Chapter 4:9

Method development for brandy ageing based on oak chips use

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Introduction

After the distillation, spirits can be maturated from several months to many years in wooden barrels. Dissolution of wood components is thought to be of prime importance. Wood is known to add value to the quality of spirits during ageing. Oak wood has been used for well over two thousand years to support the ageing of alcoholic beverages. The qualities of oak wood which favour its use for the aging of spirits include its mechanical and working properties (durability, hardness, pliability, permeability) and the extractable compounds that it contains (tannins and aromatic components). Among the many factors known to influence final quality, the most important contributor is undoubtedly the oak barrel in which maturation takes place. During the time that the raw distillate spends in the barrel, major changes occur in the chemical composition of the spirit, resulting in a product which has matured and become more acceptable to the palate. This process, called ageing or maturation, considerably modifies the composition of the beverage, allowing the production of world’s most famous spirits.

Several factors, such as the kind of wood, the heat treatment of the barrels and the ageing time have a critical influence on sensory and physicochemical composition of these brandies (Van Jaarsveld et al, 2009).

Despite the positive impact on brandy quality, ageing in wooden barrels does have a downside. Costs increase in proportion to the length of the ageing period because capital is tied up. Wooden barrels are expensive and difficult to clean and to maintain. Evaporation from wooden barrels is higher than from stainless steel tanks.

Due to this fact, it would be interesting to explore alternative ageing systems (Singleton and Draper, 1961). Treatment with oak chips, especially charred or toasted chips, is considered to hasten brandy ageing (Schwarz et al, 2014). The simplest method of adding wood-derived compounds is the use of oak chips, which are increasingly used for the maturation of many brandies (Mosedale and Puech, 1998). Subject to some limitations, using oak chips is regulated. Among the few additives that are authorised for the production of appellation d’origine contrôlée (AOC) eaux-de-vie are wood extracts. Oak extracts obtained by the traditional method of preparation, by extracting oak chips with boiling water use only, are usually devoid of most volatile components, consisting primarily of oak tannins or their degradation products (Mosedale and Puech, 1998).

Currently, in Switzerland, many cider farms are interested in the performance of trials to diversify the product with apple brandy production. However, this need is being slowed down by the fact that at least few years of aging and a large volume of fruit spirit are necessary. Due to this fact, it is very interesting to have an alternative ageing system which allows minimising the aging time and the necessary volume of wine spirit and still producing a similar product to the one obtained by the traditional ageing system. The obtained products were compared by sensory evaluation. The objective of this study was to obtain an alternative aging method by using different oak chips which allowed us to obtain, in a short period of time and with a small volume of wine spirit, a product of a similar quality to the one obtained by the traditional aging system. For that purpose, we carried out a laboratory experiment applying different conditions with regards to the amount of wood shaving and the extraction method. The
Conclusion

It can be concluded that some of the samples obtained through accelerated aging by using wood chips for two months showed sensorial characteristics and an acceptance that are very promising. However, results obtained by the discriminative test suggest that it is too early to propose the alternative accelerated aging method as a validated tool to produce brandies with similar characteristics to those aged through a traditional process. Several improvements will be considered for further studies, notably the possibility of blending different extracts, based on chemical analysis of polyphenols and aromas.

References


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Table 1.

<table>
<thead>
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<th>Oak chips/ traditional</th>
<th>No answer</th>
<th>Answer expected</th>
<th>Answer correct</th>
<th>signif.</th>
<th>P value</th>
</tr>
</thead>
<tbody>
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<td>15</td>
<td>12</td>
<td>&lt;0.0001*</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Results of test 2 out of 5 (*Significant with the level of 99.9%. Treatment uses the binomial rule (or distribution) with 1/10)