

Stabilization of rapeseed oil based oleogels for their application in bakery goods

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For the production of bakery goods solid fats like palm oil or hydrogenated vegetable oils are used in order to obtain the functional and physical properties of the product. These solid fats significantly contribute to the consumption of saturated and *trans*-fatty acids, which cause cardiovascular diseases. Moreover, consumers are interested in palm oil free products, since palm oil is strongly criticized for its environmental impacts. A nutritionally and environmentally favourable alternative to conventional triglyceride structured fats are oleogels, which are composed of a structuring agent like wax, ethyl cellulose or monoglycerides and a vegetable oil. Rapeseed oil is preferred for the preparation of oleogels due to its beneficial fatty acid composition with a high amount of unsaturated fatty acids. However, the lower oxidative stability of rapeseed oil results in bakery products with a shorter shelf life compared to products based on palm oil or hydrogenated vegetable oils.

Therefore, the presented project aims at the stabilization of rapeseed oil based oleogels via the application of antioxidants or high oleic rapeseed oil. In a first step the oxidative stability of high oleic rapeseed oil and classical rapeseed oil in combination with several synthetic or natural antioxidants was analyzed using the Rancimat method. From this experiment one antioxidant based on rosemary extract as well as high oleic rapeseed oil were selected for the production of oleogels with 5 % ethyl cellulose and 5 % monoglycerides. These oleogels were used as fat phase for the preparation of cookies and several sensory and chemical parameters of cookies stored at room temperature were analyzed over a time period of 112 days. The long term storage test confirmed that the rosemary based antioxidant and the high oleic rapeseed oil significantly contribute to the conservation of the taste, odour and structure of oleogel based cookies. Moreover, the optimized oleogels lead to less peroxide formation in cookies, even in comparison to conventional cookies from the supermarket.

To summarize, high oleic rapeseed oil and rosemary extract significantly improve the oxidative stability of oleogels, which results in oleogel based bakery products displaying a shelf life that is comparable to conventional products.