

Process of Obtaining an Antioxidant Ingredient from Red Grape Pomace var. *Tempranillo* and Its Application in Fresh and Dry-Cured Meat Products

M. Rosario Ramírez (mariarosario.ramirez@juntaex.es), Jonathan Delgado-Adámez, Miriam Sánchez-Ordóñez, M^a Jesús Martín-Mateos, Matilde D'Arrigo, Esperanza Valdés.

Centro de Investigaciones Científicas de Extremadura. Instituto Tecnológico Agroalimentario (INTAEX). Badajoz. Spain

Aim

In the winemaking process, around the 25% of the weight of the grapes is transformed into co-products/wastes. Grape pomace is the main by-product of the enological industry and consist mainly of skin, pulp, stalk residuals, and seeds. It is rich in polyphenols, which have important bioactivity. Pomace is a seasonal by-product and in order to stabilize the product the application of relatively recent technologies, like hydrostatic high pressure, offers great advantageous. This technology would allow an integral use of the by-product while obtaining a natural ingredient with antioxidant activity. This ingredient could be applied for the preservation of fresh (burger) and dry-cured meat products ("salchichón")

Material and methods

Red grape pomace (*Tempranillo* variety) was thermally blanched (103°C, 1min), milled, vacuum packaged and treated by hydrostatic high pressure (600MPa/300s) (Hiperbaric Wave 6000/55).

Four types of **pork burgers** were manufactured: control (with salt and spices), low and high pomace burgers (with 0.5 and 1% of the valorized ingredient), with metabisulfite (sulfites). Burgers were stored 7 days at 5°C.

Four types of **dry-cured sausages** were manufactured: control (with salt and spices), low and high pomace sausages (with 0.5 and 1% of the valorized ingredient), with nitrites and ascorbic acid (nitrites). Dry cured products were matured for 45 days.

Results

The pomace was stabilized by the application of a thermal blanching to inactivate the polyphenol oxidase enzyme. This would preserve phenolic compounds. The reduction of microbial loads was reached by the combination of a thermal blanching and hydrostatic high pressure, HHP. All combined treatments reached a safe product ingredient, with high antioxidant activity and phenolic compounds, which could be utilized as antioxidant ingredient for meat products preservation.

Table. Changes in the total phenolic compounds content (mg 100g⁻¹), polyphenol oxidase (PPO), antioxidant activity (mmol Trolox g⁻¹) enzyme activity (% respect to initial) and microbiological counts (CFU g⁻¹) during the valorization process of the ingredient from red wine pomace.

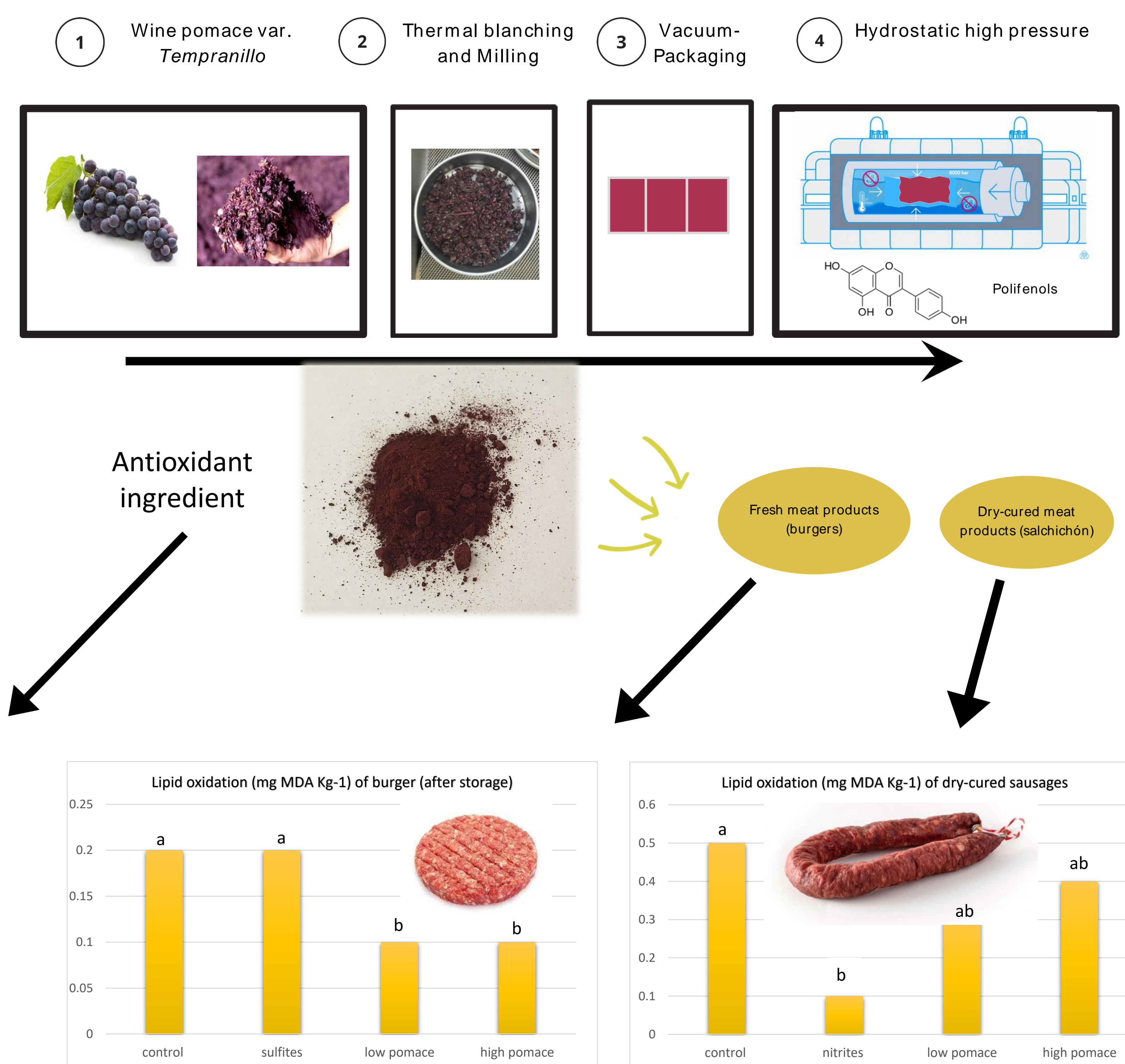
	Initial	Thermal Blanching	Thermal blanching + HHP
Phenolic comp.	467.5 ± 3.3b	506.9 ± 7.6a	486.0 ± 24.5ab
Antioxidant activity	4.9 ± 0.5b	4.9 ± 0.7b	6.0 ± 0.4a
PPO (%)	100.0 ± 4.9a	1.4 ± 0.0b	1.4 ± 0.0b
Mesophilic	2.9 ± 0.9	3.2 ± 0.2	2.9 ± 0.2
Moulds and Yeasts	2.0 ± 1.0	1.5 ± 0.6	<1
Enterobacteriaceae	2.1 ± 0.7a	<1b	<1b

HHP hydrostatic high pressure. Different letters in the same row indicate significant differences in the Tukey test.

The application of the valorized ingredient from red grape pomace was evaluated in fresh meat products (hamburgers) and dry-cured meat products (cured sausages) at levels of 0.5% and 1% (w/w). The effect was compared with a control batch (without the ingredient) and another batch manufactured with synthetic additives (metabisulfite for hamburgers and nitrites for sausages). An antioxidant effect was observed in both meat products, as the lowest levels of lipid oxidation were found in the batches containing the pomace ingredient

Acknowledgements

This research was funded by the project "Valorization of the by-products of the oenological industry through alternative technologies to conventional ones to improve the preservation of meat products" (IB20073) financed from the Junta de Extremadura and ERDF funds. Grant PRE2021-100168 funded by MCIN/AEI/ 10.13039/501100011033 and, as appropriate, by "ESF Investing in your future"



Conclusions

The antioxidant ingredient valorized from red grape pomace could serve as a natural antioxidant in meat products, such as fresh and dry-cured meat products and improve their shelf life.