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**Oleogels as new alternative frying media for potato chips and a  
replacement for conventional frying media**

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The deep-frying medium holds an essential role in the production of deep-fried products. It provides the heat transfer into the food as well as the formation of typical flavor, texture, rheological and sensory properties of the final product. Deep-frying partially replaces the water present in the food with the frying medium. Consequently, the frying medium becomes an important component of the final. Texture and rheology of the frying medium are directly related to surface properties of the fried food and can be adjusted by using specifically optimized frying media based on palm oil or modified fats.

A new alternative for reducing the proportion of saturated fatty acids (SFA) and replacing palm oil are structured oils, so-called oleogels, based on a liquid oil phase such as rapeseed oil combined with a structuring agent like sunflower wax (SFW) or monoglycerides (MG). Rapeseed oil is a nutritionally valuable edible oil because it contains a high proportion of unsaturated fatty acids and a low proportion of SFA. Melting of the structuring agent in the oil and subsequent cooling cause it to form a 3-dimensional network in which the liquid oil is embedded. The liquid oil thus changes to a solid state and the nutritionally valuable fatty acid composition of the oil is maintained. The aim of this research work is to replace the conventional liquid oils or solid fats that are used for the production of deep-fried foods with oleogels consisting of structured rapeseed oil. This should improve the haptic properties, significantly reduce the content of SFA in the products and increase the content of mono- and polyunsaturated fatty acids.

It was shown that the use of oleogels for deep frying is suitable for potato chips and other food products. Oxidation stability of oleogels was comparable to that of conventional semi-liquid and liquid frying media. The firmness and oil holding capacity of oleogels were also comparable or higher than those of conventional semi-liquid frying media. In addition, the firmness and oil holding capacity remained constant over 40 frying cycles. However, the use of MG resulted in higher levels of polar compounds, a parameter for evaluating the condition of the frying media, and therefore it is more likely that specified limit values will be reached. With regard to the breaking strength and fat content of potato chips, no clear effect could be determined by using oleogels as a frying medium. However, the color was affected positively, since a lightening of the potato chip surface was measured. In terms of appearance, feel and mouthfeel, the chips fried in oleogels were rated as less oily, representing an improvement in sensory quality.

## Keywords

Liquid oil structuring, rapeseed oil, sunflower wax, monoglycerides, sensory test

## Conference Topics

Processing (old & new products, nutrition)