

A Profiling Method to Detect Volatile Compounds as Markers for the Quality of Virgin, Cold-pressed Rapeseed Oils

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Rapeseed oil is a greatly favoured vegetable oil in Germany. For producers it is a demanding task to carefully select the seed batches for the production of virgin rapeseed oil, as only the best seed qualities are suitable for this purpose. Bad harvest and storage conditions immediately lead to degradation of the sensory properties of the oil. Only a panel group consisting of at least 3 to 5 trained panelists gives reliable and objective results for the selection of proper raw materials. Therefore sensory evaluation is a crucial step, but very costly and time-consuming. To improve quality control of virgin, cold-pressed rapeseed oils the search for an analytical method is an important goal.

In the project presented a number of 92 rapeseed oils were collected on the German market and evaluated by sensory assessment of our trained panel. On this basis a GC-MS based profiling method is used to search marker compounds responsible for sensory good and bad quality oils. Aroma-relevant components were detected in selected oil samples via GC-Olfactometry (GC-O). With help of the software platform MeltDB the occurrence of these aroma-relevant compounds in a big dataset of virgin, cold-pressed rapeseed oils were verified and the peak areas compared with respect to significant differences between sensory good and bad samples. First results showed 64 volatile compounds with different intensities between an exemplary good and an exemplary bad sample. 41 of these compounds could be detected via GC-O.

Virgin, cold-pressed rapeseed oil of good sensory quality is characterized by a seed-like and nutty flavour. For these typical attributes 12 aroma-relevant compounds were perceived by GC-O. A set of 10 aroma-relevant compounds were attributed to the atypical Off-flavours, while 19 compounds could be detected in both kind of oils. Data analysis showed a significant difference of 3-methylbutanal and 2-methylpropanal for the two groups of sensory good and bad oils. PCA yielded in partial differentiation of these two oil groups, only. To improve results further identification of relevant compounds via GC-O is needed as next working step.