

## **Influence of amylose/amylopectin ratio on wheat dough properties**

**Francesca Saitta<sup>1</sup>, Davide Emide<sup>1</sup>, Chiara Magni<sup>1</sup>, Gaetano Cardone<sup>1</sup>,  
Ermelinda Botticella<sup>2</sup>, Domenico Lafiandra<sup>3</sup>, Francesco Sestili<sup>3</sup>, Alessandra  
Marti<sup>1</sup>, Stefania Iametti<sup>1</sup>, Dimitrios Fessas<sup>1</sup>, Alberto Barbiroli<sup>1</sup>**

<sup>1</sup> Università degli Studi di Milano, Dipartimento di Scienze per gli Alimenti, la Nutrizione e l'Ambiente (DeFENS), Via Celoria 2, 20133, Milano, Italy, francesca.saitta@unimi.it

<sup>2</sup> National Research Council (CNR), Institute of Sciences of Food Production (ISPA), Via Provinciale Lecce-Monteroni, 73100, Lecce, Italy

<sup>3</sup> Università degli Studi della Tuscia, Dipartimento di Scienze Agrarie e Forestali (DAFNE), Via San Camillo de Lellis snc, 01100, Viterbo, Italy

**Keywords:** Starch, Amylose/amylopectin ratio, Molecular interaction, Food matrices.

The different wheat components cooperate to determine both the nutritional value of the flours and the technological properties and quality of the derived food products. Recent studies have shown how doughs properties strongly depend on the quality and proportions of the constituents, such as starch, proteins (especially gluten), lipids, *etc.*, as well as on the intermolecular relationships established among them [1]. In this context, modern genetic strategies were developed to modulate the amylose-to-amylopectin ratio in wheat and other cereals, allowing to explore novel functionalities in the agri-food sector [2]. High amylose genotypes are responsible for lowering food glycaemic index and promoting beneficial colon fermentation [2]; conversely, low amylose lines correlate with higher digestibility products and proved to increase sensorial quality of such products [3].

Here we present a study where a set of bread wheat genotypes with an amylose gradient from 0 to 65% on the overall starch were compared to shed light on the role of unbalance amylose-to-amylopectin ratio on protein action (gluten network formation, aggregation, *etc.*). Water competition between starchy and protein phases was considered, and thermal analysis (DSC and TGA) was applied to support spectroscopic and rheological data about the overall behaviour of the systems upon heating.

### **References**

- [1] M. Jekle, K. Mühlberger, T. Becker, *Food Hydrocoll.*, 54 (2016) 196
- [2] E. Botticella, D. V. Savatin, F. Sestili, *Front. Plant Sci.*, (2021) 1959
- [3] M. Bhattacharya, S. V. Erazo-Castrejón, *et al.*, *Cereal chem.*, 79 (2002) 178

## **Relaxation behavior of Ge<sub>25</sub>Se<sub>75</sub> and As<sub>20</sub>Se<sub>80</sub> studied by DSC**