**Unravelling the unravelled:** **Microfibrillated cellulose as texture modifier in liquid and semi-solid foods**

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Ever increasing concerns about climate change and the obesity pandemic cause food manufacturers and researchers to explore new sustainable and healthy food ingredients. The suitability of fibrous materials from citrus peels as low-caloric clean label food thickeners was explored. Two types of microfibrillated cellulose (MFC) were studied (dispersed MFC fibrils and spray-dried MFC particles) and their effect on sensory, rheological, tribological and morphological properties was determined in several liquid and semi-solid (model) foods. These properties were compared to those of a selection of commonly used thickeners (xanthan gum, chemically modified starch, native waxy corn starch). Relationships between sensory and physico-chemical properties were explored to elucidate mechanisms behind their perception.

The results presented imply that MFC prepared from citrus fibre can thicken liquid and semi-solid foods already at low polymer concentration (0.2-2.0 wt%) [1]. The material provides rheological properties that make MFC highly suitable for use in foods. A wide range of shear viscosities can be obtained, the material exhibits a yield stress and its shear-thinning behaviour is similar to that of commonly used food thickeners. Foods thickened with MFC demonstrate sensory texture properties similar to foods thickened with chemically modified starch, a polymer that is frequently used in commercial (low-fat) products [2]. Compared to xanthan gum, MFC can thicken foods in a similar way while avoiding sticky, slimy and mouthcoating texture. MFC can moreover be spray-dried in the presence of maltodextrin to improve its implementation in foods, without losing its ability to enhance viscosity, sensory thickness and creaminess [3]. MFC thus shows potential as a low-caloric clean label food thickener, which can moreover be obtained from (agricultural) plant sources.

[1] Blok, Bolhuis, Kibbelaar, Bonn, Velikov, Stieger. Comparing rheological, tribological and sensory properties of microfibrillated cellulose dispersions and xanthan gum solutions. Food Hydrocolloids 121 (2021) 107052.

[2] Blok, Bolhuis, Arnaudov, Velikov, Stieger. Influence of thickeners (microfibrillated cellulose, starch, xanthan gum) on rheological, tribological and sensory properties of low-fat mayonnaises. Food Hydrocolloids 136 (2023) 108242.

[3] Blok, Bolhuis, Velikov, Stieger. Spray-dried microfibrillated cellulose particles as texture modifier in liquid foods and their effect on rheological, tribological and sensory properties. Food Hydrocolloids 138 (2023) 108398.