



UNIVERSITÀ DEGLI STUDI DI PADOVA

Department of Agronomy, Food, Natural Resources, Animals  
and the Environment- DAFNAE

Second Cycle Degree (MSc)  
in  
Italian Food and Wine



***DESSERT AND WINE PAIRING:  
What's the best match?***

Supervisor  
Dott.  
Matteo MARANGON

Submitted by  
Giorgia Geovanna LUZI  
Student n.1147445

ACADEMIC YEAR  
2017-2018



*“What we call the beginning is often the end. And to make an end is to make a beginning. The end is where we start from”.*

*(T.S.Eliot)*



## **CONTENTS**

<b>ABSTRACT</b> .....	3
<b>1. INTRODUCTION</b> .....	5
1.1 <i>Dessert and Wine Pairing: The reasons why</i> .....	6
<b>1.2 <i>The role of FISAR (Federazione Italiana Sommelier Albergatori Ristoratori) in guiding food and wine matchings in Italy</i></b> .....	8
<b>1.3 THE MAIN VARIETIES OF ITALIAN SWEET WINES</b> .....	9
<b>1.4 ICED WINES: A special category of sweet wines</b> .....	11
<b>1.5 DULCIS IN FUNDO, SO...WHAT TO DRINK WITH?</b> .....	13
<b>1.6 FOOD, WINE, HISTORY AND SOCIETY</b> .....	14
<b>2. EXPERIMENTAL INVESTIGATION</b> .....	15
2.1 <i>Survey</i> .....	15
2.2 <i>Materials and methods</i> .....	15
2.3 <i>Results and discussion</i> .....	17
2.4 <i>Tasting session</i> .....	30
2.5 <i>Materials and methods</i> .....	30
2.6 <i>Results and discussion</i> .....	37
<b>3. GENERIC CONSIDERATIONS: Comparison between survey and tasting session results</b> .....	39
<b>4. BRAIN MECHANISMS AND WHAT IS BEHIND THE DESSERT AND WINE PAIRING PREFERENCES</b> .....	41
<b>5. CONCLUSIONS</b> .....	43
<b>REFERENCES</b> .....	45



## *ABSTRACT*

This thesis is an investigation about “Dessert and Wine Pairing” as unexplored branch of the Sensorial Analysis Science. The following study aimed to understand the reasons behind the consumer choices about dessert and wine pairing and why these are limited to few wines. It has been done a comparison between the expert suggestions and the consumer preferences in order to understand how and how much these can influence the purchasing choices. To obtain some evidences a survey and a tasting session have been conducted and the results showed a discrepancy among the two parts. A basic wine knowledge from the majority of consumers and a scarce interest to exceed prestablished schemes, together with a missed depth study of the chemical dynamics influencing the perceptions in the dessert and wine pairing from the experts, have been considered responsables for the general disinterest affecting this specific area of gastronomy. All these researches were fundamental in the definition of a new method able to make easier for the consumer to identifies the few main important points to create a good pairing not limited to the same monotonous options.



## *1.INTRODUCTION*

Food can probably be defined as one of the oldest topic the human being has been interested to, unknown tastes flavors and textures came out with the discovery of fire. To gain a major benefit from food became necessary to focus on both nutritional and gustative factors. Cooking made raw materials more complex, increasing their structure and creating new textures.

Today gastronomy has to offer the customer products perfectly balanced in their consistency, sweetness, acidity, freshness and aroma. Food pleasure results from a variety of elements that combined together grow rich. These are able to generate new flavors thanks to the chemical interaction of their molecules (*P.Moller,2014*).

Food pairing and oenology areas joined together to exalt the dishes without stressing too much the number of ingredients. When combining different raw materials is easy to cross the line between a perfect balance and to create a mess.

The desire to enhance the dish without making additional changes, pushed the need to pair food with external elements. The best solution was the match with that famous beverage today known as wine.

Nowadays the entire catering world is runned by the science of food and wine pairing which handles all the steps behind the creation of a meal. All the making process requires a strict binding with the producers, litterally “From field to fork” (*Paul B. Thompson,2015*).

Then, the real challenge is to find the perfect pairing, whose sommelier is in charge of.

Most of the “high level” restaurateurs care about having a costumized wine production for their restaurant in order to impress their signature in every single element of the menù. In this way winegrowers are motivated to create wines for specific pairings. This niche demand-offer system helps increasing the products variety also going beyond the standard market demand.

New generation Chefs like Grant Achatz (Chef and Owner at Alinea) focused their work in creating sensational experiences to offer their guests, that is more than serving deliciuos food. Raw materials represent a challenge that is to shape them to an unrecognizable form but preserving their soul and making azardus pairings in order to surprise and trick the human brain. *“People like to think the creative process is romantic. The artist drifts to sleep at night, to be awakened by the subliminal echoes of his or her next brilliant idea. The truth for me at least, is that creatvity is primarily the reasult of hard work and study”.* (*G. Achatz,2008*)

To create and maintain the balance in a plate is very difficult, and even more extreme is let it be exalted by a glass of wine.

Wine is a complex matter by its own, alive, continuously developing and endless, able to influence the food gustatory perception even when it passed over the oral cavity.

It is a multi-level player, capable to express itself in different times and capture the attention of a variety of senses as the touch of the hand that shakes the glass or the smell when aromas come out, as the sight which scans the color and the taste perceiving sweet, acid or bitter notes. All these together slowly reduce, resulting in a scent whose aftertaste reveals the wine essence.

The gastronomists try to combine such a complex element with food that is a world to explore as well. There is a sort of treaty between them and the innovation as a challenge they try to overcome everyday.

The enogastronomy has its major expression in the restaurants' dining room, where the "expertise" of chefs and sommeliers cooperate to propose the clients ideal combinations, waiting for them to enjoy the food and wine matching.

There is an attent study of meals and wines to serve, playing with elements in and out the plate, taking into account the more or less persistent notes which remain or go away, those that refresh or load the palate in order to have them beared or dulled by the right glass of wine. The menu is structured as follow with the appetizer as an introduction to the coming tasting and the rest to follow. At least comes the dessert, which wine do we pair it with?

### *1.1 Dessert and Wine Pairing: The reasons why*

The choice to deepen a particular theme as "Dessert and Wine Pairing" results from the main interest I have regarding the world of pastries and all the linked aspects that since the childhood I have been fascinated by.

Studing at the University, from the Bachelor in Science of Nutrition and Gastronomy to the Master with the integration of oenological studies, led to discover wine, a subject unfamiliar for most people. The cooking school and the practice in the bakery highlighted a similarity between dessert and wine, both play a solo role in the sector of consumption. If for salted food is easier to find a wine match instead for sweetened stuff is more limited and difficult.

From a professional point of view the most recurrent question was the reason why customers used to buy the same wines like sweet sparkling, spumante or prosecco not concerning about the dessert in the same way they do for salted food.

Italy is well known for the production of sweet wines as much as for pastries, so the decision to investigate about dessert and wine pairing was apt to understand the wine consumption habits in general terms and in the match with dessert, what are the consumer preferences and how much he or she feels confident while selecting a wine.

The experts, as we will see clearly define the role of sweet wines and how best to combine them, to understand if the choices of the consumer follow the pre-established rules both in theory and in practice I built a survey and a testing session.

The science of sensory analysis is a new and constantly evolving branch and specifically that of dessert and wine pairing has not been explored yet.

Studies and data collection related to the topic is scarce and mainly analyzes the most common food and wine matches, such as that of cheese and wine.

Nevertheless, the experimental research conducted in this thesis found out a parallelism between this and the study "*The role of acidity, sweetness, tannin and consumer knowledge on wine and food match perceptions*" (R. Koone et al, 2014). The study took into consideration different food and wine matches, including a specific one with a sweet element, milk chocolate, to understand which one between acidity, sweetness and tannicity were predominant in the appreciation of a given combination. The researchers selected a sample of both experts and ordinary people to assess whether previous knowledge can influence and how much the choice of pairings.

Four foods, Chèvre, Brie, Spicy Italian Salami and Milk Chocolate were examined and participants were asked to combine each of them with one of the following wines: Sauvignon Blanc, Chardonnay, Cabernet Sauvignon and Port, indicating what they think would be the best match.

Moreover, for each wine they tried to understand what was the most remarkable feature among the three taken in analysis. The aim of this study was to understand whether certain suggestions regarding specific food and wine matches had demonstrable scientific foundations as well as theoretical foundations.

At the end of the research the authors confirmed a truthfulness in the suggestion of some pairings. Regarding the capability to appreciate a match, they also point up the role of a previous knowledge as fundamental key for the recognition of those elements able to characterize a wine, influencing the perception of food.

## *1.2 The role of FISAR (Federazione Italiana Sommelier Albergatori Ristoratori) in guiding the food and wine matchings in Italy*

FISAR (Federazione Italiana Sommelier Albergatori Ristoratori) is one of the main federation emerging in the Italian wine sector, she trained expert oenologists and over the past years has undertaken several partnerships with other foundations, such as Slow Food, for the promotion of products of excellence in the Italian territory. In providing general guidelines apt to simplify the pairing process for the different categories of wines, FISAR analyzed the the main criteria of classification for the dishes, then through the principles of analogy and contrast pointed out the following suggestions:

1. Aromatic and fragrant dishes, thanks to their preparation in the kitchen or for the presence of aromatic herbs, require olfactory intensity and high persistence in wine (analogy).
2. In presence of unripe, bitter or pungent sensations in the dish, a soft wine is preferred (contrast).
3. Food with a good texture, intended as resistance to chewing, requires an alcoholic and body wine (analogy).
4. For long preparation dishes, with a complex cooking method that modified flavors, melted and exalted, also like seasoned food, is required a structured and aged wine (analogy)
5. Fatty dishes with sweet notes need sapid, acid or sparkling wines (contrast).
6. Oily or savory dishes are better matched with alcoholic and tannic red wines (contrast).
7. Desserts require high residual sugar wines or sweet wines (analogy).

*(FISAR, Abbinamento. <http://www.fisar.org/abbinamento/>)*

### 1.3 THE MAIN VARIETIES OF ITALIAN SWEET WINES

“Italian sweet wines are often mentioned but not so much known and these represent a various and exciting world” (M. Zanichelli, 2018)

Italy offers several productions of sweet wines, from the North to the South of the peninsula which differ according to the processing method and the variety of grapes.

Italian sweet wines are grouped in 5 different categories as follow:

1. **Natural sweet wines** are made by aromatic grape varieties like Brachetto or Moscato. The processing method expects the fermentation to be stopped in order to increase the sweetness.
2. **Late harvest sweet wines** are those maintaining a high sugar concentration level, able to muffle the acidic component in the product.
3. **Passito wines**, are those made with sun or partially sun dried berries.
4. **Muffato wines** are those known because the grapes are attacked by a mold, the botrytis cinerea, which increases the sugar content in the grapes.
5. **Fortified wines** result from the addition of alcol or cooked must.

### 1.4 Regional Sweet Wines

Each region has a specific production of sweet wines (Table 1) and own viticulture techniques, which give the wine characteristic aromatic notes.

**Table 1.** Main Italian sweet wines divided by region of production

	<i>Region</i>	<i>Wine</i>
<i>North</i>	Friuli-Venezia Giulia	Verduzzo Picolit
	Trentino-Alto Adige	Vin Santo Gewrztraminer passito
	Veneto	Recioto della Valpolicella Recioto di Soave Moscato Bianco Custoza Passito Ramandolo
	Lombardia	Moscato di Scanso Sangue di Giuda

	Piemonte	Moscato d'Asti Passito di Moscato Loazzolo Malvasia di Casorzo
<i>Center</i>	Toscana	Vin Santo Moscadello
	Marche	Verdicchio dei Castelli di Jesi
	Umbria	Montefalco Sagrantino Passito Muffato della Sala Umbria Passito
	Lazio	Aleatico di Gradoli Muffo Lazio
<i>South</i>	Campania	Falanghina Phileno Passito Sannio Moscato Castel San Lorenzo Moscato
	Puglia	Primitivo Aleatico di Puglia Moscato di Trani
	Sicilia	Marsala Moscato di Siracusa Malvasia delle Lipari Passito di Pantelleria

## 1.4 ICED WINES: A special category of sweet wines

Ice wine (*eiswein* in Germany) is one of the most amazing wines in the world. Its rich and flavorful taste, together with an incredible sweetness and an intense color create a unique dessert wine. To make ice wine, the winemaker leaves the grapes on the vine (*J.R.Fischer, 2006*), long after traditional harvest season has ended, hoping neither rain nor wildlife damage the grapes. The winemaking process requires the grapes to be picked frozen (not falled) and a temperature around  $-7^{\circ}\text{C}$ .



Because much of the water in the grapes is frozen, the pressed juice is concentrated and so sweet that the fermentation is long and slow. The production of ice wine can take 3 to 6 months with a final product of residual sugar content up to 220g/L.

The best grapes are those able to grow in cold climates and include Cabernet Franc, Merlot, Gewürztraminer, Riesling, Grüner Veltliner, Chenin Blanc, and Vidal Blanc.

As the production of ice wines requires extreme temperatures only few countries have the climatic conditions to make it like Canada, Germany, Austria and US but also Italy has its own little production:

1. “**Emozioni di ghiaccio**” is produced in Castell'Arquato (PC) by Massimiliano Croci. Malvasia of Candia (70%) and Moscato (30%) are the selected grapes for its production and the winemaking process requires a fermentation of one year or more. The production is very limited and some vintages are not available. This long period creates a unique wine with a velvety taste of candied fruit. <[www.vinicroci.com/emozione.htm](http://www.vinicroci.com/emozione.htm)>
2. “**Solenne**” is produced in Neviglie (CN) by Cascina Baricchi whose owner is Natale Simonetta. The grape variety selected for its production is white Moscato. The main characteristics of this wine are its color, straw yellow and the aromatic notes of tamarind, raisins and quince. <[https://www.cascinabaricchi.com/sites/default/files/solenne\\_0.pdf](https://www.cascinabaricchi.com/sites/default/files/solenne_0.pdf)>



3. **“Chadelune Vino dei Ghiacciai”** is produced in Valle d’Aosta with the winter harvest of Prié blanc grape. Its aromatic profile recalls to apricot, tobacco, honey and caramel. Due to the difficult production, these wines are sold in half bottles (375-500ml) at a quite expensive price, up to 50€. Ice wines a lot cheaper are commercially frozen or fake.



## *1.5 DULCIS IN FUNDO, SO... WHAT TO DRINK WITH?*

Beyond the cliché and the guaranteed match of Cantucci and Vin Santo, it is hard to find other well-known pairings. It is not common at restaurant or at home, for a birthday or any other occasion enjoying a balanced combination of a cake with the right wine.

The selection of dessert wines is random for the most cases or driven by the appearance of the bottle, anyway it falls on the same proposals, Spumante or Prosecco variously brut, dry or extra dry, but why?

The beginning rules about food and wine pairing suggested to match them following the color, like red meats with red wines and fish or white meats with white wines. Fortunately over the past years such ideologies failed and a different opinion arised, taking into account the various aspects featuring a wine. Balance is the success key for a good pairing and the color is the last thing that matters.

Thinking about how these rules have changed, investigating about dessert and wine pairing was a must, as it is a subject too often ignored. Yet if the wine is given to enhance the dishes, the dessert has the difficult task of concluding the meal, why not doing it with the right matching?

Desserts are complex products, not only for the high sugar content but also for the complexity deriving from the raw materials they are made of, fruit, chocolate and liquorous bases can be very challenging. Despite their sweetness that should match with sweet wines, people seem to appreciate more the contrast.

The discrepancy between experts opinion and consumer purchases need to be clarified.

The main difficulties for these kind of pairings are not only linked to products but also to other external aspects able to influence their perceptions, serving temperature is one of them.

Desserts and wine have strict rules about the ideal serving temperatures but most of times these influence the each other products perception. This should not be a limit as there are other factors maybe able to contrast this side effect. Ice cream represents in the dessert and wine pairing a challenge, but have you ever tried to sprinkle a scoop of chocolate ice cream with a bit of egg Marsala? It could be such an experience. The high alcohol content of Marsala, with the intense egg flavor (egg is also one of the main ingredients in the majority of ice creams) and its sweetness, is able to “warm” a little bit the ice-cream. At the same time the bitter note of cocoa balances the sweetness of wine and so they create a really good and balanced match. You will see how all the studies and reasearches to come can demonstrate this from a chemical point of view.

Desserts should not stand alone or be paired with the same wines, endless combinations deserve to be explored, but first it is necessary to understand what consumers consider about dessert and wine pairing.

## *1.6 FOOD, WINE, HISTORY AND SOCIETY*

The gastronomic panorama presents itself as a concentric structure made of 3 distinct groups of interest, two represented by solid foods, respectively salty and sweet and the other represented by the liquids of which will be examined only alcohol, with particular attention to the world of wines. It will be studied also the sociological aspect of these three spheres and their relative role in the daily scenery.

Food has always been indispensable, as main source of nourishment and pleasure, there are infinite variations, thanks to the richness of raw materials that transformed or not, animal or vegetable, can meet and satisfy world population demands. Alcoholic beverages instead assumed a different relevance during the centuries, their importance in the diet changed and today their consumption is matter of choice.

Wine was the first fermented product, together with hydromel and cider, of great importance in the Mediterranean civilizations was consumed as beverage or used as ingredient for recipes but also as symbolic element in the religious sphere (*Vinoway,2018*).

Its origins date back to the Sumerian civilization, which together with Assyrian, Babylonian, Egyptian and Carthaginian, were the first to cultivate the vine. The development of viticulture and the refinement of winemaking techniques had considerable progress thanks to the Greeks, the Etruscans and the Romans. Also the Church gave great contribute, especially after the Roman Empire fall. Bishops and monks guaranteed the survival and cultivation of the vine and for this reason were also considered “patres vinearum”.

The interest in wine, winemaking and viticulture has continued to develop during all the centuries to come, so much to give birth oenology as a discipline and science.

In order to investigate the role that today wine has on Italian tables, both in everyday life and celebration times, especially in combination with desserts, it was necessary to provide and analyze data. This purpose required the creation of a survey and a tasting session.

## *2. EXPERIMENTAL INVESTIGATION*

### *2.1 Survey*

To understand how people choose to combine a specific wine with a specific dessert, it was useful to give a questionnaire with targeted questions, which would allow to analyze the purchasing and consumption habits in the context of dessert and wine pairing. As known, consumer choices tend to be influenced by external and internal aspects of the person, by the surrounding environment and the purpose of the purchase. Then personal, social and professional aspects related to the testers have been also taken into account.

### *2.2 Materials and methods*

Facebook platform guaranteed to provide a quick questionnaire to a sample of at least 100 individuals as varied as possible. The estimated completion time was 3 minutes per user for a total of 19 questions. The formula chosen was that of multiple answers and in some cases with justification of the choice.

#### **DESSERT AND WINE PAIRING QUESTIONNAIRE**

##### **1) GENDER**

F.

M.

##### **2) AGE**

18-35

35-50

>50

##### **3) PROVENANCE**

##### **4) EDUCATIONAL LEVEL**

<HIGH SCHOOL LICENSE

BACHELOR DEGREE

>BACHELOR DEGREE

##### **5) EMPLOYMENT**

UNEMPLOYED

EMPLOYEE

FREELANCE

##### **6) WINE KNOWLEDGE**

HIGH

MEDIUM

LOW

**(6a.) Wine knowledge about DESSERT PAIRING?**

HIGH

MEDIUM

LOW

**(6b.) Wine knowledge about SALTED FOOD PAIRING?**

HIGH

MEDIUM

LOW

**7) HOW MANY TIMES YOU HAVE WINE DURING YOUR MEAL?**

USUALLY (at least once a day; e.g. lunch and/or dinner)

SOMETIMES (at least once a week; e.g. Sunday lunch)

RARELY (at least once a month; e.g. for special occasions)

**8) DO YOU PREFER:**

THE SAME WINE FOR THE ENTIRE MENU

TO CHANGE WINE FOR EACH DISH

**9) Which one among these you would pair with “DRY” DESSERTS (e.g. cookies)?**

Prosecco (dry) wine

Moscato wine

Passito wine

◆ WHY?

**10) Which one among these you would pair with SEMI-SOFT DESSERTS (e.g. fruit tart)?**

Prosecco (dry) wine

Moscato wine

Passito wine

◆ WHY?

**11) Which one among these you would pair with SOFT DESSERTS (e.g. profiterole)?**

Prosecco (dry) wine

Moscato wine

Passito wine

**12) AMON THESE WHICH ONE YOU PAIRED MOST FREQUENTLY WITH A DESSERT?**

- Prosecco (dry) wine
- Moscato wine
- Passito wine

**13) WHEN?**

- DAILY
- AT RESTAURANT
- FOR SPECIAL OCCASIONS (e.g. festivities)

**14) WHY?**

- SOMEONE SUGGESTED IT TO ME
- I HAVE ALREADY TRIED IT
- IT IS MY FAVORITE

**15) WHICH ONE OF THE FOLLOWING SITUATIONS YOU EXPERIENCED THE MOST WHILE TASTING A DESSERT AND WINE PAIRING?**

- THEY ALTERATED EACH OTHER FLAVORS
- THEY HAD DISTINCT FLAVORS BUT NOT COMPATIBLE
- THEY WERE A GOOD MATCHING

**16) HAVE YOU EVER FOUND AT RESTAURANT A SPECIFIC DESSERT WINE MENU'?**

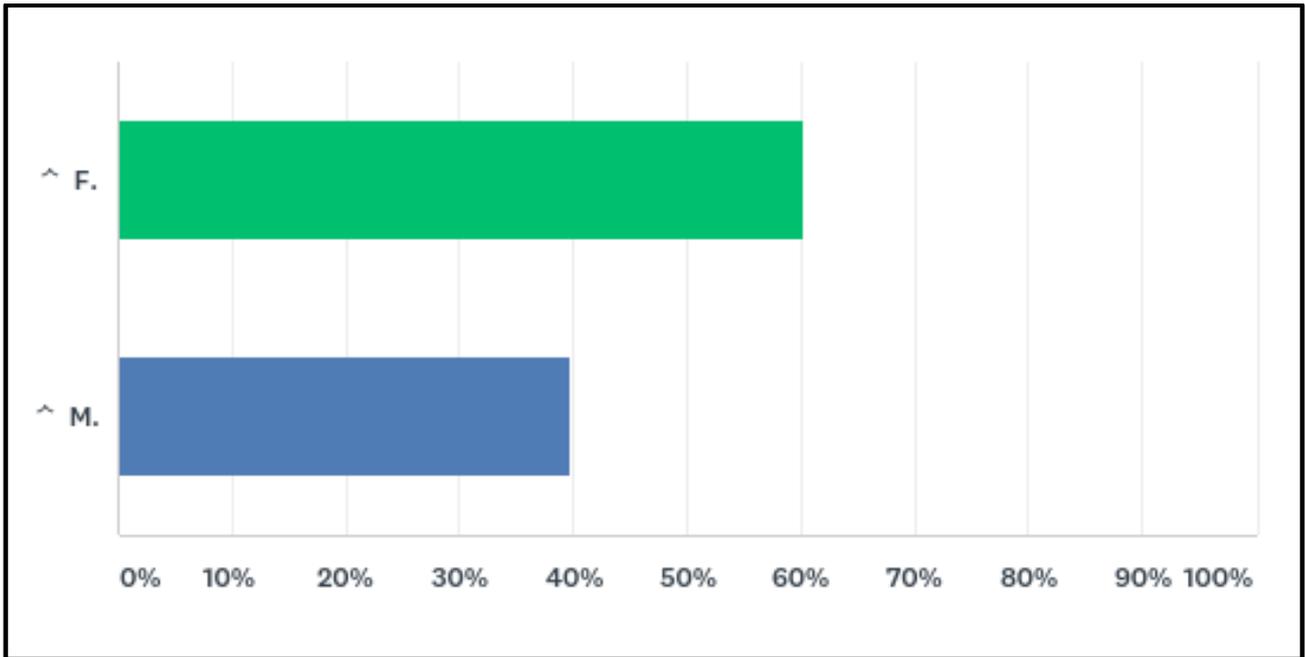
- YES
- NO

**17) If yes, in which kind of restaurant?**

### *2.3 Results and discussion*

**Presented below the questionnaire slides with the results:**

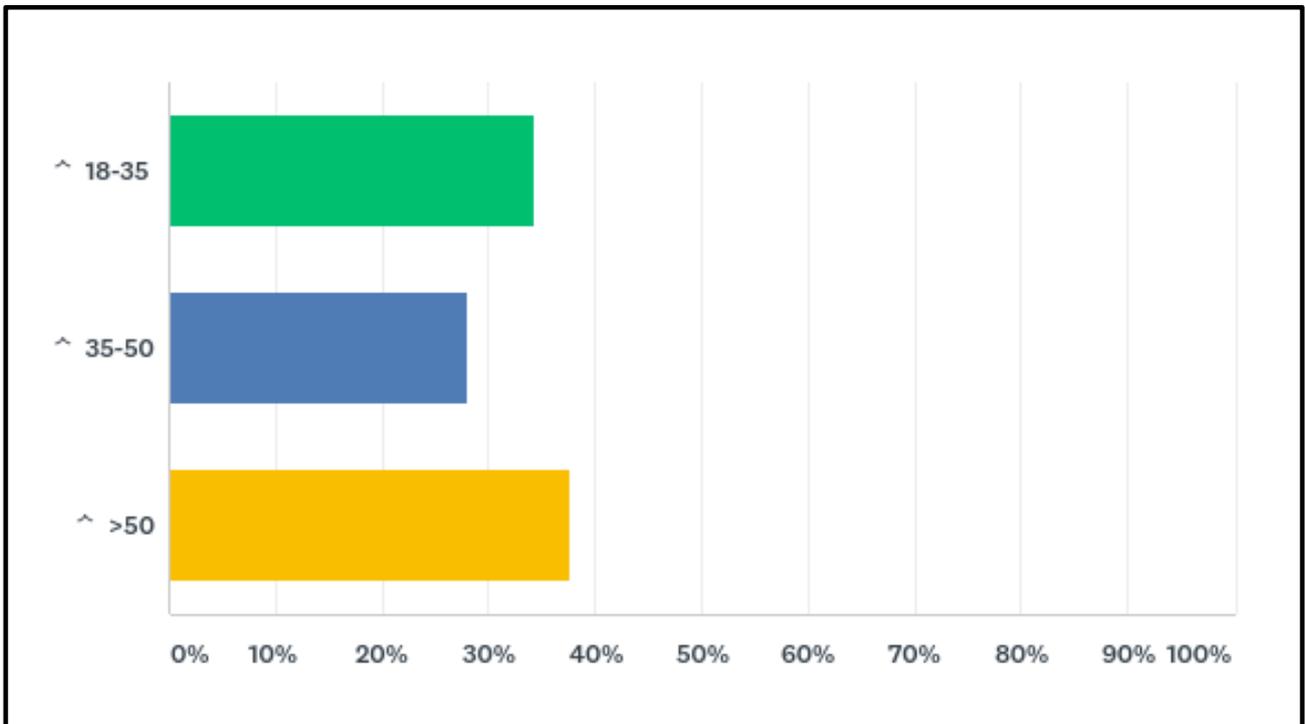
In the first part of the questionnaire, the demographic characteristics of the responders have been collected. Data showed that most of the respondents were females (Figure 1), with the dominant age group being >50 (Figure 2). The majority of respondents were from cities within the central area of Italy (Figure 3) and their educational level mainly corresponds to the high school license (Figure 4). Most of the respondents were employee (Figure 5).



**Figure 1.** Gender of respondents.

Percentage values:

- 60% females
- 40% males

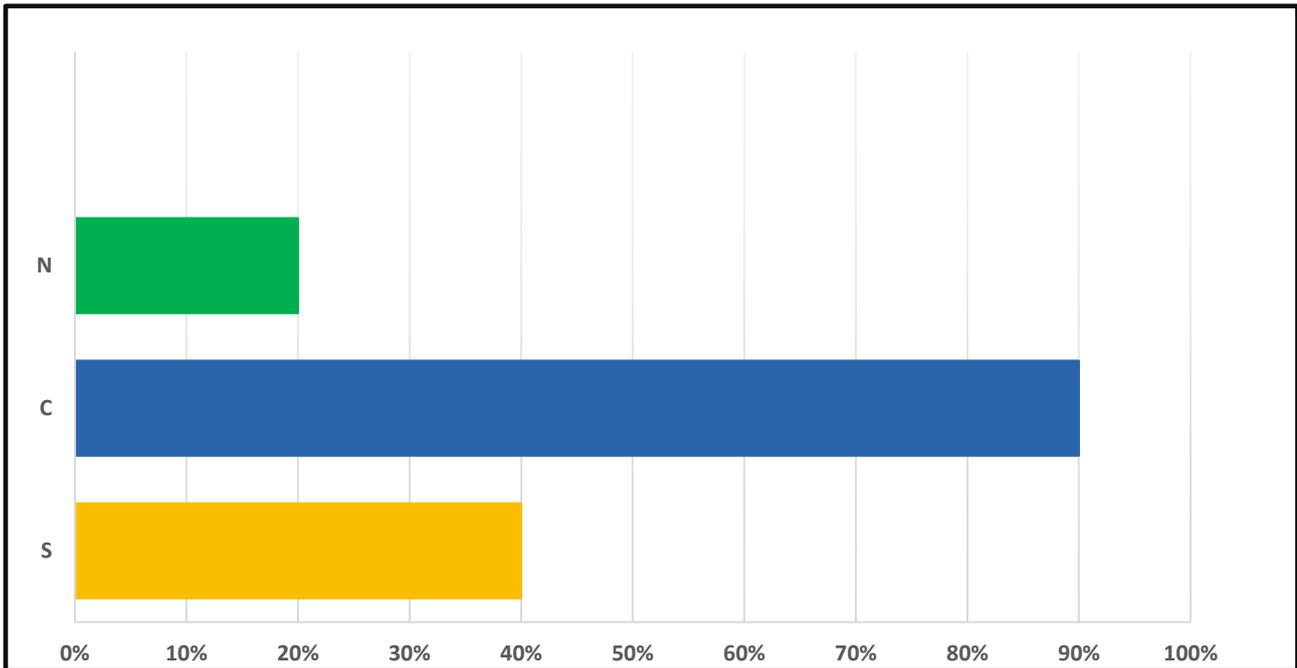


**Figure 2.** Age groups of respondents.

Percentage values:

- 37% of respondents were >50 years old
- 34 % of respondents had an age between 18-35 years

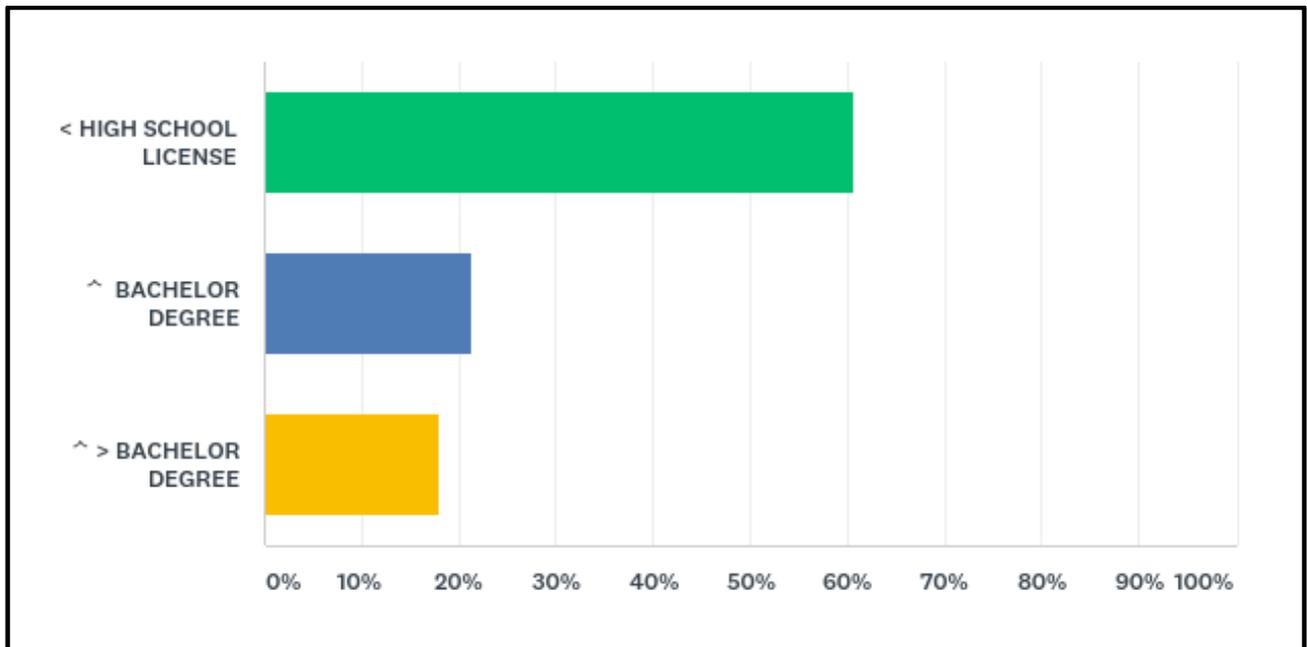
- 28% of respondents had an age between 35-50 years



**Figure 3.** Area of provenance of the respondents, N (North), C (Center), S (South).

Percentage values:

- 70% of respondents came from central Italy
- 20% of respondents came from southern Italy
- 10% of respondents came from northern Italy

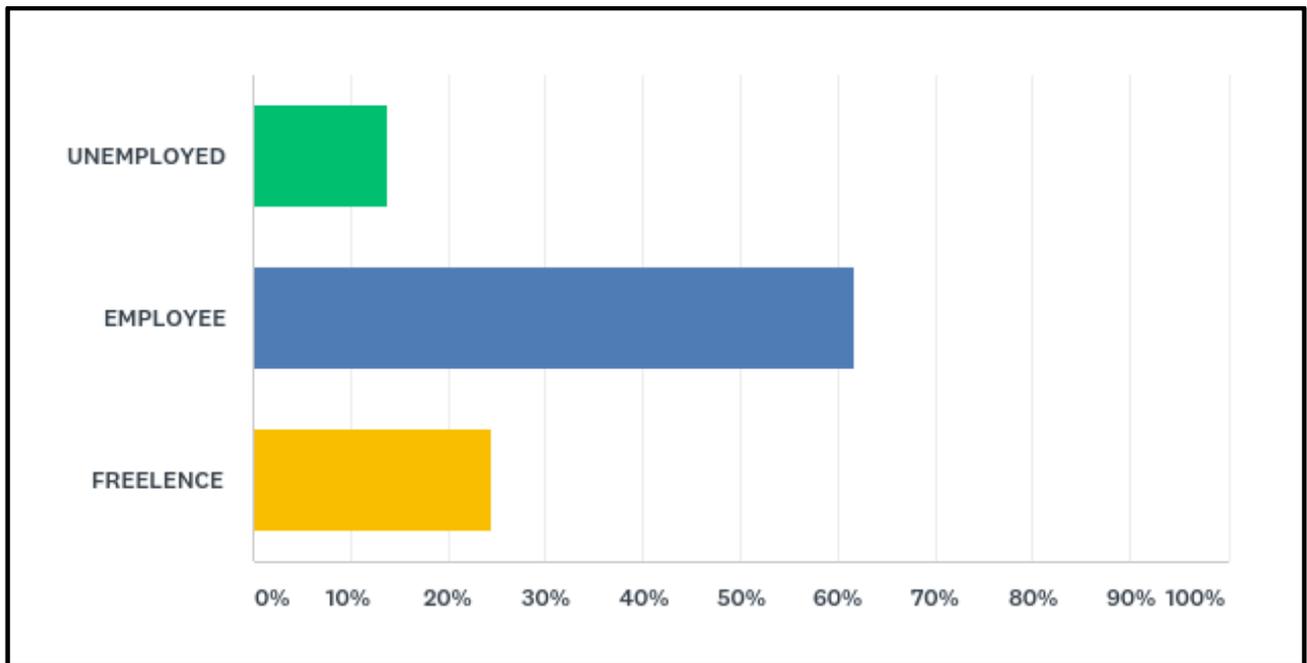


**Figure 4.** Educational level of the respondents.

Percentage values:

- 60% of respondents had high school license

- 22% of respondents had a bachelor degree
- 18 % of respondents had more than a bachelor degree

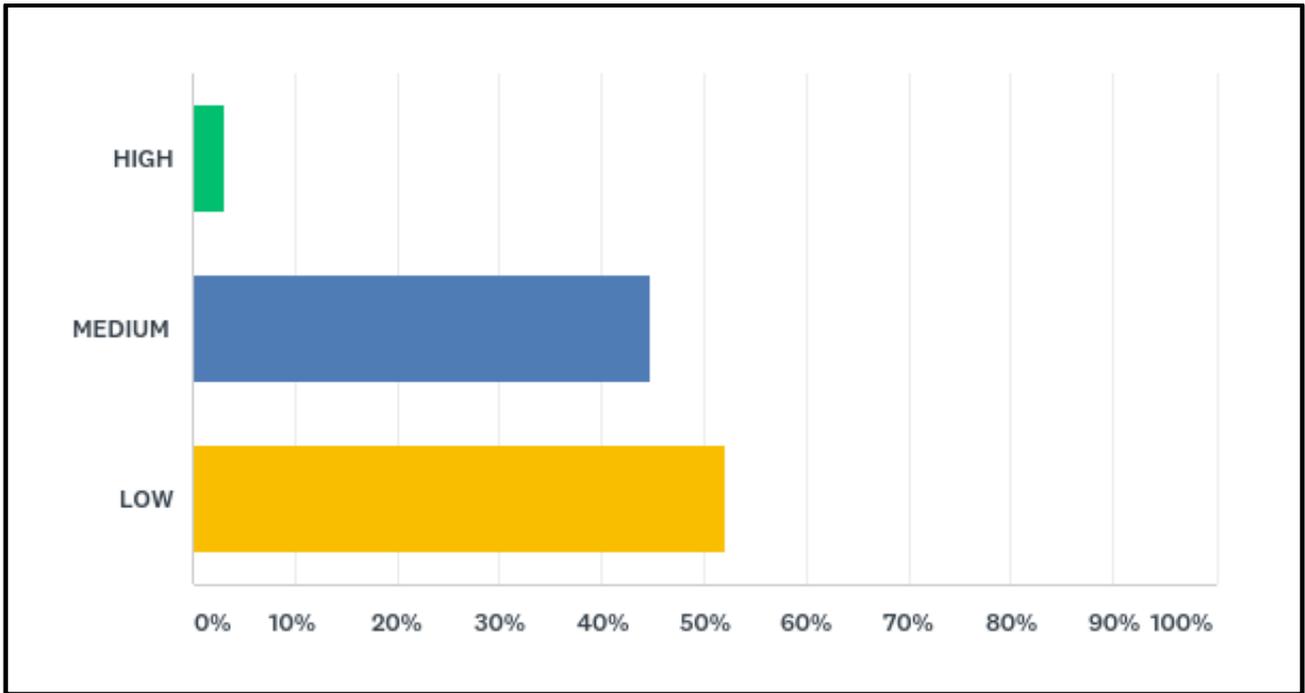


**Figure 5.** Profession of the respondents.

Percentage values:

- 61% of respondents were employee
- 24% of respondents were freelance
- 15% of respondents were unemployed

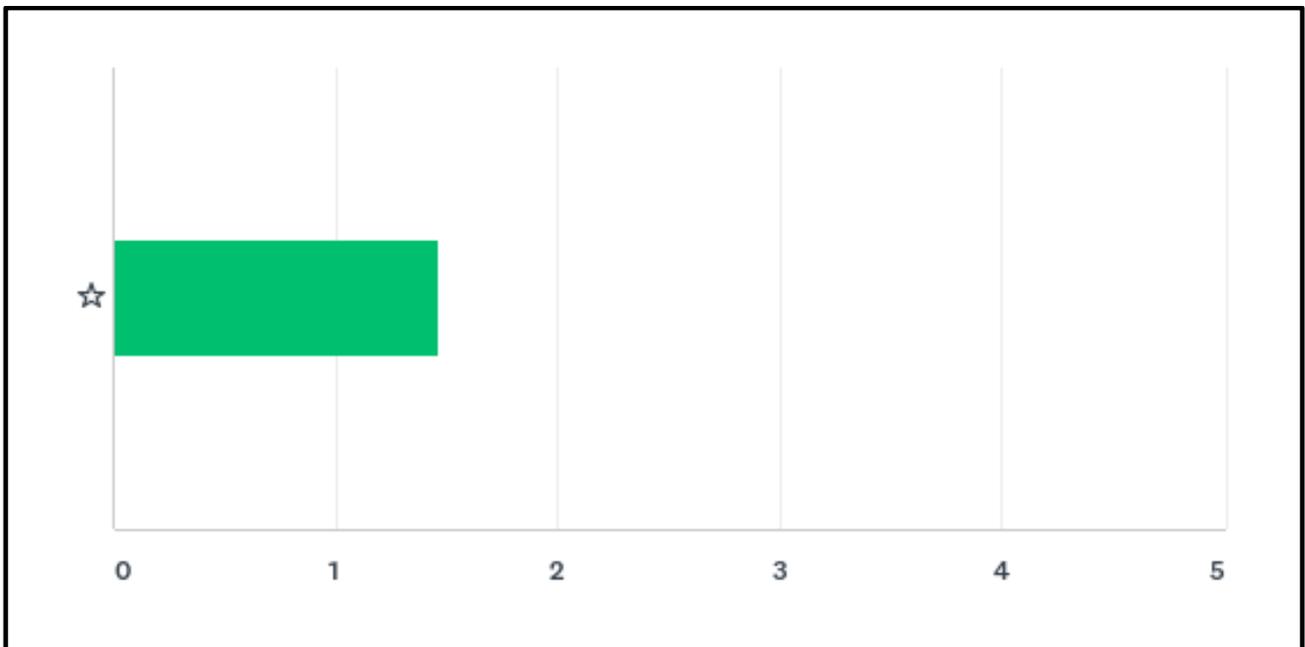
In the second part of the questionnaire have been evaluated the level of knowledge of the respondents about wine and their consumption habits. Data showed that the majority has scarce knowledge about wine (Figure 6) but the respondents feel more confident while choosing a wine to pair with a salted food (Figure 6a) respect to a dessert (Figure 6b). Respondents mainly consume wine once a week (Figure 7) and while eating they prefer the same wine for the entire menu (Figure 8).



**Figure 6.** Level of wine knowledge of the respondents

Percentage values:

- 52% of respondents had a low level of wine knowledge
- 45% of respondents had a medium level of wine knowledge
- 3% of respondents had a high level of wine knowledge

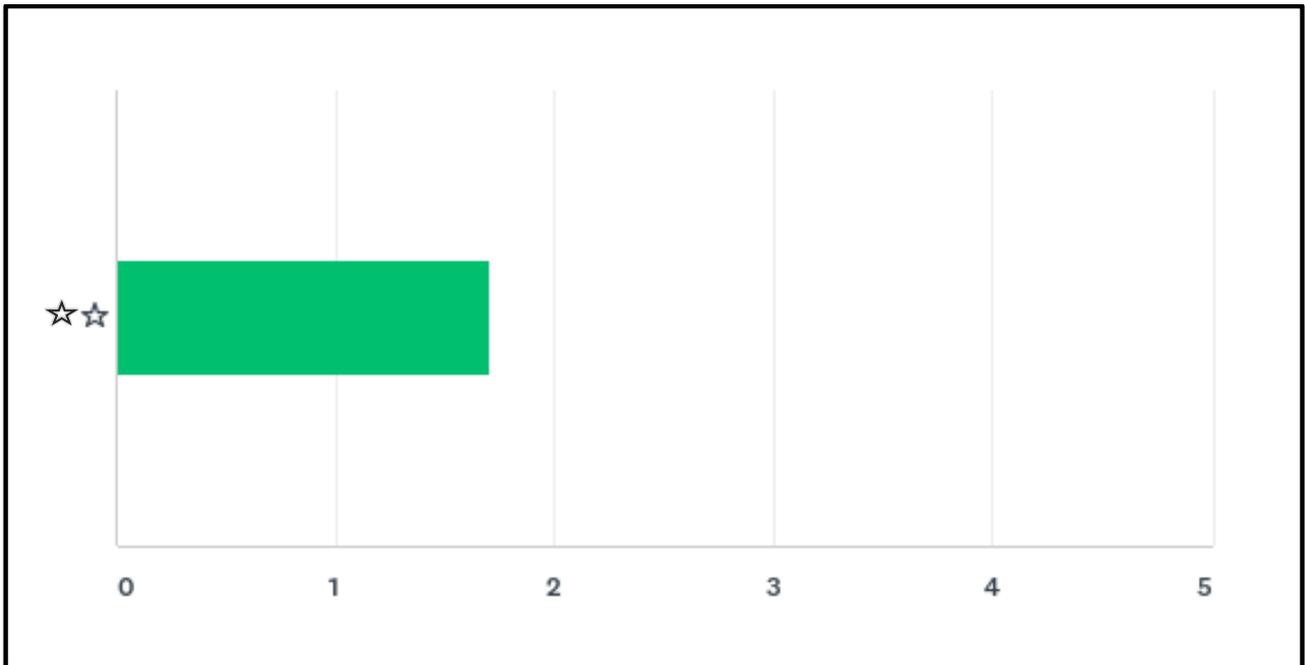


**Figure 6a.** Level of confidence while choosing a wine to pair with desserts.

One star was assigned to a scarce ability to pair dessert and wine, and it represents the 60% of respondents.

Note: Desserts except for some cases, such festivities and parties are considered as stand-alone. People don't use to have dessert and wine together and this lack of habit results in a scarce confidence while choosing a specific dessert wine. Even in that exceptional cases people are not

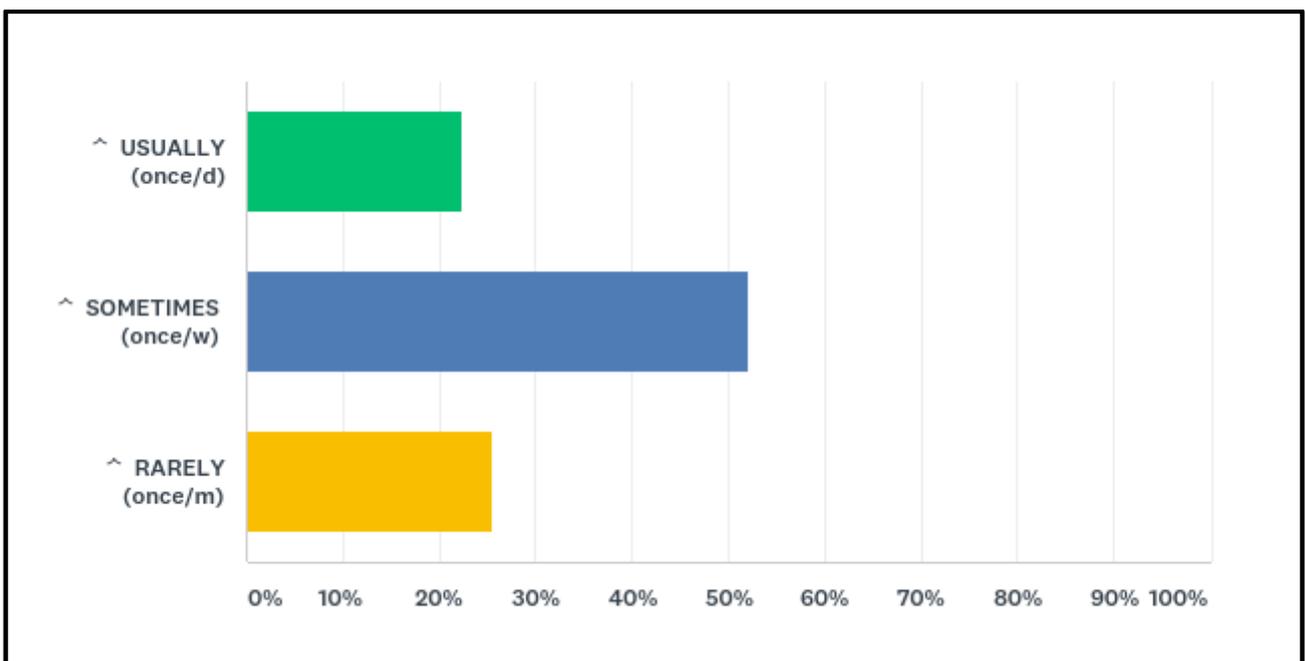
informed enough about dessert-wine matchings and are used to pair them only taking into consideration the particular occasion the are experiencing.



**Figure 6b.** Level of confidence while choosing a wine to pair with salted food

Two stars were assigned to a discrete ability to pair salted food and wine, and these represents the 53% of respondents.

Note: It is more common to have wine during a meal, so with salted food and people feel more confident and trained enough to choose a wine.

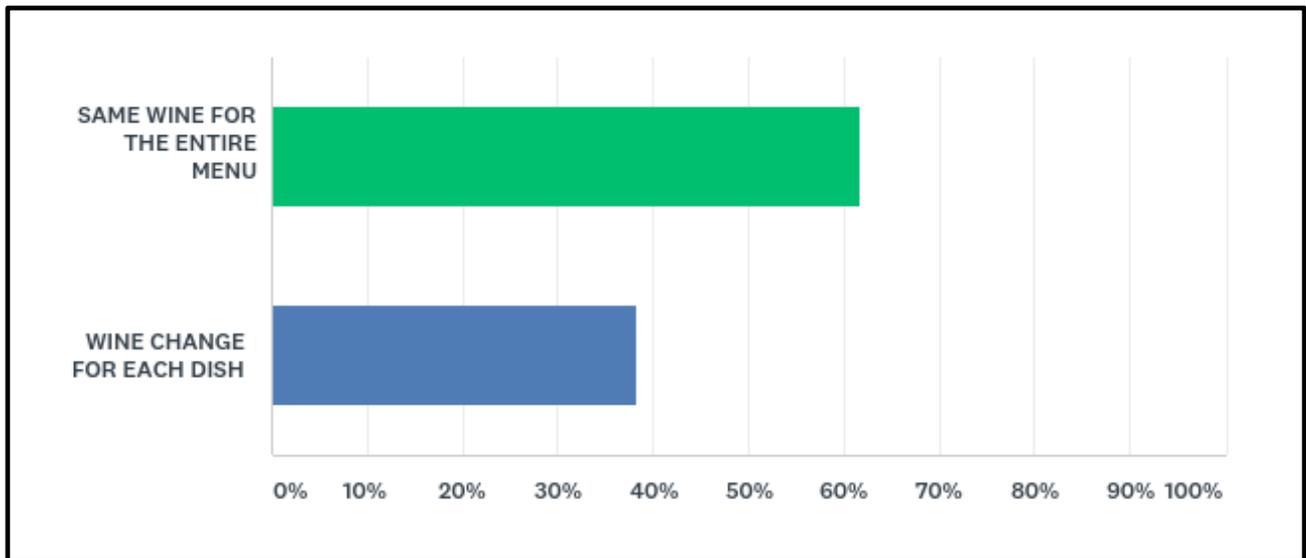


**Figure 7.** Frequency of wine consumption of the respondents.

Percentage values:

- 52% of respondents have wine once a week
- 25% of respondents have wine once a month
- 22% of respondents have wine once a day

Note: As it has been seen people have wine mostly once a week, in the majority of cases for lunch or dinner during the weekend. It can be explained by the role the wine has in the consumption habits, it represents an extra in the diet and so more proper for special meals.



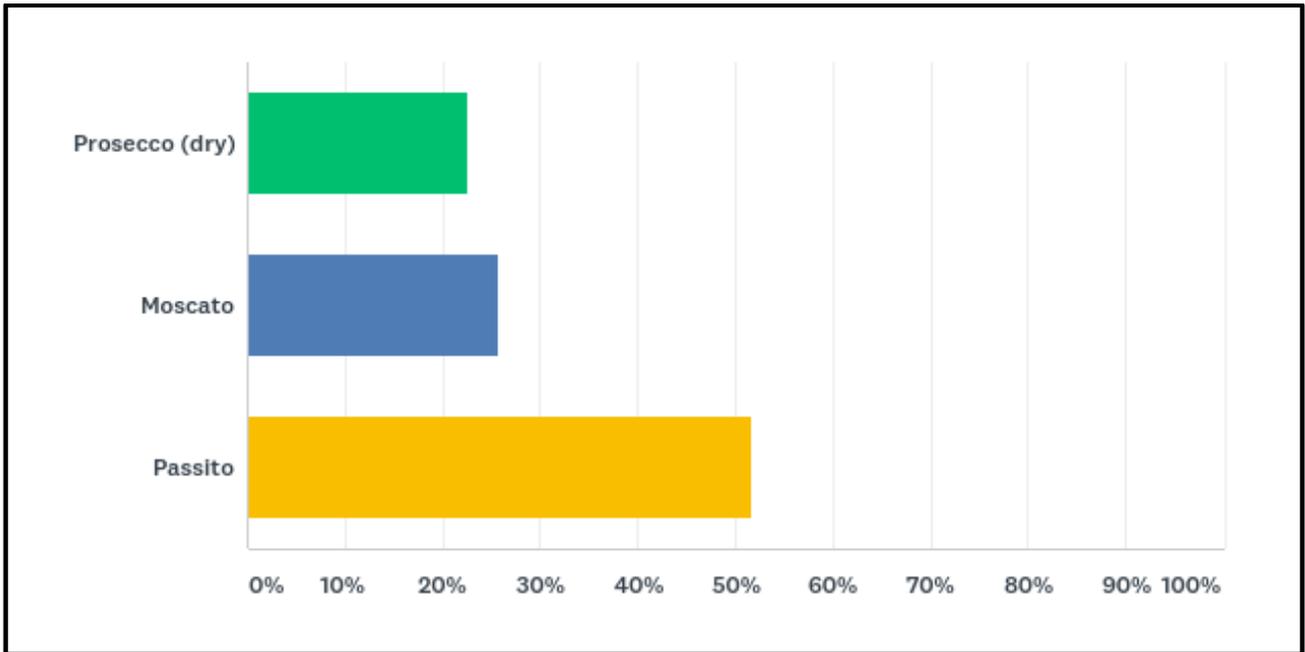
**Figure 8.** Preference of the respondents in the modality of wine consumption while eating,

Percentage values:

- 60% of respondents prefer the same wine for the entire menu
- 40% of respondents prefer to change the wine following the dish

Note: It is easier for a regular consumer to have the same wine for each dish. Also because, the change of wine during a meal, for untrained people, can create too much confusion.

In the third part of the questionnaire has been asked to the respondents to choose between 3 different wines to pair with 3 different categories of dessert and give a motivation. The respondents preferred to combine Passito wine with the category of “dry” desserts (Figure 9) due to an association with the famous pairing of Cantucci and Vin Santo wine. For the category of semi-soft desserts the respondents choosed Moscato wine due to a similarity of aromatic notes among them (Figure 10). The respondents paired the category of soft desserts with Prosecco wine because of its ability to contrast the fatty sensation resulting from this kind of desserts (Figure 11).



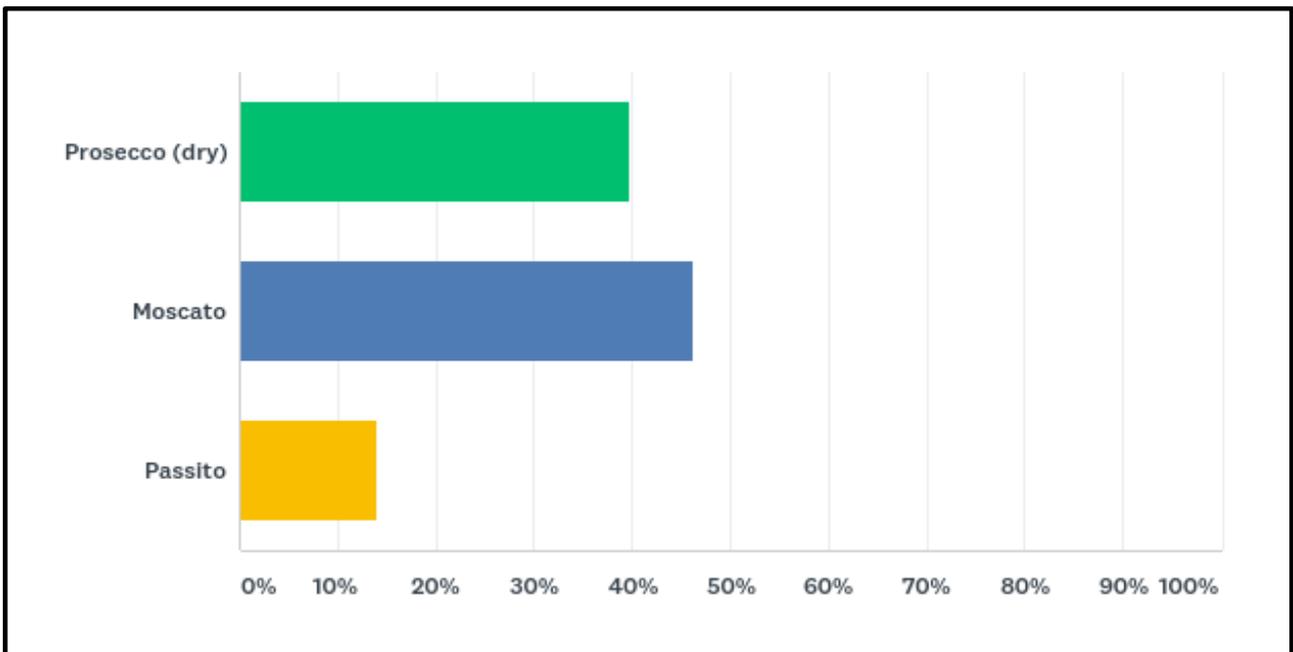
**Figure 9.** Choice of the respondents between 3 different wines to pair with “dry” desserts (ex.cookies).

Percentage values:

- 51% of respondents would pair Passito wine
- 26% of respondents would pair Moscato wine
- 23% of respondents would pair Prosecco wine

Motivation: Respondents paired “dry” desserts and Passito wine associating their preference to a classical pairing such as Cantucci and Vin Santo wine.

Note: When consumer find out a similarity between a new product and something already known feels safe in his choice.



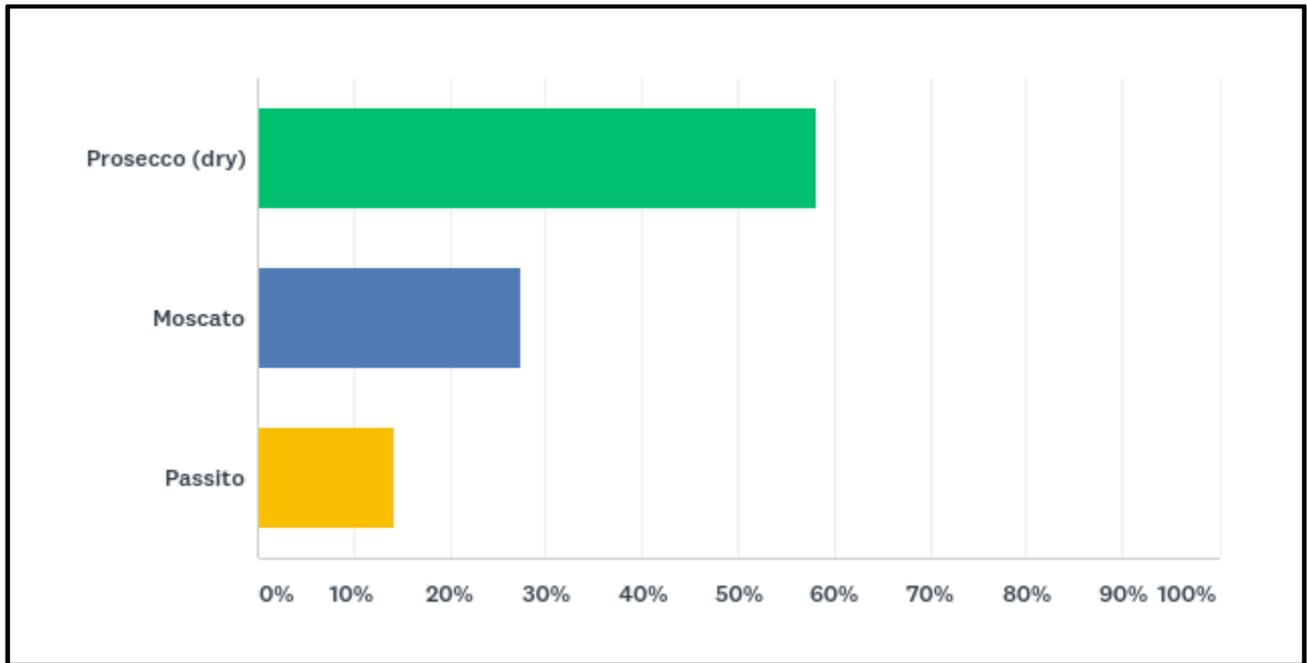
**Figure 10.** Choice of the respondents between 3 different wines to pair with semi- soft desserts (ex.fruit tart).

Percentage values:

- 46% of respondents would pair Moscato
- 40% of respondents would pair Prosecco
- 14% of respondents would pair Passito

Motivation: Respondents paired semi- soft desserts with Moscato wine motivating their preference for the aromatic similarity between the two elements.

Note: The presence of a common element, the fruit in this case, seems to suggest the consumer a sure match.



**Figure 11.** Choice of the respondents between 3 different wines to pair with soft desserts (ex. profiteroles).

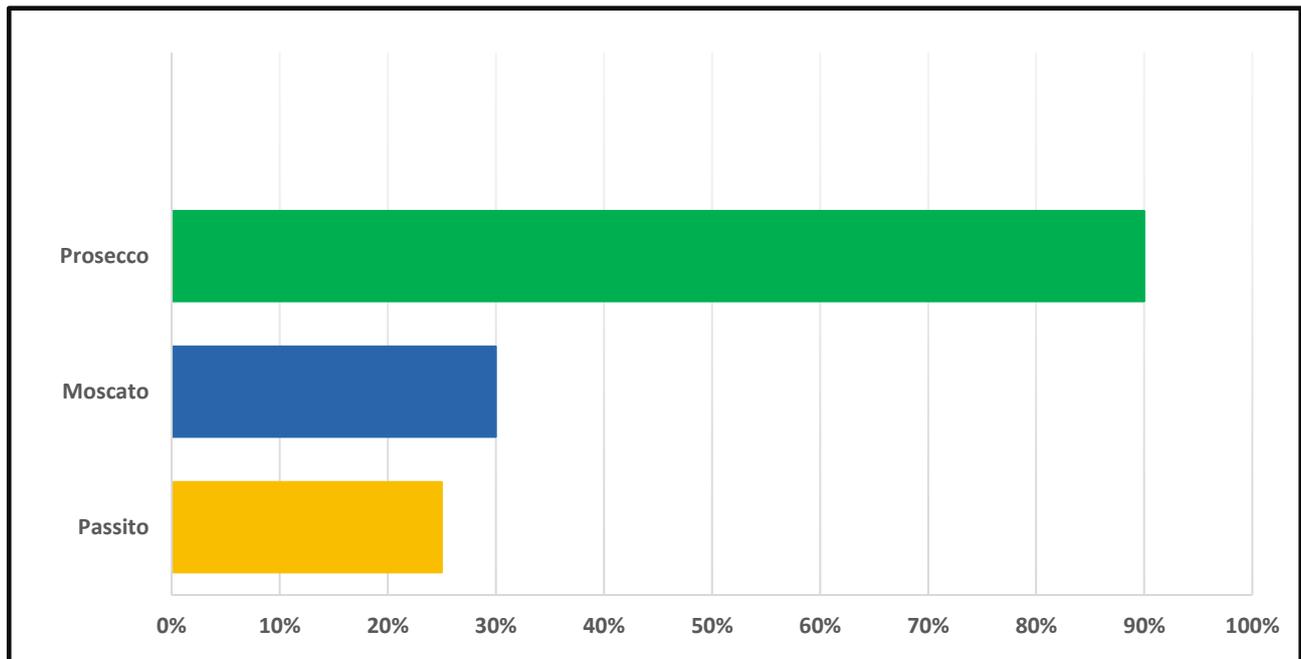
Percentage values:

- 60% of respondents would pair Prosecco
- 28% of respondents would pair Moscato
- 14% of respondents would pair Passito

Motivation: Respondents paired soft desserts with Prosecco wine motivating their preference for the ability of Prosecco to contrast the fatty sensation deriving from this kind of desserts.

Note: Despite the motivation given by the respondents, this particular case, as said before, is that exception putting in common a dessert and a wine not for shared features but for the importance of their role during special occasions. Prosecco and soft desserts are emblematic signs of celebration.

In the fourth part of the questionnaire have been collected data about the most chosen wine for a dessert and wine pairing among the 3 proposed, which occasion asks for it and the reason of the choice. The majority of respondents use to pair Prosecco wine and dessert (Figure 12) in special occasion (Figure 13). They choosed that wine because they already tried it (Figure 14).

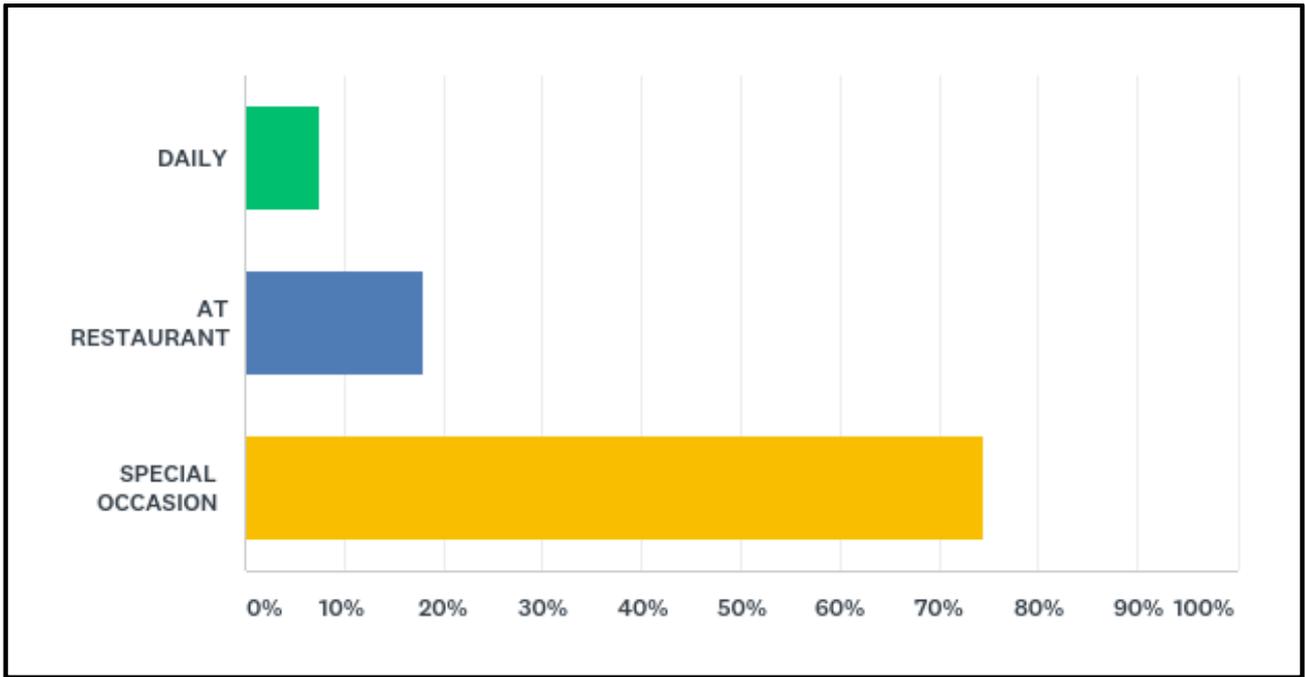


**Figure 12.** The most frequent wine paired with a dessert between the 3 proposed.

Percentage values:

- 70% of respondents tend to choose Prosecco wine for a dessert and wine pairing
- 20% of respondents tend to choose Moscato wine for a dessert and wine pairing
- 10% of respondents tend to choose Passito wine for a dessert and wine pairing

Note: Prosecco is one of the best- known Italian wine. World famous for his bubbling. Key elements for his success are quality, versatility and affordabilty. These combined togheter made it a successfull and safe choice for almost all occasions. It has not to be wonder why consumers use to pair it as much as possible.

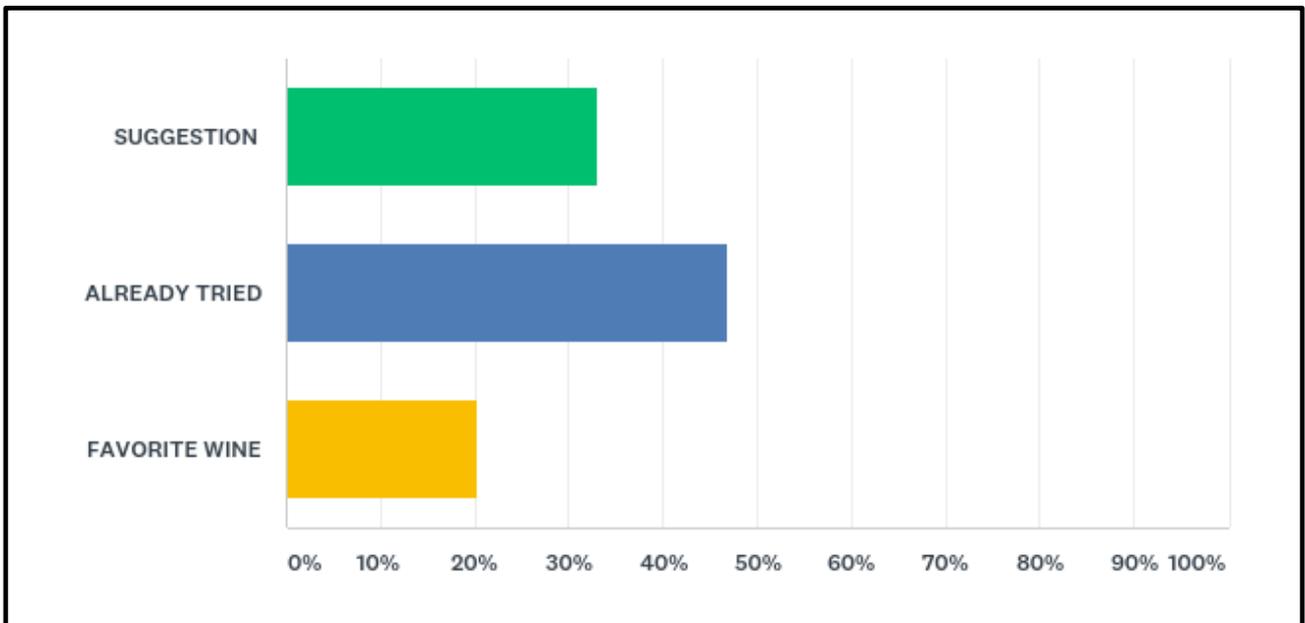


**Figure 13.** The best occasion for the respondents to pair the chosen wine with a dessert.

Percentage values:

- 75% of respondents think about dessert and wine pairing for a special occasion
- 20% of respondents think about dessert and wine pairing at restaurant
- 5% of respondents think about dessert and wine pairing daily

Note: Desserts in general have been invested with a celebrative role and in special occasions require to be paired with a special wine, Prosecco as showed before.



**Figure 14.** Motivation for the choice of that specific wine between the 3 proposed.

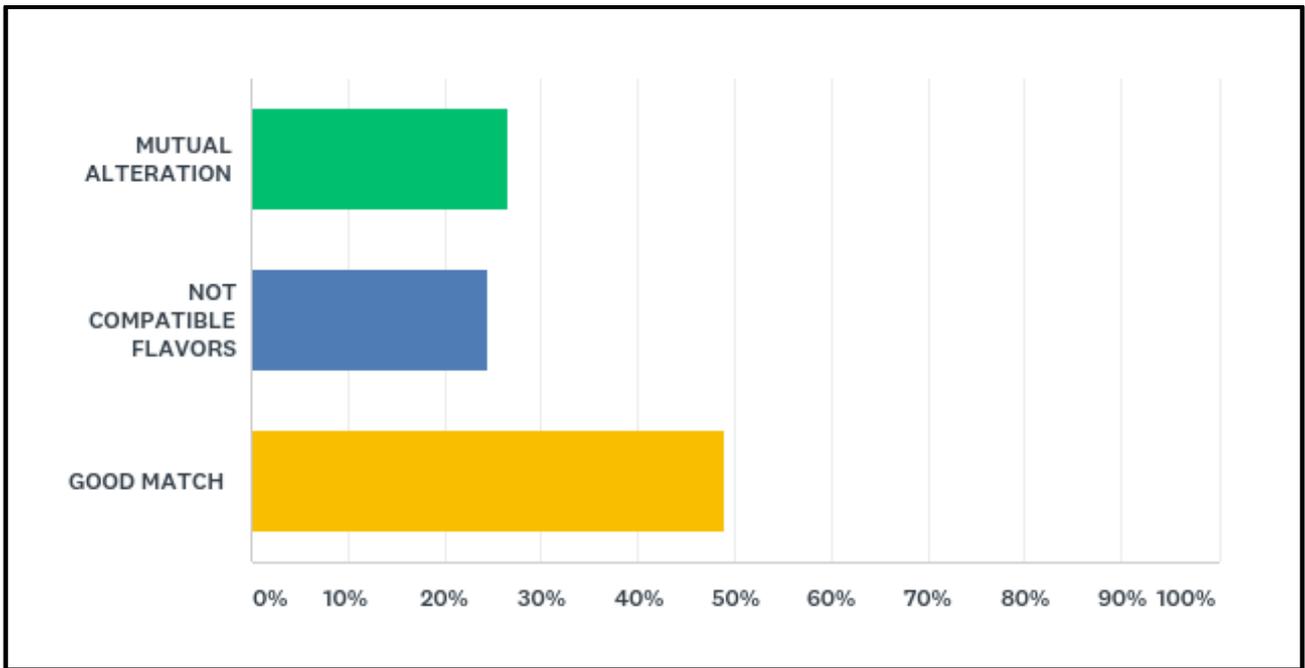
Percentage values:

- 47% of respondents for a dessert and wine pairing choose an already known wine
- 33% of respondents for a food and wine pairing choose following suggestions

- 20% of respondents for a food and wine pairing choose their favorite wine

Note: Most consumers want a sure choice, especially when concerning dessert and wine pairing.

In the last part of the questionnaire have been analyzed what the respondents experienced while tasting a dessert and wine pairing and if they ever found a specific dessert wine menu in a restaurant. For those that answered positively has been asked to specify where. Data showed that respondents mainly experiend good dessert and wine matchings (Figure 15). The majority never found at restaurant a specific dessert wine menu (Figure 16) and those who did were for the most in a starred restaurant (Figure 17).

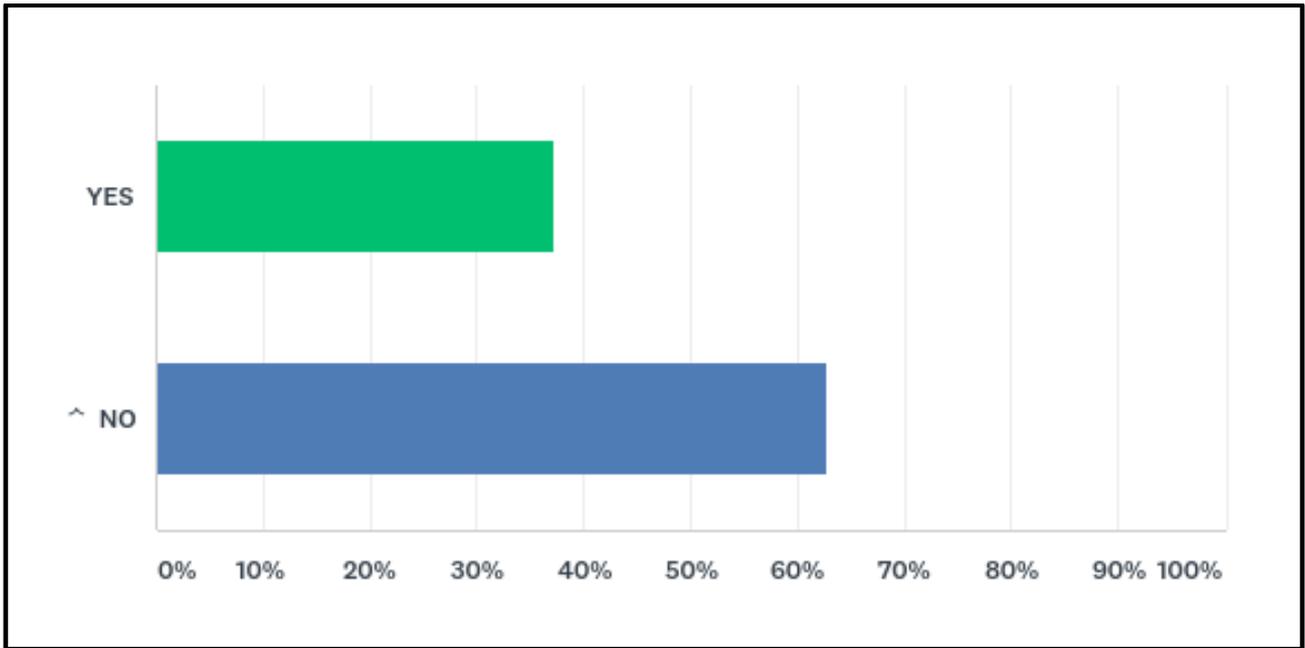


**Figure 15.** The most frequent situation the respondents experienced while tasting a dessert and wine pairing.

Percentage values:

- 49% of respondents in their past experience had good dessert and wine matchings
- 27% of respondents in their past experience found the two elements altering each other
- 25% of respondents in their past experience considered not compatible the pairing flavors

Note: People like what they know and after all the results analysed it is clear that about dessert and wine pairing there is a limited choice. We should not be surprised if respondents usually appreciate the matchings, as they tend to be always the same.

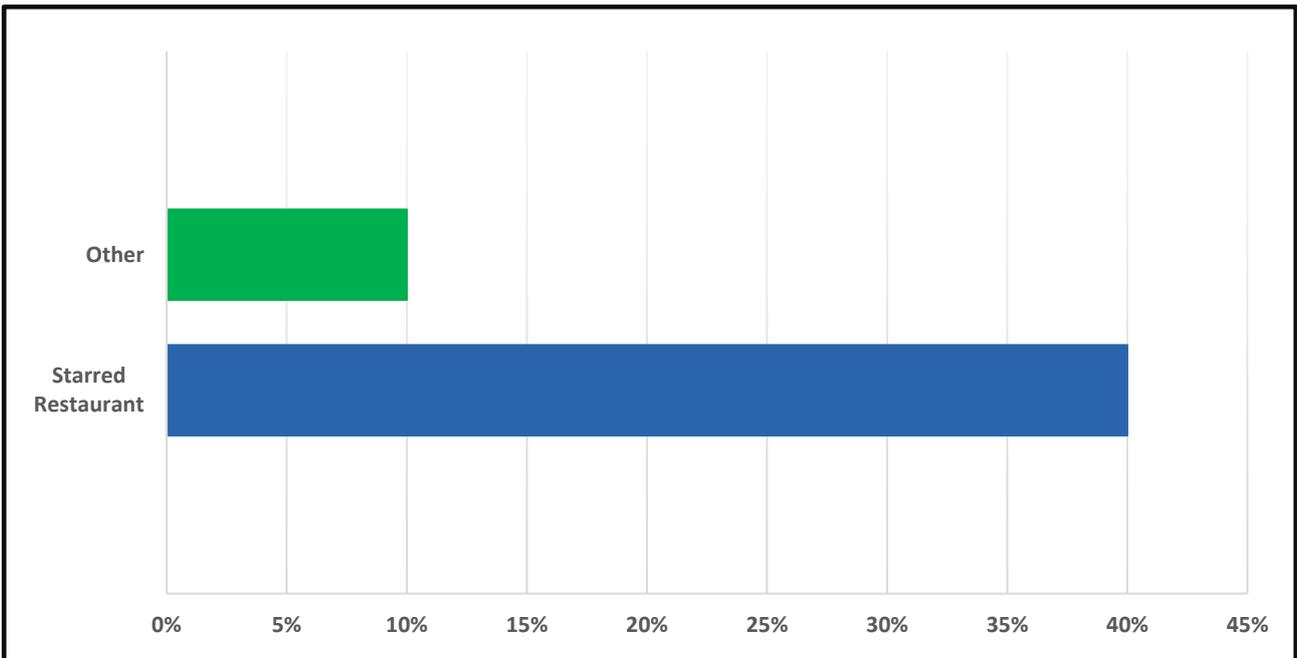


**Figure 16.** Availability of a specific dessert wine menu in a restaurant

Percentage values:

- 63% of respondents never found in a restaurant a specific menu for the dessert wines
- 37% of respondents found in a restaurant a specific menu for the dessert wines

Note: Usually at restaurant dessert means the end of the meal and if it is not a typical one or a special one, wine is not required. Restaurateurs can offer some options for dessert wine, but not specific for the desserts they serve.



**Figure 17.** If available, where the respondents found it

### Percentage values:

- 30% of respondents among those which found that kind of menu said that it was in a starred restaurant
- 7% of respondents among those which found that kind of menu said that it was in another kind of restaurant

Note: The availability of this special menu in a restaurant means the restaurateurs studied the menu in all its parts and want to have all dishes be completed with the right glass of wine, based on its characteristics, dessert included. Such careful heed can belong only to starred or luxury restaurants.

## *2.4 Tasting session*

The pairing preferences resulted from the survey were “dry” desserts (e.g. cookies) and Passito wine as a recall to the well-known pairing Cantucci and Vin Santo, semi-soft desserts (e.g. fruit tart) with Moscato wine for their similar aromatic profile and soft desserts (e.g. profiteroles) with Prosecco wine for its ability to reduce the greasy sensation coming from this kind of pastries. Being the survey based primarily on theoretical knowledge rather than practical, it has been decided to organize a tasting session in order to assess if a direct comparison of elements would have confirmed the same results.

## *2.5 Materials and methods*

13 testers were divided into groups of 3 (Figure 19). In front of them have been placed 3 monoportions desserts (Figure 18), respectively an almond cantuccio, the dry one, a fruit tart, the semi-soft one and a zabaione puff, the soft one. The 3 of them have been numbered from 1 to 3 and placed gradually according to their consistency (dry-semi/soft-soft). In a second line have been placed 3 cups of 60ml each, each one had an identification letter according to the wine, a for Prosecco (dry), b for Moscato and c for Passito.

Each tester has been asked to try, following the letters all the dessert with all the wines, at the same time they had to complete the following evaluation form. To assure the testers impartiality, no information about the products has been given to them.

## EVALUATION FORM

### TASTING SESSION

APRIL 7<sup>TH</sup> 2018

1) GENDER

F.

M.

2) AGE

18-35

35-50

>50

3) CITY OF PROVENANCE? \_\_\_\_\_

4) LEVEL OF INSTRUCTION

< HIGH SCHOOL LICENSE

BACHELOR DEGREE

>BACHELOR DEGREE

5) PROFESSION

UNEMPLOYED

EMPLOYEE

FREELENCE

6) WINE KNOWLEDGE

HIGH

MEDIUM

LOW

**\*Mark with an X, ONE of the letters to indicate the favorite wine (a,b,c) and the reason why, in the specific cells.**

**\*Guess which dessert and wine you are eating! Write their name in the specific table.**

STEP 1.

DESSERT 1	WINE	REASON	
	a	contrast	
	b	analogy	
	c	complementarity	

	DESSERT	WINE
NAME		

STEP 2.

DESSERT 2	WINE	REASON	
	a	contrast	
	b	analogy	
	c	complementarity	

	DESSERT	WINE
NAME		

STEP 3.

DESSERT 3	WINE	REASON	
	a	contrast	
	b	analogy	
	c	complementarity	

	DESSERT	WINE
NAME		

**Below a brief description of the tasted wines:**



1. **Prosecco Primo Franco 2016**

Grapes: 100% Glera- Vigneti alta collina Valdobbiadene

Serving temperature: 6°-8°C.

Alcohol: 10.5% vol.

Residual sugars: 27g/L

Winemaking techniques:

- Pressing, de-stemming, cooling of must and fermentation at controlled temperature in steel tanks.
- Second fermentation in “cuve close”
- After bottling, 30 day stay in the cellar before being sold.
- Charmat method

Typology: Dry

Suggested pairings: Salted snacks, salami and spicy food. Traditional with “dry” pastries.

\*The tasting results confirmed the appreciation with “dry” pastries, in that specific case

Cantucci. <<http://www.ninofranco.it/en/wine/primofranco/>>



## 2. Moscato Baglio Belvedere IGT

Origin: Sicilia

Grapes: 100% Zibibbo

Serving temperature: 12°-14°C.

Alcohol: 14,5% vol.

Residual sugars:

Suggested pairing: Marzipan

\*This kind of pairing suggestion let consumers understand the ability of this wine to bear high sugar content desserts.



### 3. **Passito di Pantelleria Terre di Zagara PDO**

Vine: Moscato of Alessandria or Zibibbo, partially sun-dried

Serving temperature: 12°-14°C.

Alcohol: 15,5% vol.

Harvest: traditional, manual

Winemaking techniques:

- Soft pressing and fermentation at controlled temperature
- Interruption of fermentation with cooling technique

Suggested pairings: Pastries and aged cheeses.

## THE TASTING SESSION



**Figure 18.** Test preparation.



**Figure 19.** While tasting.

**Presented below the results of the evaluation form:**

The majority of respondents (7/13) were male with the dominant age group being 18-35 years old (8/13). Most of them (9/13) had an educational level equal to the high school license and worked as freelances (7/13). The wine knowledge of the respondents results mainly (7/13) of medium level

**Table 2.** Number of respondents linked to the favorite pairings and the reason of their choice.

<i>N. of respondents</i>	<i>Favorite pairing</i>	<i>Reason</i>
7/13	CANTUCCIO-PROSECCO	ANALOGY
8/13	FRUIT TART- MOSCATO	ANALOGY
9/13	ZABAIONE PUFF- PROSECCO	COMPLEMENTARIETY

## 2.6 Results and discussion

**Pairings analysis:**

Most of the respondents (Table 2) paired Cantuccio and Prosecco as they considered them similar.

It is possible to interpret the analogy among these elements considering their main feature, the dryness.

The majority which choosed Moscato and Fruit Tart as matching, found a similarity linked to their aromatic profile. The fruity aroma of Moscato was able to meet the fruity flavor of the tart.

Zabaione puff and Prosecco created for the respondents a complementar pairing, where the fatness of the dessert has been counteracted by the dryness of the wine.



### *3. GENERIC CONSIDERATIONS: comparison between survey and tasting session results.*

In the direct comparison between the results of the two tests, the theoretical one and the practical one I noticed that in general people are more confident in choosing a wine to accompany a meal, and therefore more confident in the wine-salted matching.

Even if respondents, in both cases recognized not to have a great knowledge in the oenological field, they show instead to have considerable ability to choose combinations, despite sometimes, as in the case that we will analyze, the aspect of theoretical knowledge fails when it comes to taste, in fact:

1) For the category of semi-soft desserts (e.g. fruit tart) both tests confirmed the preference for the pairing with Moscato wine. It has been considered a good match because respondents found an accordance between the fruity aroma of the wine and the fruity flavor of the dessert, also comparing Moscato to Prosecco and Passito it results more balanced, not too sweet neither dry. At the same time has been confirmed the appreciation of soft desserts (e.g. profiteroles) with Prosecco wine, for its ability to contrast their fatty sensation, refreshing the palate.

- ◆ Prosecco is the most paired wine, mainly with desserts like classic cakes, as both are a symbol of celebration and they inevitably come to be matched on special occasions.

2) For the category of “dry” desserts, tests gave opposite results. Survey showed a preference for the combination with Passito, as a reminder of a classical matching such as Cantuccio and Vin Santo wine. Instead testing session results showed a preference for the combination with Prosecco wine, due to a similarity that has been identified in the shared characteristic of “dryness” both elements have.

Passito wine surprisingly was not paired to any of the desserts. It was the one with the highest sugar content, and for this characteristic, according to experts, had to be the easiest to pair with all the three.



#### ***4. BRAIN MECHANISMS AND WHAT IS BEHIND THE DESSERT AND WINE PAIRING PREFERENCES***

The main characteristic of desserts is to have considerable sugar content. However the perception of a dessert can be different according to consistency and structure.

Starting from the three examined in my experiment, which deliberately represent three different categories of sweets, it has to be noticed that the cantuccio and the fruit tart have in common a friable structure, the puff instead is composed by the shell and the filling which together give it mostly a soft consistence. The crunchiness or "crunch" effect has a determining role in the perception of taste as it involves not only the gustatory but also tactile senses. According to this study "*Brain tricks to make food taste sweeter: How to transform food perception and why it matters*" (Jessleen K. Kanwal, 2016) conducted by the Harvard University it has been demonstrated, through the measurement of Hz frequencies produced by some foods, that high frequencies sounds are able to enhance the perceived sweetness, instead low frequencies sounds enhance the bitterness. Moreover, different studies demonstrated that the less a food is hard, more its taste will be perceived as intense. Not surprisingly, in the tasting all the three desserts have been paired to a less sweet wine and specially for the puff it was expressed by the testers the need to pair it with a wine able to reduce the sweetness, refreshing the palate.

This phenomenon has been explained by the scientific magazine Focus which according to a study, the ingestion of a considerable quantity of sugars results in a sense of dehydration with a consequent request for water or fresh drinks. <<https://www.focus.it/scienza/scienze/perche-i-dolci-fanno-venire-sete>>

It derives from a reduction of the liquids flow in presence of a high glucose content, which in the stomach increases the satiating power with the consequent difficulty of emptying. This causes the body the need to introduce liquids.

Dr. David Mangelsdorf and Dr. Steven Kliewer, researchers at the UT Southwestern, thanks to a research started in 2002 on "*Why does drinking alcohol or consuming sugar make us thirsty*", were able to identify the FGF21 hormone as responsible for increasing the desire for water in response to large concentrations of specific nutrients that may be a source of dehydration, including sugar.

This would explain why Passito wine in the experiment was not paired with any dessert as its high sugar content could not satisfy the demand for freshness in none of the three cases.

Moscato, sweet but not like the Passito could be appreciated in combination with the tart, not only for the common fruity notes but also because the crunchy texture decreased in presence of the

cream and consequently the sweetness intensity reduced. In this way the aromatic appreciation of the Moscato prevailed over the rest, although both the dessert and the wine had a high sugar content. Moreover aromatic compounds gave that sense of freshness avoiding the request to drink something less sweet.

## 5. CONCLUSIONS

It can be assumed that beyond a certain quantity of sugar, the dessert needs to be paired with a beverage that is neutral or with a lower sugar content. Probably this is also the reason behind the great success of Prosecco.

Regarding the specific desserts and wine pairings, it can be added that the analogy principle suggested by the sommeliers is preferred in presence of balance among the two elements otherwise the contrast is preferred.

Since the sugar content of Passito overwhelmed the one of the desserts examined it could be successfully matched with those having instead a bitter note.

The scope of the Dessert and Wine pairing, so particular and full of elements difficult to manage, it clearly requires a different approach for the study of valid combinations.

In my opinion it has to start with a careful analysis of the product texture and only then consider elements such as taste and aromas. In this way will be easier to select the category or type of wines potentially valid for the combination. Then it will be analyzed the residual sugar content and the aromatic profile to follow. This method could simplify the choice and allow an immediate skimming, focusing the attention on wines that already have the right characteristics. At least, among those remaining will be examined the aromatic notes together with those of the dessert and the final pairing choice will be made. Personal liking, however, will always be the determining element in the evaluation of a match. “De gustibus non disputandum est” (*G. G. Cesare*)



## **REFERENCES**

Achatz, Grant

*Alinea*

Ten Speed Press, 2008

Croci, Massimiliano

*“Emozioni di ghiaccio”*

<[www.vinicroci.com/emozione.htm](http://www.vinicroci.com/emozione.htm)>

Dr. Mangelsdorf, David

Dr. Kliewer, Steven

*Why does drinking alcohol or consuming sugar make us thirsty?*

UT Southwestern, 2018

<<https://www.utsouthwestern.edu/newsroom/articles/year2018/alcohol-sugar-thirst.html>>

FISAR (Federazione Italiana Sommelier Albergatori Ristoratori)

*Abbinamento*

<<http://www.fisar.org/abbinamento/>>

Fischer, John R.

*Food and Wine 101: A Comprehensive Guide to Wine and the Art of Matching Wine with Food*

AuthorHouse, 2006

Franco, Nino

*“Primo Franco”, Prosecco DOCG*

<<http://www.ninofranco.it/en/wine/primo-franco/>>

Focus Magazine

*Perché i dolci fanno venire sete*

Giugno 2002

<<https://www.focus.it/scienza/scienze/perche-i-dolci-fanno-venire-sete>>

Gozzi, Mario

Harrington, Robert J.

Koone, Rebeckah

McCarthy, Michelle

*The role of acidity, sweetness, tannin and consumer knowledge on wine and food match perceptions*

Journal of Wine Research, Vol. 25, No. 3, 158–174, 2014

Kanwal, Jessleen K.

*Brain tricks to make food taste sweeter: How to transform food perception and why it matters*

Harvard University, 2016

<[sitn.hms.harvard.edu/flash/2016/brain-tricks-to-make-food-taste-sweeter-how-to-transform-taste-perception-and-why-it-matters](http://sitn.hms.harvard.edu/flash/2016/brain-tricks-to-make-food-taste-sweeter-how-to-transform-taste-perception-and-why-it-matters) >

Moller, Per

*Orosensory Perception*

Pediatric formulations, 2014

Simonetta, Natale

*“Solenne”, Essenza Nobile- Vino di Ghiaccio*

<[https://www.cascinabaricchi.com/sites/default/files/solenne\\_0.pdf](https://www.cascinabaricchi.com/sites/default/files/solenne_0.pdf)>

Thompson, Paul.B

*From Field to Fork: Food Ethics for Everyone*

Oxford University Press, 2015

Vinoway

*Storia della viticoltura*

Enciclopedia del vino,2018

<<https://www.vinoway.com/enciclopedia-del-vino/viticoltura/viticoltura-storia-ed-evoluzione/104-evoluzione-cenni-storici/116-storia-della-viticoltura.html>>

Zanichelli, Massimo

*Il Grande Libro dei Vini Dolci d'Italia*

Giunti, 2018

