

Odorant impact and quantification of selected volatile sulphur compounds (VSC) in Swiss Tilsit cheese by headspace-solid phase microextraction-gas chromatography/pulsed flame photometric detection (HS-SPME-GC/PFPD)

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In numerous cheeses, volatile sulphur compounds (VSCs) such as methanethiol, hydrogen sulphide, and methylsulphides (dimethyl sulphide, -disulphide and -trisulphide) are amongst the key flavour compounds. They are mainly derived from the decomposition of the sulphur-containing amino acids cysteine and methionine. VSCs generally show low odour thresholds, and hence their sensory properties are very pronounced even at low concentrations. Therefore, a variation of VSC concentration can significantly influence a cheese's flavour. However, since VSCs are highly volatile and reactive compounds, their analysis remains a challenge [1-5].

Here we report on VSCs in commercial Swiss Tilsit cheese. Target compounds were determined using head-space solid phase microextraction and sulphur specific detection on a gas chromatograph equipped with both mass spectrometry and pulsed flame photometric detection (HS-SPME-GC-MS/PFPD). Internal standards were employed to account for variations in extraction and analysis. In order to obtain information on odour quality and impact of target VSCs on the overall cheese flavour, samples were additionally analysed by HS-SPME-gas chromatography-mass spectrometry-olfactometry (HS-SPME-GC-MS-O).

More than a dozen VSCs were detected in different concentrations in Swiss Tilsit cheese. Hydrogen sulphide (H_2S), methanethiol ($MeSH$), dimethyl sulphide (DMS), methyl thioacetate (MTA), dimethyl disulphide (DMDS) and dimethyl trisulphide (DMTS) were found at ppb and ppt levels. In addition, carbonylsulphide (COS), carbon disulphide (CS_2), dimethylsulfoxide (DMSO) and dimethylsulfone (methylsulfonylmethane, MSM) were identified. GC-Olfactometry revealed that H_2S , $MeSH$, DMDS and DMTS were the only VSCs to have a perceivable odorant impact on the olfactometry profile of the tested cheese samples.

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