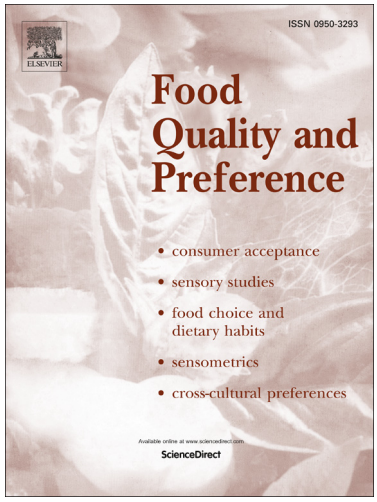

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Whey protein mouth drying influenced by thermal denaturation

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Abstract

Whey proteins are becoming an increasingly popular functional food ingredient. There are, however, sensory properties associated with whey protein beverages that may hinder the consumption of quantities sufficient to gain the desired nutritional benefits. One such property is mouth drying. The influence of protein structure on the mouthfeel properties of milk proteins has been previously reported. This paper investigates the effect of thermal denaturation of whey proteins on physicochemical properties (viscosity, particle size, zeta-potential, pH), and relates this to the observed sensory properties measured by qualitative descriptive analysis and sequential profiling. Mouthcoating, drying and chalky attributes built up over repeated consumption, with higher intensities for samples subjected to longer heating times ($p < 0.05$). Viscosity, pH, and zeta-potential were found to be similar for all samples, however particle size increased with longer heating times. As the pH of all samples was close to neutral, this implies that neither the precipitation of whey proteins at low pH, nor their acidity, as reported in previous literature, can be the drying mechanisms in this case. The increase in mouth drying with increased heating time suggests that protein denaturation is a contributing factor and a possible mucoadhesive mechanism is discussed.

Keywords

Whey protein; drying; mucoadhesion; denaturation; sequential profiling; particle size.

Abbreviations

β-LG	β-lactoglobulin
ANOVA	Analysis of variance
DLS	Dynamic light scattering
QDA	Quantitative descriptive analysis
RM-ANOVA	Repeated measures analysis of variance
WPC	Whey protein concentrate