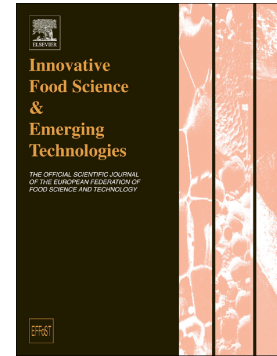


Accepted Manuscript

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PII: S1466-8564(17)30490-3
DOI: doi: [10.1016/j.ifset.2017.09.001](https://doi.org/10.1016/j.ifset.2017.09.001)
Reference: INNFOO 1839

To appear in: *Innovative Food Science and Emerging Technologies*

Received date: 3 May 2017
Revised date: 1 September 2017
Accepted date: 5 September 2017

Please cite this article as: Bettina Bellocq, Bernard Cuq, Thierry Ruiz, Agnès Duri, Kevin Cronin, Denis Ring , Impact of fluidized bed granulation on structure and functional properties of the agglomerates based on the durum wheat semolina, *Innovative Food Science and Emerging Technologies* (2017), doi: [10.1016/j.ifset.2017.09.001](https://doi.org/10.1016/j.ifset.2017.09.001)

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Impact of fluidized bed granulation on structure and functional properties of the agglomerates based on the durum wheat semolina

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Abstract - The granulation step determines the production yield and the final characteristics of the agglomerated couscous grains of durum wheat. The objective of the present work was to explore the capability of the fluidised bed technology to produce agglomerates of durum wheat semolina. The impacts of different processing conditions have been investigated on the structure and functional properties of the agglomerates. The size, shape, water content, compactness, and mechanical strength of the granules were measured. The fluidized bed agglomeration process has been found to produce agglomerates of durum wheat with different attributes compared to those produced by granulation using the low shear mixers. The results were discussed in regard to the hydro-textural approach, in order to get a better understanding of the mechanisms and relationships between process, structure, and properties. Two major agglomeration mechanisms contribute to the growth of the wet agglomerates: a fractal-structuring process followed by a phenomenon of densification. By studying the evolution of the compactness, diameter and water content, it was demonstrated that inter granular arrangements led to an expansion followed by a densification of the wet agglomerates. A relationship was proposed to describe the growth using a fluidized bed of the wet agglomerates of durum wheat semolina.

Keywords - Fluidized bed ; agglomeration ; couscous grains structure ; hydrotextral diagramm

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