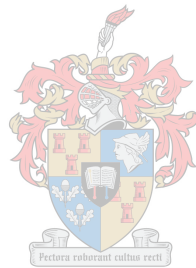# Perceptions of South African Chenin blanc wine among Consumers and Industry professionals

by

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at
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Institute for Wine Biotechnology, Faculty of AgriSciences

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Declaration

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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Summary

In the food and beverage industries, the understanding of consumer behaviour and the sensory characteristics of products are important to producers as they aid in the implementation of communication and marketing strategies. South African Chenin blanc is a white wine variety that is characterised by diverse sensory profiles, an attribute that is considered as a strength of the variety from a technical wine production perspective. Accordingly, the wine industry has become highly interested in gaining knowledge about the perceptions of consumers regarding Chenin blanc styles in particular.

The main aim of this study was to investigate the sensory and overall perceptions of Chenin blanc wine among South African consumers. Sensory analysis was conducted on three different Chenin style wines, namely fresh, complex unwooded and complex wooded wines using descriptive analysis (DA) with a trained panel. Among consumers, free listing and CATA were carried out to explore their sensory perceptions through encouraging them to freely describe their tasting experience and the selection of the perceived of aroma attributes obtained from DA. Thereafter, an exploratory study with the aid of a survey questionnaire was conducted to obtain insights of the consumers' consumption, purchase behaviour and general perceptions about Chenin blanc wine.. Industry professionals from different disciplines of the wine industry, participated in the study by providing their viewpoints on aspects regarding the position of Chenin blanc in the SA wine industry through a self-completed questionnaire.

The sensory attributes that were mostly provided by the consumers in free listing were *fruit*, *citrus*, *tropical*, *honey*, *wood*, *earthy*, *nutty* and *fresh*. A significantly lower number of attributes was perceived by consumers with CATA. The important non-sensory attributes listed by the consumers included their emotions, context of usage (occasion) and pleasure. They generally displayed an inclination towards buying wines with simple sensory label descriptors. According to the industry professionals, wine labelling and initiatives by the SA wine industry should be simple and relatable. Furthermore, Chenin blanc would highly benefit from cultivar-specific shows, due to its wide wine style spectrum.

This study contributed towards a better understanding of the perceptions of SA wine consumers about Chenin blanc wine of the two respondent groups to aid in the understanding of the market and the wine industry, as well as their prospective roles in the future of Chenin blanc in SA.

Opsomming

In die voedsel- en drankbedryf is insig in verbruikersgedrag en die sensoriese eienskappe van produkte belangrik vir produsente, aangesien dit gebruik word in die implementering van verbruikerskommunikasie- en produkbemarkingstrategieë. Suid-Afrikaanse Chenin blanc wyn is 'n witwyn variëteit wat gekenmerk word deur 'n wye verskeidenheid van sensoriese profiele. Hierdie kenmerk word algemeen as 'n positiewe kenmerk beskou vanuit 'n tegniese wynproduksieperspektief. Gevolglik is dit vir die wynbedryf belangrik om insig te verkry oor die persepsies van verbruikers oor Chenin blanc wyn.

Die hoofdoel van hierdie studie was om die sensoriese en algehele persepsies van Chenin blanc wyn onder Suid-Afrikaanse verbruikers te ondersoek. Sensoriese analise is op drie verskillende Chenin wynstyle gedoen, naamlik vars, kompleks ongehout en kompleks gehout, met beskrywende analise (Engels Descriptive Analysis, DA) met 'n opgeleide sensoriese paneel. Onder verbruikers is die metodes vrye notering (Engels Free Listing) en Merk-alles-van-Toepassing (Engels Check-all-that-applies, CATA) gebruik om die verbruikers se sensoriese persepsies te verken deur hulle aan te moedig om hul proe-ervaring en die keuse van die waargenome aroma-eienskappe wat met DA verkry is, vryelik te beskryf. Daarna is 'n verkennende studie aan die hand van 'n opname-vraelys gedoen om insigte te verkry in verbruikers se verbruik, bestedingspatrone en algemene persepsies oor Chenin blanc wyn. Industriedeskundiges vanuit verskillende dissiplines van die wynbedryf het ook aan die studie deelgeneem deur middel van 'n self-voltooide vraelys wat gehandel het oor die posisionering van die Chenin blanc variëteit in verhouding tot ander variëteite.

Die sensoriese eienskappe wat die meeste deur die verbruikers met vrye notering genoem is, was vrugte, sitrus, tropies, heuning, hout, aards (Engels earthy), neutagtig en vars. 'n Beduidende kleiner aantal eienskappe is deur verbruikers waargeneem met die CATA metode Daar was ooreenkomste tussen die twee respondentgroepe (verbruikers en industriedeskundiges) in terme van hul persepsies oor Chenin blanc. Ten spyte van die feit dat die verbruikers oorwegend rooiwyn verkies het, was hulle oor die algemeen geïnteresseerd in Chenin blanc wynstyle en het hulle aangedui dat eenvoudige sensoriese beskrywings op botteletikette 'n motivering sou wees om Chenin blanc wyn te koop. Volgens die industriedeskundiges behoort wynetikette eenvoudig te wees en van so 'n aard dat die gewone verbruiker met die beskrywings kan identifiseer. Hulle was ook van mening dat die blootstelling van Chenin blanc onder die publiek baie voordeel sal trek uit kultivarspesifieke wynskoue weens sy wye wynstylspektrum.

Hierdie studie het 'n bydrae gelewer om die persepsies van die twee respondentgroepe te onderskat om te help met die begrip van die mark en die wynbedryf, asook hul voornemende rolle in die toekoms van Chenin blanc in SA.

This thesis is dedicated to

The individuals in my life who have supported me through this journey.

Umzingisi akanashwa, ngoba akulahlwa mbeleko ngakufelwa.

Biographical sketch

Andiswa Mapheleba was born in the Transkei, South Africa on 11 April 1991. She moved to East London, where she attended at school at Cambridge Preparatory and Junior School, and later Clarendon Girls' High School. Andiswa obtained her BScAgric-degree in Viticulture and Oenology Degree in 2015. She enrolled for an MSc in Wine Biotechnology at the Institute for Wine Biotechnology, Department of Viticulture and Oenology, Stellenbosch University.

Acknowledgements

Preface

This thesis is presented as a compilation of 5 chapters as indicated below.
The style of writing of chapters 1, 2, 3 and 5 are derived from the South African Journal of Enology and Viticulture (SASEV).

Chapter 1   **General introduction and project aims**

Chapter 2   **Literature review**
The role of sensory science and consumer research in wine marketing

Chapter 3   **Research results**
Consumers' sensory perceptions of Chenin blanc wine: insights gained through tasting

Chapter 4   **Research results**
Qualitative and quantitative explorations of Chenin blanc wine between consumers and industry professionals

Chapter 5   **General discussions and conclusions**

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Clarification of key concepts

Industry

An industry is a group of enterprises offering a product or a class of products that are close substitutes for one another (Kotler & Keller, 2016).

Wine industry

In the context of this study, the wine industry refers to the definition by SAWIS (2017); wine (natural, fortified and sparkling), wine for brandy, distilling wine, brandy and other spirits distilled from distilling wine, and grape juice and grape juice concentrate for use in wine and non-alcoholic products (SAWIS, 2017).

Market

A market is defined as a collection of various consumer groups. (Kotler & Keller, 2016).

Market segmentation

The process of dividing the total market into distinct segments of consumers with similar needs and wants and selecting one or more of the segments to target with a distinct marketing mix (Schiffman & Kanuk, 2009).

Target Market

A fairly homogenous group of consumers that marketing managers feel are most likely to buy a firm's product or class of products (Lamb *et al*., 2010). In the framework of this study, this term refers to the collection of wine consumers.

Product Positioning

Positioning is the act of designing a company's offering and image to occupy a distinctive place in the minds of the target market (Kotler & Keller, 2016). The market 'position' of the product is the image and unique identity of a brand or a product, which is characterised as an intangible attribute.

Marketing

The American Marketing Association (2013) defines marketing as the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large (www.ama.org).

Promotion

Promotion is the marketing communications that inform, persuade and remind potential buyers of a product in order to influence an opinion or elicit a response. Promotion involves personal selling, advertising, sales promotions and public relations (Lamb *et al.*, 2010).

Consumer research

Part of market research in which the preferences, motivations, and buying behaviour of the targeted customer are identified through direct observation, mail surveys, telephone or face to face interviews, and from published sources (http://www.businessdictionary.com).

Terroir

The soil, climate and elevation where the grapevine is situated (Loubser, 2008).

Old vines

Older vines that are associated with producing wines of better overall quality (Robinson, 1999; Skelton, 2007). In South Africa, these vines are 35 years and older (http://oldvineproject.co.za).

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Chapter 1

General introduction and project aims

1.   Introduction and project aims

1.1 Introduction

Chenin blanc, previously known as 'Steen', was reportedly one of the first grape cultivars to be planted in South Africa (SA) in 1655 when a trading post was established by Dutch settlers in the then Cape of Good Hope (Loubser, 2008). Due to its adaptability to the dry and warm conditions that prevail in large areas of the winemaking regions of SA, Chenin blanc has become the most planted wine grape in the country, with the largest area under vines (2867 hectares) situated in the Breedekloof region, according to statistics released by the South African Wine Industry Information Services NPC (SAWIS) in October 2017 (SAWIS, 2017). Chenin blanc is of direct and indirect economic importance for the SA wine industry; for the past two decades, the category has shown steady increases in export volumes, but also attracted the international wine spotlight to SA, due to the ultra-premium quality Chenin blanc wines produced locally (Buzzeo, 2017).

In terms of the global state of the wine market in 2016, SA occupied the 7th position based on wine volumes produced (all natural wine styles, 10.5 mhl), while the local per capita consumption was a mere 7.8 litres, as indicated on Table 1.1 (SAWIS, 2017). SA, therefore, has of the lowest figures for per capita wine consumption for a wine producing country. For a wine consuming country on the other hand, the present position is not appealing, figures released for 2015 by the International Organisation of Vine and Wine (OIV) showed that SA occupied position 20 out of a total of 24 major wine consuming countries (Aurand, 2017). The aforementioned facts most certainly also affect the consumption of Chenin blanc wine.

Table 1.1 Per capita wine consumption statistics for 2016 (SAWIS, 2017).

Country	Litres
Portugal	45 .7
France	36.8
Italy	37.8
Argentina	22.4
Australia	23.6
Croatia	16.6
Chile	14.2
USA	9.8
South Africa	7.8
Japan	7.0

The SA wine industry recognised the need to revitalise the local wine market and to grow a positive wine drinking culture in SA. Hence, the *Wine Industry Strategic Exercise (WISE)* initiative was launched in 2015 and tasked to develop a national marketing strategy around wine as a lifestyle choice for future target consumers. The groundwork for this strategy was

done through a comprehensive research phase conducted by The Moss Group (mossgroup.co.za) and Wine Intelligence (www.wineintelligence.com), where focus groups and individual interviews with SA consumers were held to identify trends affecting wine consumption. Aspects that emerged from the research included a general lack of awareness amongst the consumers of the different wine styles, as well as a low involvement with wine as a product. Also emerging from the research, albeit indirect, is the seeming disconnect, or missing link, between the wine industry that is focused on the product offering (supply of wine), and the target consumer whose needs, preferences and decision-making process when buying wine is poorly understood and as a result not met.

It has been said that sensory science could be considered as the link between the wine industry and the consumer market (Francis & Williamson, 2015). From a sensory research perspective, the question remains what role does the most important intrinsic attribute of wine, namely its flavour characteristics, play in consumers' perceptions and motivation for use of the product. This study specifically addressed the question for Chenin blanc natural table wines.

Previous research on the sensory aspects of Chenin blanc conducted at the Institute of Wine Biotechnology (IWBT), Department of Viticulture and Oenology (DVO) and Department of Food Science, Stellenbosch University have uncovered and identified the wide range of styles and their respective sensory profiles were characterised (Bester, 2011; Hanekom, 2012; Van Antwerpen, 2012). Other studies investigated the effect of winemaking treatments on the sensory profiles of Chenin blanc (Weightman, 2014); the application of data mining techniques to extract the most important style sensory cues from publicly available data (Valente, 2016). The sensory profiling of two important specialist Chenin blanc style categories was also completed, namely old-vine Chenin blanc wine (Crous, 2016). In spite of the fact that these studies provided novel insights and useful information for the SA wine industry, the focus was not specifically aimed at investigating consumer perceptions and their emotions evoked when consuming Chenin blanc wine.

Globally, the understanding of the consumer's decision-making process has become essential to identify the attributes or characteristics that consumers rely on to reach a final purchase decision (Ginon *et al.*, 2014). Thus, concerning Chenin blanc, there was a clear need to establish a workflow and strategies to investigate Chenin blanc wine consumption and emotions that are prompted. It was also of interest to obtain the insights from the perspectives of wine industry professionals in order to gain knowledge and understand their perceptions about Chenin blanc in the SA wine industry.

The current study aimed to investigate consumer sensory perceptions using free listing (Hough & Ferraris, 2010) and Check-all-that-apply (CATA) (Adams *et al.*, 2007). Free listing has been proven in several studies to provide information relating consumption of food and

wine (Hough & Ferraris, 2010; Antmann *et al.*, 2011; Jaeger *et al.*, 2013; Lawrence *et al.*, 2013; Ginon *et al.*, 2014; Dos Santos *et al.*, 2015) . However, in the context of the SA wine industry, this method has not been used, nor has it been applied in the investigation of Chenin blanc perceptions. CATA was used to investigate the validity of the sensory attributes that were obtained from descriptive analysis (DA), for consumers. The perceptions of consumers and industry professionals were explored using separate questionnaires in order to gain insights and knowledge about their respective perceptions, and to aid in the comparison in the thereof.

This study was based on the opinions and perceptions of members of the public, an application for Ethical Clearance was conducted to guarantee confidentiality and safety of the participants. This was approved by the Humanities Research Ethics Committee at Stellenbosch University.

1.2 Motivation for study

It is not known how consumers describe the sensory profiles of Chenin blanc and its overall experience is not known. Furthermore, most consumers are not aware and familiar with the Chenin blanc wine styles. In sensory science, descriptions of products are obtained using descriptive profiling methods. DA techniques using trained panels produce reliable and accurate quantitative data (Lawless & Heymann, 2010). DA is ideal when the purpose is to profile products in terms of attributes (qualitative) and intensities (quantitative). DA requires intensive training and is thus not suitable when the aim is to inquire how untrained consumers view the sensory profiles of products. Rapid sensory profiling methods such as free choice profiling (FCP) (Williams & Langron, 1984) and flash profiling (FP) (Sieffermann, 2000) were developed with the aim of obtaining descriptions that depict the consumers' perceptions. However, these methods require the judges to further rank the perceived intensities, which requires more effort from respondents. Thus, to obtain the descriptions in a more efficient and rapid way, new methodologies are needed to investigate how consumers describe Chenin blanc dry wines.

In the first research chapter (chapter 3), the sensory perceptions of three Chenin blanc dry wines, which were diverse in their sensory profiles, were investigated using a trained panel and consumers. DA was used to profile the aroma and in-mouth attributes using a trained panel. Free listing and CATA were then applied using consumers to investigate their descriptions and selection of attributes that describe the wines.

Based on the feedback that was obtained in preliminary meetings with industry professionals from different fields of the wine industry (brand owner, sommelier, retail and consultant), it was

clear that the communication between consumers and industry is not connected when it comes to Chenin blanc.

In chapter 4, a qualitative methods were conducted to investigate the perceptions among consumers and industry professionals with the aid of two separate questionnaires. The consumers' behavioural habits, opinions and attitudes towards wine and Chenin blanc in particular were investigated. Industry experts were probed about their opinions and possible inputs regarding the position of Chenin blanc in the SA wine industry. For the first time, an in depth thematic analysis of the obtained text from both questionnaires was conducted to aid in the precision of analysis, providing detailed and accurate results.

1.3 Project Aim

The overall aim of the study was to develop a workflow to obtain insights about the perceptions of Chenin blanc wine with regards to the sensory characteristics and consumer behaviour. The tasks related to this aim were as follows:

Conduct preliminary meetings with industry representatives to obtain insights about the South African wine industry and Chenin blanc, current challenges that are faced and topics to investigate.

Distinguish how consumers describe their sensory and overall experience of Chenin blanc wines

    a) Select three Chenin blanc dry wines which are diverse in their sensory profile

    b) DA, training of panel and analysis of wines, using Compusense®

    c) Conduct free listing among consumers

    d) Conduct CATA among consumers

    e) Comparison of methods: DA and rapid methods in terms of validity

Obtain consumer knowledge about Chenin blanc wine experience with the aid of an online questionnaire

    a) Investigation of questionnaire topics

    b) Construction of survey on *SUsurvey*

    c) Closed-ended questions relating to opinions about wine, experiences in on and off-trade environment and purchase behaviour

    d) Open-ended questions substantiating reasons for the choices in the closed ended questions and opinions

    e) Application of thematic analysis on ATLAS.ti

Obtain expert opinions and inputs that have a potential to be applied in the SA wine industry with the aid of an online questionnaire

    a) Investigation of questionnaire topics

    b) Construction of survey on *SUsurvey*

    c) Qualitative analysis of results and application of thematic analysis on ATLAS.ti

Establish similarities and difference between consumers and industry professionals based on their collective opinions

    a) Identify areas that are in need of innovation regarding Chenin blanc and wine in general

1.4 Experimental design summary

Figure 1.1 provides the experimental design of the study, which shows the methods conducted, the number of attributes, as well as the number of the respondents.

Figure 1.1 Experimental design summary of the study; the larger circles represent the panellists and/or respondents (DA panel, consumers and wine industry professionals) that participated in the study, smaller circles are the investiagted attributes (in DA) and the tasks that were conducted by consumers (free lisiting, CATA and questionnaire) and industry professionals (questionnaire).

In chapter 3, the study commenced with DA of the three wines among 9 panel members, where 18 aroma and 5 in-mouth attributes were evaluated. A total number of 111 consumers participated in the study, where they first performed rapid sensory profiling techniques. Free listing was conducted first, followed by CATA on the 18 aroma attributes which were obtained from DA. Chapter 4 entails the investigation of the perceptions of the same consumers as in Chapter 3, and 9 industry professionals using two questionnaires.

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Chapter 2

Literature Review

2. The role of sensory science and consumer research in wine marketing

2.1 Background

There is a low number of publications that have investigated wine consumer behaviour with an aim of improving the South African domestic wine consumption. In 2004, Loubser (2004) reviewed a generic marketing development strategy for the South African wine industry, where an agreement was reached between the wine industry and government to fund a market research campaign to gain the understanding of the South African consumer. Further studies emerged concerning the identification of different segments within the black emerging market (Ndanga *et al.*, 2009), the marketing of the wine lifestyle (Green, 2010), and marketing strategies for South African wine among the black emerging market (Opperman, 2010). The prime focus of the projects that were carried out at the Institute for Wine Biotechnology, Department of viticulture and Oenology (IWBT-DVO), Stellenbosch University has been the sensory and chemical profiling of wine. Chenin blanc has been profiled using rapid sensory evaluation techniques to investigate the sensory perceptions of trained and/or untrained consumer panels (Bester, 2011; Hanekom, 2012; Weightman, 2014; Crous, 2016).

Perception is defined as the process by which an individual selects, organises and interprets information inputs to create a meaningful picture of the world (Kotler & Keller, 2016). Sensory science investigates perception thereof through methods that are used to evoke, measure, analyse and interpret responses to products that are perceived through senses such as sight, smell, touch, taste and hearing (Stone & Sidel, 2004). Furthermore, these methods relate to the ability of humans to utilise these senses to create an understanding of objects and/or environments. Consumer behaviour is defined as the acquisition, consumption and disposal of products, services, and ideas by decision making units (Jacoby, 1976). Sensory perception and consumer behaviour are disciplines that are becoming integrated in the food and beverage industries to gain the overall product perceptions among consumers for innovative marketing. However, this process is happening at a slow rate in the wine industry. In a proposal for the development of a European network for sensory and food consumer research, Jos Mojet stated that "an integrated approach directed at understanding and predicting eating and drinking behaviour and the development of consumption patterns is lacking" (Köster, 2009).

Wine is a complex product and a number of intrinsic and extrinsic factors influence how it is perceived by consumers (Charters & Pettigrew, 2007). Respectively, intrinsic and extrinsic cues are related to the product and its organoleptic properties (e.g. aroma, in-mouth attributes and colour) and properties which are not physically part of product (e.g. packing and origin)

(Sáenz-Navajas *et al.*, 2016). Collectively, sensory perception and the associations that are assigned by consumers have a major influence on their eating and drinking experience (Thomson *et al.*, 2010). Several research methods have been applied to investigate wine sensory attributes and consumer behaviour separately. These will be discussed in the following sections.

2.2 Sensory analysis

In the food industry, sensory evaluation techniques are used in product development to provide important information about the product characteristics through the measurement of human responses. The methods are divided into classical descriptive analyses and rapid sensory techniques (Valera & Ares, 2012) which will be reviewed in the following sections.

2.2.1 Descriptive analyses

Descriptive analysis (DA) is a method that is used to establish quantitative and qualitative sensory differences of products with the aid of a trained panel (Sáenz-Navajas *et al.*, 2015)**,** producing data which are known to be very detailed, robust and consistent (Moussaoui & Varela, 2010). DA has been widely applied in the food and beverage industries to investigate of a variety of product changes and research questions in product development (Lawless & Heymann, 2010). The obtained information about the products' attributes can be related with consumer perception and acceptance (Lawless & Heyman, 2010; Hopfer & Heyman, 2014). A comparison of attributes can be carried out to implement quality control specifications, benchmark products and prototypes to identify key determinants of performance, benefits or defects (Meilgaard *et al.*, 2007). However, training of the panel is expensive and time consuming as the panel needs to understand the full sensory space of the range of products (Chollet *et al.*, 2011; Moussaoui & Valera, 2010).

DA techniques

Over time, a number of DA techniques have been developed to fulfil qualitative and quantitative functions in the sensory profiling of product attributes. The Flavour Profile (FP®) method was the first descriptive analysis technique to be developed and was refined to the Profile Attribute Analysis (PAA) (Cairncross & Sjöstrom 1950; Sjöstrom, 1954; Caul, 1957; Hall, 1958; Moskowitz, 1988; Powers, 1998; Murray et al., 2001). In the 1970's, Quantitative Descriptive Analysis (QDA®) was developed to amend the difficulties that were experienced in FP® and PAA (Stone & Sidel, 2004; Stone *et a*l., 1974), such as the addition of an unstructured line scale to aid in the measurement of attribute intensities. The Texture Profile (TP®) method (Brandt *et al.*, 1963; Civille & Liska, 1975; Muñoz 1986; Szczesniak *et al.*, 1975) and the Spectrum Method ® (Civille & Lyon, 1996) were developed to assess texture

characteristics and describe attributes with the aid of standardised lexicon, respectively. Eventually, innovations of the QDA® and Spectrum Method® have led to the development of generic DA (Lawless & Heymann, 2010).

Application of generic DA

In generic DA, 8 to 12 panellists are trained using reference standards to obtain an understanding and reach an agreement about the meaning of the attributes (Lawless & Heymann, 2010). In theory, reference standards are prepared to fulfil the following role: a) as an 'anchor concept' that is assigned to a specific attribute, and b) as a 'translation device' to the audience of the study (Hopfer & Heymann, 2014). The former concept assists the panellists to use the same words to describe an attribute and the latter aids in the ability of the reader of a study to recreate the reference standard. Two training techniques are used to train a panel, the consensus or ballot method. In the former, the panel reaches an agreement about the list of attributes to be analysed after the presentation of the samples. Ballot training provides the panel with a predetermined list of attributes to be analysed (Lawless & Heymann, 2010). Once thorough training of the panel is complete, the samples are tested according to specific protocol. The results obtained from the tests are analysed using analysis of variance (ANOVA) and principal component analysis (PCA). ANOVA is a univariate statistical technique that is performed to measure the differences among products by comparing their means (Lawless & Heymann, 2010). PCA is a multivariate statistical technique that provides representation of the correlations between the products and attributes on a two dimensional space (Lê, 2014).

2.2.2 Rapid sensory profiling methods

The rapid methods were developed due to the necessity to gather descriptions of products directly from trained and untrained panels (Valera & Ares, 2014) in a fast and less expensive way. These methods are categorised into verbal-based, similarity-based and reference-based methods (Valentin *et al.*, 2012). The similarity-based method consists of the free sorting task (Hulin & Katz, 1935) and projective mapping (Dun-Rankin, 1983) and reference-based methods consist of polarised sensory positioning (Teillet *et al.*, 2010) and pivot profile (Thuillier, 2007). Flash profiling (FP) (Sieffermann, 2000) and check-all-that-apply (CATA) (Adams *et al.*, 2007) are verbal-based methods that were developed from free choice profiling (FCP) (Williams & Langron, 1984). For the purpose of this study, the following sections will review the verbal-based rapid methods, including free choice profiling.

Free choice profiling (FCP) was developed in the 1980's using untrained panellists to profile the sensory characteristics of port wine (Williams & Langron, 1984). The outcomes from this experiment provided evidence that it was not necessary to use specific sensory descriptors to

determine the relationships and differences among products as in DA. Thus, the training of a panel as in DA was not the only way to obtain the sensory characteristics of a product. In FCP, products are presented in singular form and panellists are required to list their own sensory attributes when scoring the products, there is no limitation on the number of attributes they use. Thereafter, the rating of attribute intensities is carried out using line scales (Varela & Ares, 2012). The data obtained from the FCP are analysed using General Procrustes Analysis (GPA), which enables the responses that have multiple attributes per panellist and those consisting of differences in the use of scales to be analysed (Gower, 1971). Partial Least Squares (PLS) regression is also used in the analysis of the data obtained from FCP.

CATA

Check-all-that-apply (CATA) is a method that was previously used in market research (Rasinski *et al.*, 1994) and has gained popularity in sensory analysis. CATA probes for the panellists' perceptions in a fast and simple manner, where trained or untrained panellists are provided with a predetermined list of attributes from which they are required to select those that best contextualise their product experience (Meyers & Castura, 2014). The attributes within the provided CATA list may relate to the products' sensory characteristics and/or its non-sensory characteristics and may also incorporate liking questions, i.e. relating consumer acceptance of the products (Varela & Ares, 2012). Furthermore, the list of sensory attributes may also correspond to the descriptions used by a trained panel or selected from previous results or studies.

The number of panellists that perform CATA vary between 50 to 100 or more panellists (Adams *et al.*, 2007; Dooley *et al.*, 2010; Ares *et al.*, 2011). Another step to consider when designing a CATA question is the order of the attributes in the lists, as it plays a role in the selection by the panellists. Therefore it is important that the order in which the attributes appears on the list should be randomised per panellist, primarily to exclude bias. The responses obtained from CATA produce qualitative data and the incorporation of an intensity scale provides quantitative data to increase capacity thereof (Valera & Ares, 2012).

The data obtained from CATA responses are analysed using Cochran's Q test, i.e. to assess if the panellists perceive significant differences between samples for each of the attributes (Parente, *et al.*, 2011). Additionally, the results can be represented in a multiple correspondence analysis (MCA) plot to provide a representation of the similarities or differences between samples and attributes (Ares *et al.*, 2010).

Flash profiling

In flash profiling (FP), panellists analyse a set of products simultaneously by providing their own attributes, which they further rank based on their perceived intensities (Dairou &

Sieffermann, 2002). The simultaneous differentiation of the products aids in a better discrimination, which provides more efficiency if products are similar (Delarue & Sieffermann, 2004; Mazzucheli & Guibard, 1999). Moreover, the ranking of the attribute intensities aids in the quantitative description and measurements of the products (Delarue, 2014). When the results are obtained, data analysis of rank data are followed by the construction of individual matrices for each panellists (products x attributes x attribute columns / categories). The matrices are analysed with the aid of GPA to obtain attribute and product configurations (Valera & Ares, 2012). Supplementary to the plots, Hierarchical Cluster Analysis (HCA) is applied to identify clusters of correlated attributes (Lassoued *et al.*, 2008). Due to FP's comparative application, the number of products that can be assessed is limited and is dependent on product category. Other potential difficulties are experienced in the interpretation of the attributes since each panellists generates their own attributes (Valera & Ares, 2012).

2.3 Application of consumer perception and behaviour research in the food and wine industry

Recently, the application of sensory analysis has steadily moved away from traditional sensory descriptive methods to consumer-orientated methods (Rodrigues *et al.*, 2015). Qualitative consumer research methods are applied to explore consumer perceptions and consumer behaviour (Lawless & Heymann, 2010; Calder & Tybout, 1987) by probing for information that cannot be obtained from quantitative methods. Furthermore, sensory evaluation techniques alone do not reveal the understanding of the consumption of products or food choice (Köster, 2009). The obtained information from qualitative consumer research methods provides insights of the consumers' behaviour and has the potential to be applied in the implementation of marketing strategies.

Consumer research methods such as observations, focus groups, surveys, behavioural data and experiments are used in industry to collect primary data (Kotler & Keller, 2016) to aid in product development (Lawless & Heymann, 2010). Direct methods that probe for the consumers' past behaviour, habit and hedonic appreciation are better predictors of actual food choice behaviour, attitudes and intentions (Köster, 2009).

2.3.1 Investigation of acceptance and perception using free listing and food-evoked emotion research

The investigations of consumer perception and behaviour using free listing, free word association tasks and/or food-evoked emotion research is relatively new in the food and wine industry. These studies have been applied in South America, New Zealand and Europe. However, there are no studies that have been applied in South Africa (SA). The following

sections will review studies that have been conducted in their respective countries and their findings to validate the choice of the methods that were applied in the current study.

Free listing and free word association tasks

Free listing is a qualitative method that is widely used in anthropology and was introduced to sensory science by Hough & Ferraris (2010) in their investigation of perceptions of fruit among Argentinian adolescents. According to Bernard (2005) free listing is "deceptively simple, but powerful". In this method, panellists are required to list attributes that they associate with a particular product or topic. Its speed and simplicity has demonstrated it to be well suited for its application to consumer research.

Application of free listing on food perception

Free listings has been applied in a number of studies within the food industry. Such studies explored; important package features of milk desserts (Ares & Deliza, 2010), the concept of creaminess (Antmann *et al.*, 2011), food menus among women of different income-levels using interviews (Libertino *et al.*, 2012), emotional responses prompted by food (Jaeger *et al.*, 2013) and the sensory characteristics of low sodium dry fermented sausages (Dos Santos *et al.*, 2015). The results obtained from all five studies confirmed free listing to be useful and efficient in providing consumer perceptions about intrinsic, extrinsic and emotion-related attributes, based on their respective objectives.

Application of free listing on wine perception

In the wine industry, free listing is gaining momentum as a method of choice to investigate the perception of untrained panellists. Lawrence *et al.* (2013) explored the sensory characterisation of Cabernet franc wines with the aid of free listing and DA using an untrained panel of wine professionals. The obtained findings in the free listing task highlighted specific characteristics of the wines, than those from DA. Further investigations using this method were concerning the purchase decision motives of Burgundy wine consumers, results showed identifiable purchase motive segments within the consumers (Ginon *et al.*, 2014).

Free listing data analysis

The data obtained from free listing are analysed using various qualitative methods such as those applied by ten Kleij & Musters (2003). In the aforementioned study, computer-aided textual analysis in the evaluation of open-ended survey responses was applied, where different varieties of mayonnaise were profiled among consumers. The results were represented on a correspondence analysis (CA) plot that was similar to a preference map, suggesting the panellists' preference of the varieties. In their word association studies, Mouret *et al.* (2013) and Rodrigues *et al.* (2015) used lemmatisation to summarize and categorise the

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words that were provided by the panellists. The different quantitative methods that are applied to the results obtained from the qualitative analyses include; the calculation of minimum, maximum and average frequency values of the resultant word categories (Hough & Ferraris, 2010; Dos Santos, 2015) or statistical analyses using saliency indices such as Smith's and the cognitive saliency indices. These methods are used to identify and estimate the relevance of the word categories (Ginon *et al*, 2014; Dos Santos, 2015). Multiple factor analysis (MFA) and/or CA plots using chi-square analyses investigate the differences in the products and provide a visual representation of the results.

Similar to open-ended questions, the analysis of free listing data may be time consuming. However, it is simple for the panellists to execute and indirectly provides an overview of factors that may influence consumer decisions (Ginon *et al*., 2014). Furthermore, concerning the characterisation of Chenin blanc wines, this method will aid in the preliminary profiling of sensory and non-sensory attributes which may be applied to subsequent quantitative techniques (Lawless & Heymann, 2010).

Investigation of food-evoke emotions

An emotion is defined as a "brief, intense physiological and mental reaction focused on a referent" (Clore *et al*., 1987; Lazarus 1991;Ferrarini *et al*., 2010). Emotions have been known to play a large role in the way in which a product is experienced and its acceptance among consumers (Thomson, 2007). In a number of countries, there are methods that have been developed to gain an understanding of the consumer's emotions that are associated and elicited by food products. The evidence showed the emotional profile of food products to have an effective discriminating ability more than liking measurements alone (Desmet & Schifferstein, 2008; Köster, 2009; King *et al*., 2010; Ng *et al*, 2013; Kuesten *et al*., 2014; Spinelli *et al*., 2014; Gutjar *et al*., 2015). Such findings have the potential to be implemented in product development and market strategies.

According to a review by Lagast *et al.* (2017), 70 studies have investigated the food-evoked emotions. The methods applied to the studies are divided into explicit and implicit measurements, where emotions are measured indirectly and directly while the panellists are consuming, smelling or looking at food, respectively (Lagast *et al*., 2017).

Implicit measurement of wine-evoked emotions

Two publications thus far have investigated wine-evoked emotions using implicit measurements. Silva *et al*. (2016) used focus groups to study functional and emotional conceptualisations in order to understand how non-alcoholic beer consumption is perceived compared to wine and alcoholic beer. Respectively, emotional and functional

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conceptualisations were defined as the associations with emotional connotation that reflect what a product is communicating to its consumers, and the actors that motivate the consumption of the product due to the functional consequences of the product to the consumer (Thomson, 2010). Horska *et al.* (2016) investigated the emotion of consumers during wine tasting through the measurement of the electrical activity of the brain using electroencephalography (EEG) and the analysis of facial expressions. Both studies yielded useful information regarding wine product choice and the associated emotional responses, which have the potential to be applied in the wine industry.

Explicit measurement of wine-evoked emotions

More studies have applied explicit measurements of emotions in relation to wine. Investigations were carried out to develop emotional adjectives (Ferrarini *et al.*, 2010), assess the effect of intrinsic and extrinsic cues on consumer responses with the aid of the EsSense Profie™ questionnaire (Gutjar *et al.*, 2015; King & Mieselman, 2010). Studies by Danner *et al.* (2016, 2017) explored consumers' emotions, liking and willingness to pay within different wine consumption contexts and the influence of wine information (back label and website) of Australian wines, respectively. These studies supported the investigation of food-evoked emotions due to benefits such as the inclusion of the consumer cognitive and affective experience, which aids in the prediction of liking to provide guidance to consumer product behaviour and willingness to pay.

Jaeger *et al.* (2013), compared the free listing and EsSense Profile™ questionnaire by investigating food-evoked emotions among New Zealand consumers and found that the two methods yielded slight similarities in the emotions that were elicited by the products. Thus the results obtained from food-evoked emotion studies could be compared and used to support the relevance of those obtained in free listing. In spite of the fact that the current study did not directly investigate food-evoked emotions, it should be noted that the application of free listing could provide outputs and results that are suggestive of the consumers' emotional profile when tasting the selected wines.

2.4 Investigation of purchase behaviour of wine consumers

By obtaining an understanding of the consumers' purchase decisions and behaviour, industries are able to predict the acceptance of products, thus obtaining competitive advantage in product development and marketing strategies. Concerning wine, consumer purchase decisions are influenced by behavioural factors such as previous experiences, packaging and information that is provided on the label (Lockshin *et al.*, 2006). The

environmental context (on-trade, restaurant and off-trade, retail), in which the wine is sold also plays a role.

According to Lockshin & Corsi (2012), the popularity of wine as a product and consumers' consumption behaviour thereof has resulted in an increase of the number of publications between the years 2004 and 2012, approximately 100 articles were published based on the topic of wine consumer behaviour. The results obtained from such studies are valuable to wine marketers and researchers who seek to understand consumer preferences (Bruwer *et al.*, 2011). In both the on and off-trade, extrinsic product cues play a major role on the consumers' behaviour (Bruwer *et al.*, 2012). In the on-trade premises, food also plays a role on the wine choice (Schamberg, 2002). Thus, the knowledge and insights about the extrinsic cues that prompt the consumers' interest are of vital importance in communicating messages that will attract target consumers.

By investigating the consumers' purchase behaviour, perceptions and preferences, industries can apply market segmentation and marketing techniques such as sensory marketing strategies that will be reviewed in the following section.

2.4.1 Implications of wine consumer behaviour research: Market segmentation and Sensory marketing

Market segmentation

Market segmentation entails the division of individuals of into similar traits and needs, which can be related to socio-demographic, psychographics, behavioural and geographic factors (Kotler & Keller, 2016). Segmentation is important in the identification of the trends that persist among a group of consumers. Followed by the identification of target consumers that the product will be catered to and the positioning thereof, by creating its identity in the mind of consumers.

Different notions exists regarding the correct segmentation variables to be applied to wine consumers. Atkin *et al.* (2007) suggested gender as a primary starting point when investigating wine buying decisions of consumers. For instance, in a study conducted in Australia, women were found to favour wine more than males (Bruwer *et al.*, 2011). In another study, (King *et al.*, 2011) investigated consumer preferences of Sauvignon blanc and found that females with a relatively low wine knowledge preferred wines with tropical fruit and disliked wines with a fresh green aroma. On the contrary, the segmentation of consumers based on psychographics rather than demographic variables is considered a more reliable approach. This argument is based on the fact that one demographic group may consist of consumers with different

lifestyles (Hammond *et al.*, 1996; Simcock *et al.*, 2010). In recent years, the segmentation of consumers according to generation has received much attention.

Generational Cohorts

According to Gardiner *et al.* (2013), there are three main generations of consumers, the baby boomers, Generation X and Generation Y, i.e. the millennials. The individuals of this generation are born between 1977 and 2000. However, those who are over the South African alcohol consumption age limit are of the ages between 18 and 40 years. Generation Y consumers are different to consumers of older generations in their consumption behaviour and sensory preferences (Bruwer *et al.*, 2011). They are economically active and are increasingly spending more money (Charters *et al.*, 2011; Henley *et al.*, 2011), which has made them a target marketing trend for many industries such as that of wine.

Consumer psychographics

Psychographics consider a person's beliefs, values, attitudes, motives and needs (Barber & Taylor, 2013). In a study conducted by Thach and Olsen (2004) in the United States, five psychographic wine segments were found which were associated to different lifestyle themes: relaxed lifestyle, dining ambience, fun and entertainment, social aspiration and travel lifestyle. Costa *et al.* (2004), Onwezen *et al.* (2012) and Solomon *et al.* (2002) proved that the identification of consumer segments according to their wine purchase motives would aid in the implementation of marketing strategies that would assist in product development, as well as the designs of advertising and communication promotions.

Application of sensory marketing

A relatively new marketing practice, sensory marketing has gained popularity as the incorporation of attributes that consumers can relate to in marketing labelling (Wansink *et al.*, 2000) has become crucial in the present day. Krishna (2012) defines sensory marketing as "marketing that engages the consumers' senses and affects their perception, judgement and behaviour". Sensory marketing has placed an emphasis on the knowledge of sensory perception. The primary reason for developing a sensory language is to aid in the communication of the products sensory characteristics during product development, quality control, as well as during the communication between sensory personnel, engineers and marketers (Lawless & Heymann 2010).

Swahn *et al.* (2012) suggested ways of incorporating sensory science and marketing science to enhance a sensory marketing communication approach in grocery retail stores that affect consumer choice of food products in apples. This study showed that the sensory description on labels have an influence on the consumers' product choice. In the wine industry, marketing

is applied by using wine intrinsic cues such as taste and aroma attributes. However, extrinsic product information such as innovative labelling has an influence on consumer choice (Enneking *et al.*, 2007) as these labels contain descriptions of the intrinsic cues.

Marketers and producers should aim to influence consumer decision making and purchase behaviour through the application of marketing strategies that stimulate and engage the consumers' senses. Within the retail store, sensory marketing of wine plays a major role in the attraction of consumers. For that reason, the provided attributes and information should be appealing enough to stimulate the consumers' interests and emotional responses.

2.5 Concluding remarks

Sensory and consumer behaviour research are individually important in the food industry. Moreover, based on the information presented in the previous sections, the integration of both disciplines is essential in obtaining insights relating to the overall product perceptions. The outcomes of sensory and consumer research have the potential to be applied in market research strategies. In SA, a few publications have investigated wine consumer behaviour and none have incorporated sensory analysis.

The following chapters will separately investigate Chenin blanc perceptions using sensory analysis and questionnaire research among consumers and industry professionals. The workflow of the findings is aimed at validating the need for the integration of sensory science and consumer behaviour of wine and Chenin blanc wine, specifically, in the development of innovative marketing strategies.

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Chapter 3

Consumers' sensory perceptions of Chenin blanc wine: insights gained through tasting

3. Consumers' sensory perceptions of Chenin blanc wine: insights gained through tasting

3.1 Introduction

Sensory analysis is known to be a link between product development and consumer market research, where the former focuses on the sensory attributes of food and the latter on the consumers' behaviour towards food (Moussaoui & Varela, 2010). The sensory profile can be tested using trained and untrained panels, whereas consumer liking is tested by qualitative and quantitative affective methods (Stone & Sidel, 2004). Affective tests are used by producers of consumer goods and service providers to assess the current or potential consumers' personal response and degree of liking of a product (Meilgaard *et al.*, 2007). Using consumer testing, producers are then provided with better insights about consumer perceptions. The direct investigation of consumer perceptions and opinions is important in the production and promotion of products as it provides unbiased, actionable information which provides guidance in production and ensures that the wines best meet consumer expectation (Francis & Williamson, 2015).

In descriptive analysis (DA), a robust, generic profiling method, the panellists are trained to verbalise perceptions of a product reliably with the use of common and agreed sensory language (Moussaoui & Varela, 2010). DA serves a number of purposes in industry, such as marketing and strategic product positioning, optimisation of ingredients to suit a particular target market and quality control purposes (Lawless & Heymann, 2010). Through the training of the panel, DA provides information and guidelines for industries which aim to identify sensory properties that are perceived in a particular product or for comparative purposes of a set of products (Meilgaard *et al.*, 2007). According to Murray *et al.* (2001), the training process forms a "frame of reference" for the panellists, therefore the aim of training was to accurately calibrate the wine attributes as objectively as possible, among all panellists. The training procedure also balances the uncertainties which may occur in the aroma analysis that can complicate differentiation of particular aromatic combinations. In this chapter, the sensory perceptions of three Chenin blanc dry wines that were of different in overall sensory profile were investigated using a trained panel with the aid of DA, and consumers, using free listing and CATA. These methods were applied to gain a better understanding of the attributes that describe Chenin blanc when using trained assessors and consumer. To ensure that the panellists produced accurate and consistent results, a detailed training procedure was followed by the DA panel leader.

The language that is generated in DA may not contextualise or describe the actual perceptions of consumers and their acceptance of a product (Francis & Williamson, 2015). Rapid sensory

profiling methods were established as alternatives to DA, primarily to provide more versatile and suitable outcomes (Valera & Ares 2014), i.e. depending on a particular method. More importantly, the application of rapid sensory techniques requires less time to execute and is suitable for an environment that has capital constraints.

Free listing (Hough & Ferraris, 2010) is a relatively new method in sensory science that has been used to investigate the descriptions of products by asking the panellists to provide their own attributes to describe a product. Thus, spontaneity is provided to the panellists and no specific training is required (Lawrence *et al.*, 2013). Check-all-that-apply (CATA) (Adams *et al.*, 2007) is a simple descriptive rapid sensory profiling technique that has increasingly been used with consumers. In industry, CATA is applied to probe for consumer product perceptions during product optimisation investigations and to provide results that are comparable to DA (Valentin *et al.*, 2012). Free listing and CATA can be combined to probe the overall perceptions associated with wines. On its own, free listing explores the attributes that the panellists use to describe their tasting experience without enforcing sensory-related descriptions. The analysis of the words generated in free listing was conducted at three levels of abstraction: global, subcategory and synonym attributes. The latter terminology is defined as the integration of theoretical concepts into conceptually complex integrated theory, which will be explained further in the methods and materials section (Strauss & Corbin, 1998). CATA is usually preceded by DA, primarily to obtain a list of attributes that describes the full sensory space of the products in question (Varela & Ares, 2012). This list of attributes forms the basis for CATA, it can be adapted to include other terms necessary to answer the research question.

3.2 Material and methods for benchmarking of Aroma and In-mouth attributes of Chenin Blanc dry wine using Descriptive Analysis

3.2.1 Selection of wines

The aim was to select three commercial wines that were of diverse sensory profiles to investigate the predominant perceptions, specifically among consumers. The selection procedure was conducted within a sample of four Chenin blanc dry wines from producers in Stellenbosch and Paarl area. This entailed informal sensory tasting by three researchers who had experience of Chenin blanc and a final selection was made, where possible biases were taken into consideration at all times; concerning the different sensory profiles which were prominent in each wine and the vastness of sensory profile similarities. In Table 3.1 below, are details of the wines of codes W1, W2 and W3, which were of Fresh, Complex Unwooded and Complex Wooded wine styles, respectively.

Table 3.1 The wine code, brand name, vintage and regions of the three wines which were used in the study.

Wine Code	Wine brand name	Vintage	Wine region
W1	Classic Collection CB	2016	Paarl
W2	Reserve Collection CB	2016	Stellenbosch
W3	Cathedral Cellar Wooded CB	2014	Paarl

3.2.2 Panel training

The 9 panellists who were trained using DA had extensive experience in the evaluation of food products, Chenin blanc in particular. They were all females ranging from 22 to 50 years of age. Training was done in three 2 hour sessions per week; given the fact that there were only three wines and the prior training which the panellists had with Chenin blanc, effective training and judge consistency was achieved within a period of two weeks. The wines were presented in volumes of 30 mL per panellist in black glasses for each session. Two different DA training methods were used, consensus and ballot training for aroma and in-mouth attributes respectively. In each training session, panellists conducted consensus and ballot training followed after an interval of approximately 15 min.

Consensus training: Aroma Attributes

Panellists were introduced to the three Chenin blanc wines, which they were required to smell and provide aroma attributes that they perceived individually. To reach a consensus, the attribute results were shared and discussed by the panellists. The resultant aroma attributes were recorded and the aroma standards were prepared according to Table 3.2. The general aim of creating these reference standards was to assist the panellists in identifying and to assist in the recollection of the attributes, also ensuring that a large number of reference standards were used. In the following sessions, panellists had to smell and identify the reference standards, followed by the identification of the aroma attributes which were perceived in each of the wines using a 100 mm unstructured line scale. As the training sessions proceeded, irrelevant reference standards were omitted and a resultant number of 18 aroma attributes was retained for the analysis of the wines.

Table 3.2 Reference standards of 18 aroma attributes, the actual product used and composition/ quantity presented for DA training.

Aroma attribute	Product used	Composition / Quantity
Peach	Fresh peach	¼ slice peach
Gooseberry	Fresh gooseberries	2 halved gooseberries
Pineapple	Koo canned pineapple	1 cm thick slice of canned pineapple
Guava	Koo canned guava	1 cm thick slice of canned guava
Granadilla	Fresh granadilla	1 cm thick granadilla
Lemon	Fresh lemon	¼ slice lemon
Grapefruit	Fresh grapefruit	¼ slice grapefruit
Yellow Apple	Golden Delicious apple	1 cm wedge fresh yellow apple
Tomato Leaf	Fresh tomato leaf	1 tomato leaf
Dry grass	Straw	Handful of straw
Dried Fruit	Safari dried peach, apple, apricot, pear and prune mixed fruit	Handful of chopped peach, apple, apricot, pear and prunes
Oxidized Apple	Bruised oxidised yellow apple	¼ slice oxidised apple
Vanilla / Caramel	Vanilla essence	1 drop of vanilla essence
Sweet Spice	Robertson cinnamon Robertson cloves	5 mL cinnamon and 5 mL cloves
Muscat	Le Nez Du Vin muscat flavour	1 drop muscat flavour on cotton
Honey	Spar Choice Grade Honey	5 mL honey
Butter	Lurpark Butter	5 mL butter
Toasted Oak	Medium toasted French oak chips	20 g

Ballot training: In-mouth attributes

In this training procedure, a predetermined list of attributes was used to train panellists for the evaluation of in-mouth attributes. These attributes were acidity, sweet taste, body, flavour and concentration. Initially, panellists were instructed to taste the wines and identify the intensities of the in-mouth attributes on a 100 mm unstructured line scale. Similar to a previous study by Crous (2016), the reference of these attributes were provided with the aid of definitions as indicated in Table 3.3. It should be noted that there was no formal or scientific definition for concentration, but which was obtained from popular press and the web page www.winespectator.com. Further explanations were provided by the panel leader and discussions regarding the definitions to obtain consensus and eliminate uncertainties. In the following sessions, panellists conducted the same exercises and definitions were kept as an auxiliary measure and to achieve panel consistency. None of the attributes were discarded as panellists were able to differentiate between the samples based on these attributes.

Table 3.3 In-mouth attribute definitions and references used in the ballot training for DA.

In-mouth attributes	Definition	Reference
Acidity	Initially and generally most noticeable at the tip of the tongue.	Jackson (2009)
Sweet taste	More evident along the sides of the tongue and insides of the cheeks, depending on the individual. Lingers longer considerably than the perceptions of mild sweetness.	Jackson (2009)
Body	Perceived viscosity.	Pickering and Demiglio (2008)
Concentration	When evaluating aroma and flavour, the more pronounced or evident the characteristic, the more intense the wine[1]; concentration of flavour and structural components[2].	www.winespectator.com[1]; Wine and Spirits Education Trust, 2012[2]
Flavour	Integration of retronasal aromas and mouthfeel sensations.	Jackson (2009)

Once the panellists produced consistent results and a consensus was reached for both aroma attributes and in-mouth attributes, the DA analysis of the wines followed.

3.2.3 Sample evaluation

The wines were tested by panellists in triplicate according to a randomised complete block design (Lawless & Heymann, 2010). The test was designed and run on Compusense® *five* Software (Compusense, Guelph, Canada) where the data were also captured (Addendum A). DA was conducted in a testing venue with controlled lighting and separated booths were allocated to each panellist (ISO NORM 8589, 1998). The wines were kept at a temperature of 15°C and the wines were allocated and labelled with a three-digit code. Water and unflavoured crackers were provided for cleansing of the palate.

Initially, the panellists were required to evaluate the aroma attributes of each wine by rating the perceived intensities on an unstructured line (10 cm linear scale) with anchors "none" on the left and "intense" on the right. Thereafter, the in-mouth attributes of the wines were evaluated in the same fashion. Panellists were required to take a break 10 – 15 min between each of the sessions and completion was reached once all three sessions were finished.

3.2.4 Measurement of general wine parameters

Infrared spectroscopy using the Winescan FT120 spectrometer (Foss Analytical, Denmark, 2001) was used to measure general wine parameters pH, volatile acidity, titratable acidity, malic acid, residual sugar, ethanol and glycerol (Table 3.4). The calibration models used were described by Nieuwoudt *et al*. (2004). All three wines had a residual sugar of less than 5 g/L, thus they were dry according to the SA legislation (SAWIS, 2017).

Table 3.4 General wine parameters of wines (W1, W2 and W3) obtained using the Winescan FT120 instrument.

Product	pH	Volatile acidity (g/L)	Titratable acidity (g/L)	Malic acid (g/L)	Residual sugar (g/L)	Ethanol % (v/v)	Glycerol (g/L)
W1	3.35	0.49	5.87	2.17	4.55	12.66	6.31
W2	3.48	0.56	5.67	3.06	4.38	13.53	6.94
W3	3.19	0.59	6.67	2.32	3.51	13.21	7.25

3.2.5 Data analysis

Once the DA of the wines was completed by the panellists, the data were exported to STATISTICA 13.2 ® (Statsoft Inc., www.statsoft.com) for statistical analysis of the data. Firstly, Analysis of Variance (ANOVA) was applied to test for the significance of aroma and in-mouth attributes within the wines and the Least Squares (LS) means test was carried out at the 95% significance level and plots were used to quantify the differences between the samples based on their attribute differences. Principal Component Analysis (PCA) plots were constructed to aid in the multivariate analysis of the sample set and the attributes, providing a representation of the variations which exist between these variables using PanelCheck software (Nofima, Norway).

3.3 Material and methods for the application of free listing and Check-all-that-apply (CATA) in the determination of Consumer perceptions of Chenin blanc dry wine

3.3.1 Consumers

The consumers were sampled based on stratified snowball and consumers were recruited based on the criteria that each participant had to: 1) be a wine consumer residing within the Western Cape Province, South Africa (SA) and 2) be over the SA legal drinking age (18 years and older). Recruitment was applied using emails and were encouraged to invite a person or two who meet the criteria. According to Lawless and Heymann (2010), the adequate sample size for a consumer panel is between 75 and 150. There were 111 consumers, comprising of 39 males and 72 females with age ranges between 18 to 45 years (Table 3.5).

Table 3.5 Gender and age distribution of the consumer panellists

Gender	< 20	20 - 24	25 - 29	30 - 35	> 35	Total
Female	4	39	20	4	5	72
Male	2	21	9	6	1	39
Total	6	60	29	10	6	111

3.3.2 Consumer wine sensory evaluation: free listing & CATA

The consumers were required to evaluate the sensory profiles of the wines using free listing and CATA in a blind tasting. Each method was carried out on Compusense® *five,* which aided in the capturing of the data and samples were presented in clear glasses and randomly placed with a unique three-digit code. The combined duration of the evaluation sessions were approximately 15 min with a 5 min interval between each method.

3.3.3 Free listing data analysis

As shown in Addendum D, the test began with a word association task to make the respondents feel comfortable (Son *et al.*, 2014) , by asking "If I say **the sky** what comes to mind?" and "If I say **white wine** what comes to mind?". The respondents were then required to taste each wine and list five of their own descriptions in the provided textboxes. The instruction was as follows; "Please provide FIVE words that come to mind when tasting the wine". The respondents provided one word per textbox. Free listing was the first method to be applied, followed by the evaluation using CATA. This sequence was used to avoid bias and to ensure that respondents generated their own words in free listing without the influence of the CATA attributes in the list.

3.3.4 CATA data analysis

The 18 aroma attributes that were obtained from DA were further assessed in CATA. The panellists were presented with the three wines in clear glasses that they had to smell and taste the wines and select five aroma attributes from the given list that best described each sample. Another textbox was provided for the respondent to state an additional attribute that was not provided in the list. According to Meyers and Castura (2014) the addition of a comment is to alleviate the chances of a respondent inaccurately associating an attribute which is not on the list with one that is provided.

Free Listing data analysis

A final number of 1665 words was provided by the entire panel and was exported from Compusense® five to *Microsoft* Excel for sorting and preparation for statistical analysis. Sorting of the data proceeded with a thorough inspection of the word list in order to gain an understanding of the associations. The sequence of words for each response was considered in order to aid in further contextualisation of associations. Data analysis followed a sequence of lemmatisation and arrangement of synonyms, construction of contingency tables and correspondence analysis (CA) plots of the wines and the resultant attributes categories.

Text analysis using lemmatisation, arrangement of synonyms and abstraction

Lemmatisation is the identification of the basic meaning of a word, followed by interpretation and reduction to such (Rodrigues *et al.*, 2015). This method was carried out to minimize the total number of words that were provided by the panellists. The lemmatised words were further grouped according to their similarities and patterns or trends within the dataset. The flow of categorisation was at three levels of abstraction as shown on Addendum E. Firstly, the words were grouped based on their synonyms, secondly into subcategory attributes and finally, global attribute categories. These actions were conducted to simplify the words at different levels and to account for potential associations.

The text analysis was carried out by three researchers, who individually analysed the text and then final categories were confirmed in a combined discussion after reaching a consensus on the accuracy of the meanings and categorisation (Ares & Deliza, 2010; Antman *et al.*, 2011; Lawrence *et al*., 2013; Ginon *et al.*, 2014). Overall, there were six global attribute categories; *Positive Emotion*, *Negative Emotion*, *Food Associated*, *Occasion*, *Sensory* and *Technical* which were comprised from 31 subcategory attributes (Table 3.6). Categorisation was based on the general associations of the descriptions provided by the respondents.

Table 3.6 Subcategory and global attribute categories of the words obtained in free listing.

Subcategory attributes	Global attribute Category
Excitement, Romanic, Mental Stimulation, Pleasure, Aspiration, Preference	Positive Emotion
Bewilderment, Discontentment, Dislike	Negative Emotion
Cheese, Meat, Food, Pasta, Seafood, Dessert	Food Associated
Meal Time, Leisure Time, Seasonal	Occasion
Taste, Aroma, Appearance, Mouthfeel, Flavour, Finish, Integration	Sensory
Viticulture, Chemistry, Cultivar, Age/Aging, Oenological, Quality	Technical

Analysis of global and subcategory attribute categories

The data were exported from Microsoft Excel to STATISTICA 13.2 ® (Statsoft Inc., www.statsoft.com) in preparation for statistical analyses. Frequency tables of the global, subcategory and attribute synonyms were prepared per wine. To further investigate the perceptions of the panellists, correspondence analysis (CA) was then performed on these three levels to capture the attributes which were mentioned frequently within each level of abstraction. Finally, frequency counts of the words which were not of sensory origin were made to obtain insights of word categories the respondents mentioned the most.

Analysis of the sensory subcategory attributes

The *Sensory* global attribute category consisted of the subcategory attributes; *aroma*, *taste*, *appearance*, *mouthfeel*, *flavour*, *finish* and *integration*. The attributes provided by the

respondents were carefully allocated to suitable categories based on the definitions by Jackson (2009). The reoccurrence of these attributes was recorded using frequency counts and correlations were investigated with the aid of CA plots. Supplementary observations were made between these results and those which were obtained from the DA panel.

CATA Data analysis

The data of the 18 aroma attributes that were evaluated using CATA was exported from Compusense® *five* into *Microsoft* Excel for sorting and was exported to STATISTICA 13.2 ® (Statsoft Inc., www.statsoft.com) where statistical analysis was conducted. The data were binary; either having a value of 0 or 1, each indicating the presence or absence of the perceived attribute in the wines, respectively. Frequency counts of each selected attribute per wine sample were made based on these results. Cochran's Q-test was carried out to analyse significant differences between the samples at a 90% confidence level, followed by the construction of correspondence analysis (CA) plots, which provided the graphical representation of the results.

It was of interest to calculate and compare the similarities between the results obtained from the three methods, which can be done by calculating the RV coefficient (Robert & Escofier, 1976). This measurement is used to quantify the similarities between two different configurations (Escoufier, 1973). However, as there were three wines used in this study, calculating the RV coefficient between the configurations of the CA plots obtained in free listing and CATA, and the PCA plots obtained in DA would not be statistically sufficient.

3.4 Results and Discussion

3.4.1 Descriptive Analysis (DA)
Aroma Attributes

The data retrieved from DA were analysed using a two-way ANOVA to ascertain whether samples differed significantly per attribute. The aroma attributes which illustrated similar intensities in all three wines were Grapefruit, Dry grass and Muscat ($p > 0.05$). Conversely, as indicated in Table 3.7, the mean intensities of the aroma attributes granadilla, dried fruit, honey, butter and toasted oak varied significantly ($p = 0.00001$).

Table 3.7 Aroma attributes evaluated in DA and p-values (obtained using ANOVA).

Aroma Attribute	P-value
Peach	0.00105
Gooseberry	0.00114
Pineapple	0.00046
Guava	0.00677
Granadilla	0.00001
Lemon	0.00323
Grapefruit	0.31097*
Yellow Apple	0.00076
Tomato Leaf	0.0201
Dry Grass	0.64925*
Dried Fruit	0.00001
Oxidised Apple	0.02105
Vanilla / Caramel	0.00848
Sweet Spices	0.00016
Muscat	0.70764*
Honey	0.00001
Butter	0.00001
Toasted Oak	0.00001

*p > 0.05 = not significant

A post-hoc investigation was conducted with the aid of the Least Squares (LS) Means to identify attribute differences between the wines. Principal Component Analysis (PCA) plots were made with the aid of PanelCheck software (Nofima, Norway) to find the relationships between the attributes and the samples.

In the LS means plots (Addendum B), wine sample W3 had significantly lower mean intensities for peach, gooseberry, pineapple, guava, granadilla, lemon, yellow apple and tomato leaf aroma attributes (e.g. p = 0.02010). In contrast, wine sample W3 had significantly higher intensities for the aroma notes Dried fruits, oxidised apple, vanilla / caramel, sweet spices, honey, butter and toasted oak aroma attributes (e.g. p = 0.00001). The aforementioned attributes were prevalent due to the wood treatment of the wine style (Complex wooded). The wines W1 and W2 yielded similar intensities to each other for all the aroma attributes. Thus the aforementioned wines did not differ significantly (p≤0.05) in terms of aroma profile, however as indicated on the LS means plots, the aroma profile of these two wines were significantly different from that of wine W3.

Figure 3.1 displays a PCA bi-plot that was constructed with the aim of investigating the relationships between the three wines and aroma attributes. The PCA provides a visual representation of the maximum variability, as well as the proximities among the wines and aroma attributes with principal component 1 (PC1) explaining 98% of the variance. On the left

of PC1 there was clear separations of the samples, W3 as positively associated to the aroma attributes butter, toasted oak, dried fruit and sweet spices. On the right of PC1, wines W1 and W2 seemed to associate with all the fruit-associated aroma attributes as well as Tomato Leaves. Although the attribute intensities of these two wines were not significantly different (Addendum B), it seems that, according to Figure 3.1, that wine W2 associated more with Lemon and Tomato Leaves and wine W1 more with the aroma note Yellow Apple.
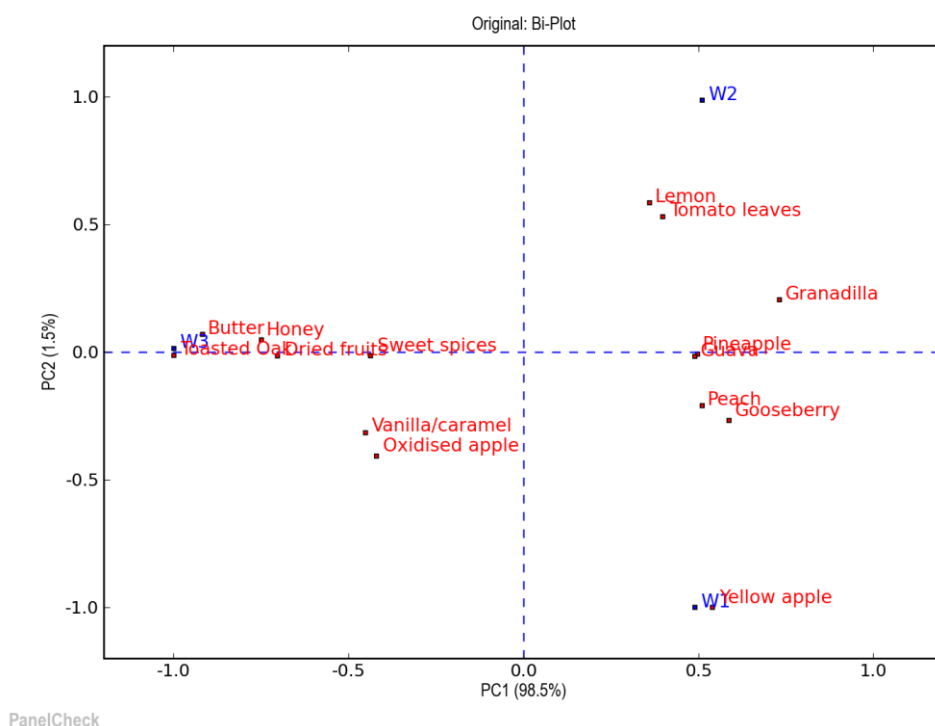
Figure 3.2 Principal Component Analysis (PCA) bi-plot of the wines (W1, W2 and W3) and aroma attributes using DA data (Obtained from PanelCheck).

In-mouth attributes

The In-mouth attributes were analysed in the same fashion as the aroma attributes. A two-way ANOVA was run on STATISTICA 13.2 ® (Statsoft Inc., www.statsoft.com) to test for the statistical differences of the in-mouth attributes by calculating their individual p-values. As shown on table 3.8, the samples differed significantly per in-mouth attribute. The LS means test was used to determine whether the wines differed significantly in terms of in-mouth attribute intensities (Addendum C). A PCA was conducted to assess sample-attribute associations of the in-mouth profile (Fig. 3.2).

Based on the LS means plots in Addendum C the W3 wine sample was significantly higher in its acidity, body, concentration and aftertaste ($p \leq 0.05$). This wine also had significantly lower sweet in-mouth intensity. Similar to the aroma attributes, wines W1 and W2 yielded inverse intensities. These two samples were lower in their acidity, body, concentration and aftertaste.

A PCA bi-plot was also constructed for the purpose of representing the relationships between wines and the in-mouth attributes (Fig. 3.2). The explained variances that were calculated were at 98.5.31% (PC1) and 1.5% (PC2).

Table 3.8 In-mouth attributes evaluated during DA and p-values (Obtained using DA).

In-mouth attributes	P-value
Acidity	0.00095
Sweet taste	0,00953
Body	0,0088
Concentration	0,00522
Aftertaste	0,00023

According to the PCA plot (Fig. 3.2), wine sample W3 was in close proximity to the attributes concentration, acidity, aftertaste and body, which is indicative of a strong association. Wine sample W1 associated with the sweet in-mouth attribute. Similar to the aroma attributes (Addendum B), both wines W1 and W2 did not differ significantly ($p>0.05$) in in-mouth attribute intensities.
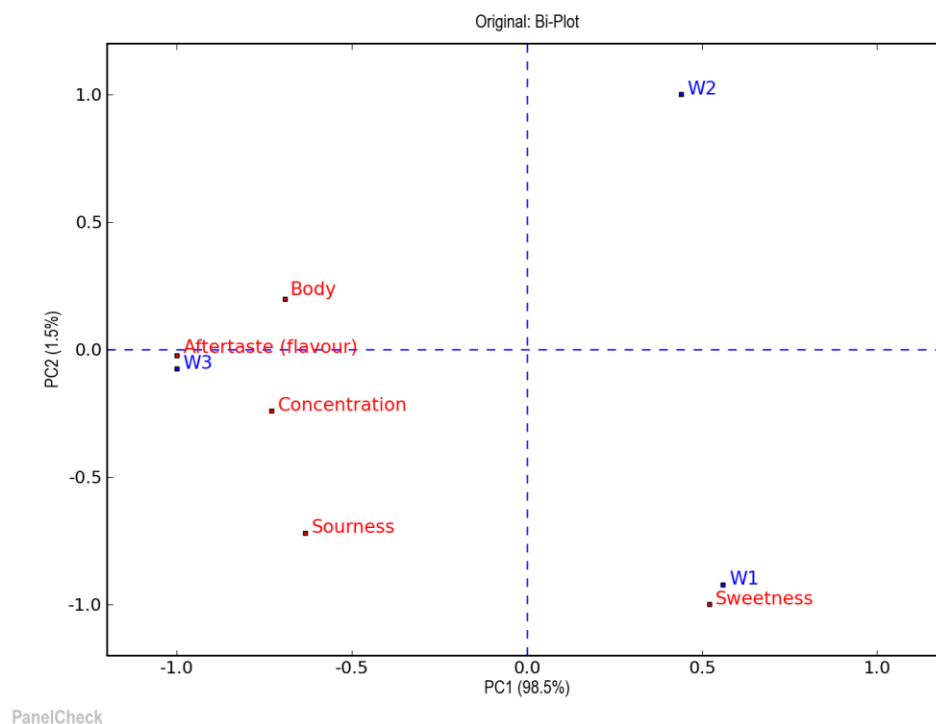
Figure 3.3 Principal component Analysis (PCA) bi-plot of wines (W1, W2 and W3) and in-mouth attributes data from Descriptive Analysis (Obtained from PanelCheck).

3.4.2 Free Listing

Frequency counts of the global and subcategory attributes were calculated and used as input data for the correspondence analysis (CA) plots using STATISTICA 13.2 ® (Statsoft Inc., www.statsoft.com) to provide a visual representation of the proximities between the wines and attributes. These representations were made to explore potential associations of words and samples, primarily to gain insight on how consumers described the samples. Figure 3.3 is a representation of the relationships between the six global attribute categories formed in free listing and wine samples. Furthermore, Figure 3.4 is a CA plot showing the wines and the captured subcategory attributes of word counts of 50 and above. Based on the results obtained on the previous CA plots (Fig. 3.3 and 3.4), further explorations of the global attributes; *positive emotion*, *negative emotion*, and *occasion* and *food pairing*, were made at a lower level of abstraction with the aid of a CA plot in Figure 3.5. The aroma profiles of the samples were investigated by means of a CA plot in Figure 3.7. Careful interpretations were made about the CA plot as this is an exploratory technique that does not include statistical significance (Valera & Ares, 2014). Thus potential patterns were interpreted in the context of the results obtained from the particular sample of respondents. Analysis of the data obtained from in-mouth attributes were not conducted due to the low number of variables in this category.

An Exploration of the relationships between Global attribute categories and wine samples

Figure 3.3 is a CA plot explaining 93.49% and 6.509% of the variance on Dimensions 1 and 2, respectively. Samples W1 and W2 were separated from W3 on Dimension1. The attributes, *sensory* and *technical* were situated close to the origin of the plot, which indicated that they did not influence the positioning of the other attributes on the plot and there was no distinctness of these attributes within the sample set. The attributes *negative emotion* and *food associated* were opposing the attributes *positive emotion* and *occasion.* Therefore, as indicated on the CA plot, negative emotions were correlated to food associated attributes and positive emotions were highly correlated to occasion-related attributes. Based on the samples, W1 was correlated to *negative emotion* and *food associated* attributes and the other two samples, W1 and W2, had more correlation to the attributes *positive emotion* and *occasion*.
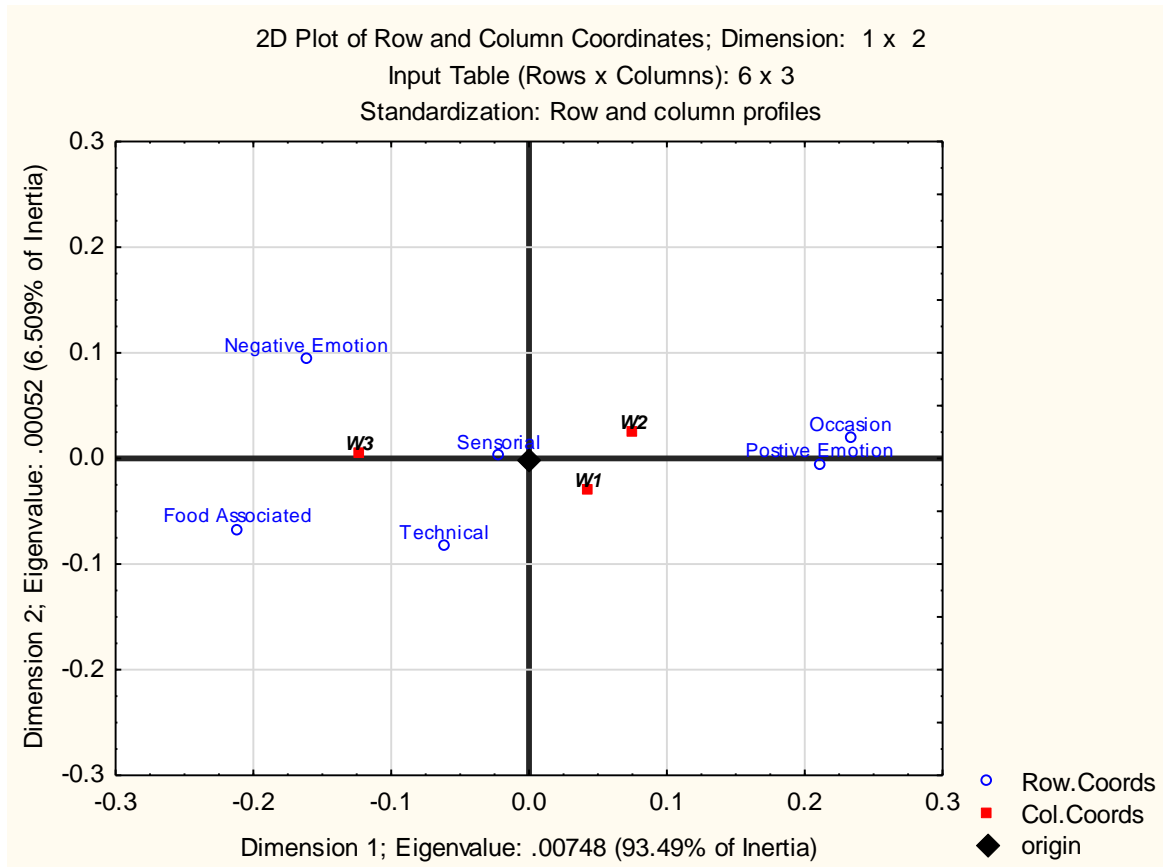
Figure 3.4   Correspondence analysis (CA) plot indicating representation of the Global attribute categories (positive emotion, negative emotion, food associated, occasion, technical) and the three wines (W3, W1, W2). Variance explained: 93.49% (Dimension 1) and 6.5% (Dimension 2).

## An Exploration of the relationships between Subcategory attribute categories and wine samples

Figure 3.4 is a representation of the subcategory attributes with word counts of 50 or more which were elicited for the sample set of wines. There were six attributes, of which five (*aroma*, *integration*, *flavour*, *mouthfeel* and *taste*) were of sensory origin and the attribute *pleasure* was from the *positive emotion* global category. Within the CA plot, dimensions 1 and 2 captured 89.97% and 10.03% of the explained variance. The wines W1 and W2 were again separated from W3. The *pleasure* attribute was the most separated and distinct from the other attributes, whereas all the other attributes were closer to the origin.
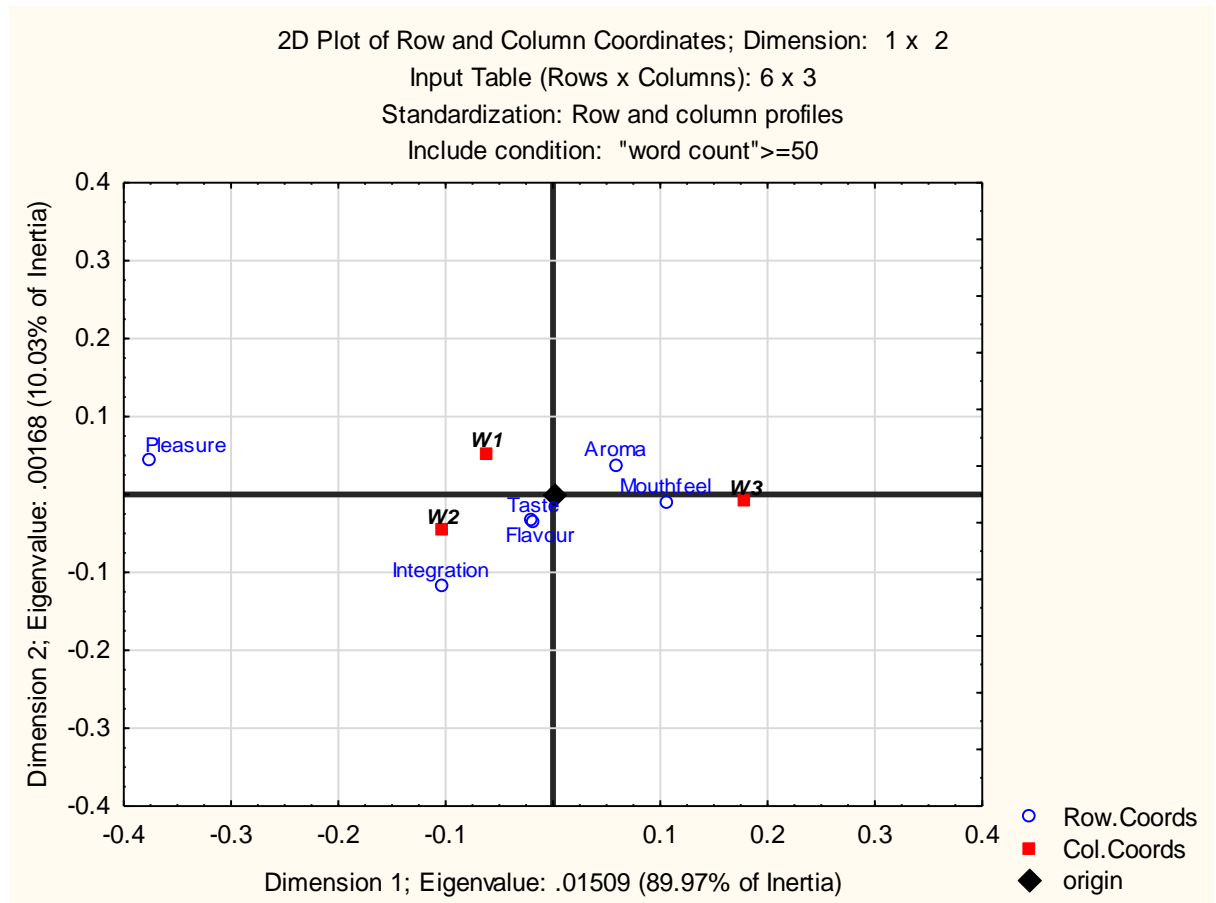
Figure 3.4 CA plot with a representation of the subcategory attributes of a word count of more than 50 (aroma, integration, flavour, mouthfeel, pleasure and taste) associating with the wines (W3, W1 and W2). Variance explained = 89.97% (Dimension 1) and 10.03% (Dimension 2).

Explorations of synonym attributes

As seen in Figures 3.3 and 3.4, there was no distinction between the *sensory* and *technical* attributes which were provided in free listing. Figure 3.5 was constructed to explore, at a lower level of abstraction, the specific attributes which were prevalent in the sample set. The explained variance for dimension 1 and 2 was 79.65% and 20.35%, respectively. A word count limit of 20 was set to capture the attributes which had the most elicitations and a total of ten attributes fell within this limit. Frequency Table F1 of these attributes is provided in Addendum F. The wines (W1, W2, and W3) were more separated in this plot. The attributes *calm*, *alcoholic*, *appearance*, *integration* and *pleasant* were situated further from the origin, indicating differentiation within the plot.
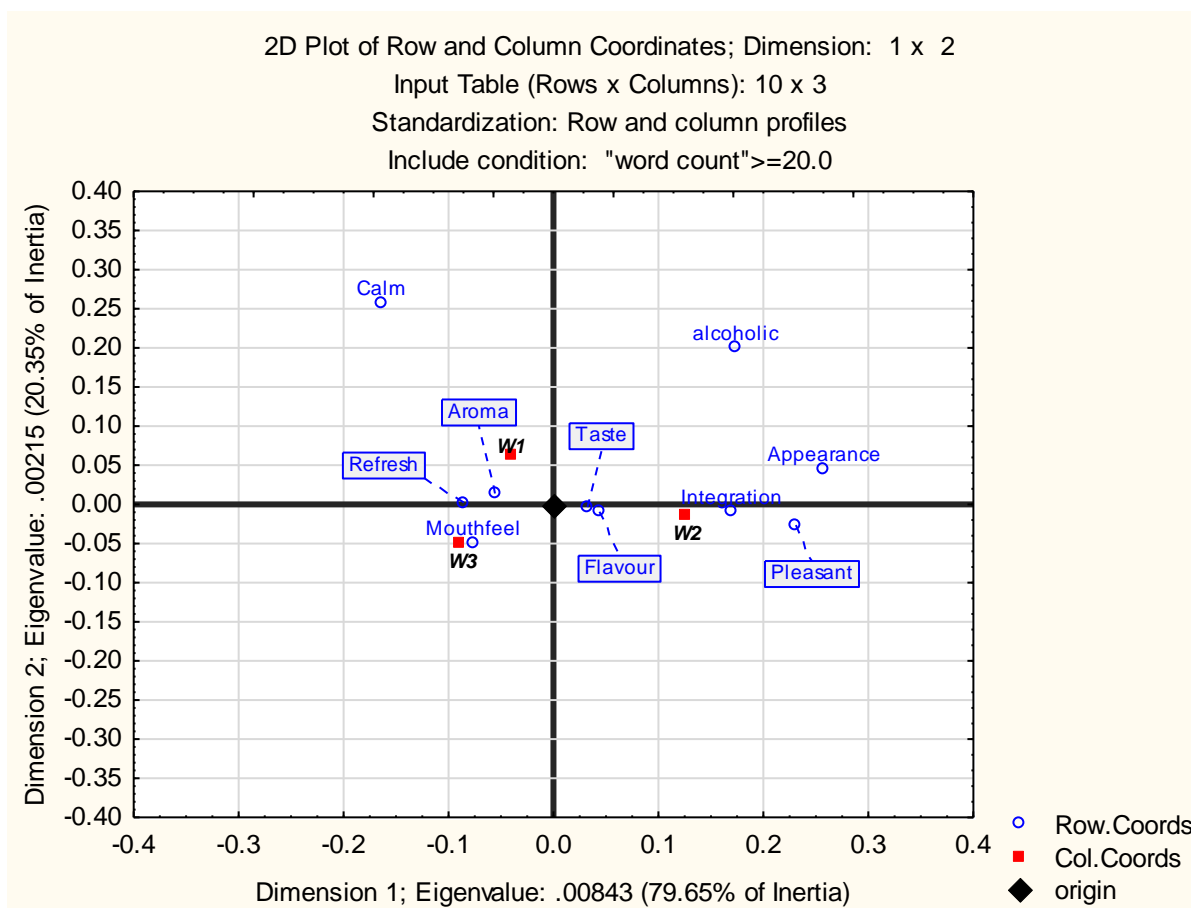
Figure 3.5 CA plot showing *a* representation of *the* association of Synonym attributes (alcoholic, appearance, aroma, calm, integration, mouthfeel, pleasant, refreshing, flavour and taste) of frequencies greater and/or equal to 20, and wines (W1, W2 and W3). Variance explained = 79.65% for Dimension 1 and 20. 35% for Dimension 2.

Figure 3.6 is a representation of the synonym categories which were not of sensory origin; *pleasant*, *calm*, *refresh* and *alcoholic*, with frequencies of 69, 21, 20 and 20, respectively. The attribute category *pleasant* was mentioned the most and had the highest association to the wine sample W2 and the sensory attribute *integration*. The attributes *alcoholic* and *calm*, were different from the other attributes, and the latter had a higher association with wine sample W1. *refreshed* was situated close to the origin, thus it was not distinct among the wine samples.
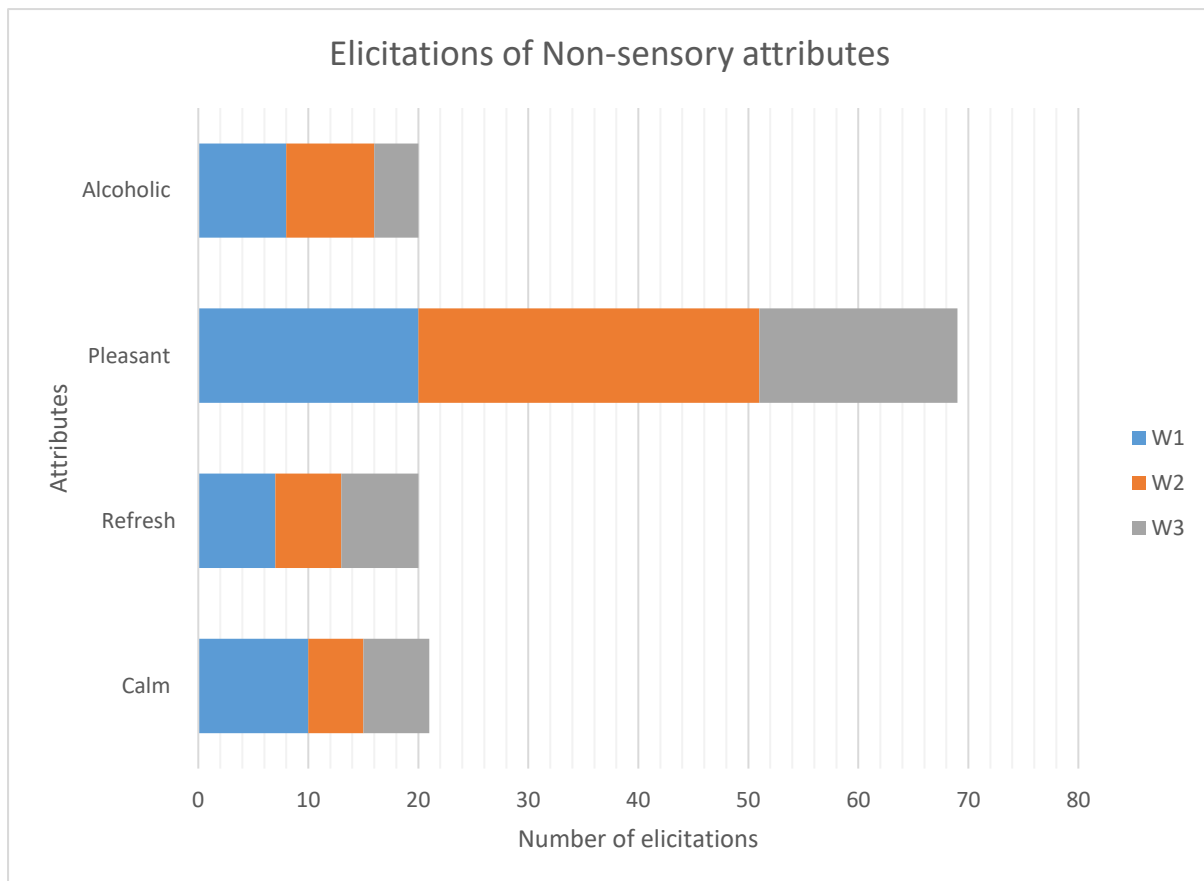
Figure 3.6 The elicitation of words which were not of sensory origin with frequencies greater than 20; alcoholic, pleasant, refresh and calm. (Obtained from *Microsoft* Excel).

Exploratory aroma profiling of the wines from free listing associations

Based on frequency counts, of eight and above, 11 classes of aroma attributes were provided by the respondents. A CA plot (Fig. 3.7), illustrating an explained variance of 86.43% on dimension 1 and 13.57% on dimension 2, was constructed to investigate the aroma characteristics of the wines. In this CA plot, W1 is on the negative side of Dimension 1 and W3 on the positive side of Dimension 1. Wine sample W2 is situated in between W1 and W3. There is a high correspondence between wine sample W1 and the attributes *fresh*, *floral*, *fruit* and *aroma*, W2 was closer to attributes *spice*, *citrus* and *tropical*, to a lesser extent and W3 to *honey*, *wood*, *earthy* and *nutty*.
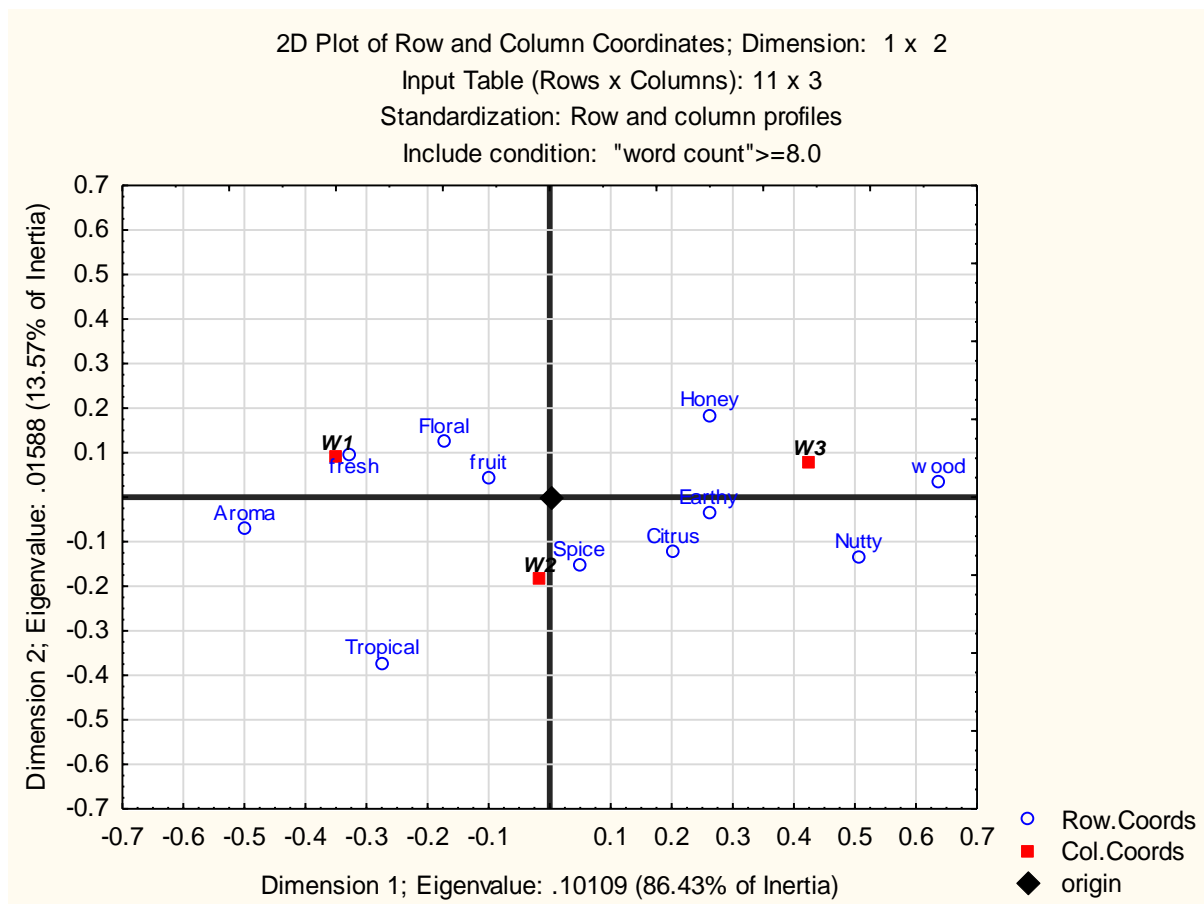
Figure 3.7 CA plot showing a representation of the words belonging to the 'Aroma' attribute subcategory of a word count equal to and/or more than 8, with the wines W1, W2 and W3 at an 86.43% (Dimension 1) and 13.57% (Dimension 2) (Obtained from STATISTICA 13.2 ®).

3.4.3 CATA

Exploring the relationships between aroma attributes and the wines using CATA

The data obtained from the CATA method were statistically analysed using STATISTICA 13.2 ® (Statsoft Inc., www.statsoft.com). Cochran's-Q test was used to test for the significance of each attribute at a confidence interval of 90% to yield the p-value. As seen on Table 3.9, 9 of the attributes were statistically significant (≤90%).

Table 3.9 The 18 attributes used in CATA sensory analysis of the wines and p-values obtained from the Cochran's Q-test (Obtained from STATITSICA®).

Attribute	p-value
Peach	0.04
Gooseberry	0.05
Pineapple	0.35*
Guava	0.01
Granadilla	0.01
Lemon	0.32*
Grapefruit	0.05
Yellow Apple	0.26
Tomato Leaf	0.79*
Dry Grass	0.74*
Dried Fruit	0.26*
Overripe Apple	0.06
Vanilla/caramel	0.01
Spice	0.67*
Muscat/Sweet grape	0.49
Honey	0.00
Butter	0.00
Toasted oak	0.00
Other	0.76*

* $p > 0.1$ = not significant

CA plots were made to provide representations of possible relationships between the wines and the 9 statistically significant aroma attributes on Statsoft STATISTICA 13.2 ® (Statsoft Inc., www.statsoft.com). Figure 3.8 is a CA plot with 89.97% of the explained variance on Dimension 1 and 10.03% on Dimension 2. Wines W1 and W2 were on the same side of dimension 1, however, there were differences observed among all three samples. Wine sample W1 was close to the attributes grapefruit, gooseberry and peach, W2 to granadilla and guava, and W3 to toasted oak, butter, honey, overripe apple and vanilla / caramel.
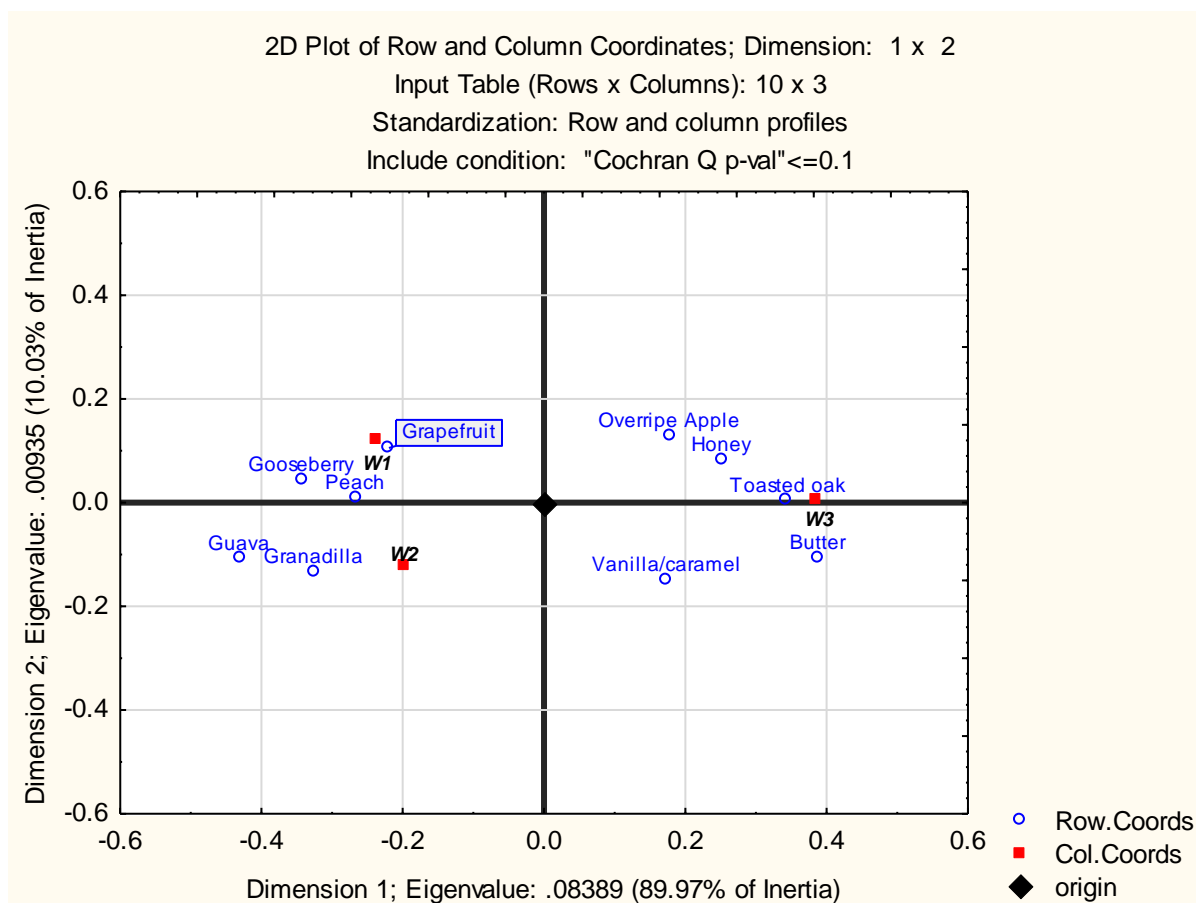
Figure 3.8 CA plot of the 10 aroma attributes which were statistically significant at Cochran's Q value and the wine samples; W1, W2 and W3 evaluated using CATA at an explained variance of 89.97% (Dimension 1) and 10.03% (Dimension 2) (Obtained from STATISTICA 13.2 ®).

3.4.4 Interactions between DA, free listing and CATA: Benchmarking, Generation and Selection of attributes.

Aroma attributes obtained in DA, free listing and CATA

DA was conducted to profile the sensory attributes (18 aroma and 5 in-mouth attributes) of the wines using a trained panel. Statistical procedures by means of a two way ANOVA showed three aroma attributes (dry grass, grapefruit and muscat) did not differ significantly between the three wines. According to LS means results and PCA bi-plots W3 showed significantly higher or lower intensities for the latter attributes. In CATA, according to the Cochran's Q test, wine W3 was significantly different when compared to the other two wines for most of the attributes. These results thus show that DA and CATA are quite comparable as profiling methods, in both methods the same attributes were used to describe the sensory profile of the respective wines.

Free listing was more distinct as respondents provided words spontaneously, the only restrictions being the number of words. Table 3.10 is a representation of the attributes which

correlated to the samples based on the respective methods which were conducted: DA, free listing and CATA. There were similar attributes among all three methods. Moreover, as already mentioned, DA using a trained panel and CATA using consumers had similar findings due to the fact that both methods evaluated the same attributes. Due to the limited number of samples tested, it was not possible to quantify the similarities or differences by using RV coefficients.

Table 3.10 Aroma attributes obtained from DA, free listing and CATA for the wines W1, W2 and W3.

Wine Sample	Aroma Attributes		
	DA	Free Listing	CATA
W1	Yellow Apple, Peach, Gooseberry	Fresh, Floral, Fruit, Aroma	Grapefruit, Gooseberry, Peach
W2	Lemon, Tomato Leaf, Granadilla	Spice, Citrus, Tropical	Granadilla, Guava
W3	Honey, Butter, Toasted Oak, Dried Fruit, Sweet Spices	Honey, Wood, Earthy, Nutty	Honey, Toasted Oak, Butter, Vanilla / Caramel

Free listing introduced attributes which described the respondents' sensory aroma and non-sensory perceptions. For instance, the attribute fresh corresponded to the sample W1, placing emphasis on its relevance as a significant attribute to consumers. Furthermore, classes of objects were also provided by the respondents, such as fruit, *citrus* and *wood*, which were corresponding to the resultant attributes in DA. Thus, in addition to being able to identify supplementary attributes, the respondents were able to elicit similar attributes as the trained panel within shorter time frame. Similar findings were obtained in studies which applied free comment (Lawrence *et al.*, 2013) and free citation-based methods(Campo *et al.*, 2010), where there were similar attributes between DA and these alternative methods. In a study conducted by Dos Santos *et a*l. (2015), there were more similarities between results obtained from free listing and Quantitative Descriptive Analysis (QDA) (Dos Santos *et al.*, 2015), thus emphasizing the effectiveness of free listing in sensory characterisation by a panel of consumers.

The association of free listing attribute categories

The aim of using free listing as an evaluation method in this study was to gain a broader understanding of the consumers' perceptions by encouraging them to provide descriptions that were subjective and not necessarily of sensory meaning. The development of these categories was carried out on different levels of abstraction; global, subcategory and synonym attributes, based on themes of the descriptions that were provided by the consumers. Thereafter, frequency counts of the variables (attribute categories per wine) were made, followed by the construction of CA plots.

The application of free listing enabled and encouraged the respondents to suggest their emotions, thus providing the emotional association that consumers have with wine. The emotions which were experienced by the respondents during consumption can provide indications of the acceptability the product, and the associations can reveal what the product is communicating to its consumers (Thomson *et al.*, 2010).

Global Category associations

The CA plots indicated that W3 prompted emotions that were negatively connoted, associating with subcategory attributes *bewilderment*, *discontentment* and *dislike* (Addendum E). This wine was also more likely to be associated with food than the other wine samples. On the other hand, W2 and to a lesser extent, W1, evoked emotions that were positive (subcategory attributes; *excitement*, *romantic*, *mental stimulation*, *pleasure*, *aspiration* and *preference*) and were associated with occasions.

Subcategory associations

According to the CA plots the emotion *pleasure* was the only attribute that was not of sensory meaning and was separated from the other attributes in the plot. Thus this attribute differentiated between the wine samples, W1 and W2 both associated more to the attribute Pleasure than W3.

Synonym attribute category associations

The attributes that were captured within this category, with a word count of 20 and above and were not of sensory meaning, were *pleasant*, *calm* and *refresh*, and *alcoholic*. In the current study the emotion *pleasant* was mentioned the most, especially associating with wine W2. In their study of developing of a list of emotional wine adjectives among Italian wine consumers, Ferrarini *et al.* (2010) also found that intense pleasure was mostly associated with wine consumption.

Calm, alcoholic and *refreshed* were used in a similar fashion for all three wine (W1, W2, and W3). In other studies (Yang *et al.*, 2002; Charters & Pettigrew, 2008; Silva *et al.*, 2016), the emotion 'to feel relaxed' (similar the attribute *calm)*, was the most popular emotional response which was associated with wine consumption. Thus the obtained results of the current study are of relevance to wine choice and the consumption thereof.

Free listing as an innovative method

In other studies, free listing was advantageous in that it identified motives which were suggestive of wine purchase decisions, providing an overview of the factors that may influence

consumer decisions (Ginon *et al*., 2014). The associations of certain wines with sensory or non-sensory attributes enhance the awareness of industry about the way in which its consumers perceive the product in question. Interesting results came about in the current study indicating that consumers used specific positive emotions and sensory attributes to describe the respective wines. These associations elicited by this group of consumers, have potential for industry to obtain the most significant drivers of consumer liking. Furthermore, these outcomes will aid in providing knowledge about the attributes that consumers use to describe certain wines and the possible emotional responses that are experienced when a particular wine is consumed, which can be a decisive factor on the consumer purchase decisions (Desmet & Schifferstein, 2008). The choice of the language used in packaging has an influence of how the information is evaluated and used to form purchasing choice or judgement (Meyers-Levy *et al*., 2010). Therefore, the attributes obtained from this particular kind of experiment provide indications of the language which industry could use.

3.5 Conclusions

The primary aim of this chapter was to explore sensory profile and consumer perception of Chenin blanc dry wine using different methodologies, i.e. DA, CATA and free listing. DA was used as a profiling technique, where 18 aroma and 5 in-mouth attributes were evaluated by a trained panel. In CATA, the same list of aroma attributes were used, however in this instance the panel was a group of wine consumers. The attributes that were elicited by the latter group of consumers in free listing were categorised according to different levels of abstraction (global, subcategory and synonym attributes). This approach was aimed at investigating consumer insights (emotional and product-specific) when drinking wine. There were similarities between the aroma attribute results obtained in DA, free listing and CATA, especially for W3.   However, there was no distinctness between W1 and W2 in terms of the sensory attributes and elicited emotional responses.

Chapter 4 will explore consumer and industry professionals' perceptions and opinions using qualitative and quantitative methods towards wine, and Chenin blanc, in particular. Insights about the extrinsic and intrinsic factors which influence consumer perceptions of wines could further influence the marketing of Chenin blanc.

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Chapter 4

Quantitative and qualitative explorations of the perceptions of Chenin blanc wine between consumers and industry

4. Quantitative and qualitative explorations of the perceptions of Chenin blanc wine between consumers and industry professionals

4.1 Introduction

One of the main challenges for marketing and consumer studies is understanding the motivations that drive consumer choice (Spinelli *et al.*, 2014). The application of sensory methods in the industry is advantageous in that it provides validated data to attain goals within the product's sensory space. However, these methods may not explicitly provide the required insights of the consumers' feelings and motivations (Danner *et al.*, 2017). The ability to predict actual consumer food choice behaviour using consumer acceptability measurements is limited, therefore methods which will address these disparities are needed. According to Bredahl *et al.* (1998), to achieve consumer acceptance of a particular product, there is a need to translate consumer demands into product specifications that are actionable for the producer. One way of obtaining the demand of a consumer is through consumer research qualitative data collection methods such as focus groups, individual in-depth interviews, observation and projective techniques (Webb, 1992).

The primary aim of consumer research is to produce knowledge about consumer behaviour (Calder & Tybout, 1987). By obtaining the insights and understanding of consumer behaviour, producers and marketing strategists have the ability to identify the preferences, motivations and buying behaviour of current and potential consumers. In the wine industry, consumer perceptions about intrinsic and extrinsic factors plays a major role in their purchase behaviour. Thus investigating the role of such factors will provide the industry with the adequate tools to formulate effective and efficient strategies to implement innovative marketing strategies to target prospective consumers. Furthermore, the insights about the opinions and perceptions from the industry's perspective aids in the comparison of the market and the industry, to better understand market-industry dynamics.

The previous chapter investigated the sensory perceptions of a sample set of Chenin blanc wines among consumers. Sequentially, the current chapter aims to explore the perceptions of the same consumers with the aid of a questionnaire. To obtain a greater scope of insight, industry professionals were requested to complete a separate questionnaire that probed for their perceptions and inputs about the SA wine industry, specifically regarding Chenin blanc wine. The responses of both consumer and industry professionals were analysed with the aid of qualitative and quantitative techniques. The results of this exploration are aimed at providing a broader perspective and understanding of wine consumers in SA. Furthermore, to address

the aspects which are in need improvement based on the respective outputs of the questionnaires.

4.2 Theoretical Background: Consumer perceptions and positioning of Chenin blanc wine

4.2.1 Consumer perceptions and opinions about Chenin blanc wine

In order to communicate the story of a product it is essential to know the audience for which it is intended. The perceptions and opinions of wine consumers in South Africa (SA) may not be widely known, especially concerning Chenin blanc wine, due to the low number of publications that have investigated this aspect.

Based on a review by Francis & Williamson (2015), there are varied opinions to be associated with demographic aspects such as gender, age, level of involvement in wine and the psychographic profiles of the consumers, food 'neophobia' or genetically based psychological differences. Therefore investigating behavioural and more so, the psychographic variables among consumers, will provide a better understanding of their perceptions. Furthermore, the understanding of how consumers perceive Chenin blanc wine will provide insights of where improvement and innovation could be implemented in order to gain the acceptance of consumers, shedding some light on the communication and positioning of Chenin blanc in the SA wine industry.

4.2.2 Communication and positioning of Chenin blanc to consumers

The understanding of the motivations of consumers is important in the implementation of successful marketing strategies, primarily communication strategies (Vehapi, 2015). Due to the complexity of wine as a product, effective measures are essential in its market positioning, which especially applies to Chenin blanc in the context of the SA wine industry. Brands with high awareness have the advantage of being considered compared to those with low awareness (Schiffman & Kanuk, 2009). Therefore measures and initiatives are needed to communicate the uniqueness and offerings of Chenin blanc to the market by expressing the appropriate narrative to gain the awareness of consumers. Regarding wine and Chenin blanc having the adequate knowledge about the impressions and perceptions of the consumers will aid in its better communication and positioning within the desired markets.

From this theoretical background, it is evident that there is an interplay between consumer perception and market positioning. For the product to be well communicated and positioned to its market, industry needs to be aware of the market's perceptions and preferences. Thus, this chapter is an exploratory study aimed at uncovering the perceptions regarding Chenin blanc among consumers and industry professionals.

4.3 Methods and materials

In this chapter, two exploratory questionnaires were designed to probe the opinions and perceptions of wine consumers and industry professionals. Firstly, a questionnaire was designed to explore consumers' consumption behaviour regarding wine and Chenin blanc specifically, the impact and efficiency of the SA wine industry initiatives on consumer perceptions and wine consumption. Secondly, a questionnaire was designed to explore industry professionals' perceptions and opinions regarding the SA wine industry and the positioning of Chenin blanc in the market. Other investigated aspects were the initiatives and efforts that have been made by the wine industry to improve the image and awareness of the cultivar and how to further improve initiatives to increase consumption of Chenin blanc wine. The information obtained from both questionnaires consisted of responses from open and closed-ended questions that were analysed using qualitative and quantitative analysis respectively.

4.3.1 Recruitment and sampling

Wine consumers were sourced based on the criteria mentioned in section 3.3.1 of the previous chapter. Wine industry professionals from different disciplines (Sommelier, Winemaker, Marketing, Sales, and Media) were invited through emails to participate in the study and were provided with a link that was directed to the survey (Addendum I).

4.3.2 Questionnaire topics

To gain insights about potential aspects of the SA Chenin blanc wine industry that need to be uncovered, preliminary meetings were conducted with wine industry professionals from different disciplines; a sommelier, wine consultant and winemaker. Based on the meetings, it was evident that the insights of industry and the market needed exploration. The minutes from the meetings were aggregated and focus points were established to form topics to be investigated with both consumer and industry professionals' questionnaire. Furthermore, similar topics were incorporated in the two questionnaires to provide a comparison of the various responses.

Consumer questionnaire topics

The aim of constructing the consumer questionnaire was to explore the perceptions and opinions of the respondents. The information obtained from the preliminary meetings and the application of market segmentation variables such as demographics, psychographics, and behaviour aided in the finding of themes to be explored in the study, as shown in Table 4.1.

Demographic concepts

The socio-demographic status of the respondents was age, gender, and income level.

Behavioural concepts

The consumption behaviour was investigated regarding the exposure of the respondents to Chenin blanc wine, frequency and duration (i.e. how long they have been drinking wine) of their consumption, and the influence of price on their buying habits.

Psychographic concepts

These concepts investigated the opinion differences and/or similarities of the respondents. The aspects were related to; the respondents' cognition of wine, what they consider as positive and negative qualities of Chenin blanc, the perceptions of Chenin blanc's wine style popularity and purchase intent. The awareness and preference of Chenin blanc wine styles, the importance of wine labelling information on their purchasing of wine and Chenin blanc in particular, the influence of intrinsic and extrinsic cues on their buying of Chenin blanc, as well as their impressions of off-trade and industry professionals were also investigated.

Table 4.1 The topics explored in the questionnaire and the information categories; Behavioural, Demographic, and Psychographic.

Topics	Questionnaire Topic Concepts		
	Demographic	Behavioural	Psychographic
Socio-demographic status	x		
Exposure to Chenin blanc wine, wine consumption frequency and duration of consumption		x	
Consumption of different types of white wines		x	
Role of price on wine purchasing		x	
Cognition of wine			x
Positive and negative qualities of Chenin blanc			x
Popularity, awareness and preference of Chenin blanc and its wine styles			x
Purchase intent, awareness and preference of Chenin blanc wine styles		x	x
Role of intrinsic and extrinsic cues on the buying of Chenin blanc		x	x
Importance of wine labelling information on purchasing of wine and Chenin blanc wine			x
Impression of off-trade and industry professionals among respondents			x

Industry professional questionnaire topics

The opinions about Chenin blanc's positioning in the SA wine market and possible inputs that could be implemented to improve thereof were investigated within the industry professionals' questionnaire. The aim was to gain a better understanding of the perspectives of the industry

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and to explore more innovative measures to communicate and position Chenin blanc to the market. The addressed topics in the questionnaire were segmented into the opinions and inputs.

Opinion concepts of industry professionals

The questions were constructed to gain a better perspective of the Chenin blanc wine from the understanding of the industry professionals, pertaining to; the contextualisation (positive and negative) thereof, market positioning and challenges that face Chenin blanc as a single varietal in the SA wine industry. The effectiveness and efficiency of industry initiatives that promote wine and Chenin blanc in particular was explored to propose alternatives that can be implemented to better the position of Chenin blanc in the SA wine industry.

Inputs concepts of industry professionals

The focus on the inputs in this questionnaire was aimed at exploring the initiatives that have potential to be implemented in the SA wine industry to improve Chenin blanc's market positioning. The respondents were asked questions relating to; the improvement of Chenin blanc's popularity, the encouragement of certain segments (e.g. black consumers) of the consumer market, and the messages that Chenin blanc should have for its consumers.

Linking topics of questionnaires

Within both questionnaires, the same topics were explored to probe for the differences and/or similarities of perceptions between these respondent groups. The questions focused on the exposure of Chenin blanc and its wine styles. Furthermore, the potential of labelling using less complicated descriptors and Chenin blanc style classification on packaging labels was explored. Finally, the respondents' opinions about initiatives and efforts made by the SA industry were also uncovered.

4.3.3 Preparation and questionnaire design

As a requirement of Humanities Research Ethics Committee at Stellenbosch University, both respondent groups were assured of confidentiality. Furthermore, it was important to ensure that they were over the SA legal alcohol consumption age by asking each respondent to confirm that they were over the age of 18 years.

The surveys were separately prepared and hosted online on *SUsurveys* Checkbox ® Version 4.7 software, a web-based e-Survey that is available to support academic staff and postgraduate students of Stellenbosch University, as shown on Addendum G and J. This service ensured that the survey could be self-administered and convenient for respondents to complete. Once the preparation of the consumer and industry professional surveys was

complete, a pilot test was conducted among 10 individuals for each survey. Statistical analyses were conducted on the quantitative data to ensure the accuracy and reliability of the test. Challenges and errors that were apparent in each of the surveys were corrected in order to ensure that the tests would produce accurate and reliable results.

Questionnaire design

Respectively, the consumer and industry professional questionnaires consisted of 35 and 31 questions each. The questions were open-ended, to obtain qualitative data and closed-ended, for quantitative data.

Consumer questionnaire design

The layout of the consumer questionnaire was similar to a study conducted by Crafford (2002), the questions were structured to get maximum control over the respondents' frame of reference. Initially, questions regarding the respondents' general acceptability and wine consumption were asked. The questionnaire proceeded to ask specific questions concerning the respondents' wine choice, followed by questions relating to their consumption of Chenin blanc wine. Thereafter, the respondent's attitudes and opinions were probed, and socio-demographic questions were placed at the end of the surveys. The reason for this structure was to avoid the premature occurrence of bias and analytical ideas among the respondents (Lawless & Heymann, 2010), and to ensure that sensitive information would not deter the respondents from answering the questions as honestly as possible.

Industry professional questionnaire design

This questionnaire was designed similarly to the consumer questionnaire; the respondents were asked general questions relating to their perceptions of Chenin blanc, and questions relating to their opinions and inputs followed. Towards the end of the questionnaire, the respondents were asked questions about their occupations and the SA wine industry, with regards to current initiatives and the inputs that would broaden the Chenin blanc market.

Closed-ended, multiple choice, ranking ordering and Best-worst questions

In both questionnaires closed-ended, multiple choice, ranking order, and best-worst scaling questions (only in consumer questionnaire) were included to address the topics of the respective questionnaire. The responses obtained from the closed-ended questions were dichotomous, i.e., the respondent had to select either "Yes" or "No", based on their response to the question. Multiple choice, rank ordering, and best-worst questions were applied to address the topics, using selection and rankings of the addressed variables.

Open-ended Questions

In theory, open-ended questions are used when the researcher seeks information by directly asking for insights from the respondents based on their opinions about certain topics. This brings forth advantages for application in product development in providing opportunities for product improvement (Lawless & Heymann, 2010). The surveys of both consumers and industry professionals used open-ended questions to probe for a) the explanations of the selections in the closed-ended questions and b) the perceptions on the addressed topics in each of the questions.

The aspects explored in the questionnaires were ; the respondents' opinions and attitudes about wine and Chenin blanc wine specifically, wine extrinsic characteristics which have an influence on the consumers' purchase decisions and the perceptions of Chenin blanc and other white wine cultivars within the context of the SA wine industry. The data obtained were analysed qualitatively by means of thematic analyses.

4.3.4 Data collection

The consumer respondents were required to conduct the questionnaire once the wine tasting was complete (Chapter 3), by clicking on the link that was provided at the end of Addendum D. Industry professionals were provided with the link to the survey. In both surveys, when the respondents had answered all the questions submission was confirmed by clicking the 'Save and Exit' button as shown in. Addenda G and J The answers were automatically saved on to Checkbox® 4.7.

4.3.5 Data analysis

The data from the consumer survey were analysed using quantitative and qualitative analysis. Respectively, quantitative and qualitative data were exported to STATISTICA 13.2® (Statsoft Inc., www.statsoft.com) and *Microsoft* Excel for sorting in preparation for ATLAST.ti Version 8 software, where thematic analysis was carried out. Due to the sample size of the industry professional respondents, the obtained data was analysed qualitatively, using thematic analysis on both ATLAS.ti and *Microsoft* Excel.

Quantitative analysis of consumer survey data

Statistical analysis of the data obtained from closed-ended, ranking, multiple choice and Best-worst scaling questions was conducted in Statsoft STATISTICA 13.2 ® (Statsoft Inc., www.statsoft.com). Frequency counts were made for responses from closed-ended and multiple choice data. Best-worst scaling and ranking data were analysed by means of Least Squared (LS) means test at a confidence interval of 95% to measure the differences between the addressed variables for each question.

Qualitative analysis of consumer and industry professionals' responses

Qualitative data is defined as that which does not contain or indicate ordinal values, this relates to non-numeric data, and it is less structured quantitative data. The scope of this definition allows for different kinds of data collection and analysis techniques (Guest *et al.*, 2012). In this segment of the study, qualitative research was applied to probe for themes in the responses obtained from open-ended questions in the consumer and industry professionals' questionnaires. This was aimed at gaining a deeper understanding of the responses obtained from the closed-ended questions with the aid of thematic analysis. Firstly, the applied thematic analysis was carried out using the ATLAS.ti software package and followed by the construction of the results into contingency tables and graphs in *Microsoft* Excel.

Thematic analysis

Applied thematic analysis examines and identifies themes from text data in a transparent and credible manner using an inductive approach (Guest *et al.*, 2012) to introduce ideas and/or recommendations from the qualitative data. In this study, thematic analysis carried out to explore the responses by allocating themes with the aid of codebook in ATLAS.ti. The codebook was created to record and sort the data according to the emergent themes and patterns of the obtained responses. To provide evidence of the thematic analyses that were carried out in the current study, Addendum H and K contain three examples of the exact responses from consumer and industry professional respondents, respectively. No alterations or grammatical and/or spelling corrections of the data was conducted.

The responses were revised, and themes were allocated based on the patterns that were observed. Sequentially, codes for each theme were allocated. Codes are textual descriptions of the semantic boundaries of a theme (observed unit of meaning) or a component of a theme (Guest *et al.*, 2012). Once the coding was complete, it was necessary to review the code group (question) - quotation (response) compatibilities in order to ensure the accuracy of the next step of the analysis. The relevance of the allocated codes was reviewed by two other researchers to ensure the accuracy of the results. Amendments were made to the inaccurate code-response allocations, and new codes were then formulated. The final step was to analyse the co-occurrence between code groups (questions) and quotations (responses) to have an illustration of frequencies.

Construction of contingency table

In ATLAS.ti, the occurrence of codes within the documents was denoted by the frequency, i.e., the number of times which a specific topic and/or idea is mentioned (Lawless and Heymann, 2010). At this stage of analysis, it was essential to select co-occurrences which had

reasonably high frequencies in order to prioritize relevant information. Thus, codes with frequencies higher than five were selected and exported to *Microsoft* Excel, where contingency tables and graphs were constructed.

4.4 Results

The results obtained from both surveys will be presented separately in the following sections, were the main findings from both the quantitative and qualitative analyses are reported for the consumer respondents. As the responses of industry professionals were analysed using qualitative methods, the results will be reported as such, and no statistical results are provided.

The results obtained from the consumer respondents are reported based on the sequence of demographic, behavioural and psychographic concepts thereof. From the industry professionals' responses, the results are reported based on their opinions and inputs as addressed in section 4.2.2. Finally, linking topics of the responses from consumers and industry professionals are compared to obtain differences and/or similarities of both respondent groups' perceptions.

4.4.1 Consumer Perceptions

Demographic Concepts

For the purpose of this study, frequency counts were made regarding the respondents' demographic status due to sample size constraints. The consumer respondents (n = 111) were individuals of different demographic groups; gender, age, racial affiliation and level of income. The gender and age distribution (Fig. 4.1) consisted of 39 males and 72 females of ages ranging from 18 to 45 years old. The majority of respondents were within the age range of 20 to 24 years (60), and the overall mean age of was 25.5 years. The racial affiliations of the respondents were 52 black, 33 coloured and 25 white individuals.

Age in years	< 20	20 - 24	25 -29	30 -35	35 +
Male	2	21	9	6	1
Female	4	39	20	4	5
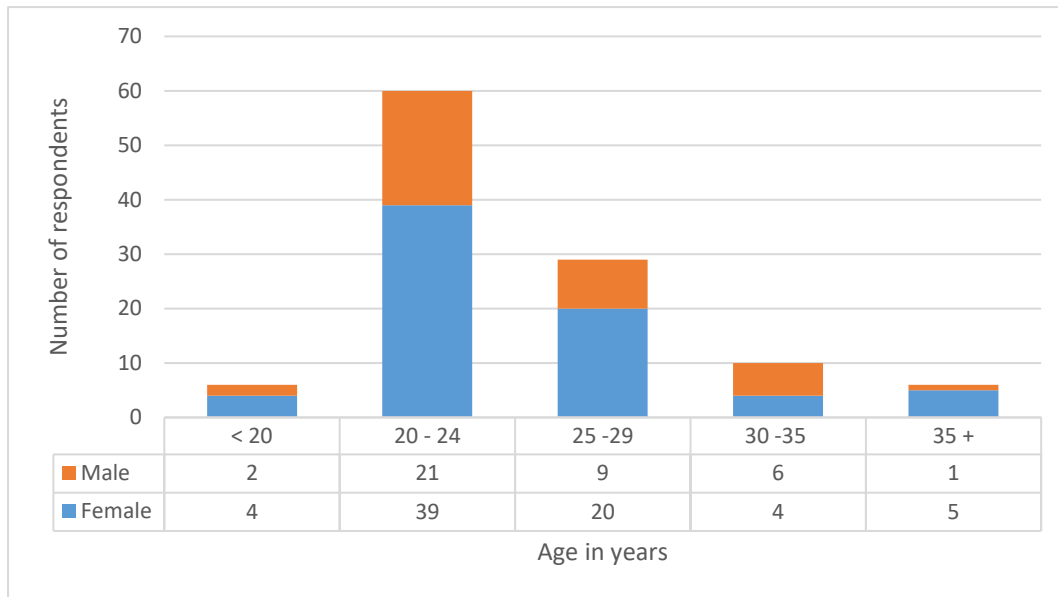
Figure 4.1 Gender and age distribution of the consumer respondents

The majority (87%) of the respondents indicated that they had an occupation, which is denoted by the category 'Other', the remainder (13%) was categorised as unemployed (Table 4.2). The educational qualifications of the respondents were 31% with a matric/grade 12/standard 10 qualification, and 69% were in the process of obtaining a degree/post-matric diploma or certificate. The monthly income distribution consisted of 42% of the respondents indicating that they preferred not to answer, 42% (24% and 18%) earned less than R15 000 per month, and incomes of R15 001 – R25 000, R25 001 – R35 000 and greater than R35 000 were earned by 7%, 5%, and 4% of the respondents respectively.

Table 4.2 Consumer respondents' occupation, educational qualification and monthly income.

Demographic Concept	% of Respondents (n = 111)
Full time Occupation / Job	
Unemployed	13
Other	87
Educational Qualification	
Matric/ Grade 12 / Standard 10	31
Degree / Post Matric Diploma	69
Monthly Income	
< R5000	24
R5001 – R15 000	18
R15 001 – R25 000	7
R25 001 – R35 000	5
R35 000 +	4
I prefer not to answer	42

Behavioural Concepts

The behavioural concepts investigated the respondents' exposure and consumption of Chenin blanc and their preference and consumption of red wine and other white varietals

Wine consumption

As indicated in Table 4.3, the respondents' wine consumption was investigated according to duration and frequency and their wine tasting experience. A higher percentage (56%) of the respondents had consumed wine for a period one to four years, and 33% had been consuming wine for a period of five to 9 years. The monthly consumption frequency consisted of 44% of the respondents who did not drink more than four times and 33% who did drink wine five to 9 times a month. Relating to the tasting room experience, a larger number (86%) had tasted wine in a cellar and/or tasting room and 72% of this number had visited no more than five times in a year. A larger number of the respondents (64%) consumed red wine more frequently than white wine.

Table 4.3 Wine consumption behaviour of the respondents; duration, frequency of wine consumption, wine tasting experience.

Wine consumption	% of Respondents (n = 111)
Duration of wine consumption (years)	
1 – 4	56
5 – 9	33
10 – 14	6
15 years or more	5
Wine consumption frequency (per month)	
1 – 4	44
5 – 9	33
10 – 14	9
15 times or more	14
Wine Tasting Room experience	
Yes	86
No	14
Wine Tasting Frequency (per year)	
1 – 5	72
6 – 12	15
13 – 24	10
More than 24 times	3
Wine category consumption	
Red	64
White	36
Chenin blanc consumption	
Yes	86
No	14

Wine category consumption

Figure 4.2 is a representation of the codes that were allocated to the respondents' reasons for their red or white wine consumption. The respondents who drink red wine (64%) more often

mentioned reasons pertaining to the *taste attributes*, *preference*, *flavours*, *food pairing*, complexity, health benefits, and body. The reasons that were provided for white wine consumption (36%) were *lighter*, *food pairing*, *easy drinking*, *refreshing, summer, and flavours* associations.
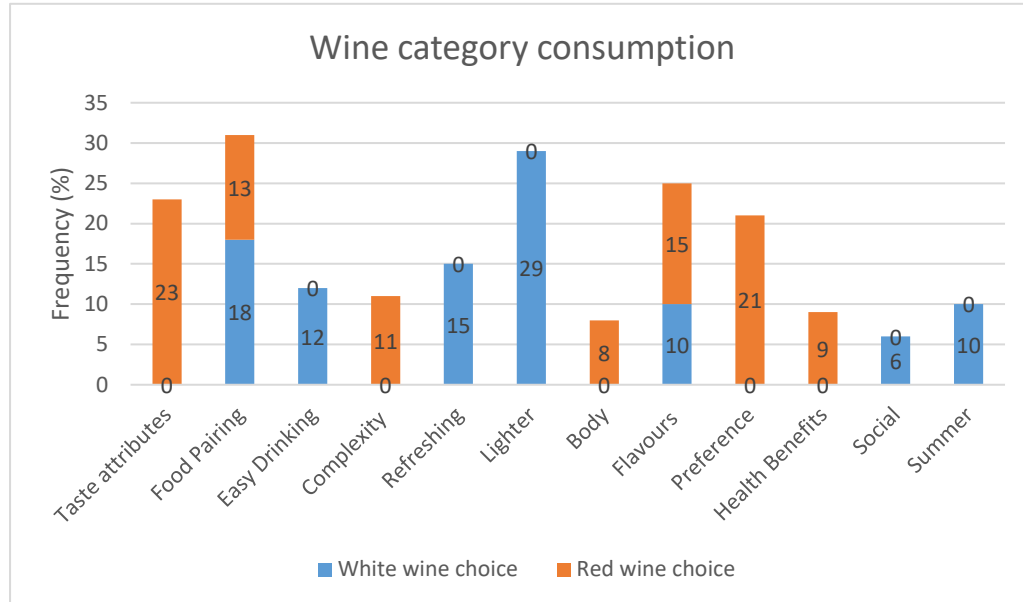
Figure 4.2 Consumers' reasons (taste attributes, food pairing, easy drinking, complexity, refreshing, lighter, body, flavours, preference, health benefits, social, summer) for red and white wine consumption from thematic analysis.

Chenin blanc consumption

A larger proportion (86%) of the respondents indicated that they have drank Chenin blanc before (Table 4.3). The respondents who indicated that they have never drank Chenin blanc before mainly provided reasons such as; *never crossed mind*, *preference of other cultivars and /or wine types* and *not familiar* at frequencies of 4, 3 and 7, respectively. The respondents who had drank Chenin blanc before were further required to provide a price point at which they had made a purchase (Fig. 4.4). The majority (63%) indicated that they had purchased at price points between R50 and R100, approximately 20% of the respondents had made purchases of less than R50 and a lower proportion had made purchases at price points greater than R100.
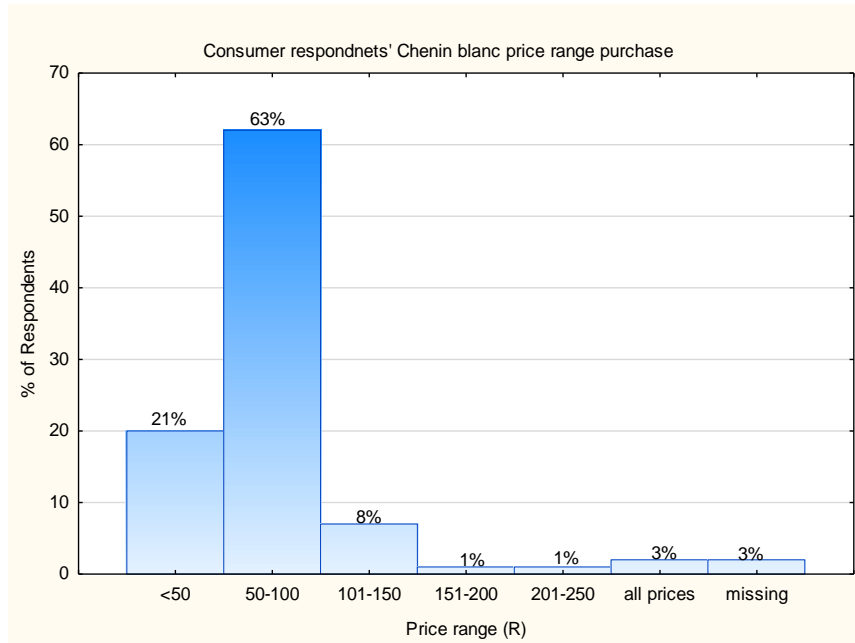
Figure 4.4 Price points at which consumer respondents had made a purchase of Chenin blanc; <50, 50-100, 101-150, 150-200, 201-250, all prices and missing values (Obtained from STATISTICA 13.2®).

Consumption of different types of White wines

The respondents were required to rank how often they drank seven types of white wines (Sauvignon blanc, Chenin blanc, Chardonnay, Natural sweet, Dry white, Sweet and Noble Late Harvest). Responses obtained from this question were analysed using an LS means plot (Fig. 4.5) to differentiate between the variables at a confidence interval of 95%. The p-value (0.0000) indicated that there were statistical differences between the wine choices. Sauvignon blanc was the most consumed wine: over four times per year, followed by Chenin blanc, approximately four times per year and Chardonnay under four times per year. There were no significant differences in the respondents' consumption of Natural Sweet, Dry white and Sweet wines, which were consumed less. Noble Late Harvest was the least consumed by the respondents.
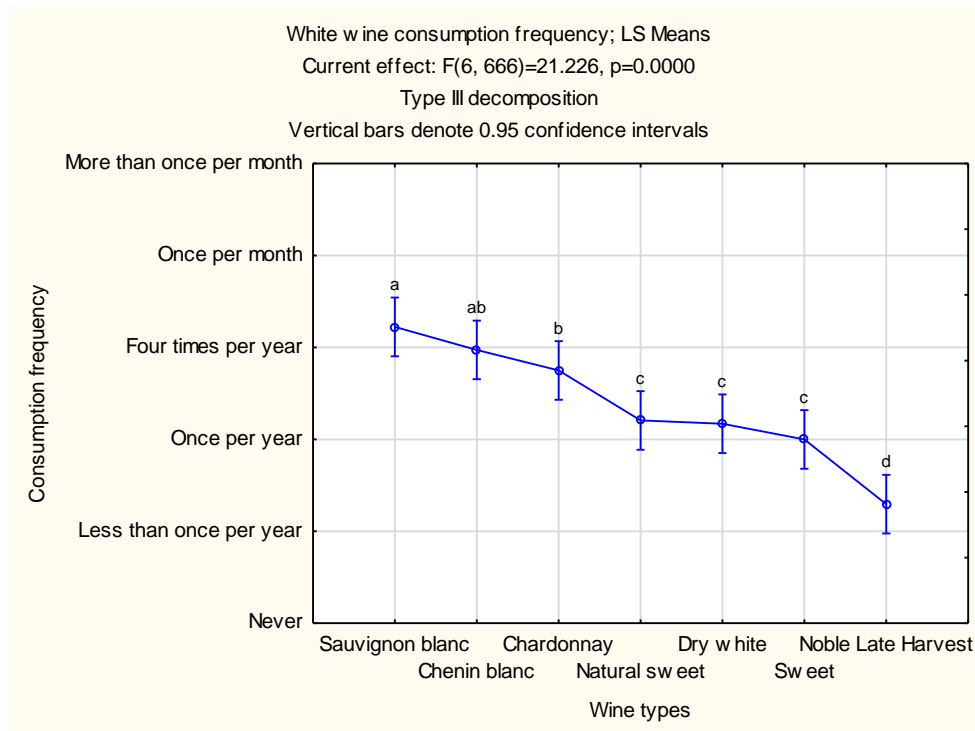
Figure 4.5 LS Means plot representing the consumption of white cultivars (Sauvignon blanc, Chenin blanc, Chardonnay, Natural sweet, Dry white, Sweet and Noble Late Harvest) among consumers. The different alphabetical letters indicate significant differences at 95% confidence level (p < 0.05), the error bars show the standard deviation (Obtained from STATISTICA 13.2®).

Role of price, intrinsic and extrinsic cues on wine purchase behaviour

The role of price on the respondents' purchase behaviour was firstly explored with the aid of questions relating to their likelihood of purchasing low-priced wine (Fig. 4.6). The importance of extrinsic cues (price, wine style, variety, region, and vintage) on the respondents' wine purchase decision was investigated with the aid of a ranking question (Fig. 4.7A). A best-worst scaling question consisting of 10 types of information (extrinsic and intrinsic cues), was used to investigate the respondents' Chenin blanc wine purchase behaviour (Fig. 4.B). The data obtained from the ranking and best-worst scaling question were analysed using LS means plots at a confidence level of 95% and the p-values showed all the variables to be significantly different.

Figure 4.6 shows the likelihood of all (n = 111) the respondents to purchase a wine due to a low price. Half (50%) of the respondents indicated that they would more likely purchase wine due to its low price depending on the occasion, 28% were most likely, and 22% were less likely to purchase wine due to its low price.

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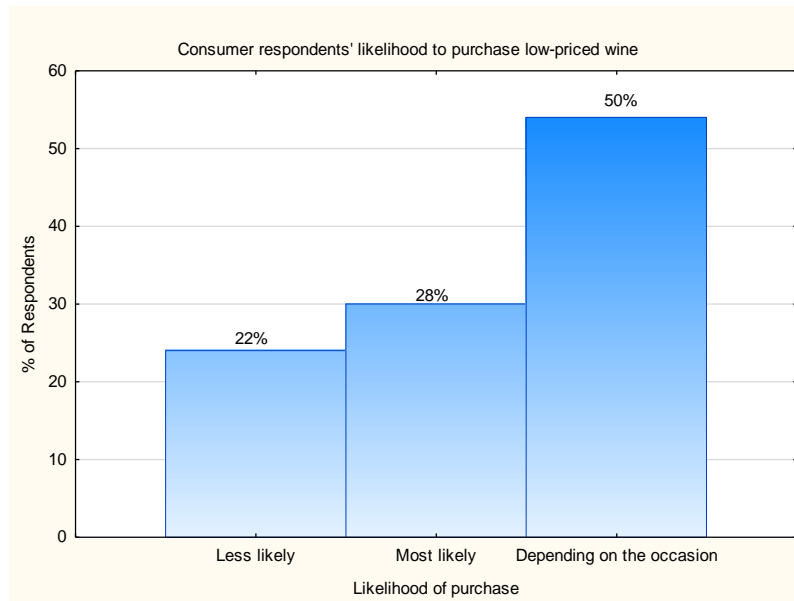
Figure 4.6 Likelihood of consumer respondents to buy wine due to its low price (Obtained from STATISTICA 13.2®).

As shown in Figure 4.7A, price was ranked to have the most positive role on the respondents' purchasing of wine, followed by wine style and variety, as well as region and vintage. According to the results shown in Figure 4.7B, *price* was considered to be of the most important criteria of the purchasing of Chenin blanc, followed by your knowledge of Chenin blanc, brand name, occasion, sensory information and word of mouth. Other factors such as the availability of Chenin blanc, Medals /Awards and the availability of other wines were ranked lower. No significant differences were observed between their rankings. Media and social networks were considered to be the least important criterion.
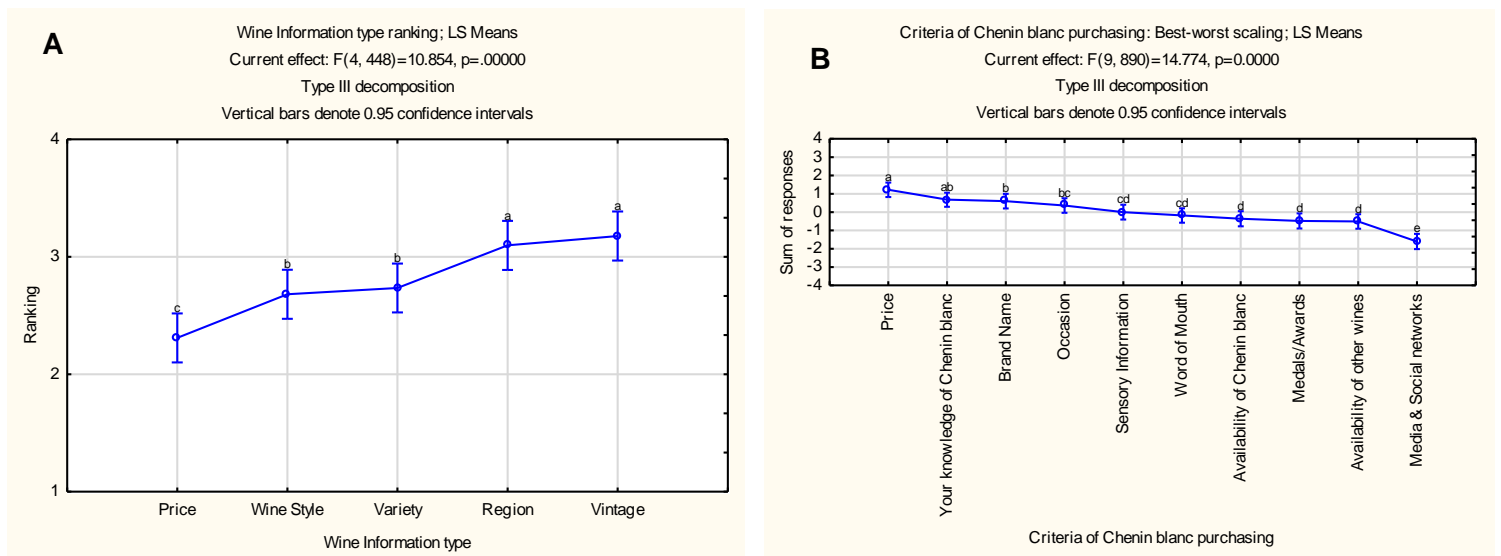
Figure 4.7 The role of wine extrinsic attributes *(price, wine style, variety, region and vintage)* on Consumers' (A) wine purchasing. *(B)* Consumers' wine purchase behaviour based on intrinsic and extrinsic attributes *(price, your knowledge of Chenin blanc, brand name, occasion, sensory information, word of mouth, availability of Chenin blanc, medals / awards, availability of other wines and media and social networks)* of Chenin blanc wine. The different alphabetical letters indicate significant differences at 95% confidence level ($p < 0.05$), the error bars show the standard deviation *(Obtained from STATISTICA 13.2®).*

Psychographic concepts

Cognition of wine

To obtain an understanding of consumer cognition of wine and white wine specifically, respondents were asked to state their first thoughts of wine and what is considered unappealing about white wine, compared to red wine. Figure 4.8 is a representation of the codes that were obtained from the responses. From these codes, *Pleasure* and *Social* had the highest frequencies (19%), followed by *Reprieve* and *Food pairing* (15%). Other codes that were obtained from the responses were *Classy*, *Type of wine*, *Wine Production* and *Sensory experience,* which were of lower frequencies.
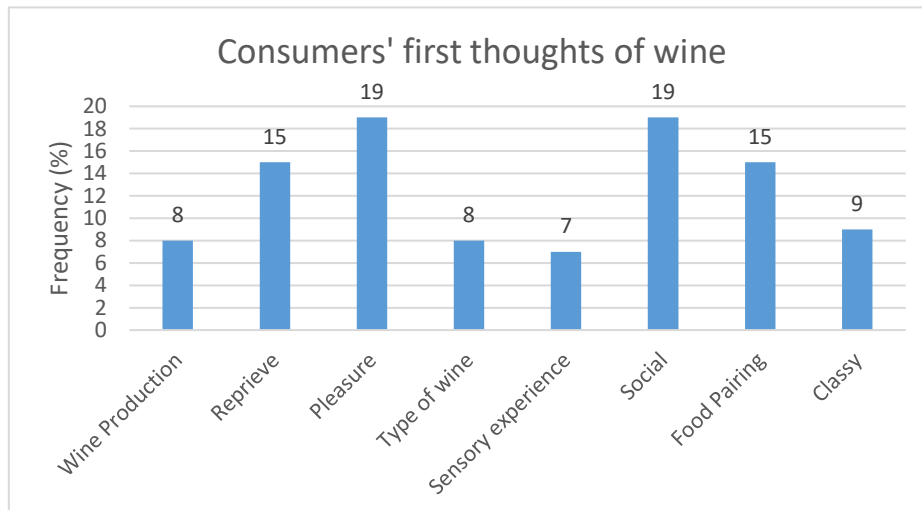
Figure 4.8 Consumers' first thoughts of wine (wine production, reprieve, pleasure, type of wine, sensory experience, social, occasion, food pairing, classy) from thematic analysis.

As indicated in Figure 4.9, the reasons provided by the respondents were mainly due to *unattractive taste attributes* (63%). Other themes were *preference for red wine* (18%), *less health and/or dietary benefits* (12%) and *less socially accepted* (7%).
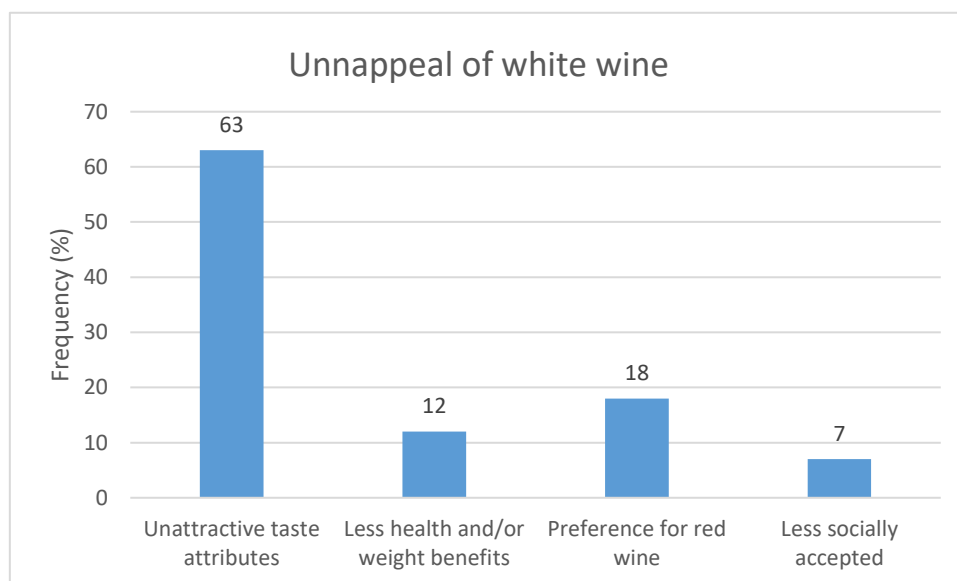
Figure 4.9 Consumers' perception of the lack of appeal of white wine codes (unattractive taste attributes, less health benefits, unpredictable buy, preference for red wine and less socially accepted) obtained in thematic analysis.

Positive and Negative qualities of Chenin blanc

The respondents were required to provide three positive and negative qualities of Chenin blanc. Figures 4.10A and 4.10B is a representation of the codes of the positive and negative qualities, respectively. The three distinguishing codes of positive themes were *taste*, *fruity* and

light, which had frequencies of 15%, 12% and 8%, respectively. Similarly, *taste* had the highest frequency among the negative qualities at 21%, followed by *blandness* (12%), *dryness* (10%).
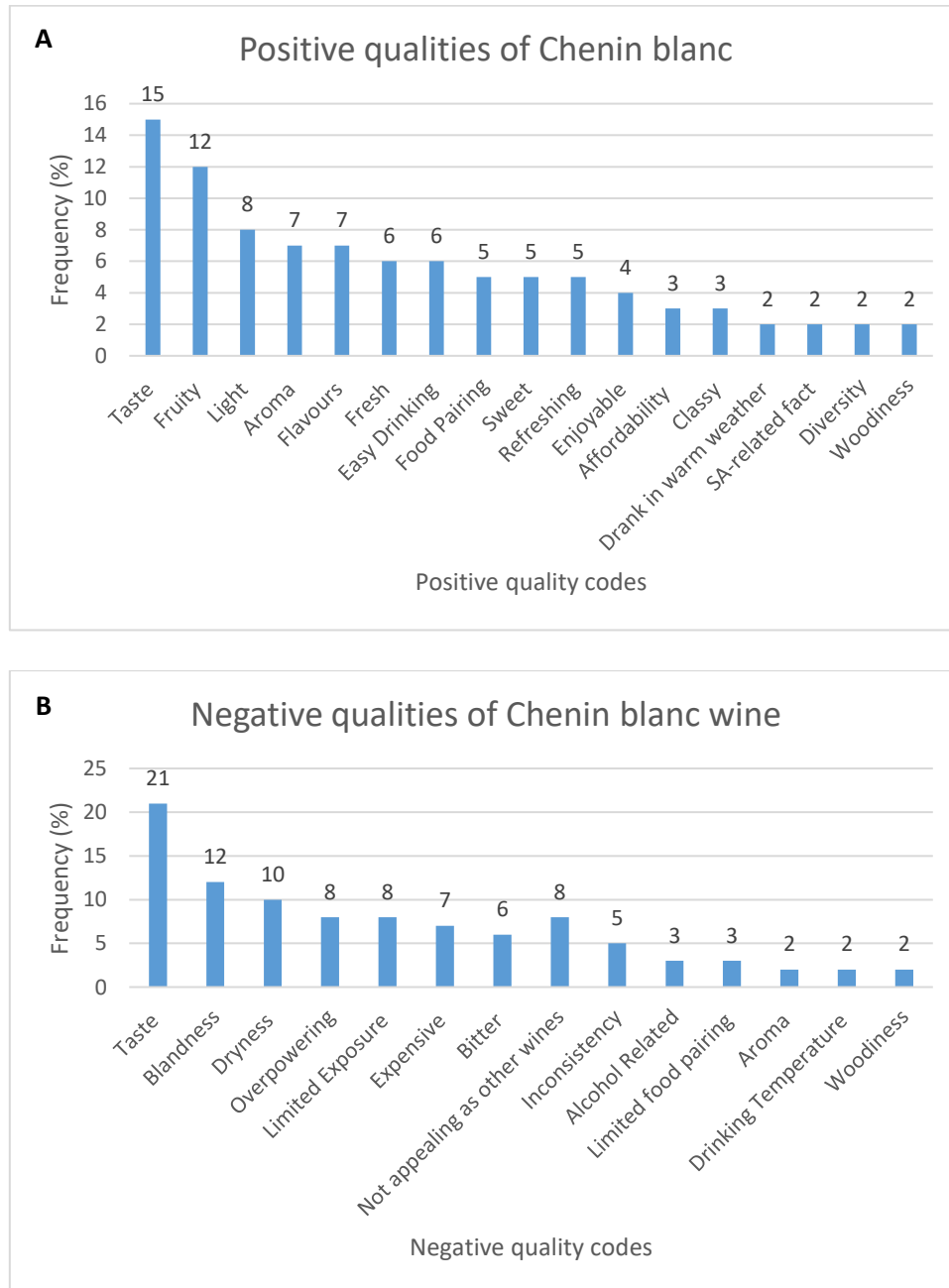
Figure 4.10 (A) Positive (taste, fruity, light, aroma, flavours, fresh, easy drinking, food pairing, sweet, refreshing, enjoyable, affordability, classy, drank in warm weather, SA-related Fact, diversity and woodiness) and (B) negative qualities (taste, blandness, dryness, overpowering, limited exposure, expensive, bitter, not appealing as other wines, inconsistency, side effects, alcohol related, limited food pairing, aroma, drinking temperature, woodiness) of Chenin blanc consumer response codes obtained from thematic analysis.

Popularity, awareness, willingness to purchase and consumer preference for Chenin blanc wine

The respondents' perception of the popularity, awareness and their preference for Chenin blanc wine and wine styles thereof is presented in this section.

Table 4.4 The popularity, awareness, willingness to buy and willingness to pay more for wine style classified Chenin blanc.

Response	% of Respondents (n= 111)
Chenin Popularity	
Yes	57
No	43
Awareness of Chenin blanc wine styles	
Yes	35
No	65
Buy more often if aware	
Yes	82
No	18
Pay more if aware	
Yes	69
No	31

Popularity of Chenin blanc

As indicated in Table 4.4, 57% of the respondents considered Chenin blanc to be popular, the reasons (Fig. 4.11A) were; *attractive taste attributes*, *popular in social settings*, *preference*, *easily accessible* and *versatile*, at frequencies of 27%, 16%, 13%, 12% and 9% respectively. According to 43% of the respondents, the reasons for Chenin blanc's unpopularity (43%) were attributed to (Fig. 4.8B); *preference for other wines* (29%), *limited exposure* (23%), *generally unpopular* (20%) and *dependent on social setting* (18%).
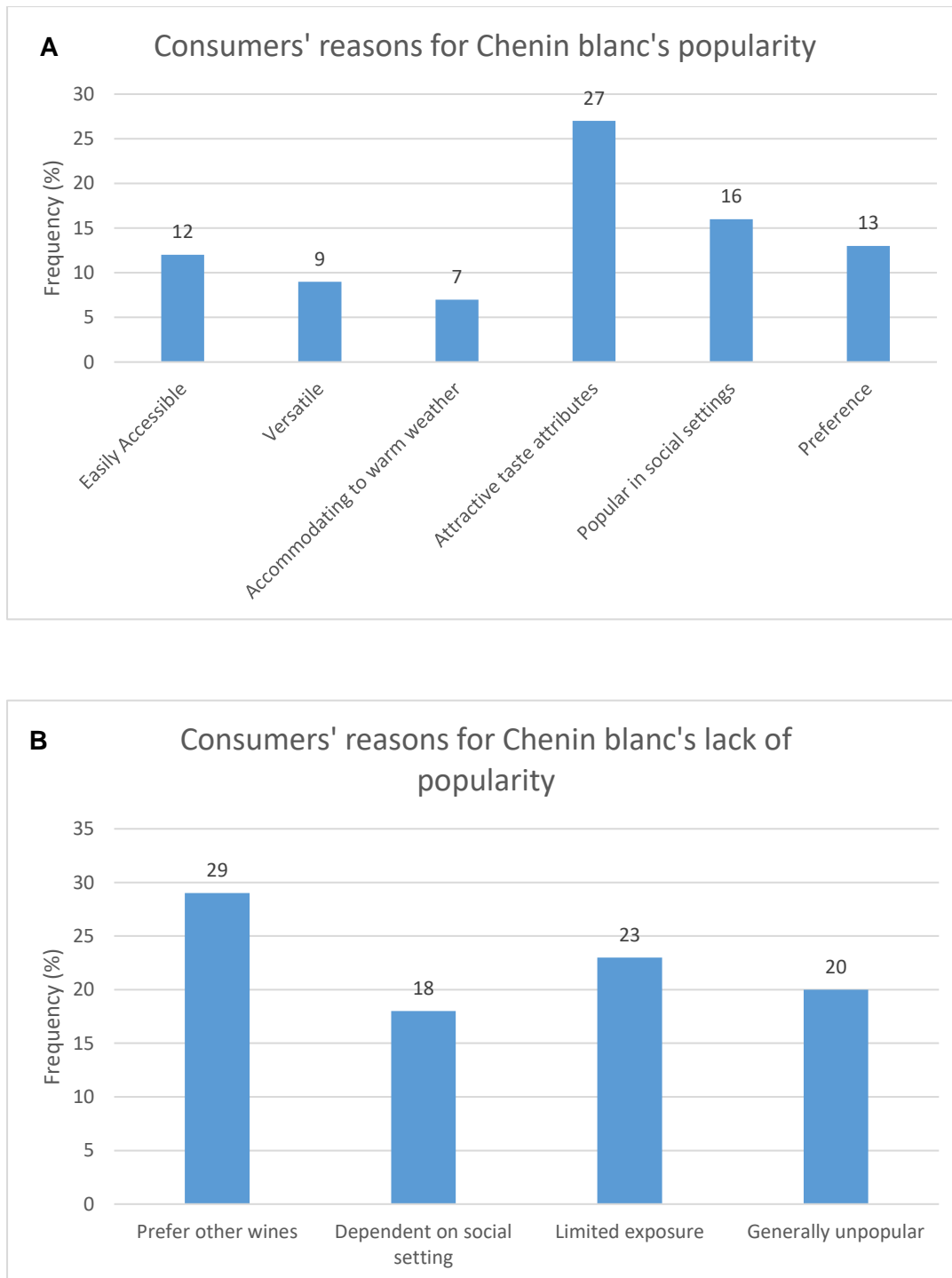
Figure 4.11 Consumers' responses to Chenin blanc's popularity, (A) (Easily accessible, Versatile, Accommodating to warm weather, Attractive taste attributes, Popular in social settings) and (B) lack thereof (Preference for other wines, Dependent on social setting, Limited exposure, Generally unpopular) codes obtained from thematic analysis.

Awareness and preference for Chenin blanc wine styles

The majority (65%) of the respondents were not aware of the Chenin blanc wine styles (Table 4.4). However, 82% indicated that they would buy more Chenin blanc wines if information was available and 69% this number were willing to pay more for the wines. In figure 4.12A, the

frequencies of their responses based on their willingness to pay more were; *better knowledge and understanding* (30%), *preference for Chenin blanc* (21%), *good quality warrants better price* (16%), *if information is appealing* (12%), *if taste is appealing* (11%) and *open to trying something new* (6%). On the other hand, the reasons for unwillingness to pay more for style classified Chenin blanc wine were; the respondents' general *preference for other wines* (66%), such measures *should be standard procedure (17%)*, respondents' *current financial status (14%) and avoiding disappointment (3%).*
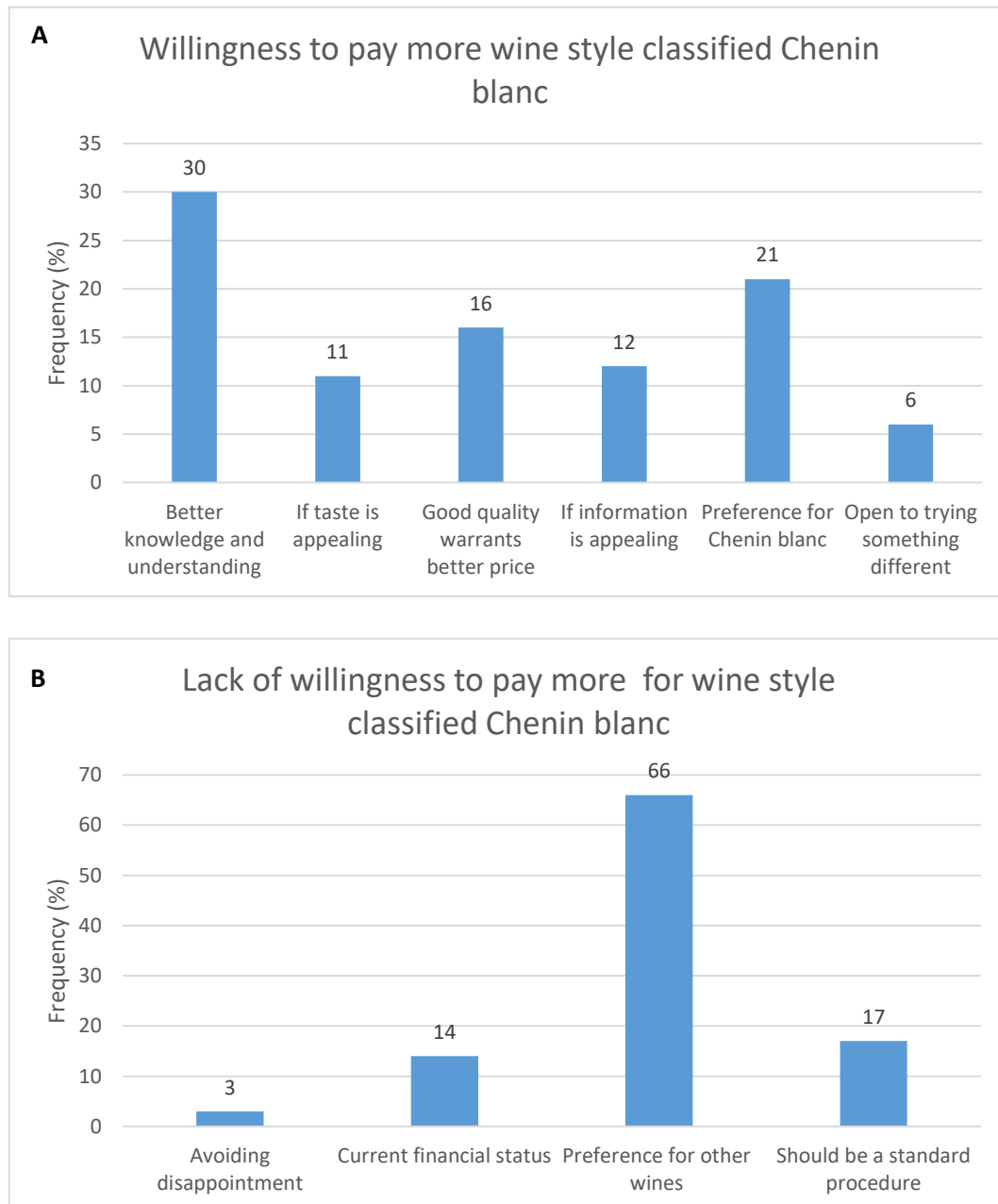
Figure 4.12 Consumers' reasons for, (A) willingness and (B) lack of willingness to pay more for style classified Chenin blanc wine codes obtained from thematic analysis.

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The respondents who were aware of the Chenin blanc wine styles were asked to rank their top three styles of which they were willing to drink more. In Figure 4.13, LS means plots were constructed at a confidence level of 95% to analyse the ranking of the respondents' preferences between six wine styles (*Rich and Ripe Unwooded*, *Rich and Ripe Wooded*, *Fresh and Fruity*, *Rich and Ripe off-dry (semi-dry)*, *Sparkling* and *Nobel Late Harvest*) of Chenin blanc. The p-value (p = 0.0000) was less than 0.05, thus indicating that the respondents significantly differed in their wine style preferences. The wine style *Fresh and Fruity* had the highest ranking, followed by *Rich and Ripe Unwooded*, R*ich and Ripe Wooded and Sparling wine*. *Noble Late Harvest* and *Rich and Ripe Off-dry* were preferred the least by the respondents.
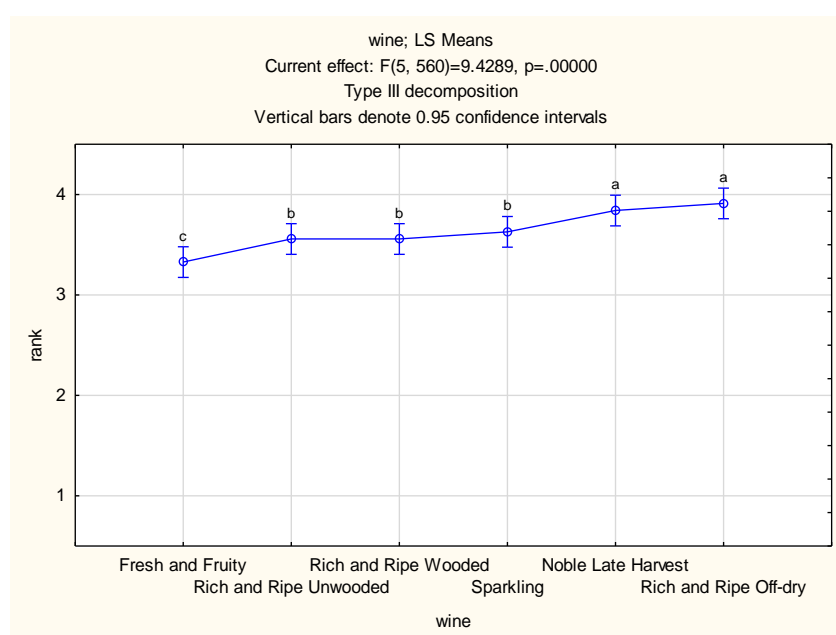
Figure 4.13 Consumer preference of Chenin blanc wine styles (Rich and Ripe Unwooded, Rich and Ripe Wooded, Fresh and Fruity, Rich and Ripe Off-dry, Sparkling and Noble Late Harvest). The different alphabetical letters indicate significant differences at 95% confidence level (p < 0.05), the error bars show the standard deviation (Obtained from STATISTICA 13.2®).

Importance of wine labelling information on purchasing of wine and Chenin blanc wine

To obtain and understanding of the importance of labelling information on consumer purchase behaviour, the respondents were required to indicate their motivation to purchase wines if less complicated descriptions were used on the back and front labels of wine packaging. The respondents were then asked whether they would be motivated to purchase Chenin blanc wine if wine style classification would be displayed on the front label of packaging. Frequency counts were made for the responses of the questions.

Table 4.5 showed that 60% of the respondents indicated they would be motivated to make a purchase of wines if less complicated descriptions were made available on the back and front

labels of packaging. A larger proportion (86%) indicated that they also would have motivation to purchase Chenin blanc if its wine styles were indicated on front labels.

Table 4.5 Influence of wine classification, wine style demarcation and health aspects consideration on purchase intent of the respondents.

Response	% of Respondents (n = 111)
Influence of uncomplicated labelling on wine purchasing	
Yes	60
No	40
Influence of Chenin blanc wine style classification on purchasing	
Yes	86
No	14

Wine industry efforts and industry professionals among respondents

The impression about the initiatives made by retail outlets and restaurants in providing enough information about wine, the effectiveness of the marketing efforts that have been made by the SA wine industry to promote Chenin blanc, as well as their awareness of the Chenin Blanc Association (CBA) were investigated to gain perspectives of the consumers' opinions.

As indicated in Table 4.6, more respondents (86%) indicated that there is not enough information provided in retail and restaurants regarding wine, the remainder (14%), further mentioned that the provided information was related to alcohol percentage, brand, cultivar, food pairing, history, origin, sensory attributes, vintage and type of wine. A large proportion (80%) of the respondents did not think that SA wine industry is making enough and effective efforts to promote Chenin blanc wine, while 86% were unaware of the CBA.

The most trusted wine industry expert in providing information about wine when a purchase is made was a winemaker with a selection by 60% of the respondents. The reasons were associated with *better understanding and knowledge*, *involvement in production* and *more experience.* Wine judges were considered to be *objective and unbiased*, to have a *better understanding*, *exposed to variety* and their *approval of quality* was also of importance to the respondents. The reoccurring reasons were *understanding*, *experience*, and *objectivity* (Addendum H).

Table 4.6 Consumers' perceptions about the information provided by retail outlets and restaurants, efforts by SA wine industry, awareness of CBA and the trusted industry experts.

Response	% of Respondents (n = 111)
Enough wine-related information provided by retail outlets and restaurants	
Yes	**14**
No	**86**
Enough and effective efforts by South African wine industry to promote Chenin blanc	
Yes	**20**
No	**80**
Awareness of Chenin Blanc Association	
Yes	**14**
No	**86**
Trusted expert	
Winemaker	**60**
Wine Judge	**15**
Sales and Retail Representative	**11**
Sommelier	**10**
Media / Journalist	**4**

To obtain an understanding of the perception differences and/or similarities between the wine industry and consumers, and exploration of industry professionals was conducted.

4.4.2 Industry professionals' perceptions

Industry professionals of different disciplines of the SA wine industry were invited to participate in the study. The resultant number (n = 9) consisted of four winemakers, three marketing professionals, a sommelier and a sales representative (Fig. 4.14). The following section will report on the findings, based on the responses obtained from the questionnaire which was designed to obtain their opinions and inputs about Chenin blanc within the context of SA wine industry.
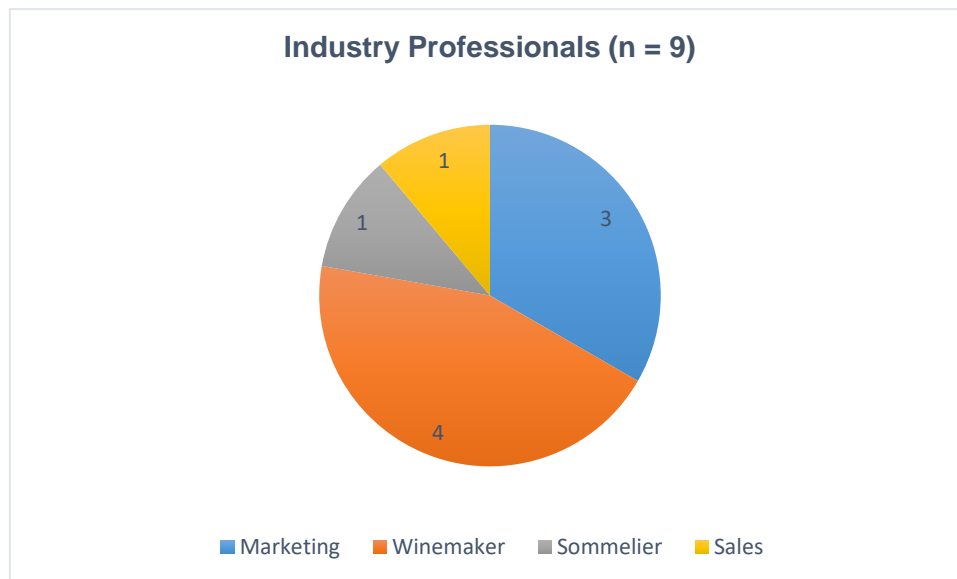
Figure 4.14 The proportion of industry professional respondents and their respective occupations.

Opinions of Industry professionals

This section explored the respondents' individual perspectives about the SA wine industry and Chenin blanc wine in particular. These aspects were probed as described in section 4.3.2.

Cognition of wine

As in the consumer questionnaire, the respondents, i.e., industry professionals were asked to provide their first thoughts on wine. This question was aimed at obtaining possible associations which the particular respondents had regarding wine. Table 4.7 is a representation of the codes and frequencies of the obtained responses.

Table 4.7 Industry professionals' themes of their cognition of wine and frequencies thereof.

Cognition of wine code	Frequency (n = 9)
Wine type	2
Food	5
Social	4
Pleasure	3
Expression	2
Work	2
Opportunity	1
Personal	1
Class	1
Interest	2

The theme *food* was mentioned most prominently, followed by *social* and *pleasure*. Other themes from the responses were *wine type*, *expression*, *work*, *interest*, *opportunity*, *personal* and *class.*

Context and distinctness of South African Chenin blanc wine

To probe for how the respondents differentiate Chenin blanc from other varietals, they were asked to state the context and distinctness of the cultivar. The predominant topics were concerning; the versatility of Chenin blanc for different terroir, the diversity of the wines that are produced in different parts of the SA wine regions, Chenin blanc's suitability for the SA climates which results in wines with true SA fruit flavours, its integration with other varietals to produce complex blends, affordability, old vines and uniqueness within the international scene. In addition, the respondents mentioned aspects such as the image of Chenin blanc not being favoured and overlooked.

The distinction of Chenin blanc by industry was mentioned in topics associated with the neutrality of the taste profile (e.g., appealing acid levels in warm and cool climates) and was associated as an intermediate between Chardonnay and Sauvignon blanc. In the production process, Chenin blanc was considered as a 'funky' grape which allows for experimentation, the versatility and complexity of the wines was associated to a 'chameleon character' that satisfies different consumer tastes. However, it is regarded as a 'workhouse' grape, which is used to produce bulk wine.

Positive and Negative Qualities of Chenin blanc

The respondents were required to provide three positive and negative qualities of Chenin blanc each. From the responses, two main themes (*production*, *sensory attributes and consumption-related attributes)* and sub-themes were made (Table 4.8).

Table 4.8 Positive and negative qualities of Chenin blanc according to the industry professionals

Positive quality themes	frequency	Negative quality themes	frequency
Production	18	**Production**	18
Vinification	7	Inexpensive price	6
Versatility	1	Hard to sell	1
Uniqueness	2	Over cropping and overproduction	3
Terroir	2	Not wine style specific	4
Old Vines	1		
Diversity	3	Low ageing ability	4
Quality	2		
Sensory and consumption- related attributes	17	**Sensory and consumption-related attributes**	12
Value for money	3	Lack of popularity	4
Aroma and taste attributes	8	Not easy drinking	1
Balance	3	Unattractive aroma and taste attributes	4
Easy drinking	3	Lack of sensory dimension	3

Within the *production* theme, the positive sub-themes were *vinification*, *versatility*, *uniqueness*, *terroir*, *old vines*, *diversity*, and *quality*. On the other hand, *inexpensive price*, *hard to sell*, *over cropping and over production*, *not wine style specific* and *low ageing ability* were considered to be Chenin blanc's negative qualities. The sensory and consumption-related themes that were mentioned as positive were; *value for money*, *aroma, and taste attributes*, *balance* and *easy drinking*. Whereas, the negative qualities were, *lack of popularity*, *not easy drinking*, *unattractive aroma and taste attributes* and *lack of sensory information*.

Market positioning, market size and price barriers of SA Chenin blanc

In terms of the respondents' opinions about the market positioning, market size and the price barriers of Chenin blanc, diverse opinions were evident. A majority of the respondents (6) were of the impression that Chenin blanc is deserving of its position in the market. Additionally, Chenin blanc was ranked as the least preferred (third) among Sauvignon blanc and Chardonnay. Three respondents indicated that its market size should be bigger and five respondents indicated that there should be an upward shift of price barriers.

Main challenges of Chenin blanc as a competitor among other white wine varietals

According to the respondents, the main challenges of Chenin blanc in the wine industry were related to its perceived quality, image among other varietals and low pricing, which were elaborated as:

- **Perception of quality**

The actual quality and perceived quality of Chenin blanc are not the same, thus deterring consumers from purchasing certain brands.

- **Image**

The idea of Chenin blanc as a blending wine, rather than a single varietal, still persists in the industry. Furthermore, Chenin blanc has an inexpensive connotation and lack of specificity compared to the popularly perceived Chardonnay and Sauvignon blanc wines.

- **Competition**

There is more potential in other varietals and affordable international wines. There are also other new varietals and other beverages, such as craft beer and gin, which may shadow Chenin blanc in the market.

- **Consumers' lack of familiarity**

In the off and on-trade industry, the consumers' lack of familiarity to Chenin blanc majorly influences the profitability of other varietals for retail outlets and restaurants.

Drawbacks of Chenin blanc in SA wine market

A list of possible drawbacks of Chenin blanc in SA was compiled based on the information in the preliminary meetings as stated in section 4.3.2. These aspects concerned factors which have an influence on the market positioning of the Chenin blanc in SA. These aspects were *too many different styles*, *level of popularity*, *SA current economic status* and *poor price perception.* The respondents were required to rank three factors which they considered as drawbacks for Chenin blanc in SA. Based on the responses, *level of popularity*, *its inexpensive appeal* and *wide wine style spectrum* were considered as Chenin blanc's main drawbacks.

Marketing initiatives and effect on market size

The respondents were asked whether there were meaningful initiatives aimed at selling more to the black consumer market. Five respondents indicated that the main initiatives were the Soweto wine festival, Fairtrade, SASA (South African Sommeliers Association); the education of waiters and sommeliers, BLACC (Black Cellar Club), and the WineX. The initiatives that were considered successful were trade shows, education and the Soweto wine festival.

Efforts by the SA wine industry with regards to the promotion of Chenin blanc were considered not to be sufficient as stated by five respondents. The stated reasons were Chenin blanc's

'cheap and cheerful' appeal and the fragmentation of the wine industry. Initiatives such as the protection of the old vines, the brand ownership of the Chenin identity were said to be present in the efforts of the CBA and Wines of South Africa (WOSA).

Recommendation and active promotion of Chenin blanc wine as flagship to consumers

From the wine industry's perspective, the respondents were asked whether they would actively recommend and promote Chenin blanc as a flagship white wine to their consumers. The majority (8) of the respondents agreed that they would provide a recommendation. The reasons of their recommendation pertained to factors such as: the prominence and distinctness of old vine Chenin blanc, its regard as SA's best kept secret, the production of the best wines, and its uniqueness which offers the best expression of terroir. Furthermore, even consumers who are unfamiliar with the wine will find a style that they enjoy. Although, it may be produced in other parts of the world such as the Loire Valley, SA Chenin blanc is very different and of top quality. However, one respondent mentioned that there are stronger cultivars to promote.

Effectiveness of wine shows at attracting SA Chenin blanc consumers

Respondents considered wine shows to be generally effective in attracting more SA Chenin blanc consumers. However, most of the responses were suggestive to the fact that more can be done by hosting the shows in other SA provinces and central Africa. Other factors that were mentioned regarded Chenin blanc's wide product spectrum, and Chenin blanc may not be considered appealing among other wine varietals. Thus it may be ideal to have Chenin blanc-specific wine shows that will incorporate the diversity of its wine styles.

Impressions of tourists about Chenin blanc

According to the respondents, tourists may have a good impression of SA Chenin blanc due to factors such as its uniqueness and favourable organoleptic factors, its acid balance, compared to the other varietals such as Sauvignon blanc and Chardonnay. The respondents proceeded to mention the great potential in wooded Chenin blanc wines. On the contrary, some tourists may consider Chenin blanc to be one dimensional, to have high residual sugar, heavily wooded, lacking complexity and ageing ability, and to have high alcohol levels. Chenin blanc may be not popular in other parts of the world other than France, but offers great value for money.

Chenin blanc wine style classification

Regarding Chenin blanc wine style, similar responses were obtained as in the consumer questionnaire. Industry professionals were required to select their top three wine styles to produce and sell to consumers; *Fresh and Fruity*, *Rich and Ripe Unwooded* and *Rich and Ripe Wooded* had the highest rankings, respectively.

The relevance of Chenin blanc wine style classifications from an industry's perspective was explored, where the respondents were asked about the importance of wine style specifications and the impressions among consumers and industry thereof. Five respondents indicated that they did not consider wine style classification to be mandatory. However, the same number of respondents expressed that they believe that consumers would be willing to pay more for style classified Chenin blanc; though it was stated that the success of such an initiative would be dependent on the education of consumers and the support from prominent producers. The respondents who indicated that they did not believe that consumers would be willing to pay more for style classified Chenin blanc mentioned that consumer knowledge might be underestimated and the cultivar is already at the base of the 'ladder' (market). The respondents also mentioned that top brands and producers are trusted more by consumers than wine style and consumers are not informed enough to know the difference.

Intrinsic implications of Chenin blanc wine style classification

In a hypothetical instance, the respondents were asked to rank the information which they would consider most suitable to classify wine styles to explore the industry's perceptions of wine style intrinsic aspects. The most ranked factors were *Sugar concentration*, *Alcohol level*, *Vine age* and *Ageing on wood*.

Inputs

In this section, wine industry inputs were explored to gain information of the possible strategies that can be implemented in the SA Chenin blanc industry to enhance its current market size. The aspects were concerning the popularity and purchasing of Chenin blanc, the encouragement of the black consumer market, the implementation of less complicated descriptors and the main messages which industry can provide to the market.

Enhancing the popularity and purchasing of Chenin blanc

The majority of the respondents (8) regarded Chenin blanc to be popular. To gain more insights of enhancing popularity in the wine market, the respondents were further asked to mention factors that would make Chenin blanc more popular and frequently purchased. The mentioned topics were relating to:

- **Exclusivity**

Popularity was considered not be important. Exclusivity has become one of the differentiating factors and focuses more on quality, rather than quantity.

- **Social Media**

Social media could be used more as a medium for communication.

- **Concerted marketing**

A joint effort to educate, intrigue and excite consumers through promotions (not discounting) and the placement of the top Chenin blanc wines and producers in the forefront.

- **Education of consumers**

To gain and sustain recognition in the market, education is important. Thus consumers should be made aware of blends which contain this cultivar and the single varietals.

Encouragement of black consumer market to purchase Chenin blanc wine

This question was aimed at exploring potential inputs which could be implemented to broaden Chenin blanc's market size by increasing the number of black consumers. The respondents were directly asked which actions they think would encourage black consumers to become more frequent purchasers of Chenin blanc wine. The responses mentioned inputs such as regular interactions with the consumer and education of consumers through tastings that are hosted in communities that black consumers live. Other inputs included, pairing of the wines with food that the consumers are familiar with, which would also encourage interest and curiosity of the consumers. Language was also addressed; there is a need to limit wine jargon by communicating in a manner which consumers understand and to incorporate SA languages other than English and /or Afrikaans. Promoting wines which are not necessarily inexpensive would encourage aspiration among consumers by making the wines more status-driven without intimidating the consumers.

Application of less complicated descriptors on labelling

The respondents were asked whether they think the application of less complicated descriptors on the labels would be an effective measure to accommodate a wide variety of consumers, the responses showed varying opinions. Respondents who agreed with the question stated that keeping it simple is more elegant and noticeable, and that the labels need to target their market without over and/or underestimating the consumers' knowledge. Innovations such as wine style colour-coding on wine labels may have potential aid in the simplification of wines. Conversely, some respondents had the impression that sophisticated descriptors are liked by some consumers. Other respondents had the impression that such measures may not entirely assist in the broadening of the wine market due to the notion that descriptors do not influence the selling of wines.

United message for retailers

The majority (8) of the respondents agreed that there needs to be a united message and a more focused approach concerning the messages which Chenin blanc producers provide to retailers. The respondents further stated that these approaches need to provide an understanding of the wine styles and the inspiration which influenced elegant wines, such as

using different packaging for a particular wine style which may be reusable. The focus should also be to improve the quality of the wines and encourage the retailers to promote, rather than discount. Such measures have been implemented. However, one respondent stated that Chenin blanc already has media attention and the focus should rather be aimed at increasing the price points.

Main messages

The respondents stated the main messages that Chenin blanc should convey need to be clear and concise for consumers to understand. These messages need to highlight the uniqueness of the SA terroir, and the quality and diversity of the wines, i.e. 'there is something for everyone and every taste'. Furthermore, the Chenin blanc wine industry itself needs to embrace and showcase the cultivar's potential and make it more interesting and appealing to consumers.

4.5 Discussion of findings

In this study, insights regarding the different opinions and perceptions of SA Chenin blanc wine between the two respondent groups, consumers and industry professionals, were explored. The integration of the two groups was aimed at obtaining insights about the SA Chenin blanc wine from a market and industry perspective. The respondent groups shared their varied perceptions about the addressed topics. There were similar topics in the two questionnaires which were formulated to establish a comparative platform between the respondent groups. The following sections will first discuss the outcomes from the individual respondent groups and will then delve into the results obtained from similar topics within the two questionnaires.

4.5.1 Consumer perceptions

The profiling of consumers was based on demographic, behavioural and psychographic concepts, which were analysed using qualitative and quantitative analytical methods. The respondents were recruited as wine consumers and consisted of 72 females and 39 males. Their resultant age distribution was between 18 and 45 years, mainly consisting of individuals between the ages of 20 and 24 years. Due to the fact that a larger number of the respondents had tasted wine at a wine cellar and were residents of the Western Cape, it is deduced that most of them were exposed to the wine industry and have wine experience.

Consumers' perception of Chenin blanc wine popularity

Although the majority of the respondents had previously drank Chenin blanc wine, a lower proportion perceived the wine to be popular. The three main reasons associated with the popularity of Chenin blanc wine were *attractive taste attributes*, its *popularity in social settings* and the respondents' *general preference* for Chenin blanc wine. On the other hand, Chenin

blanc's lack of popularity was mainly attributed to the respondents' *preference for other wines*, the cultivar's *limited exposure*, and its *generally unpopular* perception.

Red wine was consumed more than white wine, due to its *taste attributes*, *general preference*, its *flavours* and *food pairing*. The factors *unattractive taste attributes* and the general preference for red wine also supported what the respondents regarded as factors which make white wine unappealing. Similarly, McIntyre *et al.* (2015) conducted a qualitative study of alcohol consumers who avoid wine and found that taste was the main reason. The respondents preferred to drink white wine as they considered it to be *lighter*, has *food pairing* qualities, it is *refreshing* and *easy drinking*. These attributes could be noted as drivers for preference or lack thereof among consumers and could be used in the alignment of Chenin blanc wine during the viticultural and vinification stages (Francis & Williamson, 2015), as well as in the implementation of marketing strategies.

Consumers' perception of Chenin blanc wine style

In spite of the fact that the majority of the respondents were not aware of the Chenin blanc wine styles, their purchase decision was positively influenced by wine style information, and a large proportion further indicated that they would be willing to purchase more Chenin blanc wine if information regarding its wine styles was provided. Therefore, consumers rely on extrinsic cues (e.g., wine style labelling) when purchasing wine. Thus the availability of the wine's attributes is important since its sensory quality of a wine is not known before it is bought, wine consumers are highly influenced by these attributes (Schamel & Anderson, 2003).

Fewer respondents indicated that they would pay more for style classified Chenin blanc. The reasons for their willingness to pay more were better *knowledge and understanding*, their *general preference for Chenin blanc*, the idea that *good quality warrants better price* and whether the provided information is appealing. Bester (2011) found that Chenin blanc wine style knowledge was positively correlated with wine consumption, which further emphasizes the importance thereof of wine purchase behaviour. The general preference of red wine was an inhibiting factor of the willingness to pay more for wine style classified Chenin blanc wine. Moreover, a majority of consumers believed such initiatives *should be a standard procedure*, the respondents' *current financial status* and their *avoidance of disappointment*. The respondents who were aware of the Chenin blanc wine styles considered *Fresh and Fruity*, *Rich and Ripe Unwooded* and *Rich and Ripe Wooded* to be their top three wine styles of which they would be willing to consume more. In a study by Hanekom (2012), wine consumers preferred the unwooded Chenin blanc wine styles (Fresh and Fruity and Rich and Ripe Unwooded).

Consumer wine purchase intent and behaviour

The price interval at which the respondents mainly consumed Chenin blanc was between R50 and R100. According to Green (2010), consumers that purchase wines at prices greater than R50 were considered to belong to the premium sector. These consumers were considered connoisseurs and are among the younger up-and-coming and mature age groups. Additionally, price played a positive role in the respondents' purchase intent and was the most important criterion in the buying of Chenin blanc wine. In a study by Hall *et al.* (2001), price, wine taste, wine type (red or white) were key determinants of wine choice. *Wine style* and *variety* were also deemed to have a positive effect on the respondents' purchasing of wine.

Based on literature, previous experiences with wine, price, origin, grape variety, brand name, awards, packaging features and food pairing are important characteristics underlying consumer wine purchase decision (Lockshin & Hall, 2003; Goodman *et al.*, 2007; Jaeger *et al.*, 2009; Sáenz-Navajas, *et al.*, 2013). Thus, such findings aid in the prediction of consumer behaviour. In the current study, the criteria which were important on the respondents' purchasing of Chenin blanc were the *knowledge of Chenin blanc*, *brand name,* and *occasion*. There were no differences in the importance of *availability of Chenin blanc, medals /awards and availability of other wines*. *Media* and *social networks* were regarded to have the least influences.

4.5.2 Industry professionals' perceptions

This section uncovers the findings from the industry professionals' respondents who were recruited to participate in the study to provide insights of their opinions and possible inputs in the SA wine industry. Due to the fact that there were 9 questionnaires which were completed and submitted, this sample size only enabled qualitative analysis to be conducted on the responses.

Chenin blanc market positioning, size and price barriers

According to a majority of the respondents, Chenin blanc is deserving of its current position in the market and supports that there should be upward shifts in it's price barriers. However, fewer respondents believed that its market size should increase.

The context of SA Chenin blanc wine

The distinctness of Chenin blanc in SA was mostly supported by positive aspects, such as its versatility, which allows for experimentation and satisfies different consumer tastes. It's adaptability for different terroir has allowed it to express the SA climate. As a single varietal, Chenin blanc wines were believed to have a neutral taste profile which is comparable to an intermediate between Chardonnay and Sauvignon blanc, yet having a complexity when it is

vinified with other varietals. Economically, it is affordable for consumers. Its impression among tourists who visit SA was considered to be generally positive due to its uniqueness and acid balance compared to other varieties.

Industry and market challenges

According to the respondents, the SA Chenin blanc has incurred challenges such as the polarised perceptions of its quality, its persisting image as a blending wine, competition with other wine varietals and other beverages, and the lack of familiarity of consumers to the wines. Ultimately, these factors have contributed to its low price points within the on-trade and off-trade environments, making the sales of other varietals and/or beverages a better option for retail and restaurants. The persisting negative perceptions among tourists were regarded as; the unfavourable organoleptic properties such as high residual sugar and alcohol levels, heavy wood, lacking complexity, ageing ability and lack of dimension on the palate. To minimise some of the challenges that are faced in the SA wine industry, WOSA and CBA have developed initiatives such as the protection of old vines, brand ownership of the 'Chenin identity'. However, a majority of the respondents did not consider the efforts made by the SA wine industry to promote Chenin blanc to be sufficient and efficient.

Industry efforts and initiatives

It has become increasingly important to cater to the black consumer market as they have become a powerful marketing trend, having the strongest buying influence in the SA economy (Ndanga *et al.*, 2009). Of these efforts, wine festivals (e.g., Soweto wine festival) and education through marketing were claimed to be successful by the respondents. Wine shows, in particular, are effective in bringing the wines to the consumers, educating them through tasting a wide range of what the producers have to offer. Therefore, regular interactions with the consumers through more frequently hosted wine shows within black communities, in areas that are not within the Western Cape and within other African countries, will spread the message more effectively. Additionally, pairing of the wines with food which the consumers are familiar with will also encourage curiosity and interest.

Due to the wide wine style spectrum of Chenin blanc, the respondents suggested initiatives such as cultivar-specific shows to showcase Chenin blanc's variety, to accommodate a diversity of preferences and enhance its popularity by educating potential consumers. Goode (2011) proposed the education of consumers about Chenin blanc wine styles. Furthermore, previous studies have found education to play a positive role in the consumers' liking of wine, as the acquired wine knowledge increases the appreciation of wine does too (Osidacz & Francis, 2011). Thus wine producers should expose consumers who are unfamiliar with their

wines through wine tastings to gain consumer awareness and potential preference (Francis & Williamson, 2015).

On the other hand, some respondents were of the impression that consumers would not be willing to pay more for style classified Chenin blanc wine and such measures will not assist in the improvement of the Chenin blanc image.

4.5.3 Linking topics of findings from consumers and wine industry professionals

Cognition of wine and white wine choice

From both sets of the respondents' *first thoughts* of wine, the common themes were *pleasure*, *social*, *food* and/or *food pairing*, *wine type* and *class*. These themes are indicators of the common cogitations regarding wine among the respondents and are suggestive of the psychological and preference motives for drinking wine (Chang *et al.*, 2016). The themes *pleasure* and *social* were mentioned the most by consumers which is evidence of their liking and the contexts of their consumption of wine. In particular, *pleasure* has been a primary reason for wine consumption by consumers in various studies (Mouret *et al.*, 2013; Bruwer *et al.*, 2014; McIntyre *et al.*, 2015; Silva *et al.*, 2016). In their study, Mouret *et al.* (2013) investigated the social representation of wine as a function of expertise and culture with the aid of verbal association tasks, where 'novices' associated wine with social events such as dinner and party, and experts mainly referred to *sharing*, *heritage*, and *friendliness*. Consumers displayed more preference for Chenin blanc than the industry professionals, who preferred Chenin blanc the least among Sauvignon blanc and Chardonnay.

Positive and negative qualities of Chenin blanc

The consumers mainly provided responses which were associated with sensory experience for both the positive and negative qualities of Chenin blanc wine. The qualities provided by industry professionals were mainly associated with the *production* process, as well as *sensory and consumption-related attributes*, which is due to their level of expertise and knowledge. Parr *et al.* (2011) found that wine professionals tend to use extrinsic factors such as the oenological processes and terroir variables, as opposed to consumers, who used intrinsic factors relating to their wine consumption experience.

The themes *taste*, *fruity* and *light* were the main associations of Chenin blanc's positive qualities among consumers. Similarly, the industry professionals provided responses associated with aroma and taste attributes, as well as the vinification process. The negative themes which consumers mostly referred to were *taste*, *blandness* and *dryness*. Whereas, industry professionals mostly provided responses associated to Chenin blanc's *inexpensive price*, that it is *not wine style specific*, has *low ageing ability*, *lack of popularity* and *unattractive*

aroma and taste attributes. Noticeably, taste was highly mentioned in both negative and positive qualities among consumers and industry professionals' perceptions of Chenin blanc, which denotes the importance thereof in both respondent groups. Previous studies have found that the way in which consumers perceive wine quality can be related to taste and may be a contributing factor to whether they do or do not drink wine (Keown & Casey, 1995; Thompson and Vourvachis, 1995; Thach & Olsen, 2006; Bruwer, 2012; McIntyre *et al.*, 2015).

The similarities of the positive qualities between the respondents were themes such as *balance* and *easy drinking*, *affordable* and *value for money*, and *aroma and taste attributes*, which may provide an indication of the consumers' level of awareness about Chenin blanc wine, as well as the similarities between the respondents' perceptions. Likewise, similarities between the negative quality themes, such as; *unattractive aroma and taste attributes*, *lack of dimension* and *blandness*, *cheap* and *inexpensive price*, as well as *limited exposure* and *lack of popularity* were found. In this instance, the provided information can be useful in the adjustments and improvements of the stated themes regarding Chenin blanc.

Willingness to pay for Chenin blanc wine style and package labelling prospects

A majority of industry professionals predicted that consumers would be willing to pay more for wine style classified Chenin blanc. Consumers also displayed positive attitudes towards the usage of wine style classification on front labels. According to the industry professionals, such initiatives would be successful if simple and relatable descriptors are applied and education would be provided to Chenin blanc consumers who are unfamiliar to its different wine styles. In a study by Danner *et al.* (2017), the willingness to pay for a bottle of wine in a shop was substantially increased when basic wine descriptors were provided. There were similarities in the wine style category preferences between the respondent groups, where *Fresh and Fruity*, *Rich and Ripe unwooded* and *Rich and Ripe Wooded* wine styles were most preferred.

In spite of the fact that industry professionals had varied responses regarding the usage of less complicated descriptors on wine package labelling, more consumers indicated that they would be motivated to make a wine purchase if this was applied. According to Thomas (2000), a wine label can communicate a visual image, provide recognition, and stimulate interest and enhance thought. Thus packaging labelling of wine should best provide information that is interesting and understandable to consumers in order to encourage sales. Based on the responses of industry professionals; *simplicity* was a prominent theme regarding the main messages which the SA Chenin blanc wine industry should provide to its consumers.

Industry initiatives

The consumers and industry professionals did not consider the efforts by the SA wine industry enough and efficient. However, some industry professionals mentioned initiatives by industry

bodies such as WOSA and the CBA. Among the consumers, wine industry professionals such as the winemakers were trusted the most by consumers to provide information when an individual is making a wine purchase, which is mainly due to the professionals' *better knowledge and understanding,* as stated by the respondents.

The environment in which wine is purchased has an influence on the respondents purchase behaviour (Bruwer *et al.*, 2011). Most of the consumer respondents believed that retail and restaurants do not provide enough information regarding wine in general. In this study, industry professionals agreed that a united approach is needed in retail to aid in the understanding of wines to sell and promote the wines.

The promotion of wines which are not necessarily inexpensive would encourage aspiration by making wines more status driven, without intimidating consumers. A potential avenue that the industry should take to enhance the popularity of Chenin blanc is the focus on social media as a communication and promotional tool. Furthermore, its promotion should be encouraged in restaurants. In a study conducted in restaurants by Wansink *et al.* (2006), where the impact of wine promotions in stimulating sales was investigated, it was found that wine recommendation, food-wine pairing recommendations and wine tastings increased sales by 12%, 7%, 6% and 48%, respectively. Promotion is an essential step that will sustain and stimulate the market growth of Chenin blanc in the SA wine industry. To accommodate current and potential consumers who do not know about Chenin blanc, promotional activities should integrate the notion of diversity, quality, uniqueness and 'SA terroir in a glass'.

4.6 Conclusions

The responses from both groups of respondents show that there are differences between their perceptions. Among consumers, wine was profiled as a product which is associated with positively connoted attributes such as *pleasure*, *social* gatherings, *reprieve* and *food pairing*. Regarding Chenin blanc, attributes such as its *taste*, *fruitiness*, lightness, aroma, flavours, freshness and easy drinking were regarded as its positive attributes. On the other hand, its negative qualities were *taste*, *blandness*, and *dryness*. Therefore, this provides evidence of the positioning which Chenin blanc has in the minds of the consumer and as such can be utilized for marketing initiatives which aim to optimize the image of Chenin blanc among consumers.

According to the responses from both groups, it is evident that the initiatives which have been conducted by the SA wine industry to promote Chenin blanc may not be sufficient. Therefore, initiatives such as keeping the labelling simple and placement of the wines styles on front labels may persuade consumers to purchase Chenin blanc wines. Chenin blanc specific wine

shows, where its wine style spectrum is showcased, were believed to have potential to educate the consumers through tasting. Furthermore, hosting regular shows in areas other than the Western Cape will aid in attracting a wider range of consumers.

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Chapter 5

General discussion and conclusion

5. General discussion and conclusions

Consumer research is conducted to investigate consumer behaviour and perceptions pertaining to the products offered by producers. In the food industry, an important factor when investigating the consumers' perception is how the products are described in terms of its sensory characteristics. Qualitative research in sensory science has become vital in consumer research in the methods that are of use to sensory specialists, allowing the exploration of important sensory attributes and aspects associated with functional product characteristics (Lawless & Heymann, 2010). Therefore, investigating the sensory characteristics of a product among consumers provides insights of the perceptions of the respondents, thus providing the producer with the appropriate guidance to better align the product characteristics to those which are preferred by consumers. Furthermore, industries can incorporate familiar attributes which are related to the aroma profile of a wine which can favour its recognition and may increase the appreciation of the product, having a positive influence on the purchasing of the wine (Jackson, 2009). The way in which consumers describe their sensory experience of Chenin blanc is not widely known by industry, neither is its positioning in the market.

This study was conducted to explore Chenin blanc perceptions of consumers and industry professionals. Quantitative and qualitative methods were applied to uncover the perceptions of Chenin blanc among consumers and industry professionals from different disciplines of the SA wine industry. In Chapter 3, the sensory perceptions of three dry Chenin blanc wines of diverse sensory profiles were investigated with the aid of sensory profiling methods descriptive analysis (DA) using a trained panel, and free listing and Check-All-That-Apply (CATA) among consumers. Respectively, free listing and CATA were carried out to investigate how consumers describe the wines using free descriptions and sensory attributes which were obtained from DA. In Chapter 4, qualitative research methods were applied using two separate questionnaires which were distributed with the aid of an online survey among consumers and industry professionals. The questions pertained to the consumers' purchase behaviour and perceptions, as well as their attitudes towards Chenin blanc. The industry professionals were probed for their opinions and inputs regarding Chenin blanc within the context of the SA wine industry. Similar topics which were constructed with the purpose of investigating the similarities and differences between the two sets of respondents' perceptions.

5.1 Sensory Perception of Chenin blanc wines

In Chapter 3, the DA panel evaluated aroma and in-mouth attributes. Free listing and CATA were used to investigate how the consumers described the wines and how they selected the aroma attributes obtained from DA, respectively.

5.1.1 Description and selection of aroma attributes

In free listing, consumers provided similar attributes to DA such as *fruit*, *citrus*, *tropica*l, *honey*, *wood*, *earthy* and *nutty*, as seen in Table 3.10. The attribute *fresh* was highly used by consumers to describe wine W1, which is suggestive of the perceived aroma characteristics by consumers. Thus, the preceding attributes can be used as alternative aroma attributes that are applicable to consumers.

In CATA, the similar attributes that were obtained from DA were gooseberry, granadilla, honey, toasted oak, butter, vanilla / caramel. Cochran's Q test confirmed 9 attributes to be statistically significant. Therefore, it is speculated that the list of attributes obtained in DA were not precisely relevant to what the consumers perceived.

5.1.2 Non-sensory attributes obtained in free listing

In free listing, five of the six global categories obtained were not of sensory origin. These were *Positive Emotion*, *Negative emotion*, *Food Pairing*, *Occasion* and *Technical*. Therefore, free listing enabled, and encouraged the consumers to provide non-sensory words that were associated to the consumers' emotional and functional conceptualisations of the wines (Silva *et al.*, 2016). The subcategory attribute *Pleasure* had the highest frequency, which is also found in previous studies, where wine was largely associated with pleasure (Charters & Pettigrew, 2007; Ferrarini *et al.*, 2010; Parr *et al.*, 2011; Marinelli *et al.*, 2014). Overall, the synonym word categories which were elicited the most by the respondents were *pleasant*, *calm*, *refresh* and *alcoholic*.

The attributes generated from free listing show potential to be implemented in wine marketing strategies during promotion and labelling industry operations. However, this would need to be validated with a larger number of consumers.

5.2 A comparison of the perceptions and opinions of consumers and industry professionals

In Chapter 4, the questionnaires were aimed at providing insights as to how consumers and industry professionals perceive Chenin blanc. Consumers were probed for their consumption behaviour and perceptions regarding Chenin blanc as a wine of choice. Industry professionals from different disciplines of the wine industry were probed for their opinions regarding the

current image of Chenin blanc and the inputs that could be implemented in order to better position Chenin blanc in the SA wine market.

5.2.1 Similarities and differences between consumer and industry perceptions

Wine and Chenin blanc wine perceptions

According to both respondent groups, wine in general was associated with aspects such as *pleasure*, *social*, *food* and/or *food pairing*, *wine type* and *class*. Chenin blanc was perceived differently regarding its positive and negative qualities. Respectively, consumers and industry professionals mainly mentioned aspects relating to their sensory experience and the wine production process, sensory and consumption-related attributes. Within the aforementioned aspects, similar perceptions regarding Chenin blanc's positive (*balance* and *easy drinking*, *affordable* and *value for money*, and *aroma* and *taste attributes*) and negative qualities (*unattractive aroma and taste attributes*, *lack of dimension* and *blandness*, *cheap* and *inexpensive price*, and *limited exposure* and *lack of popularity*) were perceived by both respondent groups.

Chenin blanc wine style and packing label descriptors

Consumers and, to a lesser degree, industry professionals displayed positive attitudes towards the implementation of less complicated wine descriptors on package labelling. Additionally, a majority of both respondent groups agreed that there is potential for wine style classified Chenin blanc in the SA market. The success of these labelling initiatives would depend on consumer education through using simple and relatable descriptors, and the support of prominent Chenin blanc producers.

Wine industry initiatives

Current industry initiatives that promote wine and Chenin blanc wine, specifically, were not considered effective by both respondent groups. However, the efforts of WOSA and the CBA were considered effective by some industry professionals. Consumers did not consider the information provided by the retail sector and restaurants to be efficient and sufficient. Furthermore, winemakers were trusted the most to provide information during a wine purchase. Based on interviews conducted by The Moss Group, according to retail "producers do not understand the difference between brand and product, brand positioning or their consumers' preferences in wine" (CIA, 2016). Therefore, there may be disparities between retailers and wine producers and a united approach is essential to sell and promote wines.

5.2.2 Consumers' perceptions

Generally, the consumers had drank Chenin blanc before and perceived Chenin blanc to be popular. However most preferred to drink red wine.

Intrinsic attributes and associations

Taste was considered to be a very important factor on the consumers' acceptance of wine in general, i.e. consumers mostly mentioned taste for: red and white wine consumption, the lacking appeal of white wine, positive and negative qualities and popularity of Chenin blanc wine, and their willingness to pay more for wine style classified Chenin blanc wine. The intrinsic attributes which had a negative influence on the consumers' Chenin blanc wine perceptions were *blandness*, *dryness* and *bitter*ness. On the other hand, the most mentioned positive attributes that were associated with Chenin blanc wine were *fruity*, *light, aroma*, and *flavours*.

Therefore the latter attributes and associations can be implemented in the marketing of Chenin blanc wine. However, more explorations will be needed with a larger sample of consumers.

Price and extrinsic attributes

Price was regarded an important criterion on the consumers' purchasing of wine and specifically, Chenin blanc wine. However, consumers were willing to pay more for style classified Chenin blanc, provided that more information would be available thereof. Additionally, consumers indicated an increased motivation to purchase wine if less complicated descriptors were used on wine labels. The main reasons were *better knowledge and understanding*, *the general preference* for Chenin blanc and the idea that *good quality warrants better price*. However, some respondents believed such measures should be a standard procedure, they were not able to afford and were avoiding disappointment. Therefore, the industry should implement ways of informing consumers about the intrinsic qualities of Chenin blanc wine in order to increase the consumers' interest, for example, in the labelling of packaging.

5.2.3 Industry professionals' perceptions

Industry professionals indicated that SA Chenin blanc was affordable for consumers, however, the prices should increase. The distinctness of Chenin blanc was mostly associated with its versatility, wines made from old vines, uniqueness and adaptability to the SA climate, allowing the expression of different terroir and to satisfy different consumer tastes. According to the industry professionals, Chenin blanc has incurred many challenges in the SA wine industry that have contributed to its low price points in the market. The main challenges are the polarised price perceptions of its quality, its image as a bulk and blending wine, competition with other varietals and other alcoholic beverages and the lack of familiarity among consumers. Among tourists, there are unfavourable organoleptic qualities.

SA wine industry initiatives

Industry initiatives such as wine shows, where consumers are educated about wine through tasting, were deemed important in the promotion thereof. It is important to incorporate more black consumers, therefore more wine shows should be hosted in black communities and areas that are outside of the Western Cape. Furthermore, the marketing initiatives should strive to educate the consumers about what the industry has to offer. To accommodate a diversity of consumer preferences, Chenin blanc specific shows should be held to showcase the wines' variety and enable producers to educate consumers about their products.

5.3 Aspects to be considered in future research

The environmental context that wine is tasted has a major influence on the consumers' emotions (Danner *et al.*, 2016). Moreover, studying the consumers' actual consumption would provide a better understanding of their perceptions of wine. According to Jaeger *et al.* (2016) "We must increase the number of real-life consumer studies for more ecological validity". A recommendation for future research would be a study conducted in settings that consumers ordinarily consume wine. Similar to the recommendation that was provided by the industry professionals, it is necessary that the SA wine industry conducts studies in other locations outside the Western Cape. This measure will include and provide insights of a more diverse consumer base and ensure a larger representation of consumers are reached.

5.4 Conclusion

This study used sensory and qualitative analysis to gain consumer and industry relevant insights. The tasks conducted established a workflow and new research perspectives in the study of Chenin blanc wine. In Chapter 3, sensory analysis using free listing, was applied to gain the consumers' overall perceptions of Chenin blanc wines. An in-depth analysis of consumer and industry professional perceptions and opinions was conducted in Chapter 4. Qualitative analytical methods such as lemmatisation and abstraction, in Chapter 3 and thematic analysis, Chapter 4 aided in the findings.

5.5 References

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APPENDIXES

Addendum A

Descriptive Analysis (DA) Tasting Sheet

Judge no. _____   **Rep** _____   **Wine Code** _____   **Date**

_____

Peach	none ———————|—————————————————————|———	Intense
Gooseberry	none ———————|—————————————————————|———	Intense
Pineapple	none ———————|—————————————————————|———	Intense
Guava	none ———————|—————————————————————|———	Intense
Granadilla	none ———————|—————————————————————|———	Intense
Lemon	none ———————|—————————————————————|———	Intense
Grapefruit	none ———————|—————————————————————|———	Intense
Yellow apple	none ———————|—————————————————————|———	Intense
Tomato leaves	none ———————|—————————————————————|———	Intense
Dry grass/Straw	none ———————|—————————————————————|———	Intense
Dried fruits	none ———————|—————————————————————|———	Intense
Oxidised apple	none ———————|—————————————————————|———	Intense
Vanilla/Caramel	none ———————|—————————————————————|———	Intense
Sweet spices	none ———————|—————————————————————|———	Intense
Muscat	none ———————|—————————————————————|———	Intense
Honey	none ———————|—————————————————————|———	Intense
Butter	none ———————|—————————————————————|———	Intense
Toasted oak	none ———————|—————————————————————|———	Intense

Taste

Acditv

Low   Medium   High

Sweet taste

Low   Medium   High

Bodv

Watery   Full

Concentra

Low   High
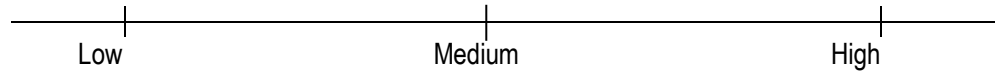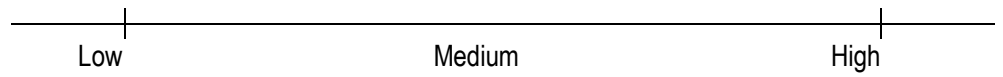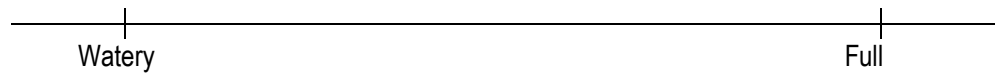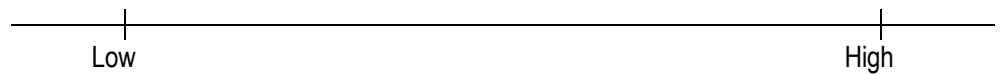
LENGTH / AFTER TASTE

Flavour

Short   Long
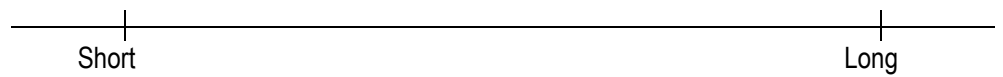
Addendum B

Least Squares (LS) Means plots of significant aroma Attributes
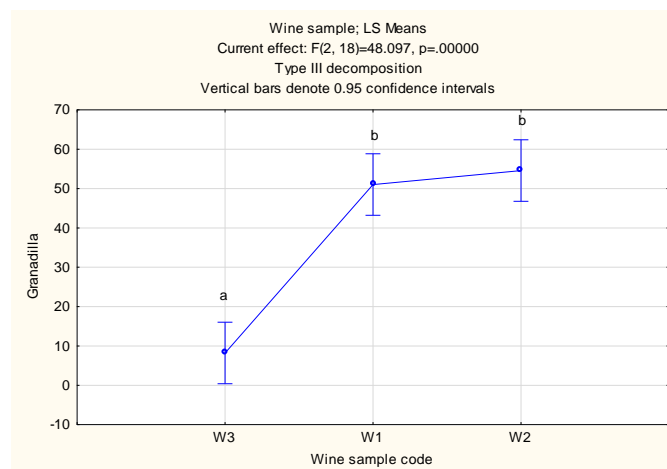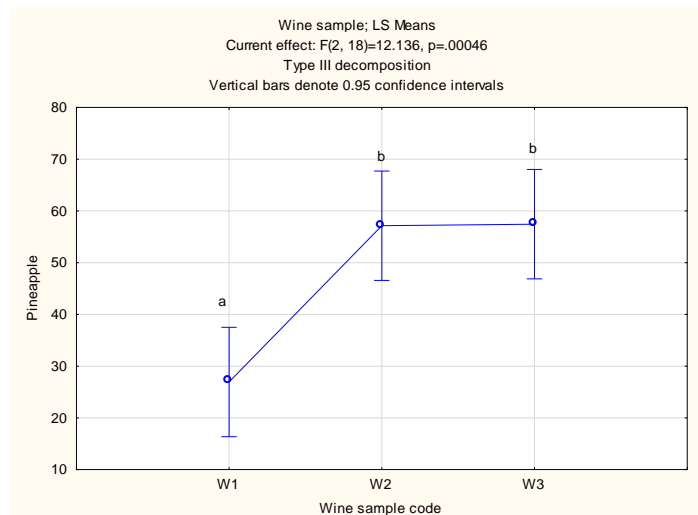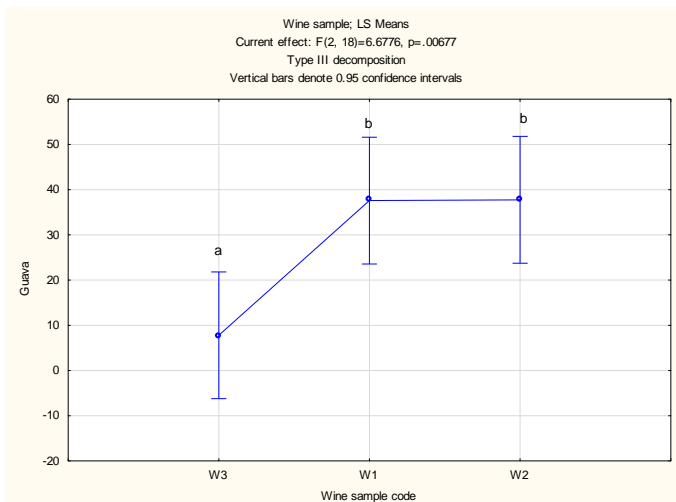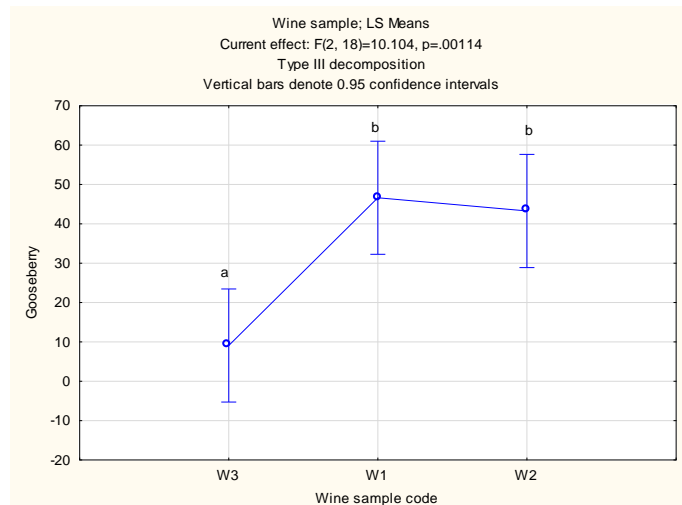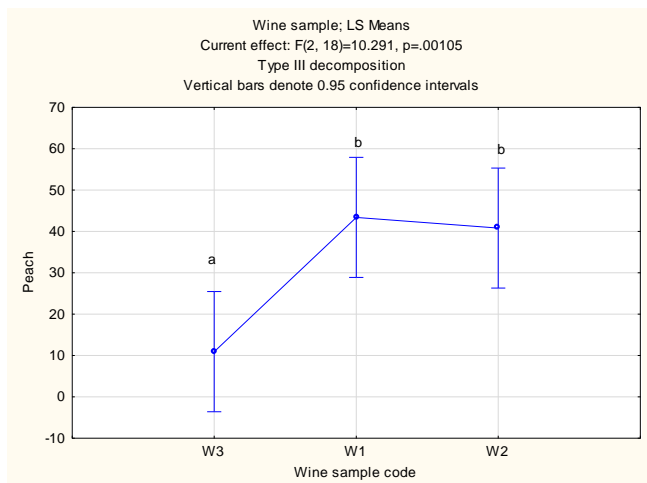
Figure B1 Least Squares (LS) Means plots for the significant attributes evaluated in descriptive analysis among wines W1, W2 and W3. Alphabetical letters indicate the significant differences (p < 0.05). Error bars denote the standard deviation (obtained from STATISTICA 13.2 ®).
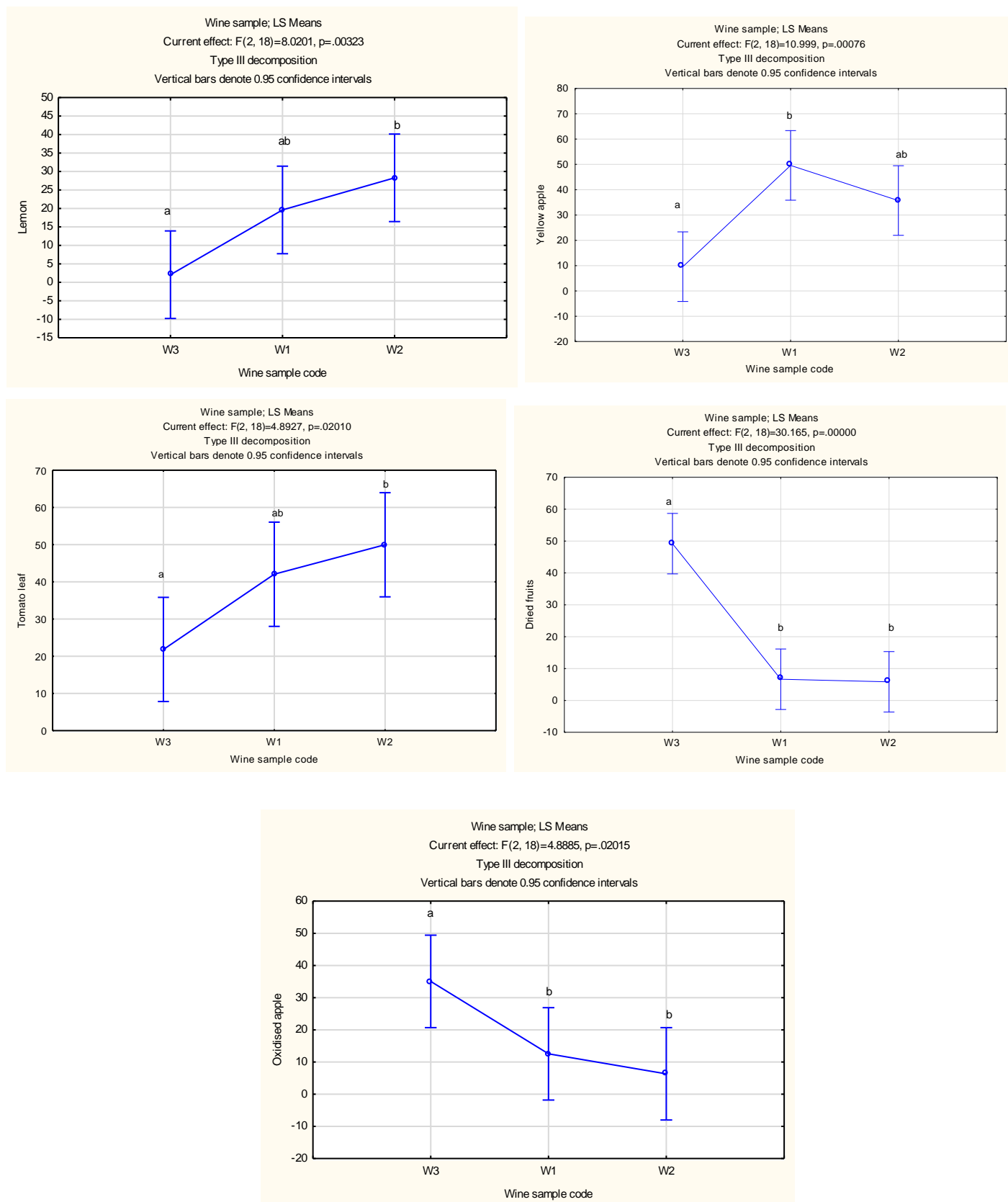
Figure B2 LS Means plots for the significant aroma attributes evaluated in descriptive analysis among wines W1, W2 and W3. Alphabetical letters indicate the significant differences (p < 0.05). Error bars denote the standard deviation (obtained from STATISTICA 13.2 ®).

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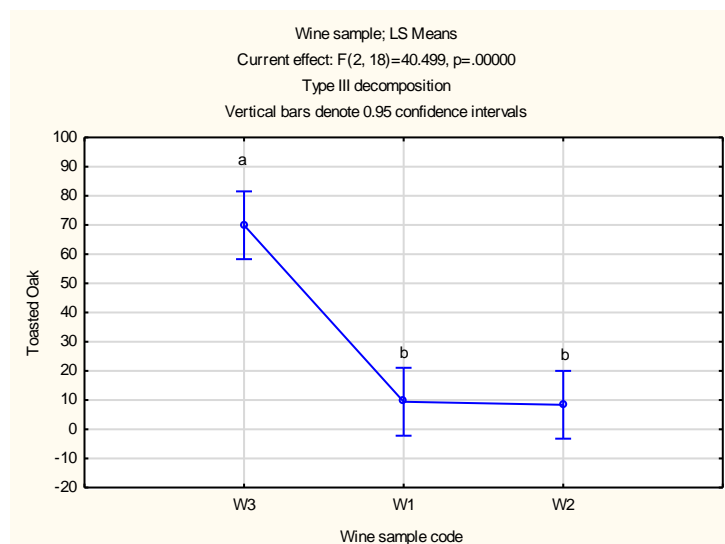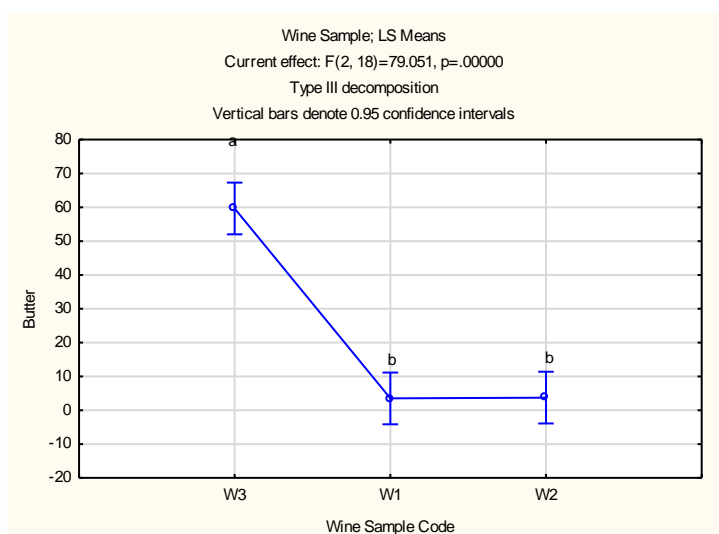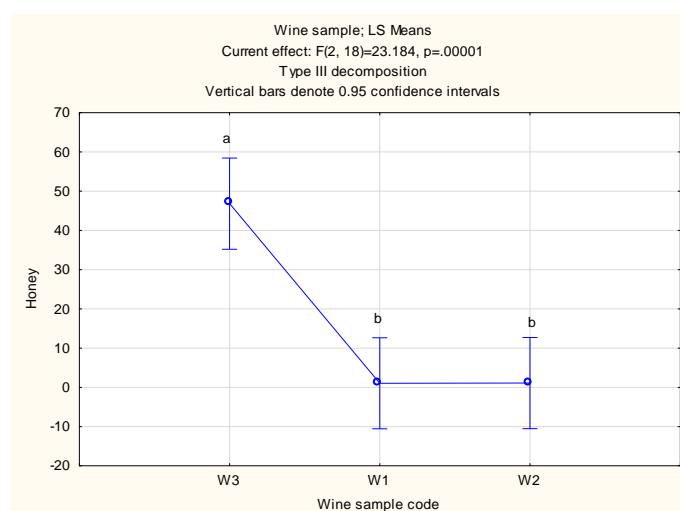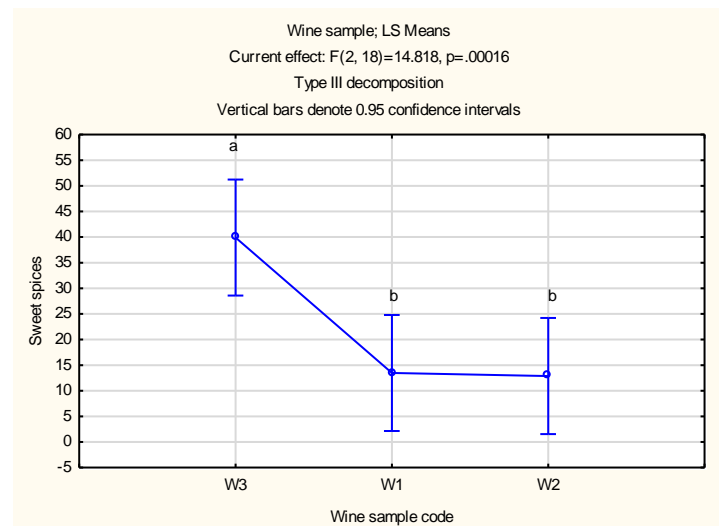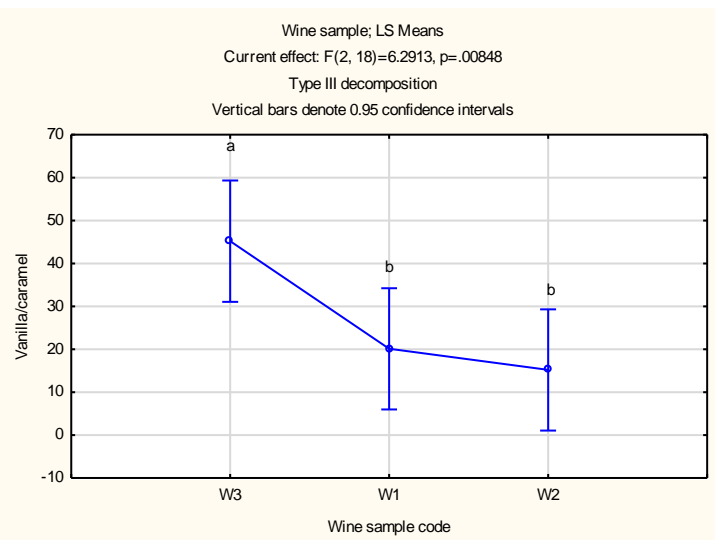
Figure B3 Least Squares (LS) Means plots for the significant aroma attributes evaluated in descriptive analysis among wines W1, W2 and W3. Alphabetical letters indicate the significant differences ($p < 0.05$). Error bars denote the standard deviation (obtained from STATISTICA 13.2 ®).

Addendum C

LS Means plots of significant in-mouth attributes
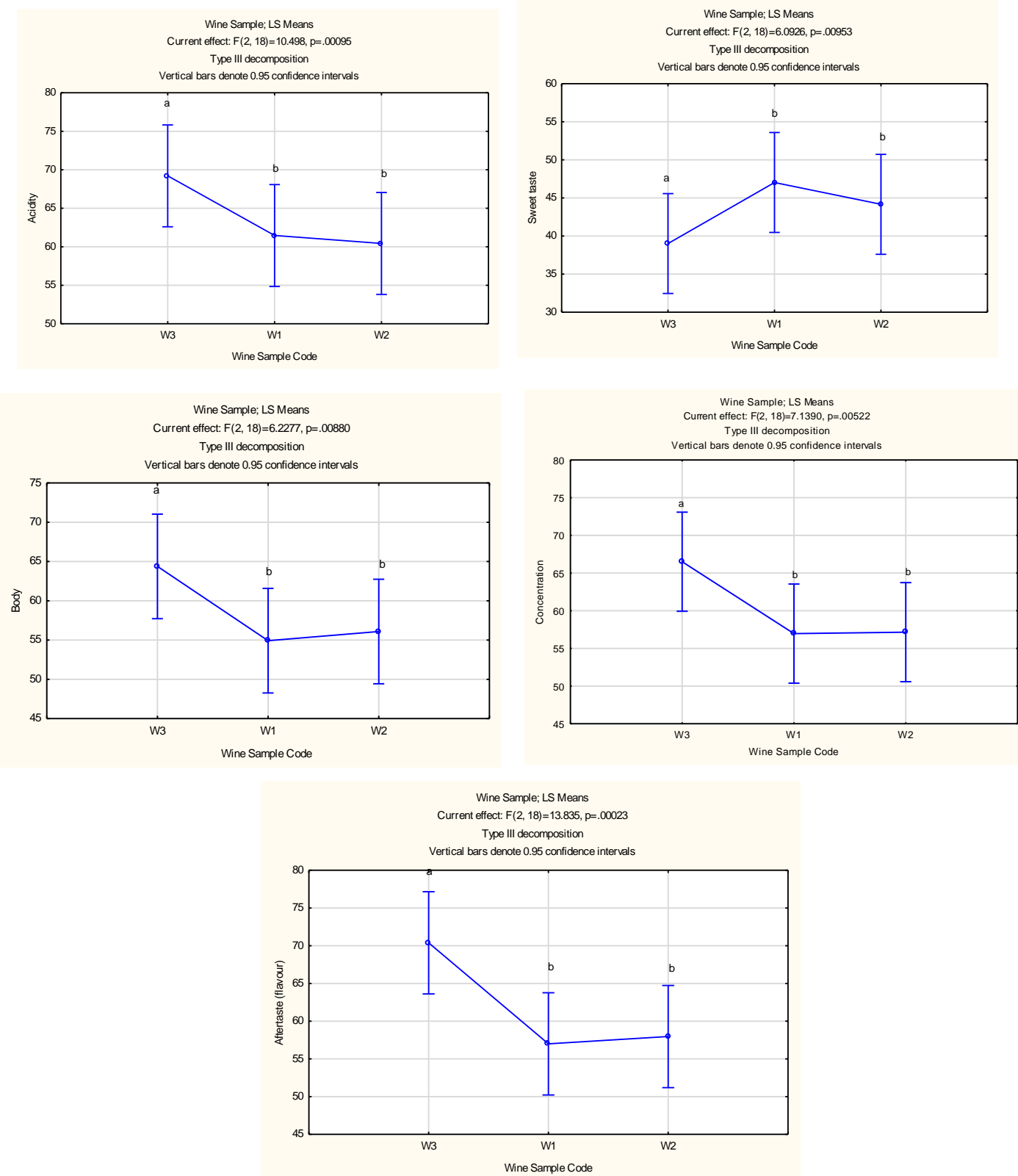
Figure C Least Squares (LS) Means plots for the significant in-mouth attributes evaluated in descriptive analysis among wines W1, W2 and W3. Alphabetical letters indicate the significant differences (p < 0.05). Error bars denote the standard deviation (obtained from STATISTICA 13.2 ®).

Addendum D

Consumer Tasting Sheet

Welcome to the Sensory lab!

You are welcome to ask the facilitator or assistants for guidance at any time.

Please do not communicate with fellow tasters.

Click the *next* button to begin

Institute for
Wine Biotechnology
STELLENBOSCH UNIVERSITY

Viticulture and Oenology
STELLENBOSCH UNIVERSITY

| | Next |

Judge number

Please enter your judge number

| | Next |

If I say **the sky** what comes to mind?

Word 1

Word 2

Word 3

Word 4

Word 5

Next

If I say **white wine** what comes to mind?

Word 1

Word 2

Word 3

Word 4

Word 5

Next

Please provide FIVE words that come to mind when tasting the wine.

Word 1

Sample: BC111

Word 2

Sample: BC111

Word 3

Sample: BC111

Word 4

Sample: BC111

Word 5

Sample: BC111

Next

Please take a short break before starting with the next tasting.

Please do not discuss the sensory evaluation with fellow tasters during the break.

Click the *next* button to resume

Next

From the list below, choose not more than **FIVE** words that best describe the wine.

Sample: BC111

- Peach ???
- Gooseberry ???
- Pineapple ???
- Guava ???
- Granadilla ???
- Lemon ???
- Grapefruit ???
- Yellow Apple ???
- Tomato Leaf ???
- Dry Grass ???
- Dried Fruit ???
- Overripe Apple ???
- Vanilla/caramel ???
- Sweet Spice ???
- Muscat / Sweet grape ???
- Honey ???
- Butter ???
- Toasted oak ???
- Other

Next

Generated by Compusense Cloud

Other

Sample: BC111

Next

Generated by Compusense Cloud

Thank you for tasting the wine, please click on the link below to complete the survey.
https://sunsurveys.sun.ac.za/Wine-Consumer-Research-.aspx

Finished

Addendum E

Table of Global and Subcategory Attributes from free listing

Table E1 List of six Global attribute categories, their 31 Subcategory attribute, the words provided in text and their synonyms from free listing technique performed by the consumers.

Positive Emotion

Subcategory attribute	Synonyms categories (words in text)
Excitement	**Adventurous** (Adventure, Adventurous) **Energised** (energised), **Fun** (Fun, Good times), **Playful** (Playful, Whimsical) **Amazing** (Amazing, Great, Awesome, Wow), **Youth** (Youth, New, Funky)
Romantic	**Passion** **Love** **Sentimental** (My mom)
Mental Stimulation	**Thought-provoking** (mindful, thoughtful) **Interesting**
Pleasure	**Clam** (Calm, peace, relaxing, relaxation)**, Freedom** (Free) **Pleasant** (Pleasant, Good, Delightful, Lovely, Nice, Enjoyable, Hmmm, Good taste, Attractive, Divine, Yummy, Passion, Enticing, Nourishing, Yum, Taste good, savour, Desirable, Just perfect, Flamboyant, Loving it) **Comfortable** (Comfortable, Accommodating, Welcoming, Friendly)**, Refreshed** (Refreshing, Very Refreshing, Refreshed) **Happy** (Happy, Happiness, Exhilarating, Content, Blissful, Merry, Joy, Smiles, Satisfied)
Aspiration	**Classy** (Classy, Sophisticated, Elegant) **Exotic Wealth / Lifestyle** (Yacht) **Beauty** (Beauty) **Appealing (**Sexy, Cute**)**
Preference	**I would buy** **Preferred**

Negative Emotion

Subcategory attribute	Synonyms categories (words in text)
Bewilderment	**Confusing** (Confusing, Deceptive, Blur) **Strange** **Shock**
Discontentment	**Sadness** (Upset, Poignant) **Unsatisfying** (Unsatisfying, Discontent, Disappointed, Unsatisfied) **Inexpensive** (Cheap, Broke)
Dislike	**Not preferred**

	Unpleasant (Unpleasant, dislike, gross , unpalatable, discomfort) **No** (No, bad)

Food Associated

Subcategory attribute	Synonyms categories (words in text)
Cheese	**Cheese** (Cheese, Blue cheese)
Meat	**Steak** (Enjoy with steak) **Lamb** (Enjoy with lamb) **Bacon** (Bacon) **Biltong** (Biltong) **Chicken** (Chicken)
Food	**Food** (Enjoy with food)
Pasta	**Pasta**
Seafood	**Seafood** (Seafood, sushi, calamari)
Dessert	**Dessert** (Ice cream, Tart)

Occasion

Subcategory attribute	Synonyms categories (words in text)
Meal Time	**Lunch** (Lunch, Sunday Lunch) **Dinner** (Dinner) **Main Course**
Leisure Time	**Picnic** **Self – indulgence / Own consumption** (Enjoy alone) **Social** (Enjoy with friends) **Weekend** (Sunday, Saturday) **Night cap** **Sundowner**
Seasonal	**Winter** **Summer** (Summer, Summery, Sunshine, Hot day) **Sunny** (Sunny, Sunny day) **Spring**

Sensory

Subcategory attribute	Synonyms categories (words in text)
Taste	**Sweet** (Sweet, Semisweet, Sweeter, a bit sweet, Slightly sweet, Sweet Aftertaste) **Acidic** (Acidity, Acidic, High Acidity, Less Acid, Semi Acid, Sour, Sourness, Sharp, Sting, Prickly sensation) **Salty** (Salt, Salty) **Metallic** (Metallic) **Bitter** (Bitter, Bitter ending, Bitterness)
Aroma	**Fruity** **Spicy**

	Toast **Butter** **Dates** **Fog/Dusty** **Green** **Floral** **Earthy** **Vegetal** **Savoury** **Nutty** **Clear** **Woody** **Turkish Delight** **Ripe** **Aromatic** **Bad Odour** **Tropical** **Honey** **Fresh** **Chemical**
Appearance	**Dark** (Dark, Dark in colour) **Clear** **White** **Yellow** (Yellow , Yellow in colour) **Artificial** (Artificial, Unnatural) **Pale** **Brightness** (Brightness, light)
Mouthfeel	**Dry** (Not Sweet, Dry, Dry Mouth, Cotton Mouth) **Soft** (Soft, Delicate, Very soft aftertaste, tender, Subtle, Gentle, Velvet) **Oily** (Oily) **Creamy** (Creamy, Milky, Milk, Foamy) **Polished** (Polished, Clean, Frank) **Smooth** **Warmth (**Warm, Throat warming, hot, burning, fire)
Flavour	**Insufficient** (Insufficient, Lacking) **Mild** (Mild, Mellow, Reserved, Not strong, Simple, Light taste) Bold (Bold, Strong, Medium strong, Intense, Stronger, More dominating taste, hard, Intense, Flavourful, Tasty, Zesty, Tangy, Flavour, Tasteful, Intense Flavour, Zest, flavoured, Strong flavour) **Dull** (Dull, Flat, Tasteless, Hollow, Flavourless, Bland, Weak , Grey , Boring, Dull palate, Predictable, Non aromatic, Empty, No aftertaste, Predictable) **Diluted** (Diluted, One Dimensional, Watery, Thin, Water) **Mineral** (Flinty, Mineral)
Finish	**Lingering** (Lingering, Aftertaste, Clingy, Long lasting taste, Resonant, Stagnant, Strong aftertaste)

	Fade (Fades, faded)
Integration	Complex (Complex, Deep, Intricate) Drinkable (Drinkable, Beginner, Easy, Easy drinking , Fine, Palatable, Average, Medium, Basic) Unbalanced (Unbalanced) Rich (Rich, Rich in Flavour, Rich on the palate) Balance (Balanced, Unbalanced) Overpowering (Overpowering, Overwhelming, Too Strong, Harsh Taste)

Technical

Subcategory attribute	Synonyms categories (words in text)
Viticulture	Vineyard
Chemistry	Esters Tannins Astringent (Astringent, Astringency) Ethanol Sulphur Oxidized Volatile
Cultivar	Cultivar (Cultivar, Chenin, Chardonnay, Sauvignon blanc)
Age / Aging	(Young wine , Matured, Mature , Ageing , Less Ageing, Vintage, Barrel, Rustic, New)
Oenological	(Lees , Skin Contact)
Quality	Faulty Quality (Quality, Well made, Better Quality)

Addendum F

Non-Sensory attributes elicitation frequencies obtained from free listing

Table F1 Elicitations of non-sensory global attributes (Food Associated, Positive Emotion, Negative Emotion and Occasion) and frequencies of the synonym categories.

Food Associated Category	Frequency
Cheese	5
Meat	6
Food	6
Pasta	4
Seafood	7
Dessert	3

Positive Emotion subcategory	Synonym category	Frequency
Excitement	Adventurous	3
	Energised	2
	Fun	2
	Playful	1
	Amazing	10
	Youth	2
Romantic	Passion	1
	Love	2
	sentimental	1
Mental Stimulation	Thought-provoking	2
	Interesting	1
Pleasure	Calm	21
	freedom	1
	Pleasant	69
	Comfortable	7
	Refreshed	20
	Happy	9
Aspiration	Classy	10
	Exotic	2
	Lifestyle	1
	Beauty	2
Preference	"I would buy"	1
	Preferred	3

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Negative Emotion Subcategory	Synonym Category	Frequency
Bewilderment	Confusing	5
	Strange	2
	Shock	1
Discontentment	Sadness	1
	Unsatisfying	3
	Inexpensive	3
Dislike	Not preferred	3
	Unpleasant	11
	Bad odour	5

Occasion Subcategory	Synonym Category	Frequency
Meals	Lunch	**3**
	Dinner	1
	Main course	1
Leisure Time	Picnic	1
	own consumption	2
	Social	4
	Weekend	7
	Night Cap	1
	Sundowner	1
Seasonal	Winter	1
	Summer	18
	Spring	2
	Sunny	4

Addendum G

Consumer Questionnaire

*Please enter your judge number

[   ]

*1.   Are you over the age of 18 years?

○ Yes

○ No

*2.   Do you drink wine?

○ Yes

○ No

*4.   What are your first thoughts when wine is mentioned?

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Why do you choose to drink your choice more frequently?

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*6. How likely would your wine purchase be influenced by its low price?

○ Less likely

○ Most likely

○ Depending on the occasion

*7. Have you ever drank Chenin blanc?

○ Yes

○ No

*8. According to your opinion, compared to other white wines, is Chenin blanc wine in fashion/ popular at the moment?

○ Yes

○ No

*Why do you say that?

*9. What do you consider not appealing about white wine in general, compared to red wine?

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*10. Indicate what you think are positive and negative qualities of Chenin blanc wine?

	Positive qualities	Negative qualities
1		
2		
3		

*11. From a scale of 1 to 3, rank the occasions for which you would most likely purchase Chenin blanc, with 1 as the least likely and 3 as the most likely?

Gift

Yourself

Social event

*12. Have you ever heard of the different wine styles of Chenin blanc?

○ Yes

○ No

*13. If information on the different Chenin blanc styles was available to you, would you be motivated to buy it more often?

○ Yes

○ No

*14 And be willing to pay more for it?

○ Yes

○ No

*14.1 Why do you say that?

[Back] [Save And Exit] [Next]

*15. How often do you generally drink the following types of wines?

	More than once per month	Once per month	Four times per year	Once per year	Less than once per year	Never
Chardonnay	○	○	○	○	○	○
Chenin blanc	○	○	○	○	○	○
Sauvignon blanc	○	○	○	○	○	○
Dry white	○	○	○	○	○	○
Natural sweet	○	○	○	○	○	○
Sweet	○	○	○	○	○	○
Noble Late Harvest	○	○	○	○	○	○

*16.   When you see a bottle of wine on a shelf of a store, what type of information attracts you the most to buy it? Name THREE.

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1.

2.

3.

*17.   How often would you say different styles of Chenin blanc wine are available at the following outlets in your area?

	Not at all available	Sometimes available	Regularly available
Liquor Store	○	○	○
Supermarkets	○	○	○
Wine boutique	○	○	○

*18.   Select the top THREE types of information that would positively influence your wine purchasing in ascending order, with 1 as the most positive and 3 as the least positive.

Price	
Variety	
Wine Style	
Region	
Vintage	

*18.1. State the reasons for marking 3 and 1?

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*18.   In the following section of questions, please select the ONE factor you consider to be MOST important as well as the ONE factor you consider to be LEAST important in your buying of Chenin blanc wine.

	Medals/Awards	Availability of Chenin blanc	Media & Social networks	Your knowledge of Chenin blanc
Least	○	○	○	○
Most	○	○	○	○

	Availability of other wines	Occasion	Availability of Chenin blanc	Brand Name
Least	○	○	○	○
Most	○	○	○	○

	Availability of Chenin blanc	Word of Mouth	Availability of other wines	Sensory Information
Least	○	○	○	○
Most	○	○	○	○

	Media & Social networks	Availability of other wines	Medals/Awards	Price
Least	○	○	○	○
Most	○	○	○	○

	Word of Mouth	Your knowledge of Chenin blanc	Occasion	Media & Social networks
Least	○	○	○	○
Most	○	○	○	○

	Your knowledge of Chenin blanc	Sensory Information	Price	Availability of other wines
Least	○	○	○	○
Most	○	○	○	○

	Occasion	Price	Word of Mouth	Medals/Awards
Least	○	○	○	○
Most	○	○	○	○

	Price	Brand Name	Your knowledge of Chenin blanc	Availability of Chenin blanc
Least	○	○	○	○
Most	○	○	○	○

	Sensory Information	Media & Social networks	Brand Name	Occasion
Least	○	○	○	○
Most	○	○	○	○

	Brand Name	Medals/Awards	Sensory Information	Word of Mouth
Least	○	○	○	○
Most	○	○	○	○

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*20.   When you choose a wine, do you generally consider its health aspects?

○ Yes

○ No

*Why do you say that?

[   ]

*21.   Would you be more motivated to make a wine purchase if less complicated words (descriptors) were used on back and front labels of the bottles?

○ Yes

○ No

*22. According to your knowledge, do retail shops and restaurants provide enough information regarding wine?

○ Yes

○ No

*23.   Would the classification of wine style on front labels motivate you to make a purchase if you knew more about the different styles of Chenin blanc wine?

○ Yes

○ No

*24.   Do you think that the South African wine industry is making enough and effective marketing efforts to promote Chenin blanc wine?

○ Yes

○ No

* Why do you say that?

[   ]

*25. Have you heard of the Chenin Blanc Association?

○ Yes

○ No

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*26. Which industry expert would you rely most on to give you information about the wine when making a purchase?

○ Sommelier

○ Wine Judge

○ Winemaker

○ Media/journalist

○ Sales and Retail Representative

*Why do you say that?

[   ]

*27. Have you ever been wine tasting at a cellar?

○ Yes

○ No

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Addendum H

Table I1 Consumers' responses Code groups, Code category and wording of answers in text according to the questions. (obtained from ATLAS.ti)

Code groups (Question theme)	Code Category	Wording of answer in text
Positive qualities of Chenin blanc (Question 3)	Accessibility	• "can find it almost anywhere" • "Can get anywhere"
	Affordable	• "Affordable" • "Its usually affordable" • "probably afforable but with class"
	Aroma	• "Aromatic" • "Aromas" • "Pleasant aroma"
	Balance	• "balanced between dry and semi-sweet wine" • "fairly neutral" • "Is a Nuetral wine"
	Classy	• "Elegant" • "Classy" • "Looks very elegant"
	Cool Temperature	• "It's smooth when chilled"
	Drank in warm weather	• "Fresh for summer" • "Great to have on a hot day" • "Perfect for a summer outside summer gathering"
	Easy drinking	• "Easy-drinking" • "Drinkable" • "easiness"
	Enjoyable	• "Fun" • "Nice to drink" • "Comfortable"
	Flavours	• "Flavour" • "Clear about the flavours" • "Continous burst of flavours"
	Food Pairing	• "Great with fish • "Good with chicken" • "Really good with snacks"
	Fresh	• "Fresh" • "Crispy" • "Always fresh and crispy"
	Fruity	• "Fruity" • "Rich in fruit" • "Tropical"
	Light	• "Its light" • "Light" • "Generally light and easy to drink
	Popular	• "Well known variety" • "Popularity"
	Refreshing	• "Refreshing" • "Cooling'
	SA related fact	• "Long SA history" • "Well known variety' • "Brandy"

	Taste	• "Taste is better" • "More taste" • "It tastes great"
	Variety	• "different types (all chenin blancs do not taste the same)" • "large variety of styles to choose from • variety of styles"
	Versatile	• "suits different occasions" • "flexible" • "Versatile"
	White wine	• "It's a white wine" • "Not red"

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Negative qualities of Chenin blanc (Question 3)	Aroma	• "too much fruity" • "pungent" • "off aromas"
	Bitter	• "Bitter" • "Bitter after taste" • "Sometimes bitter"
	Bland	• "Boring blend" • "Flat" • "Bland"
	Cheap	• "too many perceived as cheap and cheerful" • "low price" • "Can come across as too cheap"
	Dryness	• "Dry" • "Cottonmouth" • "Can be too dry"
	Expensive	• "high price" • "expensive" • "Pricey"
	Health side effects	• "Makes me get a headache" • "Hangovers" • "dehydrating"
	High in alcohol	• "It has high alcohol" • "High alcohol" • "too much alcohol and it looses its aroma"
	Inconsistent taste	• "taste differs between different wine making houses" • "Different variants are extreme" • "Unreliability"
	Less fruity	• "fruit fall flat sometimes" • "less of fruits" • "Not fruity"
	Limited exposure	• "not communicated to customers enough - as compared to a Sauvignon Blanc" • "not popular" • "Not fully known amoungst lots of my peers"

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
	Limited food pairing	• "doesnt compliment meals like red does" • "paired with fancy food" • "it limits the food i can have it with"
	Limited occasion suitability	• "not suitable for all occasions" • "specific occasion bound" • "not for celebrations"
	Not appealing as red wine and/or other cultivars	• "Sblanc or Chardonnay can taste better depending on the style required for the Chenin" • "Doesnt get me as drunk as red wine" • "Not comparable to red wine"
	Not refreshing	• "not refreshing to me"
	Over oaked	• "Aok" • "It is too "woody" for my liking. • Over oaked'
	Overpowering	• "strong kick" • "unpalatable" • "difficult to drink"
	Price variation	• "difficult to drink"
	Short ageing period	• "it doesnt age for too long" • "maturation" • "limited aging ability"
	Taste	• "High in acid" • "sharp after taste" • "doesnt taste nice"
	Drank chilled / cool	• "cannot have it at room temperature" • "it is better when chilled" • "Cooler"

Code groups (Question theme)	Code Category	Wording of answer in text
First thoughts of wine (Question 4)	Wine Production	• Wine farm and white wine • I thought of quality wines that are made from well known wine estate • Stellenbosch
	Admiration	• I was excited because I am OBSESSED with wine! • Memories
Best friend
Classic
Relax
Fun
Romance • That I would love some :-)
	Reprieve	• unwinding with friends by the fire place after a long week • Relaxation, gathering. • My first thoughts are relaxation and unwinding. I have wine every day when I get back from work to relax and unwind and to some degree ponder.
	Self-care	• drinking
enjoy
refresh
Responsible • Enjoy chilled and in room temperature and drink it responsibly. • Healthy
	Pleasure	• Enjoy chilled and in room temperature and drink it responsibly.

		• fruit, peaches and happiness • Wine not? I became so happy and I invited all my friends so we can get to taste different types of wine\<br /\>\<br /\>
	Type of wine	• Natural sweet white wine • A sparkling relaxing drink • I think of grapes. Different sweet and strong aromas, the different texture of the wine. The medium - high acidity of white wine and the strong heavy body of red wine.
	Sensory Experience	• Rich, creamy, fruity taste. • my first thought when wine is mentioned is the uniqueness of the wine and the story behind the wine also thinking about the aroma or flavours am going to get in the wine and what kind of a food I am going to pair • Relaxation, great taste, friends ,with my elegant wine.
	Overpowering	• Wine is bitter, unpalatable and acidic. Its for a selective taste. • Bitter tasting, strong smelling beverage. • Strong, awesome and amazing, complexity, strong
	Social	• An afternoon braai with friends or family. • unwinding with friends by the fire place after a long week • Connecting with different people, socialize and drinking this elegant, classy fancy drinking, alcohol. • Dinner with friends. Goes well with certain foods
	Refreshing	• I think of a refreshing drink, that is by done by the grapes and fermented in barrel or stain steel tank. • something that is refreshing and can enjoy with friends • tasty and refreshing after a long day or summer day
	Occasion	• Dinner. Event (birthday, graduation etc.). Celebration. Red wine • Wine is an alcoholic beverage and are available in different styles, namely red, white, dry, off-dry, sweet, semi-sweet and sparkling. Grapes are used to make wine. Wine can be enjoyed during lunch, at a braai or at celebrations. • Good food, great social time with friends and some elite event or occasion.
	Food Pairing	• A sophisticated drink\<br /\>- Associate it paired with a meal\<br /\>- Reminds me of Stellenbosch • good food and social event • When I think of wine, I think of relaxing and eating good food.
	Classy	• my first thought when wine is mentioned is the uniqueness of the wine and the story behind the wine also thinking about the aroma or flavours am going to get in the wine and what kind of a food I am going to pair it with my elegant wine. • I am going have a good time with my sophisticated friends

	Summer	• I think about summer, sunshine, family. • I think of something sweet and summery and something which is pleasant and not too harsh. I think of something that would keep me feeling cool and refreshed. • Relaxing Summertime with friends
		• Good food, great social time with friends and some elite event or occasion.

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Preference: Red wine (Question 5)	Taste attributes	• "Red wine is more sweeter than the white wine and the are more documented health benefits in drinking the red wine." • "Red wine has more rose options with I find sweeter and more enjoyable." • "It depends on the flavour here. I prefer fruity tastes and not something which is dry and harsh nor strong. Thus, I don't have a preference for red wine per say, but rather for something sweet, whether it be red or white"
	Complexity	• "Red wine makes your body feel warm where as white feel like it goes straight to your head because of the sharp taste. Also, red wine has more depth in flavour compared to the white wine." • "I find that you have to know more about wines to pick out a good white wine. I really enjoy a good white, but when a white is bad it's undrinkable. Â I enjoy the richness of reds and find them comforting." • "I feel red wine has more complexity and has more for me to enjoy."
	Cultivar specific	• "Merlot" • "I love Shiraz" • "I prefer the flavour of red wine, especially merlot."
	Food Pairing	• "I love redÂ wines I think that they are more interesting and complex and I love the fact that I can enjoy a glass of red wine with a steak" • "It goes with the food I like more, meats. Other heavier things like steak, biltong, emotional baggage." • "Red one is a more flavourful wine and goes with everything, moreÂ than white one does"
	Aroma	• "\<p\>Usually more aroma, less perceivable acidity and more buttery aroma\</p\>" • "Red wine, on average, has a great aroma and after taste. It is usually rich in colour and has a strong fruity aroma. You can immediately tell which fruit(s) was used while producing it. This is not to say that all fruits are immediately felt but it means that some are more present than others. Also, the colour of a red wine tells a story. Compare a Rose and a Pinotage, then you will see what I mean." • "\<p\>Red white has more flavour for me. It has a tartness but for me it has balanced out by its heavier aromas and taste. white wine does not taste smooth in my mouth. It is at times too sharp and gives me nausea.\</p\>"
	Preference	• "red wine goes well with my palate and I can stand drinking white wine" • "Although I am rather fond of white wine, I was initially exposed to red wine only and was surrounded by avid red wine lovers who cultivated the same red wine spirit in me."

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	Health Benefits	• "Red wine is more sweeter than the white wine and the are more documented health benefits in drinking the red wine" • "it doesn't give me a hangover. white wine makes me feel sick immediately after the first glass." • "don't like the taste of white wine generally tastes like vinegar and ive heard red wine is good for cholesterol"
	Body	• "I like the dryness and full body of red wine" • " red wine is more full and the wine itself bears more flavour trough every sip. " • "Its not actually true. I drink both and am impartial when offered a glass of wine. But if anything, red wine is a more full bodied wine. Which has a more complex structure."
	Flavour	• "Red one is a more flavourful wine and goes with everything, more than white one does" • "its a easy drinking wine refreshing and full of flavour" • " red wine is more full and the wine itself bears more flavour trough every sip. "

At the top of this block, preceding the Health Benefits row:

		• "Because its my favourite."

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Preference: White wine (Question 5)	Taste Attributes	• "because I love white and its not very bitter" • "I enjoy a slight acidity and I love buttery and fruity flavours." • "I find some red wine too bitter and too warm to drink in Summer"
	Food Pairing	• "It is affordable , good for entry level and taste good for me to match with every portion of food I take with" • "White wine is easier to drink in my opinion and I generally drink wine in the day or with a meal, and the food I make generally pairs better with white wine" • "Most because of the taste and how it pairs with my food - I like red meat so it goes well with it"
	Aroma	• "There's wine for every occasion, to suit different budgets. I like to share it with friends and family.. the aromas and tastes." • " refreshing light on the palate pleasant dry sweet full of aromas "
	Refreshing	• "because white wine more easy drinking wine they are lightly in style and the is no high acid and they also refreshing for me and I enjoy the fruitiness of the white wines." • "It is the lighter wine. It is fresh, crisp and fruitier therefore, I think, more enjoyable. I like that I can drink it always especially during the summer because I think its textures and freshness is cooling." • "It is more refreshing. It goes with more occasions (in my opinion). It is definitely a bottle to share."
	Easy Drinking	• "Easy drinking. My mom drinks white wine and so it is what I have grown up with - the fridge is never without a bottle or three." • "White wine is easier to drink in my opinion and I generally drink wine in the day or with a meal, and

		• "the food I make generally pairs better with white wine" • "its a easy drinking wine refreshing and full of flavour"
	Lighter	• "prefer white wine because its light and chilled and hits the right spot. I prefer drinking wine outside so a warm, thicker wine will get me drunk faster than a light white wine." • "Its light and happy" • "Its light"
	Flavour	• "It is the lighter wine. It is fresh, crisp and fruitier therefore, I think, more enjoyable. I like that I can drink it always especially during the summer because I think its textures and freshness is cooling." • "I think prefer drinking white wine because its has more fruity and fresh flavours. Red wine is an acquired taste and the flavours are more intense." • "I enjoy a slight acidity and I love buttery and fruity flavours."
	Affordability	• "I enjoy a slight acidity and I love buttery and fruity flavours." • "White wine is much more lighter than red wine and can be easily be drank with food. Red wine is sometimes much more expensive and the cheapest red wines are not drinkable." • "Not easy to drink red wine in hotter weather, white wine can be consumed any time of the year, good red wine is also more expensive.\<br /\>\ BUT, I love red wine more than white. white is just more easy every day drinking and red on special occasions"
	Social	• "There's wine for every occasion, to suit different budgets. I like to share it with friends and family.. the aromas and tastes." • "\<p\>it goes well with red meat , which is what I usually eat when I am out or on weekends\</p\>" • "Because it tastes great and I always have a great time."
	Summer	• "It is the lighter wine. It is fresh, crisp and fruitier therefore, I think, more enjoyable. I like that I can drink it always especially during the summer because I think its textures and freshness is cooling." • "South Africa is known its hot summers and I feel white wine is very refreshing when its hot and humid." • "I prefer white wine because its light and chilled and hits the right spot. I prefer drinking wine outside so a warm, thicker wine will get me drunk faster than a light white wine"

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Never Drank Chenin blanc (Question 7)	Never crossed mind	• "I've never bought it, nor has an occasion come up where I would consume it." • "It never crossed my mind" • "I might have but may not recall that it was actually chenin blanc"
	Prefer other cultivars and/or wine types	• "The times that ive paid attention id drink Chardonnay" • "I am more in to red wines"
	Not Familiar	• "I have not been introduced to it by the the people i drink wine with" • "I've just never tried it. or cant remember if i did. Not an expierenced wine drinker" • "I've just never tried it. or cant remember if i did. Not an expierenced wine drinker"

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Popularity of Chenin blanc wine (Question 8)	Easily Accessible	• "It is the easiest to find in shops" • "because every farm around here its available" • "most people buy it , it likely that you don't find in the shelves"
	Versatile	• "various wine styles, from fresh fruity to more complex" • "it tends to be more suited to a larger groups taste and it tends to be a average price" • "it's a safe wine to choose for those who are trying wine out"
	Accommodating to warm weather	• "It suites most summer occasions" • "It pairs well with summer" • "I am of the opinion that during summery months, people are more likely to drink Chenin Blanc"
	Affordable	• "Its cheap , enjoyable and doesnt get you drunk easily" • "its tasty and affordable" • "it tends to be more suited to a larger groups taste and it tends to be a average price"
	Attractive taste attributes	• "its drinkable" • "Lighter, easy-drinking wine." • "Chenin blanc is popular because I think it is not a very dry wine and its not too sweet. Its a balanced wine."
	Popular in social settings	• "I have seen many people drinking it. My girl friend aslo drinks it. a lot" • "It's a popular choice amongst friends" • "It comes up in discussion fairly often"
	Larger food pairing variety	• "The food industry has popularized it" • "Because of the weather and because I believe that had a role it plays in the choice of food and thus the wine to accompany the food."

		• "Because it is refreshing and goes with most meals"
	Chenin blanc facts	• "is one of the first vines in S.A and has a lovely aromas of tropical fruits" • "It is the cultivar that is planted the most." • "It's the most popular white wine"
	Preference	• "becouse i buy it when i feel like drinking white wine" • "it has brought something new in the industry.. almostas if they have combined all we love about white wine in one bottle" • "Because I have been wine tasting a lot and have been told so. As well as my friends and I only drink Chenin blanc"

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Lack of popularity Chenin blanc wine (Question 8)	Dislike taste Attributes	• "Its bitter" • "Occasionally its bland" • "because the little bit of oak is influencing the fruity flavours"
	Preference for other type of wine and/or cultivar	• "I know more of Red wine lovers than white" • "Honestly no clue. Feel like Sauvignon blanc is the more general choice." • "I like Chardonnay"
	Price Implications	• "Because its much expensive for young adults and student to buy at the average price" • "Because its much expensive for young adults and student to buy at the average price"
	Dependent of social setting	• "I haven't heard many people talking about drinking this particular kind of wine." • "im not around people who drink much chenin blanc" • "Even though I prefer Chenin blanc, I do not think it is popular. Many times when I have wine with friends they will almost always prefer a Sauvignon blanc or Chardonnay over a Chenin."
	Limited exposure	• "Lack of knowledge" • "im not around people who drink much chenin blanc" • "I dont think it exposed as much"
	Limited Food Pairing	• "Most people don't know what to pair it with or they just go with what's available at that moment"
	Generally Unpopular	• "i dont often see it as a wine of big choice - especially at restaurants. Their white wine lists seem to be dominated by Sauvignon Blanc." • "I do not hear people mentioning it a lot" • "Everyone has personal preference, so it does not matter that a wine is in fashion"

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
White wine Unappealing (Question 9)	Unattractive taste attributes	White wine have more acid in comparison to red wine and is not as rich in anti-oxidants as red wine - The lightness of the wine - Nothing really. Mainly the acidity characteristic of white wine can at times be overpowering
	Less health and/or dietary benefits	- Its much stronger than the red wine. It gets you drunk much faster, so I've heard from people who drink wine. - its not usually sweet or has a variety of flavour as compared to red wine.. plus, I have never heard of it being actually being healthy - It has more calories and it is not as authentic as red wine.
	Unpredictable buy	- The green bitter aspects some of the white wines have is very unappealing to me. I never know if this is going to be a good bottle or not. - when I have to choose the wine I want, I normally just go for red wine because I've had plenty of times before. I am very hesitant when it comes to white wine - I Â usually find that a bad white wine so unpleasant that I don't want to drink it all. I feel that I am more picky with white wine. If I am going to buy a white I want to have had it before so that I am assured that I will enjoy it. Whereas with reds I Â am happyÂ to buy wines that I haven't tried before. Red wines have less risk.
	Preference for red wine	- As much as it is refreshing, red wine is more tasty - It is often too harsh for my taste. I prefer softer, Â sweeter wines. - We are more exposed to red wine than white because of the romantic conation it has and also the benefits they normally say it has and sometimes the packaging -I feel red wine have more attractive packaging
	Less socially accepted	We are more exposed to red wine than white because of the romantic conation it has and also the benefits they normally say it has and sometimes the packaging -I feel red wine have more attractive packaging
	Less festive	- Its mainlyÂ associated with Â women ,and most people enjoy it with food than for pleasure and enjoyment in clubs , festivals and parties - Its mainlyÂ associated with Â women ,and most people enjoy it with food than for pleasure and enjoyment in clubs , festivals and parties - Sometimes the taste can be too fruity, or citrusy or too robust compared to red wine. For some reason I feel like it does not have the prestige red wineÂ has in terms of drinking it at big/classy occasions.
	Limited food pairing options	White wine goes well with poultry dishes such as chicken and seafood Â I eat that everyday and its usually during working day during the

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
		week on the other hand red wine is nice on weekends with red meat or braai meat
		• White wine goes well with poultry dishes such as chicken and seafood Â I eat that everyday and its usually during working day during the week on the other hand red wine is nice on weekends with red meat or braai meat
	Not Accessible	• Its not always easy to find a good white wine

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Unwilling to pay more for wine style classification (Question 14)	Avoiding disappointment	• "afraid to get dissapointed when tasting or drinking the wine after buying it"
	Current financial status	• "Student budget-Need I say more" • "As student on a budget, paying more for anything is greatly discouraging" • "It won't fit the student budget"
	Prefer red wine, wine styles and/or other cultivars	• "I am not that interested in the different styles of Chenin Blanc" • "I have been able to find good red wine in the stipulated price point. I don't see why that should change when white wine is regarded." • "Of the little white wine I do consume, I prefer sweet white wines and chenin blanc is not a sweet white wine."
	Should be standard procedure	• "Because it should come standard with the wine, not just from a marketing point of view but also from a buyers point of view. Instance if it just say Chenin on the bottle, but does not specify "wooded" and the bottle costs R120, no one (not even myself) will buy it. I want to know (read) that if I pay R120 why am I paying it, what value do I get from it _VALUE"" • "Because it should be available The fact that more information is available that more types of Chenin blanc are available shouldnt drive up the price."

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Willing to pay more for wine style classification (Question 14)	Able to afford	• "i like to try a more expensive wine every now and then - most likely it'll be to drink with my aunt." • "I feel that wine is more about the flavour than it is about the information regarding the styles avaliable - if I like a particular taste of wine, then I am more likely to purchase it, regardless of its price" • "I do not mind paying more for a product I know I will enjoy"
	Better knowledge and understanding	• "i am willing to pay more i am well-informed about the product" • "dont normally drink white but if i knew more and specifically what i like more likely to buy" • "Then one understands the quality thereof, therefore one is willing to pay more."

	If taste is appealing	• "If it taste good then I would be willing to pay more for it." • "I like how some of it is sweet" • "I will rather drink something i enjoy than drink something that is cheap especially with wine"
	Good quality warrants better price	• "Good quality warrants higher price" • "I do not compromise when it comes to quality and would be willing to be more adventurous." • "Because it is worth the price."
	If information is appealing	• "I would know more about the wine and the quality which would make the purchase more worthwhile" • "if the information provided makes the wine seem more appealing i would be willing to pay more" • "It not only educates me more as consumer about Chenin but it also gives me a variety to choose from and if it is 'premium' it would be something worth gifting to someone or even keeping as a collection for myself."
	Preference for Chenin blanc	• "Because of the different style that the chenin is made of." • "I believe that for good quality you musrt be willin to pay and I will definitely pay a good price for a good quality Chenin blanc" • "Its quite a nice wine."
	More effort means better product	• "It would seem like more effort was made and a better product was being offered. Therefore i would be willing to pay more for it."
	Open to trying something different	• "I'm always game to try new wines" • "I do not compromise when it comes to quality and would be willing to be more adventurous." • "I want to explore more styles of chenin blanc - e.g. orange wine"

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Information type Supplied in retail (Question 22)	Alcohol Percentage	• "Alcohol level" • "alcohol volume and how is it in your mouth and etc"
	Brand	• "Brand and vintage"
	Cultivar	• "Name of cultivar, the vintage" • "What it is and where it is from"
	Food Pairing	• "They type of wine, what it tastes like and what you can pair it with"
	History	• "The year, the ingredients, history"
	Origin	• "Where the wine is made" • "The notes of the wine, blend and which farm or wine region it is from." • "What it is and where it is from"
	Sensory Attributes	• "The flavours" • "The notes of the wine and what it tastes like and what you can pair it with." • "The notes of the wine, blend and which farm or wine region it is from"
	Vintage	• "Brand and vintage" • "The year"

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	Type of wine	• "Name of cultivar, the vintage" • "The type of wine, what it tastes like and what you can pair it with" • "The quality" • "The notes of the wine, blend and which farm or wine region it is from"

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Marketing Efforts enough and efficient (Question 24)	There is a market	• "Its well known" • "I hear about it from friends" • "Loads of wine tasting farms available, SA wine is popular in other countries"
	Diversity of Chenin blanc	• "We find different wines" • "They make different types of Chenin blanc" • "There are many Chenin blancs available in South Africa"
	Promotions, social media and advertisements available	• "Chenin Blanc Association" • "Load of wine tasting farms available, SA wine is popular in other countries." • "Social media plays a huge role alongside magazine articles regarding Chenin"
	Accessibility (farms, restaurants and shops)	• "I understand that it depends on the region and availability of grapes" • "I know about Chenin blanc and most farms have Chenin blanc"

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Marketing Efforts not enough and efficient (Question 24)	Industry segmentation	• "I think the South African wine industry only promotes the wine in general (red and white wines)" • "Because the wine industry is segmented. Its an individual environment in most parts" • "I don't think the wine industry in South Africa is making enough mark"
	Less focus and exposure to Chenin blanc	• "I don't often see anyone promoting a chenin blanc - they rather promote their other styles like Sauvignon Blanc more often in my opinion" • "A lot of emphasis is placed on Sauvignon blanc and red wine." • "Before moving to Stellenbosch I hardly knew about wine and wine tasting. I had to go to farms to learn more"
	Limited exposure to other communities (black and other provinces)	• "they dont share the history if it with other people" • "I don't regularly see any promotions in the shops in my area"

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Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
		• "I hardly see any wine ad on tv's or targets on black communities as the booming promising target market"

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Trusted Professional: Media (Question 26)	Easily Accessible	• "I read a lot and watch a lot of tv, therefore it's the greatest place to." • "I have easy access" • "Everyone can see it"
	Less complicate terms used	• "they would use less complicated terms in a way of making the viewer or reader understand"

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Trusted Professional: Sales Representative (Question 26)	Better People skills	• "a sales person know mostly what people like because he is the one that see what mostly lie or prefare to buy" • They are accessible at wine farms and trained • Because they get trained to tell you about the wine and they are your • sales person know mostly what people like because he is the one that see what mostly lie or prefare to buy • Because they get trained to tell you about the wine and they are your first point of contact before purchasing
	Knows trends	• a sales person know mostly what people like because he is the one that see what mostly lie or prefare to buy • Hopefully they have a well-developed taste than i do. • Hopefully they have a well-developed taste than i do.
	Experience and training in sales	• Because they consider the selling of wines • They make a living selling wine – they need to sell good wines • Because they are the last person you buy wine from

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Trusted Professional: Sommelier (Question 26)	Experience and training	• So that I can tell the story of the wine and aromas • They're experts • They are experienced and have a wide tasting knowledge
	Knows consumers' preferences	• He/She would know what I'd want when I request a wine
	Objective opinions	• They usually aren't trying to sell you anything, an objective opinion would be given. The fact that they are an expert of pairing wine with food makes them even more credible!

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Trusted Professional: Wine Judge (Question 26)	Approves quality of wine	- He is the judge - Because they are knowledgeable of what is good or not - A wine judge in my opinion is the best 'consumer' as they would have exposure and knowldge of predicting what people will most likely enjoy.A wine judge in my opinion is the best 'consumer' as they would have - Because he is knowledgeable of what is best or not
	Better understanding	- They are more knowledgeable about wine - better understanding of the product maybe even studied winemaking - Because I feel they know best without being bias like the wine makers as the wine makers might promote the wines they make - They are more knowledgeable about wine
	Exposed to variety	- it more helpful ,you test diffrent wines - They are exposed to a wider variety of wines to make the judgements - As a wine judge is in constant contact with various wine and is always judging them.
	Knows trends	- A wine judge in my opinion is the best 'consumer' as they would have exposure and knowldge of predicting what people will most likely enjoy.A wine judge in my opinion is the best 'consumer' as they would have - They are experts in wine
	Objective and unbiased	- Objective review - Most unbiased (maybe) - I think that they won't be biased

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Trusted Professional: Winemaker (Question 26)	Better understanding and knowledge	- Because they make it and know more about it - They have more in depth knowledge about wine - they seem to have a broader knowledge of what makes wine great
	More experience	- Experienced - A winemaker have much more experience and will tell me what is in the bottle that he made and I can ask him everything that I want to ask - They work hands on with the product creating it from scratch.
	Makes it	- They make it - They know more about the wine which they produce - Because they would know the information since they are the one who made the wine.

	Provides more information	• They give you a sense of connection between the product and the place where the product was produced • A winemaker have much more experience and will tell me what is in the bottle that he made and I can ask him everything that I want to ask. • He's the person making it. H/She should be able to tell the story better

Code groups (Question theme)	Code Category (List three)	Wording of answer in text (Three per code)
Have not been wine tasting at a wine cellar / tasting room (Question 27)	Lack of Exposure	• "haven't been exposed to one yet" • " haven't been exposed to such" • "My availability and lack on information on wine cellars that do tastings"
	Limited Time / Opportunity	1. "I haven't made the time to do so as yet" 2. "I have never had a chance." 3. "I have done wine tasting in restaurants before however not in a cellar. I have been meaning to visit one but I simply just have not had the time to do so yet."
	Lack of Interest	• "Not very appealing • "because for the first time I was not interested in wine but now I have that passion so I can visit"
	Lack of Knowledge	• "I have never heard of it" • "I have never heard about it"

Addendum I

Industry Professionals' Survey Invitation

Invitation - Wine Industry Professionals Survey [Invitation Actions]

Message	▼
Format:	**HTML**
From:	**SUNsurveys <surveys@sun.ac.za>**
Login Option:	**Automatic Login**
Allow Opt Out:	**No**
Subject:	**Invitation to take a survey at Checkbox® 6**
Body:	

> You been invited to participate in a research study conducted by Andiswa Mapheleba – MSc Wine Biotechnology, from the Institute of Wine Biotechnology, Department of Viticulture and Oenology (IWBT-DVO) at Stellenbosch University. The results will be contributed to a thesis. You were selected as a possible participant in this study because you are a member of South African wine trade.
>
> Your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part. Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law.
>
> This study has been approved by the Humanities Research Ethics Committee (HREC) at Stellenbosch University and will be conducted according to accepted and applicable national and international ethical guidelines and principles.
>
> By Clicking below, You voluntarily give consent to participate in this study.
>
> Click here to take the survey.

Recipients [View All]	▶
Responses [View All]	▼

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Addendum J

Industry Professionals' Survey

*Please enter your judge number.

[   ]

*1. Are you over the age of 18 years?

○ Yes

○ No

*2. What are your first thoughts when wine is mentioned? Name THREE.

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| |

*3. How long have you been working in the wine industry?

○ 1 - 4 years

○ 5 - 9 years

○ 10 - 14 years

○ > 15 years

*4. Rank (1 as the least likely and 3 as the most likely) which wines you prefer most.

Chenin blanc [   ]
Sauvignon blanc [   ]
Chardonnay [   ]

*5. What do you think contextualizes and sets S.A. Chenin blanc from other S.A. white cultivars?

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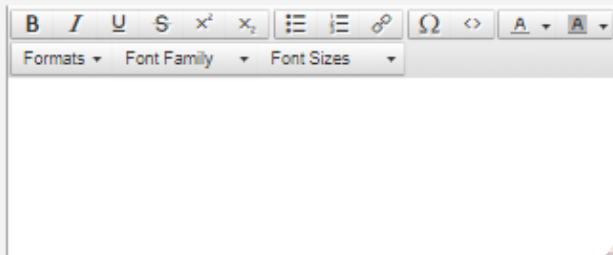
*6. Indicate what you, as wine trade, think are positive and negative qualities of Chenin blanc wine?

	Positive qualities	Negative qualities
1	[ ]	[ ]
2	[ ]	[ ]
3	[ ]	[ ]

*7. According to your opinion, compared to other white wines, is Chenin blanc wine in fashion/ popular at the moment?

○ Yes

○ No

*8. In your opinion, as wine trade, what do you think sets Chenin blanc apart from other white wine varietals ?

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9. Do you think wine style classifications are mandatory?

○ Yes

○ No

*10. As a wine trade person, would you recommend Chenin blanc as the SA flagship white wine to consumers?

○ Yes

○ No

*10.1. Why do you say that?

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*11. Do you think the size of the Chenin blanc market is deserving of its position?

○ Yes
○ No

*12. Do you think that the South African wine industry is making enough marketing efforts to promote Chenin blanc wine?

○ Yes
○ No

*12.1. Why do you say that?

[   ]

*13. Do you think that there is a need for a shift of Chenin blanc price barriers?

○ Yes
○ No

*14. Based on your experience, do you think that consumers are willing to pay more for wine style classified Chenin blanc?

○ Yes
○ No

*14.1. Why do you say that?

[   ]

*15. How would you, as a wine trade person, encourage more of the black community to become frequent purchasers of wine?

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*16. Has industry done any meaningful initiatives to sell more wine to the black market?

○ Yes
○ No

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*17. Do you think the industry can benefit from the addition of less complicated descriptors on the labels to accommodate a wider variety of consumers?

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*18. According to your knowledge and experience, do you think there is a need for Chenin blanc producers to have a united message for retailers or a more focused approach?

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*19. Rank which THREE (1 as the least likely and 3 as most likely) of the following types of Chenin blanc wine styles you think are the most important to produce and sell to consumers.

Rich and Ripe Unwooded	
Rich and Ripe Wooded	
Fresh and Fruity	
Rich and Ripe Off-dry	
Sparkling	
Noble Late Harvest	

*20. Do you think placing the wine style on the front label of a bottle has the potential to simplify purchasing of wine for consumers?

○ Yes

○ No

*21. Would purchasing Chenin blanc be in your top three purchases to drink?

○ Yes

○ No

[Back] [Save And Exit] [Next]

*22. Would you actively promote or recommend Chenin blanc to consumers?

- ○ Yes
- ○ No

*22.1. Why do you say that?

[   ]

*23. Would you buy Chenin blanc as a gift?

- ○ Yes
- ○ No

*23.1. Why do you say that?

[   ]

*24. From a scale of 1 to 3, based on your knowledge, rank the information that would be most suitable to classify wine styles, with 1 as the least likely and 3 as most likely.

Sugar level (e.g. sweet /dry)	[ ]
Acidity	[ ]
CO2 concentration	[ ]
Vine age	[ ]
Ageing on wood	[ ]
Fermentation process (Spontaneous/Inoculated)	[ ]
Alcohol	[ ]
Sulphur dioxide (SO2)	[ ]

*25. According to your knowledge and experience, what is the general impression of overseas tourists about Chenin blanc? What are their likes and dislikes with regard to Chenin blanc?

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*26. How effective are wine shows in attracting more S.A. Chenin blanc consumers?

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*27. Rank what would you consider as the top THREE (1 as least and 3 as most) drawbacks for Chenin blanc in S.A.?

Cultivar characteristics

Too many different styles

Level of popularity

S.A.'s current economic state

Poor price perception

*28. According to your knowledge, what are the main challenges facing Chenin blanc as a competitor with other white wine varietals, on-trade and off-trade?

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*29. What is your present full time occupation/job?

☐ Sommelier

☐ Winemaker

☐ Marketing

☐ Sales

☐ Media

*30. What are the main messages you think the wine industry should tell consumers about Chenin blanc?

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*31. If there were more factors that would make Chenin blanc more popular and frequently purchased, what would they be?

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Addendum K

Table L1 Wine Industry Professionals' responses Code groups, Code category and wording of answers in text, according to first throughts of wine, and negative and positive qualities of Chenin blanc (obtained from ATLAS.ti)

Code groups (Question theme)	Code Category	Wording of answer in text
First thoughts of wine (Question 2)	Food	• "ol> - Red Wine - White wine - Food " • "Lets get the party started. 2. Good food 3. Great company" • "Lets get the party started. 2. Good food 3. Great company"
	Wine type	• "ol> - Red Wine - White wine - Food " • "work winemaker red of white"
	Social	• "firends, red, white, sparkling" • "Pleasure, socializing, food." • "Art Work Social "
	Pleasure	• "interest pleasure intrigue" • "Pleasure, socializing, food." • "Personal Show of class Enjoyment"
	Expression	• "Art Work Social " • "Culture Food Opportunity"
	Work	• "Culture Food Opportunity" • "Art Work Social "
	Interest	• "Art Work Social " • "work winemaker red of white"
	Opportunity	• "Culture Food Opportunity"
	Personal	• "Personal Show of class Enjoyment"
	Class	• "Personal Show of class Enjoyment"

Code groups (Question theme)	Code Category	Wording of answer in text
Positive Qualities of Chenin blanc (Question 6)	Vinification	• "Easy to vinify" • "Good blending component" • "Good acid retention"
	Good Quality	• "Exceptional quality from old vines" • "South African rubicon for white"
	Balance	• "In blends, balances other cultivars and hold the blend well together." • "It tends to be neutral compared the other popular cultivars such as Chardonnay and Sauvignon blanc. Warm climate Chenin and cool climate chenin seem to keep the healthy acid levels." • "easy drinking, Good natural acidity"
	Versatility	• "Versatile"
	Uniqueness	• "Good single cultivar" • "Terroir driven, Unique fruit profile"
	Terroir	• "It tends to be neutral compared the other popular cultivars such as Chardonnay and Sauvignon blanc. Warm climate Chenin and cool climate chenin seem to keep the healthy acid levels." • "Terroir driven, Unique fruit profile"

		•	"Expressive of terroir and cellaring"
	Value for Money	•	"Affordable"
		•	"Value for money"
	Aroma and/or taste attributes	•	"Good aroma and taste spectrum"
		•	"good mid palate weight"
		•	"Delicious"
	Old vines	•	"Exceptional quality from old vines"
	Diversity	•	"Variety of styles available, Palate weight"
		•	"Style diversity"
		•	"wide flavour spectrum"
	Easy Drinking	•	"Very drinkable
		•	easy drinking, Good natural acidity"
		•	"Easy to drink"
Negative qualities of Chenin blanc (Question 6)	Not easy drinking as other cultivars	•	"Not as easy to drink when simple like Sauvignon blanc or Chardonnay"
	Unfavourable aroma and/or taste attributes	•	"Not very aromatic which leads to too much wood treatment in wooded chenins"
		•	"Precieved as cheap wine, It can be very neutral"
		•	"Too much plonk flooded in market"
	Inexpensive price and appeal	•	"price per lt"
		•	"Cheap and cheerful"
		•	"Precieved as cheap wine, It can be very neutral"
	Not style specific	•	"Style specificity"
		•	"Hard to predict style of wines"
		•	"No defined style may confuse"
	Low age ability	•	"Ageabilty"
		•	"Sometimes too young"
		•	"Made for instant drinking"
	Lack of popularity	•	"It is popular and trendy from cheap and poorly made a lot of times."
		•	"Not fasionable"
		•	"Some are quite nutral in Flavours, Relatively unkown"
	Hard to sell	•	"Harder to sell than others, High cropping left un-checked"
	Over cropping and overproduction	•	"Over production"
		•	"Harder to sell than others, High cropping left un-checked"
		•	"Can tend to over crop"
	One dimensional	•	"Can be boring and one-dimensional"
		•	"could be 1 dimensional"
		•	"Can be too neautral"