

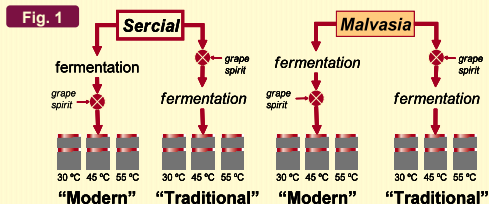
INTRODUCTION

Sercial and Malvasia wine samples were obtained from two production procedures: "Traditional" and "Modern", differences related with the moment when the grape spirit is added respectively before and after fermentation period. The wine musts were afterwards "baked" at three temperatures of 30°C, 45°C and 55°C, for three months and then submitted to one year of oak barrel maturation [1,2].

The experimental design objective was to choose among the samples in order to optimize the quality of the final product and the test objectives, (1) to screen if the panel was able to detect significant differences among the samples for different procedures at the same temperatures, (2) to compare seven samples for degree of typical character and (3) to obtain a measure of the reliability of the results.

MATERIALS AND METHODS

Wine Samples –Sensory tests were conducted using industrial trials samples in order to establish the correlation between two different procedures: "Traditional" and "Modern" at 30°C, 45°C and 55°C, for three months.



Sensory studies.

The sensory panel group consisted of Fifteen judges were selected based on previous acuity tests and sensory performances [3,4].

For training, four sessions were held, in each of which two samples of commercial wines were presented with eleven reference aroma standards to help the panelists identify and remember the sensory attributes found in the evaluated wine samples [5]. The compositions are listed in the Table 2.

Table 2. Attributes used for Training Sessions and Composition of reference standards

Aroma*	Composition
dried fruit	mixed dried fruit (raisins+prunes+figs)
nutty	mixed nuts (walnuts + almonds)
musty	verbally defined as "a damp basement"
cocoa	cocoa flavor (hot chocolate)
vanilla	Water solution of vanilla extract
cherry	mixture of cherry preserves and maraschino cherry extract
citrus	teaspoon of a mixture of orange/lemon natural extracts and grape
coffee	fresh brewed coffee
rum	dark rum
oak	American oak chips in a water solution
mushroom	fresh mushrooms
brown sugar	burnt brown sugar
Flavor by mouth*	
caramels	
sweet	
bitter	
alcohol	
astringent	

*Only available during training sessions
All the standards were presented in individual basic corked tu

For Triangle Tests, Two triangle test sessions were conducted for both Sercial and Malvasia wines, to determine if there was a detectable difference between the "traditional" and "moderno" procedures, under two different sets of conditions. In each tray were presented six wine samples for three temperatures 30°C, 45°C and 55°C. Panelists were told not to analyze the wine color just aroma.

For Ranking Protocol (Individual), Three (aroma/taste) ranking sessions of Sercial and Malvasia wines in a meaningful scale, were held in order to evaluate the sensory impact of baking temperature on the "typical character".

For Ranking Protocol (Global Sercial & Malvasia), Two (aroma) ranking sessions were conducted. The judges ranked samples in order of "typical character" aroma, in a meaningful scale, from 1 (most typical) to 6 (less typical) comparing to two references of both Sercial and Malvasia commercial wine samples.

Chemical Studies Gas Chromatography: GC-O analysis was employed using dichloromethane extracts in order to identify the substances responsible for the aromatic notes associated with descriptors [1].

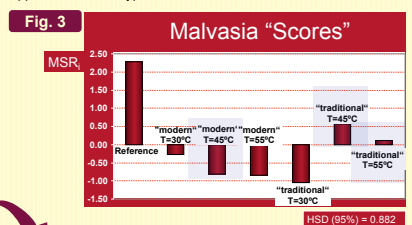
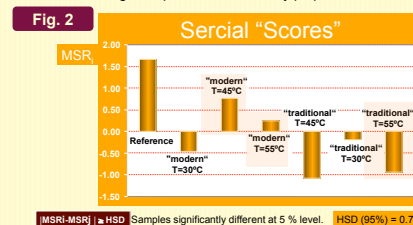
MADEIRA WINES:

sensory impact of two production procedures on the "typical character" of malvasia and sercial wines

RESULTS AND DISCUSSION

1 Triangle tests were conducted and results showed that wines were significantly different for different procedures at the same temperature. The sensory impact of baking temperature on the "typical character" of Madeira was evaluated by ranking. According to the grape varietal, baking temperature and production procedure three sets were held with six samples and one added reference of a commercial wine, unanimously recognized as "typical", for both categories.

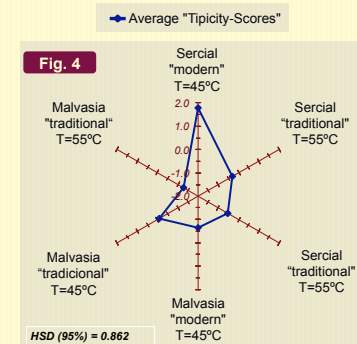
Ranks were converted to scores according to the Fisher and Yates method [3] and analyzed by analysis of variance to examine differences among wines. General correlation and other database mining methods were used to identify the production practice that have the largest impact on wine sensory properties and which one approaches to the typical character of Madeira Wine.



Process as well as Temperature played a major role on the perceived quality of the wines.

Panel ranked with statistical significance (95%), the "traditional" procedure for Malvasia and "modern" procedure for Sercial, as the most typical, at an optimal baking temperature of 45°C (fig 2 and 3).

2 Samples with high scores of Malvasia and Sercial were reevaluated by tipicity of the aroma ONLY, by the panel (fig 4).



✓ Sercial "modern" baked at 45°C were considered as the most typical !!!

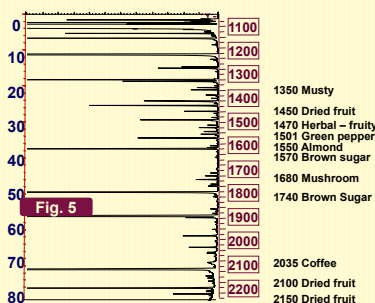
CONCLUSION

- ✓ Production procedures and its baking temperature relative to Malvasia and Sercial Wines can influence the typical character and then the perceived "quality". The panel ranked with statistical significance (95%), the "traditional" procedure for Malvasia and "modern" procedure for Sercial, as the most typical, at an optimal baking temperature of 45°C.
- ✓ The application of the "modern" production procedure only to Sercial wines may help reduce production costs while maintaining sensory quality.
- ✓ This work illustrates how to select a procedure that can be used by Madeira vineyard managers to achieve specific wine characteristics, leading to ability to perform precision production model in order to optimize quality.

3 On-Going Work

Identification of the Key substance responsible for the "aroma-quality" using by hyphenated techniques.

By GC-O analysis of Sercial "modern" T 45°C, it was possible to highlight nine odor-active zones presenting the typical odor descriptors selected by the panel (fig 5)



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This work was financially supported by Fundação para a Ciência e a Tecnologia (FCT), as part of the Projects - POCTI / AGRI / 47192 /2002. - "IMPACT" POCTI, Agencia de Inovação SA and FEDER