

A HIGH-THROUGHPUT SNP-BASED APPROACH FOR THE TRACEABILITY IN THE ITALIAN PASTA SUPPLY CHAIN

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Recently, the growing interest in “high-quality and healthy” food has spread widely both in home cuisine and restaurants. People want to know what they eat and where the food components come from.

Pasta is one of the most popular foods worldwide and Italy is the first country for its consumption and the second world producer. According to Italian law, dry pasta can be made exclusively with durum wheat.

The project “Digitalization Processes of Public Administrations and Production Areas According to the Guidelines of the Industry 4.0 Program” of the University Consortium for Socioeconomic and Environmental Research (CURSA) aims, among others, to help all the stakeholders of the pasta supply chain, through advanced digital services that, in real-time, allow to know the progress of durum wheat production, in terms of qualitative factors (such as protein content, or yield-related parameters) in more than 70 stock centres located throughout Italy (details in <https://granoduropasta.unitus.it/>).

In this context, traceability, in its broader meaning, is one of the main targets to pursue, including molecular traceability that allows to detect the presence of specific durum wheat cultivars throughout the pasta chain.

The project, which just started, foresees the characterization, by SNP

analysis identified by using the 7K Wheat Array (TraitGenetics GmbH, Gatersleben, Germany), of a large number of cultivars commercialized by breeding companies, representing the most cultivated durum wheat in Italy in 2022 and 2023. Among the expected results, there is the creation of an SNP database useful for cultivars discrimination along the food chain. For this purpose, the genotyping will be performed through the use of the Biomark X9 (Standard BioTools, California, US), an innovative instrument able to perform up to 9216 nanoliter-scale SNP analyses simultaneously. A high throughput system is essential because of the high number of samples, which includes those collected at the sowing, harvesting, milling and pasta-making stages, in different farms distributed throughout the Country, in the two years of project duration.

This strategy will be cost and time effective and may become a turning point for the molecular traceability of durum wheat in Italy.