

GC-MS-based Profiling Method for the Differentiation of Sensory Good and Bad Virgin Cold-pressed Rapeseed Oils

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Since several years the market share of rapeseed oil is constantly growing. With the seed-like and nutty taste and smell and the favorable fatty acid composition rapeseed oil is the most popular edible oil in Germany. One of the most important parameters for this type of oil is the evaluation of the sensory quality which is very labour-intensive and time-consuming. Even if it is organized according to standardized methods with well-trained test persons there is a rate of misinterpretations. This could lead to marketing of bad quality oils and a resulting financial damage for the respective oil mill. In the present paper a dynamic headspace-GC-MS-based method was developed to overcome this problem and to improve the quality control of virgin, cold-pressed rapeseed oil. By olfactometry in combination with a chemometric approach the most relevant volatile compounds for the differentiation between sensory good and bad oils were identified. With this system 31 volatile components were detected in a dataset of sensory good and sensory bad rapeseed oils. From these compounds altogether 13 volatile components show significant differences ($\alpha=0.05$) in concentration between both groups of oils. These components belong to the groups of esters (6), aldehydes (3) alcohols (3) and others (1). With exception of the 3 aldehydes all volatile compounds with significant differences occur more frequently in sensory bad virgin cold-pressed oil samples.

On basis of these 13 compounds Principle Component Analysis shows a distinction between sensory bad and sensory good rapeseed oils with only a few false classifications. With the developed method for the first time a helpful analytical tool is available that can support the time-consuming and labor-intensive sensory evaluation of virgin rapeseed oil.

This IGF Project AiF 18039N of the FEI is supported via AiF within the programme for promoting the Industrial Collective Research (IGF) of the German Ministry of Economics and Energy (BMWi), based on a resolution of the German Parliament.