

THE USE OF HIGH AMYLOSE SVEVO TO IMPROVE THE NUTRITIONAL PROPERTIES OF DURUM WHEAT PRODUCTS IN MEDWHEALTH PROJECT

MANCO A.*, BRUNO G.**, D'AMICO L.*, DURANTE M.*, MILANO F.*, PALOMBIERI S.**
, VOLPATO M.***, GIUBERTI G.****, CALABRISO N.*****, MASSARO M.*****,
SCODITTI E.*****, CARLUCCIO M. A.*****, SESTILI F.**, LADDOMADA B.*

*) Institute of Sciences of Food Production-ISPA, CNR, Italy

**) University of Tuscia, DAFNE-UNITUS, Italy

***) Grandi Molini Italiani SpA, Italy

****) Università Cattolica del Sacro Cuore, Piacenza, Italy

*****) Institute of Clinical Physiology, IFC (CNR), Italy

durum wheat breeding line, resistant starch, bioactive compounds, glycaemic index, glycaemic load

This study was undertaken within MEDWHEALTH, a project funded by the EU under the PRIMA program for Research and Innovation solutions in the Mediterranean region. The project aims at developing durum wheat derived products typical of the Mediterranean Countries with improved nutritional and health properties [1]. Several innovative materials were considered in the project, including a durum wheat line with high amylose (HA) content developed from cv. Svevo by modifying the starch biosynthesis through TILLING. In this study, Svevo-HA was used to make several products (i.e. semolina, cooked and uncooked pasta, bread, crackers, breadsticks, and biscuits) which were compared with those derived from Svevo wild type for major bioactive compounds and antioxidant capacity. Individual polyphenols and isoprenoids (tocochromanols and carotenoids) were analysed by HPLC-DAD. In addition, other major qualitative components such as fibre, carbohydrates and glycaemic index were evaluated. By comparing the content of phenolic acids, tocochromanols and carotenoids across the Svevo and Svevo-HA food samples, we observed a different quali-quantitative composition of phenolic acids and isoprenoids. We found that semolina and bread derived from Svevo-HA had higher total phenolic acids content than those from Svevo. Concerning the isoprenoids profile, the carotenoids and tocochromanols were not significantly different in semolina and bread

derived from the two durum wheat lines. Carotenoids and tocopherols were higher in uncooked Svevo-HA pasta compared to the corresponding Svevo-WT product. We also observed that Svevo-HA semolina and the derived food products had lower starch digestibility and glycaemic index compared to Svevo. These results demonstrate that the altered content of amylose and amylopectin in Svevo-HA is important to improve several aspects of the nutritional quality of traditional Mediterranean durum wheat-based products.

References

1. Romano, G.; et al. Phytochemical Profiling and Untargeted Metabolite Fingerprinting of the MEDWHEALTH Wheat, Barley and Lentil Wholemeal Flours. *Foods* 2022, 11, 4070.
2. Sestili F. et al. D. TILLING mutants of durum wheat result in a high amylose phenotype and provide information on alternative splicing mechanisms. *Plant Sci.* 2015, 233, 127–133.

Funding: PRIMA Section 1, 2020 Agrofood Value Chain IA Topic: 1.3.1–2020 (IA), MEDWHEALTH, project grant no. 2034.