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Will sustainability shape the future wine market?

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Abstract

Technical improvements in the sustainability of wine making will likely proceed thorough a progressive refinement of processing strategies without substantial discontinuities. The new varieties obtained through interspecific crossings represent a new technological paradigm with remarkable effects on cropping conditions. Indeed, vineyards planted with these new varieties require few treatments and result in a dramatic reduction in the pesticide use, production costs and carbon footprint. Wine consumption scholars should closely examine how the media will communicate these varieties to the general public, as we anticipate that this will influence consumers' perception of risk and, in turn, directly affect the market.

Keywords: New varieties; Consumer preferences; Denomination of origin

Sustainability has been the focus of international institutions and most national governments—although not always with the same emphasis—since at least 1987 when the United Nations World Commission on Environment and Development (Brundtland Commission) published the Report "Our Common Future". Sustainable development was defined as "development that meets the needs of current generations without compromising the ability of future generations to meet their own needs". The report made explicit the triple dimensions of sustainability: environmental, social and economic. The UN has recently relaunched its challenge for sustainable development with its 2030 Agenda for Sustainable Development, which proposes 17 Sustainable Development Goals. Since 1999, institutional concern for sustainability in the wine sector has been addressed by the International Organization for Grape and Wine (OIV) with a series of resolutions. The last resolution was the 2016 OIV General Principles of Sustainable Vitiviniculture - Environmental - Social - Economic and Cultural Aspects. During the same period, the agricultural policies of the main producing countries increasingly stimulated the evolution of production towards sustainability.

Institutional pressure has stimulated many initiatives in the wine industry, including a demand for policy compliance. Media pressure, retailers' concerns and specific local requests or, in many cases, a voluntary commitment to environmental and social issues has also played a part. Indeed, after the pioneering establishment of the California Sustainable Winegrowing Alliance in 2003, many different sustainable winegrowing programmes were developed through collaborative efforts driven by national institutions and associations in the so-called New World wine-producing countries (such as

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Australia, New Zealand, South Africa, and more recently, Chile). In the core European producing countries, different initiatives concerning single winegrowing areas or limited groups of winegrowers were first established (Corbo et al., 2014; Flores, 2018), resulting, in some cases, in the larger adoption of sustainability standards. Simultaneously, with growing interest in the larger adoption of production protocols that aim to make conventional viticulture and wine-making more sustainable (as California), a relevant growth of organic vineyards has developed worldwide (OIV, 2017).

Unfortunately, we do not know much about the impact on production costs and profitability of the transition towards more sustainable production processes or how critical it is for wineries committed to sustainability to conciliate environmental and social goals with economic sustainability. Two research projects that analysed the cost impact of the involvement in "conventional" sustainability programmes (Pomarici et al., 2015; Jourjon et al., 2016) show that when specific capabilities are available in managing obligations related to the sustainability schemes in the vineyard and in the winery, the adoption of such schemes does not have a negative impact on cost and profitability. The same conclusion may reasonably be drawn for organic production, considering its rapid expansion in cold and wet areas, where the control of fungal disease is more difficult.

Interestingly, the attention to sustainability issues by the wine industry seems anticipatory compared to consumer sensitivity. Nevertheless, in 2012, Lockshin and Corsi in their seminal review on wine consumer behaviour included, as clearly accepted knowledge, a specific subparagraph for the relation between sustainable/organic wine and consumers. "Sustainable/organic wines represent another area where wine marketing researchers should not dedicate much energy. It is known that a small segment of the population is willing to buy this type of wine. Segment size has been small, and it has not grown much …. Consumers seem to be unwilling to trade quality for a wine that is organic/sustainable and will not spend more for these wines compared to regular ones" (p.17). Nevertheless, this conclusion is strongly challenged by recent evidence in the wine consumer literature (see, for a complete review, Schaufele and Hamm, 2017) and by the increasing consumer demand for healthy and quality food and beverages in developed countries (Lee and Yun, 2015).

Indeed, several authors report that a considerable segment of consumers across different countries have positive perceptions towards sustainable wine (e.g., Mueller Loose and Remaud, 2013), and they also identify specific targets in the wine-consumer population, such as females with higher incomes and people living in urban areas (Woods et al., 2013; Pomarici and Vecchio, 2014).

Recently, Schäufele and Hamm (2017) identified and reviewed 34 articles (between January 2000 and March 2016) addressing consumer perceptions, preferences and willingness-to-pay for wine with sustainability characteristics. The authors concluded that the available results suggest that producing and marketing wine with sustainability features is a promising strategy for quality differentiation, particularly for wine that is both local and organic. However, the authors also warned that further understanding of consumers' attitudes and their buying motives regarding different sustainability attributes is needed.

An analysis of consumer interests clearly provides a dramatic stimulus for the wine industry to proceed towards a larger adoption of sustainable practices—to comply not only with institutional recommendations but also with consumer preferences. From this perspective, sustainability issues will become a crucial element in the development of competitive advantage of single wineries and of country wine-supply chains.

To take the maximum advantage of the sustainability-oriented changes in production processes, it will be necessary to better understand which sustainability attributes consumers are more sensitive to in order to focus changes in production processes and communication strategies.

Currently, the vast majority of available studies on sustainable wines have investigated consumer choices via stated preferences; future research should rely on revealed preferences to avoid social desirability bias (clearly very strong when dealing with sustainability). In addition, scholars should increase their efforts on moving their research settings inside real-market environments (such as wine stores, supermarkets and restaurants) to analyse all the factors that influence consumer preferences for sustainable wines, as it is now well acknowledged that individual hedonic responses are strongly influenced not only by internal factors but also by external, environmental cues. For instance, social pressures (such as towards sustainable choices) may more likely arise during a dinner with friends or colleagues at a wine bar than during a frugal lunch inside the household. Therefore, wine-consumer researchers should attempt to recreate an environment physically resembling the specific contextual situation they want to investigate (e.g., via virtual reality). Another important topic to be further investigated is the relationship between core wine attributes (such as brand awareness and information on the region of origin or denomination) and wine with sustainability characteristics. A thorough understanding of the interactions among these key attributes of sustainable wines can effectively guide firms in their marketing decisions.

Moreover, supplementary research should investigate consumers' taste expectations originating from sustainability features of a wine. For example, less wine-involved consumers could apply heuristics to assign higher value to sustainable wines, whereas regular wine drinkers might automatically process sustainable information as a proxy for lower sensory quality products. This possibility exists despite the recent paper by Delmas and Gergaud (2014) that shows that eco-labelled and organic wines receive better ratings by wine critics.

Finally, to maximise the value generated by efforts in the improvement of sustainability performance, we would like to highlight two innovative patterns that deviate from more traditional marketing strategies. As we believe that additional information disclosure, such as specific details on sustainability features, would have little impact on consumers'

choices (especially if too technical or complicated) and thus not increase awareness or subsequent sales.

A first alternative line of strategies relies on interventions in the choice architecture. For example, organising a dedicated physical space on the store shelf for sustainable wines could increase visibility and accessibility and, consequently, purchases. Clearly, this type of intervention can be arranged only with the support of retailers, who could, in fact, benefit from an enhanced social reputation by such actions.

A second interesting and quite novel research path is the investigation of the opportunities offered by crossmodal correspondences (i.e., the expected and actual taste of a product can be influenced by the different shapes and colours of the product's packaging) when promoting sustainable wines consumption. For example, sustainable characteristics could be consistently linked to a particular bottle (or label) shape and colour to foster market penetration and recognisability. In this case, strong cooperation should be created among sustainable wineries that can jointly decide the most promising tactics. Finally, we would like to emphasize that, while wine consumer preference heterogeneity is likely to continue to rise, common drivers of selection will most likely emerge among groups of individuals. For example, the vastly increased usage of social media in everyday life by younger generations will progressively urge wineries to efficiently communicate their sustainability efforts through these media. Consequently, wine-firm managers—and oenologists—will have to radically increase the amount of interactions with the final consumers (as via pictures, stories and live streaming) that were previously committed to sales agents, retailers, or restaurant owners.

Trying to analyse how the sustainability issues impact the wine industry and, above all, how they may impact in the future, it is reasonable to consider that the environmental awareness of consumers, at least in the areas and social classes more interested in wine, is likely to increase, as signalled by the planetary consensus for Greta Thunberg initiatives. The consequence of such evolution is probably that the results in terms of social and, specifically, environmental sustainability already obtainable with the adoption of "conventional" sustainable protocols or with organic protocols, could no longer be sufficient for consumer expectations. Therefore, the wine industry will likely be forced to search for more sound/relevant results in grape production and wine making.

Starting from wine making, it is expected that it will be necessary to deeply modify processing protocols, reducing, at minimum, the use of additives and processing aids and of energy intensive physical oenological practices. The probable changes in wine labelling in the European Union could represent a further stimulus. Moreover, it will be necessary to reduce the environmental impact of bottles and packaging, which are currently among the main factors of the wine production carbon footprint. Regarding this point, it is possible to emphasize that a transition towards the use of lighter bottles and packaging would be much easier with a clear endorsement of the wine critics community.

The search for improvement in wine making sustainability will likely proceed thorough a progressive refinement of processing strategies without substantial discontinuities. The perspective in grape production is, on the contrary, very different. As already illustrated in this journal by Montaigne et al. (2016), the research has already made available new varieties obtained by conducting interspecific crossings (*Vitis vinifera* and other species of the genus *Vitis*) followed by "back-crossing" or "introgression". These varieties have a very high percentage of *V. vinifera* genes (approximately 99%), and the derived wines offer *Vinifera quality* but with factors of disease resistance to Downy Mildew and Oidium and fair adaptability to environmental stresses coming from the other *Vitis* species genotype. In fact, these new varieties represent a new technological paradigm of resistance to disease with the remarkable effect of cropping conditions. Vineyards planted with these new varieties require only one or two treatments, with a dramatic reduction of the pesticide use, production costs and the carbon footprint generated by the crop protection. This is a radically different situation with respect to the vineyards managed according to the principles of integrated pest management (sustainable protocols) or organic production (which also require a large use of copper, distributed through repeated treatments). The already available and authorized new resistant varieties are now relatively few, but as claimed by Montaigne and colleagues, "generations of varieties are arriving, offering a hyper-choice, and will be subject to tests in different contexts; the learning processes are at work". Of course, the adopting process is not straightforward. There are regulatory issues, as discussed also in this journal in the editorial by John Barker (2017), technical issues related to a risk of reduction in biodiversity and an insurgence of new disease and, finally, the need of consumers' acceptance.

Concerning consumers, to the best of our knowledge, only one study has been performed on the acceptance of new hybrid varieties (Espinoza et al., 2018). The authors show a positive attitude towards wines coming from these new varieties, but insights are scant or purely anecdotal. It is likely that consumer perceptions of this innovation will be largely driven by mass media coverage and reporting which, in turn, will at least in part be influenced by nurseries involved in new varieties multiplication and distribution, and wine producers already using new varieties or associations such as PIWI international. Therefore, wine consumer scholars should closely examine how the media could communicate hybrid varieties to the general public. We anticipate that this communication will influence consumers' perception of risk (not the objective, technical risk) and the naturality of the wine and, in turn, directly affect consumer choices and thus the final market demand.

Nevertheless, what is now possible to foresee is that, absent the case of specific negative events or the evidence of a poor oenological performance in most conditions that would determine a sudden sunset of their fortunes, these new varieties will change the competitive scenario of the wine market. The emergence of these new varieties may determine a new supply segmentation where, on the one side, there will be the intrinsically sustainable wines coming from the new varieties,

and on the other side, there will be wines coming from the traditional *Vitis vinifera* varieties. As a matter of fact, a new quality paradigm rooted in the minimal needs of pesticides and operations in the vineyard is challenging the traditional quality paradigm based on *Vitis Vinifera* varieties, which have made fortunes selling old world wines and the new world wine supply over the last 40 years. This new segmentation will stress current marketing strategies.

The supply based on a portfolio of traditional varieties, mainly the international varieties, will have to be revised. And customers will have to become accustomed to changing their cognitive references in wine choice, including to new varieties with new names, related or not with some *Vitis vinifera* varieties. The supply strategy based on GI should absorb the inclusion of new varieties without great effort in the New World producing countries, where the use of geographical name is mostly not subject to production rules concerning the applied variety. The impact of new varieties diffusion will be different in the European system of designation of origin (PDO wines) and geographical indication (PGI wines), where the use of a geographical name to identify a wine is conditioned by the respect of a self-established (by producers) and officially recognised set of rules, which includes admitted varieties (product specification). According to EU regulations, the new hybrids are already admitted in the production of PGI wines, and their use will be likely permitted in the production of wines with a designation of origin after the conclusion of the EU agricultural policy reforms currently in progress. This is an important preliminary condition, but the actual use of new varieties in the production of PDO and PGI wines will require changes in product specifications of the single PDO and PGI wines; this change can only happen after a negotiation among concerned producers who have to agree that the sensory profile of wines obtained using these varieties is consistent with the desired sensory profile. This process will likely be simple for PGI wines and is currently already happening; the case of PDO wines, at least in all cases where the reputation of the produced wine is strictly linked with a typical sensory profile, will be more difficult and eventually characterised by recognisable and well-known varietal sensory traits. If the confidence of consumers with new varieties grows rapidly, it is likely that European PDO wine producers will be forced towards difficult decisions: to change their product specification admitting new varieties, selecting among the available varieties consistent with their production style, or remaining faithful to the old varieties. A change would require accepting the minimisation of the environmental impact of production and reduced, unstable yields and becoming a niche segment, representing a new case of heroic viticulture that is witness to a past Golden Age of wine.

From the previous considerations, it appears clear that a critical point in the diffusion of the new varieties is their destructive potential concerning the supply/demand categories that currently shape the wine market worldwide and that offer a system of landmarks that orients producers and consumers, i.e., known popular varieties and the combinations between these varieties and places. The dismantling of this system would be risky. Indeed, researchers and nurseries are working hard to make available new resistant varieties that imitate the traditional varieties, both international varieties, such as Cabernet Sauvignon or Chardonnay, or local varieties (largely used in many countries). To reduce the risk of the loss of landmarks in the market, we highly recommended that an internationally recognised protocol be rapidly defined, which would eventually be patronised by OIV to certify the oenological equivalence between a new variety and a traditional variety. This strategy could facilitate a smooth adoption of the new varieties and a substantial improvement of wine sustainability without dramatic effects in the market. Regarding the possible effects of sustainability-oriented technical change on the wine sector, it is worth mentioning the introduction into the market of new varieties obtained via new techniques of genetic transformation, such as cis-genetic or genome editing. The actual availability of such novelties is not close, in part because of normative constraints. Anyway, the potential of these novelties seems much higher than those of new hybrids, and their introduction likely will have similar effects.

Conflict of interest

Authors have no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.wep.2019.05.001.

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