TRANSFORM

Nutraceutical extraction from Australian wine industry waste

The challenge

In 2019, the Australian wine industry crushed 1,730 kilotonnes of wine grapes to produce our wine. From this, 350 kilotonnes of grape skins and seeds (also known as grape marc) were leftover. According to CSIRO, they are the most abundant food loss stream in horticulture in Australia.

A reported 70% of this grape marc is aggregated and used to extract grape alcohol, tannins, tartaric acid, and to produce bioenergy. Unfortunately, the economic benefits of aggregating and utilising grape marc for lower value uses in the smaller wine regions have not yet stacked up. Consequently the remaining tonnes are not currently used and stay in smaller wine-growing areas such as the Yarra Valley, Mornington and Bellarine Peninsulas.

In these areas, Pinot noir is the most widely grown/crushed grape, leading to the creation of more than 1,500 tonnes of grape marc per annum.

The grape seeds in grape marc are also used in the production of grape seed extract, a highly sought-after ingredient in the Australian nutraceutical industry.

Our plan

The Australian wine industry prides itself on its clean and green image. It aims to utilise as much wine industry waste as possible, including the grape marc. Using this grape marc to produce grape seed extract is one of the most promising areas of waste valorisation.

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Australian Government
Department of Industry, Science, Energy and Resources

Business Cooperative Research Centres Program

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This project will initially aim to utilise 250 tonnes of predominantly Pinot marc, which is the preferred source of grape seed extract. It will work toward producing fully traceable Australian grape seed extract from the 2020 vintage to go into the Asian market as a premium product.

The laboratory stage validation, including technical feasibility and yield optimisation, has been achieved. Therefore, the next stage of commercialisation is moving from this proof of concept to a pilot-plant capable of producing the required quantity of grape seed extract for Swisse Wellness.

Should the project go according to plan grape seed extract production will be scaled up in year two, and the facility will be investigated for its potential to produce additional nutraceutical extracts.

Key contributors

Viridi Innovations Pty Ltd is an innovative start up company that has developed (in close collaboration with Swinburne University of Technology) a novel procedure to extract polyphenols from grape seed extract. The successful rolling out of their technology with an industrial scale pilot plant will validate their "waste to value" process that will allow for on-site processing of solid wine waste to produce polyphenols which are high in compounds with widely researched health benefits to serve the food and beverage and neutraceutical industry.

Austeng is a boutique engineering company that specialises in the design and manufacture of special purpose equipment for industry and will play a key role as a "tech enabler" working closely with Viridi and Swinburne to design, test and build the pilot plant.

Timeline

March 2020 - March 2021

Project leader

Professor Enzo Palombo
Swinburne University of Technology

Participants

Swisse

SWINBURNE UNIVERSITY OF TECHNOLOGY