

Accepted Manuscript

Dry heating of whey proteins leads to formation of microspheres with useful functional properties

Elise Schong, Marie-Hélène Famelart

PII: S0963-9969(18)30532-5
DOI: [doi:10.1016/j.foodres.2018.07.004](https://doi.org/10.1016/j.foodres.2018.07.004)
Reference: FRIN 7744
To appear in: *Food Research International*
Received date: 5 April 2018
Revised date: 28 June 2018
Accepted date: 3 July 2018

Please cite this article as: Elise Schong, Marie-Hélène Famelart , Dry heating of whey proteins leads to formation of microspheres with useful functional properties. *Food Research International* (2018), doi:[10.1016/j.foodres.2018.07.004](https://doi.org/10.1016/j.foodres.2018.07.004)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Dry heating of whey proteins leads to formation of microspheres with useful functional properties

Elise Schong¹, Marie-Hélène Famelart^{1,*} marie-helene.famelart@inra.fr

¹STLO, UMR 1253, INRA, Agrocampus Ouest, 35000 Rennes cedex, France

*Corresponding author.

Abstract

Modification of whey protein isolate (WPI) powders is used in the food industry to enhance the functional properties of WPI. We investigated the impact of severe dry heating (DH) at 100°C for up to 36 h on an alkaline-treated (pH 9.5), spray dried (water activity of ~0.24) WPI powder. Dry heated powders and their reconstituted suspensions were analysed. DH for 0-6 h led to 47% loss of native proteins, increases in the levels of soluble aggregates (x2.2) and of advanced glycation end-products of the Maillard reaction (at least x2.7) and to powder browning (at least x3) with a 95% decrease in free lactose content. DH for at least 12 h led to a decrease in soluble aggregates with concomitant formation of large, stable and insoluble microparticles. These microparticles had a microsphere structure, contained 98% of water phase and were made of insoluble powder particles resulting from protein cross-links during DH. Microparticle size could be altered by varying the pH of the suspension: at pH 6.5, microsphere size was 3-5 times larger than powder particle size, but decreased as the suspension pH neared the isoelectric point. DH could be a useful method for producing functional protein ingredients as these microparticles had very high water retention properties and high viscosity values.

Keywords: Whey proteins; Microparticle; Dry heating; Aggregation; Maillard reaction; Rheology

Download English Version:

<https://daneshyari.com/en/article/8888397>

Download Persian Version:

<https://daneshyari.com/article/8888397>

[Daneshyari.com](https://daneshyari.com)