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Italian consumers' preferences regarding dealcoholized wine, information and price

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Abstract

Italian consumers' preferences regarding dealcoholized wines are measured in terms of alcoholic content and the dealcoholization intensity information on the label. The analysis assumes dealcoholized wine is an imperfect substitute for traditional wines. Dealcoholization level, price, and other wine attributes are simultaneously evaluated by drawing on choice-modeling techniques. The results suggest that alcohol content of wine positively influences consumers' preferences and that dealcoholization generates aversion. Consumers tend to buy dealcoholized wine only for a discount proportional to the reduction in alcohol content. The target group for dealcoholized wine is younger, infrequent consumers, label readers, and people with alcohol dependency problems. Policy implications concern the fact that dealcoholized wine should not be labeled or marketed as a wine and that actions aimed at increasing consumer confidence toward this new product should be implemented.

Keywords: Dealcoholized wine; Choice modeling; Acceptability; Willingness to pay

1. Introduction

Wine preferences research is the focus of a plethora of papers and journals. One of the numerous concerns of this section of the literature is the role of wine attributes and price in orienting wine purchases. Common results confirm that origin, vintner, vintage, and brand reputation significantly affect consumers' preferences and their perception of the product (Orth and Krška, 2002; Angulo et al., 2000; Lai and Del Giudice, 2006; Di Vittorio and Ginsburgh, 1994; Lecocq and Visser, 2006; Noeva, 2006).

Some of those contributions, such as hedonic analyses widely populating the literature, have highlighted the positive relationship between alcoholic content of wine and price, as well as between alcoholic content and its perceived quality. Those results were confirmed in Spain and in Sweden in specific studies (Nerlove, 1995; Angulo et al., 2000) as well in a twelve-country comparison study (Goodman et al., 2008), although the significance or the magnitude of alcoholic content as a quality attribute generally indicates that it is not the most influential attribute in orienting consumers' choices. Product differentiation in the wine sector plays an important role in helping producers to escape price competitiveness in such a fragmented sector (Stasi et al., 2009).

In addition, alcohol consumption has grabbed the attention of governments. In recent years, more restrictive rules on alcohol consumption and responsibility have been enforced. Awareness campaigns have focused on the message of reducing alcohol consumption for social and personal reasons. Therefore, it is important for the wine sector to consider a response to these policy signals and analyze the emerging

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consumer interest in products containing less alcohol than has been traditionally been associated with wine.

The scientific framework allows concluding that the valuation of the current market and the forecasts of demand trends for wines with low alcohol as well as other products obtained from dealcoholization are quite problematic due to the lack of data and appropriate investigations. However, a few available sources contribute important information, even if it is represented by partial analysis and mostly limited to a specific geographical context.

A recent survey in Germany on the evolution of alcohol-free and very-low-alcohol wine signals a significant increase in consumption (Hieronimi, 2010). In the second-half of the decade 2000–2010, alcohol-free products were more requested than products with alcohol content between 0.5% and 4% by volume. A French research study showed that chardonnay and syrah wines with 9% alcohol obtained through dealcoholization were perceived negatively for less than half the participants, while 17% of respondents expressed positive expectations (Meillon et al., 2010a, 2010b). Loss of authenticity and concerns about quality have been the main reasons for aversion. Low calorie content, appropriateness for drivers, and a general positive effect on health were the reasons attracting the smaller portion of consumers (Masson et al., 2010). A study conducted in the British market stated that consumers wishing to limit their consumption of alcohol mainly chose soft drinks rather than light wine. The concluding remarks affirmed that this behavior is attributable to ineffective marketing policies and low-quality products, and that the increasing pressure of campaigns against alcohol, promotion of road safety, and greater attention to diet could be good reasons to orient consumers toward dealcoholized wine (Pickton and Wright, 1998). Twelve years later, in 2010, the market for so-called low-alcohol wine has grown by 83%. It now represents 1% of the wine sold in the UK, with a growth potential between 3% and 10% (Corbet-Milward and Loftus, 2011).

According to experts, consumers should be directed and informed to create a better perception of producers and products through investments in marketing that so far have been lacking. However, many analysts believe that there is room for growth in the sector, especially if producers improve the organoleptic characteristics of wine and promote the benefits of its nutraceutical components, while legislators revise legal and terminology constraints to permit positioning low-alcohol product as wine instead of as a dietary product. The big retail chains are also very interested in investing in the growth of dealcoholized wine. In fact, they have introduced a range of private-label products, including some wines with alcohol content around 9.5–10% by volume (Corbet-Milward and Loftus, 2011).

Results of an Italian survey of 900 consumers showed that alcohol level was decisive in the choice of nearly half of respondents: 40.7% of interviewees tended to choose products with more moderate alcohol content, a category that, according to 73% of the sample, corresponds to wines with alcohol content less than or equal to 10%. Although these results may suggest good prospects for such products, it is necessary to devote more efforts to analyzing the characteristics of the Italian market and the attitudes of consumers. The wine market is complex and multidimensional, particularly in Italy, where it is tied to traditional and cultural factors (SWG, 2010).

The literature outlook, in conclusion, suggests that dealcoholized wine (DW) could be intended, from firms' perspective, as a differentiation strategy that allows firms to escape price competition and product substitution in a mature market with growth potential. Moreover, DW could present an opportunity to extinguish the Italian wine surpluses, which are pushing down prices. From consumers' perspective, it presents health opportunities in terms of calorie content and positive effects of wine through the ingestion of antioxidants and nutraceuticals. Further evidence is that there is a need to better test the perception of dealcoholized wine products intended as complex products. With this purpose in mind, the present work aims to test the hypothesis of DW as an imperfect substitute for conventional wine to understand consumers' preferences regarding DW in general and draw attention to consumers' acceptance of the technologically possible dealcoholization categories in combination with other quality attributes. In addition, we measure the price premium consumers who are willing to pay or the discount they are willing to accept, to depict market opportunities, determine potential profits, and derive conclusions at the industry and policy levels.

The experiment does not aim at measuring consumers' preferences after tasting, which are generally useful to draw conclusions about the consumption phase, repeated purchase, and habit formation. In this work, we aim to get acquainted with the impact of the new product on consumers' quality and price expectations, which are influential in determining acceptability when the product is introduced to the market for the first time.

A choice modeling method (CMM) has been chosen for this analysis to econometrically estimate consumers' preferences and willingness to pay (WTP). The present study, however, results in a first attempt to evaluate the acceptability of dealcoholized wine.

After the present introduction, the remainder of the paper highlights the production technology of DW in Section 2. Section 3 presents the theory and methodology. Section 4 presents the results and relative comments. Finally, Section 5 concludes with a discussion of the implications and directions for further studies.

2. Dealcoholized wine: production and technologies

Several technological advances have been made to partially reduce alcohol content in finished wines. A variety of high-tech and low-tech processes are used to remove most of the alcohol: centrifugation, reverse osmosis, osmotic transport, spinning-cone column, thin-film evaporation under reduced pressure, and thermal gradient processing. These processes reduce the wine to sirup, which is later reconstituted into wine; some wineries use water to reconstitute, and others use grape juice or grape concentrate. The outcome of the process is the

same: a product that looks and tastes like traditional wine but is less than 0.5% of alcohol. These techniques allow producing wines by removing alcohol and retaining the original flavor as much as possible.

These dealcoholized beverages, first introduced to the marketplace about 20 years ago, are usually labeled as "less than 0.5% alcohol." This alcohol content is low enough to exempt the product from alcoholic beverage regulation in most jurisdictions, and producers often point out that fresh-squeezed orange juice may contain similar amounts of alcohol through natural fermentation.

An added benefit of the removal of alcohol is the reduction of about one-third of the calories. Moreover, the positive effects associated with red wine can still be found in the dealcoholized version. Recent studies have shown that the powerful antioxidants in red wine can reduce the risk of heart disease in some people; these same antioxidants, called catechins, are also found in dealcoholized red wine (Tamura et al., 2009; Goldberg et al., 2001; Donovan et al., 2002).

More specifically, alcohol content is processed at different intensities. There are four categories from the most intense process to the lightest. They are alcohol free, dealcoholized, partially dealcoholized, and reduced alcohol content, as described in detail in Table 1.

DW production and sales are regulated in the framework of the CMO (Common Market Organization) for the wine sector (art. 25, par. 2, lett. B of EC reg. n. 479/2008). On the other hand, the Italian position on the subject is very clear: the Ministry of Agriculture does not intend to provide permission to produce DW. However, it does not prevent importing and selling dealcoholized wines in the Italian market as long as they are clearly identifiable by labeling.

3. Theory and method

Conjoint choice experiments have become very popular in this type of analysis as this approach is particularly attractive and is a valid alternative to the contingent valuation method for nonmarket goods when secondary data are not available (Burton et al., 2001). The basic assumption of choice models (CMs) is that products must be defined by a limited number of key attributes, each with a limited number of levels. A set of products is constructed based on these attributes and levels, and consumers must choose their most preferred option from a small set of profiles. Attributes usually refer to characteristics known to consumers, such as extrinsic attributes. However, the attractiveness of this set of methods consists of identifying choices that represent the trade-offs made in actual purchasing decisions in front of market shelves.

Random Utility Theory affirms that individuals choose the alternative yielding the greatest net utility, which can be represented as follows:

$$U_{ij} = V_{ij} + \varepsilon_{ij} = Z_i S_{ij} \beta_{ij} + \varepsilon_{ijt} \quad (1)$$

where $i = 1,\ldots, N$ indicates the individuals, and $j = 1,\ldots, J$ indicates the alternatives from which the consumer has been asked to choose. Eq. (1) shows that the utility U of the individual i relative to the product j is composed by an indirect utility V term, which is known to researchers, and the stochastic term ε, which is unknown to researchers but known to the consumer. The indirect utility includes a matrix of product attributes S, measured as discrete, dummy, and continuous variables, which include the price vector and a vector of coefficients β, which could be assumed to take different values based on consumers' preferences and characteristics Z.

The model is implemented by choosing a particular distribution of disturbances, where typically alternatives are assumed to be independently and identically distributed and follow a Gumbel distribution. McFadden (1974) has shown that a random utility model can be estimated through the maximization of the logarithmic version of a conditional logit likelihood function:

$$\text{Prob}(Y_i = j) = \exp[\lambda_j Z_i S_j' \beta_{ij}] / \Sigma_j \exp[\lambda_j Z_i S_j' \beta_{ij}] \quad (2)$$

Table 1
Definitions of DW based on intensity of the process and alcoholic content.

Alcohol free wine	Dealcoholized wine	Partially dealcoholized wine	Reduced alcohol content wine
Obtained exclusively from wine or special wine as described in the International Code of Enological Practices of the OIV.	Obtained exclusively from wine or special wine as described in the International Code of Enological Practices of the OIV.	Obtained exclusively from wine or special wine as described in the International Code of Enological Practices of the OIV.	Obtained exclusively from wine or special wine as described in the International Code of Enological Practices of the OIV.
Has undergone a dealcoholization treatment according to the OIV International Code of Enological Practices.	Has undergone a dealcoholization treatment according to the OIV International Code of Enological Practices.	Has undergone a dealcoholization treatment according to the OIV International Code of Enological Practices.	Has undergone a dealcoholization treatment according to the OIV International Code of Enological Practices.
Alcohol below 0.05%.	Alcohol below 0.5%.	Alcohol between 0.5% and 8.5%, or between 0.5% and the minimum alcoholic strength of wine established at the national level.	Has an alcoholic strength by volume greater or equal to 8.5% or greater or equal to the minimum alcoholic strength of wine established in the national legislation of the producing country; has been reduced by more than 2% vol. with respect to the alcoholic strength by volume of the wine or the special wine of origin.

Source: International Organization of Vine and Wine (OIV).

where Y denotes the choice made (0 when an option is not chosen, 1 otherwise). The model estimates the sign and intensity of effects—β parameters. In addition, the model accounts for heterogeneous preferences across consumers, taken into account by measuring the impact of socio-demographics, the matrix Z, on quality perception, and preference scale—heteroscedasticity—over the options proposed to consumers through the vector of λ parameters[1].

An additional feature of this approach is that parameters can be combined to assign monetary value to consumers' preferences, giving rise to the WTP, which could be intended as the change in price that, after a change in product quality, brings back the utility to its initial level (Roselli et al. 2006; Cicia et al., 2005; Burton et al. 2001). This rationale refers to the part-worth evaluation (Burton et al. 2001). Specifying the S of Eq. (2)as a matrix composed of X, the sub-matrix of quality attributes, and P, the price vector, the WTP will be:

$$E(\mathrm{WTP}_j) = \vartheta' X_j \beta_j / \vartheta' \boldsymbol{P} \beta_{price} \quad (3)$$

Finally, the WTP results as the ratio of the marginal effects between attributes and price, identifying the compensating variation between quality and price; that is, the monetary value consumers' assign to an additional quality level.

3.1. Survey and data

The aim of the work is to measure consumers' preferences for wine attributes through a simulated market in which dealcoholized wines obtained by processes of different intensities are introduced. Data were collected through a questionnaire-based survey. Respondents were selected randomly at the exits of shopping malls, specialty stores, and supermarkets in Apulia, Italy. The total number of choice sets completed was 330. As the sample has not been stratified over any socio-demographic variable, our data do not aim to be fully representative of Italian consumers; this study thus represents a first attempt to measure consumers' reactions to these new products and does not offer the possibility to make any quantitative inference on the entire Italian population.

Interviews were carried out in April 2010. Consumers were asked to select one among three alternative wine products with different characteristics per choice set; these were the same attributes but at different levels. To hide the main scope of the survey and to reduce the corresponding biases, dealcoholization level and alcohol content were just two attribute levels among a wider set of combinations (Burton et al., 2001). This strategy was adopted in order to recreate a realistic choice environment in which wine attributes in the survey correspond to the real set of information proposed to consumers on the bottle labels at the shelves of the retail market.

The set of attributes and levels considered for obtaining the choice sets are shown in Table 2. To reduce the number of alternatives presented to interviewees, an experimental design has been applied that reduces the alternatives with orthogonality criteria (Orthoplan procedure of SPSS 13.0), giving rise to 15 alternatives. Just one example is shown in Table 3.

Price variations have been assigned randomly to alternatives, assuring that no dominant alternatives were created within a choice set, and the 15 alternatives were randomly assigned to three different questionnaires to avoid interviewee fatigue. Moreover, given that prices differ across geographical areas, to give a realistic monetary value to alternatives, the price of the base alternative was set equal to the mean price of the area where the interview was carried out[2]. Prices of the other alternatives, then, were calculated applying the percentage variation, randomly assigned as described before, to the mean price of the interview location. The three questionnaires were assigned randomly to consumers.

Questionnaires were organized in two parts: the first concerned the choice of the alternatives, and the second was about socio-demographics[3]. Before the interview, the attributes and the answering procedure were briefly presented. Table 4 reports sample descriptive statistics.

4. Estimation and results

Conditional logit, mixed logit, and heteroscedastic extreme value (HEV) have been widely used in the empirical analysis regarding genetically modified food (Burton et al., 2001; Roselli et al., 2006; Stasi et al., 2008), environmental goods evaluation (Morrison et al., 1996; Adamowicz et al., 1998; Blamey et al., 1998; Bennet, 1999; Hansen and Schmidt, 1999), food labeling, and food quality (Cicia et al., 2004, 2005; Bjorner et al., 2002). The simplest likelihood specification is the conditional logit, in which variance of preferences is assumed to be unitary across alternatives (λ=1). The second specification consists of the heteroscedastic extreme value (HEV) logit, which estimates parameters and variance ($\lambda \neq 1$ for $j \neq 1$) (Burton et al., 2001).

The effect of heteroscedasticity on consumers' preference choosing wines other than the status quo, which is the conventional wine, implies a certain experimental attitude in consumption, which is certainly not found in consumers choosing the status quo. Therefore, the possible source of heteroscedasticity, in this model specification, could be interpreted as a different experimental attitude of consumers toward new products. The independent variables predicting such a behavior should allow segmenting experimental and conservative consumers.

The last model specification is a mixed logit. Unlike conditional logit, it assumes preferences related to one or more product attributes to be heterogeneous; thus, a random parameter associated with these attributes is estimated over a

[1]The likelihood function does not account for the variability over the t dimensions (the alternatives to which each single consumer is exposed) in λ and $ZX\beta$, assuming that the correlation between stocastic terms of different choice sets e_{ijt} and e_{ijt} is null. Nonetheless, this is interesting for further development of the econometric aspects that could account for correlation across trials.

[2]Mean prices correspond to the average price of the area calculated on the base of AcNielsen database and corrected by inflation rate.

[3]Questionnaires in Italian are available upon request from the authors.

Table 2
Attributes and their levels.

Attributes	Levels
% price variation with respect to mean wine price of the area	−15, −10, 0, 10, 15, 20, 30, 40
Sulfites	Present (1), none (0)
Organic grape production	Organic (1), conventional (0)
Dealcoholization level (final alcoholic content)	Regular—no dealcoholization process applied (13% alcohol) Reduced alcoholic content (11% alcohol) Partially dealcoholized (8.5% alcohol) Dealcoholized (0.5% alcohol) Alcohol free (0.05% alcohol)

The status quo was considered red wine with 13% alcohol content with sulfites and produced from conventional grapes, which corresponds to a wine with modal attributes and mean price.

Table 3
Example of alternatives presented to consumers within a choice set.

Information	Wine 1	Alternative 1[a]	Alternative 2[a]
Price	€ 3.88	€ 4.46	€ 4.27
Alcoholic content (%)	13	8.5	11
Process applied to the base product sulfites Organic	With sulfites	(Partial dealcoholization with sulfites) Organic	(Reduced alcoholic content without sulfites)
Choose one	□	□	□

[a]These are just three combinations with randomly picked attribute levels. Normal wine could also be without sulfites, partially dealcoholized, not organic, and offered at different prices.

Table 4
Descriptive statistics of the sample.

Variable	Category	%	Mean	St. dev	Min	Max
Gender	Female	45.16				
Age			34.70	10.82	20	78
Education	5th grade	1.34				
	8th grade	12.10				
	High school	28.76				
	College	40.32				
	MSc/PhD	17.47				
Number of underage children			0.40	0.85	0	3
Income (euros per year)	No income	2.69				
	Less than 15,000	33.60				
	15,000–30,000	36.83				
	30,000–50,000	16.13				
	50,000–70,000	6.72				
	More than 70,000	4.03				
Purchasing volume per week (ml)			0.68	0.91	0.10	4.00
Has health issues associated with drinking alcohol		1.3				
Considers alcohol a problem for society (1–5 scale)			3.72	1.26	1	5
Considers alcohol a personal problem (1–scale)			2.13	1.45	1	5
General attention to health aspects (1–5 scale)			3.48	1.17	1	5
Attention to label when purchasing food (1–5 scale)			2.86	1.34	1	5
Teetotalers		2.68				
Average price of wine purchased (euros per bottle)			4.73	2.52	1.5	10

stochastic variable obtained over a $k=1000$ random draws sample. Then the parameter associated with each attribute is $\beta=\beta_{\text{avg}}+0.0001\sum_k \beta_k \nu_k$.

Before defining the final specification of the random utility equation, the three alternative model specifications: conditional, HEV, and mixed logit, were estimated over three different sets of variables[4], reflecting different ways to deliver dealcoholization information. The first set of variables considers just the information on alcohol content (Model 1) as well as the eventual organic production, the presence of sulfites, and the

[4]The MDC procedure of SAS 9.0 was used for the estimation.

Table 5
Estimation results: wine attribute preferences.

Variable	Model 1 Alcohol		Model 2 Process		Model 3 Process and alcohol	
	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value
Price	−0.606[a]	0.375	−0.483[a]	0.29	−0.452[b]	−1.49
Alcohol	0.052[b]	1.45	–	–	0.015	0.35
Alc. free	–	–	−0.682[a]	−2.29	−0.489	−0.79
Dealc.	–	–	−0.282	−1.39	−0.112	−0.21
Part. dealc.	–	–	−0.274	−1.05	−0.19	−0.54
Reduced	–	–	−0.132	−0.5	−0.085	−0.29
Organic	0.402	1.25	0.426[a]	1.66	0.404[b]	1.53
Sulfites	−0.907[c]	−3.75	−0.870[c]	−4.88	−0.842[c]	−4.33

[a]0.1 prob.
[b]0.15 prob.
[c]0.01 prob.

price, which are also reported in the other models. Model 2 includes variables concerning the intensity of the processes (alcohol reduction, partial dealcoholization, total dealcoholization) of reaching different dealcoholization levels. The third set, Model 3, considers both alcoholic content information and the dealcoholization process intensity information. The likelihood ratio specification test (χ^2) outcome allows concluding that the conditional logit specification is the best among the three types of models, with 0.1% probability of rejecting the null hypothesis.

As shown in Table 5, although not all coefficients were significant, an important outcome is that consumers showed aversion toward dealcoholized wines that was more pronounced as the intensity of the dealcoholization process increased (see Model 1).

The most interesting outcome was consumers' positive attitude towards alcohol, which confirmed what has been reported in most of the wine demand and price literature (Nerlove, 1995; Angulo et al., 2000; Goodman et al. 2008). Consumers, even when exposed to low-alcohol alternatives on the shelves, associate quality with alcohol. Consequently, when only the process intensity was included in the model, alcohol-free wine generated a significant aversion in consumers, although other dealcoholization intensities were slightly less significant. The full model, Model 3, did not provide significant coefficients relative to dealcoholization, but did so for price, organic status, and sulfite content.

The three specification models furnished comparable results: consumers show decreasing utility when price and sulfites increase. By contrast, alcohol content and organic grape production generate positive attitudes. These results allow concluding that information on the dealcoholization process intensity and information about the alcoholic content were perceived similarly; they are therefore interchangeable for labeling these products, and dealcoholized wine does not generate high acceptability. Sulfite treatment of wine is strongly perceived as negative and significant, probably because consumers think this substance impacts their health. Organic grape production, as expected, generates positive attitudes, although not always significant.

From our calculation by means of part-worth analysis, as in Eq. (3), consumers would be willing to buy dealcoholized wine only if (approximately) a € 0.085 discount was applied for each percentage point of alcohol subtracted from the original wine[5]. As a consequence, a reduction of 2% alcohol would require a discount of about € 0.17, while substantial reductions of alcohol would require a significant price reduction (e.g., alcohol-free wine, from a 12% alcohol product, would require a € 1.025 discount).

Organic status generates positive consumers' preferences, while sulfites generate aversion. These last results confirm what has been already found in the food economics literature that analyzed consumers' organic consumption attitudes and the need for mandatory labeling, already enforced in Italy, stating that sulfites have been used as additives in wine fermentation (Table 6).

Finally, ex-post-market segmentation was conducted in order to understand how consumer characteristics could affect alcohol and dealcoholized wine preferences. The results indicated that, in both models, younger drinking people showed weaker preferences for higher alcoholic wines; therefore, they have a weaker association between wine quality and alcohol and represent a potential segment for dealcoholized wines. Similar results have been found for people who pay more attention to food and wine labels, probably because they associate alcohol with high caloric content of wine. People declaring they have issues with alcohol or who consider alcohol a personal problem in general are also a potential segment for dealcoholized wine.

More specifically, when analyzing the model specification in which alcohol content information is declared on the label, interesting results come to light. In fact, households with children not of a drinking age (less than 18), as well as people paying strong attention to health and people who strongly believe that alcohol is a problem for society, prefer lower alcoholic content wines. Similar results were found for people drinking cheaper wine (probably because they do not look for higher quality wines or they do not associate quality with alcoholic content), and teetotalers (probably because they would like to start the wine experience with an alcohol-free wine). On the other hand, people who have health issues with alcohol and people with higher education prefer wine with higher alcoholic content; probably because they have experienced the relationship between quality and alcohol. Similar results were found for people who drink more wine.

The model analyzing dealcoholized versus conventional wine identifies the ideal target: younger people, light drinkers, people focused on reading labels, and people who have issues with alcohol.

5. Concluding remarks and future research

Our results led us to conclude that DW would not be preferred to conventional wine unless there was a discount proportional to the alcoholic "distance" between the two.

[5]This result is calculated by means of Eq. 5.

Table 6
Estimation results with alcohol/dealcoholization consumers' profile.

Parameter	Interaction	Alcohol level			Dealcoholization		
		Estimate		*t*-value	Estimate		*t*-value
Price		−0.329		−1.280	−0.511	***	−2.260
Alcohol/dealcoholization		0.268	***	2.160	−2.675	***	−2.210
	Drinking age-33 dummy	−0.132	***	−2.720	1.086	***	2.480
	Gender	−0.008		−0.300	−0.185		−0.660
	Underage children	−0.049	***	−2.080	−0.035		−0.150
	Education	0.051	***	3.080	−0.415	***	−2.500
	Teetotaler	−0.303	***	−2.540	16.149		0.020
	Dislike wine	−0.060		−1.300	0.014		0.030
	Health issues with alcohol	0.559	***	2.830	−17.474		−0.020
	Volume of wine per week	0.063	***	2.930	−0.511	***	−2.740
	Average price of wine drunk	−0.008	*	−1.480	0.061		1.100
	Attention to health	−0.014		−1.140	−0.049		−0.410
	Attention to food labels	−0.021	**	−1.890	0.313	***	2.820
	Alcohol as problem for society	−0.012		−1.130	0.100		0.950
	Alcohol as a personal problem	−0.019	***	−2.100	0.177	**	1.850
Organic		0.382	*	1.520	0.508	***	2.220
Sulfites		−0.822	***	−5.310	−0.802	***	−5.200

Therefore, as a differentiation strategy, DW would not be successful, unlike its production coupled with other health-oriented attributes such as "no sulfites." On the other hand, given the difficult condition of Italian producers, who are struggling to sell wine surpluses, DW could be a strategy to reduce the excess of supply while attending to the effects of the restructuring of the sector pushed by the last CMO[6].

From the regulatory point of view, DW cannot be produced in Italy at the moment, although it can be imported conditionally with proper labeling. Whether DW should be labeled as wine is under debate within the Italian government. Our results, suggest that since consumers do not substitute conventional wine for DW there is little likelihood that Italian traditional producers would lose market shares because of DW. Proper labeling and effective regulation of this processed wine need to be enforced to supply consumers with appropriate information.

Market implications refer to the hypothetical failure in considering DW as a substitute for traditional wines. It is possible that a marketing mix idealizing DW as a substitute for other beverages could make this product profitable.

Our data showed that only 10% of the sample was willing to buy dealcoholized wine. Estimates, on the other hand, confirm that low knowledge of the wine world and young age could be major sources of consumers willing to try this new product. However, alcohol information seems to be more effective in orienting consumers, not the "dealcoholized" attribute. Moreover, in order to be successful, DW should be cheaper than conventional wine because consumers would be willing to try a dealcoholized version of a wine only if a certain level of discount was applied.

No precise considerations on profitability could be made. Given our results, additional costs due to the dealcoholization process would thus reduce the profits compared to those achieved with traditional production. Nonetheless, dealcoholization produces alcohol as a by-product; this by-product has its own market. Profitability calculations, then, need to account for this additional source of revenue, which is usually not considered when producing conventional wines.

The results suggest that DW should be marketed not as a wine nor as a close wine substitute but as a different beverage. On the other hand, the product is not known by consumers. To widen the target market, marketing strategies should insist on promoting the product and increasing consumers' confidence in DW and in the dealcoholization process.

Future research should address the need to support these conclusions with a representative sample. It should also evaluate consumers' reactions to different ways of presenting or marketing the product to understand the close substitutes bundle to adopt the most appropriate differentiation strategy. Moreover, sensory tests could complete this analysis, enabling further considerations that account for repeated purchases and the relationship of consumers with the actual consumption of the product.

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The research resulted as the joint work of the four co-authors. Nonetheless, Antonio Stasi, wrote paragraph nos. 3 (with the exception of 3.1), and 4. Francesco Bimbo, paragraph no.3.1, Rosaria Viscecchia, paragraph no. 2, Antonio Seccia, 1, while the conclusions, paragraph no.5, have been written in cooperation.

[6]Restructuring includes measures to reduce vine cultivated area with incentives to growers.

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