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ALTERNATIVE PHYSICAL TREATMENTS TO SULFITES ON WINE

Introduction and objectives

Sulfites are a wide-used additive in the food industry since a long time ago because of its high effectiveness and cheap price, and wines are not an exception. Despite this, the populations' interest increase in clean labels is challenging the industry to find different ways to find alternative treatments with the same effects. The objectives of this final degree project will be:

- Understand the action mechanism of sulfites.
- See sulfite's pros and cons.
- See some of the alternative physical treatments and their viability.

Sulfites

Added in one of the 8 different permitted forms, sulfite is used as an antioxidant, antiseptic and color fixative because of its effectivity and low cost. It allows to the producer to control the microbiota in all the process stages, allowing to stop the fermentation process when they want or choose to inoculate to get the desired wine. Despite all the pros, it is considered as an allergen and there are reported health problems related to sulfites. In addition, social rejection has increased in recent years.

Alternatives

High Hydrostatic Pressure:

✓ Very effective against the microbiota, increase phenol extration in grapes, decrease polyphenol-oxidase activity

✗ High price, lack of information for the impact on aging process

Ultra High pressure Homogenitzation:

✓ Elimination of the microbiota, decrease polyphenol-oxidase activity, decrease higher alcohols levels(low quality wine odor), cheaper than HHP

✗ Necessity to inoculate the microbiota and increase of the fermentation time

UV light:

✓ More useful against bacteria than yeasts, partial inactivation of polyphenol-oxidase

✗ Can't stop fermentation, product turbidity dependent, technology doesn't allowed for wines because european legislation

Ultrasounds:

✓ More impact in yeasts because their size, useful for compound extraction, increase aging potential

✗ Volume dependent process, needs more studies

Pulsed electric fields:

✓ Efective against microbiota, low-frequency PEF allows to increase yeasts performance, increase polyphenols extraction

✗ Not a total microbiota inactibation, needs more studies

Conclusions

Nowadays, there is not an alternative treatment that can substitute sulfites at all. All of them have their pros and cons, but the viability in industry is not clear yet and more studies are needed.

In addition, wine is a complex product with many variables, so we will need to see how our product will react to the treatments and if it will develop as expected.

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