09	5.48 ±0.08	2.62 ±0.04
Sunflower	48.05 ±1.51	2.08 ±0.39	1.00 ±0.20	5.37 ±0.15	2.58 ±0.10
Rice	48.18 ±0.79	2.26 ±0.17	1.09 ±0.08	5.46 ±0.11	2.63 ±0.04