



**Citation:** Giulia Maesano, Giuseppe Di Vita, Gaetano Chinnici, Gioacchino Pappalardo, Mario D'Amico (2021) What's in organic wine consumer mind? A review on purchasing drivers of organic wines. *Wine Economics and Policy* 10(1): 3-21. doi: 10.36253/wep-9101

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**Data Availability Statement:** All relevant data are within the paper and its Supporting Information files.

**Competing Interests:** The Author(s) declare(s) no conflict of interest.

## What's in organic wine consumer mind? A review on purchasing drivers of organic wines

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**Abstract.** Consumer interest in organic wine is growing, but the effects of organic label, consumer quality perception and the support for the benefits claim of organic wine are not yet fully understood and at times doubtful. The literature shows a very heterogeneous picture regarding consumer behaviour and preferences for organic wine. This study seeks to understand the link between organic wine and consumer purchasing drivers. Using a systematic literature review, the paper explores the characteristics of consumer of organic wine, the motivation on consumer behaviour and preferences for organic wine, as well as the sensory quality and the presence of additives when evaluating wine quality and in shaping consumers' attitudes. The results show how socio-economic and psychological characteristics of consumer as well as quality perception affect their behaviour for organic wine. Little consensus on the benefits in terms of improved sensory quality of organic wine compared to conventional one. Among sensory qualities, taste has been found to be both a key driver and barrier to organic wine consumption. Based on literature studies, consumers have positive opinions toward organic wine, which is perceived as healthy and environmental friendly. However, despite the growing market interest in wine, scientific information about the organoleptic differences between conventional and organic remains scarce and the topic requires more in-depth analysis. Understanding the profile of consumer and the factors that influence consumer behaviour provide information to the organic wine industry.

**Keywords:** organic wine, consumer behaviour, taste, sensory quality, wine additive, sustainability, wtp.

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### 1. INTRODUCTION

Consumer demands for safer, better quality, and healthier foods has led to an increased demand for organic products [1].

The belief that organic products provide benefits for health [2,3], environment [4,5,6] and the high quality standards, such as better taste, are positively related to the attitude towards organic wine [7,8,9]. However, the sup-

port for the benefits claim for organic wines is not yet fully understood and at times doubtful in the literature.

Studies comparing organic and conventional wine show that positive attitudes and buying intentions consumers have about organic food in general do not seem to extend to organic wine. Interestingly, a study on wine consumption identified different consumer segments with preferences for organic food, but heterogeneous preferences for organic wine [9]. In line of this, in the survey of Janssen et al. [10] a quarter of the organic food consumers declared to not buy organic wine and may willing to buy more organic wine if their favourite type and variety of conventional wine would be available in organic production at similar quality and price levels [10].

The organic label on wine has been associated with a lower quality product, which is the reason why consumers tend to prefer organic wine to the conventional equivalents at lower prices [11]. Olsen et al. [12] provide possible explanations for consumers' resistance to purchasing organic wine showing that wine is primarily associated with sensory quality, which is the main feature underlying wine consumption [13].

Nowadays, even if there is the image of organic wines has improved, an important obstacle to its consumption is still the bad reputation linked to the wine taste [13,14].

From producer's point of view, because of the lack of clarity on the value added by organic method production and relative label, some wineries currently adopt organic practices without being certified. According to Delmas and Grant [14] some American organically wine-makers do not use organic label on the bottle or become certified but do not provide the information on their bottle label. The reason could be that most of these wineries think that there is a negative image linked to lower sensory quality, associated with organic wine. Also in Australian market the organic attribute receives a low value by the so-called "average Australian wine consumer" not willing to pay premiums for it [15,16]. Australians consumers do not value organic products in general, more than conventional ones and are not willing to pay more for sustainability features [17].

Despite the relatively low weight of organic wine in the overall wine market, many consumer studies identified the potential for increasing organic wine purchases [18].

In light of contrasting empirical findings on consumer perceptions of organic wine, there is an on-going debate about growth potential of organic wine. As a consequence, by examining the existing literature on preference's and consumers' behaviour that characterize the organic wine demand, we investigate the role that socio-demographic characteristics, motivations, beliefs, sen-

sory features and wine additives play in directing consumer choices towards organic wines.

The objectives of the study therefore are: (1) to identify the socio-demographic characteristics of organic wine consumers trying to detect their profile; (2) to understand the drivers and motivations on consumer behaviour and preferences for organic wine; and (3) to determine consumer perception when evaluating sensory quality of organic wine and in shaping consumers' attitudes.

This study would contribute to further understanding of wine consumers in relation to their preferences and perception of organic wine. The aim of the paper is to generate a set of findings regarding consumer behaviour towards organic wines in order to provide a brief summary of the current literature on this topic.

The paper explores the characteristics of consumer of organic wine, the motivation on consumer behaviour and preferences for organic wine, as well as the sensory quality and the presence of additives when evaluating wine quality and in shaping consumers' attitudes in order to solve the gap in the economic literature. Understanding the profile of consumers and the factors that influence consumer' behaviour provide information to the organic wine industry.

## 2. METHODOLOGY

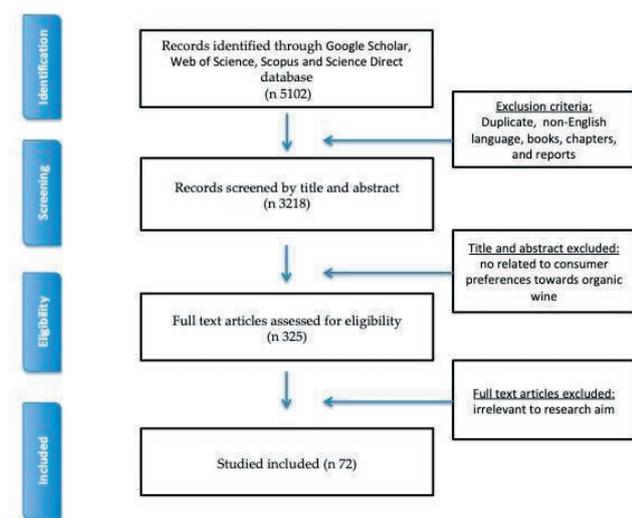
The review was carried out in order to select studies and to summarize the literature about consumer preferences, purchasing behaviour, willingness to pay and quality perception towards organic wine.

The review followed a detailed and replicable protocol [19]. A flow chart is provided in Figure 1. The review was carried out following the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) [20,21,22].

Data were collected using the main scientific/economic electronic research databases. The literature searching was conducted in the on-line scientific database: Google Scholar, Web of Science, Scopus, and Science Direct in order to include the relevant literature [20].

The search was carried out from April to June 2020, and it included studies that were conducted after 2004, which was considered to be a suitable range for including the recent trends on the topic under investigation and to avoid outdated articles. We finished the search on the 3th of June 2020.

The keywords used in this searching method, combined with the word "wine" and "organic", were the following: "preferences", "perception", "consumers", "con-



**Figure 1.** Flow chart diagram visualizing the database literature searching procedure. The exclusion criteria are indicated. Source: prepared by authors for use in this investigation.

sumption”, “attitudes”, “behaviour”, “willingness to pay”, “motivation”, “choices”, “attributes”, “label” “taste”. The first keywords were used to limit the search to studies that consider organic wine, while the second group to identify the studies based on consumer behaviour analysis and preferences.

Only research papers written in English were included in the database in order to delimit the literature characterized by high visibility within the scientific community.

Because of the problems of availability and readability for some related literature, it is hard to include all studies in this field.

Figure 1 shows a flowchart of the database searches and the exclusion criteria followed. The search initially produced a total of 5102 records.

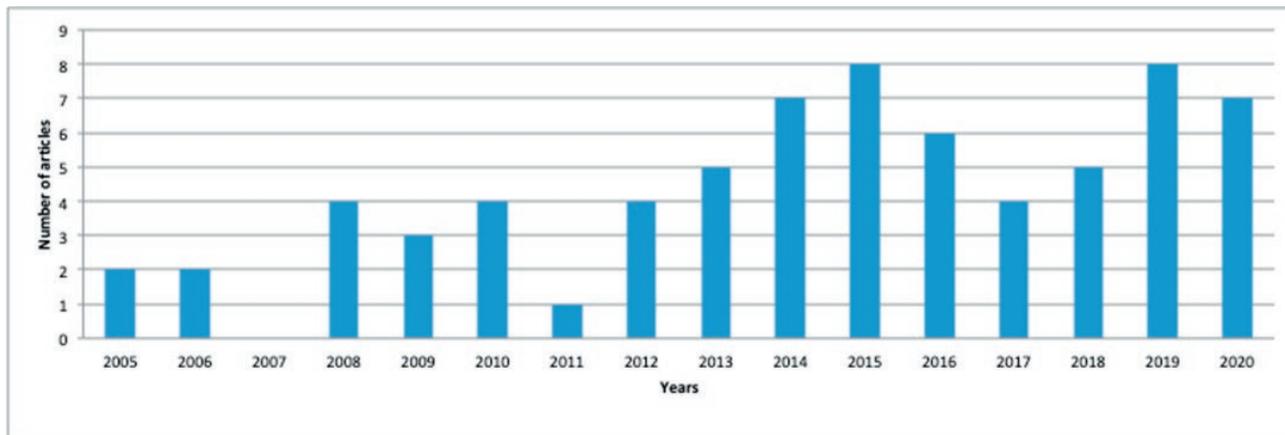
The screening process for the selection of relevant literature was conducted in two stages: Screening and Eligibility [21,22].

In the Screening phase, the selected papers were examined and the number decreased to 3218 by applying the primary exclusion criteria. Only articles written in

**Table 1.** Attributes related to organic wine chosen for the review.

Variable	Reference
Consumer behaviour and preferences	Chinnici et al. [23]; McEachern and McClean [24]; Fotopoulos et al. [25]; Loureiro [26]; Chang and Zepeda [27]; Poveda et al. [28]; Krystallis et al. [29]; Olsen et al. [12]; Bazoche et al. [30]; Bernabeu et al. [31]; Remaud et al. [15]; Stolz and Schmid [13]; Barber et al. [32]; Forbes et al. [33]; Zepeda and Deal [34]; Barber et al. [35]; Brugarolas et al. [2]; Mueller and Remaud [36]; Siriex and Remaud [16]; Chiodo et al. [37]; Mann et al. [3]; Olsen et al. [38]; Barber and Taylor [39]; Corsi and Strøm [40]; Loose and Lockshin [41]; Loose and Remaud [42]; Pagliarini et al. [43]; Vecchio [44]; Ay et al. [45]; Costanigro et al. [46]; Pomarici and Vecchio [47]; Rahman et al. [48]; Wiedmann et al. [7]; Bazoche et al. [49]; Kim and Bonn [50]; Ogbeide [51]; Rojas-Méndez, et al. [52]; Saltman, et al. [53]; van Tonder and Mulder [54]; Bonn et al. [4]; D’Amico et al. [5]; Delmas et al. [55]; Pomarici et al. [56]; Sellers [57]; Sogari et al. [8]; Abraben et al. [58]; Amato et al. [59]; Seralini and Douzelet [60]; Deneulin and Dupraz [61]; Espinoza et al. [62]; Pomarici et al. [63]; Sarabia-Andreu and Sarabia-Sánchez [64]; Schäufele et al. [9]; Capitello and Sirieix [65]; Di Vita et al. [66]; Dominici et al. [67]; Gassler et al. [68]; Mauracher et al. [69]; Rahmani et al. [70]; Seralini, et al. [71]; Streletskaia et al. [72]; Janssen et al. [10]; Jorge et al. [73]; Lim et al. [74]; Sohn, et al. [75]; Szolnok, et al. [76]; Taghikhah et al. [77].
Purchasing Motivation	Chinnici et al. [23]; McEachern and McClean [24]; Fotopoulos et al. [25]; Chang and Zepeda [27]; Poveda et al. [28]; Olsen et al. [12]; Bazoche et al. [30]; Bernabeu et al. [31]; Stolz and Schmid [13]; Barber et al. [32]; Forbes et al. [33]; Zepeda and Deal [34]; Barber et al. [35]; Brugarolas et al. [2]; Siriex and Remaud [16]; Mann et al. [3]; Olsen et al. [38]; Barber and Taylor [39]; Rahman et al. [48]; Wiedmann et al. [7]; Bazoche et al. [49]; Kim and Bonn [50]; Rojas-Méndez et al. [52]; Bonn et al. [4]; D’Amico et al. [5]; Pomarici et al. [56]; Sogari et al. [8]; Pomarici et al. [63]; Schäufele et al. [9]; Capitello and Sirieix [65]; Di Vita et al. [66]; Dominici et al. [67]; Gassler et al. [68]; Rahmani et al. [70]; Janssen et al. [10]; Jorge, et al. [73].
Sensory quality perception	Loureiro [26]; Stolz and Schmid [13]; Forbes et al. [33]; Siriex and Remaud [16]; Mann et al. [3]; Loose and Lockshin [41]; Pagliarini et al. [43]; Delmas and Grant [14]; Rahman et al. [48]; Wiedmann et al. [7]; Garaguso and Nardini [78]; Kim and Bonn [50]; Ogbeide [51]; Delmas et al. [55]; Abraben et al. [58]; Seralini and Douzelet [60]; Espinoza et al. [62]; Gassler et al. [68]; Seralini, et al. [71].
Willingness to pay	Deneulin and Dupraz [61]; Loureiro [26]; Poveda et al. [28]; Krystallis et al. [29]; Bazoche et al. [30]; Remaud et al. [15]; Forbes et al. [33]; Barber et al. [35]; Brugarolas et al. [2]; Mann et al. [3]; Olsen et al. [38]; Corsi and Strøm [40]; Loose and Lockshin [41]; Loose and Remaud [42]; Pagliarini et al. [43]; Vecchio [44]; Ay et al. [45]; Costanigro et al. [46]; Pomarici and Vecchio [47]; Wiedmann et al. [7]; Ogbeide [51]; D’Amico et al. [5]; Pomarici et al. [56]; Sellers [57]; Sogari et al. [8]; Abraben et al. [58]; Amato et al. [59]; Espinoza et al. [62]; Pomarici et al. [63]; Schäufele et al. [9]; Di Vita et al. [66]; Gassler et al. [68]; Mauracher et al. [69]; Rahmani et al. [70]; Streletskaia et al. [72]; Jorge et al. [73]; Lim et al. [74].

Source: prepared by authors for use in this investigation.



**Figure 2.** Numbers of articles per year (2005–2020). Source: prepared by authors for use in this investigation.

English were included in this study [21]. Duplicates from different databases were excluded at this stage.

In the Eligibility phase, articles were selected based on information in the title and then in the abstract [21,22]. The examination of the title and abstract led to the elimination of several articles that were not focused on consumer behaviour or not focused on consumer behaviour in relation to organic wine. In this stage, the number of papers was reduced to 325.

Subsequently, in the Inclusion phase, each paper was further reviewed based on the information contained in the full text in order to decide whether each study meets the eligibility criteria for the purpose of this review [21].

Finally, after excluding irrelevant articles based on their objectives, a sample of 72 articles was selected to respond to our research question in the categorization and analysis stage.

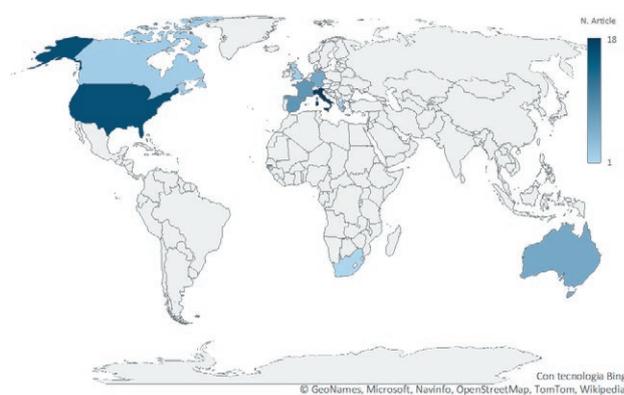
### 2.1. Overview of selected studies

The final set of articles was divided in four sections, according to the core-investigated topic (Table 1):

- Consumer behaviour and preferences (n = 67)
- Purchasing Motivation (n = 36)
- Willingness to pay (n = 37)
- Studies on organic wine sensory quality (n = 19). Within this section, two sub-sections were found with articles that dealt specifically with taste and sensory quality perception and additive wine perception.

A total number of 72 articles were selected as suitable for the literature review. Several articles investigated more than one topic. Therefore, the sum of the figures is greater than 72.

Figure 2 describes the temporal distribution per year of the reviewed articles from 2005 to 2020. Although the



**Figure 3.** Area where the selected studies were conducted. Source: prepared by authors for use in this investigation.

total number of articles was quite limited, there was an increasing trend of papers published in the latest years. This attests the growing attention toward the topic under investigation in this review. Nevertheless, the relative small number of articles demonstrates the need for further research on specific issues that will hereby be presented.

The studies analyzed in this review were carried out worldwide. Figure 3 shows an overview of the countries where the selected studies were carried out: 48 studies were from in European countries, including Italy (18), France (8), Germany (6), Spain (8), Switzerland (4), the United Kingdom (2) and Greece (2); 16 studies were conducted in the USA; and the rest were from Canada (2) and South Africa (1).

Several articles investigated more than one Country. Therefore, the sum of the figures is greater than 72.

### 3. RESULTS

#### 3.1. Socio-demographic characteristics

##### *Gender*

As occurred for organic products in general, previous research shows also for wine the relevance of gender in buying organic, highlighting that women are more organic wine-sensitive than men [3]. In addition, also a high WTP may be due to a gender status: women tend to pay more attention to such products compared to men [36,35,26,3,44,47,57]. Controversy, D'Amico et al. [5] and another study carried out by Di Vita et al. [66] found that Italian women are those less willing to spend a large amount of money for organic wine.

##### *Age*

There are lots of early studies on the age influence consumer's organic attitude and behaviour by different researchers. Most of them are likely to support the statement that - younger individuals are likely to be more sensitive to environmental issues [31,8,69]. However, despite being interested in eco-friendly practices might not have a financial budget to buy organic products, which are considered more expensive [3,8]. Conversely, other research shows that being older significantly increases the probability of buying organic wines and a high WTP [44,47,57,63].

##### *Education*

Level of education is another demographic variable positively correlating with organic attitudes. The positive relationship has been identified by large amount of previous studies [79,80]. Based on studies carried out by Diamantopoulos et al. [81], consumers with high level of education are expected to have much clearer and full perspective understanding on ecological issues. In addition, a high level of information regarding wine in general, but also specific claim for the sustainability of the wine, led consumers to prefer organic wine [3].

##### *Income*

Income is another social-demographic variable affecting organic attitudes and behaviours described by Straughan and Roberts [82]. They pointed a common belief: the higher income level the person has, the more he/she is likely to support organic food purchasing.

Besides, as one of social-demographic factors, income is usually taken as a predictor of sustainable behaviour [82]. Schäufole and Hamm [9] demonstrated that the German attitude consumers buying organic wines are in line with their real behaviour. However, the higher price of these products is an obstacle for some

low-income consumer segments. According to these findings, high WTP may be due to a higher household income [26,56,57,9]. However, D'Amico et al. [5] did not find this correlation.

#### 3.2. Value and Belief

##### *Environmental concerns*

Consumers with an environmental orientation show a better willingness to buy organic wine [28,32,39] and are more likely to pay higher price premium [35,38,5,8]. Consumers who had the highest expenditure share for organic wine showed strong pro-environmental attitudes and a preference for sustainable products [18].

The analysis conducted by Pomarici et al. [56] on Italian wine consumers revealed an interest in eco-friendly wine and the demand to preserve natural resources and reduce water consumption when producing wine. In addition, consumers with a higher interest in environmentally friendly wines spent more for wines consumed at home and the consumer segment with a low involvement in environmentally friendly wines was mainly focused on the price when it comes to wine choice [56].

A study carried out by Schäufole and Hamm [18] indicated that ethically concerned wine consumers accounted for 35% of all German wine-purchasing households. However, only 21% showed a relatively high level of action when it came to environmentally conscious wine purchase behaviour. The rest of the ethically concerned wine consumers were indeed sustainably oriented, but did not convert these attitudes into actual purchase behaviour, probably because of the so-called "price barrier".

Controversy, in some studies, environmental concerns do not appear to be good predictors of attitude toward organic wine [52] and consumers' perception of environmental friendliness had neither an effect on the purchase of organic wine [3,50] nor on the consumption of organic wine [3], nor on the preference for organic wine [48]. The authors explain these results with an absence of trust in the organic label or a lack of information regarding organic certification. That's because wine follows different trends and mechanism compared to other organic food products.

Studies show that some consumers have a low involvement and interest in sustainability issues and very low WTP for eco wine. They consider price the only important attribute for their purchasing decision [31] and do not consider an eco-label as a strong element of differentiation and they identify these wines with a low overall quality [26]. In a study conducted by Bazoche

et al. [30] it seems that some consumers are not willing to pay any price premium for environmental benefit of sustainable wine even when they are informed about the possible negative effects of pesticides used in the wine-growing process and think that sustainability issues do not concern the wine industry.

#### *Healthy concern*

Studies demonstrate that organic grapevines suffer more biotic stresses than conventional one and therefore produce higher amounts of secondary metabolites, such as phenolic compounds [83]. Higher amounts of phenolic compounds or other health-related compounds in organic wine comply with consumer perception that these products are healthier. Nevertheless, such trends are still not fully demonstrated [84,85,83].

According to literature [32,52], organic wines are perceived to be healthier and with lower amounts of pesticide than conventional wine. Many studies in the literature compare the health properties of organic and conventional wine [85,86,87]. However, these studies showed little or no significant differences between organic and conventional products.

Positive health effects are strong determining factor in organic wine preferences [7,4]. Perceiving organic wine as healthier than other wines was the best predictor for Swiss consumers' choice of organic wine [3]. Even for Greek organic food buyers, the organic label had a health-related aspect and was found very important in purchasing wine [25]. Moreover, consumers with a healthy life style are willing to pay a higher price for an organic wine [28].

In studies performed by McEachern and McClean [24], Stolz and Schmid [13], and later by Sirieix and Remaud [16], organic wine was perceived to be healthier than conventional wine, mainly due to the absence of synthetic pesticides and additives in the winemaking process. However, the authors found that organic wines still face some problems in terms of sensory perception.

Jorge et al. [73] studied the role of consumer tolerance of ambiguity in explaining organic wine purchase behaviour, showing that the positive influence of consumers' healthy attitude on their willingness to pay for organic wine is weak in individuals less tolerant of ambiguity. Evidence shows that positive consumer attitudes are not always reflected in their willingness to pay for organic wine.

#### *Geographical and local origin*

Geographical origin has been indicated as important purchasing criteria in wine consumption [5] and its role has discussed by several authors of consumer studies

showing that origin attribute was more important purchase criteria than production method [31,37,3,10].

The study carried out by Mann, et al. [3] on Swiss consumers revealed that the country of origin attribute was more important than the organic attribute in wine choice [3]. Also for 'Protected Designation of Origin' (PDO) label was considered more important than production method (organic or conventional) since it was the most important attribute in wine choice. In addition, consumers who appreciate organic wine assign greater importance to the local claims [88].

Interestingly, an important finding that came from the survey carried out by Remaud et al. [15] was the strong link between the region of origin and organic attributes in wine preferences. However, authors underlying that consumer do not always associate the regional product with the organic process [15].

The literature is full of studies that have investigated the role of geographical indication - such as PDO - and organic label on consumer's choice, showing that PDO certification prevails on the organic claim [89,90,91]. The role of Geographical Indications certification over organic certification has been also detected for organic wines [92].

With regard to locally attribute, the organic wine consumption is different from the dynamics related to the locally produced food [3]. Locally produced wines have received particular attention by scholars [5,93], but the studies that analysed the connection between local and organic wines are still limited.

### *3.3. Attitudes*

#### *Habits*

Habits play a major role in food purchasing decisions. They are affected by contextual variables and the formation of attitudes and thus conciliate between behaviour and attitudes/context [34]. The study of Capitello et al. [65] found that consumers involved with wine demonstrate a greater ability to evaluate product-attribute associations for sustainable wines than do ethically minded consumers who are not involved with wine.

According to the result of studies carried out by Barber et al. [32] and Gassler et al. [68] organic wine consumer generally had a higher intention to buy organic food, in general.

Being responsible for food shopping, wine purchasing and consumption frequency, and interest in sustainable food shopping may increase the purchase probability for social, environmental or ethical labelled wine as well as the willingness to pay a price premium [44,56].

Vecchio [44] found wine consumption frequency and caring about environmental sustainability in wine

shopping to be significant factors influencing the WTP premiums for wines with an environmental and an ethical feature.

Additionally, Pomarici et al. [56] showed that the consumer segment, which was highly interested in environmentally friendly wines, was characterised by individuals who drink wine more frequently. In general, environmentally oriented consumers spend more for wines consumed at home, and their wine choices are more influenced by grape variety [56]. Mauracher et al. [69] found that consumers characterized by a low consumption frequency have a higher WTP for organic wine.

Organic wine is regularly being purchased by only 3% of the German wine drinkers, merely 4% of consumers purchase organic wine at least once a month, 25% at least once a year and approximately 75% do not buy organic wine at all [76].

Based on these results, they assumed that a certain share of the estimated total consumption of approximately 1 million hectolitres organic wines in Germany is being purchased unintentionally.

This result underlines the outcomes of Corsi and Strøm [40] who stated that the attribute organic wine is not the key driver for buying wine.

#### *External environment*

Contextual factors are external conditions, which can be constraints or incentives for the purchase of wine with organic characteristics.

The study of Sarabia-Andreu and Sarabia-Sánchez [64] is the first to report on the potential influence of implicit and explicit attitudes on organic wine purchase intention. It has been found that only explicit attitudes significantly influence organic wine purchase intention. In contrast, implicit attitudes, more strongly connected with non-conscious behaviour drivers, are not significant predictors of this intention. Moreover, only attitudes towards intrinsic attributes and arousal feelings significantly explain purchase intention.

In 2020 for the first time, the study of Sohn, et al. [75], provided insights into the impact of the product-unrelated retail atmospherics on organic wine purchase intentions, discovering the psychological mechanisms between social cues and organic wine purchase intentions, and showing that consumers seem to integrate the mere presence of social cues in their virtual shopping environment to form these purchase intentions.

#### *Trust*

Trust was important in efforts to enhance perceptions of sustainability practices of retailers and the impact of organic wine's health-related benefits [4].

Bonn et al. [4] revealed that trust in either the producer or retailer may completely reverse the impact of price on the purchase of organic wine from negative to positive. This points to the importance of consumers' attitudes when looking at the influence of context on purchase behaviour. Trust in the winery was found, besides taste, the main factor influencing consumers' behavioural intentions to purchase organic wine [50].

This suggests that consumers are more likely to purchase organic wine if they trust the retailer selling the product.

#### *Curiosity*

For the first time, Chinnici et al. [23] in a study on consumption of organic food highlighted consumer' curiosity as driver affecting consumers preferences towards organic wine. This result was confirmed by Tsourgiannis, et al. [94], whom founded curiosity as one of the main factors in organic wine purchase, and later by D'Amico et al. [5] in a study on consumer preferences for organic wines without sulphites that identified curiosity as relevant buying motivation. Di Vita et al. [66] also found that consumers attached greater importance to personal motivations such as curiosity.

### *3.4. Information and knowledge*

#### *Information and awareness*

Regarding the influence of information, the studies of Wiedmann et al. [7] and Ay et al. [45] provided empirical evidence that a higher level of information was related to a more positive perception or preference for organic wine.

Different results were reported by Bazoche et al. [30]: whereby information on the harmful consequences of pesticide use did not have a significant effect on consumers' WTP for organic and environmentally friendly wine. However, adding visual information (labels, no tasting) compared to blind tasting significantly increased consumers' WTP. In this regard, van Tonder and Mulder [54] revealed the importance of images when buying organic wine in a retail environment because organic labels should contain 'natural' images.

Espinoza et al. [62] compared French preferences for wines from resistant varieties, certified organic wine, and conventional wine. They showed that providing consumers with environmental and health information improve strongly consumers' preferences and WTP for organic wine, while it penalises those for conventional wine.

Streletskaya et al [72] investigated consumer demand when information about production standards is provided. They found that while organic labels carry a willing-

ness to pay price premium, information about certification standards and conventional wine making practices could reduce WTP for all wines. Providing information about organic certification standards reduced consumer WTP for both absence labelled and conventional wine categories. This effect largely disappears for organic wine, but not wine made with organic grapes, when information about conventional winemaking practices is also provided.

#### *Knowledge and expert rating*

Research has shown that knowledge, in general, is directly related to consumer wine purchase behaviours determining that what consumers think they know about a subject is a better predictor than what they actually knew [32].

The level of knowledge about organic products was directly related to the acceptance of organic wine for Spanish consumers [2] and the probability of paying a premium price for organic wine with no added sulphites for Italian consumers [5]. In the study of Kim and Bonn [50], consumers declaring a greater knowledge of organic wine stated a significantly higher willingness to purchase and to recommend organic wines. On the other hand, people with a higher overall wine knowledge only had a higher behavioural intention to recommend organic wine.

Purchase intention and label awareness correlated significantly [42] and knowledge of the environmental label increased Italian consumers' WTP premiums for the environmental labelled wine [44]. Sellers [57] showed that Spanish consumers with a higher level of knowledge about sustainable products had higher WTP values, while the level of knowledge about wine culture had a negative impact on the willingness-to-pay a price premium. However, Pomarici et al. [56] showed that the consumer segment found to be highly interested in environmentally friendly wines was characterised by individuals who considered themselves more experienced regarding wine, paid more attention to the information on the back-label and were more affected by grape variety when choosing wine.

### *3.5. Sensory properties of organic wine*

#### *Taste*

Taste is one of the most important key factors in assessing wine quality both for organic and conventional wines [48]. However, its role in the organic wine consumer perception is quite controversial.

In recent study, Rahmani et al. [70] showed that wine taste, evoked emotions and actual liking signifi-

cantly influenced consumers' preferences, especially in the case of organic and selected vintage organic wine.

The taste attribute of organic wine received some criticism and constitutes a perceived risk [51] and a purchase barrier [18]. Some consumers express disappointment as they think that organic wine tastes worse than conventional wines, mainly due to too much acidity; and only very few consumers indicated that they appreciate the taste of organic wine [13].

In a survey on US consumers, the taste alone has always influenced the participant's preference for wines. After tasting wine, the attribute organic had no further influence their purchase decision [48]. In the study of Rojas-Méndez, et al. [52] on Canadian consumers, organic wine was not consumed by wine drinkers since they do not associate it with good taste or positive past experience.

Controversy, other studies showed that consumer detected advantages in terms of taste of organic wine [3]. In the recent study carried out by Lim et al. [74] the preference for organic wine was correlates positively with the perception of quality implied by the eco labels.

Kim and Bonn [50] found that organic wines have a significantly better taste compared to the conventional ones. Furthermore, Wiedmann et al. [7] showed that appearance and taste of organic wine was judged to be better than conventional wine, regardless of their knowledge and attitude towards organic products in general. Seralini and Douzelet [60] found that the tastes of organic wines were judged by consumers to be less artificial and to last longer.

Pagliarini et al. [43] found that consumers would be willing to pay more for organically produced wines than traditional ones those. However, consumers were not able to distinguish between organic and conventional wines in a blind tasting. This result indicates that the willingness to pay a premium price for organic wine may be due to consumers' attitudes and involvement in sustainability issues. Also New Zealand consumers believed sustainable wines to be of equal or better quality than conventional wines and were prepared to pay a higher price for these wines [33].

Gassler et al. [68] studied taste and quality perceptions of German consumers and their WTP for organic wine with a blind tasting and found that organic wine was perceived as tastier and of higher quality and value.

Delmas and Gergaud [55] showed that eco-labelled and organic wines receive better ratings by wine critics. When eco-labelled and regular wines were tasted, without respecting similar varieties, soils, and years, in another large study using 74,148 bottles from 3,842 Californian vineyards, the organic wines were also significantly pre-

ferred. According with their results, eco certification is associated with a statistically significant increase in wine quality rating. Being eco certified increases the scaled score of the wine by 4.1 points on average [55]. This result was confirmed in a study analysing French wines in a blinded manner, but using this time similar varieties, soils, and years, for two neighbour vineyards, one being sprayed with synthetic pesticides, the other not [60].

Controlling for a variety of wine attributes, the analysis carried out by Abraben et al [58] finds that wines produced with organic practices, but not certified as organic and wines certified, but not labelled as organic receive a higher price compared to conventional wine, for wines with low quality ratings. According with their results, as the wine's quality rating increases, the positive effects of organic practices and certification on price decrease, and for wine with higher quality ratings, organic practices and certification is associated with lower prices relative to other- wise comparable conventional wine.

#### *Aroma*

Regarding to the aroma attribute, it has been considered as relatively unimportant [25] or significant only for specific target of organic wine consumers. Therefore, this attribute has been generally taken into consideration jointly with other sensory features [25]. Controversy, few studies comparing sensory and hedonic qualities of organic and conventional wine highlighted differences in sensory perception among consumers [43]. However, although the health benefits of wine consumption are published in medical studies, the research has not made the link of added personal benefits due to environmental practices. For example, the study carried out by Garaguso and Nardini [78] showed that organic red wines produced without addition of sulphites are comparable to conventional red wines with regard to the total polyphenol and flavonoid content, the phenolic profile, and the antioxidant activity.

Interestingly, consumers take into account also the processing methods for the sensory qualities of wine, while production methods are considered to have a lower impact on the taste. In purchasing decision, the major role is played by processing method, and look at production of wine merely as a purchasing criterion of minor importance [13].

Dominici et al. [67] investigated the impact of the hand-harvested method on consumer wine preferences. According to their results, consumers prefer wine produced with hand-harvested grapes, but there is not interaction between organic and hand-harvested attributes in consumer preferences.

#### *Colour*

As regards the role of colour attribute of wine, it has been extensively investigated in consumer studies on conventional wines [95], but its role is still limited in the literature of organic wine consumer. However, it has been observed that colour attribute is not considered a relevant attribute in organic wine consumption [3]. The survey carried out on Swiss consumers [3] revealed that the organic attribute was more important than wine colour, but, at the same time, less important than the price and the country of origin. The study of Šottníková et al. [96] deals with the colour and sensory evaluation of conventional and organic wines, showing that colour evaluation and sensory evaluation did not showed any noticeable differences between conventional organic and wines.

#### *Phenolic profiles of organic wine*

According to a study by Mulero et al. [85], wines produced from organic and conventional grapes harvested in the same location and fermented using a similar protocol showed difference in their respective phenolic profiles.

Cozzolino et al. [84] compared the mid-infrared spectra of both commercial organic wines and non-organic wines and found that organic and conventional wines do result in different phenolic profiles [84].

Martin and Rasmussen [83] used geographically paired monovarietal wines produced in California, using the same winemaking protocol. In these wines, the concentration of total phenolic compounds was significantly higher in organic Pinot noir wines compared to conventional ones, whereas conventional Syrah wines showed higher levels of total phenolic compared to organic ones, suggesting that grape varieties may react differently to organic production methods. However, wine sensory analysis showed no noticeable difference in the visual aspect, the aroma intensity and quality, nor the taste of organic and conventional wines [83].

### *3.6. The role of additives in organic wine perception*

#### *Sulphite taste perception*

Organic wines contain less preservative such as sulphur dioxide, a natural substance used in both conventional and organic processes for inhibiting unwanted yeasts and bacteria [59].

As described by Provost et al. [97], besides being free of synthetic pesticides, many organic wines contain lower amounts of sulphur dioxide than conventional wines [98], which may constitute a commercial advantage [46].

Garaguso and Nardini [78] examined total polyphenols and flavonoids content, phenolic profile and anti-

oxidant activity of organic red wines produced without sulphur dioxide/sulphites addition in comparison to conventional red wines. Polyphenols and flavonoids content were slightly higher in organic wines in respect to conventional wines, however differences did not reach statistical significance. The phenolic acids profile was quite similar in both groups of wines. Antioxidant activity was higher in organic wines compared to conventional wines, although differences were not statistically significant. Their results indicate that organic red wines produced without sulphites addition are similar to conventional red wines with regard to the total polyphenols and flavonoids content, the phenolic profile and the antioxidant activity.

The use of sulphites is perceived as the least natural feature [99] and has attracted attention among scholars, since it is perceived as risky additive and unhealthy by consumers [46].

With this regard, there are evidences that consumers are willing to pay higher price for wines without sulphites, confirming the negative perception of this additive [46,5,59]. Nowadays, the use of sulphites is widespread in winemaking; thus, consumers may be more familiar with the attribute from wine labels compared to other attributes about additives, processing aids and technologies.

D'Amico et al. [5] found a higher willingness to pay for wines without added sulphites, but inadequate information discourages consumers from paying a price premium for wine without sulphites in Italy [5].

In the study of Capitello et al. [65] on Italian and French consumers, wine with no added sulphites was perceived differently from the other types of sustainable wines.

In line with these results, Italian and Spanish consumers were willing to trade conventional wine with wine without sulphites, and more than 80% of the consumers were willing to pay additional premium prices [60].

As found in the review carried out by Deneulin and Dupraz [61], even for Swiss consumers the sensory quality is considered the main value for wine. They are also willing to pay more for wines with the label "no-added sulphites" or "organic and biodynamic".

#### *The content of copper in organic wine*

Copper is the major chemical component authorized for treatments of organic agriculture. Most Copper-containing agricultural inputs are fungicides [60]. The copper concentration may influence the taste of wine, and this could explain why wines with less copper may be preferred to wines with synthetic pesticides.

Research confirm that copper pollution has been found to affect the phenolic compound content, colour, and antioxidant activity of wine, which may change the taste [100].

Séralini et al. [72] have studied the levels, taste, and toxicity of copper in wines compared the use of copper in chemically treated and organic vineyards. They asked to describe the tastes detected, founding that tasters were able to detect the taste of copper in a wine spiked in a blinded manner to a level of 0.15 mg/l. When added at 1 or 1.5 mg/l it was found to clearly modify the taste of wine. Tasters were asked also to describe the nose or mouth detection in primary and preliminary testing at the minimal level of copper that was found in organic wines. According with results, copper breaks the complexity of nose and mouth sensations, especially for red wine. The description was easier for white wine: a brisk nose and a slightly acidic taste. Around 1 mg/l, it was always identified in comparison with the same natural wine that was not spiked and negatively disrupted the taste for tasters.

Provenzano et al. [101] determined the copper content in organic grapes and wines in relation to the total and available copper content in soil. It was shown that if the use of copper-containing products in the vineyard complies with the EU rules for organic viticulture. The level of copper in organic wines ranged from 0.1-0.4 mg/l, within the legal limits established for safeguarding the health of consumers.

It has been shown [102] that from 10 mg/l it inhibits fermentation, as do agrochemicals residues, but often this is compensated for in treated wines by adding significant amounts of modified yeasts. This is a common practice in wines when fungicides are applied in the vineyard and detected as major pesticides in non-organic wines [60], since most natural yeasts are killed by fungicides. Briefly, more copper and cupric residues are found in non-organic wines than in organic ones, due to less chemical applications in the latter case, and more time between the last application and the harvest.

## 4. DISCUSSION

The results obtained from literature studies on consumer perceptions of organic wine are at times doubtful and cannot automatically be translated or applied to identify a homogenous class of organic wine consumers.

The multidisciplinary study of consumer science has highlighted that several factors can motivate consumer behaviour towards a more sustainable consumption: among these are relevant cognitive aspects, such as values,

belief, attitudes and motivation – but also external factors – such as incentives, norms and public policies [103].

As has been shown by the many studies already carried out, the profile of organic consumers is highly variable, since its behaviour is strongly influenced by socio-demographics and psychological characteristics of consumer as well as quality perception of organic wine.

The results of the literature research categorise six different variables influencing the purchase of organic wine: (1) consumer's socio-demographics characteristics, (2) value and belief, (3) attitude, (4) information and knowledge, (5) sensory properties of organic wine, and (6) the role of additives in organic wine perception.

Intrinsic characteristics of consumer, such as socio-demographic characteristics influence consumer preferences for organic wine [18] and have resulted useful to identify an organic consumer 'profile. The stereotypical organic wine consumer is female and with a comparatively high level of education and income. We found also that gender and income have a positive correlation with the willingness to pay an additional price for organic wine.

Our study confirms the high relevance of other different factors that shape behaviour towards organic wine consumption. Among these, value and belief towards healthy and the environment concerns are positively associated with consumer behaviour toward organic wine. Most wine consumers, in fact, purchase organic wine for its perceived health and environmental benefits [3].

There is a linkage between environmental values and the purchase of organic wines [38]. Environmental consciousness of consumers was identified as one of the most important drivers in their buying behaviour towards organic products [27,34,33,4].

Health-related aspect was found as good predictor in purchasing wine [25,3] and consumers with a healthy life style are willing to pay a higher price for an organic wine [28]. Also values and beliefs regarding geographical and local origin are often motivators for the purchase of organic wine [3].

With regard to attitude, habits play a major role in food purchasing decisions. They are affected by contextual variables and the formation of attitudes and thus conciliate between behaviour and attitudes/context [34]. Also curiosity [66] and trust [4] represents important drivers for promoting the consumption of wine produced from organic grapes.

Studies provided empirical evidence that also a higher level of information and knowledge were related to a more positive perception and preference for organic wine [7,45] determining that what consumers think they know about a subject is a better predictor than what they actually knew [32].

In wine consumption, hedonic aspects have a higher impact on the purchase behaviour than the utilitarian aspect [104]. Despite the importance of extrinsic cues for determining the quality and influencing the purchasing decision, consumers are mainly driven by sensory qualities of wine [13]. Considering the hedonic features of wine [105], the organic attribute is subordinate to sensory characteristics, which were found very influential in determining wine purchasing decisions [106].

A concern among consumers is that organic wine might require a trade-off between sensory quality and organic features [107]. While consumers wish to protect the environment, they are not willing to do this choosing a product of inferior sensory quality [108]. In other words, in order to achieve low environmental impact, green products would have not to be of lower sensory quality [14].

Among sensory qualities, taste has been found an important determinant influencing consumers' behavioural intentions to purchase organic wine [43,7,50]. Taste constitutes both a key driver and barrier to wine consumption [107] and one of the major perceived risks, as outlined by Mitchell and Greatedorex [109]. However, in general, wine consumers do not have an adequate level of sensory perception expertise [32], and they are not always able to identify sensory difference between organic and conventional wines [43].

Several studies focused on the role of sensory attributes in consumer behaviour for conventional wines [110,111,95]. But the number of studies focused on sensory attributes for organic wines is still limited [3,43,7]. For these reasons, the role of sensory attributes in organic wine consumption is not well defined or at time doubtful and could be deeply analysed in future researches.

A segment of research dealing with organic wine consumption has been addressed to investigate the role of additives in organic wines [13]. Outcomes also revealed the prominent role in the absence of sulphites. Saltman, et al. [53] have found that consumers would like that additives used during winemaking be mentioned on the wine label.

Studies comparing organic and conventional growing systems mostly addressed the carry-over of mineral pesticides such as copper from grape to grape juice or wine [101,112], and the impact of organic management on grape and wine composition [84,85], wine's sensory attributes [83] and wine's healthiness [113,86,87]. It is not fully clear the potential impact of organic grape management on wine and properties. Studies comparing the quality of organic to conventional wine may face many challenges related to, for example, the increase

of wine healthiness for organic wine, the improve wine sensory attributes of organic wine or mineral pesticides such as copper carry over to wine.

Given the review's findings, we assume that there is a segment of consumers with positive perceptions concerning to organic production methods of wine, who are willing to pay a premium price for such a wine. However, the results underline that the effect of the variable "price" depends on consumers' attitude, values and beliefs regarding organic wine. Consumers are willing to pay an additional price for organic wine since they attach greater importance than conventional wine to personal motivations [66]. In fact, overall, our findings show that the additional price premium for organic wine seems to be due to attributes not pertaining directly to the organic wine. Intrinsic characteristics of organic wine such as sensory attributes (i.e. taste, colour and aroma) do not affect the additional price whereas consumer' characteristics such as value and belief and attitude significantly affect the evaluation of organic wine [66].

Price is another factor that affects preferences for organic wine. In particular, consumers that state that price is a very important factor in the wine choice are less willing to pay for organic wine. In line with previous studies, consumers who are less interested in the sustainability of wine mainly pay attention to the price when choosing a bottle, while in contrast, the more environmentally oriented consumers spend, on average, more for wines consumed at home [56].

Several authors concluded that price and origin were more important purchase criteria than production method [31,37,3,10], pointed out a negative image regarding quality and higher price of organic wine [13,38]; while other studies emphasised the importance of the organic label as a cue for quality [43,7,10].

Consumers value the organic claim more than the other social responsibility and environmental claims and are willing to pay a price premium for organic wines [74]. However, the attitude is not due to the perception of organic wine sensory quality [42]. When consumers perceive a wine as having high quality they might be less willing to pay for further environment-friendly certifications [114,115]. Environmental sustainability is less important than taste of the wine [41] and consumers are not willing to pay more for the environmentally friendly wine when quality is perceived lower [26].

## 5. CONCLUSION

The increasing of demand for organic food is an important pathway towards sustainable food systems

[77] since organic food has important environmental and health benefits. Increasing consumers' demand for organic food reinforces the rate of organic farming adoption and the level of farmers' risk acceptance.

The available results suggest that producing wine with sustainability features, particularly for organic wine, is a promising strategy for quality differentiation. In this regard, the role of consumers and their preferences is an important factor in shaping the transition to a sustainable food supply chain.

Understanding what is in consumer mind and what drives consumers wine choice, as well as their individual motivations and perceptions has always been crucial for successfully marketing wine, especially as the consumption patterns and preferences for wine have changed significantly since the late 1980s [116,25].

The future of organic wine will depend, to a large extent, on consumer demand. Thus, a consumer-oriented approach to understanding organic wine preferences is important not only in its own right, but also in terms of shifting market dynamics.

The organic wine characteristics such as health and environmental benefits should be reinforced into the mind of wine consumers. Aside from the health and environmental benefits, marketing effort should promote the taste of organic wine. In order to influence consumers' attitudes, organic wines should be extended to them as a package of product that has health and environmental benefits, better taste, and positive experience.

The benefits associated with health have to be highlighted since health-conscious people are more likely to have positive attitudes toward organic wine. The inclusion of "no added sulphite" could appear clearly and promote to consumers [52].

Previously, organic wine was perceived as healthier but less tasty than conventional wine [13]. The results highlight that there is still prejudice concerning the sensory characteristics related to organic wine. In fact, many consumers still have the idea that is good for the environment but not for those who drink it. This prejudice has its roots at the early beginning of organic wine-making, when organic producers focussed on grape production rather than on processing.

In more recent times, organic wines have reached better reputation, giving clear evidence that good sensory quality can be achieved even with organic techniques. In this regard, blind testing of organic and conventional wine would help to clarify whether the rather negative image of organic wine is just a prejudice or if organic wine still faces a lack of sensorial quality. Therefore, regular organic wine tasting events should be conducted with the wine makers.

Interestingly, some consumers perceive organic wine as genuine taste compared to conventional wine [13,16]. The authors suggest trying to incorporate terms such as genuine and distinctive taste in the communication strategy of these wines.

The review also indicated that, due to the low awareness of the broad concept of “sustainability”, marketers and retailers should disseminate relevant information on environmental aspects of organic wine production to raise consumers’ knowledge of sustainable wine production in order to influence purchase behaviour.

Environmental and health benefits can require scientific analyses to determine; this is above the scope of most consumers thus creating difficulty in convincing individuals about these benefits. Therefore, taste must be promoted just as vigorously as environmental and health benefits in the organic equation in order to attract a premium.

Finally, nowadays despite the importance that consumer attach to natural wine as well resveratrol enhanced wines [117,118], no study was addressed to test the preference and the environmentally consciousness of consumers for healthier and natural organic wine. In addition, health aspects of organic production processes like the absence of pesticide residues will be an important argument for potential consumers of organic wine [119,120]. This is even more important than to improve the only moderate taste image of organic wine.

Understanding the profile of consumers, purchasing drivers and the quality perception towards organic wine provide useful information to the organic wine industry [121].

Further research should be addressed to analyse also the role of high polyphenols content in organic wines, both naturally enhanced or artificially enriched, as well as for the natural wines, in order to gain a better understanding of the current trends. Furthermore, new marketing research techniques such as neuromarketing and eye tracking could be useful to identify future market perspectives of organic wine.

With regard to the limitations of this study, we highlight that, due to the relative restricted number of studies analysed, the results should be generalized with caution.

#### ACKNOWLEDGEMENTS

The work was carried out in the framework of the activities of the project MODESTI by Starting Grant “PIAno di inCEntivi per la RIcerca di Ateneo 2020/2022 (Pia.ce.ri.)” UNICT (5A722192150). Project leader: Gaetano Chinnici.

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