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Consumer insights and willingness to pay for attributes: New Zealand wine in California, USA

Peter Tait
Paul Rutherford
Tim Driver
Xuedong Li
Caroline Saunders
Paul Dalziel

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Report prepared for the Integrating Value Chain project funded by Our Land and Water National Science Challenge

Agribusiness and Economics Research Unit
P O Box 85084
Lincoln University
Lincoln 7647
New Zealand

Ph: (64) (3) 423 0372
http://www.lincoln.ac.nz/AERU/

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Executive Summary

A theme of the Our Land and Water (OLW) National Science Challenge is to achieve "greater value in global markets". This includes "understanding our international customers' demands for products from New Zealand's land and water". This research is funded by the OLW national science challenge from the programme Integrating Value Chains and is one of a series of four reports assessing consumer behaviour and preferences in market. In addition the report examines consumer's use of media and technology to obtain information on and/or purchase products. This report is on consumer's behaviours and attitudes towards purchasing, using and gaining information on wine (specifically Sauvignon Blanc) in California.

Wine is a significant export for New Zealand (NZ), as it was ranked the 8th largest agricultural export by value in 2016. In 2017, Sauvignon Blanc is the most common variety of NZ wine by both quantity and production area and has been consistently so over the past 10 years. It has increased in value and production over this time.

The USA is currently NZ's largest market for total wine exports by value, including white wine. NZ wine exports to the USA in 2017 were valued at approximately NZ$517 million, increasing in value by 12.3 per cent from the previous year. This is approximately 33 per cent higher than the second-largest market for NZ wine exports (the United Kingdom). The USA is also NZ's largest export market for white wine, valued at approximately NZ$490 million in 2016/17. California has the highest wine consumption by volume in the USA, as well as being the largest wine producer.

To examine Californian consumer preferences and willingness-to-pay (WTP) for, as well as use of digital media and smart technology in relation to, wine, the Agribusiness & Economics Research Unit (AERU) undertook an online survey of 764 consumers. This included asking consumers about their reasons for consumption; where and how they purchased wine; knowledge and perceptions of Māori culture and products; attitudes to wine consumption and production methods; sustainability label awareness, and the use of digital media and smart technology to find out more and/or purchase wine. A choice experiment was also conducted to elicit consumer WTP for a range of wine product attributes.

Initially, participants were asked to indicate their knowledge of a range of countries, showing that almost half of the participant knew a lot/a fair amount of NZ. This is perhaps not surprising, as knowledge of NZ was a screening factor for completing this survey.

Californian consumer Sauvignon Blanc consumption and purchasing habits

Participants were shown to be reasonably frequent wine consumers, with over half purchasing wine either more than once a week or about once a week. Participants purchased wine most frequently 'for usual personal consumption at home', followed by 'for a celebration', 'at a restaurant', and then 'for a gift'. A range of prices that consumers usually paid for wine in a range of settings were identified, with the most common including:

- 'for usual personal consumption at home' was between $10 and $15 per bottle
- 'for a celebration' was between $15 and $25 per bottle
- 'at a restaurant' was between $26 and $35 per bottle
- 'at restaurant by the glass' was between $7 and $10 per glass
- 'for a gift' was between $15 and $25 per bottle

In addition, participants identified NZ as the third most recognized country of origin on wine from a selection of seven prominent wine-producing countries, with the USA ranked first and France ranked second. Participants also stated that NZ was the third most frequent country of purchase (with 10 per cent purchasing it daily and 17 per cent weekly), with the USA ranked first and France second. The USA was also ranked first for producing high quality Sauvignon Blanc, with France ranked second and NZ ranked third.

The results of this report show participants' familiarity with NZ wine-producing regions, with particularly strong awareness of Marlborough as a wine-producing region (23 per cent stated 'I prefer wine from this region' and 27 per cent stated 'I am aware of this region and have tried wine produced here').

Californian consumer attitudes to Sauvignon Blanc products

The survey results reported on respondent attitudes towards wine. Firstly, participants indicated that the most commonly associated attribute with higher quality Sauvignon Blanc wines was taste profile (75 per cent strong association/moderate association), followed by reputation of winery (74 per cent strong association/moderate association) and country of origin (68 per cent strong association/moderate association). Participants also stated their preferred alternative to Sauvignon Blanc was Chardonnay, followed by Pinot Grigio/Pinot Gris and Riesling.

For NZ Sauvignon Blanc, participants indicated the most important attributes was distinctive taste (43 per cent high importance/some importance), followed by value (41 per cent high importance/some importance) and higher quality (40 per cent high importance/some importance).

When asked what taste profile they associated with NZ Sauvignon Blanc, the four most frequently given associations were 'refreshing' (62 per cent strong association/moderate association), 'crispness' (62 per cent strong association/moderate association), 'smooth' (62 per cent strong association/moderate association), and 'clean' (61 per cent strong association/moderate association) were.

The top ten ideal Sauvignon Blanc taste attributes were also identified from the survey results, with refreshing ranked first, crisp ranked second and clean ranked third.

Californian consumer knowledge of Māori culture and enterprise

Participants were also asked the extent of their knowledge of Māori culture and associations with Māori enterprise. Participants showed a moderate awareness of Māori culture (16 per cent 'I know a lot about Māori culture', 35 per cent 'I know a few things about Māori culture'). With most associating wine produced from a Māori enterprise with the attributes of 'care of traditional cultures' (62 per cent strong association/moderate association), 'local knowledge' (62 per cent strong association/moderate association) and 'natural' (61 per cent strong association/ moderate association).

Californian consumer attitudes to Sauvignon Blanc production practices

Participants indicated their perceptions, knowledge and preferences regarding wine consumption and production. Firstly, participants indicated their agreement with a range of statements in relation to wine production, including the economic, environmental and social impact of wine production, personal health, pest management, organic and biodynamic production, wine information and purchasing, and winery visitation. Participants mostly agreed that 'wine production is an important sector in the economy' (68 per cent strongly agree/agree), followed by 'I feel that purchasing sustainable products helps protect the environment' (66 per cent strongly agree/agree) and 'I could be interested in buying a bottle of with a sustainable label (showing environmental, economic and social aspects)' (65 per cent strongly agree/agree).

In addition, most respondents agreed that 'the quality of wine is directly related to the production practices' (64 per cent strongly agree/agree), 'I am worried about the long term effects of pesticides and additives in conventional modern wine production' (59 per cent strongly agree/agree) and 'I would like to have more information about sustainably produced wines' (59 per cent strongly agree/agree).

Consumer awareness of sustainability labels

The most frequently seen sustainability labels on wine are also identified, with USDA Organic being the most common (47 per cent) followed by Napa Green Certified (38%) and importantly, Sustainable Winegrowing New Zealand was the fifth most commonly seen label on wine (12 per cent).

The number of participants who had purchased wine with these labels mirrored this, with USDA Organic being the most purchased (8 per cent always, 12 per cent often), and the Sustainable Winegrowing New Zealand (SWNZ) label was the 5th most purchased (3 per cent always, 4 per cent often). Participants also indicated their associations with the SWNZ label, with the most common associations including 'sustainability' (29 per cent strong association, 29 per cent moderate association), 'high quality' (27 per cent strong association, 28 per cent moderate association) and 'natural' (27 per cent strong association, 29 per cent moderate association).

Californian consumer WTP for selected Sauvignon Blanc attributes

The results of the Choice Experiment show that respondents are willing to pay on average the highest premium for wine produced from the USA ($9.10/750ml bottle), followed closely by NZ wine ($8.99). These are the highest average premiums estimated over the set of attributes considered and reflect the established recognition of country-of-origin as an important signal of quality. These values are closely followed by the premium that a good critic score can attract, $8.20 on average for a score of 90 points). In terms of production attributes, the highest premiums were found for organic production methods. Respondents were willing to pay on average $6.15 more for a wine produced with 100 per cent organic inputs, and slightly less for wine made with organic grapes but with some non-organic inputs ($5.04). Looking at the attributes that reflect the components of the Sustainable Wine New Zealand programme, results indicate that the most preferred outcome is pest and disease management which attracts an average premium of $4.07 per bottle, and the least is biodiversity management (average WTP $1.84/bottle).

Compared to the average price of a bottle of Sauvignon Blanc in the standard Californian retail market, respondents were willing to pay on average, a 46 per cent premium for USA produced wine, followed by 45 per cent more for NZ, and then 22 per cent more for French wine. The results also show that Californian wine consumers were willing to pay 31 per cent more for 100 per cent organic production, followed by 25 per cent more for made with organic grapes, and then 20 per cent more for pest & disease management.

Californian consumer's use of digital media and technology in relation to finding information about and purchasing Sauvignon Blanc

Participants were surveyed to determine their perceptions towards and use of digital media and smart technology in relation to wine. Initially, participants indicated that they accessed the Internet using both mobile devices and home computers, with home computer slightly more frequent than mobile devices.

Respondents indicated significant use of both mobile devices and home computers for wine selection inspiration or wine production information, with home computer use slightly higher than mobile devices. Overall, the top digital media sources used for wine selection and product information were Google search, YouTube, Wikipedia and online retailers. Participants indicated that multiple sources of information influenced their wine selection inspiration and production information seeking, most prominently celebrity chefs most influenced wine inspiration while health professionals were more influential for production information.

The research also reported on participants' use of mobile devices in relation to wine. Participants stated that they used their mobile devices most frequently at home for both wine selection inspiration and production information. Following this, participants gave their use of a number of smartphone-interactive technologies (barcodes, QR codes, RFID/NFC) in relation to finding information about and purchasing wine, with participants most frequently using barcodes for both information searching and purchasing. All technologies were used more frequently for information searching than for purchasing. Participants said their top reasons for using mobile apps in relation to wine information gathering and purchasing, were to access product reviews and obtaining discounts/coupons. Specific apps that were used most frequently included Yelp (30 per cent), UberEats (20 per cent) and retailer apps (15 per cent).

Participants reported their wine expenditure across different retail channels when shopping for wine. The highest average expenditure across the sample was for grocery stores (29 per cent) followed by wine/liquor stores (15 per cent) and restaurants or similar (12 per cent). Average expenditure for online retailers was 7 per cent.

Sauvignon Blanc was the most frequently purchased wine online from any country of origin (22 per cent often/sometimes), followed by Chardonnay/Cabernet Sauvignon and Merlot (21 per cent often/sometimes, each). Sauvignon Blanc was also the most frequently purchased wine online from NZ. The main reasons for shopping online for wine were 'I like the convenience of having products delivered to my home' (21 per cent), 'there is a greater variety of products' (18 per cent), 'I have access to special offers and promotions' (16 per cent)'and that 'prices are generally lower' (11 per cent).

Participants then indicated on their levels of trust in sources of wine product information and wine purchasing. For wine product information, product packaging/labelling was the most trusted source of information (86 per cent high trust/moderate trust). A small number of the participants stated their reasons for a low level trust in generic mobile apps/branded mobile apps, product packaging/labelling, online costumer reviews, and/or online social community in relation to wine product information searching. In terms of low trust for generic mobile apps/branded mobile apps, the most commonly stated reasons included 'I do not trust the provider of the information'; 'I have privacy concerns regarding the technology'. In terms of low trust in the other sources, the most commonly stated reasons was 'I do not trust the provider of the information'.

For wine purchasing, the use of personal computers was the most trusted sources among a selection of seven sources (personal computer, online shopping, mobile device, barcodes/QR codes, branded mobile apps, RFID/NFC technology, and generic mobile apps). A small number of the participants indicated their reasons for a low level trust in the seven sources. Overall, the top three commonly stated reasons were 'I do not trust the information provided'; 'I am not familiar with the technology involved'; and 'I have privacy concerns regarding the technology involved'.

Finally, participants indicated the most common sources of information about or awareness of new wine, with 'in-store (from where I currently do wine shopping)' and 'word-of-mouth' being the most common sources (51 per cent and 44 per cent respectively).

Chapter 1
Introduction

A theme of the Our Land and Water (OLW) National Science Challenge is to achieve "greater value in global markets". This includes "understanding our international customers' demands for products from New Zealand's land and water". This research is funded by the OLW national science challenge in the programme Integrating Value Chains and is one of a series of four reports assessing consumer behaviour and preferences in market. In addition the report examines consumer's use of media and technology to obtain information on and/or purchase products. This report is on Californian consumer's behaviours and attitudes towards wine. The other reports are on yogurt and kiwifruit in Shanghai, and beef in California. These markets and products were selected in consultation with the project advisory board.

The current report details the development and application of a survey of Californian wine consumers. The survey is designed to examine three main areas: consumption behaviour, willingness to pay (WTP) for credence attributes, and the use of digital media and smart technologies.

While search attributes such as price or colour can be observed directly, and experience attributes such as flavour or texture can be assessed when consumed, credence attributes such as environmental sustainability cannot be immediately seen or experienced at the point of sale (Wirth et al., 2011). For products promoting credence attributes, the role of verification including labelling is of significant importance.

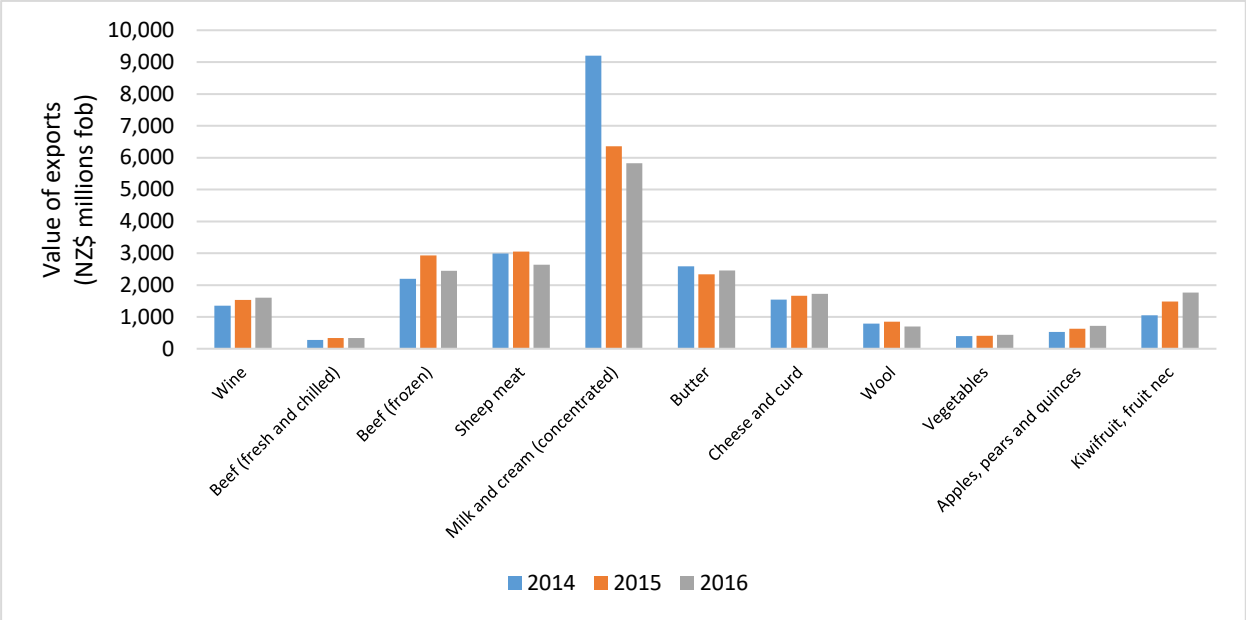
Agricultural exports are an important contributor to the NZ economy. While NZ historically relied on key markets such as the United Kingdom for export trade, it has over the last decade shifted its export focus to as China. It is important for NZ exporters to understand these markets and the different cultures and preferences of those consumers. Doing so is critical for market access, and for realising potential premiums (Guenther et al., 2015). It is also important to assess the use of smart media by consumers to find out more information on and purchase products. This covers online shopping (e-commerce), social media and mobile devices (smartphones) as well as the use of QR Codes and barcodes. These technologies provide mechanisms for the effective marketing and selling of NZ food and beverage products. It is important for exporters to both understand and consider their use in the development of effective digital marketing and sales strategies (Driver et al., 2015).

1.1 New Zealand wine market profile

At present, wine is an important export product for NZ. As shown in

Figure 1-1, when compared with other key agricultural exports, wine represented New Zealand's 8th largest agricultural export by value in 2016.

Figure 1-1: Value of key New Zealand agricultural exports, 2014-2016

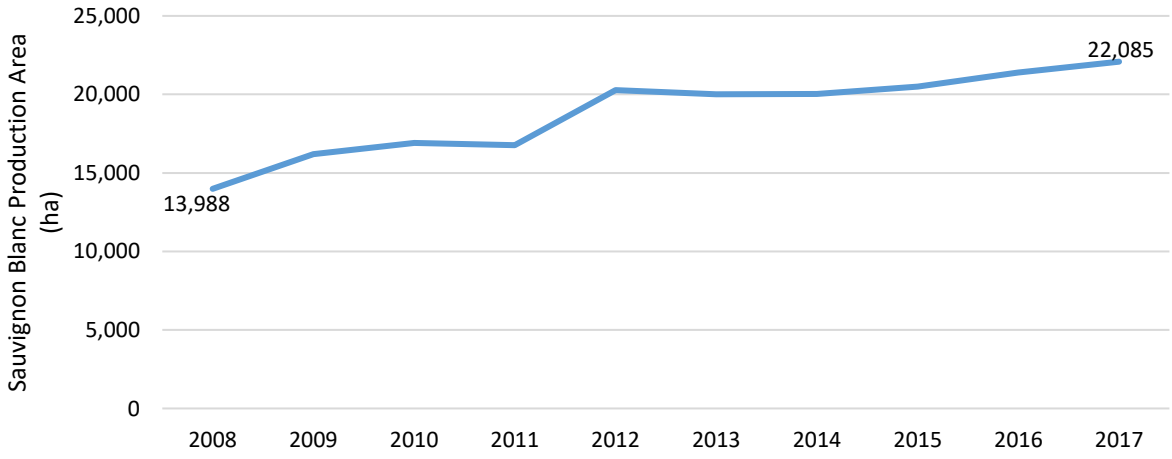


Source: Statistics New Zealand, 2016.

Sauvignon Blanc is the most produced variety of NZ wine by both quantity and production area. In 2017 (year ended June), 22,085 hectares were dedicated to the production of sauvignon blanc, representing nearly 60 per cent of total production area for wine in NZ, and approximately 75 per cent of total production area for white wine (NZW, 2017). This has increased steadily over time, as shown in Figure 1.2. Sauvignon Blanc is also the highest produced NZ wine product by weight, as shown by wine grape production between 2008 and 2017 in

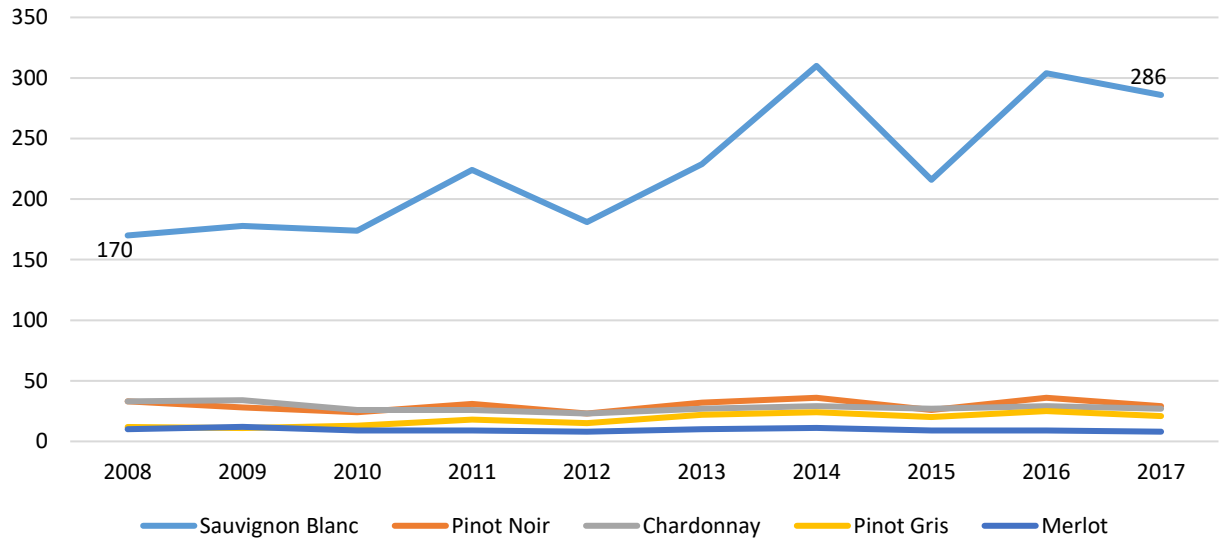
Figure 1-3.

Figure 1-2: Sauvignon Blanc vineyard area, New Zealand (hectares), 2008-2017 (year ended June)



Source: NZW, 2017.

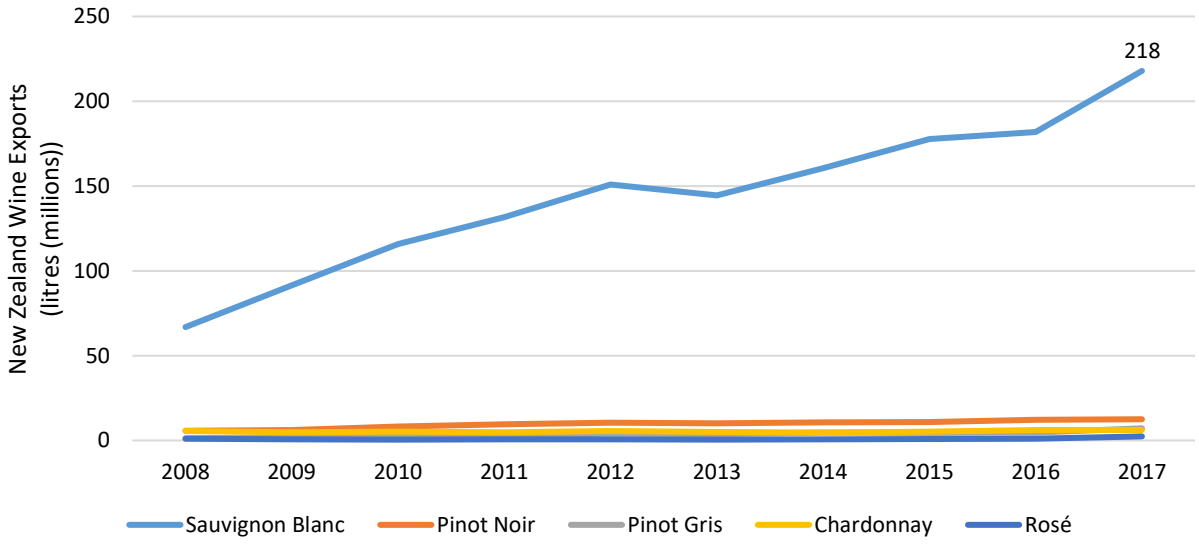
Figure 1-3: New Zealand wine grape production (tonnes (000)), 2008-2017



Source: NZW, 2017.

Sauvignon Blanc is also a significant export product relative to other NZ wines. The total value of NZ wine exports for year ended June 2017 was an estimated NZ$1.66 billion, with a total export volume of 253 million litres (NZW, 2017). As shown in Figure 1.4, Sauvignon Blanc was the highest exported wine product from 2008 to 2017. In 2017, NZ exported approximately 218 million litres of Sauvignon Blanc, compared with 12.5 million litres of Pinot Noir and 7 million litres of Pinot Gris (the second and third most exported wine respectively).

Figure 1-4: New Zealand wine exports (litres (millions)), 2008-2017



Source: NZW, 2017.

1.2 USA wine market: Background

The USA is currently NZ's largest market for wine exports by value, as shown in Table 1.1. NZ wine exports to the USA in 2017 were valued at approximately NZ$517 million, increasing in value by 12.3 per cent from the previous year, and valued approximately 33 per cent higher than the second-largest market for NZ wine exports (the United Kingdom). The USA is also NZ's largest export market for white wine, valued at approximately NZ$490 million in 2017 (year ended June) (NZW, 2017).

Table 1.1: Value of New Zealand wine exports (NZ$000), 2015-2017

Rank	Country	2015	2016	2017	% change (2016-2017)
1	United States of America	372,241	460,600	517,258	12.30
2	United Kingdom	353,931	381,809	389,272	1.95
3	Australia	362,188	361,677	371,099	2.61
4	Canada	94,906	107,372	107,434	0.06
5	Netherlands	41,479	44,480	45,439	2.16
6	China	27,069	27,593	31,758	15.09
7	Ireland	17,472	21,309	21,658	1.64
8	Singapore	20,691	20,570	18,596	-9.60
9	Hong Kong	17,680	17,333	18,553	7.04
10	Japan	13,773	13,796	14,565	5.57

Source: NZW, 2017.

California is a historically prominent state for wine consumption, representing the highest wine consumption by volume in the USA in 2012 (Villanueva et al., 2015). Similarly, California is the largest US state for wine production, with 4,391 total wineries, representing 45 per cent of total US wineries by state (Wines and Vines, 2018). The Californian wine market was selected for analysis in consultation with the advisory board and in particular due to NZ Winegrowers having three of its nine strategic marketing locations in the USA being in the state of California (NZW, 2017).

1.3 US consumer preferences for wine

Previous work undertaken by the AERU has examined consumer preferences for credence attributes of food and beverage products including sustainability attributes, in several international markets relevant to NZ exporters (Guenther et al., 2015; Miller et al., 2014, 2017; Saunders et al., 2015). In particular, Saunders et al. (2015) identified a range of sustainability attributes important to consumers in their selected countries (China, India, Indonesia, Japan, Korea and the UK) in relation to food and beverage products. The authors identified seven key attributes, including quality, price, fair trade, animal welfare, environmental quality, health food and food safety. Results in their study showed that in relation to quality and price, most respondents in all countries stated that the seven attributes were either very important or important. In relation to animal welfare, environmental quality, health food and food safety, developing countries indicated an overall higher rating of importance than developed countries (Saunders et al., 2015). The results of that research provided important information in developing the survey. However, the results of that research provided important information in developing the survey.

Several studies have identified determinants of wine purchasing for US consumers. Thach and Olsen (2016) examined the effect of ethnicity on wine consumption in the US, finding differences between ethnic segments (African-American, Asian-American, Hispanic and White American) with regards to wine preferences and purchasing behaviour. This included differences in preferences regarding the taste profile of wine, as well as a number of other attributes which factored into consumers' wine purchase decision-making processes, including brand, price, varietal, place of origin, vintage, label, medals won, value for money, alcohol level, and organic and/or biodynamic production methods (Thach and Olsen, 2016). Other

studies have also shown that ethnic and cultural factors may influence consumer preferences for wine in the US (Velikova and Dodd, 2016).

Similarly, Villanueva et al. (2015) examined the demographic and socio-economic characteristics of US wine drinkers between 1972 and 2012. The authors found that over this period overall preferences and associations with wine had shifted from a product consumed by those with higher income and education to one which was consumed by younger and married people, particularly women. This suggested a shift away from stereotypical associations of wine as being consumer purely by connoisseurs to a wider variety of consumers (Villanueva et al., 2015). Chrysochou et al. (2012) reviewed existing literature to determine US Generation Y consumer preferences for wine, finding that previous experience with tasting a wine product, personal recommendations, grape variety, having read about wine and brand names of products were all determinants of wine product purchase (Chrysochou et al., 2012). These findings are similar to those found by other studies in that wine knowledge and previous experience are important determinants of wine purchase, especially for younger wine consumers (de Magistris et al., 2011; Hussain et al., 2007).

Atkin and Thach (2012) examined differences in wine product preferences between millennials (21-29 years old) and elders (multiple ranges between 30-39 and 60 and over). The authors found differences between age groups for attributes including brand, vintage, place of origin (country, region, state and appellation), alcohol content, label imagery, medals won and organic status, with younger consumers showing higher preferences for brand, alcohol content, label imagery, medals won, appellation and organic status than their elder counterparts (Atkin and Thach, 2012).

Previous studies have identified US consumer preferences for wine product attributes, including credence attributes. Credence attributes can be defined as product qualities that cannot be immediately seen or experienced at the point of sale (Wirth et al., 2011), and can include food safety, animal welfare, environmental protection and similar attributes (Miller et al., 2014).

Kelley et al. (2015) examined US consumer preferences for a number of general and credence attributes, including nutritional content (alcohol content, number of calories), packaging, sustainability, organic and environmental attributes. Across all participants, the authors found that the most preferred attributes (i.e. those that would increase their regular purchasing of wine as a result of the inclusion of these attributes) included fewer than 80 calories per 5 oz serving (45.9 per cent of participants), portion of proceedings of bottle donated to a cause the participants cares about (41.8 per cent), marketed as being made with "sustainably farmed" or "naturally farmed" grapes (39.7 per cent of participants), marketed as "made with organically grown grapes" (35.8 per cent) and marketed as being USDA-certified organic (35.2 per cent). The authors also found that different demographic and wine consumer-specific segments (including super core (drink wine more than once a week), core (drink wine once a week) and marginal (drink wine less frequently) segments) exhibited different preferences for general and credence attributes, with more frequent wine consumers showing higher preference for all attributes than less frequent consumers (Kelley et al., 2015).

Olsen et al. (2012) examined the relationship between US consumers' environmental values and organic wine consumption, finding a clear link between environmental values and organic wine purchasing, with environmentally-conscious consumers willing to sacrifices and pay more for organic wine (Olsen et al. 2012). However, Rahman et al. (2014) found that US consumers may be more influenced by a wine's taste than its organic status, with organic status having little influence on participants' purchase decisions following a taste-test experiment.

1.4 US digital media and smart technology use in relation to wine

One such channel for product communication is new technologies, particularly digital media and smart technologies. These include online shopping (e-commerce), social media and mobile devices (such as

smartphones). These technologies provide mechanisms for the effective marketing and selling of NZ primary products. It will be important for agribusiness supply chain managers to both understand and consider their use as it is essential to the development of effective digital marketing and sales strategies.

Previous work conducted by the Agribusiness and Economics Research Unit (AERU) has examined the use of digital media and smart technologies in relation to food and beverage products in international markets relevant to NZ exporters. This work has shown that the use of digital media and smart technologies in relation to food and beverage products (for the purposes of finding product information and purchasing products) is important for consumers in international markets, with its use being particularly pronounced in developing over developed countries (Driver et al., 2015; Miller et al., 2017). While this work did not include the USA as a key market of interest, a number of other studies have examined digital media and smart technology use by US consumers. In the context of the current report, studies specifically examining wine have been included.

Thach and Olsen (2015) examined US consumer use of online and social media in relation to wine. This included purchasing wine online, using social media to discuss wine, using social media to discuss wine, get information and look up prices, and using mobile device(s) to use apps for information and/or coupons, as well as use wine-specific apps. In particular, the authors found differences in the use of these technologies based on consumer segments (low spenders, moderate spenders, high spenders), with high spenders generally using digital media (e.g. online shopping, social media) in relation to wine purchasing more frequently than low spenders, and low spenders generally using mobile phones in relation to wine more frequently than high spenders (Thach and Olsen, 2015). Olsen et al. (2016) also found that particular segments of US wine consumers (based on Schwartz' Theory of Basic Values) may be more likely to engage in online discussions about wine than others.

Higgins et al. (2014) examined the role that digital technology in relation to consumer wine purchases in the US, particularly QR codes and wine-specific smartphone apps. The authors found that those consumers with higher awareness and knowledge of wine (i.e. considered themselves connoisseurs, enjoyed talking about wine) and higher preference for environmental credence attributes (local, organic, sustainably produced) were more likely to use technology in relation to their wine purchase decisions. The authors found that the presence of a QR code on a wine label would increase consumers' likelihood of wine purchasing. Those consumers impacted positively by the presence of a QR code on a wine label were also more likely to find environmental attributes more desirable, particularly local production, environmentally-friendly production, organically grown grapes and certified sustainable production. Similarly, those same participants were more likely to use a range of online media sources to find out more about wines, including Google (56 per cent) and Facebook (33 per cent).

Other studies have examined relationships between consumer use of technology and preferences and behaviour in relation to wine in countries other than the US. For example, Sillani et al. (2017) examined German consumer preferences for wine communication methods, finding that the presence of a QR code on wine packaging increased consumers' expected perceived value of the product (Sillani et al., 2017).

Lockshin and Corsi (2012) reviewed literature examining consumer behaviour in relation to wine between 2003 and 2012. The authors found that there was a greater need for studies examining online and social media influences on wine searching and purchasing behaviour, citing current barriers to higher frequency of online shopping for wine as a lack of ability to sample products and a perception of increased risk with online monetary transactions (Lockshin and Corsi, 2012).

Finally, an older study from Thach (2009) examined Californian winery use of digital media for marketing and retail purposes, finding that a very small fraction used digital media tools (such as blogs, podcasts and vlogs) to communicate with their customers, with 61 per cent of wineries having an e-commerce option for customers to purchase wine online (Thach, 2009). This is important, as later studies have found that the use of direct marketing channels (e.g. online, email, cellar door sales) can contribute to increased sales, and ultimately a significant portion of overall winery revenue (Forbes and Kennedy, 2016). However, Gilinsky

and Eyler (2016) show that US wine producers still rank the use of Internet-based channels for market research, marketing and sales as less important than finance and accounting skills, with marketing and operations skills sought after by smaller over larger wineries.

Chapter 2
Methodology

The method included a structured and self-administered online survey that included a Choice Experiment, conducted in California, USA in January 2018. The surveys were administered through Qualtrics™, a web-based survey system, and had a sample size of 764 Sauvignon Blanc consumers.

Sampling involved the recruitment of participants from an online panel database of consumers provided by an international market research company. These panels are profiled, broadly recruited and frequently refreshed by the company. The respondents for each survey are recruited by online marketing. The company holds a participation history of each panel member. Each respondent who completes the survey is compensated with a retail voucher. Potential respondents were recruited by e-mail and screened out they consumed Sauvignon Blanc less than monthly, or new nothing about NZ. The email included a short description of the study, a link to start the online survey and instructions to run the survey.

The survey was developed by the research team drawing from a literature review on US consumer trends for wine (see Chapter 1), results from previous surveys examining consumer attitudes in overseas markets (Guenther et al., 2015; Miller et al., 2014; Saunders et al., 2015), a pilot survey of 100 Californian Sauvignon Blanc consumers (November 2017) and consultation with industry partners and stakeholders.

2.1 Choice experiments

This study employs the stated preference method of choice experiments to estimate consumer WTP for attributes of Sauvignon Blanc wine. Choice experiments have been extensively used to value consumer preferences for food product attributes (Tait et al., 2015; 2016; 2016b; Miller et al., 2017). As opposed to revealed preference methods such as using direct or indirect market prices, this survey based approach facilitates valuation of attributes that may not be directly observable in market prices such as the attributes explored in the current report. The ability of this method to identify which individual attributes are more important in consumer choices, and to estimate marginal WTP for these attributes, has seen this approach to valuation become increasingly favoured by researchers.

The method involves simulating the context in which consumers would normally make choices among a set of competing Sauvignon Blanc alternatives. This is achieved by designing an experiment in which wine attributes are systematically and independently varied to produce multiple choice scenarios. In this study, alternative Sauvignon Blanc wines presented to consumers are described by the management practices of production, wine critic scores, country of origin and price. Consumers are then asked to indicate their preferred wine alternative in each scenario, with the observed levels of attributes in the chosen and non-chosen alternatives modelled in a probabilistic econometric framework. The resulting model outputs can then be used to estimate consumer WTP for the wine attributes of interest. A fuller presentation of theoretical and statistical procedure can be found in Appendix 2 Statistical Method.

2.2 Selection of wine attributes

The central objective of the Choice Experiment is motivated by the following hypothesis:

> *"It is possible to use original research in key international markets to determine credence attributes matched to NZ production systems that are valued by international consumers of all agri-food products sourced from NZ, especially from Maori enterprises"*

While *search* attributes such as price or colour can be observed directly, and *experience* attributes such as flavour or texture can be assessed following consumption, *credence* attributes are not able to be directly observed or verified by consumers' consumption of the product. For products promoting credence attributes, the role of labelling is of significant importance.

When making product choices, consumers can face significant cognitive burden, time constraints and other external noise in processing label information which can be exacerbated by overly complex label formats. Graphical elements may add clarity and may require less cognitive effort improving consumers understanding and be quicker to process compared to text only formats. Likewise, the use of symbols is often used to summarise diverse information shortening processing time as well as being visually attractive However, there is concern that symbol type formats may by overly simplistic, leading to the so-called halo effect in which a risk lies in consumers generalising that a product performs favourably on elements that are not able to be explicitly identified in the label. For labels that are intended to represent multiple attributes, this debate highlights the necessity for formats that achieve a middle ground in label design between overly simple and overly complex formats. This issue in particularly relevant to contemporary debate on sustainability labelling that suggests use of holistic labels as a format comprised of multiple attributes represented in a comparable way.

Figure 2-1: Sustainable Wine NZ label

The Sustainable Wine NZ label (Figure 2-1) can be considered a symbol type format, representing multiple, unobserved, credence attributes. The question concerning which of the SWNZ attributes influences consumer choices, provides focus for the selection of Sauvignon Blanc attributes to include in the choice experiment. An examination of the individual elements that comprise the SWNZ label (Figure 2.2) in conjunction with literature review, and the scoping survey, led to a final set of attributes to be included in the choice experiment (Table 2.1).

Figure 2-2 Pillars of sustainability for NZ wine

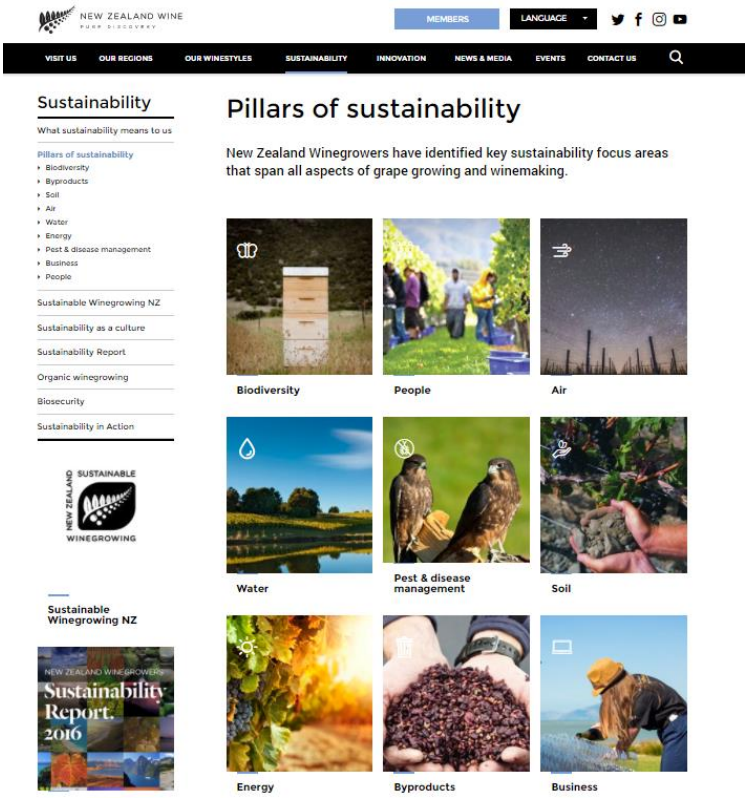


Table 2.1: Wine attributes included in the choice experiment

Biodiversity Management	The winery or grower has set aside area for biodiversity restoration or enhancement on the same property as the vineyard, or off site.
Water Management	Monitoring, measurement and limitation of water resources is undertaken.
By-product Management	Production by-products are diverted from landfill and turned to beneficial use.
Energy Management	Monitoring, measurement and limitation of energy resources is undertaken.
Pest & Disease Management	Integrated control strategies used to optimise control and fruit quality and prioritise minimisation of the impact on the receiving environment.
Organic Production	*100% Organic*: Both growing and processing are Organic. No GMOs. No added sulfites. No synthetic fertilisers or agrichemicals.
	Made with Organic grapes: Grapes are Organic but some ingredients are not. Sulfites may be added. No GMOs. No synthetic fertilisers or agrichemicals in grape growing.
Social Responsibility	Collective community ownership of vineyards and wineries can enhance social responsibility. Socially responsible vineyards and wineries actively include public interest into decision making.
GHG Management	Monitoring, measurement and limitation of GHG emissions is undertaken.
Critic rating	Score out of 100, from a well-known critic. A wine score is a simple way for a wine critic to communicate their opinion about the quality of a wine.
Country of Origin	Country where the wine is made.
Price	Price for a 750ml bottle of Sauvignon Blanc.

In addition to sustainability attributes, the Choice Experiment includes a Country of Origin attribute, and a critic rating attribute. Within the Choice Experiment literature, Country-of-origin has been found to be one of the most important wine attributes, including for wine consumers in Russia (Cicia et al., 2013), China (Xu and Zeng, 2014; Willainson et al., 2016) and Spain (Mtimet and Albisu, 2006). As well as regional appellations in Italy (Scarpa et al., 2010), Spain (Kallas et al., 2013; Barreiro-Hurle et al., 2008) and Australia (Jarvis et al., 2010; Lockshin et al., 2006). Likewise, we include a critic score attribute as these have consistently been found to have a strong influence on consumer choices (Costanigro et al., 2014; Miller et al., 2015; Williamson et al., 2016; Lockshin et al., 2006).

Social responsibility attributes have been defined in many diverse ways, with no clear dominant definition (Miller et al., 2017b). The description used here was formed on the basis of being a central defining characteristic of Māori enterprises. This view was formed by review of Māori enterprise definitions available online used in current products. These reflected an important Māori enterprise characteristic concerning collective ownership structures. The review also revealed a second major defining characteristic, stewardship over relevant natural resources including land. We consider that the environmental sustainability attributes already included are sufficient to meet this criteria and so do not specify a stewardship specific attribute.

2.3 Wine attribute levels

The levels that each wine attribute can take are presented in Table 2.2. Price levels were determined by the distribution of observed market prices in California for Sauvignon Blanc (as at December 2017). Countries of origin were selected based on volumes of sales in California for 2017.

Table 2.2: Wine attribute levels

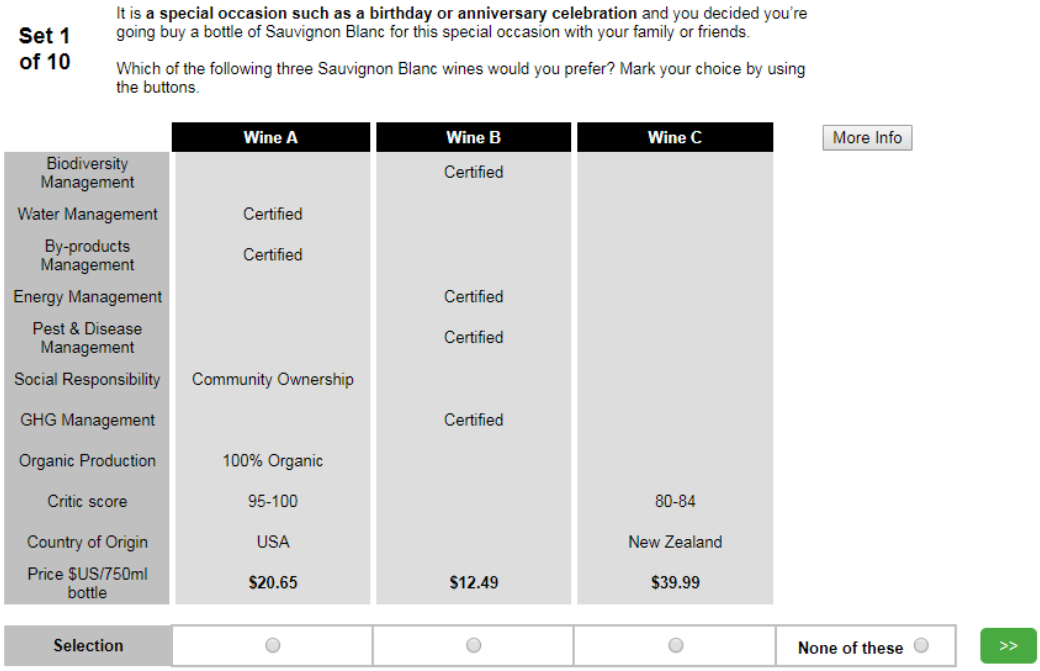
Wine attributes	Attribute levels					
Biodiversity Management	No label	Certified				
Water Management	No label	Certified				
By-product Management	No label	Certified				
Energy Management	No label	Certified				
Pest & Disease Management	No label	Certified				
Organic Production	No label	Made with organic grapes		100% Organic		
Social Responsibility	No label	No label		Community owned and operated		
GHG Management	No label	Certified				
Critic rating	No label	80-84	85-89	90-94	95-100	
Country of Origin	No label	NZ	Chile	South Africa	USA	France
Price $US201/750ml	7.97, 13.49, 15.99, 20.99, 27.76, 39.99					

2.4 Experimental design

It is not possible to present respondents with all possible combinations of attribute levels (Table 2.2). Instead, Experimental Design methodology is used to create combinations of attribute levels, which represent a subset of the total combinations possible, and maximise the amount of statistical information available. These combinations are formed into choice sets. Figure 2-3 presents an example of a choice set shown to respondents. Each choice set comprises four options, of which respondents chose their preferred option. Three options present alternative Sauvignon Blanc wines, while the fourth is a 'none of these' option.

The study employs NGene™ software to apply a D-efficient fractional factorial design approach. Providing information on the likely values of model coefficient estimates improves this process. For the initial experimental design, we looked at similar studies for design parameters, then updated these with coefficient estimates from a model fitted to pilot survey data (n=100). The resulting updated experimental design is applied to the remaining number of respondents with each respondent answering ten choice sets.

Figure 2-3 Example wine choice set shown to respondents



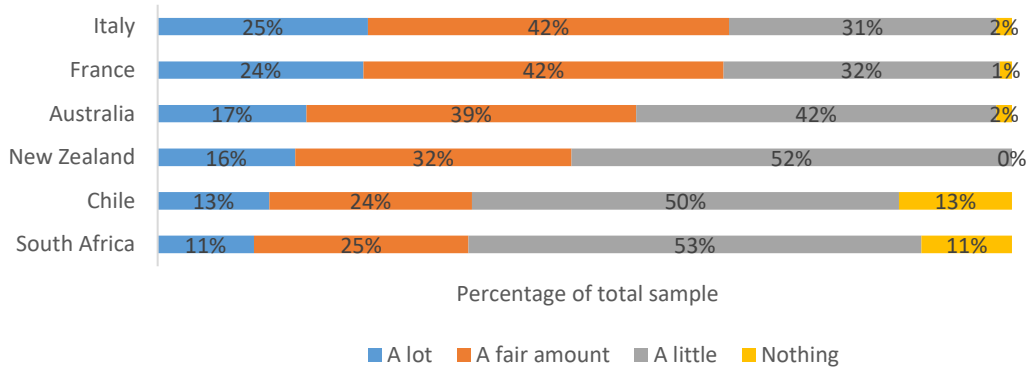
Chapter 3
Results

This chapter presents the results of the survey examining California consumer preferences for wine (specifically Sauvignon Blanc), including their knowledge of particular countries (3.1), wine purchasing habits (3.2), knowledge of Māori culture and enterprise (3.3), attitudes to wine production (3.4) and sustainability label awareness (3.5) as well as their use of digital media and smart technology in relation to wine (3.6). The results of a choice experiment are presented in Chapter 4.

3.1 Knowledge of countries

Participants were initially asked to indicate how much they knew about a series of countries using a four-point Likert scale, including the points A lot (1), A fair amount (2), A little (3) and Nothing (4). For the purposes of this research, these countries were selected as they are important wine exporting countries; Italy, France, Australia, Chile and South Africa, as well as NZ. Results are shown in Figure 3-1, all participants indicated some level of knowledge of NZ. Almost half of the participants knew a lot/a fair amount of NZ. Over 50 per cent of the participants indicated they knew a little of NZ. This is perhaps not surprising given knowledge of NZ was a screening factor for completing the survey.

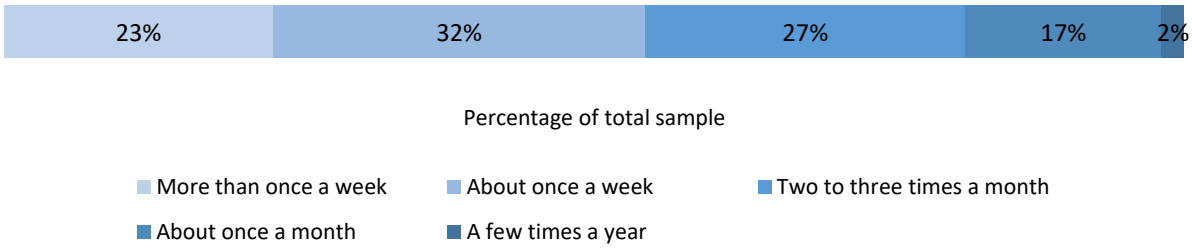
Figure 3-1: Knowledge of countries



3.2 Wine purchasing habits

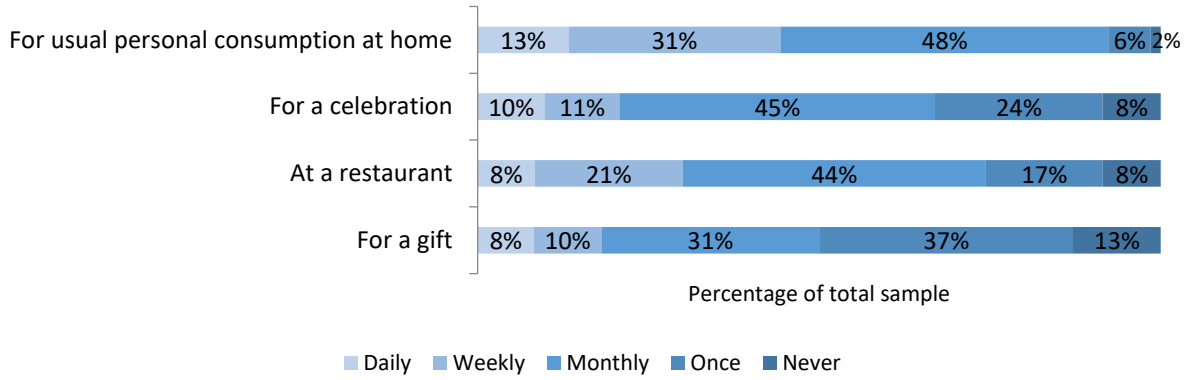
The next set of questions were concerned with participants' purchasing habits in relation to Sauvignon Blanc. Participants were first asked to indicate the frequency at which they consume Sauvignon Blanc, ranging from more than once a week to a few times a year. Results are presented in Figure 3.2. It shows that the largest group of participants consumed Sauvignon Blanc about once a week (32 per cent), followed by two or three times a month (27 per cent) and then more than once a week (23 per cent).

Figure 3-2: Sauvignon Blanc consumption frequency



Participants were also asked to state how often they purchased Sauvignon Blanc for different occasions, including for usual personal consumption, for a celebration, at a restaurant and for a gift. These results are presented in Figure 3-3. The most frequent overall purchasing occasion was 'for usual personal consumption at home' (44 per cent daily/weekly), followed by 'at a restaurant' (29 per cent daily/weekly) and 'for a celebration' (21 per cent daily/weekly).

Figure 3-3: Frequency of purchase of Sauvignon Blanc occasions



Following this, participants who purchased more than 'never' were asked to indicate their usual spend on Sauvignon Blanc in each relevant purchase occasion. Figure 3-4 shows participants' usual price for a bottle of Sauvignon Blanc for usual personal consumption at home, ranged from $2-3 per bottle to over $25 per bottle. The most common usual price per bottle on wine for usual personal consumption at home was $10-15 per bottle (31 per cent), followed by $8-10 per bottle (20 per cent) and $15-20 per bottle (18 per cent).

Figure 3-4: Usual price of Sauvignon Blanc bought for usual personal consumption at home

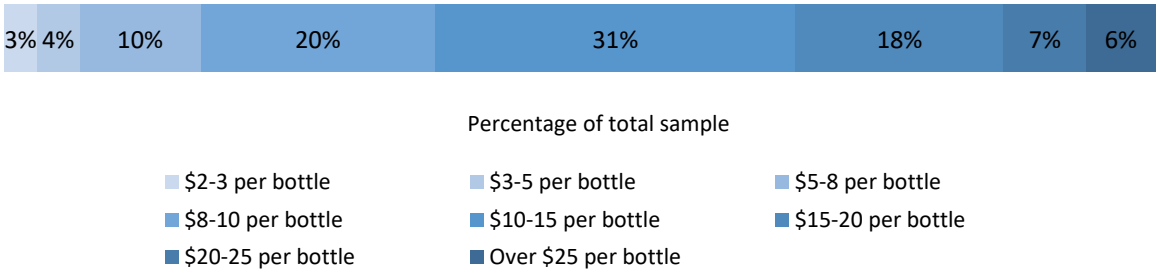
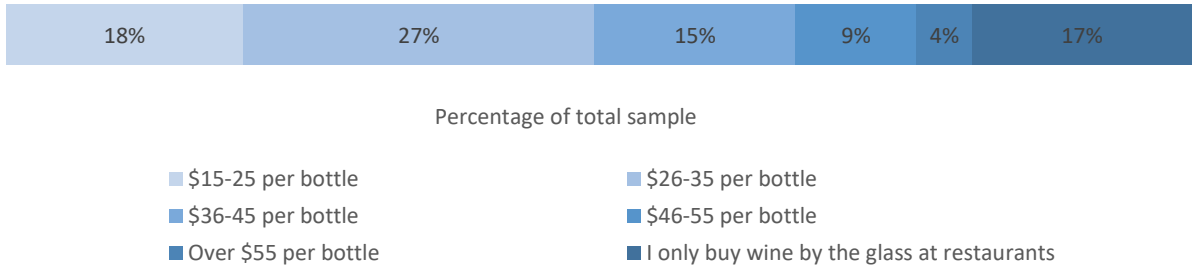


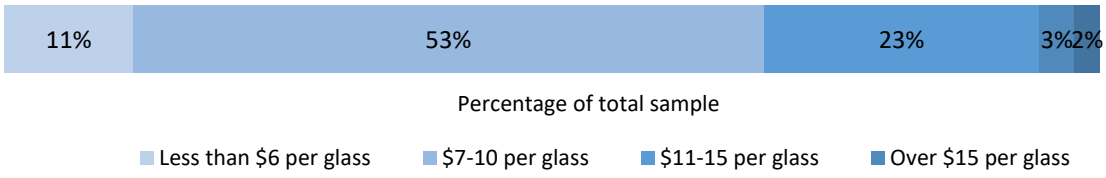
Figure 3-5 shows the price participants' usually spend on Sauvignon Blanc at a restaurant, ranging from -$25 per bottle to over $55 per bottle. This included the option to that participants only buy wine by the glass at restaurants. In this context, the most common usual spend was shown to be $26-35 per bottle (27 per cent), followed by $15-25 per bottle (18 per cent).

Figure 3-5: Usual spend on Sauvignon Blanc at a restaurant



Correspondingly, Figure 3-6 shows the price participants' usually spend on Sauvignon Blanc at a restaurant by the glass, with the most common spend being $7-10 per glass (53 per cent), followed by $11-15 per glass (23 per cent) and less than $6 per glass (11 per cent).

Figure 3-6: Usual spend on Sauvignon Blanc at a restaurant by the glass



Participants were then asked to indicate their usual spend on Sauvignon Blanc for a celebration, ranging from ranging from under $5 per bottle to over $55 per bottle. Results are presented in Figure 3-7. The most common usual spend is shown to be $15 - 25 per bottle (28 per cent), followed by $26 -35 per bottle (19 per cent), and $5 -10 per bottle (18 per cent).

Figure 3-7: Usual price of Sauvignon Blanc bought for a celebration

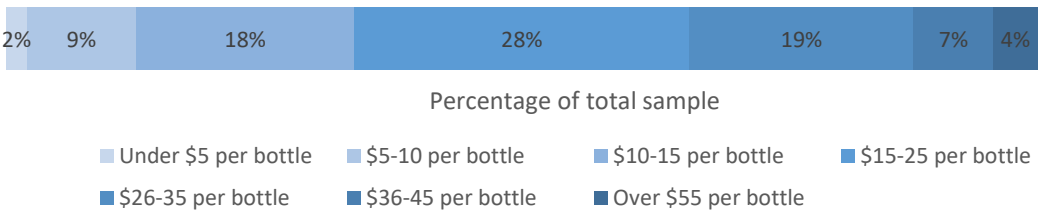
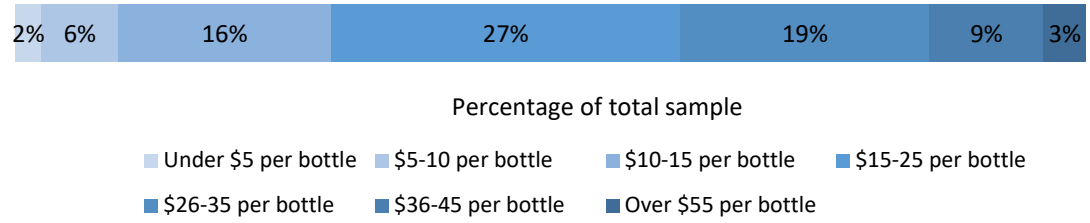


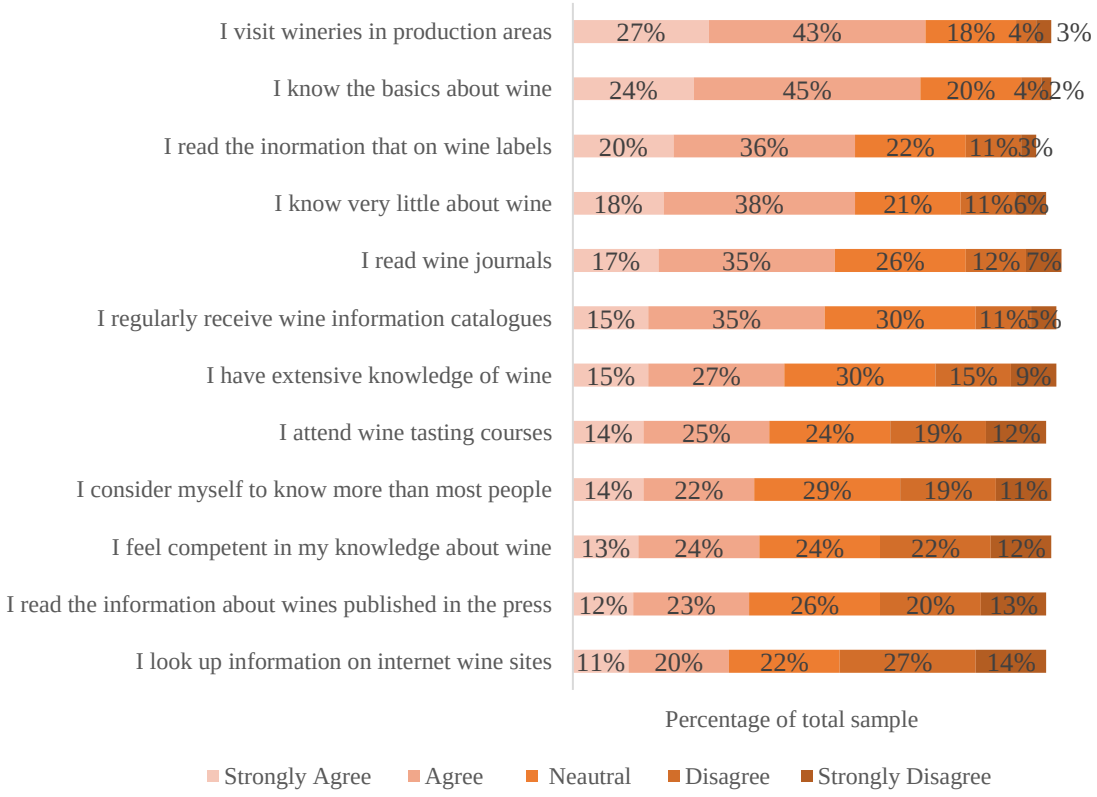
Figure 3.8 shows participants' usual spend on Sauvignon Blanc as a gift, ranging from under $5 per bottle to over $55 per bottle. The most common usual spend is shown to be $15-25 per bottle (27 per cent), followed by $26-35 per bottle (19 per cent) and $10-15 per bottle (16 per cent).

Figure 3-8: Usual price of Sauvignon Blanc bought for a gift



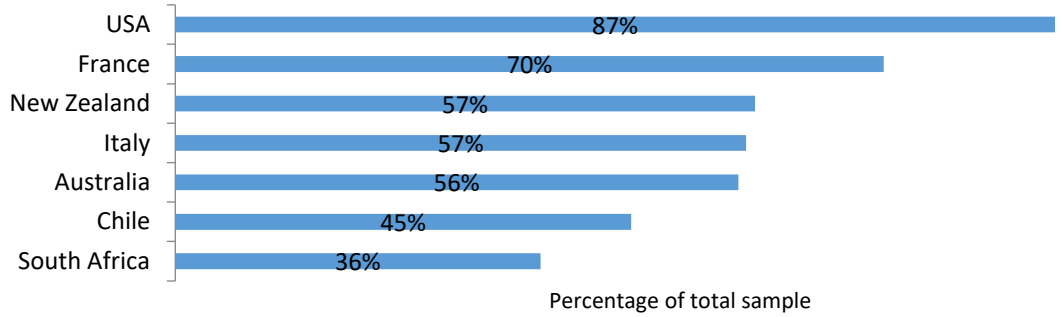
Participants were then asked to indicate their agreement with a range of statements in relation to their wine experience, knowledge and engagement. Results presented in Figure 3-9, reveal that most respondents have at least a basic level of knowledge (69 per cent strongly agree/agree) and visit wineries in production areas (70 per cent strongly agree/agree). Over half of respondents read the information that on wine labels (56 per cent strongly agree/agree). While under a third look up information on internet wine sites (31 per cent strongly agree/agree). Overall, about 15 per cent could be considered as relatively expert consumers who are actively engaged in knowledge seeking and experiences.

Figure 3-9: Wine experience, knowledge and engagement



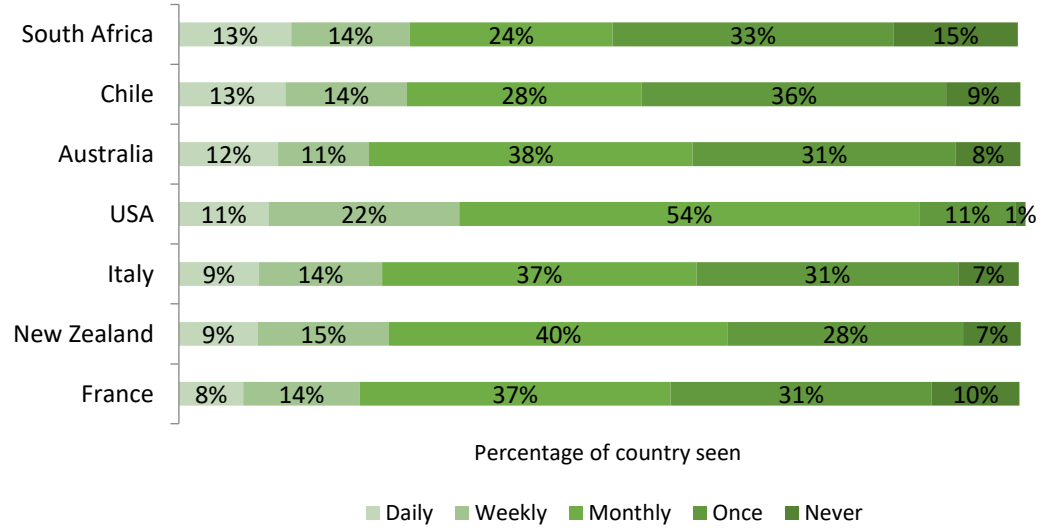
Following this line of questioning, participants were asked to indicate if they had seen Sauvignon Blanc being sold with a particular country-of-origin. These included the USA, France, Italy, Australia, Chile and South Africa, as well as NZ. As shown in Figure 3.10, the USA was the most commonly identified country-of-origin for wine (87 per cent), followed by France (70 per cent) and NZ/Italy (57 per cent each).

Figure 3-10: Percentage of participants who had seen Sauvignon Blanc sold by country of origin



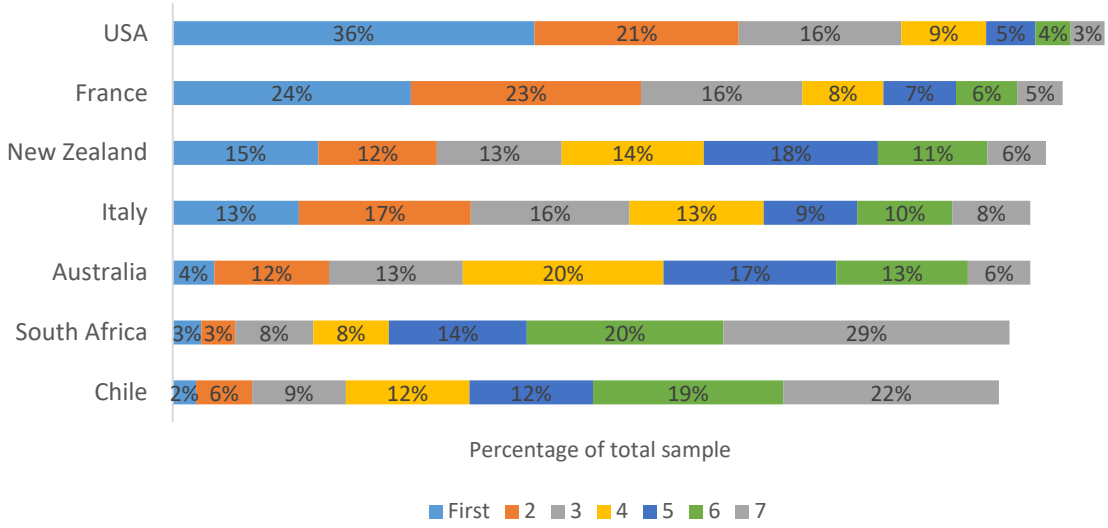
For the countries that participants had seen, they were then asked to indicate the frequency at which they had purchased Sauvignon Blanc from that country. The results, Figure 3-11, reveal the highest conversion rate from country viewed to purchased is for US wine, with just 1% of respondents who had seen a US wine having never bought one. The lowest conversion rate is for South African wine, with 15% of respondents who had seen such wines never purchasing them.

Figure 3-11: Frequency of purchase by country of origin



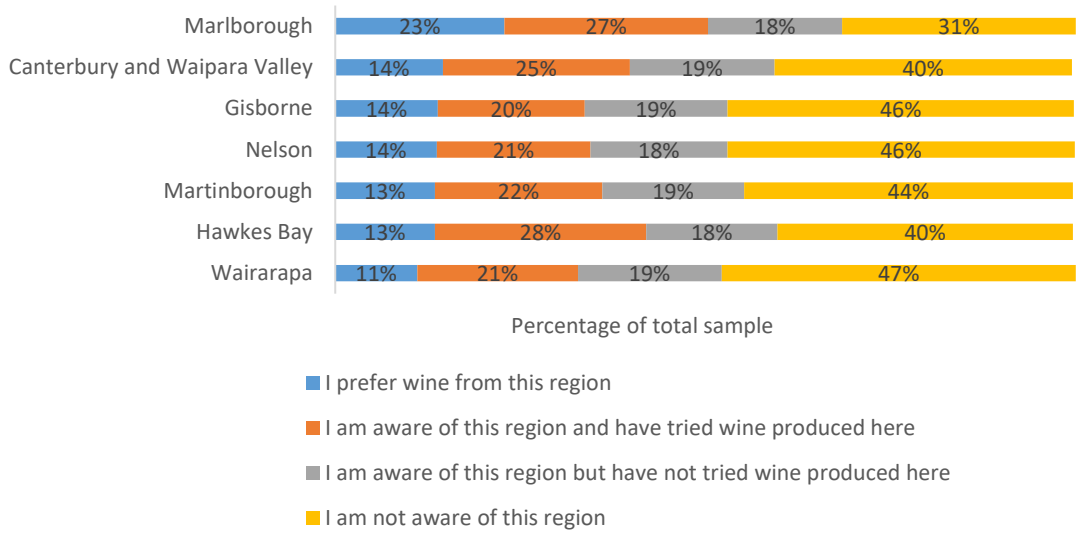
Following this, participants were asked to indicate which countries they believed produced the highest quality Sauvignon Blanc. These results are presented in Figure 3.12, the country most often ranked first for producing high quality Sauvignon Blanc was the USA, followed by France and then NZ.

Figure 3-12: Ranking of countries for producing high quality Sauvignon Blanc



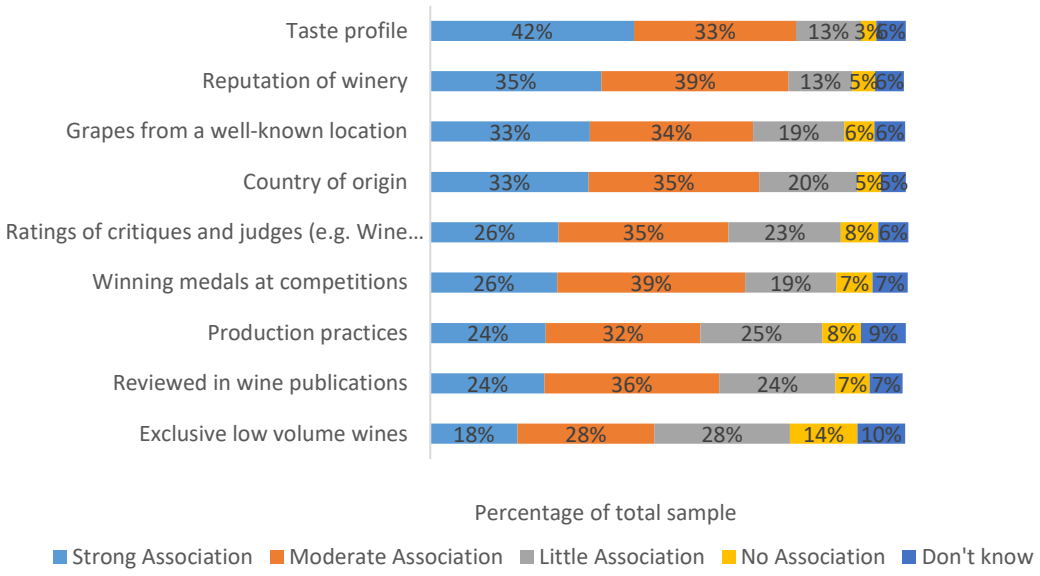
Participants were also asked to indicate their familiarity with a range of Sauvignon Blanc producing regions of NZ. As shown in Figure 3-13, Marlborough was shown to be the most well-known Sauvignon Blanc producing region of NZ (50 per cent I prefer wine from this region/I am aware of this region and have tried wine product here), with similar levels of familiarity shown for all other regions.

Figure 3-13: Familiarity with Sauvignon Blanc producing regions of New Zealand



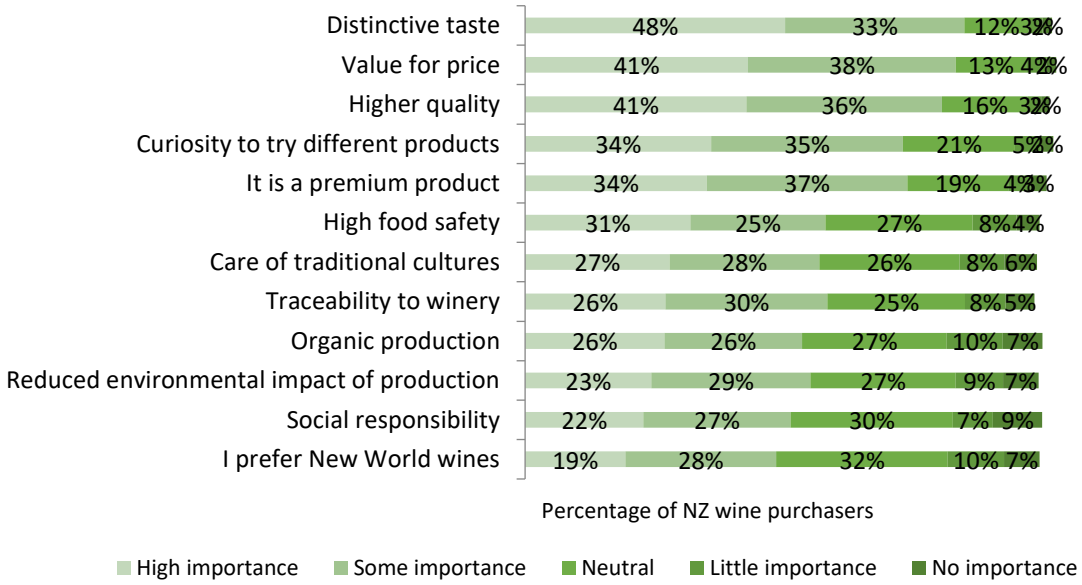
Participants were then asked to indicate the attributes that they associate with higher quality Sauvignon Blanc wines using a four-point Likert scale including a don't know response. Results are shown in Figure 3.14. The three most commonly associated attributes with high quality Sauvignon Blanc included taste profile (75 per cent strong association/ moderate association), reputation of winery (74 per cent strong association/moderate association), and country of origin (68 per cent strong association/moderate association).

Figure 3-14: Associations with higher quality Sauvignon Blanc wines



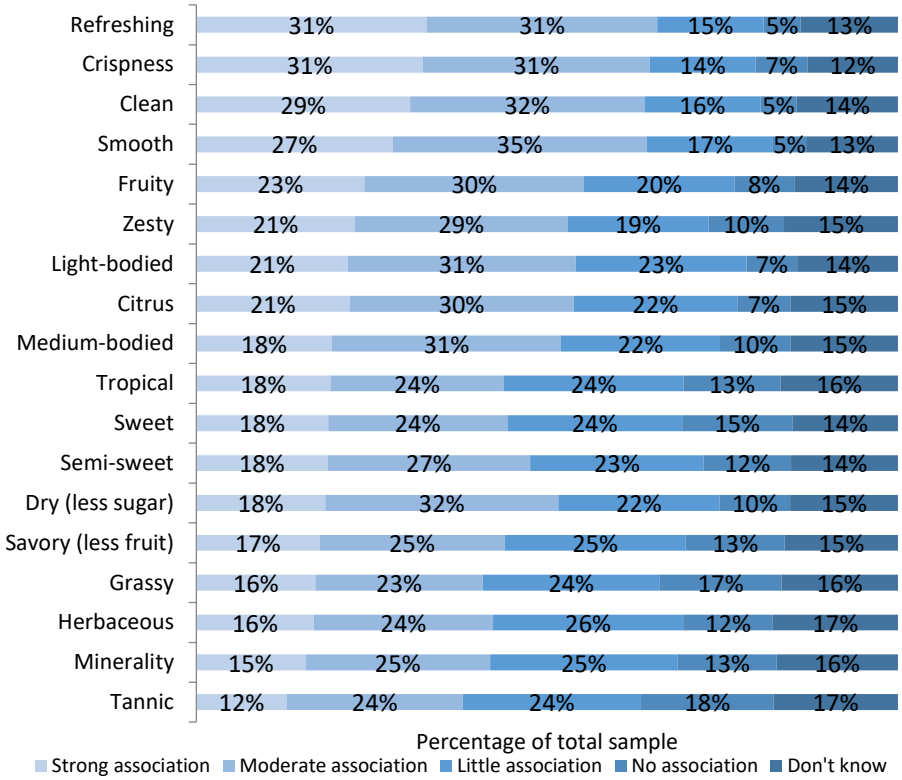
Following this, participants who had purchased NZ Sauvignon Blanc at least once (Fig. 3.11, n = 407, 53 per cent of total sample) were asked to indicate the importance of attributes in their purchase decision. Results indicate, as shown in Figure 3-15, distinctive taste is the most important attribute (81 per cent high importance/some importance), followed by value for price (79 per cent high importance/some importance) and higher quality (77 per cent high importance/some importance).

Figure 3-15: Importance of attributes in New Zealand Sauvignon Blanc purchasing



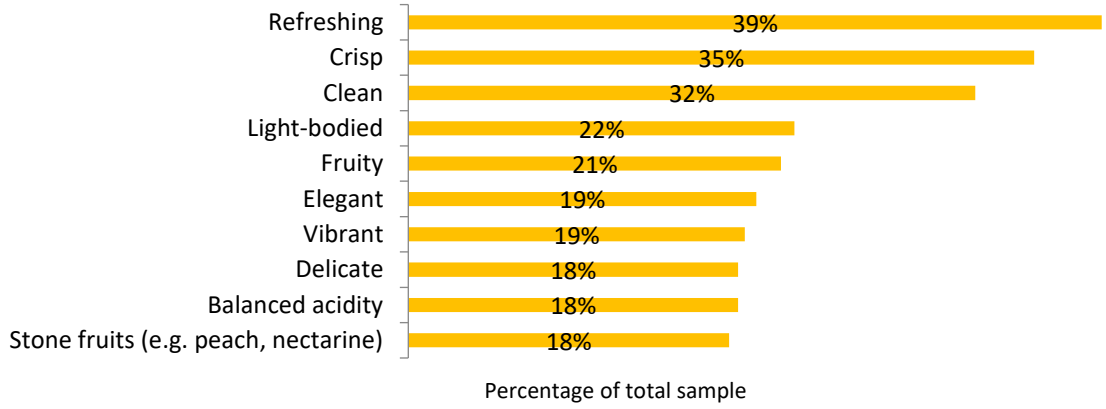
Following this, participants were asked to indicate the taste profile that they associated with NZ Sauvignon Blanc. Results are shown in Figure 3-16. The most commonly stated taste profile associations for NZ Sauvignon Blanc included refreshing (62 per cent strong association/moderate association), crispness (62 per cent strong association/moderate association) and clean (61 per cent strong association/ moderate association).

Figure 3-16: Taste profile associated with New Zealand Sauvignon Blanc



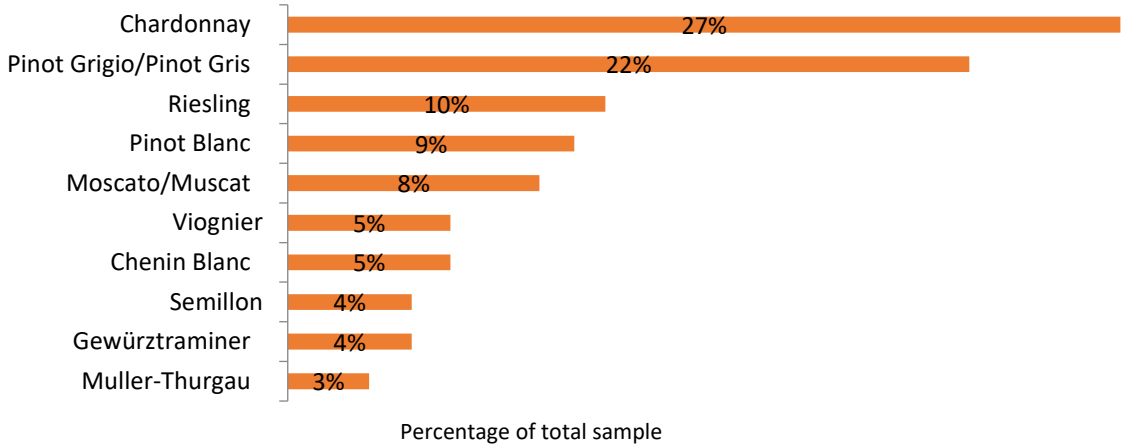
Similarly, participants were asked to indicate which flavour attributes their ideal Sauvignon Blanc would have, choosing all that applied, with the most selected flavour attributes shown in Figure 3.17. These results are similar to the previous question in that participants' ideal Sauvignon Blanc product would contain the most common taste profile attributes that are associated with NZ wine, including refreshing (39 per cent), crisp (35 per cent) and clean (32 per cent).

Figure 3-17: Ideal Sauvignon Blanc taste attributes (top 10)



Participants were also asked to indicate what their preferred wine product choice would be if Sauvignon Blanc was not available, with results presented in Figure 3-18. The top one alternative wine product was Chardonnay (27 per cent), followed by Pinot Grigio/Pinot Gris (22 per cent). The top two alternatives are the third- and fourth-most produced NZ wines respectively (NZW, 2017).

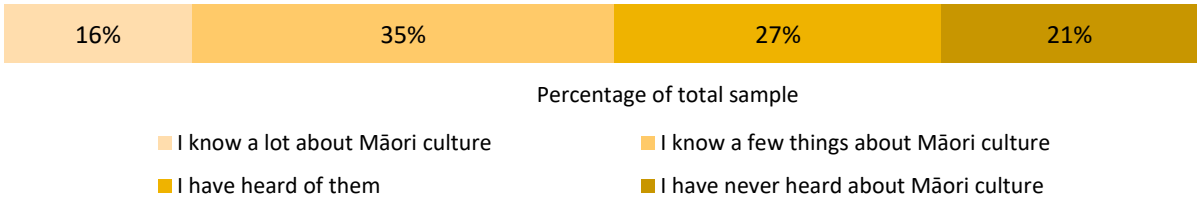
Figure 3-18: First alternative to Sauvignon Blanc if unavailable



3.3 Māori culture and enterprise

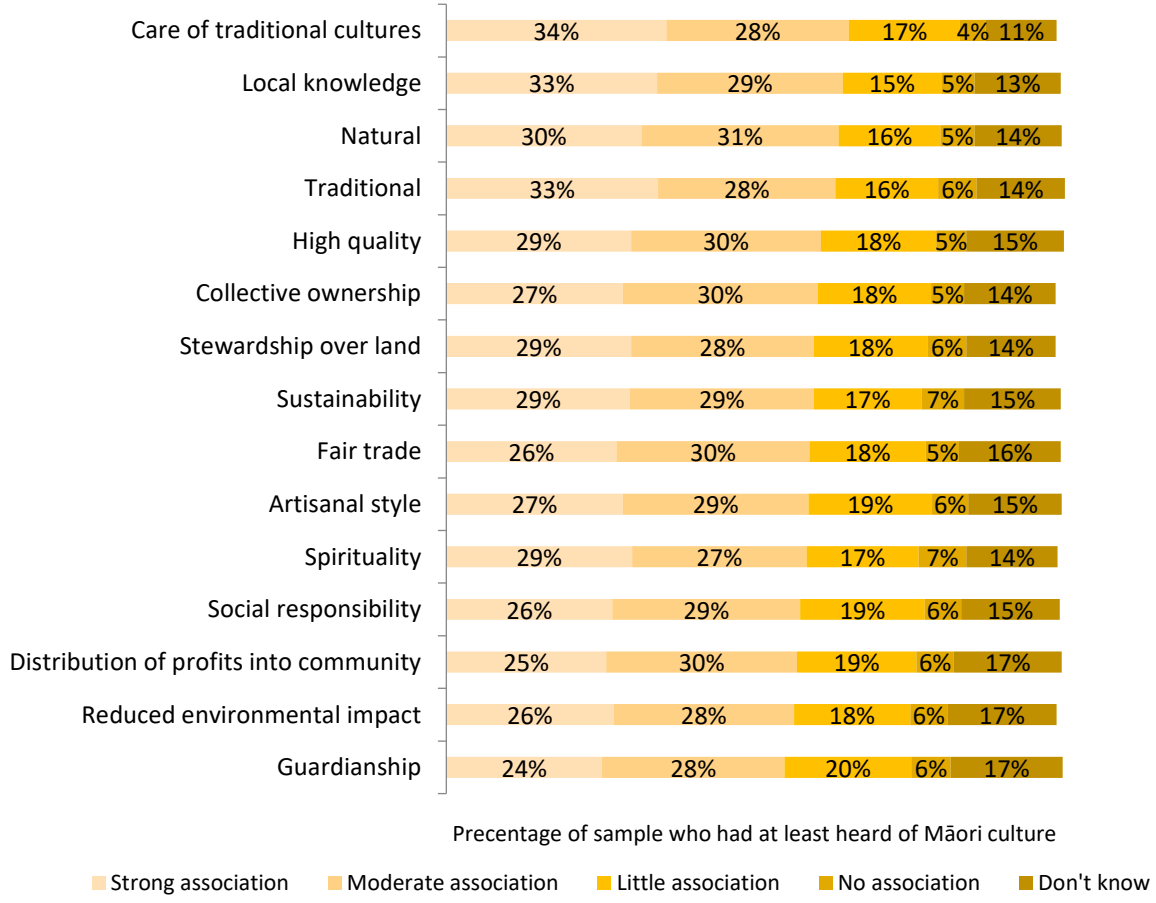
The survey also examined participants' knowledge of and associations with Māori culture, generally and specifically in relation to Sauvignon Blanc production. Participants were initially asked to approximate their knowledge of Māori culture, as shown in Figure 3.19. This shows that many knew a few things about Māori culture (35 per cent), or a lot (16 per cent).

Figure 3-19: Knowledge of Māori culture



Following this, participants who had at least heard of Māori culture (n = 592) were asked to indicate to what extent they associated a series of attributes with wine produced from a Māori enterprise. Results are shown in Figure 3-20. Similar results were shown across attributes, with the most commonly associated attributes including care of traditional cultures (62 per cent strong association/moderate association), local knowledge (62 per cent strong association/moderate association) and natural (61 per cent strong association/moderate association).

Figure 3-20: Attributes associated with wine produced from Māori enterprise

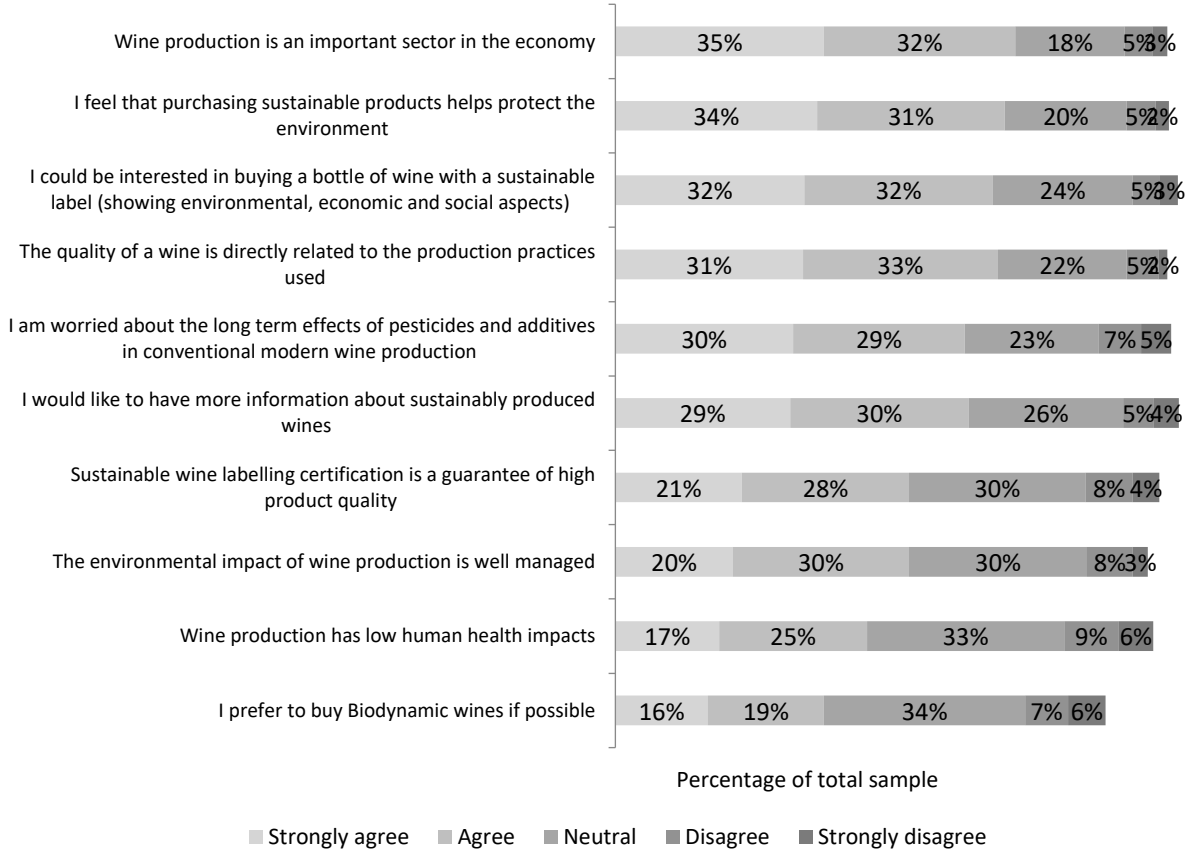


3.4 Attitudes to wine consumption and production practices

Participants were also asked to indicate their agreement with a range of statements in relation to wine production practices. This included statements regarding participants' views on the economic, environmental and social impact of wine production, pest management, organic and biodynamic production. Additionally, participants were asked about their perception of the relation of wine consumption and health benefits. Results are shown in Figure 3.21. The most commonly agreed statement was 'wine production is an important sector in the economy' (67 per cent strongly agree/agree), followed by 'I feel that purchasing sustainable products helps protect the environment' (66 per cent strongly agree/agree) and 'I could be interested in buying a bottle of with a sustainable label (showing environmental, economic and social aspects)' (65 per cent strongly agree/agree).

Most respondents also agreed that 'the quality of wine is directly related to the production practices' (64 per cent strongly agree/agree), 'I am worried about the long term effects of pesticides and additives in conventional modern wine production' (59 per cent strongly agree/agree) and 'I would like to have more information about sustainably produced wines' (59 per cent strongly agree/agree).

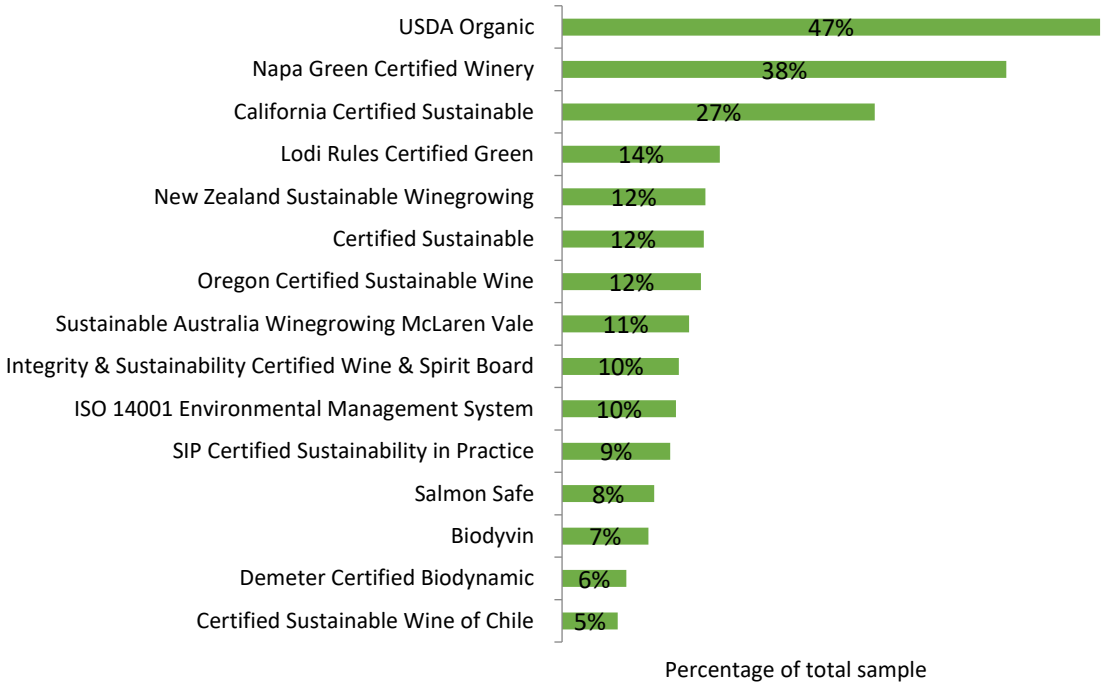
Figure 3-21: Agreement with statements relating to wine production practices



3.5 Sustainability Label Awareness

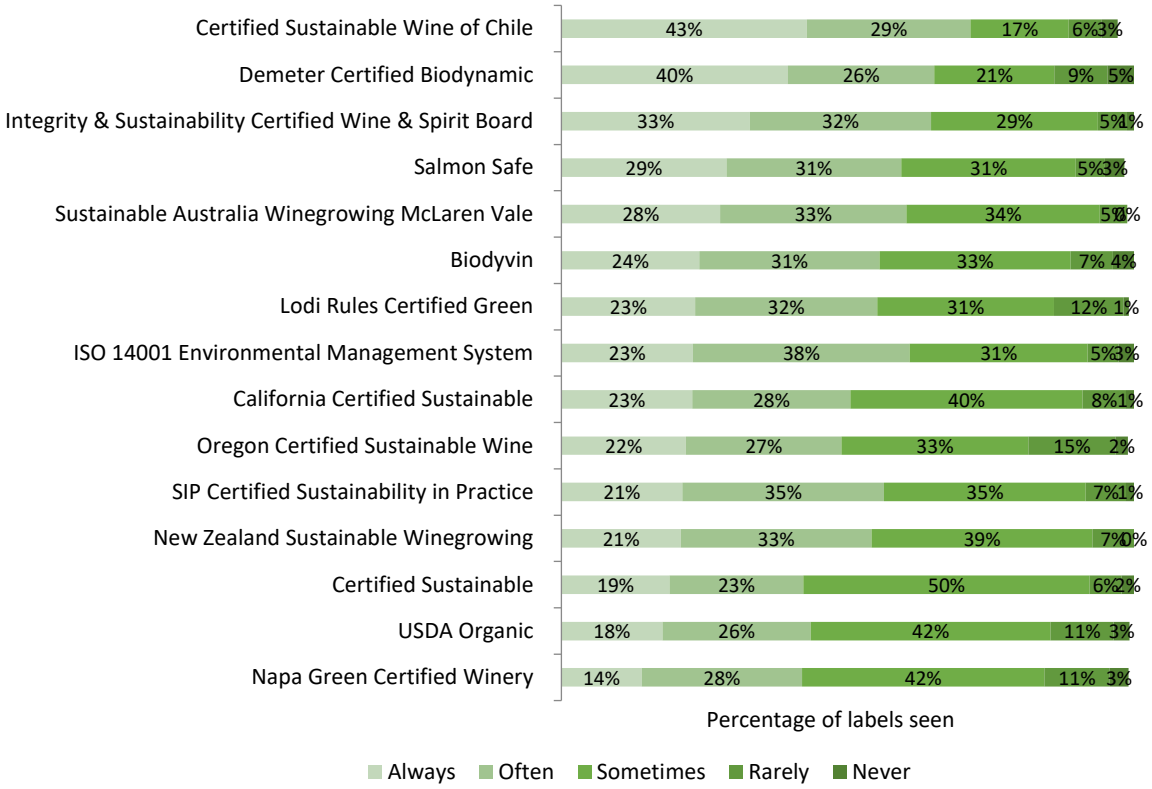
The following set of questions asked participants to consider their perceptions, knowledge and preferences regarding wine product labelling and production standards. Initially participants were asked to indicate if they had seen Sauvignon Blanc with any of a series of labels attached. Results are presented in Figure 3.22. The most commonly seen labels included USDA Organic (47 per cent), followed by Napa Green Certified Winery (38 per cent) and then California Certified Sustainable (27 per cent), with 12 per cent stating that they had seen the SWNZ label.

Figure 3-22: Seen Sauvignon Blanc with sustainability labels



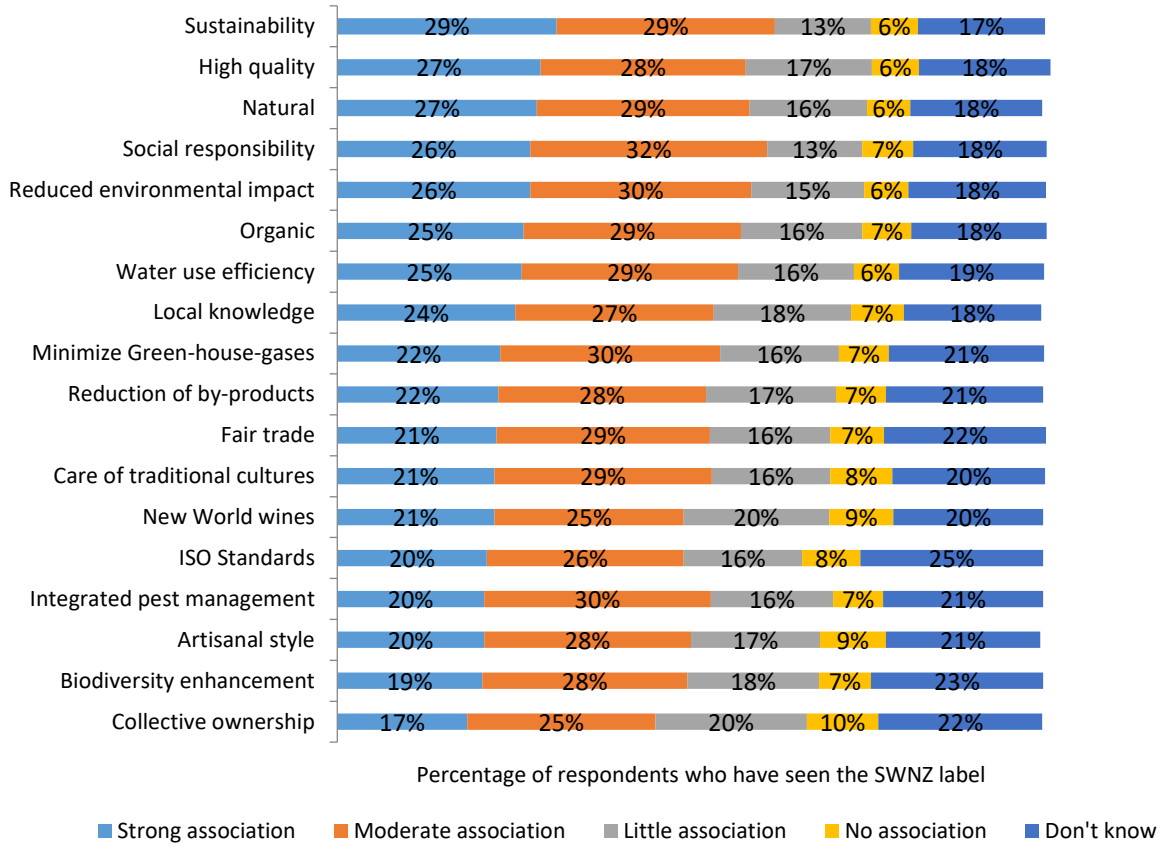
Participants were then asked to indicate the frequency at which they had purchased Sauvignon Blanc with the labels that they had seen. Results, as shown in Figure 3.23, reveal that even though the Chilean programme was seen the least, it has the highest rate of 'always' consumers. Conversely, the organic and Napa Green labels were seen the most but had the lowest rates of 'always' consumers. For the SWNZ label, over half said they purchased at least 'often', while 39 per cent said they purchased 'sometimes'. Most consumers who saw a relevant label, went on the purchase that label to some extent, with few respondents indicating never purchasing a label that they had seen. This suggests that consumers actively look for and then purchase specific labels of interest.

Figure 3-23: Sustainability label purchase frequency



Participants, who had indicated that they had seen Sauvignon Blanc with the SWNZ label (n = 92) were then asked to indicate which attributes they associated with the sustainability programme. Results are presented in Figure 3.24, and show that the most associated attributes are the general issues of 'sustainability', 'high quality' and 'natural'. However, around 40% of consumers think there is 'little' , 'none' or don't know if there is an association, relatively consistently over all attributes.

Figure 3-24: Attributes associated with Sustainable Winegrowing New Zealand label

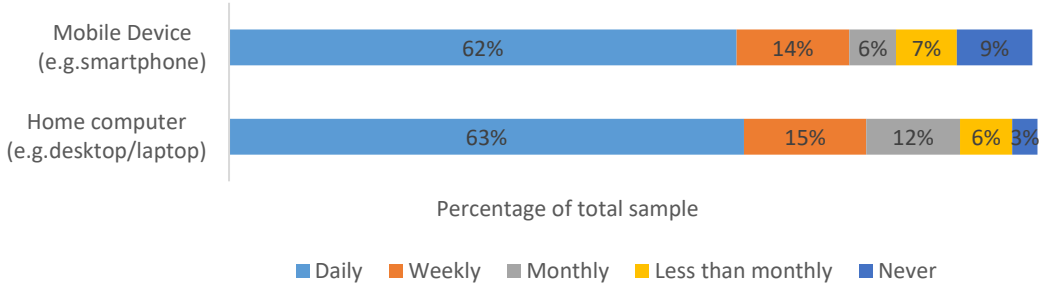


3.6 Digital media and smart technology use for wine

The survey asked participants to describe the ways in which they used various forms of digital media and smart technology in relation to finding information about and/or purchasing wine.

Firstly, participants were asked to indicate how often they accessed the internet using mobile devices (e.g. smartphone) and home computers (e.g. desktop/laptop). Results are presented in Figure 3-25, which shows very similar access rates for both home computers (63 per cent daily) and mobile devices 62 per cent daily), with participants using home computers slightly more than mobile devices overall.

Figure 3-25: Frequency of access the Internet using mobile devices and home computer



Following this, participants were asked to indicate if they use particular digital media sources via home computer or mobile device for the purposes of wine selection inspiration or to find out how a wine product is produced. Table 3.1 shows the percentage of participants using online digital media sources across device

and reason. Thirteen per cent of the total sample did not use any online digital media sources (n = 99). The highest rate of inspiration and production searching is for 'google search' using home computer. The social media sources of information (Facebook, Instagram and Twitter) all have higher rates of mobile device access compared to home computers. Overall, participants tended to use digital media sources for wine selection inspiration more frequently than for information about wine production. Participants also used their mobile devices frequently for both purposes. Digital media sources that were used the most in relation to wine selection inspiration and/or finding wine production information, included Google search, online retailers, food company web pages, food blogs and YouTube.

Table 3.1: Use of online digital media for wine selection inspiration and production information

	Inspiration		How Produced	
	Mobile Computer	Home Device	Mobile Computer	Home Device
Google search	31%	38%	23%	28%
Online retailer	22%	29%	14%	17%
Food company web pages	15%	24%	14%	18%
Food blogs	17%	23%	11%	16%
YouTube	20%	23%	16%	17%
Facebook	23%	22%	16%	14%
Wikipedia	17%	20%	17%	18%
Forums	11%	17%	11%	11%
Pinterest	17%	16%	12%	10%
Instagram	22%	15%	14%	8%
Reddit	10%	12%	8%	9%
Twitter	16%	12%	12%	8%

Percentage of total sample

Participants were asked to indicate which sources of information influenced them when searching for wine product selection inspiration or production information. Table 3.2 shows that participants were influenced more by all sources when searching for wine selection inspiration over production information. Consumers are most influenced by celebrity chefs when searching for wine selection inspiration (39 per cent), whereas health professionals are most influential for production information (24 per cent).

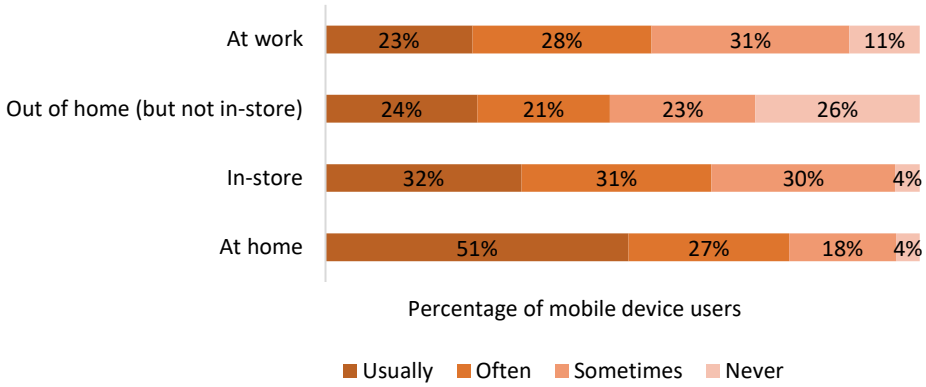
Table 3.2: Influences on wine selection inspiration and knowledge of production processes when searching for information about wine

	Inspiration	How Produced
Celebrity chefs	39%	20%
Health professionals	29%	24%
Industry marketing boards	26%	19%
International bodies (e.g. World Health Organization)	23%	23%
Non-government organizations (e.g. Greenpeace)	22%	21%
Other celebrities	22%	13%
Sports celebrities	19%	13%
Government information	17%	19%

Percentage of total sample

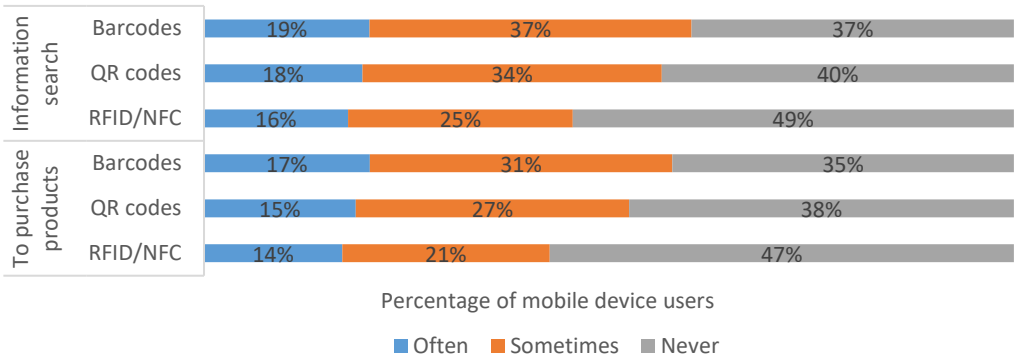
Participants who used mobile devices to search for inspiration or product information (Table 3.1, n = 500) were also asked to indicate where they usually did this Figure 3-26. Most mobile use is happening in their home (78 per cent usually/often), and there is a significant level in-store information searching (62 per cent usually/often).

Figure 3-26: Place of use of mobile device to search for wine information or inspiration



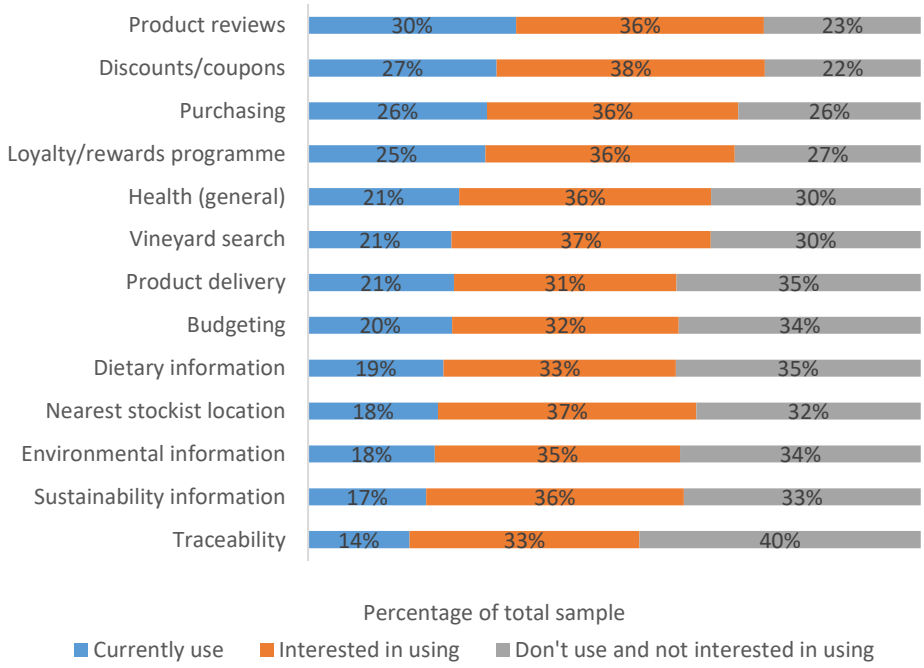
Mobile device users were also asked to indicate the frequency at which they had used a series of smartphone-interactive technologies (barcodes, QR codes, RFID/NFC) for the purposes of finding information or purchasing wine. Results are presented in Figure 3-27, showing that the most frequently used interactive technology for information searching was barcodes (56 per cent often/sometimes), followed by QR codes (52 per cent often/sometimes) and RFID/NFC (41 per cent often/sometimes). Likewise, the most frequently used interactive technologies for purchasing products were barcodes (48 per cent often/sometimes), followed by QR codes (28 per cent often/sometimes) and RFID/NFC (22 per cent often/sometimes), with all technologies used less frequently for this purpose.

Figure 3-27: Use of smartphone technologies for product information or purchasing



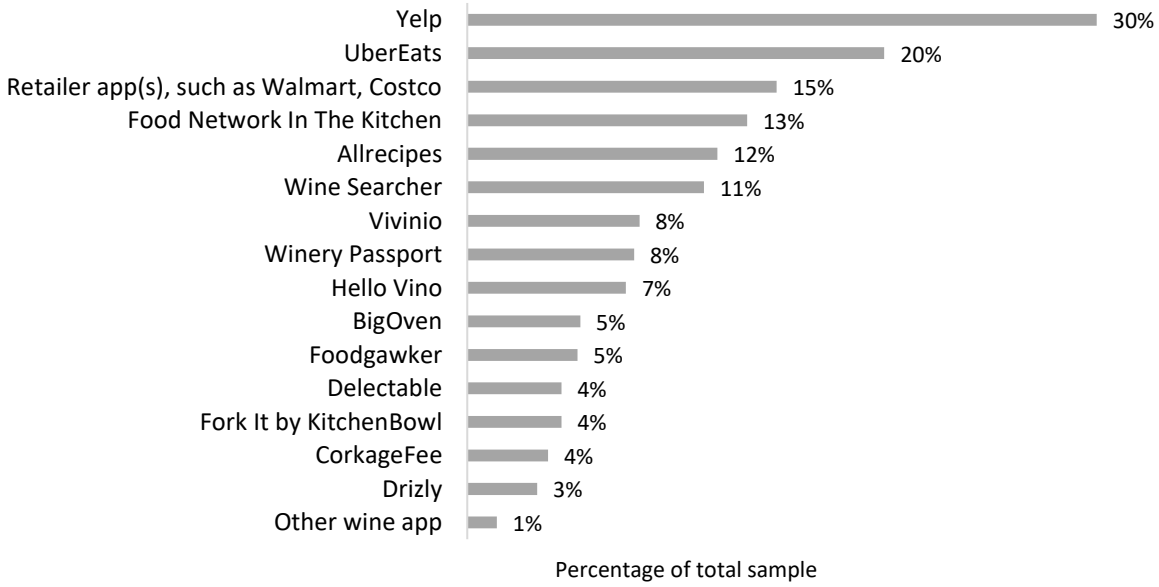
Participants were asked to indicate to what extent they had used mobile apps in relation to searching for wine information and purchasing reasons, stating whether they currently use these apps, are interested in using them, or don't use them and are not interested in using them. These results are shown in Figure 3.28. Overall, there appears to be a significant gap between interest and actual use. For example, one in four participants used mobile apps for wine information and purchasing, with another third interested in doing so. The most commonly stated reasons for using mobile apps were product reviews (30 per cent currently use, 36 per cent interested in use) and obtaining discount/coupons (27 per cent currently use, 39 per cent interested in use), followed by purchasing (25 per cent currently use, 37 per cent interested in use) and then loyalty/rewards programs (24 per cent currently use, 37 per cent interested in use).

Figure 3-28: Use of mobile apps for wine information and purchasing



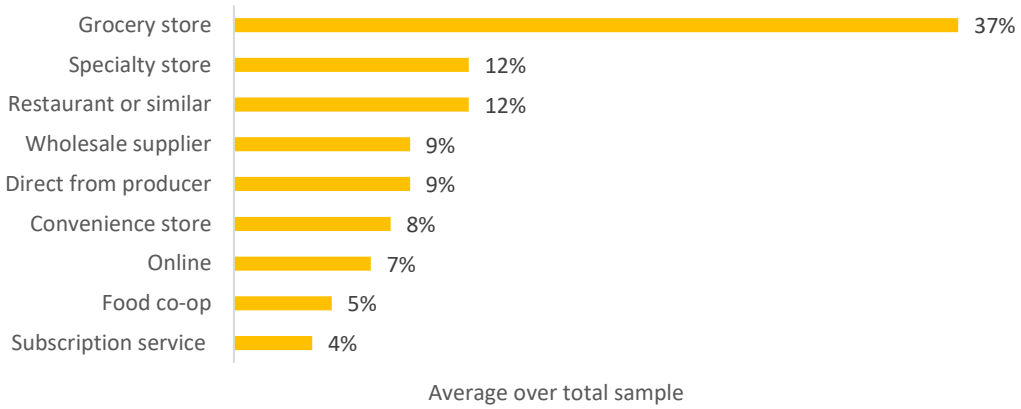
Participants who currently use apps (n = 429) were also asked to indicate which apps (from a select list) they used on their mobile device in relation to information on wine and its purchase. These apps allow consumers to find product information, purchase products and/or write product reviews. Results are presented in Figure 3-29, showing the highest overall use of Yelp (30 per cent), followed by food delivery ordering app UberEats (20 per cent) and retailer apps (15 per cent). Participants also indicated use of wine-specific apps, such as Wine Searcher (11 per cent), Vivinio (8 per cent), Winery Passport (8 per cent) and Hello Vino (7 per cent).

Figure 3-29: Use of selected apps with mobile device for wine information and purchasing



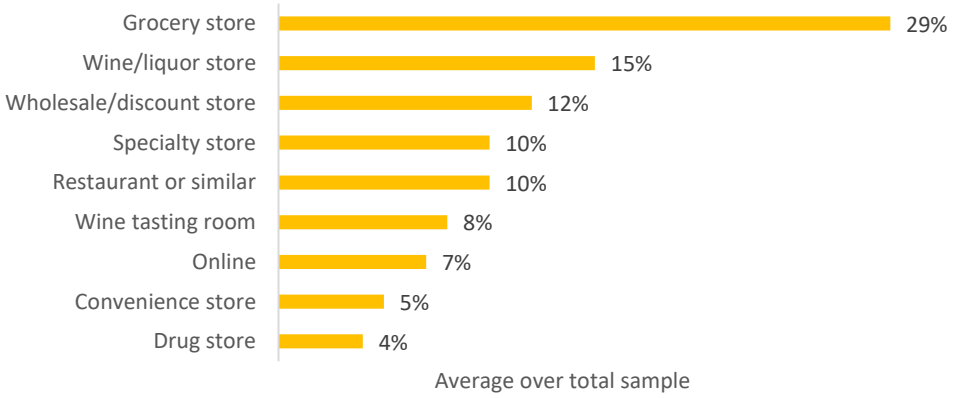
The survey also contained a series of questions designed to elicit participants' use of online shopping for wine. Firstly, participants were asked to indicate their percentage of purchases from a series of retailer types for their usual food and beverage shopping. Results are presented in Figure 3-30, showing grocery stores as having the highest average purchase rate (79 per cent), followed by restaurant or similar and specialty store (12 per cent each). An average of 7 per cent of food and beverage purchases were made online.

Figure 3-30: Average percentage of food and beverage purchases by retailer type



Following this, participants were asked to indicate the percentage of their usual wine purchases from a series of retailer types. Results are presented in Figure 3-31, with grocery store also shown to have the highest average purchase rate (29 per cent), followed by wine/liquor stores (15 per cent) and then wholesale/discount stores (12 per cent). An average of 7 per cent of wine purchases were made online with 34 per cent of the total sample making some purchases online.

Figure 3-31: Average percentage of wine purchases by retailer type



Participants who purchased wine online (n = 259) were also asked to indicate the frequency at which they purchased particular types of wine, either from any country of origin or NZ. These results are shown in Figure 3.32 and Figure 3.33. For wine with any country of origin, Sauvignon Blanc showed the highest purchase frequency (66 per cent often/sometimes), followed by Chardonnay/Cabernet Sauvignon (63 per cent often/sometimes).

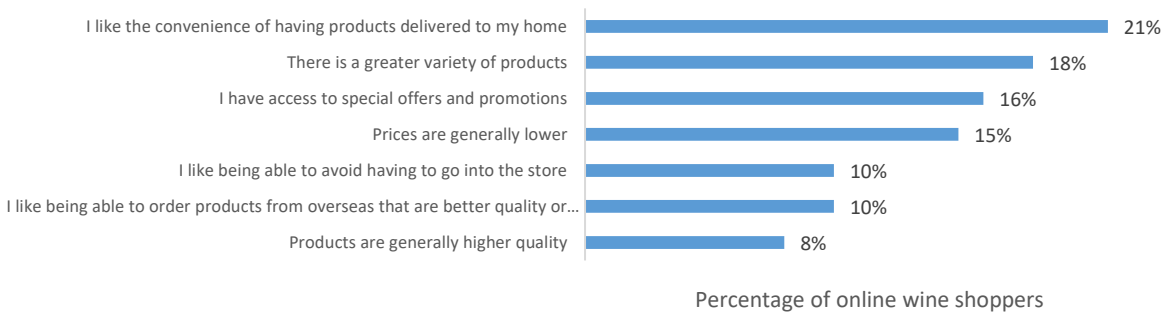
Figure 3-32: Frequency of online purchases of wine from any country of origin

Figure 3-33 shows the frequency of online purchases buyers for particular types of NZ wine. As with other country of origin wines, Sauvignon Blanc has the highest purchase frequency (53 per cent often/sometimes).

Figure 3-33: Frequency of online purchases of New Zealand wine

Participants who purchased wine online were then asked to indicate their main reason for shopping online. Results are presented in Figure 3.34, showing the convenience of home delivery as the most common main reason (21 per cent), followed by a greater variety of wines (18 per cent), access to special offers/promotions (16 per cent) and generally lower prices (15 per cent).

Figure 3-34: Main reasons for shopping online for wine

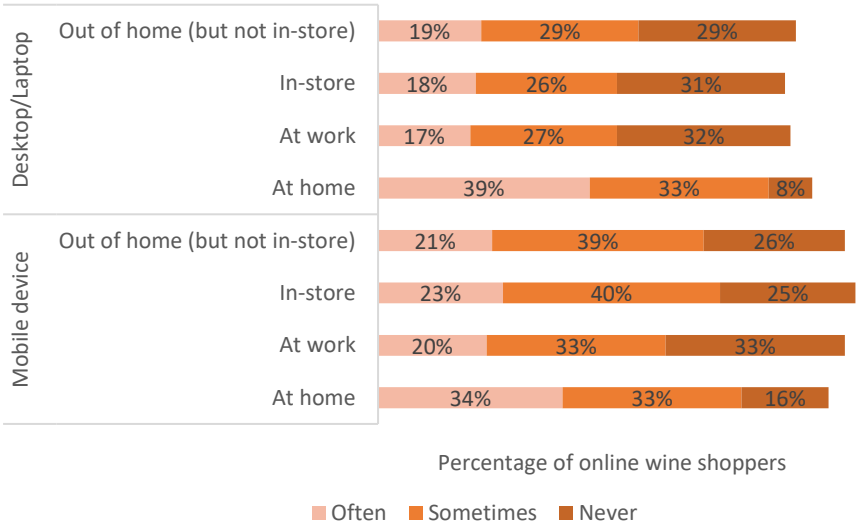


Following this, participants who purchased wine online were then asked to indicate which online retailers they purchased wine from. Results are presented in Figure 3-35. Online consumers find supplier trust an important consideration in their retail channel choice. Wine/liquor stores are the most popular online channel retailer choice (31 per cent often), followed by specialty retailers (29 per cent often).

Figure 3-35: Online channel retailer choices

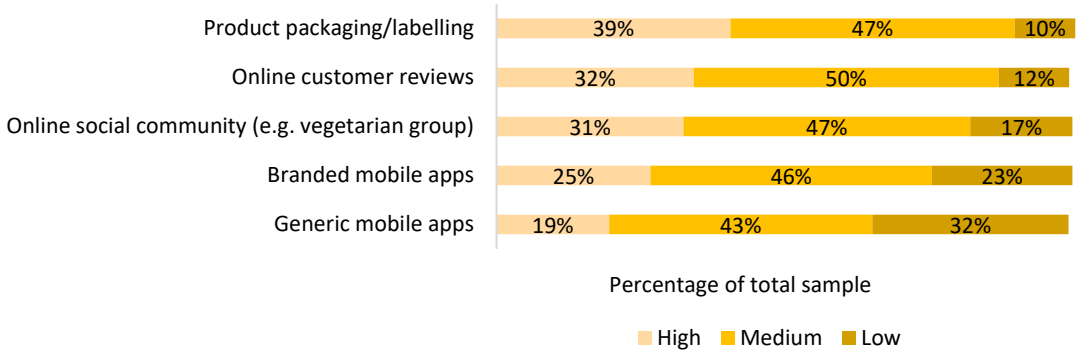
Participants who purchased wine online were also asked to indicate which devices they used, and in which locations, for the purpose of making wine purchases online. Results are presented in Figure 3-36. Most online purchases occur at home on a desktop/lap top (39 per cent often), but is closely followed by purchases at home on a mobile device (34 per cent often. Overall, the frequency of mobile devices use for purchase appears higher than for desktop devices.

Figure 3-36: Online purchase device and location



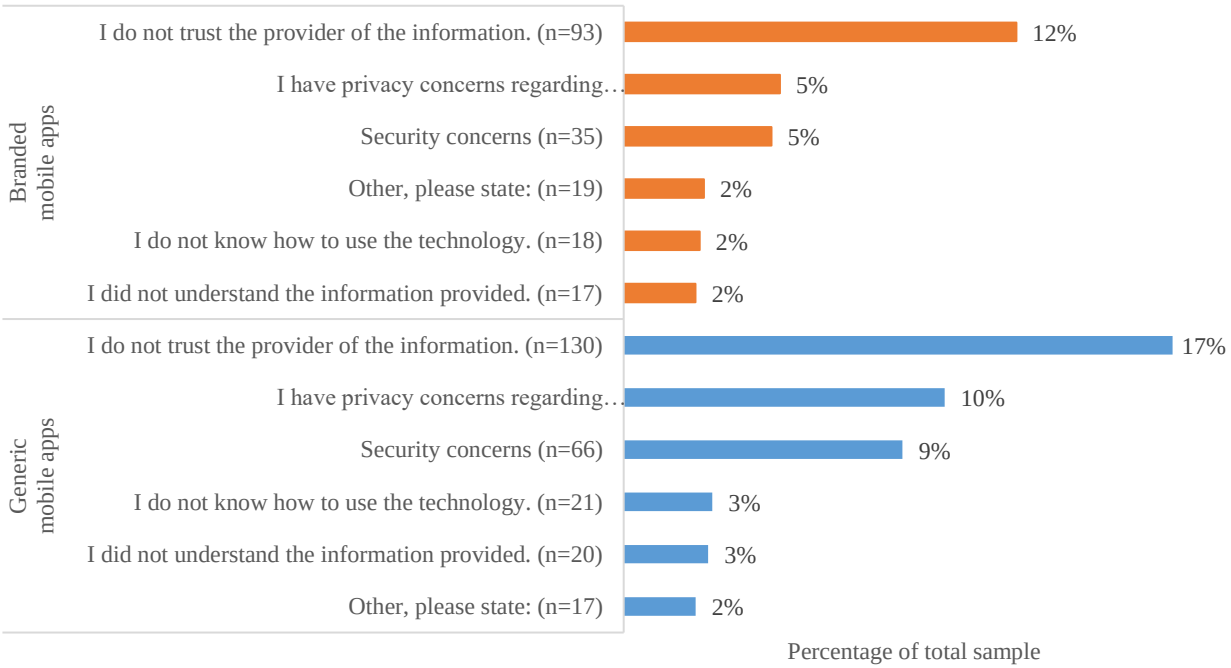
The next set of questions asked participants to consider trusted sources for either information on wines or purchasing wine. Firstly, participants were asked to indicate the extent to which they trusted a series of sources when looking for information regarding wine. Results are presented in Figure 3-37. This shows the most trusted source of wine information to be product packaging/labelling (86 per cent high trust/medium trust), followed by online consumer reviews (82 per cent high trust/ medium trust) and online social communities (78 per cent high trust/medium trust).

Figure 3-37: Level of trust in sources of wine information searching



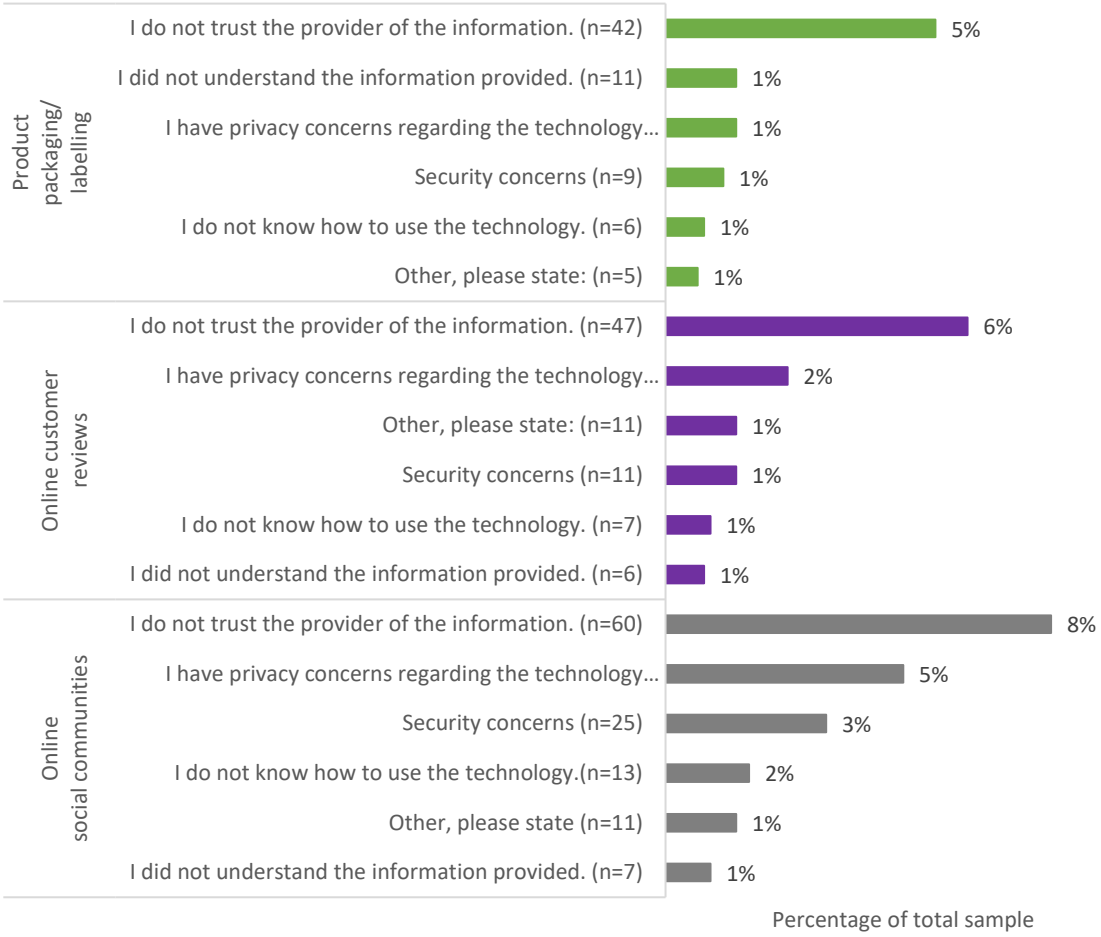
For participants, who had indicated that they had a low level of trust in generic mobile apps/branded mobile apps, were then asked the reasons they did not trust in wine information searching from these two sources. Results are presented in Figure 3-38. The most commonly reason for a low level of trust in both sources was 'I do not trust the provider of the information' (12 per cent branded mobile apps, 17 per cent generic mobile apps, respectively), followed by 'I have privacy concerns regarding the technology' (5 per cent branded mobile apps, 10 per cent generic mobile apps, respectively).

Figure 3-38: Main reasons for low trust in generic mobile apps/branded mobile apps in relation to wine information searching



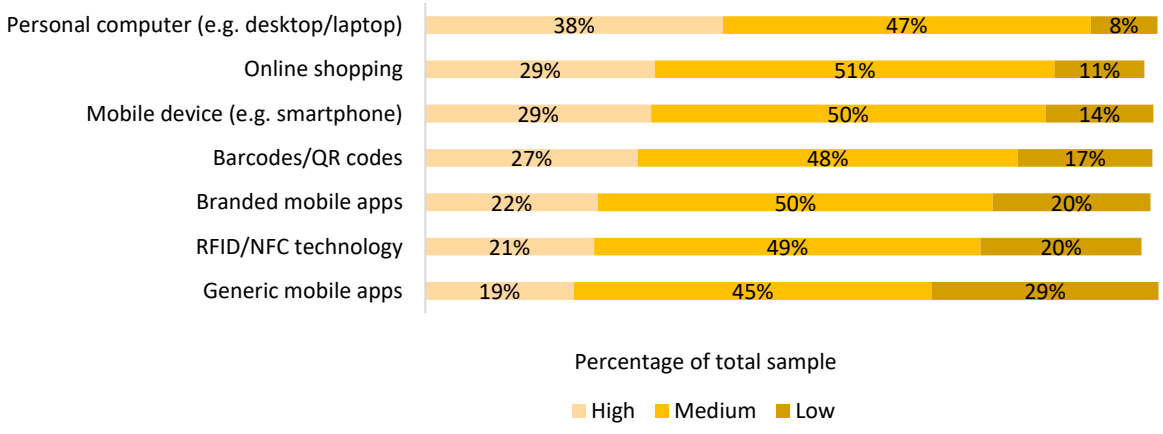
Similarly, participants who had indicated that they had a low level of trust in product packaging/labelling, online costumer reviews, and/or online social community were then asked to the reasons they did not trust in information searching for wine from these three sources. Figure 3-39 shows that the most commonly indicated reason was 'I do not trust the provider of the information' (5 per cent product packaging/labelling, 6 per cent online customer reviews, 8 per cent online social community).

Figure 3-39: Main reasons for low trust in product packaging/labelling, online costumer reviews, and/or online social community for wine information searching



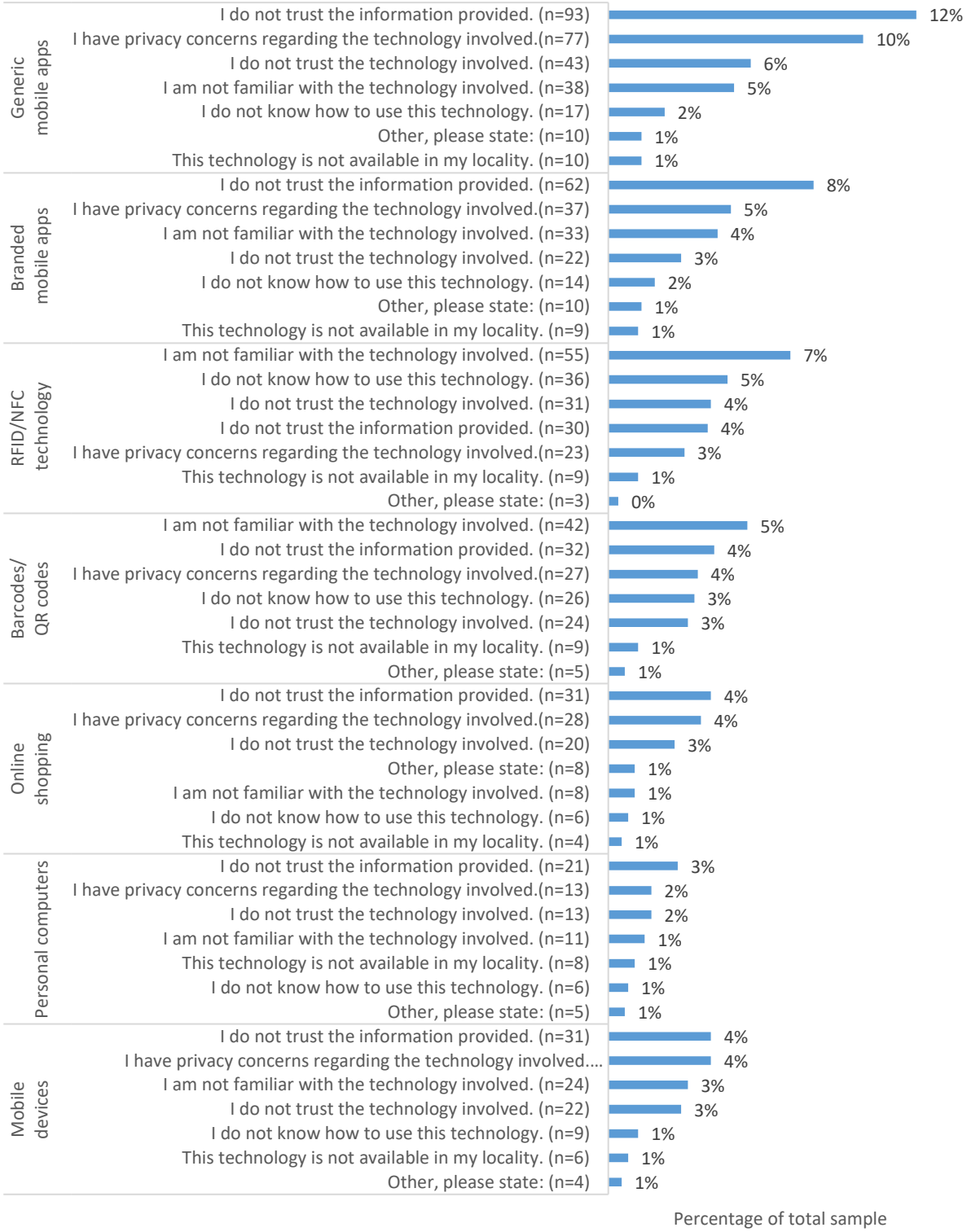
Participants were then asked to the extent to which they trusted a range of sources for purchasing wine. Results are presented in Figure 3.40, with personal computers being the most trusted source for purchasing wine (85 per cent high trust/medium trust), followed by online shopping (80 per cent high trust/medium trust) and mobile devices (79 per cent high trust/medium trust).

Figure 3-40: Level of trust in sources for wine purchasing



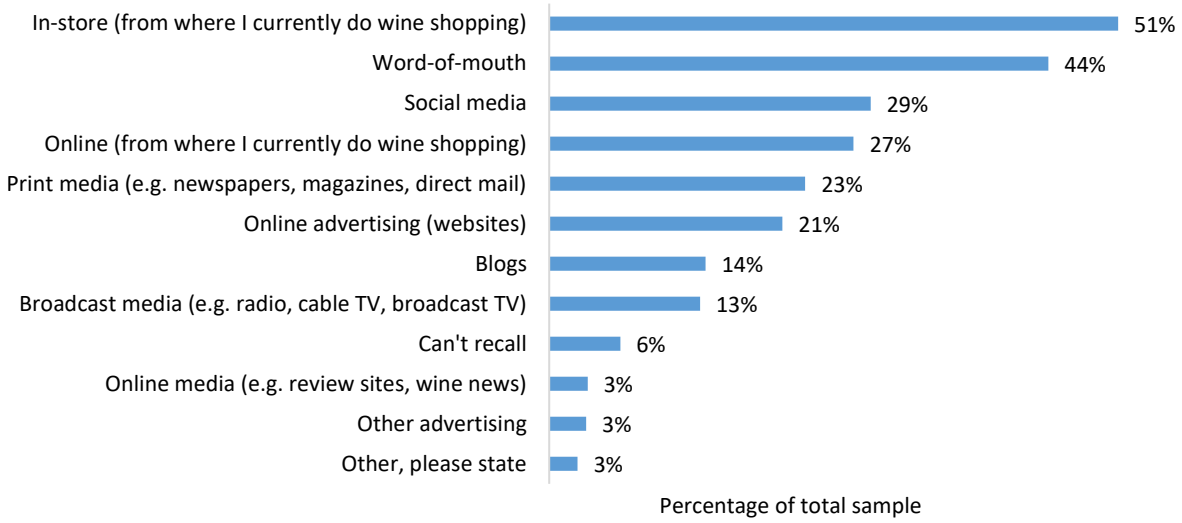
Following this, participant who had a low trust in personal computer, online shopping, mobile device, barcodes/QR codes, branded mobile apps, RFID/NFC technology and generic mobile apps, then were asked the reasons why they did not trust these sources, the results of which are presented in Figure 3.41. Overall, the top three commonly reasons were 'I do not trust the information provided', 'I am not familiar with the technology involved', and then 'I have privacy concerns regarding the technology involved'.

Figure 3-41: Main reasons for low trust in the sources for wine information purchasing



Finally, participants were asked how they usually found out or became aware of new wines. Results are presented in Figure 3.42. The most common source of or awareness of new wines was 'in-store (from where I currently do wine shopping)' (51 per cent), followed by 'word of mouth' (44 per cent) and 'social media' (29 per cent).

Figure 3-42: Sources of awareness of new wine



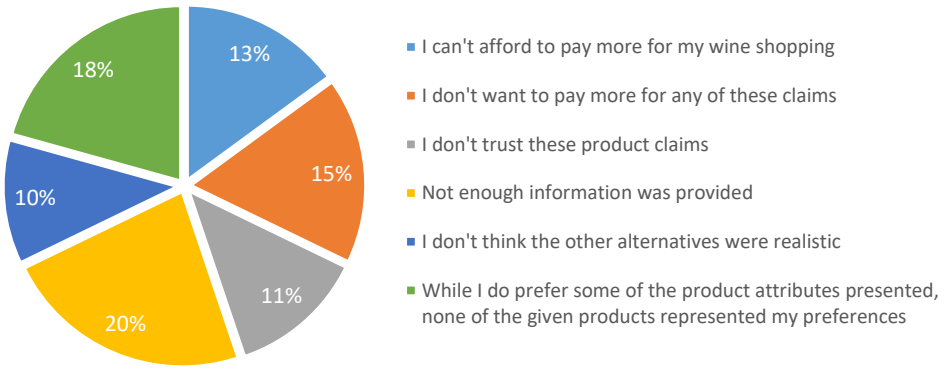
Chapter 4
Choice Experiment Analysis

This chapter presents the results of the choice experiment described in Chapter 2 designed to examine which selected attributes may influence consumers sauvignon blanc wine choices. The attributes included in the choice experiment used to describe wines were focused around production practices inherent in the individual elements that comprise the Sustainable Wine Growing NZ standard. And attributes known to be important determinants of wine consumers product choices, the country of origin, an assessment of quality, and the price:

- Biodiversity management
- Water management
- By-product management
- Energy management
- Pest and disease management
- Social responsibility
- GHG management
- Organic production
- Country where wine is made
- Critic score
- Price per 750ml bottle

Alternatives described by differing combinations of these attributes were presented to consumers who then indicated their preferred wine alternative in each scenario (e.g. Fig. 2.3). The attributes associated with a respondents chosen wine alternative, and those from the non-chosen alternatives, were analysed using a Mixed Logit Error Components (MXLEC) model (see Appendix 2 for technical details). This type of model constitutes a standard contemporary methodology. When making choices, respondents may select the 'none of these' option in a choice set. This is usually a truthful indication of their *unwillingness to pay* for the wines and associated attributes presented to them in a particular choice scenario. One in five respondents chose the 'none of these' option in at least one choice set, with this option chosen 393 times in total (5% of all choices (7,606) across the sample). Respondents who chose this option were asked a follow up question to ascertain their reasons (Figure 4-1).

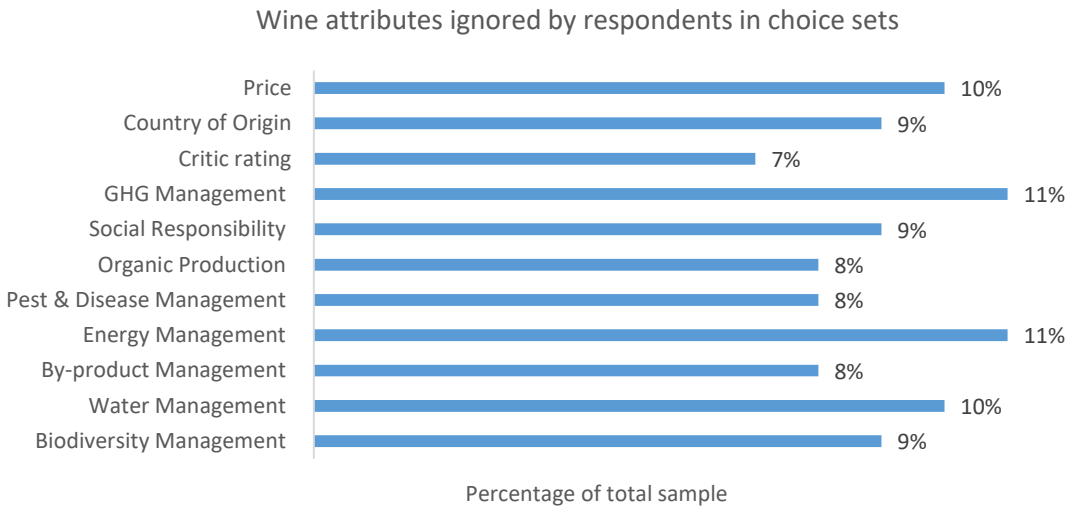
Figure 4-1: Reasons for choosing the "none of these' option in a wine choice set



An underpinning statistical assumption is that all the information that a respondent sees in a choice set has a role to play in determining their choice of wine option. If respondents ignore some of the attributes when they select their preferred option, this assumption is weakened and requires further examination. Following each choice task, respondents were asked to indicate which, if any, of the wine attributes being considered did they ignore (Figure 4-2). We can see that each outcome is ignored to some degree. We test for any effect of this behavioral information analytically and find no improvement over the current model specification (

Table 4.1).

Figure 4-2: Wine attributes ignored when selecting preferred wine options



By conventional econometric standards the model performs well (as shown in Table 4.1). All wine attributes are statistically significant, meaning that they are important factors in a consumers choice of wine options. The model predicts how respondents choose a particular wine option based on the outcomes and costs associated with that option. The parameter estimates tell us how an attribute relates to the overall utility of consumers from the benefits they perceive from each attribute. The model generates a distribution for each random parameter (normal) with the mean and standard deviation of the distribution reported. A larger magnitude of the standard deviation of the distribution indicates a relatively larger degree of preference differences across respondents for that wine attribute outcome. For example, respondents have the most diverse preferences for selecting a wine option from France (s.d. =1.64), meaning that some respondents will not want a French Sauvignon Blanc while others have strong positive preference for French wine. Estimated parameters indicate that respondents are more likely to choose a Sauvignon Blanc option that is produced in the US, while they are less likely to choose wine options imposing greater prices. Other findings include that consumers are more likely to select one of the Sauvignon Blanc options presented than the 'none of these option'.

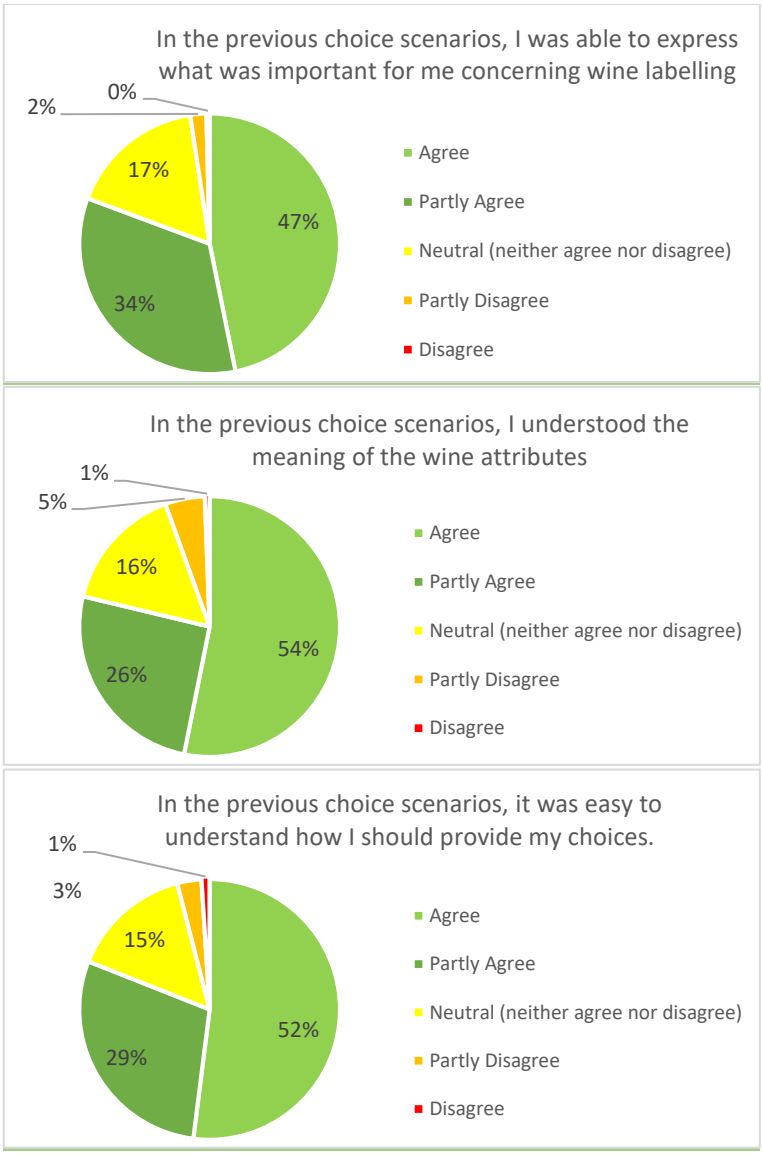
Table 4.1: Mixed Logic Error Component model of wine choices

	Parameter mean estimates[1]		Standard deviation of random parameters	
Random parameters in utility function				
Biodiversity Management	0.169***	(0.04)	0.199*	(0.12)
Water Management	0.325***	(0.05)	0.501***	(0.07)
By-products Management	0.290***	(0.04)	0.447***	(0.06)
Energy Management	0.202***	(0.05)	0.917	(0.21)
Pest & Disease Management	0.375***	(0.04)	0.289***	(0.09)
GHG Management	0.218***	(0.05)	0.227***	(0.12)
Social Responsibility	0.241***	(0.05)	0.552***	(0.06)
Made with Organic grapes	0.467***	(0.04)	0.718***	(0.06)
100% Organic	0.568***	(0.06)	0.371***	(0.11)
Critic Score	0.075***	(0.00)	0.006***	(0.00)
Country-of Origin				
Chile	0.269***	(0.09)	0.384***	(0.14)
South Africa	0.217***	(0.08)	0.009	(0.32)
France	0.369**	(0.15)	1.640***	(0.13)
USA	0.840***	(0.08)	0.937***	(0.08)
NZ	0.831***	(0.15)	1.267***	(0.13)
Price of 750ml bottle of Sauvignon Blanc	0.092***	(0.00)	0.092***	(0.00)
Opt-out 'none of these'	4.422***	(0.31)		
Latent Random Effects				
Standard Deviation	3.109***	(0.22)		
Model Fit Statistics				
Log Likelihood function	7,317			
Log Likelihood chi^2 stat (33 df)	5,761***			
McFadden Pseudo R^2	0.33			
Number of observations	7,606			

***, **,* denote statistical significance at the 1 per cent, 5 per cent and 10 per cent levels respectively for the null hypothesis that a parameter estimate is not significantly different from zero.
Standard errors in brackets.
[1] Parameter mean estimates indicate the estimated average value in the model, for each different parameter.

Debriefing questions following the choice tasks demonstrate that when answering the wine choice scenarios respondents were able to express what was important to them in wine labelling, that they understood the meaning of the wine attributes, and were able to complete the choice task (Figure 4.3).

Figure 4-3: Sauvignon Blanc choice task debriefing: ability to express importance, understanding of attributes meaning, understanding of choice task exercise



4.1 Consumer willingness-to-pay for credence attributes

Applying model estimates (Table 4.1) and equation 1.10 (Appendix 2 Statistical Method) generates estimates of respondents WTP for attributes of Sauvignon Blanc (Table 4.2). WTP is an estimate of how much money a respondent would be willing to give up for a change in the relevant wine attribute, and is calculated using the ratio of an attribute parameter and the cost parameter. These estimates reveal that the country-of-origin is an important wine attribute. The results show that respondents are willing to pay on average the highest premium for wine produced from the USA ($9.10/750ml bottle), followed closely by NZ wine ($8.99). These are the highest average premiums estimated and reflect the established recognition of country-of-origin as a signal of quality. These values are closely followed by the premium that a good critic score can attract. To get a sense of this effect, the marginal value per point over 80 is multiplied by 10 to give an estimate of value for a critic score of 90 (Figure 4-4). In terms of production attributes, the highest premiums were found for organic production methods. Respondents were willing to pay on average $6.15 more for a wine produced with 100 per cent organic inputs, and slightly less for wine made with organic grapes but with some non-organic inputs ($5.04). Looking at the attributes that reflect the components of the Sustainable Wine New Zealand programme, results indicate that the most preferred outcome is pest and disease management which attracts an average premium of $4.07 per bottle, and the least is biodiversity management (average WTP $1.84/bottle).

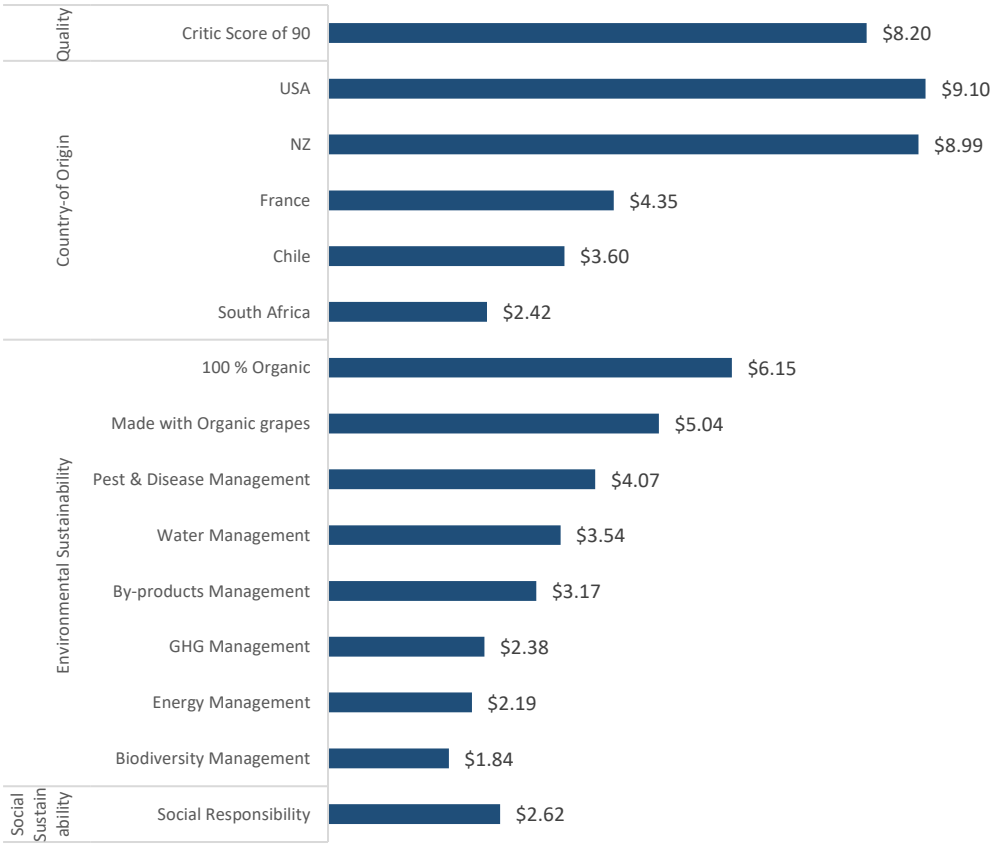
In relation to the average price of a bottle of wine presented to respondents in the wine choice scenarios (Table 2.2) results suggest that respondents were willing to pay on average a 46 per cent premium for USA produced wine, followed closely by 45 per cent premium for NZ produced wine. In terms of production attributes, relative to this average price, respondents were willing to pay 31 per cent more for 100 per cent organic production, followed by 25 per cent more for made with organic grapes, and then 20 per cent more for pest & disease management.

Table 4.2: Wine consumers' willingness-to-pay for selected credence attributes

Wine Attributes	WTP $US/750ml bottle (2017)
Biodiversity Management	$1.84 [9%]* (1.09, 2.6)^
Water Management	$3.54 [18%] (2.69, 4.39)
By-products Management	$3.17 [16%] (2.43, 3.92)
Energy Management	$2.19 [11%] (1.43, 2.96)
Pest & Disease Management	$4.07 [20%] (3.25, 4.89)
GHG Management	$2.38 [12%] (1.61, 3.14)
Social Responsibility	$2.62 [13%] (1.71, 3.52)
Made with Organic grapes	$5.04 [25%] (4.09, 5.99)
100 % Organic	$6.15 [31%] (5.27, 7.04)
Critic Score ($per 1 point above 80)	$0.82 [4.0%] (0.73, 0.9)
Chile	$3.60 [18%] (2.7, 4.51)
South Africa	$2.42 [12%] (1.08, 3.75)
France	$4.35 [22%] (2.29, 6.42)
USA	$9.10 [46%] (7.96, 10.25)
NZ	$8.99 [45%] (6.59, 11.39)

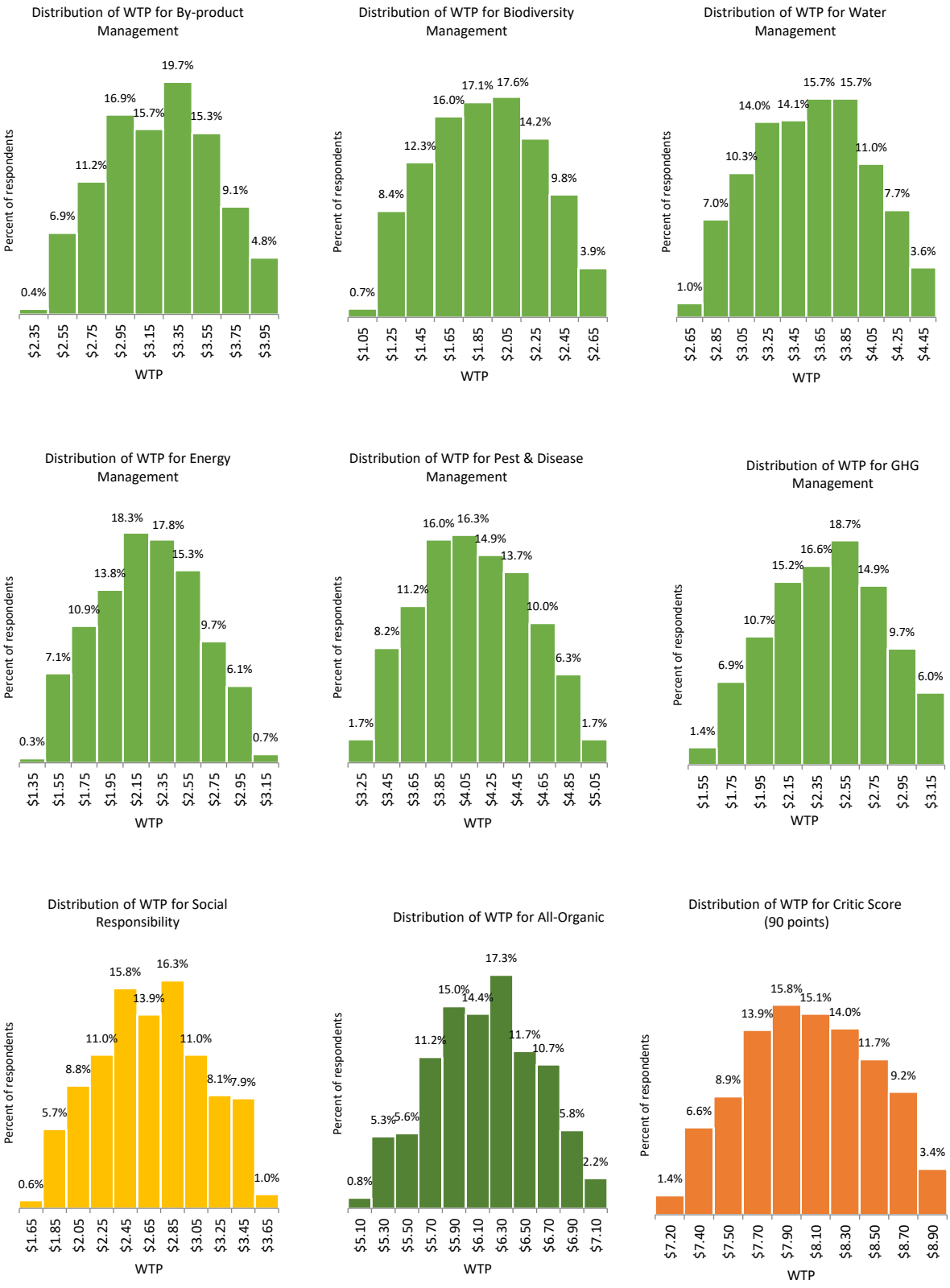
Note: ^$US 2017 Average WTP (95 per cent Confidence Interval)
*WTP as per cent of average price used in choice experiment in square brackets

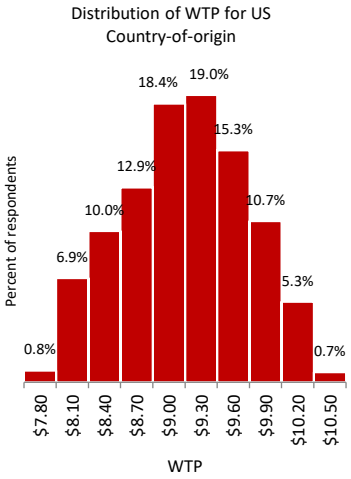
Figure 4-4: Average willingness-to-pay for selected wine attributes

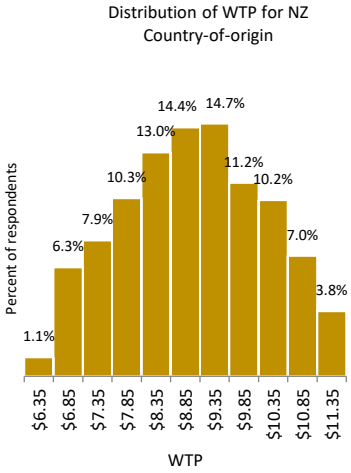


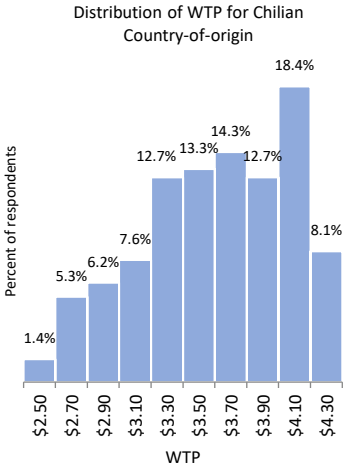
Focusing on the average WTP premiums presented in Table 4.2 and Figure 4-4 can obscure the range of values that are held by different respondents in the survey. Examining the distributions of WTP can help to identify the proportion of consumers who are WTP higher and lower values (Figure 4-5). These distributions reveal that for some attributes there is a relatively narrow range of estimates while for others the spread of preferences held across the sample is greater. For example, comparing the distributions of WTP for US country-of-origin to that of NZ reveals that preferences for US wine are more concentrated relative to NZ. An implication of this is that, although average WTP for US wine is slightly higher than for NZ, there is a significantly larger segment of the sample that are WTP relatively high premiums for NZ wine than there are for US wine.

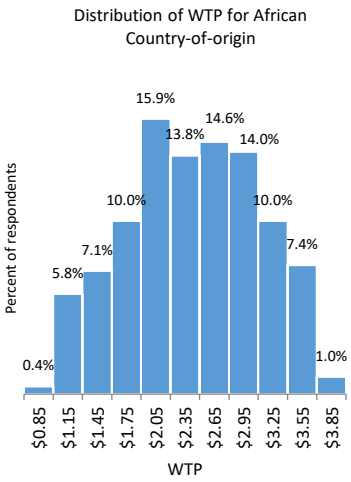
Figure 4-5: Distributions of willingness-to-pay for wine attributes

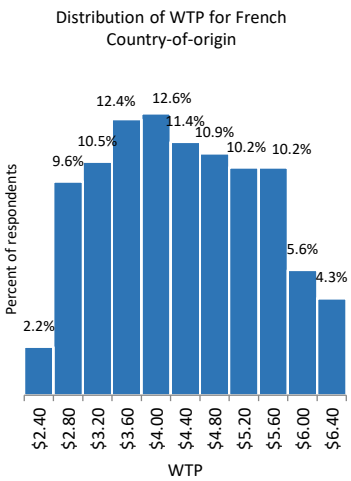



Distribution of WTP for US
Country-of-origin
Percent of respondents
0.8%
6.9%
10.0%
12.9%
18.4%
19.0%
15.3%
10.7%
5.3%
0.7%
$7.80
$8.10
$8.40
$8.70
$9.00
$9.30
$9.60
$9.90
$10.20
$10.50
WTP


Distribution of WTP for NZ
Country-of-origin
Percent of respondents
1.1%
6.3%
7.9%
10.3%
13.0%
14.4%
14.7%
11.2%
10.2%
7.0%
3.8%
$6.35
$6.85
$7.35
$7.85
$8.35
$8.85
$9.35
$9.85
$10.35
$10.85
$11.35
WTP


Distribution of WTP for Chilian
Country-of-origin
Percent of respondents
1.4%
5.3%
6.2%
7.6%
12.7%
13.3%
14.3%
12.7%
18.4%
8.1%
$2.50
$2.70
$2.90
$3.10
$3.30
$3.50
$3.70
$3.90
$4.10
$4.30
WTP


Distribution of WTP for African
Country-of-origin
Percent of respondents
0.4%
5.8%
7.1%
10.0%
15.9%
13.8%
14.6%
14.0%
10.0%
7.4%
1.0%
$0.85
$1.15
$1.45
$1.75
$2.05
$2.35
$2.65
$2.95
$3.25
$3.55
$3.85
WTP


Distribution of WTP for French
Country-of-origin
Percent of respondents
2.2%
9.6%
10.5%
12.4%
12.6%
11.4%
10.9%
10.2%
10.2%
5.6%
4.3%
$2.40
$2.80
$3.20
$3.60
$4.00
$4.40
$4.80
$5.20
$5.60
$6.00
$6.40
WTP

Chapter 5
Conclusions

Sauvignon Blanc is the most produced variety of NZ wine by quantity and value. It is an important export for the NZ economy, and the USA is NZ's largest export market for white wine, valued at approximately NZ$490 million in 2017 (year ended June). California is a prominent state for wine consumption, consuming the most wine by volume in the USA.

This report presents the results from a survey of California Sauvignon Blanc consumers to examine wine consumption and purchase behaviours; knowledge of wine; use of digital media and technologies to find out information about and/or purchase wine; and to estimate consumer WTP for attributes of NZ Sauvignon Blanc.

Californian consumer Sauvignon Blanc consumption and purchasing habits

Survey participants were frequent Sauvignon Blanc consumers, with over 50 per cent of the participants purchasing wine either more than once a week or about once a week. Participants purchased wine most frequently 'for usual personal consumption at home'. A range of prices that consumers usually paid for wine in a range of settings were identified, with the most common being:

- $10-15 per bottle 'for usual personal consumption at home'
- $26-35 per bottle at 'a restaurant'
- $7-10 per glass 'at a restaurant'
- $15-25 per bottle 'for a gift'
- $15-25 per bottle 'for a celebration'

In addition, participants identified NZ as the third most seen country of origin on wine from a selection of seven prominent wine-producing countries, with the USA ranked first and France second. Participants also stated that NZ wine was the third country most frequently purchased (10 per cent daily, 17 per cent weekly), with the USA ranked first and France second. The USA was also ranked first for producing high quality Sauvignon Blanc, with France ranked second and NZ ranked third.

The results of this research reveal participants' familiarity with NZ wine-producing regions, with particular awareness of Marlborough as a wine-producing region (23 per cent 'I prefer wine from this region', 22 per cent 'I am aware of this region and have tried wine produced here').

Californian consumer attitudes to Sauvignon Blanc products

Participants were asked about the attributes they associated with wine. Firstly, associations were made between a range of attributes and high quality wines, with taste profile identified as the most commonly associated attribute (75 per cent strong association/moderate association), followed by reputation of winery (74 per cent strong association/moderate association) and country of origin (68 per cent strong association/moderate association). Participants said their preferred alternative to Sauvignon Blanc was Chardonnay (27 per cent), followed by Pinot Grigio/Pinot Gris (22 per cent) and Riesling (22 per cent).

For NZ Sauvignon Blanc, participants stated the most important attributes were distinctive taste (43 per cent high importance/some importance), followed by value for price (41 per cent high importance/some importance) and higher quality (40 per cent high importance/some importance).

When asked what taste profile they associated with NZ Sauvignon Blanc, the four most frequently given associations were 'refreshing' (62 per cent strong association/moderate association), 'crispness' (62 per cent strong association/moderate association), 'smooth' (62 per cent strong association/moderate association), and 'clean' (61 per cent strong association/moderate association) were. The first three of these match exactly with respondents stated ideal Sauvignon Blanc taste attributes.

Californian consumer knowledge of Māori culture and enterprise

The report presents participants' knowledge of Māori culture and associations with Māori enterprise. Participants showed a moderate awareness of Māori culture (16 per cent 'I know a lot about Māori culture', 35 per cent 'I know a few things about Māori culture'), most highly associating wine produced from a Māori enterprise with the attributes 'care of traditional cultures' (62 per cent strong association/moderate association), 'local knowledge' (62 per cent strong association/moderate association) and 'natural' (61 per cent strong association/ moderate association).

California consumer attitudes to Sauvignon Blanc production practices

Participants indicated their perceptions, knowledge and preferences regarding wine consumption and production. Respondents mostly agreed that 'the environmental impact of wine production is well managed', 'sustainable wine labelling certification is a guarantee of high product quality'; and 'I would like to have information about sustainably produced wine'.

Most respondents also agreed that 'I am worried about the long term effects of pesticides and additives in conventional modern production'; and 'the quality of wine is directly related to production practices used'.

Californian consumer sustainability label awareness

The most frequently seen sustainability labels on wine are also identified, with USDA Organic being the most common (47 per cent) followed by Napa Green Certified (38%) and importantly, SWNZ was the fifth most commonly seen label on wine (12 per cent).

The number of participants who had purchased wine with these labels mirrored this, with USDA Organic being the most purchased (8 per cent always, 12 per cent often), and SWNZ was the fifth most purchased (3 per cent always, 4 per cent often). Participants also indicated their perceived associations with the SWNZ label, with the most common associations including 'sustainability' (29 per cent strong association, 29 per cent moderate association), 'high quality' (27 per cent strong association, 28 per cent moderate association) and 'natural' (27 per cent strong association, 29 per cent moderate association).

Californian consumer WTP for selected Sauvignon Blanc attributes

The results of the Choice Experiment show that respondents are willing to pay on average the highest premium for wine produced from the USA ($9.10/750ml bottle), followed closely by NZ wine ($8.99). These are the highest average premiums estimated over the set of attributes considered and reflect the established recognition of country-of-origin as an important signal of quality. These values are closely followed by the premium that a good critic score can attract, $8.20 on average for a score of 90 points). In terms of production attributes, the highest premiums were found for organic production methods. Respondents were willing to pay on average $6.15 more for a wine produced with 100 per cent organic inputs, and slightly less for wine made with organic grapes but with some non-organic inputs ($5.04). Looking at the attributes that reflect the components of the Sustainable Wine New Zealand programme, results indicate that the most preferred outcome is pest and disease management which attracts an average premium of $4.07 per bottle, and the least is biodiversity management (average WTP $1.84/bottle).

Compared to the average price of a bottle of Sauvignon Blanc in the standard Californian retail market, respondents were willing to pay on average, a 46 per cent premium for USA produced wine, followed by 45 per cent more for NZ, and then 22 per cent more for French wine. The results also show that Californian wine consumers were willing to pay 31 per cent more for 100 per cent organic production, followed by 25 per cent more for made with organic grapes, and then 20 per cent more for pest & disease management.

Californian consumer's use of digital media and technology for Sauvignon Blanc information searching and purchasing

Respondents indicated significant use of both mobile devices and home computers for wine selection inspiration or wine production information, with home computer use slightly higher than mobile devices. Overall, the top digital media sources used for wine selection and product information were Google search, YouTube, Wikipedia and online retailers. Participants indicated that multiple sources of information influenced their wine selection inspiration and production information seeking, most prominently celebrity chefs most influenced wine inspiration while health professionals were more influential for production information.

The research also reported on participants' use of mobile devices in relation to wine. Participants stated that they used their mobile devices most frequently at home for both wine selection inspiration and production information. Following this, participants gave their use of a number of smartphone-interactive technologies (barcodes, QR codes, RFID/NFC) in relation to finding information about and purchasing wine, with participants most frequently using barcodes for both information searching and purchasing. All technologies were used more frequently for information searching than for purchasing. Participants said their top reasons for using mobile apps in relation to wine information gathering and purchasing, were to access product reviews and obtaining discounts/coupons. Specific apps that were used most frequently included Yelp (30 per cent), UberEats (20 per cent) and retailer apps (15 per cent).

Participants reported their wine expenditure across different retail channels when shopping for wine. The highest average expenditure across the sample was for grocery stores (29 per cent) followed by wine/liquor stores (15 per cent) and restaurants or similar (12 per cent). Average expenditure for online retailers was 7 per cent.

Sauvignon Blanc was the most frequently purchased wine online from any country of origin (22 per cent often/sometimes), followed by Chardonnay/Cabernet Sauvignon and Merlot (21 per cent often/sometimes, each). Sauvignon Blanc was also the most frequently purchased wine online from NZ. The main reasons for shopping online for wine were 'I like the convenience of having products delivered to my home' (21 per cent), 'there is a greater variety of products' (18 per cent), 'I have access to special offers and promotions' (16 per cent)'and that 'prices are generally lower' (11 per cent).

Participants indicated that wine/liquor stores and specialty stores were their main online retailers used for wine shopping. Participants indicated most of their online wine purchases occurred at home on a desktop/laptop (39 per cent), and about one in four participants made wine purchases in store on a mobile device.

Participants indicated their levels of trust in sources of wine information and wine purchasing. For wine information, product packaging/labelling was the most trusted source of information (86 per cent high trust/moderate trust). A small number of participants stated their reasons for a low level trust in generic mobile apps/branded mobile apps, product packaging/labelling, online costumer reviews, and/or online social community in relation to wine information searching. In terms of low trust for generic mobile apps/branded mobile apps, the most commonly stated reasons included 'I do not trust the provider of the information'; 'I have privacy concerns regarding the technology'. In terms of low trust for the other sources, the most commonly stated reasons was 'I do not trust the provider of the information'.

For wine purchasing, the use of personal computers was the most trusted technology among a selection of seven (personal computer, online shopping, mobile device, barcodes/QR codes, branded mobile apps, RFID/NFC technology, and generic mobile apps). A small number of participants indicated their reasons for a low level trust. Overall, the top three commonly stated reasons were 'I do not trust the information provided'; 'I am not familiar with the technology involved'; and 'I have privacy concerns regarding the technology involved'.

Finally, participants indicated their most common source of awareness of new wine products, with 'in-store (from where I currently do wine shopping)' and 'word-of-mouth' being the most common sources (51 per cent and 44 per cent respectively).

What may be of concern to marketers is the observation that while respondents are aware of NZ as a wine country of origin, they are much less so of the SWNZ label. And that what respondents associate mostly with the label are which elements are directly observable, and may lack a deeper understanding of the pillars of sustainability inherent in the SWNZ programme.

While the findings reported here are helpful in describing the overall characteristics of the average Californian Sauvignon Blanc consumer, greater depth of understanding will be possible with further analysis of responses to allow better scrutiny across potential segments of the market. Possible consumer segments include high vs. low consumption, high vs. low expenditure, online purchasers, NZ wine purchasers, and high digital and technology engagement amongst others.

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Appendix 1
Demographics

Figure A.1. Gender

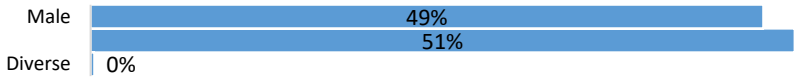


Figure A.2. Age

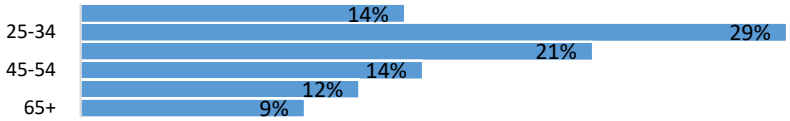


Figure A.3. Type of area

Figure A.4. Household make-up

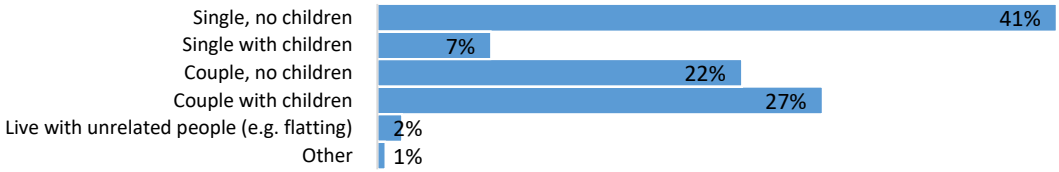


Figure A.5. Highest level of education

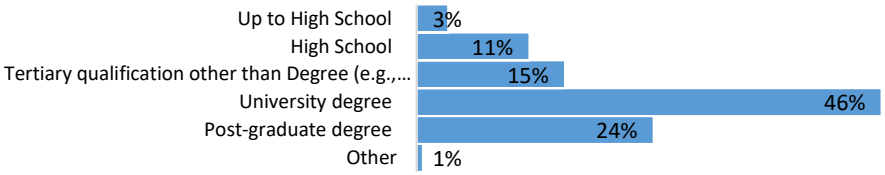
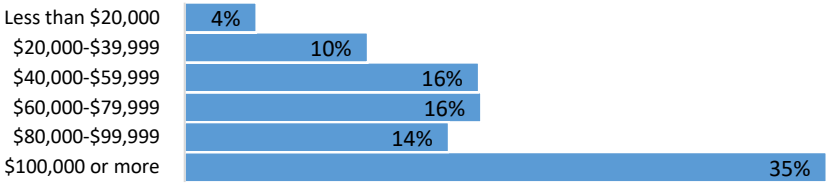


Figure A.6. Gross annual household income (US$)



Appendix 2
Statistical Method

This appendix provides technical details of statistical analysis of choice data. The appendix includes a brief description of the theoretical foundations of choice analysis followed by statistical probability estimation approaches, focusing on contemporary models applied in this report. Lastly, the method used in generating monetary estimates is described.

B.1 Conceptual Framework

In Choice Experiments (CEs), researchers are interested of what influences, on average, the survey respondents' decisions to choose one alternative over others. These influences are driven by people's preferences towards the attributes but also the individual circumstances such as their demographics or perceptions of the choice task (e.g., the level of difficulty or understanding) (Hensher et al. 2015).

Each alternative in a choice set is described by attributes that differ in their levels, both across the alternatives and across the choice sets. The levels can be measured either qualitatively (e.g., poor and good) or quantitatively (e.g., kilometres). This concept is based on the characteristics theory of value (Lancaster 1966) stating that these attributes, when combined, provide people a level of utility[1] *U* hence providing a starting point for measuring preferences in CE (Hanley et al. 2013; Hensher et al. 2015). The alternative chosen, by assumption, is the one that maximises people's utility[2] providing the behavioural rule underlying choice analysis:

$$U_j > U_i \qquad (0.1)$$

where the individual *n* chooses the alternative *j* if this provides higher utility than alternative *i*. A cornerstone of this framework is Random Utility Theory, dated back to early research on choice making (e.g., Thurstone 1927) and related probability estimation. This theory postulates that utility can be decomposed into systematic (explainable or observed) utility *V* and a stochastic (unobserved) utility ε (Hensher et al. 2015; Lancsar and Savage 2004).

$$U_{nj} = V_{nj} + \varepsilon_{nj} \qquad (0.2)$$

where *j* belongs to a set of J alternatives. The importance of this decomposition is the concept of utility only partly being observable to the researcher, and remaining unobserved sources of utility can be treated as random (Hensher et al. 2015). The observed component includes information of the attributes as a linear function of them and their preference weights (coefficient estimates).

$$V_{nsj} = \sum_{k=1}^{K} \beta_k x_{nsjk} \qquad (0.3)$$

with *k* attributes in vector x for a choice set s. Essentially, the estimated parameter β shows "the effect on utility of a change in the level of each attribute" (Hanley et al. 2013, p. 65). This change can be specified as linear across the attribute levels, or as non-linear using either dummy coding or effect coding approaches. The latter coding approach has a benefit of not confounding with an alternative specific constant (ASC) when included in the model (Hensher et al. 2015).

[1]Related terminology used in psychology discipline is *the level of satisfaction* (Hensher et al. 2015).
[2]In choice analysis, utility is considered as *ordinal utility* where the relative values of utility are measured (Hensher et al. 2015).

B.2 Statistical Modelling of Choice Probabilities

The statistical analysis aims to explain as much as possible of the observed utility using the data obtained from the CE and other relevant survey data. In order to do so, the behavioural rule (eq. 1.1) and the utility function (eq. 1.2) are combined (Hensher et al. 2015; Lancsar and Savage 2004) to estimate the probability of selecting an alternative *j*:

$$\Pr_{nsj} = \Pr\left(U_{nsj} > U_{nsi}\right) = \Pr\left(V_{nsj} + \varepsilon_{nsj} > V_{nsi} + \varepsilon_{nsi}\right) = \Pr\left(\varepsilon_{nsi} - \varepsilon_{nsj} < V_{nsj} - V_{nsi}\right) \forall j \neq i \qquad (0.4)$$

where the probability of selecting alternative *j* states that differences in the random part of utility are smaller than differences in the observed part. A standard approach to estimate this probability is a conditional logit, or multinomial logit (MNL) model (McFadden 1974). This model can be derived from the above equations (1.2 and 1.3) by assuming that the unobserved component is independently and identically distributed (IID) following the Extreme Value type 1 distribution (see e.g. Hensher et al. 2015; Train, 2003). Although the MNL model provides a "workhorse" approach in CE, it includes a range of major limitations (see e.g. Fiebig et al. 2010; Greene and Hensher 2007; Hensher et al. 2015):

- Restrictive assumption of the IID error components
- Systematic, or homogenous, preferences allowing no heterogeneity across the sample
- Restrictive substitution patterns, namely the existence of independence of irrelevant alternatives property where introduction (or reduction) of a new alternative would not impact on the relativity of the other alternatives
- The fixed scale parameter obscures potential source of variation

Some or all of these assumptions are often not realised in collected data. These restrictive limitations can be relaxed in contemporary choice models. In particular, the random parameter logit (RPL) model (aka, the mixed logit model) has emerged in empirical application allowing preference estimates to vary across respondents (Fiebig, et al. 2010; Hensher et al. 2015; Revelt and Train, 1998). This is done by specifying a known distribution of variation to be parameter means. The RPL model probability of choosing alternative *j* can be written as:

$$\Pr_{nsj} = \frac{\exp(\beta_n' x_{nsj})}{\sum_J \exp(\beta_n' x_{nsj})} \qquad (0.5)$$

where, in the basic specification, $\beta_n = \beta + \eta_n$ with η being a specific variation around the mean for *k* attributes in vector *x* (Fiebig, et al. 2010; Hensher et al. 2015). Typical distributional assumptions for the random parameters include normal, triangular and lognormal distributions, amongst others. The normal distribution captures both positive and negative preferences (i.e., *utility* and *disutility*) (Revelt and Train, 1998). The lognormal function can be used in cases where the researcher wants to ensure the parameter has a certain sign (positive or negative), a disadvantage is the resultant long tail of estimate distributions (Hensher et al. 2015). The triangular distribution provides an alternative functional form, where the spread can be constrained (i.e., the mean parameter is free whereas spread is fixed equal to mean) to ensure behaviourally plausible signs in estimation (Hensher et al. 2015). Further specifications used in modelling include parameters associated with individual specific characteristics (e.g, income) that can influence the heterogeneity around the mean, or allowing correlation across the random parameters. The heterogeneity in mean, for example, captures whether individual specific characteristics influence the location of an observation on the random distribution (Hensher et al. 2015). In this study, the frequency of visits to rivers, streams and lakes was used to explain such variance.

Another way to write this probability function (in eq. 1.4) (Hensher et al. 2015) involves an integral of the estimated likelihood over the population:

$$L_{njs} = \int_{\beta} \Pr_{nsj}(\beta) f(\beta|\theta) d\beta \qquad (0.6)$$

In this specification, the parameter θ is now the probability density function conditional to the distributional assumption of β. As this integral has no closed form solution, the approximation of the probabilities requires a simulation process (Hensher et al. 2015; Train, 2003). In this process for data *X*, *R* number of draws are taken from the random distributions (i.e. the assumption made by the researcher) followed by averaging probabilities from these draws; furthermore these simulated draws are used to compute the expected likelihood functions:

$$L_{nsj} = E(\Pr_{nsj}) \approx \frac{1}{R} \sum_{R} f(\beta^{(r)}|X) \qquad (0.7)$$

where the $E(\Pr_{nsj})$ is maximised through Maximum Likelihood Estimation. This specification (in eq. 1.6) can be found in Hensher et al. (2015). In practice, a popular simulation method is the Halton sequence which is considered a systematic method to draw parameters from distributions compared to for example, pseudo-random type approaches (Hensher et al. 2015).

B.3 Econometric Extensions

Common variations of the RPL model include specification of an additional error component (EC) in the unobserved part of the model. This EC extension captures the unobserved variance that is alternative-specific (Greene and Hensher 2007) hence relating to substitution patterns between the alternatives (Hensher et al. 2015). Empirically, one way to explain significant EC in a model is SQ-bias depicted in the stochastic part of utility if the EC is defined to capture correlation between the non-SQ alternatives (Scarpa et al., 2005).

Another extension which has gained increasing attention in recent CE literature, is the Generalized Mixed Logit (GMXL) model (Czajkowski et al. 2014; Hensher et al. 2015; Juutinen et al. 2012; Kragt 2013; Phillips 2014). This model aims to capture remaining unobserved components in utility as a source of choice variability by allowing estimation of the scale heterogeneity alongside the preference heterogeneity (Fiebig et al. 2010; Hensher et al. 2015). This scale parameter is (inversely) related to the error variance, and in convenient applications such as MNL or RPL, this is normalised to one to allow identification (Fiebig et al. 2010; Louviere and Eagle 2006). However, it is possible that the level of error variance differs between or within individuals, due to reasons such as behavioural outcomes, individual characteristics or contextual factors (Louviere and Eagle 2006).

Recent GMXL application builds on model specifications presented in Fiebig et al. (2010), stating that β_n (in eq. 1.4) becomes:

$$\beta_n = \sigma_n \beta + \gamma \eta_n + (1-\gamma)\sigma_n \eta_n \qquad (0.8)$$

where σ is the scale factor (typically = 1) and $\gamma \in \{0,1\}$ is a weighting parameter indicating variance in the residual component. In the case the scale factor equals 1, this reduces to the RPL model. The importance of the weighting parameter is the impact on the scaling effect on the overall utility function (population means) versus the individual preference weights (individual means): when γ parameter approaches zero the scale heterogeneity affects both means, whereas when this approaches one the scale heterogeneity affects only the population means (Hensher et al. 2015; Juutinen et al. 2015). Interpretation of these parameters includes

- If γ is close to zero, and statistically significant, this supports the model specification with the variance of residual taste heterogeneity increases with scale (Juutinen et al. 2012); and
- If γ is not statistically significant from one, this suggests that the unobserved residual taste heterogeneity is independent of the scale effect, that is the individual-level parameter estimates differ in means but not variances around the mean (Kragt, 2013)

The scale factor specification (eq. 1.7) can also be extended to respondent specific characteristics associated with the unobserved scale heterogeneity (Hensher et al. 2015; Juutinen et al. 2015):

$$\sigma_n = \exp\{\overline{\sigma} + \tau\omega_n\} \qquad (0.9)$$

where $\overline{\sigma}$ *is* the mean parameter in the error variance; and ω is unobserved scale heterogeneity (normally distributed) captured with coefficient τ (Hensher et al. 2015; Juutinen et al. 2015; Kragt, 2013). Juutinen et al. (2012), for example, in context of natural park management found that respondents' education level and the time spent in the park explained the scale heterogeneity ($\tau > 0$, p-value < 0.01). In this study, the respondents indicated levels of choice task understanding and difficulty were used to explain scale heterogeneity.

B.4 Estimation of Monetary Values

Typically the final step of interest in the CE application is the estimation of monetary values of respondent preferences for the attributes considered in utility functions. These are commonly referred to as marginal willingness-to-pay (WTP). WTP estimation is based on the marginal rate of substitution expressed in dollar terms providing a trade-off between some attribute k and the cost involved (Hensher et al. 2015) and is calculated using the ratio of an attribute parameter and the cost parameter. WTP can take into account interaction effects, if statistically significant, such as with the respondent demographics. WTP of attribute *j* by respondent *i* is calculated as the ratio of the estimated model parameters accommodating the influence of the random component (Cicia et al. 2013) as:

$$WTP_i^j = -\left(\frac{\beta_j + \varepsilon_{ij}}{\beta_{price} + \varepsilon_{ip}}\right) \qquad (0.10)$$

The estimated mode parameters can also be used to estimate compensating surplus (CS) as a result of policy or quality change in a combination of attributes, using (Hanemann, 1984):

$$\mathbf{CS} = \frac{-1}{\beta cost}\left[\ln\sum_{j=1}^{J}\exp\left\{V_j^0\right\} - \ln\sum_{j=1}^{J}\exp\left\{V_j^1\right\}\right] \qquad (0.11)$$

which calculates the difference in utilities before the policy or quality change (V_0) and after the policy or quality change (V_1) (Hanley et al. 2013; Lancsar and Savage 2004). Similar to WTP, the monetary estimation of this change is possible by using the estimate for the monetary attribute $\beta_{cost.}$. Lastly, there are some challenges associated with the empirical estimation of the WTP in the RPL based models. One approach is to use a fixed cost, which simplifies the WTP estimation (Daly et al. 2012) but which may not be as behaviourally a plausible consideration as allowing heterogeneous preferences towards the cost attribute (Bliemer and Rose, 2013; Daziano and Achtnicht, 2014). Conceptually, the estimated cost parameter is a proxy for the marginal utility of income for respondents and economic theory suggests individuals will respondent differently to varying income levels. The use of a random cost parameter however, presents complications in deriving population distribution moments from the ratio of two random parameters.

Appendix 3
Questionnaire

WINE ATTRIBUTES SURVEY

Welcome to this survey about consumer preferences for wine attributes.

The survey is an on-line questionnaire that takes about 10 – 15 minutes. You do not have to participate. You have the right to decline to answer any question or stop the survey at any time. If you do stop the survey before the end, the information you have provided will be destroyed.

The Agribusiness and Economics Research Unit at Lincoln University in New Zealand are conducting this survey. Data will be held on a secure server on the University campus. The survey does not collect identifying information, and your responses cannot be linked to you. The survey has been reviewed and approved by the Lincoln University Human Ethics Committee. The lead researcher is Dr Peter Tait, and his manager is Prof Caroline Saunders. If you have any questions or concerns about the research, you may contact them at:

Peter Tait	Caroline Saunders
+64 3 423 0384	+64 3 423 0382
peter.tait@lincoln.ac.nz	caroline.saunders@lincoln.ac.nz

Completion of the survey will be taken as your consent to participate in this research. If you complete the survey, you will not be able to withdraw your information at a later date. If at any time you wish to withdraw from the survey simply close your browser window.

To begin the survey, click the >> button.

Yours sincerely, Dr. Peter Tait

Which state do you live in?

- ❍ Arizona
- ❍ California
- ❍ Nevado
- ❍ Oregon
- ❍ Washington
- ❍ Other, please specify: _____

How often do you purchase **Sauvignon Blanc?**

- ❍ Daily
- ❍ Weekly
- ❍ Fortnightly
- ❍ Monthly
- ❍ Less than once a month
- ❍ Never

How much do you know about the following countries?

	Nothing	A little	A fair amount	A lot
Australia	❍	❍	❍	❍
New Zealand	❍	❍	❍	❍
South Africa	❍	❍	❍	❍
Chile	❍	❍	❍	❍
France	❍	❍	❍	❍
Italy	❍	❍	❍	❍

How often do you consume Sauvignon Blanc?

- ❍ More than once a week
- ❍ About once a week
- ❍ Two to three times a month
- ❍ About once a month
- ❍ A few times a year

How often do you buy Sauvignon Blanc for the following reasons?

	Daily	Weekly	Monthly	Once	Never
For usual personal consumption at home	❍	❍	❍	❍	❍
For a gift	❍	❍	❍	❍	❍
For a celebration	❍	❍	❍	❍	❍
At a restaurant	❍	❍	❍	❍	❍

[Display occasions in Q3 not “never” in Q2]

How much do you usually spend on Sauvignon Blanc?

For usual personal consumption at home

- ❍ $2-3 per bottle
- ❍ $3-5 per bottle
- ❍ $5-8 per bottle
- ❍ $8-10 per bottle
- ❍ $10-15 per bottle
- ❍ $15-20 per bottle
- ❍ $20-25 per bottle
- ❍ Over $25 per bottle

At a restaurant

- ❍ $15-25 per bottle
- ❍ $26-35 per bottle
- ❍ $36-45 per bottle
- ❍ $46-55 per bottle
- ❍ Over $55 per bottle
- ❍ I only buy wine by the glass at restaurants
- ❍ I bring my own and pay corkage
- ❍ I don’t buy wine at restaurants

When buying wine by the glass (same skip logic at “at a restaurant”)

- ❍ Less than $6 per glass
- ❍ $7-10 per glass
- ❍ $11-15 per glass
- ❍ Over $15 per glass
- ❍ I don’t buy wine per glass

For a celebration

- ❍ Under $5 per bottle
- ❍ $5-10 per bottle
- ❍ $10-15 per bottle
- ❍ $15-25 per bottle
- ❍ $26-35 per bottle
- ❍ $36-45 per bottle
- ❍ $46-55 per bottle
- ❍ Over $55 per bottle

Have you seen Sauvignon Blanc being sold with the following country of origin? Please select all that apply.

	Seen	Not seen
Australia	❍	❍
New Zealand	❍	❍
France	❍	❍
USA	❍	❍
Italy	❍	❍
Chile	❍	❍
South Africa	❍	❍

How often have you purchased wine with the following country of origin? Please select all that apply.

	Daily	Weekly	Monthly	Once	Never
Australia	❍	❍	❍	❍	❍
New Zealand	❍	❍	❍	❍	❍
France	❍	❍	❍	❍	❍
USA	❍	❍	❍	❍	❍
Italy	❍	❍	❍	❍	❍
Chile	❍	❍	❍	❍	❍
South Africa	❍	❍	❍	❍	❍

Which countries do you think produce the highest quality Sauvignon Blanc? Please rate the following countries by selecting a rank.

	Australia	New Zealand	France	USA	Italy	Chile	South Africa
1st	❍	❍	❍	❍	❍	❍	❍
2nd	❍	❍	❍	❍	❍	❍	❍
3rd	❍	❍	❍	❍	❍	❍	❍
4th	❍	❍	❍	❍	❍	❍	❍
5th	❍	❍	❍	❍	❍	❍	❍
6th	❍	❍	❍	❍	❍	❍	❍
7th	❍	❍	❍	❍	❍	❍	❍

How familiar are you with the different Sauvignon Blanc producing **regions of New Zealand**?

	I **prefer** wine from this region	I am aware of this region and **have** tried wine produced here	I am aware of this region but have **not** tried wine produced here	I am **not aware** of this region
Hawkes Bay	❍	❍	❍	❍
Martinborough	❍	❍	❍	❍
Marlborough	❍	❍	❍	❍
Wairarapa	❍	❍	❍	❍
Nelson	❍	❍	❍	❍
Canterbury and Waipara Valley	❍	❍	❍	❍
Gisborne	❍	❍	❍	❍

What do you associate with the higher quality Sauvignon Blanc wines? Please select all that apply.

- ☐ Country of origin
- ☐ Reputation of winery
- ☐ Exclusive low volume wines
- ☐ Grapes from a well-known location
- ☐ Ratings of critiques and judges (e.g. Wine Spectator)
- ☐ Reviewed in wine publications
- ☐ Winning medals at competitions
- ☐ Production practices
- ☐ Taste profile

Why did you purchase New Zealand Sauvignon Blanc? Please indicate the importance the following **reasons** have in your choice to purchase **New Zealand Sauvignon Blanc.**

	High importance	Some importance	Neutral	Little importance	No importance	Don't know
Distinctive taste	❍	❍	❍	❍	❍	❍
Higher quality	❍	❍	❍	❍	❍	❍
Value for price	❍	❍	❍	❍	❍	❍
Curiosity to try different products	❍	❍	❍	❍	❍	❍
Reduced environmental impact of production	❍	❍	❍	❍	❍	❍
I prefer New World wines	❍	❍	❍	❍	❍	❍
It is a premium product	❍	❍	❍	❍	❍	❍
High food safety	❍	❍	❍	❍	❍	❍
Social responsibility of production	❍	❍	❍	❍	❍	❍
Traceability to winery	❍	❍	❍	❍	❍	❍
Organic production	❍	❍	❍	❍	❍	❍
Care of traditional cultures	❍	❍	❍	❍	❍	❍
Other, please state	❍	❍	❍	❍	❍	❍

What taste profile do you **associate** with **New Zealand** Sauvignon Blanc?

	Strong association	Moderate association	Little association	No association	Don't know
Crispness	❍	❍	❍	❍	❍
Grassy	❍	❍	❍	❍	❍
Herbaceous	❍	❍	❍	❍	❍
Clean	❍	❍	❍	❍	❍
Refreshing	❍	❍	❍	❍	❍
Clean	❍	❍	❍	❍	❍
Citrus	❍	❍	❍	❍	❍
Light-bodied	❍	❍	❍	❍	❍
Tropical	❍	❍	❍	❍	❍
Fruity	❍	❍	❍	❍	❍
Minerality	❍	❍	❍	❍	❍
Tannic	❍	❍	❍	❍	❍
Dry (less sugar)	❍	❍	❍	❍	❍
Savory (less fruit)	❍	❍	❍	❍	❍
Sweet	❍	❍	❍	❍	❍
Semi-sweet	❍	❍	❍	❍	❍
Smooth	❍	❍	❍	❍	❍
Zesty	❍	❍	❍	❍	❍
Medium-bodied	❍	❍	❍	❍	❍
Other, please state	❍	❍	❍	❍	❍

What does your **ideal** Sauvignon Blanc taste like? Drag and drop as many descriptions as you prefer from the list into the box on the right. Put your most preferred taste characteristic at the top.

Light-bodied	Medium-bodied	Full-bodied	Fruity	Tropical fruits (e.g. pineapple, melon)	Stone fruits (e.g. peach, nectarine)
Citrus fruits (e.g. lemon, orange)	Dry	Balanced acidity	Fresh acidity	High acidity	Elegant
Refreshing	Crisp	Vibrant	Grassy	Complex	Flinty
Minerality	Sharp	Racy	Intense	Pungent	Tangy
Floral	Herbaceous	Concentrated	Clean	Delicate	Creamy
Subtle	Complex	Biscuit	Smokey	Vanilla	Savory
Spicy					

How much do you know about New Zealand's indigenous culture, Māori?

- ❍ I know a lot about Māori culture.
- ❍ I know a few things about Māori culture.
- ❍ I have heard of them.
- ❍ I have never heard of them.

What would you associate with wine produced from a Māori enterprise?

	Strong association	Moderate association	Little association	No association	Don't know
Reduced environmental impact	❍	❍	❍	❍	❍
Social responsibility	❍	❍	❍	❍	❍
High quality	❍	❍	❍	❍	❍
Collective ownership	❍	❍	❍	❍	❍
Spirituality	❍	❍	❍	❍	❍
Stewardship of land	❍	❍	❍	❍	❍
Distribution of profits into community	❍	❍	❍	❍	❍
Sustainability	❍	❍	❍	❍	❍
Local knowledge	❍	❍	❍	❍	❍
Guardianship	❍	❍	❍	❍	❍
Artisanal style	❍	❍	❍	❍	❍
Care of traditional cultures	❍	❍	❍	❍	❍
Traditional	❍	❍	❍	❍	❍
Fair trade	❍	❍	❍	❍	❍
Natural	❍	❍	❍	❍	❍
Other, please state	❍	❍	❍	❍	❍

If Sauvignon Blanc was not available, what would be your **first alternative** white wine variety option?

- ❍ Pinot Grigio/Pinot Gris
- ❍ Riesling
- ❍ Chardonnay
- ❍ Gewürztraminer
- ❍ Pinot Blanc
- ❍ Muller-Thurgau
- ❍ Chenin Blanc
- ❍ Semillon
- ❍ Chenin Blanc
- ❍ Viognier
- ❍ Other, please state

Please indicate your level of agreement with the following statements:

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I know very little about wine	❍	❍	❍	❍	❍
I know the basics about wine	❍	❍	❍	❍	❍
I feel competent in my knowledge about wine	❍	❍	❍	❍	❍
I consider myself to know more about wine than most people	❍	❍	❍	❍	❍
I have extensive knowledge of wine	❍	❍	❍	❍	❍
I read the information that is on the label	❍	❍	❍	❍	❍
I visit wineries in the production areas	❍	❍	❍	❍	❍
I read the information about wines published in the press	❍	❍	❍	❍	❍
I attend wine tasting courses	❍	❍	❍	❍	❍
I read wine journals	❍	❍	❍	❍	❍
I regularly receive wine information sheets or catalogues	❍	❍	❍	❍	❍
I look up information on Internet wine sites	❍	❍	❍	❍	❍

Please indicate your level of agreement with the following statements:

	Agree	Partly agree	Neutral	Partly disagree	Disagree
Wine production is an important sector in the economy	❍	❍	❍	❍	❍
I prefer to buy organic wines if possible	❍	❍	❍	❍	❍
I prefer to buy biodynamic wines if possible	❍	❍	❍	❍	❍
I would like to have more information about sustainably produced wines	❍	❍	❍	❍	❍
The environmental impact of wine production is well managed	❍	❍	❍	❍	❍
Wine production has low human health impacts	❍	❍	❍	❍	❍
The quality of USA wine is better than the quality of comparable foreign wine	❍	❍	❍	❍	❍
It is very important to me to know where the wine I buy is produced	❍	❍	❍	❍	❍
Sustainable wine labelling certification is a guarantee of high product quality	❍	❍	❍	❍	❍
I am worried about the long term effects of pesticides and additives in conventional modern wine production	❍	❍	❍	❍	❍
I feel that purchasing sustainable products helps protect the environment	❍	❍	❍	❍	❍
The quality of a wine is directly related to the production practices used	❍	❍	❍	❍	❍
I could be interested in buying a bottle of wine with a sustainable label (showing environmental, economic and social aspects)	❍	❍	❍	❍	❍

Have you **seen** Sauvignon Blanc with the following **labels**?

	Seen	Not seen		Seen	Not seen
LIVE CERTIFIED SUSTAINABLE	❍	❍	Sustainable Australia Winegrowing McLaren Vale	❍	❍
California Certified Sustainable	❍	❍	Integrity & Sustainability Certified Wine and Spirit Board 4477 796701	❍	❍
Certified Sustainable Wine of Chile	❍	❍	Salmon Safe	❍	❍
New Zealand Sustainable Winegrowing	❍	❍	Napa Green Certified Winery	❍	❍
Oregon Certified Sustainable Wine	❍	❍	USDA Organic	❍	❍
Lodi Rules Certified Green	❍	❍	Demeter Certified Biodynamic	❍	❍
SIP Certified Sustainability in Practice	❍	❍	Biodyvin	❍	❍
Environmental Management System ISO 14001	❍	❍			

[Display if "seen" in previous question.] How often do you **purchase** Sauvignon Blanc with the following labels?					
	Always	**Often**	**Sometimes**	**Rarely**	**Never**
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍

	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
	❍	❍	❍	❍	❍
 BIODYVIN	❍	❍	❍	❍	❍

[Display if "seen" in previous question.]

What do you associate with Sustainable Winegrowing New Zealand?

	Strong association	Moderate association	Little association	No association	Don't know
Reduced environmental impact	❍	❍	❍	❍	❍
Social responsibility	❍	❍	❍	❍	❍
High quality	❍	❍	❍	❍	❍
Collective ownership	❍	❍	❍	❍	❍
New World wines	❍	❍	❍	❍	❍
Biodiversity enhancement	❍	❍	❍	❍	❍
Minimisation of Greenhouse gases	❍	❍	❍	❍	❍
Sustainability	❍	❍	❍	❍	❍
Local knowledge	❍	❍	❍	❍	❍
Water use efficiency	❍	❍	❍	❍	❍
ISO Standards	❍	❍	❍	❍	❍
Artisanal style	❍	❍	❍	❍	❍
Integrated pest management	❍	❍	❍	❍	❍
Care of traditional cultures	❍	❍	❍	❍	❍
Reduction of by-products	❍	❍	❍	❍	❍
Organic	❍	❍	❍	❍	❍
Fair trade	❍	❍	❍	❍	❍
Natural	❍	❍	❍	❍	❍
Other, please state	❍	❍	❍	❍	❍

Comparing wines

In the next set of questions, please imagine you are purchasing a bottle of Sauvignon Blanc from your usual liquor store or supermarket etc. for **usual personal consumption at home**.

AND [SPILT SAMPLE TEST OF PURCHASE OCCASION]

In the next set of questions, please imagine you are purchasing a bottle of Sauvignon Blanc from your usual liquor store or supermarket etc. **for a special occasion with family or friends**.

You will be shown a series of Sauvignon Blanc choice sets, each displaying three different wines.

Each wine is labelled with information describing how the wine was produced and the price per bottle. The wines differ based on the information presented otherwise they are the same. All products presented are 750ml, contain the same alcohol level, and meet all relevant U.S. government certification standards.

Wine attributes for you to consider in the next questions	
Biodiversity Management Certification	The winery or grower has been set aside area for biodiversity restoration or enhancement on the same property as the vineyard, or off site.
Water Management Certification	Monitoring, measurement and limitation of water resources is undertaken.
By-product Management Certification	Production by-products are diverted from landfill and turned to beneficial use.
Energy Management Certification	Monitoring, measurement and limitation of energy resources is undertaken.
Pest & Disease Management Certification	Integrated control strategies used to optimise control and fruit quality and prioritise minimisation of the impact on the receiving environment.
Organic Production Certification	100% Organic: Both growing and processing are Organic. No GMOs. No added sulfites. No synthetic fertilisers or agrichemicals.
	Made with Organic grapes: Grapes are Organic but some ingredients are not. Sulfites may be added. No GMOs. No synthetic fertilisers or agrichemicals in grape growing.
Social Responsibility Certification	Collective community ownership of vineyards and wineries can enhance social responsibility. Socially responsible vineyards and wineries actively include public interest into decision making.
GHG Management Certification	Monitoring, measurement and limitation of GHG emissions is undertaken.
Flavour style	Light, Medium or Full bodied
Critic rating	Recent score out of 100, from a well-known critic. A wine score is a simple way for a wine critic to communicate their opinion about the quality of a wine.
Country of Origin	Country where the wine is made.
Price	Price for a 750ml bottle of Sauvignon Blanc.

For each question, please choose which wine you would most likely purchase. This includes keeping in mind how the price of a selected wine would fit in your usual grocery budget.

Please click the >> button to continue.

CHOICE EXPERIMENT

[Choice experiment here]

In the previous choice sets which, if any, of the wine attributes did you ignore when making your choices?

- ☐ I used all the available information and didn't intentionally ignore any product attributes.

  OR

  Please select all the product attributes that you didn't consider at all when making your choices:

- ☐ Social responsibility
- ☐ Biodiversity
- ☐ Greenhouse gases
- ☐ Organic
- ☐ By-products
- ☐ Water
- ☐ Country of origin
- ☐ Energy
- ☐ Critic score
- ☐ Flavor style
- ☐ Pest & disease
- ☐ Price

In the previous choice sets, it was easy to **understand** how I should provide my choices.

- ❍ Agree
- ❍ Partly agree
- ❍ Neutral (neither agree nor disagree)
- ❍ Partly disagree
- ❍ Disagree

In the previous choice sets, I was able to **express what was important for me** regarding wine labelling.

- ❍ Agree
- ❍ Partly agree
- ❍ Neutral (neither agree nor disagree)
- ❍ Partly disagree
- ❍ Disagree

In the previous choice sets, I **understood the meaning** of the labelling alternatives.

- ❍ Agree
- ❍ Partly agree
- ❍ Neutral (neither agree nor disagree)
- ❍ Partly disagree
- ❍ Disagree

In the previous choice sets, how did you find **expressing which type of wine labelling information** was important to you?

- ❍ Very easy
- ❍ Fairly easy
- ❍ Neither easy nor difficult
- ❍ A little difficult
- ❍ Very difficult

In the previous choice sets, did you chose the "**none of these**" option in most of all of the choice sets?

- ❍ Yes
- ❍ No

Please indicate the main reason for doing so:

- ❍ I can't afford to pay more for my wine shopping
- ❍ I don't want to pay more for any of these claims
- ❍ I don't trust these product claims
- ❍ Not enough information was provided
- ❍ I don't think the other alternatives were realistic
- ❍ I would not buy any of the given alternatives
- ❍ While I do prefer some of the product attributes presented, none of the given products represented my preferences
- ❍ Other reason, please specify: _____

The next set of questions are about the use of technology for wine shopping.

How often do you access the Internet using the following devices?

	Daily	Weekly	Monthly	Less than monthly	Never
Mobile device, e.g. smartphone	❍	❍	❍	❍	❍
Home computer, e.g. desktop/laptop	❍	❍	❍	❍	❍

Do you use any of the following to search for **wine selection inspiration** or to find out **how a wine is produced?** Please select all that apply.

	INSPIRATION		HOW PRODUCED	
	Mobile Device	**Home Computer**	**Mobile Device**	**Home Computer**
Twitter	☐	☐	☐	☐
Pinterest	☐	☐	☐	☐
Instagram	☐	☐	☐	☐
Facebook	☐	☐	☐	☐
YouTube	☐	☐	☐	☐
Reddit	☐	☐	☐	☐
Food company web pages	☐	☐	☐	☐
Food blogs	☐	☐	☐	☐
Wikipedia	☐	☐	☐	☐
Forums	☐	☐	☐	☐
Google search	☐	☐	☐	☐
Online retailer	☐	☐	☐	☐

When searching for **wine selection inspiration** or **how a wine is produced**, are you influenced by any of the following? Please select all that apply.

	Inspiration	How Produced
Celebrity chefs	☐	☐
Sports celebrities	☐	☐
Other celebrities	☐	☐
Health professionals	☐	☐
Government information	☐	☐
Industry marketing boards	☐	☐
Non-government organisations (e.g. Greenpeace)	☐	☐
International bodies (e.g. World Health Organisation)	☐	☐

When **using your mobile device** to search for inspiration or product information about wine, where do you usually do this?

	Usually	Often	Sometimes	Never
At home	❍	❍	❍	❍
In-store	❍	❍	❍	❍
Out of home, but not in-store	❍	❍	❍	❍
At work	❍	❍	❍	❍

Have you ever used any of the following technologies in conjunction with your **smartphone** to search for wine-related **information** and/or make wine **purchases**?

	Information search			To purchase products		
	Often	Sometimes	Never	Often	Sometimes	Never
Barcodes	❍	❍	❍	❍	❍	❍
QR codes	❍	❍	❍	❍	❍	❍
RFID/NFC	❍	❍	❍	❍	❍	❍

Do you currently, or would you be interested in, **using mobile apps** for **wine** for the following reasons?

	Currently use	Interested in using	Don't use and not interested in using
Health (general)	❍	❍	❍
Dietary information	❍	❍	❍
Sustainability information	❍	❍	❍
Environmental information	❍	❍	❍
Budgeting	❍	❍	❍
Purchasing	❍	❍	❍
Nearest stockist location	❍	❍	❍
Product reviews	❍	❍	❍
Traceability	❍	❍	❍
Loyalty/rewards programmes	❍	❍	❍
Discounts/coupons	❍	❍	❍
Product delivery	❍	❍	❍
Vineyard search	❍	❍	❍
Other, please state	❍	❍	❍

Do you currently use any of the following apps on your mobile device? Please select all that apply.

	Yes
Yelp	☐
UberEats	☐
Fork It by KitchenBowl	☐
BigOven	☐
Food Network In The Kitchen	☐
Foodgawker	☐
Allrecipes	☐
Delectable	☐
Vivinio	☐
Winesearcher	☐
Hello Vino	☐
Drizly	☐
CorkageFee	☐
Winery Passport	☐
Cellar Tracker	☐
Retailer app(s) (such as Walmart, Costco)	☐
Other wine app, please state	☐

What percentage of your usual **food and beverages** purchases are made at the following retailers:

[sum of slider constrained to = 100% of total food and beverage purchases]

_____ Chain supermarkets
_____ Speciality stores
_____ Farmers' markets
_____ Restaurant or similar
_____ Subscription box
_____ Direct from producer
_____ Wholesale supplier
_____ Food co-op
_____ Convenience stores
_____ Online
_____ Other, please state:

What percentage of your usual **wine** purchases are made at the following retailers:

[sum of slider constrained to = 100% of total food and beverage purchases]

_____ Grocery store
_____ Specialty store
_____ Drug store
_____ Online
_____ Restaurant or similar
_____ Wholesale/discount store
_____ Winery tasting room
_____ Convenience store
_____ Wine/liquor store
_____ Other, please state

What kinds of wine do you **buy online**? Please select all that apply.

	Any country of origin			NZ produced wine		
	Often	Sometimes	Never	Often	Sometimes	Never
Sauvignon Blanc	❍	❍	❍	❍	❍	❍
Chardonnay	❍	❍	❍	❍	❍	❍
Pinot Gris	❍	❍	❍	❍	❍	❍
Riesling	❍	❍	❍	❍	❍	❍
Gewürztraminer	❍	❍	❍	❍	❍	❍
Sparkling	❍	❍	❍	❍	❍	❍
Pinot Noir	❍	❍	❍	❍	❍	❍
Merlot	❍	❍	❍	❍	❍	❍
Cabernet Sauvignon	❍	❍	❍	❍	❍	❍
Syrah	❍	❍	❍	❍	❍	❍
All/multiple types	❍	❍	❍	❍	❍	❍
Other, please state	❍	❍	❍	❍	❍	❍

What is your **main reason** for shopping online for wine?

❍ Prices are generally lower.
❍ I have access to special offers and promotions.
❍ Products are generally higher quality.
❍ There is a greater variety of products available.
❍ I like the convenience of having products delivered to my home.
❍ I like being able to order products from overseas that are better or not available domestically.
❍ I like being able to avoid having to go into the store.
❍ Other, please state: _____

When making wine purchases online, which of the following do you use? Please select all that apply.

	Often	Sometimes	Never
Wholesale/discount suppliers	❍	❍	❍
Direct from producer	❍	❍	❍
Chain supermarkets	❍	❍	❍
Wine/liquor store	❍	❍	❍
Specialty stores	❍	❍	❍
Organic stores	❍	❍	❍
Amazon	❍	❍	❍
Only suppliers that I know and trust	❍	❍	❍
Only retailers that I've used before	❍	❍	❍
Other, please state	❍	❍	❍

When making wine purchases online, which device(s) do you use and where? Please select all that apply.

	Mobile Device			Desktop/Laptop		
	Often	**Sometimes**	**Never**	**Often**	**Sometimes**	**Never**
At home	❍	❍	❍	❍	❍	❍
At work	❍	❍	❍	❍	❍	❍
In store	❍	❍	❍	❍	❍	❍
Out of home (but not in store)	❍	❍	❍	❍	❍	❍

When looking for **information regarding wine**, what level of **trust** do you have in the following:

	High	**Medium**	**Low**
Generic mobile apps	❍	❍	❍
Branded mobile apps	❍	❍	❍
Online social community (e.g. vegetarian group)	❍	❍	❍
Online customer reviews	❍	❍	❍
Product packaging/labelling	❍	❍	❍

Why do you not trust **generic mobile apps / branded mobile apps** for wine information searching? Please select all that apply.

- ☐ I do not trust the provider of the information.
- ☐ I have privacy concerns regarding the technology involved.
- ☐ I do not know how to use the technology.
- ☐ I did not understand the information provided.
- ☐ Security concerns
- ☐ Other, please state: _____

Why do you not trust **online social communities / online customer reviews / product packaging/labelling** for wine information searching? Please select all that apply.

- ☐ I do not trust the provider of the information.
- ☐ I have privacy concerns regarding the technology involved.
- ☐ I do not know how to use the technology.
- ☐ I did not understand the information provided.
- ☐ Other, please state: _____

When **purchasing wine**, what level of **trust** do you have in the following:

	High	Medium	Low
Mobile device (e.g. smartphone)	❍	❍	❍
Personal computer (e.g. desktop/laptop)	❍	❍	❍
Online shopping	❍	❍	❍
Generic mobile apps	❍	❍	❍
Branded mobile apps	❍	❍	❍
Barcodes/QR codes	❍	❍	❍
RFID/NFC technology	❍	❍	❍

Why do you not trust **mobile devices / personal computers / online shopping / generic mobile apps / branded mobile apps / barcodes/QR codes / RFID/NFC** for wine purchasing? Please select all that apply.

- ☐ I do not trust the technology involved.
- ☐ I have privacy concerns regarding the technology involved.
- ☐ I do not know how to use this technology.
- ☐ This technology is not available in my locality.
- ☐ I am not familiar with the technology involved.
- ☐ I do not trust the information provided.
- ☐ Other, please state: _____

How do you usually find out or become aware of new wine? Please select all that apply.

- ☐ In-store (from where I currently do most of my food product shopping)
- ☐ Online (from where I currently do most of my food product shopping)
- ☐ Word-of-mouth
- ☐ Online advertising (websites)
- ☐ Social media
- ☐ Blogs
- ☐ Print media (newspapers, magazines, direct mail)
- ☐ Broadcast media (radio, cable TV, broadcast TV)
- ☐ Other advertising
- ☐ Can’t recall
- ☐ Other, please state: _____

Demographics

The following questions will help us to compare our survey with the general population. Please remember that this is an anonymous survey, and that you cannot be identified from any information you provide.

Which of these cities do you live in, or closest to? Please select one option.

- ❍ Bakersfield
- ❍ Chico
- ❍ El Centro
- ❍ Fresno
- ❍ Hanford
- ❍ Los Angeles
- ❍ Madera
- ❍ Merced
- ❍ Modesto
- ❍ Napa
- ❍ Oxnard
- ❍ Redding
- ❍ Riverside
- ❍ Sacramento
- ❍ Salinas
- ❍ San Diego
- ❍ San Francisco
- ❍ San Jose
- ❍ San Luis Obispo
- ❍ Santa Cruz
- ❍ Santa Barbara
- ❍ Santa Rosa
- ❍ Stockton
- ❍ Vallejo
- ❍ Visalia
- ❍ Yuba City

Gender:

- ❍ Male
- ❍ Female
- ❍ Diverse

Age:

- ❍ 21-24
- ❍ 25-34
- ❍ 35-44
- ❍ 45-54
- ❍ 55-64
- ❍ 65+

What type of area do you live in?

- ❍ Urban
- ❍ Suburban
- ❍ Rural

Please indicate which of the following best describes your household make-up:

- ❍ Single, no children
- ❍ Single with children
- ❍ Couple, no children
- ❍ Couple with children
- ❍ Live with unrelated people (e.g. flatting)
- ❍ Other: _____

What is your highest level of education?

- ❍ Up to high school
- ❍ High school
- ❍ Tertiary qualification other than degree (e.g. diploma, vocational, etc)
- ❍ University degree
- ❍ Post-graduate degree
- ❍ Other: _____

Please indicate your total household income before taxes over the past 12 months:

- ❍ Less than $20,000
- ❍ $20,000-$39,999
- ❍ $40,000-$59,999
- ❍ $60,000-$79,999
- ❍ $80,000-$99,999
- ❍ $100,000 or more
- ❍ Prefer not to answer

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