



Abstract

# Assessment of the Possibility of Using Differential Scanning Calorimetry in Thermal Analysis of Fat Isolated from Whey Protein Concentrate <sup>†</sup>

Diana Mańko-Jurkowska \* , Agnieszka Górńska and Jakub Łukasiewicz

Department of Chemistry, Institute of Food Sciences, Warsaw University of Life Sciences, 02-787 Warsaw, Poland

\* Correspondence: diana\_manko\_jurkowska@sggw.pl

<sup>†</sup> Presented at the 3rd International Electronic Conference on Foods: Food, Microbiome, and Health—A Celebration of the 10th Anniversary of Foods' Impact on Our Wellbeing, 1–15 October 2022; Available online: <https://sciforum.net/event/Foods2022>.

**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% 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



**Citation:** Mańko-Jurkowska, D.; Górńska, A.; Łukasiewicz, J. Assessment of the Possibility of Using Differential Scanning Calorimetry in Thermal Analysis of Fat Isolated from Whey Protein Concentrate. *Biol. Life Sci. Forum* **2022**, *18*, 43. <https://doi.org/10.3390/Foods2022-12979>

Academic Editor: Arun Bhunia

Published: 30 September 2022

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

**Supplementary Materials:** The following are available online at <https://www.mdpi.com/article/10.3390/Foods2022-12979/s1>. Conference poster.

**Author Contributions:** Conceptualization, D.M.-J. and A.G.; methodology, D.M.-J. and A.G.; software, D.M.-J. and A.G.; validation, D.M.-J. and A.G.; formal analysis, D.M.-J. and J.Ł.; investigation, J.Ł.; resources, D.M.-J. and J.Ł.; data curation, D.M.-J. and J.Ł.; writing—original draft preparation, D.M.-J. and J.Ł.; writing—review and editing, D.M.-J.; visualization, D.M.-J. and J.Ł.; supervision, D.M.-J.; project administration, D.M.-J.; funding acquisition, D.M.-J. All authors have read and agreed to the published version of the manuscript.

**Funding:** Research equipment was purchased as part of the “Food and Nutrition Centre—modernization of the WULS campus to create a Food and Nutrition Research and Development Centre (CŻiŻ)”, cofinanced by the European Union from the European Regional Development Fund under the Regional Operational Programme of the Mazowieckie Voivodeship for 2014–2020 (Project No. RPMA.01.01.00-14-8276/17).

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The authors declare no conflict of interest.