**Testing for allergenic residues in wine: a storm in a tea cup?**

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*A study was commissioned by Winetech in 2013 to determine whether it is necessary for wineries to have every batch of winetested for potential residues if allergenic proteins were used as processing aids during the winemaking process. Such a practice will not just be time consuming but also very costly. We are happy to report based on this study and similar studies done in Australia and Europe that the testing of every batch is not required if good winemaking practices in terms of the use of fining agents, as well as specific filtration guidelines, are followed. Producers who fine their wines, but intend to sell them unfiltered will have to label the allergenic agent used or alternatively test each batch, since residues above the OIV / EU legal limit of 0.25 mg/l may remain.*

**What the law requires:**

EU Commission Regulation (EC) No 607/2009, that deals with the labelling requirements of allergens in wine (when the ingredients used during the production of wines are still present in the final product), has been amended by EU regulation 579/2012 on 29 June 2012. This regulation determines that wine exported to, or produced in the EU, must be labelled for allergens (terms concerning sulphites, milk and milk-based products and eggs and egg-based products) under the following conditions:

* All wine from the harvests of 2011 and wine of the 2012 harvest, labelled before 30 June 2012, will be exempt from mandatory egg/milk allergen labelling.
* Wine of the 2012 harvest, labelled after 30 June 2012, will not be exempt.

**The South African study:**

The determination of allergenic fining agent protein residues in wines were done using an ELISA method. Sampling was done with the assistance of the SAWIS inspectors. Wine samples were requested from wine cellars who wished to participate in the project. These samples must have been treated with either casein (milk powder), egg white proteins (ovalbumin) or lysozyme. The winemaker was requested to declare the amount of allergen or fining agent that was added, the type of fining/filtering techniques used and the size of the filters, e.g. 0.6 μm filter.

**Study 1:**Samples were drawn at various intervals during the winemaking process: before fining, after fining, after bulk filtration, before bottling and after bottling. The sample set was red wines of the 2013 and 2014 harvests and therefore only comprised of wine processed with albumin or lysozyme.

**Study 2:**In addition to the voluntary sampling, a questionnaire was introduced on Wine Online for a period of one month for all certified wine submissions. Samples were collected from certified wines that were treated with allergens, which were then submitted to the laboratory for analyses. All the wines in the sample set were final bottled and labelled red and white wines, ready to be sold on the market or exported. These samples were analysed for the presence of casein, egg white and lysozyme and the results quantified for concentrations above 0.25 mg/l.

**The results:**

In **study 1** a total of 79 samples were collected for analysis. The sampling procedures were statistically sound. All wines were treated using with either ovalbumin (egg white) or lysozyme. Only four producers however used lysozyme. Ten g/hl of lysozyme was added to a relative small volume and even though the wines were not filtered, no residual lysozyme could be detected in the wine samples. A larger sample set will however have to be studied before a conclusive observation can be made in the case of this allergen.

The average dosage of albumin used by producers was between 2 and 3 g/hl of wine. All wines were fined between three and 11 days after production. All wines were analysed directly after fining, but before filtration, showed the presence of allergens at different concentrations, except for one wine. However, all wines that **were positive** for the presence of allergens, showed that **no residual allergen could be detected after the wine was filtered**. The size of the filters that were used for filtration was between 0.2 and 0.65μm. Only in one instance residual albumin was detected after filtration. The wine was then filtered with a filter size of 0.45μm and cold stabilised before bottling. The wine was re-analysed after bottling and no residual albumin could be detected.

In **study 2** a total of 43 samples were analysed. All wines in the sample set were final bottled and labelled samples that were ready to be sold in the market place or exported. Wines were fined using the following type of proteins: ovalbumin (egg white), casein and gelatine. Gelatine is not considered an allergen. Only one sample was treated with lysozyme and it tested negative for the presence of residual lysozyme. The size of the filters that were used for filtration before bottling was between 0.45 and 0.65μm. All bottled samples (both red and white wine) tested negative for the presence of residual albumin or casein.

**Conclusions from the SA study:**

In general wines that tested positive for the presence of allergens after fining, tested negative for the presence of allergens after filtration, with the exception of one wine. This suggests that filtration, using the correct filter size (between 0.2 and 0.65 μm), could indeed remove residual allergens from the wine **(if the dosages in this study is applied)** and therefore negate the need to label or test for allergens and therefore save cost.

All certified final bottled and labelled wine in the sample set tested negative for the presence of residual albumen or casein. The levels of residual allergens were all found to be below the 0.25 mg/l detection level, above which allergen labelling becomes mandatory.

If a higher dosage of allergen was added to a smaller volume of wine, then the initial filtration after fining can be followed up by a second filtration just before cold stabilisation and bottling to ensure that all residual allergens are removed.

No correlation could be found between the initial dosage of fining agent added, the volume of wine and the quantified residual allergen remaining in the wine after fining. Literature suggests that different fining agents react differently with different wines and even with the same wine.

**Results from international studies:**

A 2015 publication by Elena Penas and co-workers reviews the allergen residue studies done over the past few years. Here are the results from some of the studies mentioned in the review:

* No detectable amounts of egg white with ELISA in four experimental wines treated with egg white at 4 g/hl; egg white detected with ELISA at a level of 0,2 mg/l when a dosage of 20 g/hl was used
* No detectable amounts of casein in four experimental wines fined with 6 and 30 g/hl potassium caseinate; treatment with bentonite and crossflow filtration after casein treatment leaves no detectable casein residues
* No ovalbumin detected with ELISA above 1 mg/l in 40 commercially available Australian wines fined with egg white proteins
* No casein detected in with ELISA in 153 commercially available Australian wines
* The use of bentonite or sheet filtration, followed by sterile filtration can eliminate egg allergens

The authors conclude that in most of the studies they reviewed showed that most wines are free (below 0.25 mg/l) from allergens after bottling. However in some cases egg white proteins were detected after bottling and egg white residues are also more frequent than milk protein residues.

The removal of allergenic additives or fining agents can be optimised following specific guidelines set by the OIV. These guidelines can easily be followed by winemakers and labelling can be avoided.

For more results on international studies refer to the above mentioned open access review.

**References:**

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