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Yogurts with an increased protein content and physically modified starch: rheological, structural, oral digestion and sensory properties related to enhanced satiating capacity

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Abstract

Protein is the most effective food macronutrient providing a satiating effect. Thus, formulating dairy foods with increased protein contents can help to modulate food intake. Oral perception cues also contribute an increased perception of satiating capacity when the oral residence time and handling are longer and more laborious. In the present work, yogurts were prepared with double skimmed milk powder (MP) and whey protein (WP), as well as a control (C) without extra protein. Three more samples were prepared by adding 2% of a physically modified starch to each (CS, MPS and WPS, respectively), in order to increase the consistency and impart creaminess. Rheological tests were used to characterize the flow and viscoelastic properties of the samples before and after saliva treatment, and their microstructure was observed. Finally the differences in sensory perceptions elicited by the samples were related to consumers' expected satiating capacity and liking scores. Before *in vitro* oral digestion, MP showed denser areas than C; in WP, two protein networks could be distinguished. In the samples with added starch, starch granules were embedded in the protein networks. After *in vitro* oral digestion the protein tended to aggregate; the starch granules maintained their structure indicating that they were not broken down by the saliva. These observations were related

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