The Taste of Rapeseed Based Dietary Fat Was Superior to That Based on Sunflower Oil, When Used for Frying and Baking

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Recent studies have shown that monounsaturated fatty acids are comparable with polyunsaturated fatty acids regarding the effects on serum lipoprotein lipid levels. Rapeseed oil has a higher content of monounsaturated fatty acids as well as of linolenic acid and a different composition of antioxidants, tocopherols, than sunflower oil. These differences might affect the lipid oxidation process of the two fats. Comparisons of these fats also regarding the off-flavour when used for frying or baking would therefore be very interesting. Many of the secondary oxidation products have a small molecular weight and a very low off-flavour threshold value and are therefore easy to assess by a sensory panel. The aim of this study was therefore to evaluate if there are any differences in stability of the fats against heating in form of fried or in baked products measured by sensory analyses.

Material and methods: Two liquid margarines based on sunflower or rapeseed oil were used for frying and baking. Margarines, crepes and minced meat were fried in electric frying pans at different temperatures and sweet butter bread and cakes were baked. An expert panel of 7 members assessed the sensory properity of the food eaten using sensory evaluation methods.

Margarines:
The liquid margarines were added to the pans to a 5 mm deep layer of fat. The margarines were heated to 165°C and 175°C into two pans for 5 minutes. The fat was absorbed in bread before sensory evaluation.

Crepes:
The margarines was added to the batter before frying. The crepes were fried at 175°C and 185°C for three minutes.

Minced meat:
Fresh minced meat beef was formed to thin cakes of meat, weighing 150 g each. Liquid margarine was added to each pan. The meat was fried at 175°C and 185°C for 3 minutes.

Sweet butter bread and cake:
Sunflower and rapeseed oil liquid margarine were baked into sweet butter bread and a cake.

Sensory analyses: A descriptive test (Stone & Sidel 1985, Piggott 1988) was used to determine the sensory profile for the margarines, the minced meat and the crepes. The sensory attributes were assessed on a continous intensity scale from 0 to 9 (0 = free from off-flavour, 9 = rancidity, off-flavours). A preference test was used to measure the preference of the fats in the sweet butter bread and cake. The data in the experiment was analysed by the analyses of variance and by binominal function.

Results: The sensory panel assessed both total taste, fatty taste and rancid taste and scored for the rapeseed oil margarine lower than those of the sunflower oil margarine. The difference was statistically significant. The difference between the crepes fried with different margarines was less pronounced than that between the pure margarines. Only at 175°C there was a significant difference between the crepes while there was no difference at at higher temperature, 185°C. Frying of minced meat did not reveal any difference between the fats at the different temperatures. Products baked with the rapeseed oil margarine such as cake and sweet butter bread were preferred by 74% and 68% respectively in the preference test.

In conclusion: Resistance of heat of rapeseed oil margarine and sunflower oil margarine was evaluated by sensory analysis. The rapeseed oil margarine was judged to be more free from off-flavour and rancid taste than sunflower oil margarine. Minor differences were seen in the flavour of rapeseed oil margarine when added to the batter of the crepe, while no differences were observed in the fried minced meat. The difference between the fried margarines decreased with increasing temperature. The sweet butter bread and the cake baked with the rapeseed oil margarine were preferred significantly more often compared to the products baked with sunflower oil margarine. Rapeseed oil margarine seems to be more resistant to heating than sunflower oil margarine. The chemical changes during the pan frying and baking have been studied by us, but the results are not yet available.