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UNIVERSITETET I STAVANGER, FACULTY OF SOCIAL SCIENCES, NORWEGIAN
SCHOOL OF HOTEL MANAGEMENT**

HAAGA-HELIA, UNIVERSITY OF APPLIED SCIENCES

MASTER'S THESIS

STUDY PROGRAM:

**Master's in Culinary Leadership &
Innovation**

TITLE:

**THE WILLINGNESS TO PAY FOR ORGANIC AND BIODYNAMIC WINES IN
FRANCE**

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The willingness to pay for organic and biodynamic wines in France

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Abstract

In recent years, French consumers are increasingly concerned by environmental issues and demanding of eco-friendly products. Thus the market of eco-friendly products in France, including wines, is booming. This quantitative research, based on 172 surveys collected in France, aims to study the willingness of French consumers to pay for organic and biodynamic wines, especially to determine the surplus of price that they would be ready to accept for a wine certified by one of these two labels and to assess the influence of consumers' socio-demographic and behavioural characteristics on this surplus. The results show that consumers are approximatively ready to pay 1 to 10% more for a biodynamic or an organic wine. For both types of wine labels, the willingness to pay of a consumer is positively correlated to his level of environmental concern, importance of eco-friendly farming, preference for eco-friendly products and perception of organic and biodynamic wines. Consequently, for a French consumer, higher is the level of these variables better will be the willingness to pay. Nonetheless, this willingness to pay for organic and biodynamic wines is not affected by the gender, the perception of eco-friendly products, the knowledge in the field of wines, the frequency of purchase and of consumption of wine, and the knowledge in the field of organic wines.

Keywords: Quantitative research, Organic and Biodynamic wines, Willingness to pay, France.

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Foreword

This thesis represents the final point to my studies in Hospitality & Culinary Management. This exercise gave me the opportunity to acquire new knowledge about eco-friendly wines but also to better understand the method of applied research.

I would like to thank the Institute Paul Bocuse, the Haaga-Helia University and the University of Stavanger for providing me the opportunity to integrate the Master's in Culinary Leadership & Innovation and for all the knowledge that I have acquired through this program.

I would specially like to thank my thesis advisor, Madam Bayet-Robert, for all the help, the consideration and the time that she dedicated to me all along this work. It was a very pleasant time to work with her and to receive all her advises.

Introduction

In 2016, the organic market in France is worth around 7 billion Euros, while it was only 5.76 billion in 2015, which represents an increase of more than 20% in one year. Moreover, between 2015 and 2016, the number of organic producers increased of 12% and the number of processors, distributors, importers and exporters engaged in organic field of 10% (Agence Bio, 2017). There has also been an increase of more than 16% of the organic agricultural surface and the 1.5 million ha has been exceeded (33% in conversion), which represents more than 5.8% of the French useful agricultural area (Agence Bio, 2016). This boom of the organic market and production in France responds to the behavioural change of consumers, who seem increasingly sensitive to the respect of environment and eco-friendly methods. Indeed, the number of French people who feel concerned about environmentally friendly products and/or the principles of sustainable development has considerably increased in recent years, from 66% in 2013 to 89% in 2015, to 92% in 2016. Furthermore, about 7 French out of 10 (69%) admitted to consume organic products at least once a month in 2016, while they were 65% in 2015 and only 37% in 2003. Moreover, the population of daily consumers is also growing, since they were 15% in 2016 against 10% in 2015 and 9% in 2014 (Agence Bio/CSA, 2016).

Concerning organic wines, the market trends seem to correspond to the ones observed for organic products in general. Indeed, the production and the wine market has been booming in recent years, the same applies for French behaviour which seems to evolve. In 2015, organic wines represented 7,5% of the global wine market, which represents an increase of 17% in relation to 2014 (Didier Perréol – Président de l'Agence BIO, 2017).

Moreover, the area of French organic vineyards has more than tripled in 8 years, from 14,632 hectares in 2007 up to 68,565 hectares in 2015, that is to say 8.7% of the national vineyard's surface (Didier Perréol – Président de l'Agence BIO, 2017).

In 2016, about 11% of French people consumed organic wines, however only 15% of consumers of organic products drank organic wines. Besides, it has been observed that 76% of consumers of organic wine have been doing it for less than 5 years, which highlights that enthusiasm for organic wine is relatively recent (Agence Bio/CSA, 2016). At last, young people (18 to 24 years) seem particularly sensitive to the ecological arguments of organic wines. Indeed, this age group represents 14% of consumers of organic wines, while it is only 8% of consumers of conventional wine (Didier Perréol – Président de l'Agence BIO, 2017). According to a study made by the BIO Agency and the CSA in 2015, one of the main levers to increase the consumption of organic wine depends on the price, followed by the local aspect and the availability in store (Agence Bio/CSA, 2015). Furthermore, Lockshin and Corsi have reported that consumers are not ready to exchange wine's quality against environmental features, thus eco-friendly and conventional wines should be sold at the same price (Lockshin & Corsi, 2012).

So today, the eco-friendly certified wines seem to take more and more importance for French consumers. Besides, the price component appears to play an important role in the purchasing process of this type of product. In fact, many studies have been conducted on the buying behaviour and the willingness to pay (WTP) for organic food or beverage products, however very few studies have been conducted regarding the willingness to pay for organic and biodynamic wines.

Therefore, this research aims to study the willingness to pay (WTP) of French consumers for organic and biodynamic wines by determining the surplus of price that they would be ready to pay for a wine certified by one of these two labels and by assessing how consumers' socio-demographic and behavioural characteristics affect this surplus.

From a scientific point of view, the main issues of this research rely on new insights concerning behaviour and willingness to pay for these two types of wine. As regards all operators of organic and biodynamic wine (producers, processors, distributors, etc.), this research will allow them to better understand characteristics of their customers, which could be helpful for future commercialization, distribution or marketing strategies. Finally, this research will bring information on the WTP of French consumers for these wines, which will allow operators to better adapt their price policy to the actual market in order to maximize the number of consumers and consequently their profit.

In order to fulfil the research objectives, a survey which collect data on the sociodemographic characteristics, the behaviours and the willingness to pay has been conducted on Internet, then the results has been analysed by using the software SPSS and Excel (SpSS, 2012). In terms of theoretical framework, this research paper relies on a literature review focused on the organic and biodynamic labels, and on the concept of willingness to pay. Finally, the main findings of the research will be discussed and compared with results of previous studies, in order to underline the main implications and limits of this research.

Literature Review

The Organic and Biodynamic wines

Organic wine.

History of the organic label

The organic farming, and consequently the organic viticulture, is a very specific mode of production, transformation and management that aims to produce high quality product by mixing environmental practices, reduction of inputs, high degree of biodiversity and conservation of the balance of natural resources (Provost & Pedneault, 2016).

Officially recognized by the French public authorities since the agricultural law of 1980, the organic farming was the object of national specifications before being stated at European level by the regulation n°2092/91 of the Council of June 24th, 1991 (The Council of the European Communities, 1991). However, even if the recognition of the organic farming by the European Community dates 1991, it is only in 2012 that the organic wine is defined by the European Commission by its regulation R (EU) 203/2012, which became effective on 1st August 2012 (The European Commission, 2012). Consequently, in France, as state of the European Union, the national label “Agriculture Biologique (AB)” which regulated up to there the biological wine, is replaced in 2012 by the Eurofeuille label, which guarantees the application of the specifications of the European Commission.

However, there is today a certain cohabitation between the European and the national label. This is mainly due to the behaviour and mentality of French consumers, which have difficulty to evolve, therefore the logo AB remains anchored in their mind, and that despite the Europeanization of rules for organic producers.

Indeed, according to the barometer Organic Agency/CSA of year 2016, 97% of the French consumers know the label AB whereas only half of them know about the Eurofeuille label (Agence Bio/CSA, 2016). Therefore, due to its impact on the purchasing behavior for organic products, the national label AB, which is facultative, is still present in France on a wide range of products (food, wine, ...).

Method of viticulture and winemaking

Unlike the AB label, which only took into account viticulture and not wine making, the Eurofeuille label defines and regulates organic wine throughout the process (viticulture and wine making) and proposes to slightly reduce inputs during the wine making.

The regulation establishes that only products containing at least 95% of ingredients derived from organic production may bear the European organic logo. This regulation authorizes the presence of 0.9% of GMOs incidentally or technically unavoidable, in particular in fermentation grapes, in the products labelled. (The European Commission, 2012).

Regarding the organic production method, it is based on the non-use of synthetic chemical products (fertilizer, pesticides...), the recycling of organic matter, a sustainable management system for agriculture (use of compost, moderate work of the ground, long rotation, mechanical weeding, ...) and the respect for the natural balance and biodiversity.

Concerning the transformation process, it is based on the use of biological ingredients, limited use of additives and the use of environmentally friendly and non-polluting processes. Finally, during the wine making the only ingredient of vegetable origin which can be used is the grape (no use of sugar, alcohol...).

Certification procedure

According to the Organic Wine Regulation R (EU) 203/2012, from the harvest of 2012, only the wines that respect the European specifications of the organic wine-making can bear the organic mention and display the logo Eurofeuille. For the wines produced before the 1st August 2012, it may continue to be marketed with the words "wine from organic grapes" until stock depletion, but the use of the European logo is prohibited. Concerning the producers who already respect the regulation and who can provide supporting documents, it is possible to apply for retroactive certification. Finally, the producers in organic conversion can claim it through the mention "wine in conversion to organic farming", on condition of respecting the European specifications (The European Commission, 2012).

In order to ensure the respect of European specifications, regulations have been put in place at all steps of the chain. Thus, to obtain organic certification, a winegrower must call upon a certifying organization, inscribed on the list of organizations or public authorities responsible for monitoring in accordance with Article 35 (b) of Regulation (EC) 834/2007 (The Council of the European Union, 2007). For example, in France there are only 9 accredited certifying and control bodies (see List in Appendix A)

Once the winegrower's request has been made, the organization contacted will send a contract proposal, including a commitment to respect the organic regulations. In addition, the organization must control the activity of the operator at least once a year in order to issue a certificate of compliance (The European Parliament and the Council of the European Union, 2009).

To conclude the Eurofeuille certification is a multiple steps process that includes a request, annual controls and temporal certifications.

Biodynamic wine.

History of the biodynamic label

Biodynamic agriculture is a system of agricultural production derived from the esoteric current of anthroposophy, founded by the Austrian scientist and philosopher Rudolf Steiner (1861-1925) in 1913 (Larousse, 2017). In June 1924, at the request of several farmers and two German agronomists (Erhard Bartsch and Immanuel Vögele) concerned about the development of chemical fertilizers and industrial agriculture, Rudolf Steiner presented an Agricultural Course at Koberwitz Estate in Silesia (present-day Poland) to an audience of farmers, veterinarians and scientists. Through the 8 conferences which constitute his course, Rudolf Steiner explained the philosophical and technical bases of an agricultural method, more in harmony with nature, which he considered as an alternative (Paull, 2011).

From the creation of the method, Rudolf Steiner has tried to develop experimental protocols in order to adapt in practice and to check the effectiveness of his methods. After his death, these experiments have continued and have been conducted by an Experimental Circle of Anthroposophic Farmers. An extensive correspondence is then established between the circle of participants. Then this correspondence will be relayed by a "Letter," itself replaced in 1927, by a true periodical. The journal, entitled "Biologisch-Dynamischen Wirtschaftsweise in Mitteleuropa", was run by the researcher and biologist Ehrenfried Pfeiffer, who was the first major propagator of biodynamic methods. This concern for experimentation reflects Steiner's thinking which aims to connect scientific approach and philosophy within the sector of agriculture (Besson, 2007).

In 1932 in Germany, the Demeter Association was founded in order to support and promote the biodynamic agriculture. The Demeter Symbol is then introduced, and the first standards for Demeter quality control formulated (Demeter France, 2017c).

In France, the French Association of biodynamic culture was created in 1958, the Union of Biodynamic Farming in 1973 and the Movement of biodynamic culture in 1975 (Le Mouvement de l'Agriculture Bio-Dynamique, 2017). Still in France, the association Demeter France will not emerge before 1979 (Demeter France, 2017c).

More specifically as regards the world of wine, the International Union of Winegrowers practicing Biodynamic Farming (SIVCBD: "Syndicat International des Vignerons en Culture Bio-Dynamique") and its label Biodyvin have been founded in 1995. This syndicate is composed of winegrowers exploiting their entire field using biodynamic methods and who claim their practice through the brand Biodyvin (BIODYVIN Syndicat International des Vignerons en Culture Bio-Dynamique, 2017).

To conclude, today it is true that one part of the scientific community and some producers look at biodynamic methods with scepticism and consider them as dogmatic. Nevertheless, a significant proportion of the results presented in scientific journals have demonstrated the effects of biodynamic methods on the yield of the vineyard, soil quality and biodiversity (Foissner, 1987; Goldstein, 1986; Reganold, 1995).

Method of viticulture and winemaking

The biodynamic agriculture does not advocate a return to nature, but promotes understanding of the laws of nature in order to better respect them in agricultural practices. Thus, the winegrowers who use this method try to intensify the life of the soil in order to improve exchanges between the land and plants.

Nowadays, many consider biodynamic practices to be more stringent and rigorous than organic practices (McCullough, Qenani, & MacDougall, 2012). We can almost consider that the biodynamic method is built on the organic method while going further. Indeed, many practices are common to both methods, as the use of compost, the long rotations, the moderate work of the ground, the mechanical weeding, the prohibition of synthetic pesticides and fertilizers.

However, the biodynamic system differs from organic system in several points. Firstly, in a biodynamic operation, farming practices are based on the following six principles: biodiversity, crop rotation, homeopathic fertilizers, use of compost, animal life and natural cycles (seasonal, planetary, lunar, zodiacal) (Delmas, 2010). We can notice through these pillars that biodynamic method distinguishes itself by taking into account all natural energies and organisms as well as the rhythm of the nature and the astral influences. Furthermore, the use of homeopathic fermented herbal preparations is also one of the specific characteristics of biodynamic farming (BIODYVIN Syndicat International des Vignerons en Culture Bio-Dynamique, 2017). These plant preparations, developed on the basis of information provided by Rudolf Steiner, aim to stimulate, rebalance and revitalize the plant and the ground rather than to feed or treat it. There are a total of eight preparations, six preparations have to be added to the compost, while the seventh has to be sprayed on the soil and the last one directly on the plants during the growth (Carpenter-Boggs, Kennedy, & Reganold, 2000).

Secondly, “while organic farming methods focus on eliminating pesticides, growth hormones and other additives, biodynamic farming emphasizes creating and managing a self-sufficient and healthy ecosystem” (Delmas, 2010). Thus, with the biodynamic method, the farm is considered and managed as a whole living organism where everything is interconnected and self-sufficient (McCullough et al., 2012).

Thirdly, even if both organic and biodynamic methods avoid the use of chemical fertilizers, they are distinguished by the purpose and the rigor of this practice. Indeed, while organic farming aims to establish sustainable agricultural production by minimizing external inputs and avoiding industrial products, although it allows them under certain conditions, biodynamics aims to produce healthy plants by prohibiting the use of soluble fertilizers and pesticides, whether natural or not. Thus biodynamic method only allows composts of plant or animal substances that can be decomposed by the living organisms present in the compost (Le Parisien, 2017).

It is also important to note that during wine making, the biodynamic method allows the sticking of wine, the filtration, industrial yeasts and the chaptalisation (addition of sugar) but only for sparkling wines. However, the use of sulphur is more limited than for organic wines and conventional wines. For example, for red wine, conventional vinification allows 160mg/L of sulphur according to European standards and 100mg/L of sulphur for Eurofeuille label, versus 70mg/L in biodynamic vinification (Demeter France, 2017c).

To conclude, the final objective of the biodynamic method lies in the suppression of all oenological inputs and practices that aim to modify the natural equilibrium of grapes. In other terms, Biodynamic farming promotes a production without addition, withdrawal and modification (BIODYVIN Syndicat International des Vignerons en Culture Bio-Dynamique, 2017).

Certification procedure

For biodynamic wine, there is no European regulation. The two important certifiers that regulate the production of biodynamic wines are Demeter and Biodyvin. It is important to note that both organizations require that the wines be certified Eurofeuille according to European regulations (Demeter France, 2017c). Consequently, the fields must respect the European specification and the specification, which is more exigent (less inputs authorized, more winemaking regulations, ...), of the biodynamic labels.

- The Demeter label

Unlike the Biodyvin label, Demeter certification covers a wide range of raw agricultural products (fruits, vegetables, cereals, meat, etc.) and processed products (food, cosmetics, textiles). The International Demeter Standards, that ensure respect for biodynamic principles in agricultural areas and during the processing of products, have been created in 1992 (Demeter International, 2017). It is important to note that Demeter requires the total conversion of the domain to the biodynamic practices, thus the mix in terms of farming methods is not authorized (Demeter France, 2017a).

Concerning the wine making, Demeter proposes three types of certification:

- “Demeter wine” or “Biodynamic wine”: concerns wines vinified according biodynamic practices.
- "Wine derived from Demeter grapes": concerns wines produced from certified biodynamic grapes. However, there is no restriction for winemaking.
- “Under conversion to Demeter”: concerns domains that have started their conversion and that respect the Demeter’s regulation (Demeter France, 2017a).

For the winemakers who wish to obtain the Demeter's certification, this requires a conversion period. This period varies according to the age of the European organic certification. Indeed, if the vineyard is not certified organic, the conversion will have to last three years. However, if the domain has already started its conversion to organic farming or has been certified organic for more than 3 years, the conversion period will be reduced. In addition to this conversion period, winegrowers will have to take part in a technical training on biodynamic practices with an agency recognized by Demeter (Demeter France, 2017b).

Lastly, as for the Eurofeuille certification, a control of all operators is carried out annually in order to ensure the respect of the biodynamic rules. This control is made by Demeter's controllers or by controllers from an independent organisms mandated by Demeter (In France: Ecocert, Agrocet and Certipaq) (Demeter France, 2017b).

- The Biodyvin label

It is only in 1998 that members of the International Union of Winegrowers practicing Biodynamic Farming (SIVCBD) decided to draft specifications that all farms must respect to claim the Biodyvin label. In 2002, the SIVCBD, in a quest for impartiality, has decided to call on an external auditing agency in order to verify the practices of its members. Thus the company Ecocert (one of the leaders of organic certification in France) becomes the main partner of the SIVCBD (BIODYVIN Syndicat International des Vignerons en Culture Bio-Dynamique, 2017).

In order to obtain the Biodyvin label, winegrowers must commit themselves in a certification process that lasts four years. It is only at the end of this period of conversion that the SIVCBD issues the label, unless the domain has already been certified by Demeter for 3 years, in this particular case there is no conversion period.

The conversion process is carried out in 3 main steps. The first one is an interview with the SIVCBD's management committee, which aims to judge the practices in place within the field and to ensure the motivation of the winemaker. The second stage, which will be renewed each year of conversion, is a tasting. The objective of this tasting is not to judge the intrinsic quality of wine but rather to understand the work performed and its impact on wine. It is only after the validation of those two firsts steps that the field will be accepted in first year of conversion. Finally, the third step lies in the participation to annual exchange meetings and trainings organized by the union. Thus, each member must observe his activity in order to detect possible improvements that could be brought to the biodynamic method. The aim is to be able to continuously improve the method and to allow members to improve themselves by exchanging their observations (BIODYVIN Syndicat International des Vignerons en Culture Bio-Dynamique, 2017).

To conclude, as for the Eurofeuille certification, both Biodynamic certifications are done through a multiple steps process that includes respect of specifications, inspections and yearly renewal (McCullough et al., 2012).

The willingness to pay for sustainable products

Concept of willingness to pay

The concept of willingness to pay (WTP), appeared in the Economic Literature in 1902 (Davenport, 1902), has been defined as the maximum price that a purchaser is ready to pay for a given quantity of a product or a service (Kalish & Nelson, 1991; Kohli & Mahajan, 1991; Wertebroch & Skiera, 2002). Consequently, the WTP allows to express, in a monetary unit the value or the utility that a buyer attributes to the consumption of a product or service. Thus, more important is the utility or value conferred by the consumer to the product's consumption higher is the price that he is ready to pay (Le Gall-Ely, 2009).

The willingness to pay mainly depends on the product attributes, the consumers socio-demographic characteristics and others external factors that have a direct or indirect influence on the product's choice. Thus, the WTP will vary according to these different factors and any change brought to these factors will have a direct impact on the WTP (Cranfield & Magnusson, 2003). Consequently, being able to measure the WTP and to know the factors influencing it allow to fix the price according to the demand in order to optimize turnover, margin or even market share (Le Gall-Ely, 2009).

Previous studies on the willingness to pay for eco-friendly products

Numerous studies have examined consumer willingness to pay for eco-friendly products, and especially for the organic and pesticide free food. For example, in 1991, the researchers Misra, Huang and Ott determined that most of the consumers were not ready to pay a higher price for pesticide-free fresh product. Indeed, most respondents (54%) of the survey respondents were not ready or not sure to pay a higher price.

Moreover, 87% of the respondent who were ready to pay a higher price were willing to pay at most 10% more for certified pesticide-free fresh product (Misra, Huang, & Ott, 1991). In 1995, Bagnara founds that 52% of the respondents were willing to pay a higher price, but most of them were willing to pay only 20% more (Bagnara, 1995). A study carried out by Hutchins and Greenhalgh in 1997, shows that half of the consumers were willing to pay more for organic food products and most of them were ready to pay between 10 and 20% more (Hutchins & Greenhalgh, 1997). While in 2001, Boccaletti and Nardella founds that 72% of the respondents were not willing to pay more than 15% of premium for pesticide-free fruits and vegetables while 11% of the respondents were not willing to pay more (Boccaletti & Nardella, 2000). Finally, the Cranfield and Magnusson's study in Canada indicates that about 67% of respondents would be willing to pay 1 to 10% more for pesticide free food products, while only 5% of respondents would be ready to pay more than 20% of price premium (Cranfield & Magnusson, 2003). To summarize, research's results have shown that consumer WTP for eco-friendly products is about 1 to 20% more than for conventional products.

Nonetheless, it has been found that several consumers' socio-demographic and behavioural characteristics affect the WTP for this type of products. First of all, it appears that consumers who are concerned by the environment are more likely to pay a higher price for organic. Indeed, in 2000, the study conducted by Gil, Garcia and Sanchez in Spain indicates that consumers who feel concerned by environmental deterioration are more willing to purchase organic foods at a higher price (Gil, Gracia, & Sanchez, 2000). This is in accord with Cranfield and Magnusson's results, in 2003, which suggest that consumers who feel concerned by the impact of pesticides on the environment and who pay attention to sustainable agricultural production are more likely to pay a higher price for pesticide-free fresh food products (Cranfield & Magnusson, 2003).

Moreover, a study made in 2009 reveals that the level of environmental knowledge also influences positively the willingness to pay for sustainable wines (Barber, Taylor, & Strick, 2009).

Secondly, the WTP appears to vary according to gender of the consumer. Thus, according to several studies, men seem to be less likely to pay a premium price for environmental characteristics than women (Boccaletti & Nardella, 2000; Cranfield & Magnusson, 2003; Loureiro, 2003).

Thirdly, the age of consumers has also an impact on the willingness to pay for sustainable products. However, the literature seems to be divided concerning the relation between age and WTP. Indeed, Cranfield et al. have demonstrated that respondents over 65 years are more willing to pay no premium or a small premium than respondents under 65 years (Cranfield & Magnusson, 2003). Whereas, Misra et al. have found in their study of 1991 an highest level of WTP within consumers who are over 60 years (Misra et al., 1991).

Finally, contradictory results have been found concerning the relation between the WTP for eco-friendly products and the level of education of the consumers. Indeed, while some authors found that the WTP increases with higher level of education (Cranfield & Magnusson, 2003; Jordan & Elnagheeb, 1991; Van Ravenswaay & Hoehn, 1991) others have found an inverse correlation between WTP and level of education of consumers (Boccaletti & Nardella, 2000; Buzby, Skees, & Ready, 1995; Malone, 1990).

To conclude, these studies reveal that there is a relation between socio-demographic characteristics of a consumer and his WTP for eco-friendly products, however the nature of this relation is still questionable.

Method

Design

According to the Dictionary of Statistics & Methodology of Paul Vogt and Burke Johnson, the research design consists in the art and science of planning processes used to carry a study, in order to find the most reliable and relevant results (Vogt & Johnson, 2011). The design of this research follows the steps proposed by Saunders, Lewis and Thornhill in their concept of research “onion” (Saunders, 2011). Knowing that, each layer of the onion represents a step of the research process, this concept illustrates a system of progression that allows to build a research successfully (see Figure Research Onion in Appendix B).

Figure 1. *Research Design*

Research philosophy	=>	Post positivism
Research approach	=>	Deductive
Research strategy	=>	Survey
Research method	=>	Quantitative
Research type	=>	Descriptive and analytic
Time horizon	=>	Cross-sectional

This research follows a deductive approach with the post positivism philosophy. Indeed, it starts from a theory, then collects data that support or contradict this theory and finally conducts an experiment which aims to measure and analyse numerically the characteristics and behaviours of a sample. The objective is to extend the results to an entire population and to confront them to those found in previous researches. Nonetheless, the post positivism philosophy leads to a certain relativism, thus even if the results of this type of studies are valid and relevant, it is considered that the absolute truth cannot be found, given that many variables are not taken into consideration (EduTech Wiki; Research Methodology).

The research used a quantitative method as it is based on a survey that collects data regarding socio-demographic, behavioural and willingness to pay characteristics of a sample of the French population.

Research will be descriptive because it aims to describe characteristics and phenomenon observed within the population studied, but it is also analytic as results will be compared to those of previous studies. (DifferenceBetween.com, 2012)

Time horizon of the study is cross-sectional, as it involves an analysis of a survey conducted at a specific time (interval of 10 days), without manipulating the independent variables or the environment (Cherry, 2017).

Data Collection

Secondary data.

Secondary data has been gathered within the literature review. This review is composed of reports, publications, regulations, specifications, newspapers and internet articles.

Primary data.

A survey, inspired from similar previous researches, has been built in order to collect information on the profile of participants and to identify some of their consumption behaviours for eco-friendly products and for wines, especially the willingness to pay for wines certified organic or biodynamic.

The survey, available in Appendix C, is structured in six parts. The first part, questions 1 to 3, collects information about socio-demographic characteristics, such as gender, age and level of education.

The second part, questions 4 to 8, is related to the environmental perception and consumption of eco-friendly products. The third one, questions 9 and 10, investigates about knowledge of biodynamic method and products. The fourth part, questions 11 to 14, is related to the knowledge and consumption of wines. The two last parts, questions 15 to 18 and 19 to 22, gather questions about knowledge, perception and willingness to pay for organic and biodynamic wines.

Sample

The survey has been sent by mail, the 30th April 2017, to a maximum of French people issued from my own network (family, collaborators, friends, etc.), but also to the students of the Institute Paul Bocuse. Moreover, it has been put online, from the 30th of April to the 9th of May (10 days), through social medias, as Facebook or LinkedIn. This sampling technic can be assimilated to the snowball sampling, given that any participants can share or send the survey via mail or social media to their friends or to any potential respondents. This method has been chosen because it helps to increase the number of answers while being easy to put in place. However, the main drawbacks of this technique consist in the fact that we cannot ensure the representativeness of the sample and that people who are not connected to internet or social media cannot participate.

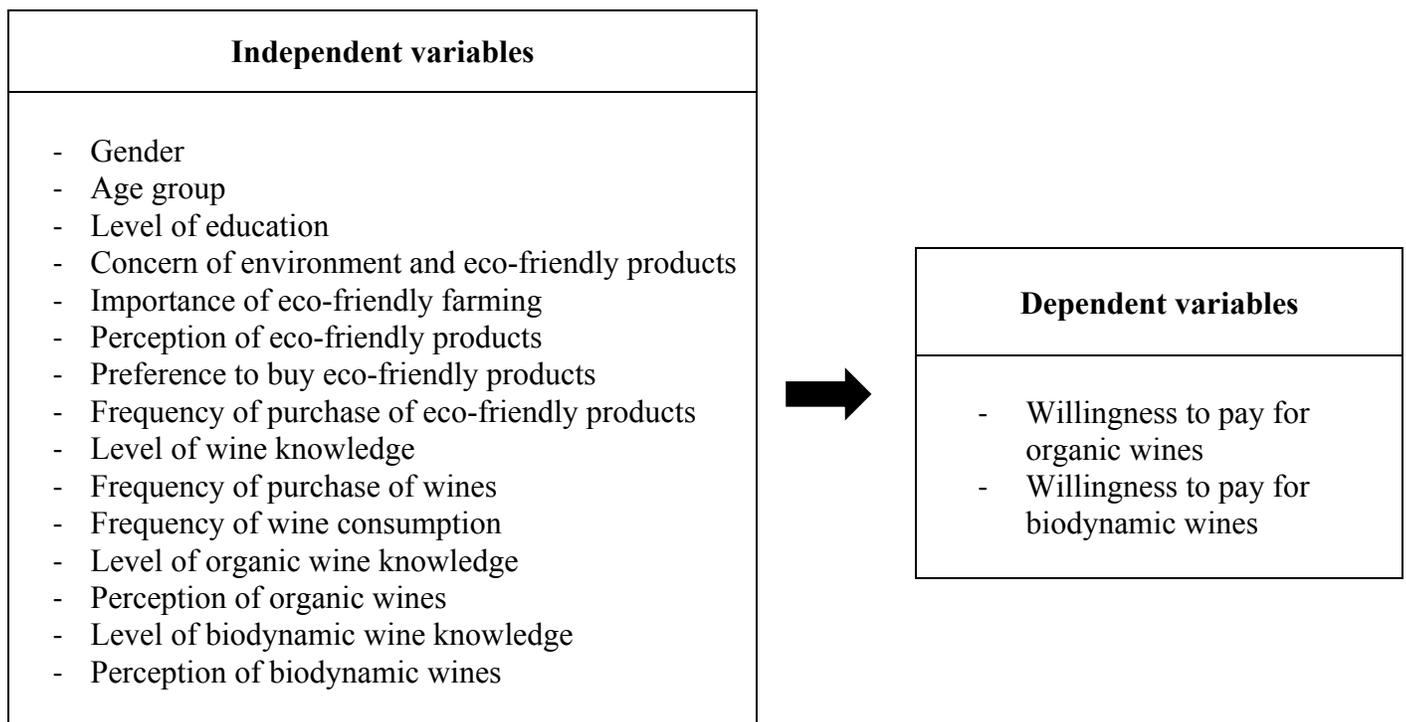
After 10 days, I received 198 answers to my survey, however a review of these data has revealed that 26 surveys were not usable because of a constituency problem (e.g. Some people answered “No” to the question “Are you ready to pay a premium price for organic label”, but they specified in the following question that they will be “ready to pay 6 to 10%” more for this label, which is clearly incoherent).

Consequently, these 26 surveys have been removed and only 172 surveys (86,8% of the total number of answers) have been taken into account for the research.

Data Analysis

The data analysis has been made by using the software SPSS (SpSS, 2012) and Excel, and it is composed of two main parts. The first part gathers the descriptive statistics (with cross-tabulation) of the answers of the survey. The second one consists in the analysis of the relationship, using the Pearson’s Chi Square and Correlation, between the independent variables and the dependent variables (see Figure 2). The objective is to determine if the independent variables affect the premium price that respondents will be ready to pay for a wine certified organic or biodynamic instead of a conventional one.

Figure 2. *Independent and Dependent Variables*



Results

Descriptive Statistics of the survey results

Socio-demographic data.

Table 1. *Descriptive Statistics – Socio-Demographics Questions*

	Frequency	Percent
Gender		
<i>Female</i>	102	59,30%
<i>Male</i>	70	40,70%
Age		
<i>18-25 years old</i>	97	56,40%
<i>26-40 years old</i>	26	15,12%
<i>41-65 years old</i>	45	26,16%
<i>More than 65 years old</i>	4	2,33%
Level of Education		
<i>Secondary School</i>	9	5,23%
<i>University studies 1st Cycle</i>	71	41,28%
<i>University studies 2nd Cycle</i>	58	33,72%
<i>University studies 3rd Cycle</i>	31	18,02%
<i>Without diploma</i>	3	1,74%

In Table 1, we observe that the sample seems more or less well proportionate in terms of gender, even if there are few more women (102) than men (70).

Concerning the age, more than half of the panel is between 18 and 25 years old (56,4%), this may be explained by the fact that surveys have been sent to my personal network, which is principally constituted of people around my age. Furthermore, the survey has been published through social media, in which the millennials are usually more active than older people, and sent by mail to the students of the Institut Paul Bocuse, where most people are under 25 years old. We can also notice that only 4 respondents (2,33%) are over 65 years, which could be explained by the reasons mentioned above.

Regarding the level of education, only few respondents do not have any diploma (3) or only secondary school diploma (9) while most respondents have university degrees (1st cycle: 71, 2nd cycle: 58, 3rd cycle: 31). The important presence of interviewed people with a degree of 1st and 2nd university cycles might be explained by the fact that the survey was sent by mail to the students of a university school.

To conclude, it is important to notice that both genders are well represented in the sample, nevertheless there is a high number of young people (between 18 and 25 years old) and a strong presence of people who have followed university studies.

Ecology: perception and behaviours.Table 2. *Descriptive Statistics – Ecology perception and behaviours*

	Frequency	Percent
Do you feel concerned by the environment and the eco-friendly methods ?		
<i>Strongly concerned</i>	46	26,74%
<i>Concerned</i>	99	57,56%
<i>Neutral</i>	25	14,53%
<i>Not concerned</i>	2	1,16%
How important eco-friendly farming is for you ?		
<i>Very important</i>	41	23,84%
<i>Important</i>	89	51,74%
<i>Moderately important</i>	30	17,44%
<i>A bit important</i>	8	4,65%
<i>Not important</i>	4	2,33%
How do you perceive eco-friendly products ?		
<i>Negatively</i>	2	1,16%
<i>Neutral</i>	21	12,21%
<i>Positively</i>	149	86,63%
In general, do you prefer to buy products which are certified eco-friendly ?		
<i>Strongly agree</i>	45	26,16%
<i>Agree</i>	86	50,00%
<i>Neutral</i>	31	18,02%
<i>Disagree</i>	7	4,07%
<i>Strongly disagree</i>	3	1,74%
Frequency of purchase of eco-friendly products		
<i>Less than once a year / Never</i>	7	4,07%
<i>Less than once a month</i>	19	11,05%
<i>Once a month</i>	33	19,19%
<i>Once a week</i>	66	38,37%
<i>Several times a week</i>	47	27,33%

Table 2 presents descriptive statistics of the answers to the questions concerning the respondents' behaviours towards eco-friendly methods and products. Thus, more than half of the interviewees (57,56%) feel concerned by the environment and eco-friendly methods, and 26,74% feel strongly concerned. Whereas 14,53% have a neutral position and only 1,16% of the participants do not feel concerned.

Concerning the eco-friendly farming, it seems important for a majority of respondents. Indeed, 51,74% of the people surveyed think that eco-friendly farming is important and 23,84% say that it is very important. However, 17,44% feel that it is moderately important, and 4,65% consider it of few importance and 2,33% not important at all.

Moreover, a large majority of participants perceive positively the eco-friendly products (149 in 172 respondents), whereas only 2 respondents perceive them negatively and 21 neutrally.

Concerning the preference of purchasing Eco-friendly labelled product, the interviewees seem generally to agree (50%) and 26,16% strongly agree. Nevertheless, 18,02% of the respondents adopt a neutral position, while 4,07 % disagree and 1,74% strongly disagree.

As regards the purchasing frequency of eco-friendly products, more than half (65,7%) of interviewed persons admit buying weekly eco-friendly products (27,33% do it several times a week and 38,37% once a week). A significant part of the participants (19,19%) admit buying this type of products at least once a month, whereas 15,12% of respondents rarely buy it (11,05% less than once a month and 4,07% less than once a year/never).

In conclusion, the eco-friendly products and methods seem to be well anchored in the mind of the people who were interviewed. Indeed, 84,3% of the sample feel at least concerned by the environment, 86,63% perceive positively the eco-friendly products and only 6,98% say that eco-friendly farming is not very important. Finally, 76,16% prefer to buy eco-friendly products and 65,7% do it at least once a week.

Knowledge of Biodynamic products.Table 3. *Descriptive Statistics – Knowledge of Biodynamic products*

	Frequency	Percent
Do you know biodynamic products ?		
<i>Yes</i>	80	46,51%
<i>No</i>	92	53,49%
Do you know the difference between organic and biodynamic products ?		
<i>Yes</i>	68	39,53%
<i>No</i>	104	60,47%

Thanks to descriptive statistics of the Table 3, we can observe that 80 people know biodynamic products while 92 people do not. Besides, only 68 people know the difference between biodynamic and organic products.

Consequently, 15% (12 respondents in 80) of the people who hear about biodynamic products do not make any difference between this type of products and the organic products. Thus, less than half of the interviewees know what is biodynamic products (46,51%) and only 39,53% of the respondents know how to differentiate biodynamic and organic products.

Wine: knowledge and behaviours.Table 4. *Descriptive Statistics – Wine knowledge and behaviours*

	Frequency	Percent
Level of wine knowledge		
<i>Novice</i>	33	19,19%
<i>Intermediate</i>	76	44,19%
<i>Advanced</i>	58	33,72%
<i>Expert</i>	5	2,91%

Purchase Frequency of wine		
<i>Less than once a year / Never</i>	5	2,91%
<i>Less than once a month</i>	16	9,30%
<i>Once a month</i>	52	30,23%
<i>Once a week</i>	73	42,44%
<i>Several times a week</i>	26	15,12%

Frequency of wine consumption		
<i>Less than once a year / Never</i>	2	1,16%
<i>Less than once a month</i>	8	4,65%
<i>Once a month</i>	17	9,88%
<i>Once a week</i>	62	36,05%
<i>Several times a week</i>	83	48,26%

Most important characteristic that influences the choice of wine		
<i>Age</i>	4	2,33%
<i>Grape Variety</i>	61	35,47%
<i>Origin</i>	81	47,09%
<i>Price</i>	25	14,53%
<i>Eco-friendly Label</i>	1	0,58%

Table 4 allows us to identify the characteristics and the attitudes toward wine of the interviewed persons. Thus, almost half of the participants have an intermediate level of knowledge of wine (44,19%), while 33,72% admit to have an advanced level. Besides, 19,19% admit to be novice and only five respondents (2,91%) consider themselves as experts in this field.

Regarding the purchase frequency, more than half of the sample (57,56%) buy wines at least once a week (Once a week: 42,44% and Several times a week: 15,12%), whereas 30,23% admit to buy it once a month. To finish, 9,30% of the people who were interviewed purchase wine less than once a month and only 2,91% do it less than once a year.

For the frequency of wine consumption, we can observe that a large part of the panel (84,31%) drinks wine at least once a week. In the other side, almost 10% of interviewees (9,88%) drink wine monthly and 5,81% do it less than once a month (Less than once a month: 4,65% and Less than once a year/Never: 1,16%).

Concerning the question about the most important characteristic that influences the choice of wine, we can notice that the sample seems to be divided between the criterion Grape variety (35,47%) and the Origin (47,09%). The price criterion comes in third position with 14,53%, whereas the Age (2,33%) and the Eco-friendly label (0,58%) only represent 2,91% of the answers.

To conclude, the sample seems highly sensitive to the wine in general. Indeed, 80,82% of people report to have an intermediate or better level of wine knowledge. Besides, a large part of the interviewees admits to buy (57,56%) and to drink wine (84,31%) at least once a week. To finish, the origin and the grape variety of the wine seem to be the most important criteria when respondents have to choose their wines, but the price seems to be also an important characteristic for one part of the people interviewed.

Organic and Biodynamic wine: knowledge, perception and willingness to pay.Table 5. *Descriptive Statistics – Organic wine Questions*

	Frequency	Percent
Level of organic wine knowledge		
<i>Novice</i>	122	70,93%
<i>Intermediate</i>	37	21,51%
<i>Advanced</i>	11	6,40%
<i>Expert</i>	2	1,16%
How do you perceive organic wines ?		
<i>Negatively</i>	4	2,33%
<i>Neutral</i>	53	30,81%
<i>Positively</i>	115	66,86%
Willingness to pay a premium price for a wine labelled organic in regards to conventional wine		
<i>Yes</i>	125	72,67%
<i>No</i>	47	27,33%
How much more will you be ready to pay for ?		
<i>Not ready to pay more</i>	47	27,33%
<i>Ready to pay 1 to 5% more</i>	48	27,91%
<i>Ready to pay 6 to 10% more</i>	63	36,63%
<i>Ready to pay 11 to 20% more</i>	10	5,81%
<i>Ready to pay more than 20% more</i>	4	2,33%

Table 6. *Descriptive Statistics – Biodynamic wine Questions*

	Frequency	Percent
Level of biodynamic wine knowledge		
<i>Novice</i>	133	77,33%
<i>Intermediate</i>	29	16,86%
<i>Advanced</i>	8	4,65%
<i>Expert</i>	2	1,16%
How do you perceive biodynamic wines ?		
<i>Negatively</i>	2	1,16%
<i>Neutral</i>	86	50,00%
<i>Positively</i>	84	48,84%
Willingness to pay a premium price for a wine labelled biodynamic in regards to conventional wine		
<i>Yes</i>	115	66,86%
<i>No</i>	57	33,14%
How much more will you be ready to pay for ?		
<i>Not ready to pay more</i>	57	33,14%
<i>Ready to pay 1 to 5% more</i>	42	24,42%
<i>Ready to pay 6 to 10% more</i>	55	31,98%
<i>Ready to pay 11 to 20% more</i>	12	6,98%
<i>Ready to pay more than 20% more</i>	6	3,49%

The analysis of tables 5 and 6 shows a small difference between the organic and the biodynamic wine knowledge. It seems that participants have a better knowledge of organic wine than biodynamic. Indeed, 50 participants have admitted to be better than novice in the organic wine field, for only 39 for biodynamic wines. In order to identify if this difference of level of knowledge, I have conducted on SPSS a Cross-tabulation with Chi-Square analysis of this two variables. The results, presented in the Table 8, show that this difference of knowledge is significant (Pearson Chi-Square = 162,45; df = 9; p = 0,000 < 0,05).

Table 7. SPSS Cross-tabulation & Chi-Square Tests – Organic/Biodynamic Wine Level of Knowledge

Level of organic wine knowledge * Level of biodynamic wine knowledge Crosstabulation

			Level of biodynamic wine knowledge				Total
			Novice	Intermediate	Advanced	Expert	
Level of organic wine knowledge	Novice	Count	116	6	0	0	122
		% within Level of organic wine knowledge	95,1%	4,9%	0,0%	0,0%	100,0%
	Intermediate	Count	15	20	2	0	37
		% within Level of organic wine knowledge	40,5%	54,1%	5,4%	0,0%	100,0%
Advanced	Count	2	3	5	1	11	
	% within Level of organic wine knowledge	18,2%	27,3%	45,5%	9,1%	100,0%	
Expert	Count	0	0	1	1	2	
	% within Level of organic wine knowledge	0,0%	0,0%	50,0%	50,0%	100,0%	
Total		Count	133	29	8	2	172
		% within Level of organic wine knowledge	77,3%	16,9%	4,7%	1,2%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	162,450 ^a	9	,000
Likelihood Ratio	97,279	9	,000
Linear-by-Linear Association	96,226	1	,000
N of Valid Cases	172		

a. 10 cells (62,5%) have expected count less than 5. The minimum expected count is ,02.

For the perception of the two wine labels, we can notice a large difference of opinion within the panel. Indeed, 115 participants out of 172 (66,86%) perceive positively organic wines whereas only 84 participants (48,84%) perceive positively the biodynamic ones (see Table 5 and 6). Moreover, one interviewee out of two (50%) has no opinion on biodynamic wines, which is probably due to the fact that a majority of respondents do not know exactly what are biodynamic products (see Table 3). As for the difference between level of knowledge for both labels, I made a cross-tabulation and Chi-square tests (see Table 8) to validate or not the significance of this difference of perception. Thus, results show that this difference of perception is significant (Pearson Chi-Square = 30,295; df = 4; p = 0,000 < 0,05).

Table 8. *SPSS Cross-tabulation & Chi-Square Tests – Organic/Biodynamic Wine Perception*

How do you perceive organic wine ? * How do you perceive biodynamic wine ? Crosstabulation

			How do you perceive biodynamic wine ?			Total
			Positively	Neutral	Negatively	
How do you perceive organic wine ?	Positively	Count	72	43	0	115
		% within How do you perceive organic wine ?	62,6%	37,4%	0,0%	100,0%
	Neutral	Count	10	41	2	53
		% within How do you perceive organic wine ?	18,9%	77,4%	3,8%	100,0%
	Negatively	Count	2	2	0	4
		% within How do you perceive organic wine ?	50,0%	50,0%	0,0%	100,0%
Total		Count	84	86	2	172
		% within How do you perceive organic wine ?	48,8%	50,0%	1,2%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30,295 ^a	4	,000
Likelihood Ratio	32,350	4	,000
Linear-by-Linear Association	22,456	1	,000
N of Valid Cases	172		

a. 5 cells (55,6%) have expected count less than 5. The minimum expected count is ,05.

Regarding the willingness to pay a premium price for having a wine labelled organic or biodynamic, we can see that people interviewed appear to be more ready to pay a higher price for organic label (72,67% of the sample) than for biodynamic label (66,86%) (see Table 5 and 6). Thanks to cross-tabulation and Chi-Square tests (see Table 9), we can admit that this difference of willingness to pay a premium price is significant (Pearson Chi-Square = 85,410; $df = 1$; $p = 0,000 < 0,05$).

Table 9. SPSS Cross-tabulation & Chi-Square Tests – WTP surplus for Organic/Biodynamic Wine

Would you be ready to pay a premium price for organic characteristics in regards to conventional wine ? * Would you be ready to pay a premium price for biodynamic characteristics in regards to conventional wine ? Crosstabulation

			Would you be ready to pay a premium price for biodynamic characteristics in regards to conventional wine ?		Total
			Yes	No	
Would you be ready to pay a premium price for organic characteristics in regards to conventional wine ?	Yes	Count % within Would you be ready to pay a premium price for organic characteristics in regards to conventional wine ?	109 87,2%	16 12,8%	125 100,0%
	No	Count % within Would you be ready to pay a premium price for organic characteristics in regards to conventional wine ?	6 12,8%	41 87,2%	47 100,0%
Total		Count % within Would you be ready to pay a premium price for organic characteristics in regards to conventional wine ?	115 66,9%	57 33,1%	172 100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	85,410 ^a	1	,000		
Continuity Correction ^b	82,083	1	,000		
Likelihood Ratio	86,954	1	,000		
Fisher's Exact Test				,000	,000
Linear-by-Linear Association	84,913	1	,000		
N of Valid Cases	172				

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 15,58.

b. Computed only for a 2x2 table

Regarding the answers concerning the amount of the surplus that they will be ready to pay, there is a significant difference between organic and biodynamic (Pearson Chi-Square =311,062; $df = 16$; $p = 0,000 < 0,05$; see Table 10). Indeed, there are more respondents ready to pay 1 to 5% (48 people for organic against 42 for biodynamic) or 6 to 10% (63 people against 55) more for a wine certified organic than for a biodynamic wine (see Table 5; 6 and 10). Nonetheless, it is important to notice that 10,47% of respondents are ready to pay more than 11% of premium price for having a wine certified biodynamic, whereas only 8,14% will accept to do it for organic wine (see Table 5 and 6). Finally, when we observe the correlation we find that there is a strong significant and positive relationship between these two variables (Pearson Correlation= 0,76; Sig.(2-tailed) = 0,000 < 0,05). Therefore, more the amount of surplus that participants are ready to pay for organic wine increases, more the surplus for biodynamic wine increases and vice versa.

Table 10. SPSS Cross-tabulation, Chi² & Correlation – % of surplus for Organic/Biodynamic Wine

How much more will you be ready to pay for organic characteristics ? * How much more will you be ready to pay for biodynamic characteristics ? Crosstabulation

Count		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
How much more will you be ready to pay for organic characteristics ?	Not ready to pay more	41	3	3	0	0	47
	Ready to pay 1 to 5% more	8	34	4	1	1	48
	Ready to pay 6 to 10% more	7	5	45	6	0	63
	Ready to pay 11 to 20% more	1	0	3	5	1	10
	Ready to pay more than 20% more	0	0	0	0	4	4
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	311,062 ^a	16	,000
Likelihood Ratio	204,259	16	,000
Linear-by-Linear Association	98,745	1	,000
N of Valid Cases	172		

a. 16 cells (64,0%) have expected count less than 5. The minimum expected count is ,14.

Correlations

		How much more will you be ready to pay for organic characteristics ?	How much more will you be ready to pay for biodynamic characteristics ?
How much more will you be ready to pay for organic characteristics ?	Pearson Correlation Sig. (2-tailed) N	1 172	,760** 172
How much more will you be ready to pay for biodynamic characteristics ?	Pearson Correlation Sig. (2-tailed) N	,760** 172	1 172

** . Correlation is significant at the 0.01 level (2-tailed).

The relationship between independent variables and the WTP for both wine labels

The gender.

Table 11. SPSS Cross-tabulation & Chi² – Gender & WTP Organic/Biodynamic Wine

Crosstab

Count

		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Gender	Female	29	33	31	7	2	102
	Male	18	15	32	3	2	70
Total		47	48	63	10	4	172

		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Gender	Female	35	30	28	6	3	102
	Male	22	12	27	6	3	70
Total		57	42	55	12	6	172

Chi-Square Tests – Organic

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5,166 ^a	4	,271
Likelihood Ratio	5,190	4	,268
Linear-by-Linear Association	,998	1	,318
N of Valid Cases	172		

a. 3 cells (30,0%) have expected count less than 5. The minimum expected count is 1,63.

Chi-Square Tests – Biodynamic

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4,914 ^a	4	,296
Likelihood Ratio	4,991	4	,288
Linear-by-Linear Association	1,902	1	,168
N of Valid Cases	172		

a. 3 cells (30,0%) have expected count less than 5. The minimum expected count is 2,44.

By observing the Table 11, we can notice that for both labels there are some differences of willingness to pay depending on the gender of participants. However, the Chi-Square Tests reveal that for organic (Pearson Chi-Square= 5,166; df= 4; p = 0,271 > 0,05) and biodynamic labels (Pearson Chi-Square= 4,914; df= 4; p = 0,296 > 0,05), the difference of WTP between male and female is not significant. Therefore, we can assume that the gender of a respondent does not affect the willingness to pay for these wine labels.

The age.

Table 12. SPSS Cross-tabulation & Chi² – Age & WTP Organic Wine

Crosstab

Count

		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Age	18-25 years old	32	27	31	5	2	97
	26-40 years old	7	11	6	1	1	26
	41-65 years old	8	10	22	4	1	45
	Over 66 years old	0	0	4	0	0	4
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17,010 ^a	12	,149
Likelihood Ratio	17,970	12	,117
Linear-by-Linear Association	6,190	1	,013
N of Valid Cases	172		

a. 10 cells (50,0%) have expected count less than 5. The minimum expected count is ,09.

Table 13. SPSS Crosstab, Chi², Contingency Evaluation & Person's Correlation – Age & WTP Biodynamic Wine

Crosstabulation

			How much more will you be ready to pay for biodynamic characteristics ?					Total
			Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Age	18-25 years old	Count	43	23	19	8	4	97
		% within Age	44,3%	23,7%	19,6%	8,2%	4,1%	100,0%
	26-40 years old	Count	8	8	7	2	1	26
		% within Age	30,8%	30,8%	26,9%	7,7%	3,8%	100,0%
	41-65 years old	Count	5	11	26	2	1	45
		% within Age	11,1%	24,4%	57,8%	4,4%	2,2%	100,0%
	Over 66 years old	Count	1	0	3	0	0	4
		% within Age	25,0%	0,0%	75,0%	0,0%	0,0%	100,0%
Total		Count	57	42	55	12	6	172
		% within Age	33,1%	24,4%	32,0%	7,0%	3,5%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29,756 ^a	12	,003
Likelihood Ratio	31,452	12	,002
Linear-by-Linear Association	8,321	1	,004
N of Valid Cases	172		

a. 10 cells (50,0%) have expected count less than 5. The minimum expected count is ,14.

Symmetric Measures

		Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	,384			,003
Interval by Interval	Pearson's R	,221	,071	2,949	,004 ^c
Ordinal by Ordinal	Spearman Correlation	,263	,071	3,550	,000 ^c
N of Valid Cases		172			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on normal approximation.

Table 12 shows that there is not significant difference, according to the age group, in terms of amount of surplus that participants will be ready to pay for a wine certified organic (Pearson Chi-Square= 17,01; df= 12; $p = 0,149 > 0,05$). Consequently, there is no relationship between the age of participants and the willingness to pay for an organic wine.

Thanks to Table 13, we can notice that there is a significant difference of willingness to pay for biodynamic wines depending on the age of the respondents (Pearson Chi-Square= 29,756; df= 12; $p = 0,003 < 0,05$). Thus, it appears that participants who are “18-25 years old” are less likely to pay a premium price for organic characteristics, given that 44,3% (43 out of 97) of them are not ready to pay more, while the same patterns are observed for only 30,8% of 26-40 years (8 out of 26), 11,1% (5 out of 45) of 41-65 years old and 25% of over 66 years (1 out of 4). Moreover, when respondents from the youngest age group are principally not ready to pay more, the biggest part of people with more than 41 years old admit to be ready to pay 6 to 10% more for having a wine certified biodynamic (41-65 years old: 57,8%; Over 66 years old: 75%). Concerning participants with 26-40 years old, most of them are not ready to pay more or ready (30,8%) to pay 1 to 5% more (30,8%).

The results of the contingent valuation show that there is a moderate relationship between age and likelihood to pay a surplus which is not due to coincidence (Contingent Coefficient= 0,384; $p = 0,003 < 0,05$). Furthermore, results of the Pearson’s correlation show that there is a moderate positive correlation, which is significant, between age of the participants and amount of surplus that they will be ready to pay for a wine with biodynamic characteristics, therefore the older is a respondent, the higher is the amount of surplus that he will be ready to pay (Pearson’s $R = 0,221$; $p = 0,004 < 0,05$).

The level of education.

Table 14. SPSS Cross-tabulation & Chi² – Level of Education & WTP Organic Wine

Crosstabulation

Count		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Education Level	Without diploma	2	0	1	0	0	3
	Secondary School diploma	2	4	2	1	0	9
	University studies 1st Cycle	19	22	26	4	0	71
	University studies 2nd Cycle	19	16	17	3	3	58
	University studies 3rd Cycle	5	6	17	2	1	31
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15,525 ^a	16	,487
Likelihood Ratio	17,287	16	,367
Linear-by-Linear Association	3,358	1	,067
N of Valid Cases	172		

a. 16 cells (64,0%) have expected count less than 5. The minimum expected count is ,07.

Table 15. SPSS Crosstab, Chi² & Correlation – Level of Education & WTP Biodynamic Wine

Crosstabulation

			How much more will you be ready to pay for biodynamic characteristics ?					Total
			Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Education Level	Without diploma	Count	3	0	0	0	0	3
		% within Education Level	100,0%	0,0%	0,0%	0,0%	0,0%	100,0%
	Secondary School diploma	Count	4	2	2	1	0	9
		% within Education Level	44,4%	22,2%	22,2%	11,1%	0,0%	100,0%
	University studies 1st Cycle	Count	26	18	21	4	2	71
% within Education Level		36,6%	25,4%	29,6%	5,6%	2,8%	100,0%	
University studies 2nd Cycle	Count	21	15	12	7	3	58	
	% within Education Level	36,2%	25,9%	20,7%	12,1%	5,2%	100,0%	
University studies 3rd Cycle	Count	3	7	20	0	1	31	
	% within Education Level	9,7%	22,6%	64,5%	0,0%	3,2%	100,0%	
Total		Count	57	42	55	12	6	172
		% within Education Level	33,1%	24,4%	32,0%	7,0%	3,5%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30,686 ^a	16	,015
Likelihood Ratio	33,241	16	,007
Linear-by-Linear Association	7,614	1	,006
N of Valid Cases	172		

a. 16 cells (64,0%) have expected count less than 5. The minimum expected count is ,10.

Correlations

		Education Level	How much more will you be ready to pay for biodynamic characteristics ?
Education Level	Pearson Correlation	1	,211**
	Sig. (2-tailed)		,005
	N	172	172
How much more will you be ready to pay for biodynamic characteristics ?	Pearson Correlation	,211**	1
	Sig. (2-tailed)	,005	
	N	172	172

** . Correlation is significant at the 0.01 level (2-tailed).

Concerning the level of education and the WTP for organic wines (see Table 14), the results analysis shows that there is no significant difference of WTP between the levels of education (Pearson Chi-Square= 15,525; df= 16; $p = 0,487 > 0,05$). Therefore, we can conclude that the level of education does not influence the answer to the question concerning likelihood to pay a surplus for a wine certified organic compared to conventional one.

The results presented in Table 15 show that all respondents (100%) without diploma and almost half of participants (44,4%) with secondary school degree are not ready to pay a premium price for a biodynamic wine. Considering interviewees that have done university studies at 1st or 2nd level, the majority of them (63,4% of 1st cycle and 63,8% for 2nd cycle) is ready to pay a premium price and the amount of surplus seems to oscillate between 1 and 10%, given that this interval gathers 55% of respondents from 1st cycle and 46,6% of the 2nd cycle. To finish, participants with the highest degree (University studies 3rd cycle) are almost all ready to pay a premium price (90,3% of them) and the amount of surplus seems to be situated between 6 to 10% as this price range gathers 64,5% of this segment of population.

The Chi-Square analysis shows that this difference of WTP for biodynamic wines according to the level of education is significant (Pearson Chi-Square= 30,686; df= 16; $p = 0,015 < 0,05$). Finally, the Pearson's correlation shows that there is a significant and positive relation between the level of education and the amount of surplus that respondents are ready to pay for this type of wine (Pearson's $R = 0,211$; $p = 0,005 < 0,05$). Consequently, the higher the education level of an interviewee is, the higher the amount of surplus that he is ready to accept for biodynamic wines will be.

The concern of environment and eco-friendly methods.

Table 16. SPSS Cross-tabulation, Chi² & Pearson's Correlation – Environment Concern & WTP Organic/Biodynamic Wines

Crosstab

Count

		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Do you feel concerned by the environment and the eco-friendly methods ?	Strongly concerned	6	6	27	5	2	46
	Concerned	28	33	31	5	2	99
	Neutral	11	9	5	0	0	25
	Not concerned	2	0	0	0	0	2
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30,374 ^a	12	,002
Likelihood Ratio	32,389	12	,001
Linear-by-Linear Association	22,878	1	,000
N of Valid Cases	172		

a. 10 cells (50,0%) have expected count less than 5. The minimum expected count is ,05.

Correlations

		Do you feel concerned by the environment and the eco-friendly methods ?	How much more will you be ready to pay for organic characteristics ?
Do you feel concerned by the environment and the eco-friendly methods ?	Pearson Correlation	1	-,366**
	Sig. (2-tailed)		,000
N		172	172
How much more will you be ready to pay for organic characteristics ?	Pearson Correlation	-,366**	1
	Sig. (2-tailed)	,000	
N		172	172

** . Correlation is significant at the 0.01 level (2-tailed).

Crosstab

Count

		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Do you feel concerned by the environment and the eco-friendly methods ?	Strongly concerned	7	9	21	6	3	46
	Concerned	36	26	29	6	2	99
	Neutral	12	7	5	0	1	25
	Not concerned	2	0	0	0	0	2
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21,352 ^a	12	,045
Likelihood Ratio	23,650	12	,023
Linear-by-Linear Association	16,472	1	,000
N of Valid Cases	172		

a. 10 cells (50,0%) have expected count less than 5. The minimum expected count is ,07.

Correlations

		Do you feel concerned by the environment and the eco-friendly methods ?	How much more will you be ready to pay for biodynamic characteristics ?
Do you feel concerned by the environment and the eco-friendly methods ?	Pearson Correlation	1	-,310**
	Sig. (2-tailed)		,000
N		172	172
How much more will you be ready to pay for biodynamic characteristics ?	Pearson Correlation	-,310**	1
	Sig. (2-tailed)	,000	
N		172	172

** . Correlation is significant at the 0.01 level (2-tailed).

Results presented in Table 16 show that there is, for both wine labels, a significant difference of WTP according to the level of concern for environment and eco-friendly methods (Organic Label: Pearson Chi-Square= 30,374; df= 12; $p = 0,002 < 0,05$ / Biodynamic Label: Pearson Chi-Square= 21,352; df= 12; $p = 0,045 < 0,05$). Thus, respondents who feel not concerned or who adopt a neutral position are less likely to pay a surplus for a wine certified by one of these labels. Indeed, for organic wines, all respondents who feel not concerned and almost half (44%, 11 out of 25) of respondents with a neutral position are not ready to pay a surplus. Whereas, only 28,3% of participants who feel concerned and 13% of those strongly concerned adopt the same attitude. For biodynamic wines, the same pattern is observed, given that all interviewees not concerned and 48% of those with a neutral position are not ready to pay a surplus, while it is the case for only 36,4% of people concerned and 15,2% of those strongly concerned.

Furthermore, the Pearson's correlations show that, for both wine labels, there is significant and moderate relationship between the WTP and the respondent's level of concern about environment and eco-friendly methods (Organic Label: Pearson's $R = -0,366$; $p = 0,000 < 0,05$). / Biodynamic Label: Pearson's $R = -0,310$; $p = 0,000 < 0,05$). Results indicate, for both cases, that the correlation is negative, this is due to the fact that answers to the environmental concern question are coded in the opposite way ("1" = "Strongly concerned" => Highest level of concern and lowest score; "4" = "Not concerned" => lowest level of concern and highest score). Therefore, the software indicates that the higher the participant's level of concern is, the higher the amount of surplus that he is likely to pay for an organic or biodynamic wine is.

The importance of eco-friendly farming.

Table 17. SPSS Cross-tabulation, Chi² & Pearson's Correlation – Importance of Eco-friendly farming & WTP Organic/Biodynamic Wine

Crosstab

Count

		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
How important eco-friendly farming is for you ?	Very Important	5	7	25	2	2	41
	Important	19	28	32	8	2	89
	Moderately important	15	9	6	0	0	30
	A bit important	4	4	0	0	0	8
	No importance	4	0	0	0	0	4
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	43,650 ^a	16	,000
Likelihood Ratio	47,821	16	,000
Linear-by-Linear Association	29,315	1	,000
N of Valid Cases	172		

a. 15 cells (60,0%) have expected count less than 5. The minimum expected count is ,09.

Correlations

		How important eco-friendly farming is for you ?	How much more will you be ready to pay for organic characteristics ?
How important eco-friendly farming is for you ?	Pearson Correlation	1	-,414**
	Sig. (2-tailed)		,000
	N	172	172
How much more will you be ready to pay for organic characteristics ?	Pearson Correlation	-,414**	1
	Sig. (2-tailed)	,000	
	N	172	172

** . Correlation is significant at the 0.01 level (2-tailed).

Crosstab

Count

		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
How important eco-friendly farming is for you ?	Very Important	6	9	19	4	3	41
	Important	24	23	32	8	2	89
	Moderately important	18	7	4	0	1	30
	A bit important	5	3	0	0	0	8
	No importance	4	0	0	0	0	4
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	37,618 ^a	16	,002
Likelihood Ratio	43,412	16	,000
Linear-by-Linear Association	27,271	1	,000
N of Valid Cases	172		

a. 15 cells (60,0%) have expected count less than 5. The minimum expected count is ,14.

Correlations

		How important eco-friendly farming is for you ?	How much more will you be ready to pay for biodynamic characteristics ?
How important eco-friendly farming is for you ?	Pearson Correlation	1	-,399**
	Sig. (2-tailed)		,000
	N	172	172
How much more will you be ready to pay for biodynamic characteristics ?	Pearson Correlation	-,399**	1
	Sig. (2-tailed)	,000	
	N	172	172

** . Correlation is significant at the 0.01 level (2-tailed).

Table 17 shows that, for both types of wine, there is a significant difference of WTP according to the level of importance attributed to the eco-friendly farming (Organic Label: Pearson Chi-Square= 43,650; df= 16; p= 0,000 < 0,05 / Biodynamic Label: Pearson Chi-Square= 37,618; df= 16; p= 0,002 < 0,05). Indeed, participants who consider eco-friendly farming as being a bit, moderately or not important are less willing to pay a surplus for having one of these wines than those who consider it as important or very important, since all respondents who consider it not important and half of those who consider it a bit important (4 out of 8 for Organic; 5 out of 8 for Biodynamic) or moderately important (15 out of 30 for Organic; 18 out of 30 for Biodynamic) are not ready to pay more. Whereas, more than two thirds of interviewees who consider it important (78,7% for Organic and 73% for Biodynamic) and more than 85% (87,8% for Organic and 85,4% for biodynamic) of those who consider it very important are ready to pay a higher price for an organic or biodynamic wine.

These trends are confirmed by the results of the Pearson's correlations, given that it shows for both labels that there is a significant and moderate correlation between WTP and level of importance of eco-friendly farming (Organic Label: Pearson's R= -0,414; p= 0,000 < 0,05) / Biodynamic Label: Pearson's R= -0,399; p= 0,000 < 0,05). Once again, the values of "R" are negative because of the coding of the data (e.g. "1" = "very important" => highest level of importance but lowest score; "5" = "not important" => lowest level of importance but highest score). Consequently, the more important eco-friendly farming for an interviewee is, the more the surplus that he is ready to pay for a wine certified organic or biodynamic increases.

The perception of eco-friendly products.

Table 18. SPSS Cross-tabulation & Chi² – Perception of Eco-friendly products & WTP Organic/Biodynamic Wine

Crosstab

Count

		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
How do you perceive eco-friendly products ?	Positively	35	41	59	10	4	149
	Neutral	10	7	4	0	0	21
	Negatively	2	0	0	0	0	2
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13,645 ^a	8	,092
Likelihood Ratio	15,030	8	,059
Linear-by-Linear Association	11,256	1	,001
N of Valid Cases	172		

a. 8 cells (53,3%) have expected count less than 5. The minimum expected count is ,05.

Crosstab

Count

		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
How do you perceive eco-friendly products ?	Positively	46	34	52	11	6	149
	Neutral	9	8	3	1	0	21
	Negatively	2	0	0	0	0	2
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10,122 ^a	8	,257
Likelihood Ratio	11,499	8	,175
Linear-by-Linear Association	6,284	1	,012
N of Valid Cases	172		

a. 7 cells (46,7%) have expected count less than 5. The minimum expected count is ,07.

Results presented in Table 18 demonstrate that there is no significant difference of WTP for organic or biodynamic label according to the perception of eco-friendly products (Organic Label: Pearson Chi-Square= 13,645; df= 8; p= 0,092 > 0,05 / Biodynamic Label: Pearson Chi-Square= 10,122; df= 8; p= 0,257 > 0,05). Therefore, the perception of eco-friendly products does not affect the respondent's WTP for an organic or biodynamic wine.

The preference for purchasing eco-friendly products.

Table 19. SPSS Cross-tabulation, Chi² & Pearson's Correlation – Preference for purchasing Eco-friendly products & WTP Organic/Biodynamic Wine

Crosstab

Count

		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
In general, do you prefer to buy products which are certified eco-friendly ?	Strongly Agree	6	10	23	5	1	45
	Agree	21	26	33	5	1	86
	Neutral	13	10	6	0	2	31
	Disagree	4	2	1	0	0	7
	Strongly Disagree	3	0	0	0	0	3
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30,510 ^a	16	,016
Likelihood Ratio	32,026	16	,010
Linear-by-Linear Association	17,862	1	,000
N of Valid Cases	172		

a. 15 cells (60,0%) have expected count less than 5. The minimum expected count is ,07.

Correlations

	In general, do you prefer to buy products which are certified eco-friendly ?	How much more will you be ready to pay for organic characteristics ?
In general, do you prefer to buy products which are certified eco-friendly ?	Pearson Correlation Sig. (2-tailed) N	1 ,000 172
How much more will you be ready to pay for organic characteristics ?	Pearson Correlation Sig. (2-tailed) N	-,323** ,000 172

** . Correlation is significant at the 0.01 level (2-tailed).

Crosstab

Count

		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
In general, do you prefer to buy products which are certified eco-friendly ?	Strongly Agree	8	11	17	6	3	45
	Agree	24	23	32	6	1	86
	Neutral	18	7	4	0	2	31
	Disagree	4	1	2	0	0	7
	Strongly Disagree	3	0	0	0	0	3
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	31,204 ^a	16	,013
Likelihood Ratio	34,580	16	,005
Linear-by-Linear Association	18,041	1	,000
N of Valid Cases	172		

a. 15 cells (60,0%) have expected count less than 5. The minimum expected count is ,10.

Correlations

	In general, do you prefer to buy products which are certified eco-friendly ?	How much more will you be ready to pay for biodynamic characteristics ?
In general, do you prefer to buy products which are certified eco-friendly ?	Pearson Correlation Sig. (2-tailed) N	1 ,000 172
How much more will you be ready to pay for biodynamic characteristics ?	Pearson Correlation Sig. (2-tailed) N	-,325** ,000 172

** . Correlation is significant at the 0.01 level (2-tailed).

Table 19 allows to identify a significant difference of WTP, for both wine labels, according to the level of preference for purchasing eco-friendly products (Organic Label: Pearson Chi-Square= 30,510; df= 16; $p = 0,016 < 0,05$ / Biodynamic Label: Pearson Chi-Square= 31,204; df= 16; $p = 0,013 < 0,05$). These patterns are confirmed by the results of the Pearson's correlations, indeed they show that for both labels there is a moderate correlation between the WTP and the level of preference for buying eco-friendly products. Results are once again negative because of the data coding which is done in the opposite way ("1" => "strongly agree" => highest degree of preference but lowest score; "5" => "strongly disagree" => lowest degree of preference but highest score), therefore results of the Pearson's correlations show that the more a participant prefers to buy eco-friendly products, the more his WTP for wine certified organic or biodynamic increases (Organic Label: Pearson's $R = -0,323$; $p = 0,000 < 0,05$) / Biodynamic Label: Pearson's $R = -0,325$; $p = 0,000 < 0,05$).

The purchasing frequency of eco-friendly products.

Table 20. SPSS Cross-tabulation, Chi² & Pearson’s Correlation – Frequency of purchase of Eco-friendly products & WTP Organic Wine

Crosstab

Count		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Frequency of purchase of eco-friendly products	Several times a week	5	9	29	3	1	47
	Once a week	13	20	26	5	2	66
	Once a month	12	14	4	2	1	33
	Less than once a month	11	4	4	0	0	19
	Less than once a year / Never	6	1	0	0	0	7
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	47,274 ^a	16	,000
Likelihood Ratio	49,338	16	,000
Linear-by-Linear Association	29,504	1	,000
N of Valid Cases	172		

a. 13 cells (52,0%) have expected count less than 5. The minimum expected count is ,16.

Correlations

		Frequency of purchase of eco-friendly products	How much more will you be ready to pay for organic characteristics ?
Frequency of purchase of eco-friendly products	Pearson Correlation	1	-,415**
	Sig. (2-tailed)		,000
	N	172	172
How much more will you be ready to pay for organic characteristics ?	Pearson Correlation	-,415**	1
	Sig. (2-tailed)	,000	
	N	172	172

** . Correlation is significant at the 0.01 level (2-tailed).

Results of table 20 demonstrate that there is a significant difference of WTP for the organic wine according to the purchasing frequency of eco-friendly products (Pearson Chi-Square= 47,274; df= 16; p = 0,000 < 0,05). Indeed, most of the respondents who buy eco-friendly products less than once a month (57,9%, 11 in 19) or less than once a year (85,7%, 6 in 7) are not willing to pay more for a wine labelled organic. Concerning those who buy them once a month, the opinion seems divided between “not ready to pay more” (36,4%) and “ready to pay 1 to 5% more” (42,4%), while those who purchase this type of product at least once a week seem to hesitate between “ready to pay 1 to 5% more” (30,3%) and “ready to pay 6% to 10% more” (39,4%). To finish, the majority of people with the highest purchasing frequency of eco-friendly products (“Several times a week”) are “ready to pay 6 to 10% more” (61,7%, 29 out of 47).

Furthermore, the Pearson’s Correlation shows that there is significant and moderate relationship between the WTP for organic wine and the frequency of purchase of eco-friendly products (Pearson’s $R = -0,415$; $p = 0,000 < 0,05$). The result is negative because of the data coding (“1” = “Several times a week” => highest frequency but lowest score; “5” = Less than once a year/Never => smallest frequency but highest score), thus in reality the correlation is positive. Consequently, the higher the purchasing frequency of eco-friendly products is, the higher the WTP for having an organic wine is.

Table 21. SPSS Cross-tabulation & Chi²- Frequency of purchase Eco-friendly products & WTP Biodynamic Wine

Crosstab

Count		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Frequency of purchase of eco-friendly products	Several times a week	9	10	22	4	2	47
	Once a week	18	17	22	6	3	66
	Once a month	13	9	8	2	1	33
	Less than once a month	11	5	3	0	0	19
	Less than once a year / Never	6	1	0	0	0	7
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25,210 ^a	16	,066
Likelihood Ratio	28,246	16	,030
Linear-by-Linear Association	19,452	1	,000
N of Valid Cases	172		

a. 14 cells (56,0%) have expected count less than 5. The minimum expected count is ,24.

However, concerning biodynamic wines, the Chi-Square tests presented in Table 21 demonstrate that there is no significant difference of WTP according to the purchasing frequency of eco-friendly products (Pearson Chi-Square= 25,210; df=16; $p = 0,066 > 0,05$). Therefore, the frequency of purchase of eco-friendly products does not affect the willingness to pay for biodynamic wines.

The level of knowledge in the field of wines.

Table 22. SPSS Cross-tabulation & Chi²– Level of Wine Knowledge & WTP Organic/Biodynamic Wines

Crosstab

Count		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Level of wine knowledge	Novice	9	12	8	4	0	33
	Intermediate	18	20	31	3	4	76
	Advanced	19	14	22	3	0	58
	Expert	1	2	2	0	0	5
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12,447 ^a	12	,410
Likelihood Ratio	13,811	12	,313
Linear-by-Linear Association	,317	1	,573
N of Valid Cases	172		

a. 11 cells (55,0%) have expected count less than 5. The minimum expected count is ,12.

Crosstab

Count		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Level of wine knowledge	Novice	13	10	7	2	1	33
	Intermediate	23	17	28	4	4	76
	Advanced	21	14	16	6	1	58
	Expert	0	1	4	0	0	5
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11,805 ^a	12	,461
Likelihood Ratio	12,953	12	,372
Linear-by-Linear Association	,631	1	,427
N of Valid Cases	172		

a. 10 cells (50,0%) have expected count less than 5. The minimum expected count is ,17.

The Chi-Square tests of Table 22 demonstrate that there is no significant difference of WTP for organic and biodynamic wines according to the level of wine knowledge (Organic Label: Pearson Chi-Square= 12,447; df= 12; p= 0,410 > 0,05/ Biodynamic Label: Pearson Chi-Square= 11,805; df= 12; p= 0,461 > 0,05). Thus, the level of wine knowledge does not impact the WTP for both types of wine.

The purchasing frequency of wines.

Table 23. SPSS Cross-tabulation & Chi²– Frequency of purchase of Wines & WTP Organic/Biodynamic Wine

Crosstab

Count		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Frequency of purchase of wine	Several times a week	9	7	7	2	1	26
	Once a week	20	17	30	5	1	73
	Once a month	11	17	20	2	2	52
	Less than once a month	6	4	6	0	0	16
	Less than once a year / Never	1	3	0	1	0	5
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12,622 ^a	16	,700
Likelihood Ratio	14,712	16	,546
Linear-by-Linear Association	,072	1	,788
N of Valid Cases	172		

a. 15 cells (60,0%) have expected count less than 5. The minimum expected count is ,12.

Crosstab

Count		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Frequency of purchase of wine	Several times a week	8	7	7	3	1	26
	Once a week	29	16	20	6	2	73
	Once a month	10	14	23	2	3	52
	Less than once a month	8	3	5	0	0	16
	Less than once a year / Never	2	2	0	1	0	5
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16,938 ^a	16	,390
Likelihood Ratio	19,868	16	,226
Linear-by-Linear Association	,133	1	,716
N of Valid Cases	172		

a. 13 cells (52,0%) have expected count less than 5. The minimum expected count is ,17.

Results of Table 23 illustrate the fact that there is no significant difference of WTP for organic and biodynamic labels according to the purchasing frequency of wines (Organic Label: Pearson Chi-Square= 12,622; df= 16; p= 0,700 > 0,05 / Biodynamic Label: Pearson Chi-Square= 16,918; df= 16; p= 0,390 > 0,05). Consequently, there is no relationship between the purchasing frequency of wines of a participant and his WTP for wine certified by one of these two labels.

The frequency of wine consumption.

Table 24. SPSS Cross-tabulation & Chi²– Frequency of wine consumption & WTP Organic/Biodynamic Wine

Crosstab

Count		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Frequency of wine consumption	Several times a week	23	21	32	6	1	83
	Once a week	13	16	26	4	3	62
	Once a month	7	6	4	0	0	17
	Less than once a month	3	4	1	0	0	8
	Less than once a year / Never	1	1	0	0	0	2
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13,196 ^a	16	,658
Likelihood Ratio	15,788	16	,468
Linear-by-Linear Association	3,369	1	,066
N of Valid Cases	172		

a. 18 cells (72,0%) have expected count less than 5. The minimum expected count is ,05.

Crosstab

Count		How much more will you be ready to pay for biodynamic characteristics ?				Total	
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more		Ready to pay more than 20% more
Frequency of wine consumption	Several times a week	25	18	30	8	2	83
	Once a week	17	16	21	4	4	62
	Once a month	9	5	3	0	0	17
	Less than once a month	5	2	1	0	0	8
	Less than once a year / Never	1	1	0	0	0	2
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14,849 ^a	16	,536
Likelihood Ratio	17,574	16	,349
Linear-by-Linear Association	6,865	1	,009
N of Valid Cases	172		

a. 16 cells (64,0%) have expected count less than 5. The minimum expected count is ,07.

Concerning the frequency of wine consumption, the same trends as for the purchasing frequency of wines is observed. Indeed, Table 24 shows that there is no significant difference of WTP according to the frequency of wine consumption (Organic Label: Pearson Chi-Square= 13,196; df= 16; p = 0,658 > 0,05 / Biodynamic Label: Pearson Chi-Square= 14,849; df= 16; p= 0,536 > 0,05). Thus, the frequency of wine consumption of a respondent does not affect his WTP for the organic or biodynamic wines.

The level of knowledge in the field of organic wines.

Table 25. SPSS Cross-tabulation & Chi²- Level of organic wine knowledge & WTP Organic/Biodynamic Wine

Crosstab

Count		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Level of organic wine knowledge	Novice	39	29	45	6	3	122
	Intermediate	6	15	13	2	1	37
	Advanced	2	2	5	2	0	11
	Expert	0	2	0	0	0	2
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14,993 ^a	12	,242
Likelihood Ratio	14,239	12	,286
Linear-by-Linear Association	1,294	1	,255
N of Valid Cases	172		

a. 13 cells (65,0%) have expected count less than 5. The minimum expected count is ,05.

Crosstab

Count		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Level of organic wine knowledge	Novice	48	27	36	7	4	122
	Intermediate	6	14	13	2	2	37
	Advanced	3	0	5	3	0	11
	Expert	0	1	1	0	0	2
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20,672 ^a	12	,055
Likelihood Ratio	21,868	12	,039
Linear-by-Linear Association	4,895	1	,027
N of Valid Cases	172		

a. 13 cells (65,0%) have expected count less than 5. The minimum expected count is ,07.

Thanks to the results presented in Table 25, we can admit that there is no relation between the level of organic wine knowledge and the WTP for the organic or biodynamic wines. Indeed, according to the Chi-Square Tests there is no significant difference of WTP for both types of wine according to the organic wine knowledge (Organic Label: Pearson Chi-Square= 14,993; df= 12; p= 0,242 > 0,05 / Biodynamic Label: Pearson Chi-Square= 20,672; df= 12; p= 0,055 > 0,05).

The perception of organic wine.

Table 26. SPSS Cross-tabulation, Chi² & Pearson's Correlation – Perception of organic wine & WTP Organic/Biodynamic Wine

Crosstab

Count

		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
How do you perceive organic wine ?	Positively	14	34	54	9	4	115
	Neutral	29	14	9	1	0	53
	Negatively	4	0	0	0	0	4
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	48,039 ^a	8	,000
Likelihood Ratio	49,710	8	,000
Linear-by-Linear Association	38,715	1	,000
N of Valid Cases	172		

a. 8 cells (53,3%) have expected count less than 5. The minimum expected count is ,09.

Correlations

		How do you perceive organic wine ?	How much more will you be ready to pay for organic characteristics ?
How do you perceive organic wine ?	Pearson Correlation Sig. (2-tailed)	1	-,476** ,000
	N	172	172
How much more will you be ready to pay for organic characteristics ?	Pearson Correlation Sig. (2-tailed)	-,476** ,000	1
	N	172	172

** . Correlation is significant at the 0.01 level (2-tailed).

Crosstab

Count

		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
How do you perceive organic wine ?	Positively	27	27	45	10	6	115
	Neutral	28	15	8	2	0	53
	Negatively	2	0	2	0	0	4
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22,619 ^a	8	,004
Likelihood Ratio	26,181	8	,001
Linear-by-Linear Association	16,070	1	,000
N of Valid Cases	172		

a. 8 cells (53,3%) have expected count less than 5. The minimum expected count is ,14.

Correlations

		How do you perceive organic wine ?	How much more will you be ready to pay for biodynamic characteristics ?
How do you perceive organic wine ?	Pearson Correlation Sig. (2-tailed)	1	-,307** ,000
	N	172	172
How much more will you be ready to pay for biodynamic characteristics ?	Pearson Correlation Sig. (2-tailed)	-,307** ,000	1
	N	172	172

** . Correlation is significant at the 0.01 level (2-tailed).

Results of the Chi-Square Tests, presented in Table 26, show that for the two wine labels, there is a significant difference of WTP according to the perception of organic wine (Organic Label: Pearson Chi-Square= 48,039; df= 8; $p = 0,000 < 0,05$ / Biodynamic Label: Pearson Chi-Square= 22,619; df= 8; $p = 0,004 < 0,05$). This indicates that the perception of organic wine affects the WTP for the organic and biodynamic wines.

Indeed, this pattern is confirmed by the results of the Pearson's correlations, which demonstrate that there is, for both labels, a moderate and significant correlation between these two variables (Organic Label: Pearson's $R = -0,476$; $p = 0,000 < 0,05$) / Biodynamic Label: Pearson's $R = -0,307$; $p = 0,000 < 0,05$). The value of the correlation is negative in the table, but this is due to the data coding ("1" = "positively" => Best perception but lowest score; "3" = "negatively" => Worst perception but highest score). Thus the true nature of the correlation is positive and therefore the better the participant's perception is, the higher his WTP for wine certified organic or biodynamic is.

The level of knowledge in the field of biodynamic wines.

Table 27. SPSS Cross-tabulation & Chi²– Level of biodynamic wine knowledge & WTP Organic Wine

Crosstab

Count		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Level of biodynamic wine knowledge	Novice	38	37	48	6	4	133
	Intermediate	7	8	12	2	0	29
	Advanced	2	2	2	2	0	8
	Expert	0	1	1	0	0	2
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8,504 ^a	12	,745
Likelihood Ratio	7,738	12	,805
Linear-by-Linear Association	,516	1	,473
N of Valid Cases	172		

a. 13 cells (65,0%) have expected count less than 5. The minimum expected count is ,05.

Table 28. SPSS Cross-tabulation, Chi² & Pearson’s Correlation – Level of biodynamic wine knowledge & WTP Biodynamic Wine

Crosstab

Count		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
Level of biodynamic wine knowledge	Novice	53	31	39	5	5	133
	Intermediate	3	10	12	4	0	29
	Advanced	1	0	3	3	1	8
	Expert	0	1	1	0	0	2
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30,878 ^a	12	,002
Likelihood Ratio	30,000	12	,003
Linear-by-Linear Association	11,880	1	,001
N of Valid Cases	172		

a. 13 cells (65,0%) have expected count less than 5. The minimum expected count is ,07.

Correlations

		Level of biodynamic wine knowledge	How much more will you be ready to pay for biodynamic characteristics ?
Level of biodynamic wine knowledge	Pearson Correlation Sig. (2-tailed)	1	,264**
	N	172	172
How much more will you be ready to pay for biodynamic characteristics ?	Pearson Correlation Sig. (2-tailed)	,264**	1
	N	172	172

** . Correlation is significant at the 0.01 level (2-tailed).

Table 27 shows that there is no significant difference of WTP for a wine certified organic according to the level of biodynamic wine knowledge (Pearson Chi-Square= 8,504; df= 12; p= 0,745 > 0,05). Consequently, we can admit that the respondent's level of knowledge in the field of biodynamic wines does not impact his WTP for organic wines.

However, there is a different trend concerning the WTP for biodynamic wines. Indeed, results of Table 28 show that there is significant difference of WTP for wines certified biodynamic according to the level of knowledge of this type of wine (Pearson Chi-Square= 30,878; df= 12; p= 0,002 < 0,05). Besides, results of the Pearson's correlation reveal a positive and moderate relationship between these variables (Pearson's R= 0,264; p= 0,000 < 0,05). Thus, the more the level of biodynamic wine knowledge increases, the more the WTP for this wine label also increases.

The perception of biodynamic wine.

Table 29. SPSS Cross-tabulation, Chi² & Pearson's Correlation – Perception of biodynamic wine & WTP Organic/Biodynamic Wine

Crosstab

Count

		How much more will you be ready to pay for organic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
How do you perceive biodynamic wine ?	Positively	14	23	38	7	2	84
	Neutral	31	25	25	3	2	86
	Negatively	2	0	0	0	0	2
Total		47	48	63	10	4	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16,015 ^a	8	,042
Likelihood Ratio	16,244	8	,039
Linear-by-Linear Association	11,286	1	,001
N of Valid Cases	172		

a. 8 cells (53,3%) have expected count less than 5. The minimum expected count is ,05.

Correlations

		How do you perceive biodynamic wine ?	How much more will you be ready to pay for organic characteristics ?
How do you perceive biodynamic wine ?	Pearson Correlation	1	-,257**
	Sig. (2-tailed)		,001
	N	172	172
How much more will you be ready to pay for organic characteristics ?	Pearson Correlation	-,257**	1
	Sig. (2-tailed)	,001	
	N	172	172

** . Correlation is significant at the 0.01 level (2-tailed).

Crosstab

Count

		How much more will you be ready to pay for biodynamic characteristics ?					Total
		Not ready to pay more	Ready to pay 1 to 5% more	Ready to pay 6 to 10% more	Ready to pay 11 to 20% more	Ready to pay more than 20% more	
How do you perceive biodynamic wine ?	Positively	8	21	41	10	4	84
	Neutral	47	21	14	2	2	86
	Negatively	2	0	0	0	0	2
Total		57	42	55	12	6	172

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	50,577 ^a	8	,000
Likelihood Ratio	55,414	8	,000
Linear-by-Linear Association	40,913	1	,000
N of Valid Cases	172		

a. 7 cells (46,7%) have expected count less than 5. The minimum expected count is ,07.

Correlations

		How do you perceive biodynamic wine ?	How much more will you be ready to pay for biodynamic characteristics ?
How do you perceive biodynamic wine ?	Pearson Correlation	1	-,489**
	Sig. (2-tailed)		,000
	N	172	172
How much more will you be ready to pay for biodynamic characteristics ?	Pearson Correlation	-,489**	1
	Sig. (2-tailed)	,000	
	N	172	172

** . Correlation is significant at the 0.01 level (2-tailed).

Finally, Table 29 demonstrates that there is a significant difference of WTP, for both types of label, according to the perception of biodynamic wine (Organic Label: Pearson Chi-Square= 16,015; df= 8; $p = 0,042 < 0,05$ / Biodynamic Label: Pearson Chi-Square= 50,577; df= 8; $p = 0,000 < 0,05$). Therefore, the perception of biodynamic wine seems to affect the WTP for the two different labels. This is confirmed by the results of the Pearson's correlations. Indeed, there is a moderate and significant correlation between the perception of biodynamic wine and the WTP for both wine labels (Organic label: Pearson's $R = -0,257$; $p = 0,001 < 0,05$ / Biodynamic label: Pearson's $R = -0,489$; $p = 0,000 < 0,05$). The value of the result is negative, but this is due to the data coding ("1" = "positively" => best perception but lowest score; "3" = "negatively" => worst perception but highest score), thus the true nature of the correlation is positive. Consequently, we can admit that the better the perception of biodynamic products is, the higher the WTP for organic and biodynamic wines will be.

Results summary

As a conclusion, results of the 172 surveys show that the sample is more or less well proportionate in terms of gender, but there is a majority (56,4%) of young people within participants and most of the respondents admit to have a university degree (160 out of 172). Furthermore, the panel seems highly sensitive to ecology, given that a strong majority of interviewees feel concerned about eco-friendly methods and products (84,3%) and positively perceive it (86,63%), whereas only 12 people out of 172 consider eco-friendly farming as a bit or not important. In addition, they generally prefer to buy eco-friendly (76,16%) and 113 people out of 172 declare purchasing it weekly. Nevertheless, less than the half (80) know biodynamic products and only 68 participants know the difference between organic and biodynamic products. Regarding the wine, most of the people surveyed admit to buy (57,56%) and to drink (84,31%) wine at least once a week, besides there is a good level of knowledge about this field as 80,82% of the sample have at least an intermediate level.

In regards to the organic and biodynamic wines, we notice that there is lower level of knowledge than for the conventional wine, since a large majority of participants admit to have a novice level of knowledge concerning these two wine labels (Organic: 70,93% – Biodynamic: 77,33%). Nonetheless, it appears that respondents have a better knowledge of organic than biodynamic wines. Regarding the perception, the panel seems to better perceive organic wines (66,86% of positive perception) than biodynamic (48,84% of positive perception) wines. Besides, a large part of participants (50%) have a neutral position concerning biodynamic wines, but it is important to notice that there are more people that perceive organic wine (2,33%) negatively than for the biodynamic (1,16%).

Concerning the willingness to pay a premium price for organic or biodynamic wines, it appears that interviewees are more ready to pay a higher price for the organic label (72,67%) than for the biodynamic label (66,86%). The amount of surplus, that they will be ready to pay, tends to oscillate between 1 to 10% of the price of a conventional bottle, given that this interval gathers 64,54% of the sample for the organic wine and 56,4% for the biodynamic wine. However, there are more respondents who are willing to pay more than 11% of surplus for biodynamic wine (10,47%) than for organic wine (8,14%). Furthermore, the research shows a strong positive relationship between the willingness to pay for organic and biodynamic wines, thus when the willingness to pay for organic wine increases the willingness to pay for biodynamic wine also increases, and vice versa.

Regarding the influences of the different independent variables on the WTP for organic and biodynamic wines, we observe that the variables “Gender”, “Perception of eco-friendly products”, “Level of wine knowledge”, “Frequency of purchase of wines”, “Frequency of wine consumption” and “Level of organic wine knowledge” do not affect the respondents’ willingness-to-pay for organic and biodynamic wine. Nevertheless, the variables “Concern of environment”, “Importance of eco-friendly farming”, “Preference of buying eco-friendly products”, “Perception of organic wine” and “Perception of biodynamic wine” are positively correlated to the WTP for both labels. Consequently, the higher the level of these variables is, the higher the WTP for the two labels is. Moreover, the same type of correlation is observed in regards to the variables “Purchasing frequency of eco-friendly products” and the WTP for organic wines, but not for biodynamic. To finish, while the variables “Age”, “Level of education” and “Level of biodynamic wine knowledge” are positively correlated to the WTP for biodynamic wines, it seems that they do not affect the WTP for organic wines.

Discussion

Comparison with results of previous studies

The number of French people who feel concerned by environmental issues and eco-friendly methods has raised in recent years, from 66% in 2013 to 92% in 2016 (Agence Bio/CSA, 2016). The present study also highlights that a strong majority of people (84,3%) feel concerned by the environment and eco-friendly products. Besides, only few respondents (6,98%) consider eco-friendly farming as being a bit or not important. Thus, we can conclude that the level of environmental preoccupation of French people has clearly increased since 2013, but today it seems to get stabilized around 85%. Concerning the consumption of organic products, in 2016, 69% of French have admitted to consume organic products at least once a month while they were only 37% in 2003 (Agence Bio/CSA, 2016). The analysis of the 172 surveys highlights that interviewees are also buying this type of products regularly, given that 84,88% of them are purchasing eco-friendly products at least once a month. Besides, 65,7% of participants admit to buy it every week and 76,16% prefer generally to buy this type of products instead of conventional ones. Therefore, as the level of environmental concern, the frequency of consumption and purchasing of eco-friendly products in France seems to be relatively high.

In the nineties, researchers have found that approximatively half of the consumers are ready to pay more for a product with eco-friendly characteristics (Bagnara, 1995; Hutchins & Greenhalgh, 1997; Misra et al., 1991). However, more recent studies have demonstrated that a strong majority (around 70%) of consumers will be ready to pay more for this type of product (Boccaletti & Nardella, 2000; Cranfield & Magnusson, 2003).

Thus, the results of the present research seem to be in accordance with the most recent research, given that 72,67% of the sample is ready to pay more for the wine certified organic and 66,86% for the biodynamic wine. This underlines that the willingness to pay for eco-friendly products, including wine labels, has grown in recent years.

According to the previous researches, the surplus, that consumers will be ready to pay for a product with eco-friendly characteristics, seems to oscillate between 1 and 20% of the original price (Bagnara, 1995; Boccaletti & Nardella, 2000; Cranfield & Magnusson, 2003; Hutchins & Greenhalgh, 1997; Misra et al., 1991). The statistics analysis of the study demonstrates that 64,54% of participants are ready to pay 1 to 10% more for an organic wine, while only 8,14% are ready to pay more than 10%. As regards biodynamic wine, 56,4% of respondents are willing to pay 1 to 10%, while 10,47% are willing to pay more than 10%. Consequently, it seems that the surplus that French consumers are ready to pay for a wine labelled organic or biodynamic is lower than the surplus that they accept for eco-friendly products in general. These findings underline the fact that the WTP for eco-friendly characteristics is more or less specific to each range of products.

Furthermore, several studies find a significant difference of WTP for eco-friendly products according to the gender, indeed it seems that men are less likely to pay a premium price for a product with environmental characteristics than women (Boccaletti & Nardella, 2000; Cranfield & Magnusson, 2003; Loureiro, 2003). However, the research's results show that the gender of a respondent does not affect his willingness to pay for both types of wine. Therefore, we can admit that the gender of a consumer does not always impact his willingness to pay for eco-friendly products.

Concerning the influence of the age of a consumer on his willingness to pay for products with environmental characteristics, some researchers find a greater WTP within people under 65 years old (Cranfield & Magnusson, 2003), while others find a greater WTP within people over 60 years (Misra et al., 1991). Furthermore, in France, a recent study demonstrates that young consumers (18-24 years old) are particularly sensitive to eco-friendly arguments and consequently are more likely to pay a premium price for a product with an environmental label (Didier Perréol – Président de l'Agence BIO, 2017). In the present research, the results' analysis demonstrates that there is no relation between the age of an interviewee and his WTP for organic wine. Nevertheless, the age seems to be positively and moderately correlated to the WTP for biodynamic wine, thus the older the respondent is, the higher the amount of surplus that he is ready to pay for a biodynamic wine will be. Consequently, this comparison of results allows to highlight the fact that the consumer's age can impact his WTP for eco-friendly products, but this depends on the type of product and label.

Considering the relation between the level of education of a consumer and his WTP for products with environmental characteristics, searchers seem to hesitate, given that a number of them find a positive correlation (Cranfield & Magnusson, 2003; Jordan & Elnagheeb, 1991; Van Ravenswaay & Hoehn, 1991) while others a negative correlation (Boccaletti & Nardella, 2000; Buzby et al., 1995; Malone, 1990). The present results show that the level of education of a participant is positively correlated to his WTP for biodynamic wine, nevertheless there is no relation between the level of education and the WTP for organic wine. Thus, it seems that the level of education may impact the WTP for eco-friendly products, but this is not valid for all types of products and environmental labels.

Finally, several studies demonstrate that the environmental concern of a consumer is positively correlated to his WTP for eco-friendly products (Cranfield & Magnusson, 2003; Gil et al., 2000). This trend seems to be also valid in the present research, given that results illustrate the same type of correlation between the level of environmental concern and the WTP for organic and biodynamic wine. Thus, we can conclude that the higher the level of environmental of a consumer is the greater his WTP for products with environmental characteristics will be, including organic and biodynamic wines. Therefore, the WTP for this range of products should grow in the future, since it is positively correlated to the level of environmental concern which continuously raises in the last years.

Impacts of the research

The survey analysis allows to highlight several patterns in the mind and behavior of French consumers. First of all, it appears that French consumers are highly sensitive to environment. Indeed, a strong majority of them feel concerned by environmental methods and have a positive perception of products with eco-friendly characteristics. Besides, most of them prefer in general to buy this range of products and do it regularly. Secondly, French people seem to be great purchasers and consumers of wine, as they purchase wine at least once a month and consume it at least once a week. Thus, the organic and biodynamic wine should take benefits from this two dynamics of market.

Regarding the price, two thirds of French consumers are ready to pay more for a wine certified biodynamic or organic. Most of them are ready to pay between 1 to 10% more for an organic or biodynamic wine. Therefore, this difference of price shows that organic and biodynamic labels tend to become a competitive advantage in the wine industry.

However, it appears that several factors influence the willingness to pay for organic and biodynamic wines. To start, the level of environmental concern of a consumer and the level of importance of eco-friendly farming are positively correlated to his WTP for these two types of label. Thus, in order to increase the WTP, it will be interesting that all operators of organic and biodynamic wine work on a communication plan that would help to sensitize French consumers to the environmental issues.

Moreover, the perception of both labels positively affects the WTP, therefore operators should promote the benefits of the organic and biodynamic viticulture. This will probably help to improve the perception of these wines and therefore the WTP.

To finish, this study shows that the more a consumer prefers to buy eco-friendly products the more he will be likely to pay a higher price for an organic or biodynamic wine. Thus, it will be interesting for the operators of organic and biodynamic wines, to work with other eco-friendly operators in order to create a joint marketing policy which would push the consumers to buy products with environmental characteristics.

Limits of the research

Results of this research present several limits at different levels, consequently they cannot be taken literally. To start, the study is based on the analysis of 172 surveys, it is obvious that findings which are valid within a limited sample cannot be thoroughly extended to the whole French population. Moreover, the panel is not perfectly homogeneous in terms of age, gender and level of education, thus results could be partially skewed because of data gaps.

Finally, the socio-demographic and behavioural characteristics of the people interviewed are not perfectly consistent with those observed in the entire French population.

For example, according to the national statistics 64,7% of French have a secondary school degree or less (INSEE, 2017), whereas only 6,97% of the population interviewed have the same level of education. For the wine knowledge, it appears that 55% of French consumers have a novice level while 80,82% of the sample think to be better than novice (Le Figaro Vin, 2016). Furthermore, 87,79% of respondents admit to buy wine at least once a month, but only 51% of the French population have the same purchasing frequency (Le Figaro Vin, 2016). Thus, results of this research suffers from representativeness problems mainly due to the sample characteristics.

There are also some limits due to the use of a survey. To start, results of the survey are more or less influenced by my own personality and perception, given that I have written the questions and the possible answers of the survey. Therefore, results may be different if the questions as well as the possible answers are expressed in a different way. Furthermore, the surveys were anonymous so it is impossible, in these conditions, to control and ensure the veracity of participant's answers. Besides, the survey is constituted of a certain number of questions (22), consequently the concentration of the respondents is going down all along the survey and this could affect their answers' choice. To finish, the survey is one of the tools that can be used for determining the willingness to pay of a population. However, the fact that respondents only estimate but do not pay a surplus for a specific product, skews the results. Indeed, if participants have to really spend their own money, the results may be different. Thus, because of the investigation method used, research's results may not be totally relevant.

Conclusion

The purpose of this quantitative research on the willingness to pay for organic and biodynamic wines is to estimate the surplus of price that French consumers will be ready to pay for a wine certified by one of these labels, and to determine if socio-demographic and behavioural characteristics have an impact on this surplus.

Thus the literature review and the analysis of the 172 surveys of this study, demonstrate that French consumers are highly and increasingly concerned by ecology issues. Besides, most of them positively perceive eco-friendly products and prefer to purchase this type of products instead of conventional ones.

Concerning the wine in general, French people seem to be great connoisseurs and consumers, however their knowledge concerning the wine certified organic or biodynamic seems limited in comparison. Furthermore, within the sample the perception of these types of wine seems to be shared while the perception of eco-friendly products is clearly positive.

About the willingness to pay, it appears that French consumers are ready to pay a higher price for a wine certified organic or biodynamic. The amount of premium price oscillates between 1 and 10% of the price of a bottle of a traditional wine. This WTP for organic and biodynamic wines is not affected by the gender, the perception of eco-friendly products, the level of wine knowledge, the frequency of purchase and consumption of wines, and the level of organic wine knowledge of a French consumer.

For both types of labels, the WTP is positively correlated to the level of environmental concern, the importance of eco-friendly farming, the preference for buying eco-friendly products instead of conventional ones and the perception of organic and biodynamic wines.

Therefore, higher is level of these variables better will be the willingness to pay of a French consumer. Besides, when the willingness to pay for organic wine increases the willingness to pay for biodynamic wine also increases, and vice versa.

Moreover, the same type of correlation is observed between the purchasing frequency of eco-friendly products and the WTP for organic wine, but not for biodynamic. Nevertheless, the age, the level of education and the level of biodynamic wine knowledge of a consumer are positively correlated to the WTP for biodynamic wine, while they do not affect the WTP for organic wine.

Thus, the results of this study show that the organic and biodynamic labels tend to become qualitative advantages in the wine market, given that consumers are ready to pay 1 to 10% more for a wine certified by one of these labels. Knowing that French consumers are increasingly demanding of this type of products, the future of wines labelled organic or biodynamic seem to be bright. However, as it has been demonstrated beforehand, this research presents several limits. But, even if the results cannot and must not be taken literally, it could and must constitute a good base for future researches. It would be interesting to make researches on the same subject but in a different way, as for example, another method of questioning people on their WTP or simply do the same survey but with a different sample or even with another type of product (food, beer, ...). Therefore, these further researches will help to estimate more accurately the WTP of French consumers for organic and biodynamic wines and to better understand what affects it.

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Appendix

Appendix A: List of control bodies and control authorities in the organic sector



European
Commission

Report generation date : 05/04/2017

Member States of the European Union (EU28)

LIST OF CONTROL BODIES AND CONTROL AUTHORITIES IN THE ORGANIC SECTOR

France

System:A

Last submission date : 28/03/2017

Code	Name and Address	Territorial limitation	Comments
FR-BIO-01	<p>ECOCERT FRANCE</p> <p>B.P. 47 F-32600 L'Isle Jourdain France TEL: +33 (0)5 62 07 34 24 FAX: +33 (0)5 62 07 11 67 EMAIL: info@ecocert.com WEBSITE: http://www.ecocert.fr</p>		
FR-BIO-07	<p>AGROCERT</p> <p>6, rue George Bizet F-47200 Marmande France TEL: +33 (0)5 53 20 93 04 FAX: +33 (0)5 53 20 92 41 EMAIL: agrocert@agrocert.fr WEBSITE: http://www.agrocert.fr</p>		
FR-BIO-09	<p>CERTIPAQ BIO</p> <p>56 rue roger Salengro 85013 LA ROCHE SUR YON France TEL: 0251051492 FAX: 0251052711 EMAIL: bio@certipaq.com WEBSITE: http://www.certipaqbio.com CONTACT: .</p>		





Report generation date : 05/04/2017

Member States of the European Union (EU28)

LIST OF CONTROL BODIES AND CONTROL AUTHORITIES IN THE ORGANIC SECTOR

France

System:A

Last submission date : 28/03/2017

Code	Name and Address	Territorial limitation	Comments
FR-BIO-10	<p>BUREAU VERITAS CERTIFICATION FRANCE</p> <p>Immeuble le Guillaumet, 60, av. du Général De Gaulle F-92046 LA DEFENSE Cedex France TEL: +33 (0)1 41 97 00 74 FAX: +33 (0)1 41 97 08 32 EMAIL: jean-michel.lefevre@fr.bureauveritas.com WEBSITE: http://www.bureauveritas.com</p>		
FR-BIO-12	<p>Certisud</p> <p>70, avenue Louis Sallenave F-64000 PAU France TEL: +33 (0)5 59 02 35 52 FAX: +33 (0)5 59 84 23 06 EMAIL: certisud@wanadoo.fr WEBSITE: http://www.certisud.fr</p>		
FR-BIO-13	<p>CERTIS</p> <p>Immeuble le Millepertuis, Les Landes d'Apigné F-35650 LE RHEU France TEL: +33(0)2 9960 82 82 FAX: +33(0)2 9960 83 83 EMAIL: certis@certis.com WEBSITE: http://www.certis.com.fr</p>		

Control Bodies and Control Authorities approved on 31/12/2016 - submission by 31/03/2017 unless otherwise specified





Report generation date : 05/04/2017

Member States of the European Union (EU28)
LIST OF CONTROL BODIES AND CONTROL AUTHORITIES IN THE ORGANIC SECTOR

France

System:A

Last submission date : 28/03/2017

Code	Name and Address	Territorial limitation	Comments
FR-BIO-15	<p>BUREAU ALPES CONTROLES</p> <p>3, impasse des Prairies F-74940 ANNECY-LE-VIEUX France TEL: +33(0)4 5064 0675 FAX: +33(0)4 5064 0602 EMAIL: contact@alpes-controles.fr WEBSITE: http://www.alpes-controles.fr</p>		
FR-BIO-16	<p>QUALISUD</p> <p>15, avenue de l'Océan F-40500 SAINT SEVER France TEL: +33(0)5 5806 1521 FAX: +33(0)5 5875 1336 EMAIL: contact@qualisud.fr WEBSITE: http://www.qualisud.fr</p>		
FR-BIO-17	<p>BIOTEK AGRICULTURE</p> <p>Routes de Viélaïnes 10120 SAINT-POUANGE France TEL: 0325417871 FAX: 0325417875 EMAIL: contact@terrae-biotek.com WEBSITE: http://www.biotek-agriculture.fr CONTACT: Anita PETIT</p>		

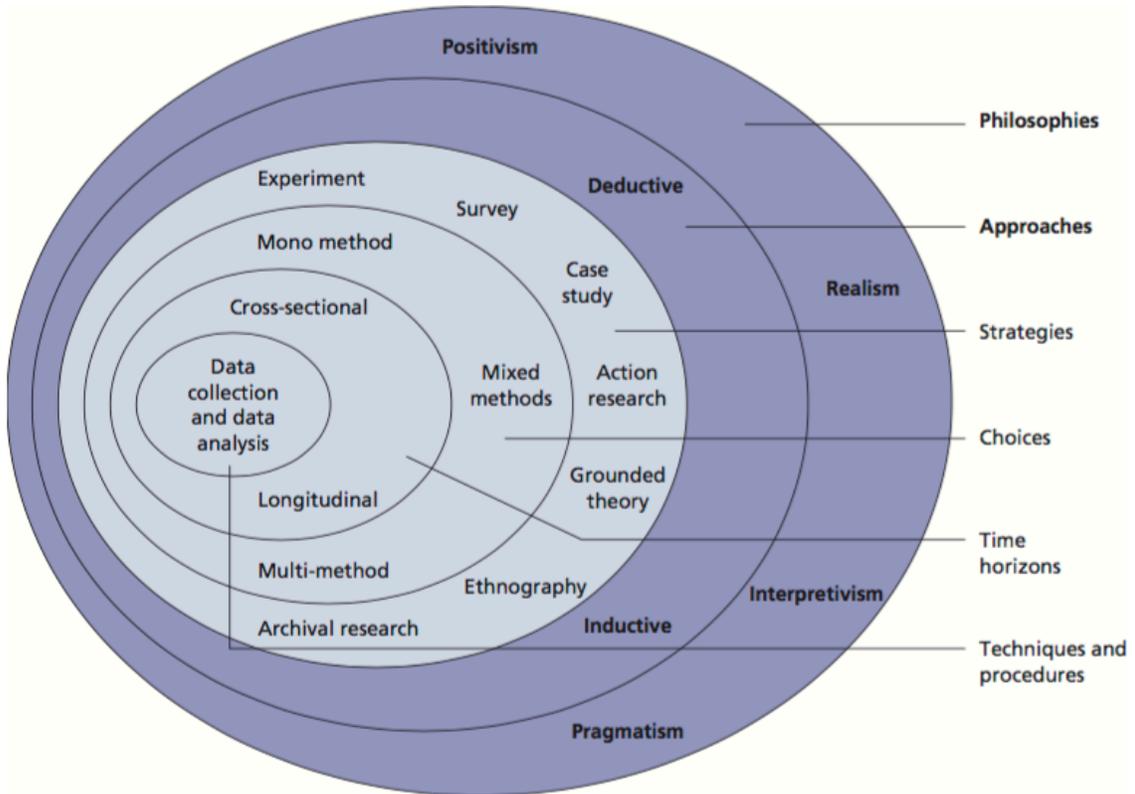
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33/92



(The European Commission, 2016)

Appendix B: The research “onion”



(Saunders, 2011)

Appendix C: Survey

QUESTIONS	ANSWERS
1) What is your gender ?	Male Female
2) What is your age group ?	18-25 26-40 41-65 More than 65
3) What is your level of education ?	Secondary school University studies 1st Cycle University studies 2nd Cycle University studies 3rd Cycle Without diploma
4) Do you feel concerned by the environment and the eco-friendly methods ?	Not concerned Neutral Concerned Strongly concerned
5) How important eco-friendly farming is for you ?	Very important Important Moderately important A bit important Not important
6) How do you perceive eco-friendly products ?	Negatively Neutral Positively
7) In general do you prefer to buy products which are certified eco-friendly ?	Strongly agree Agree Neutral Disagree Strongly disagree`
8) What is your frequency of purchase of eco-friendly products ?	Less than once a year/Never Less than once a month Once a month Once a week Several times a week

9) Do you know biodynamic products ?	Yes No
10) Do you know the difference between organic and biodynamic products ?	Yes No
11) What is your level of knowledge of wine ?	Novice Intermediate Advanced Expert
12) What is your frequency of purchase of wines ?	Less than once a year/Never Less than once a month Once a month Once a week Several times a week
13) What is your frequency of wine consumption ?	Less than once a year/Never Less than once a month Once a month Once a week Several times a week
14) What is the most important characteristic of a wine when you have to choose one ?	Age Grape variety Origin Price Eco-friendly Label
15) What is your level of knowledge of organic wine ?	Novice Intermediate Advanced Expert
16) How do you perceive organic wines ?	Negatively Neutral Positively
17) Would you be ready to pay a premium price for having a wine certified organic in regards to conventional wine ?	Yes No
18) How much more will you be ready to pay ?	Not ready to pay more Ready to pay 1 to 5% more Ready to pay 6 to 10% more Ready to pay 11 to 20% more Ready to pay more than 20% more

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<p>19) What is your level of knowledge of biodynamic wine ?</p>	<p>Novice Intermediate Advanced Expert</p>
<p>20) How do you perceive biodynamic wines ?</p>	<p>Negatively Neutral Positively</p>
<p>21) Would you be ready to pay a premium price for having a wine certified biodynamic in regards to conventional wine ?</p>	<p>Yes No</p>
<p>22) How much more will you be ready to pay ?</p>	<p>Not ready to pay more Ready to pay 1 to 5% more Ready to pay 6 to 10% more Ready to pay 11 to 20% more Ready to pay more than 20% more</p>