

Abstract

Assessment of the Possibility of Using Differential Scanning Calorimetry in Thermal Analysis of Fat Isolated from Whey Protein Concentrate [†]

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Abstract: The aim of the study was to assess the possibility of using differential scanning calorimetry (DSC) in thermal analysis of fat isolated from three commercial whey protein concentrates (WPC) containing 80% of whey protein in dry matter. In the first stage of the research, fat was extracted from WPC using the Folch method, and the fat fraction was analyzed for the fatty acid composition by gas chromatography (GC). In the next stage, the thermal properties of the fat were analyzed by DSC by determining the temperature and enthalpy of phase transitions of individual triacylglycerol fractions. The fatty acid profile of the tested samples was similar with the literature data for cow's milk fat, which is dominated by saturated fatty acids (>60%), and the highest content is shown by palmitic acid (~30%) and oleic acid in the *cis* conformation (>23%). The fatty acid composition was related to the DSC melting profiles, where endothermic peaks of the low and/or medium and high melting triacylglycerol fractions in the temperature range of -5.5 °C to 35 °C were observed.

Keywords: whey protein concentrate; fatty acid composition; differential scanning calorimetry

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