

# How sweet is your wine? - A reflection on consumers choices

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**Abstract.** The culture of wine consumption reaches consumers of different ages, behaviors and life habits. The introduction of new consumers in the world of wine often happens through the consumption of wine-derived beverages, in most cases with a high sugar content, due to reasons of palatability, familiarity and acceptance. This is due, among other reasons, to the conditioning of the consumer's palate to the sweet taste, also causing a high consumption of sugary drinks such as softdrinks, in addition to several other foods with a high content of added sugars. In the case of beverages, the sweetening is a resource frequently used throughout the industry to provide greater palatability to the product, attracting consumers who prefer sweeter flavors, and may also provide greater acceptance among the youngsters, in addition to potentially leading to immoderate consumption of alcoholic beverages. These habits have a direct impact on consumers' health, mainly because they favor the development of non-communicable chronic diseases (NCDs). With the aim of seeking to better understand the profile of Brazilian consumers of wines and grapes derivatives, and their relationship with the consumption of sugar and alcohol, a survey was carried out through the application of a questionnaire.

## 1 Introduction

According to several studies, humans have a natural preference for sweetness [1,2], which can be influenced by early introduction to sugar added food and beverages [3].

Sugar, as an essential component of food and beverages, not only provides sweetness but also plays a significant role in the flavor, texture, and preservation of beverages [2]. Global sugar consumption has increased in recent years, raising health concerns due to its association with several health adversities [4]. Among others, the consumption of sugars in high doses can lead to dental caries, cardiovascular diseases, hypertension, dyslipidemia, insulin resistance, type 2 diabetes mellitus, fatty liver disease and, consequently, mortality from all causes [5]. Sugar levels in wine can vary according to type, variety, country, producing region and year. Studies carried out in other countries

have been attempting to understand the relationship between taste preference, age and consumption volume. A recent study published by [6], revealed that the young palate of Indian millennial consumers who have just begun experimenting with wine is likely to prefer sweeter wines as compared to dry wines.

Sena-Esteves, Mota and Malfeito-Ferreira (2018) [7] have studied the preference for sweet taste in red wine according to consumer categories of age, gender, drinking experience and personality type. In their study, they affirm that residual sugar can be modulated to shape the sensory properties of wines in order to create "softer" and more desirable products.

The role of understanding the motivations of alcohol preference and consumption is important not only for disease prevention, intervention, and policy management, but also for market segmentation, product development, and optimization [8].

In that regard, there is still a lack of data on the wine consumer profile globally. Therefore, with the aim of seeking to better understand the profile of Brazilian consumers of wines and grapes derivatives, and their relationship with the consumption of sugar and alcohol, a survey was carried out through the application of a questionnaire.

## 2 Material and methods

### 2.1 The survey

The survey was carried out through the application of a google forms questionnaire, prepared by the authors, shared with random legal drinking age Brazilian consumers ( $n = 540$ ). The questions were based on the following areas: demographic characteristics, preferences and habits on alcoholic beverages and on non-alcoholic beverages, perception on wine labeling, lifestyle and general health state.

**Table 1.** Percentage of subjects in each class of the categories under study.

Categories	Classes	% of subjects
Age	18-25 years	6.6
	26-35 years	25.2
	36-45 years	26.5
	more than 46 years	41.7
Gender	Female	56.1
	Male	43.7
	Not informed	0.2
Professional in the wine sector?	Yes	16.7
	No	83.3

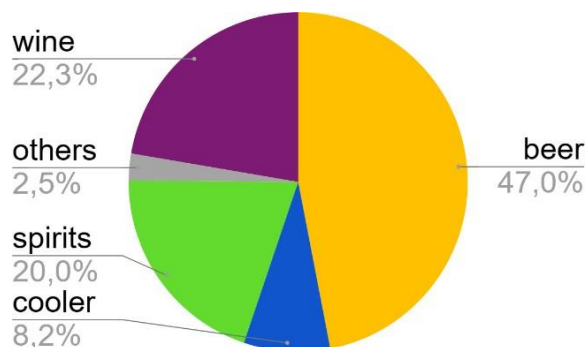
The majority of the subjects who contested the questionnaire were over 46 years old. In relation to gender, the majority was represented by females.

Additionally, only 16.7% of the subjects self-reported as being professionals of the wine sector.

## 3 Results and Discussion

### 3.1 About preferences in the consumption of alcoholic beverages

In order to understand the consumption habits of the participants, they were initially asked whether or not they consume alcohol and what beverages they usually consume (Fig. 1).



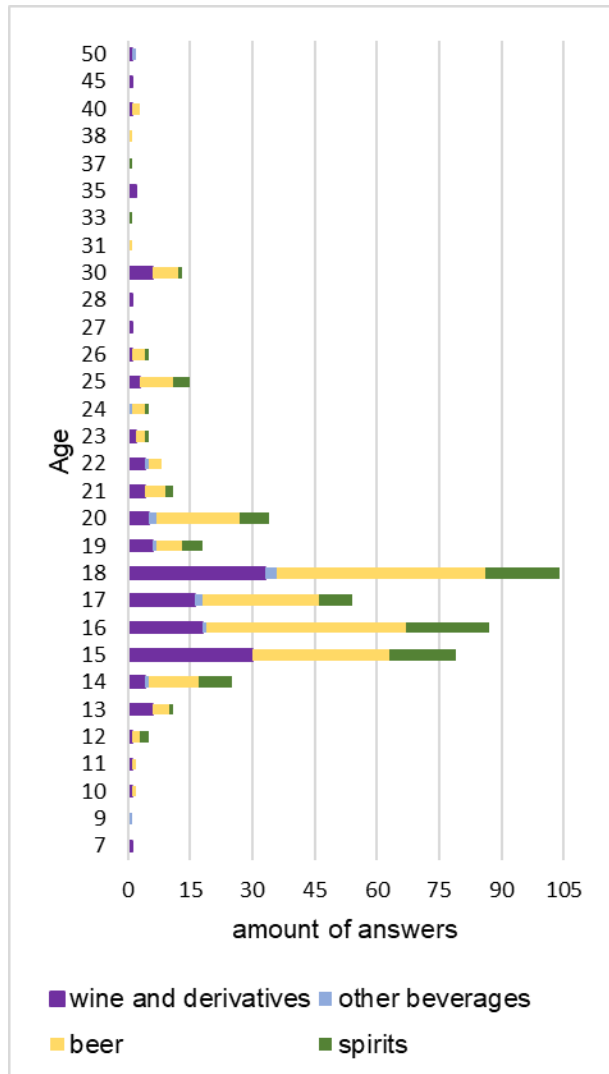
**Figure 1.** First beverage consumed.

Most respondents claim to have started drinking alcoholic beverages between the ages of 14 and 25, with beer being the most common introductory beverage, followed by wine. The results obtained in this research are consistent with a previous study [8], which describes that most Brazilians claim that alcoholic beverages were introduced between the ages of 14 and 25, with beer being the most frequently consumed beverage, followed by wine and wine-based beverages, such as wine cooler and wine cocktails. Another similar conclusion was obtained in a previous study conducted in the United States [9]. The author characterizes adolescence as a period of searching for sensations and experiences. Although alcohol consumption by adults occurs on a greater number of occasions, adolescents tend to drink at high levels, however, on a smaller number of occasions. Furthermore, in countries such as Ireland, Germany, the United Kingdom and the Netherlands, alcohol abuse among 15- and 16-year-olds is reported by at least 28% of the surveyed public.

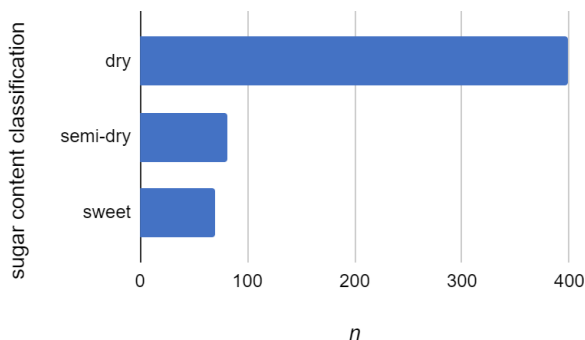
### 3.2 Preferences related to sugar content

Participants who consumed wine were asked their preference regarding sugar content, according to the following classifications: dry, semi-dry or sweet. As shown in Fig. 3, the vast majority of them expressed their preference for dry wines, which according to the Brazilian legislation represents a maximum of 4 g/L of residual sugar. To a lesser extent, the semi-dry and sweet wines were chosen, respectively. A study carried out among Portuguese consumers, [6] investigating patterns of sweetness preference in wines with a sugar content between 2 and 32 g/L, revealed that the overall preference ranged between 4.8 to 21.9, with a maximal liking at 8 g/L. Additionally, the authors concluded that men and more experienced consumers showed a greater preference for less sweet wines, while women and early-stage consumers preferred sweeter wines. Addictions or health issues of the respondents were not evaluated, but studies state that the consumption of sweeter drinks may be linked to drug addiction [10].

The authors observed a greater preference for sweets in alcoholics than in non-alcoholics, in addition to having reached the same conclusion in a research with cocaine dependent people. One of the explanations for this is that the ingestion of carbohydrates, such as sugars, releases serotonin, a neurotransmitter related to calm and satisfaction, which tends to improve mood.



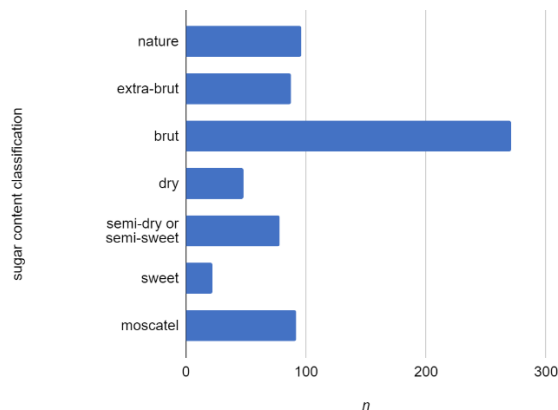
**Figure 2.** Number of subjects that started drinking alcohol at each age range and the first beverage they have consumed.



**Figure 3.** Preferences regarding sugar content of wine.

Similarly, participants who consumed sparkling wines were asked their preference regarding sugar

content, according to the following classifications: nature, extra-brut, brut, semi-dry, semi-sweet and sweet. As shown in Fig. 4, most of them prefer brut sparkling wines.



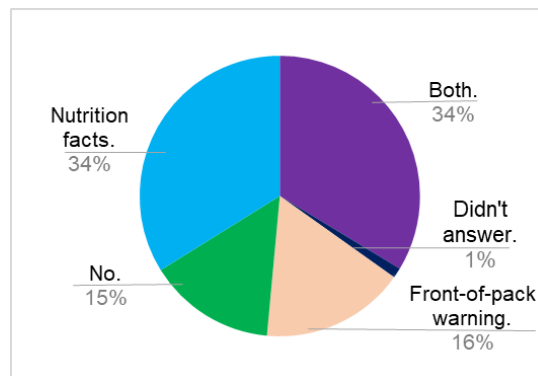
**Figure 4.** Preferences regarding the sugar content of sparkling wines.

### 3.3 What the consumer expects from information on the label

Finally, in order to understand the type of information that the consumer expects to find on the label, they were asked whether wine labels should inform about the sugar content in the drink - such as nutrition facts, front-of-pack warnings, or both - or not. Most of the participants (85%) in this research understand that the wine label should warn the consumer about its sugar content, with 34% of them indicating wine labels should have both the nutrition facts and the front label warning of high sugar content, when applicable (Fig. 5).

## 4 Conclusions

The results of this preliminary study demonstrate that, although the general preference is for dry wines and brut sparkling wines, the total consumption of wines, in general, by some individuals, when combined to its sugar content, represents the total recommended daily intake of sugar per person.



**Figure 5.** What should wine labels inform?

Furthermore, this work aimed to raise questions regarding sugar consumption, and it is the beginning of a research that will be continued.

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