

Ascertaining risk of an allergic reaction from consuming wine in Australia

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Declaration

‘I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.’

Creina S. Stockley

Summary

The first recorded risks to food safety date back to the Roman Empire and examples include the preservation of foods and adulteration of wine with the poisonous sweetener, lead acetate, which had fatal consequences for consumers. The latest recorded risks to food safety include allergies to food and food ingredients, which are increasing in prevalence and with life threatening consequences. Allergens can occur unintentionally in foods such as wine, being ingredients not intended to remain in the final product. Such examples are the proteinaceous processing aids used in the clarification of wine, which are derived from egg, fish, milk or nuts, although a review of the published literature revealed no adverse reactions that had been attributed to them. As the basis of food allergy management is the complete avoidance of all foods that could contain the causative allergen, this has resulted in a reduction in choice of potentially safe foods for allergic consumers such as wine, until studies had been undertaken to ascertain their allergic potential. This body of research comprised four inter-related studies undertaken to ascertain the risk of an allergic reaction occurring in sensitive adult individuals from the consumption of protein-fined wine in Australia.

A series of four studies were the first undertaken to ascertain the risk of an allergic reaction in sensitive individuals from Australian wine fined with egg, fish or milk and products derived thereof, and/or to which nut-derived non-grape tannins were added. The four studies comprised: the development of sensitive and specific ELISAs for the candidate allergens in wine; the analysis of a diverse panel of 113 wines, 109 of which were produced with these proteinaceous processing aids; the development of an alternative *in vitro* assay (BAT) to predict the potential allergenicity of protein fined-

wines; and a food challenge of protein-fined and un-fined wines in 37 individuals, 26 of whom were food-allergic.

Sensitive and specific ELISAs were developed for the most abundant potent egg and milk allergens, and for peanut-derived allergens in wine. The level of detection was between 1-8 µg/L and is among the lowest for such assays. When the ELISA were applied to the panel of wines, no residual egg, milk or peanut-related protein was detectable in the protein-fined wines. Residual egg was only detected in two wines to which whole eggs had been added, and these wines were labelled as containing egg. In the food challenge with protein-fined and unfined wines, no clinically significant life threatening adverse reactions were elicited by the wines in the 37 individuals. The subsequently developed BAT was, however, insufficient sensitive to be an alternative to the ELISA or BAT but may be considered as an adjunctive tool to predict potential allergenicity.

This body of work therefore has ascertained that in this food-allergic population of adults, Australian wine fined with egg, fish or milk or to which non-grape, nut-derived tannin has been added and made according to good manufacturing practice, poses a low risk of allergic reaction attributable to allergenic residual proteins in wine.