
Technical notes

Wines heat stabilised with Aspergillopepsin enzymes are now accepted by major export markets

The AWRI has previously reported on a new way to protein stabilise wines using the enzymes Aspergillopepsin 1 and 2 (AWRI publication #1444, AWRI publication #1500, AWRI publication #1621). This novel process was scaled up from the laboratory bench to pilot scale industry trials in 2011, and then to commercial wines made by two companies during the 2012 vintage. Wines from that trial (Chardonnay, Riesling and Sauvignon Blanc) have recently been tested, and remain heat stable three years after treatment.

However, one impediment to the application of this technology in industry has been the need to gain regulatory approval for wines made using this process in Australia's major export markets. The AWRI, in collaboration with Wine Australia, has actively pursued those approvals, which have now been obtained.

An application was made by the AWRI to Food Standards Australia New Zealand (FSANZ) to amend the Australia and New Zealand Food Standards Code to include Aspergillopepsin 1 and 2. The application was successful, and the change was gazetted on 4 December 2014 (Commonwealth of Australia Gazette 2014). That approval not only allows wines which have been protein stabilised using the enzymes to be sold throughout Australia and New Zealand, but was a necessary first step to gaining approval in other parts of the world.

AT A GLANCE

What are Aspergillopepsin enzymes and what are they used for?

Aspergillopepsin 1 and 2 are enzymes which have the ability to degrade haze-forming proteins in grape juice, rendering the resulting wine 'heat stable'.

How do they work?

The enzymes are added to juice pre-fermentation. The juice is then heated to unfold the proteins, allowing the enzymes to degrade them.

What are the advantages?

The use of these enzymes eliminates the need for bentonite, with obvious savings in labour and logistics in the winery. Additionally, unlike bentonite, no lees are created by the enzyme treatment, so there are no lees to dispose of, and no wine is lost. Economic analysis of the process demonstrates substantial cost savings compared to batch bentonite treatment, with the cost being comparable to in-line bentonite addition.

Who should I contact if I need help or have feedback?

Please feel free to contact the AWRI with any queries or comments regarding the use of Aspergillopepsin enzymes to protein stabilise your wines.

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It should be noted that the FSANZ approval is for the two specific enzymes, and does not automatically relate to commercial products containing those enzymes. The AWRI advises wine producers to seek assurance from their suppliers that all wine additives and processing aids are compliant with all relevant food standards.

Australia and New Zealand are both members of the World Wine Trade Group (WWTG), along with Argentina, Canada, Chile, Georgia, South Africa and the USA. The members have an 'Agreement on Mutual Acceptance of Oenological Practices', which came into force in 2002. Under that agreement, each country accepts the oenological processes of the other members, upon formal notification of changes being provided. Notification of the inclusion of Aspergillopepsin 1 and 2 in the Australia and New Zealand Food Standards Code was provided to the WWTG by Australia's representative from Wine Australia, at a meeting held on 30 April 2015, and consequently from that date, wines made using the Aspergillopepsin enzymes can be exported to the member countries.

With regard to the European Union, on 1 December 2008 Australia and the European Community signed an international wine agreement which came into force on 1 September 2010. Annex 1 of that agreement contains a list of 'oenological practices and processes authorised for wines originating in Australia, under conditions laid down in Australian rules and in particular the Australian Wine and Brandy Corporation Act 1980, Trade Practices Act 1974, and the Australia New Zealand Food Standards Code'. Item 15 on that list includes 'enzymes approved for food usage'. Because Aspergillopepsin 1 and 2 have now been approved for food use under the Australia New Zealand Food Standards Code, wines in which they have been used can be exported into the European Union.

Similarly, China's food standard GB 2760–2014 states that enzymes produced from *Aspergillus niger* and *Aspergillus oryzae* are permissible for use in wine, and the change to the Australia New Zealand Food Standards Code lists *Aspergillus niger* as a permissible source of both Aspergillopepsin 1 and 2, and *Aspergillus oryzae* as a permissible source of Aspergillopepsin 1. Consequently, Australian wine producers can be confident that the use of these enzymes derived from *Aspergillus niger* and *Aspergillus oryzae* is not a barrier to exporting wine made with them to China.

The AWRI continues to hold stocks of the commercially made Chardonnay, Riesling and Sauvignon Blanc wines from the 2012 trial. In each case there are two wines, one having been treated with bentonite and the other with Aspergillopepsin 1 and 2. The AWRI is happy to supply bottles of these six wines to any wine producers, suppliers, or other interested parties who would like to taste them.

References

Commonwealth of Australia Gazette, Food Standards, FS 93, Amendment 151, 4 December 2014.

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