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COMITÉ DE LA COMMUNAUTÉ ÉCONOMIQUE EURO-
PÉENNE INDUSTRIES COMMERCE VINS - CEEV



CENTRE DE RECERCA I INVESTIGACIÓ DE CATALUNYA
S.A.



MICROFLORA

NON-THERMAL PROCESS TO REPLACE USE OF SULPHITES AND OTHER CHEMICAL PRESERVATIVES IN EUROPEAN WINES TO MEET NEW EUROPEAN DIRECTIV

PROJECT NUMBER: 262507

PROJECT DURATION: 01.12.2010 – 31.01.2013

Coordinated by Fraunhofer IGB

FUNDING

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BACKGROUND

Wine is susceptible to spoilage due to microbial growth and oxidation. Yeast can grow during wine aging and storage and ferment small amounts of residual sugars, leading to turbidity, off-flavours and CO₂ production. Wine is also susceptible to oxidation, resulting in browning, loss of fruity aroma and aldehydic odours. Current accepted best practice to preserve wine is through the addition of sulphite in the form of sulphur dioxide (SO₂) E220 as antimicrobial and antioxidant agent. However, current EC regulations are demanding a significant reduction in the use of sulphur dioxide in wines due to health concerns. PreserveWine is a partnership of European SMEs that has identified a promising non-thermal process to achieve biological stabilization of wines while avoiding the use of chemical preservatives and keeping their high quality. Pressure Change Technology (PCT) is a low cost process with minimum energy use that has potential with further development and validation to reduce the use of sulphur dioxide in the winemaking process. PCT is a novel technique that involves charging a liquid product with pressure and an inert gas and then rapidly releasing the pressure. The sudden pressure release causes microbial cell walls to rupture, inactivating microorganisms. This process has been demonstrated on a small scale batch unit and in a semi-continuous process for fruit juices. Current development involves its scientific validation with wines and its scale-up into a continuous in-line pre-industrial demonstration unit.

PROJECT OBJECTIVES

- Repeated validation of the process to reduce microbial loading and protect wine from chemical and biological oxidation
- Enhanced organoleptic quality (aroma and taste) of wine when compared to "sulphited wine" when assessed by a trained taste panel
- Pilot scale demonstration of the PCT system capable of being integrated into a commercial winemaking process line, at flexible design for optional application at various processing stages
- Full HACCP compliance (risk assessment)
- Provide data to scale up to industrial capacity of 1.2 m³/h at energy costs of 40 % to comparable thermal processes



PreserveWine plant.

PROJECT PROGRESS

The PreserveWine Project successfully developed and validated a 120 L/h continuous PCT system to stabilize wine and wine must with high- pressure (500 bar), by significantly reducing microbial load and reducing the oxidation potential. Full safety and risk assessments were included and a certificate of conformity, provided by a German technical auditor (TÜV) was obtained. The novel PreserveWine system significantly reduced the amount of oxygen in wine, thus providing protection against oxidation directly after treatment and during long-term storage in bottles. Further positive effects included the protection of wine from colour changes (e.g. intensity of red colour) and the maintenance of physicochemical and sensory quality.

SOCIO-ECONOMIC IMPACT

According to the Comité Européen des Entreprises Vins (CEEV), the main objective of the wine CMO (Reg 479/2008) is "to increase the competitiveness of EU wines, by providing EU oenologist with the largest possible choice of oenological practices so that they can adapt their wines to changing consumers' demands. Sulphites are included in the positive list of allergenic substances to be labeled (annex III of Directive 2000/13). Therefore, the reduction of the SO₂ average dose without undermining the wine quality is an overall objective for the EU wines". Accordingly, PCT is a technology that has the potential to provide significant benefits when compared with existing techniques; especially in providing consumers the perception of a healthy, preservative-free product.

PROJECT STRUCTURE

