

Abstract

NUTRALYS[®] Pea Protein and NUTRALYS[®] S85 Plus: A Range of High Nutritional Quality Pea Proteins with Characteristic Digestion Profiles [†]

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[†] Presented at the 14th European Nutrition Conference FENS 2023, Belgrade, Serbia, 14–17 November 2023.

Abstract: The objectives of the present research were to investigate (1) the nutritional quality through the Protein Digestibility-Corrected Amino Acid Score (PDCAAS); (2) the apparent viscosity under simulated in vitro gastric conditions of two pea protein isolates named NUTRALYS[®] pea protein and NUTRALYS[®] S85 Plus. In the first study, the in vivo protein digestibility was measured according to the methodology recommended by the FAO/WHO in 1991. Growing rats were fed a diet containing 10% proteins or a protein-free diet during a minimum of a 5-day balance period with daily collection of faeces. The true digestibility was measured using the rats' nitrogen intake and fecal nitrogen. PDCAAS was calculated using the amino acid profile and the protein digestibility. In the second study, in vitro gastric digestion was simulated using the NIZO SIMPHYD model. The profiles of “fast-” or “slow-digested” proteins were evaluated and compared to whey and casein proteins by measuring the evolution of the viscosity in these conditions. Both of the tested proteins displayed a balanced amino acid profile with high concentrations of arginine, branched-chain amino acids, lysine and glutamic acid. The true protein digestibility of NUTRALYS[®] pea protein and NUTRALYS[®] S85 Plus were 97% ± 2 and 96% ± 3, respectively. According to the FAO/WHO requirement profile (2007) mainly used in Europe for adults or the profile from 1991 mainly used in the United States for all age groups except infants, the PDCAAS results of NUTRALYS[®] pea protein were 93 and 81, respectively. The PDCAAS scores of NUTRALYS[®] S85 Plus were 92 and 81, respectively (Study 1). The digestion of NUTRALYS[®] pea protein resulted in a clear increase in viscosity during the gastric acidification and a sudden drop in viscosity after the addition of the gastric enzymes. The viscosity profile of NUTRALYS[®] S85 Plus did not change during digestion (Study 2). The range of pea proteins evaluated in these studies displayed a high nutritional quality profile. NUTRALYS[®] pea protein is an “intermediate-fast protein” and NUTRALYS[®] S85 Plus is a “fast-digested protein”, meaning that these ingredients can be adapted to specific nutritional needs. These results show that plant-based proteins, like those of the NUTRALYS[®] range, may allow us to design high-quality protein.



Citation: Guérin-Deremaux, L.; Perreau, C.; Lefranc-Millot, C.; De Jong, S. NUTRALYS[®] Pea Protein and NUTRALYS[®] S85 Plus: A Range of High Nutritional Quality Pea Proteins with Characteristic Digestion Profiles. *Proceedings* **2023**, *91*, 289. <https://doi.org/10.3390/proceedings2023091289>

Academic Editors: Sladjana Sobajic and Philip Calder

Published: 6 February 2024



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Keywords: plant-based; protein; nutritional quality; viscosity; fast-protein

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

Funding: This research was funded by Roquette.

Institutional Review Board Statement: The animal study protocol was approved by the Ethics Committee of animal experimentation of Nord–Pas de Calais CEEA 75 (00619.03 and 12/08/2015).

Informed Consent Statement: Not applicable.

Data Availability Statement: Data available on request due to restrictions (privacy, legal and ethical reasons).

Conflicts of Interest: Catherine Lefranc-Millot, Laetitia Guerin-Deremaux and Caroline Perreau are employees of ROQUETTE FRERES, that provided financial support for this research.

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