

# 2<sup>nd</sup> Workshop of Food Waste Recovery & Open Innovation

**PROGRAMME & ABSTRACTS**

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**What we do**

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## Food enrichment with by-products of winemaking: results of physico-chemical, nutritional and sensory effects

R. Marchiani, M. Bertolino, D. Ghirardello, S. Belviso, M. Giordano, G. Zeppa

Dept. of Agriculture, Forest and Food Sciences (DISAFA), University of Turin, Grugliasco, Italy

[giuseppe.zeppa@unito.it](mailto:giuseppe.zeppa@unito.it)

### Abstract

Grape pomace (GP), composed by a mix of grape seeds and skins, corresponds to approximately 62% of the waste generated during winemaking. Although part of GP is distilled for ethanol extraction, the majority of this material is wasted with several environmental and economic issues. Since GP is a source of polyphenols, it has been proposed as functional ingredient in order to create novel foods with enhanced nutritional value minimizing the volume of agricultural wastes. Therefore, the objective of researches performed in the last years by DISAFA was to evaluate the feasibility of using GPs obtained from different varieties (Chardonnay, Moscato, Barbera, Pinot Noir, Muller etc.) in different functional foods like yogurt<sup>2</sup>, semi-hard and hard cheeses<sup>1-3</sup>, beer, bread, pasta, cakes, meat, beverages and others<sup>4</sup>. GPs powder were added at different concentration (6% for yogurt; 0.8 and 1.6% for cheeses; 2% for beer and so on). The effect on physico-chemical characteristics, total phenolic content, radical scavenging activity and sensory acceptability were evaluated during the storage (3 weeks for yogurt) of the products and the ripening for cheeses (30 days for semi-hard and 6 months for hard cheese). The addition of grape skin flour in yogurt done a significant increase of total phenolic compounds (TPC) and radical scavenging activity (RSA) with respect to control one. The TPC and RSA values of fortified yogurts were retained during yogurt storage and no significant changes were observed. Another example of application of GPs on food was for the manufacture of Toma-like and Cheddar cheeses. Also in this case the addition of GPs had no effects on gross composition of the resulting cheeses. The most important results highlighted, attributable to GPs addition to cheese, were a higher antioxidant activity and phenolic content in all fortified cheeses, but to obtain a significant increase of cheese antioxidant activity it is necessary to add at least 1.6% of GPs. During ripening, the addition of non-sterile GPs did not interfere with starter and non-starter lactic bacteria and cheese proteolysis. The use of GPs containing antioxidants as ingredient in cheesemaking is thus a new approach to achieve a functional cheese. However in order to obtain a real beneficial effect on human health, further studies are required to investigate in more detail the antioxidants' bioavailability of these novel products. Fortification/enrichment with the appropriate amount of grape antioxidant dietary fibre only allows for the labelling of foods as fibre-rich, while other possible health claims must be substantiated by specific studies.

### Keywords

grape by-products, yogurt, cheese, polyphenols, sensory analysis

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### References

1. Torri L., Piochi M., Marchiani R., Zeppa G., Dinnella C., Monteleone E. (2016). A sensory- and consumer-based approach to optimize cheese enrichment with grape skin powder. *Journal of Dairy Science*, 99, 194-204.
2. Marchiani R., Bertolino M., Ghirardello D., McSweeney P.L.H., Zeppa G. (2016). Physicochemical and nutritional qualities of grape pomace powder-fortified semi-hard cheeses. *Journal of Food Science and Technology*, 53(3), 1585-1596.
3. Marchiani R., Bertolino M., Belviso S., Giordano M., Ghirardello D., Torri L., Piochi M., Zeppa G. (2016). Yogurt Enrichment with Grape Pomace: Effect of Grape Cultivar on Physicochemical, Microbiological and Sensory Properties. *Journal of Food Quality*, 39, 2, 77-89.
4. Lavelli V., Torri L., Zeppa G., Fiori L., Spigno G. (2016). Recovery of winemaking by-products for innovative food applications. *Italian Journal of Food Science*, 28, 542-564.