



**Brand perceptions on the adoption of plastic bottles in the  
South African wine industry: a qualitative study**

N Steenkamp

Supervisor: Dr Franci Cronje

Vega School of Brand Leadership, Cape Town Campus

24 October 2015

## **Declaration**

*I hereby declare that the Research Report submitted for the Honours in Strategic Brand Communication degree to The Independent Institute of Education is my own work and has not previously been submitted to another University or Higher Education Institution for degree purposes.*

## **Acknowledgements**

I wish to express my sincere thanks to my supervisor, Dr Franci Cronje for providing expertise and insight that significantly assisted my research. A special thanks to my parents for your constant guidance and always being a fabulous spell checker!

## Abstract

The aim of this research study was to gain a better understanding of the perception of the consumer and the winemaker regarding the concept of the use of polyethylene terephthalate (PET) bottles in the wine industry. Conducting research on this study was considered essential as the consumer and winemaker are struggling to adopt to the PET concept , notwithstanding the fact that PET bottles offers multiple benefits such as being lightweight and being environmentally friendly.

The research for this study was conducted through interviews with winemakers' and surveys completed by consumers with regard to their perceptions regarding the adoption of the PET concept. The most significant results that stood out from this research study were the perception that wine in PET bottles is considered cheap as well as the traditional factor indicating that wine should only be produced in a glass bottle to reflect the quality of the wine. The conclusion of this study is that neither the winemaker nor the consumer is yet ready to adopt to the use of wine in PET bottles.

## Table of Contents

Declaration .....	i
Acknowledgements .....	i
Abstract .....	ii
Chapter 1 .....	1
Background and context of study .....	2
Problem statement .....	3
The main research question and set of three sub-questions .....	3
Objectives of the study .....	3
Purpose statement .....	4
Rationale .....	4
Chapter 2 .....	6
Literature Review .....	7
Chapter 3 .....	14
Research Methodology .....	15
Chapter 4 .....	23
Research Findings .....	24
Chapter 5 .....	33
Conclusions .....	34
References .....	35
Annexures .....	35

# Chapter 1

## Background and context of study

The purpose of this research study is to find the reason for the consumer not adapting to PET wine bottles. This research is important because this product has many benefits. The distinctive benefit is that it is environmentally friendly. The background to this research is the whole adoption process from glass to plastic and the benefits when adapting to this new concept. This research study will be analysing why the consumer is not accepting this concept and will also be looking at the resistance to the adoption process from the winemaker's viewpoint. The research is feasible because it makes use of interviews, surveys and doing a comparative analysis between glass and plastic. This study uses the qualitative method when conducting the research. This research method gathered data on the opinions of the PET concept. The target population was the general winemaker and wine drinking consumer in the Western Cape.

According to a study conducted by the American Association of Wine Economists (Kalkowski, J. 2008), the production and distribution of wine emits over six billion tons or one percent of greenhouse gas annually.

Considerations for the environment, such as CO<sup>2</sup> emissions and the carbon footprint of industries to name but two, are increasingly influencing decision makers when they have to decide about the choice of packaging materials. Environmental considerations are very much in the public domain and are on the agenda of high level discussions such as the G8 summit and Davos Economic Forum. There is a shift to the use of Polyethylene Terephthalate (PET) products due to consumer pressure to use eco-friendly and sustainable products.

This study focuses on the gap between the winemaker's perception and the consumer's perception regarding the concept of wine in a plastic bottle and their adoption process of accepting this new concept.

Wine producers will no doubt become obliged to not only embrace these trends in terms of production but also in the specific packaging methods they choose. According to Gordon Grant, MD of Palandri wines in Western Australia, they are getting many requests for eco-friendly packaging which either have a small carbon footprint or are totally recyclable (Carter, F. 2006).

One of the major factors in packaging design is to incorporate specific elements that will draw a consumer's attention subconsciously prior to the purchasing process (McTigue Pierce, 2012).

## **Problem statement**

The problem is to determine why the two mentioned parties struggle to adapt to the PET concept. There are many benefits in using plastic material instead of glass material in the manufacturing process of the wine bottle, but still the consumer and the winemaker struggle to adapt to this material regardless of its multiple benefits.

Due to the fact that consumers are becoming increasingly environmentally conscious, we all should follow this trend and respect our environment (Farrow, 2015). There remains however a big mental block within the mind of the consumer that wine in plastic bottles is of inferior quality.

Therefore, what is the obstacle that prevents them from making this mind-

shift? In conclusion, it is clear that PET holds many benefits to the consumer, the winemaker and the environment, but still 'something' restricts stakeholders from adopting.

## **The main research question and set of three sub-questions**

To what extent is the wine industry in South Africa willing to adopt PET containers?

The sub-questions are:

- 1) What is the perception of the winemaker regarding plastic wine bottles?
- 2) What is the perception of the consumer regarding plastic wine bottles?

## **Objectives of the study**

In this study I want to understand to what extent the wine industry is willing to adopt the PET concept. In order to answer this research question, a general perception needs to be gleaned as to how winemakers and the consumer perceive PET bottles.

This study will thus determine what measures it would take from the winemaker to adopt the strategy so that the new strategy (PET bottles) will be adopted quicker by the consumer through educating the consumer on the benefits of plastic wine bottles.

## **Purpose statement**

The purpose of this study is to gain understanding on what the inhibitors are concerning wine in PET bottles using local and international trends and research with a strong emphasis on the positive impact that the adoption of plastic wine bottles can have on the environment such as reducing the carbon footprint and reducing CO<sup>2</sup> emissions. The benefits should be clear to the winemaker and the wine drinking consumer.

In order to answer the main research question, the objective of this study is to gather information with regard to my research question, by obtaining the opinions of winemakers to determine how inclined they are to use PET wine bottles and whether they have utilized it in the past. Additional information should be gathered concerning the customer's perception regarding the use of PET wine bottles. Research will also be done to see which winemakers can already show success with the use of PET wine bottles. It is critical to obtain the perceptions of both the winemaker and the wine drinking consumer, because they are inter-dependant on each other.

## **Rationale**

Wine packaging has changed through history from the traditional clay pots and wooden barrels to current packaging, such as glass bottles, aluminium tins and tetra packs (Isle, 2014). An innovative direction developed by Mondi Packaging is described in an article in Landbouweekblad by Botha (2010). The objective of this innovative direction is to persuade the South African winemakers and consumers to make use of PET bottles.

Some of the many benefits of PET according to Petainer (2013), are that it is lightweight, reusable and recyclable. Currently PET bottles have not successfully been adopted by either the winemaker or the consumer partially because it had a few disadvantages such as limited shelf life. Moodie (2010) states that PET bottles has been developed that contains the Amguard Bind-Ox additive, which resulted in an extended shelf life of up to 24 months.

Regrettably, not even the above mentioned awareness of the extended shelf life could successfully persuade the winemaker or consumer to adapt to this new concept.

In order to generate an understanding of why neither the winemaker nor the consumer wants to adapt to this new concept, given the mentioned benefits and disadvantages, research on the perceptions of the winemaker and the consumer regarding their resistance to this concept must be conducted. Attention will also be given to the environmentally positive impact of PET bottles such as a smaller carbon footprint and lower CO<sub>2</sub>emissions.

# Chapter 2

## Literature Review

PET bottles have been used internationally and locally. The objective of this study is to use the international and local data and experiences of international and local winemakers and consumers, to persuade winemakers and consumers to change their resistance to the use of “plastic wine bottles” and to adapt to PET wine bottles, which is an environmentally friendly and cost effective alternative to glass bottles. An observation was made that there is a gap between how the winemaker perceive the consumer’s reaction to plastic wine bottles and the perception of the consumer of wine in plastic bottles.

### Theme 1 : PET bottles and their application in an environmentally conscious society

The use of Polyethylene Terephthalate (PET) bottles in the South African wine industry is a relatively new concept and there are only a few producers in the game at his stage.

One of the main advantages of producing wine in PET bottles are that they are environmentally friendly (Moodie, 2016) in that less carbon is emitted in the production process and less fuel is used in transportation because the bottles weigh less than glass bottles and are smaller in size than glass bottles. The other benefits are that the bottles will not shatter when dropped, which is a ideal for picnics and festivals. This also means that there is no hazard for glass cuts for consumers in supermarkets

One of the producers is Mondipak Plastics who produces the PET bottle which is manufactured with a double layer of PET that has an oxygen barrier layer in between, which prevents oxidation. (Beverage Review, 2011)

According to Petainer (2013) the benefits of PET bottles include the advantage of being lightweight, flexible and reusable. Harrington (2009) claims in his study on the environmental impact of single use packaging, that PET bottles are the greener alternative to glass bottles.

The pro-PET lobby claims that the manufacturing of PET bottles has a 75% smaller carbon footprint than the production of glass bottles and that the carbon emission is also 50% less than the carbon emissions during glass bottle production (Food Review, 2010).

Petainer (2013) cites the example that plastic bottles (PET bottles) are environmentally friendly because they weigh less than glass bottles, the trucks that transport the plastic bottles will therefore emit less CO<sup>2</sup>. PET is the most recycled domestic packaging polymer.

PET bottles are much smaller in size and therefore 36% extra bottles can be stacked in a container. This results in a saving in fuel and carbon emissions which leads to more effective transport (Gerber, 2011).

The recycling of PET bottles seems to be more complex than glass, yet PET recycling uses less energy than the energy used to melt down glass. (Hu, 2012:35).

However, the anti-PET lobby point out some disadvantages of PET packaging.

The organoleptic qualities of wine play an important role when deciding on packing material. Experiments done with white wine showed that white wine produced in mono-layer PET bottles did not evolve well over time. The reason for this is the rapid oxidation that takes place in PET bottles over a 12 month period (R. Ghidossi *et al.* 2012:311).

The results of the above mentioned experiment counter argues Van Rooyen's (Avontuur Estate) point of view which states that no oxygen infiltrates into the PET bottle. Therefore no developing or aging can take place in the bottle.

## Theme 2 : The international perception of the consumer and the winemaker with regard to the PET concept

To form an concept that will persuade the winemaker and consumer that the benefits of PET bottles need not be restricted to soft drinks only, but can be viable in the alcoholic beverage industry as well, a thorough understanding of the existing perceptions that the winemaker and consumer have of wine in PET bottles, must be acquired (Smith, 2010).

Current literature indicates a growing awareness worldwide of the benefits of using PET bottles in the wine industry. Louis Moodie, Sales Manager at Mondi Packaging, has received encouraging responses from the South African wine industry with regard to wine in PET bottles. Some winemakers perceive the PET wine bottles as being very innovative and others even said that they feel compelled to start using environmentally friendly PET bottles to reduce the CO<sup>2</sup> emissions and thus leave a smaller carbon footprint (Moodie, 2016).

South African winemakers are starting to change their perception of producing wine in PET bottles.

The quality of wine is of paramount importance to winemakers and they will therefore carefully scrutinise the effect of PET bottles on the quality of the wine. (Lourens, 2016)

Research by Holland Colours (an international top producer of colourants for PET packaging) shows that PET packaging is the preferred packaging option for younger wines (four to five months old). Older wine needs aging and this component does not happen in PET packaging. Mondi, on the other hand, disagrees and is of the opinion that some of the well-known (aged wines) wine estates in SA are already using Mondipet packaging when exporting some of their wines.

Oxygen ingress is a major enemy for wines. Active and passive barriers are used in PET bottles to prevent oxygen ingress. PET bottles are protected against UV light by pigmentation of the bottle. Blind tastings is a good barometer of the quality of the wine and blind tasting research done by Polypet shows that PET bottles has no effect on the taste of wine in the first 24 months of shelf life (Food Review, 2010).

Mr Guillaume Nel, the winemaker at Backsberg wine estate, has bought into the concept of producing wine in PET bottles. "This product is something we believe in. We're putting a Merlot and a Sauvignon Blanc into the PET bottles, which will be the same wines we've been putting into glass" (Backsberg, 2016). Backsberg have been monitoring the production of wine in PET bottles worldwide and are comfortable with the quality of PET bottles produced locally by Mondi. Although producers may be sceptical initially to using PET bottles and will probably bottle their low end wines in PET bottles, they will most likely change their minds once they see that consumers

start adapting to the idea that they can also buy quality wine in PET bottles (Chance, 2010).

In this study further research will be conducted to establish why certain winemakers have adapted to this new environmentally friendly concept of using PET wine bottles and why other winemakers are still resisting this new concept. Research will also be done to determine why mid and high end wines are not produced in PET bottles.

The other side of the coin is the perception of the consumer. If the consumer does not accept the PET bottle, market forces will drive the winemaker back to traditional glass bottles. PET bottles are by nature smaller in size than the traditional glass wine bottle and may therefore be less conspicuous and may not attract the consumer's eye. Another obstacle in the consumers buying decision is that plastic bottles are usually linked to soft drinks and the contents can taste like plastic. Wine is an upmarket purchase and the uninformed consumer may be hesitant to purchase a perceived "cheap" product because it is packaged in plastic (Eedes, 2012). When a consumer purchases wine in a restaurant it is usually a luxury purchase and the consumer would like to purchase the wine in a glass bottle because it exudes an air of superiority (Atkin, 2015).

According to Schuemann (Caliendo, 2012), other consumer perceptions regarding the PET concept are that because the PET bottles are smaller in size, the consumer erroneously assumes that the content is less than the content of the standard size bottle of wine. Another perception problem is that because PET bottles look similar in appearance (such as the label and logo) to the original glass containers, the consumer is not aware that it is actually an alternative, environmentally-friendly package (Caliendo, 2012).

The uneducated consumer needs to be made aware of the quality of PET bottles and that the plastic material does not affect the contents. This study will aim to prove that the consumers' perception that wine produced in plastic bottles is a cheap product is unfounded.

South African producers need to be aware that their packaging choices could soon have a direct impact on their business, especially where wine exports are concerned. Focusing on sustainable packaging could help ensure that producers do not miss out

in gaining market share from other international wine producers who are taking strides in this area, such as Australia.

Theme 3 : Current local and global PET initiativesThe switch from glass bottles to PET bottles has been an increasing trend in the South African consumer market.

Appletiser demonstrated this radical mind shift when they decided to package their new 350ml and 1, 25ml juice in PET bottles supplied by Boxmore. One of the prime reasons was the reduction in weight of the bottles and the resulting cost-saving in transport. This new direction was previously opposed because it was thought that the move to plastic would negatively affect the brand premium image.

The consumption of spring water is huge market in South Africa. Valpre (produced by Coca –Cola) took the initiative at their Heidelberg plant and started to produce Valpre in plastic bottles. The new Valpre PET bottles have a much lower carbon footprint than glass bottles and up to 30 per cent fully recyclable plant material is used in the manufacturing process (Hu, 2012:35).

PET bottles are not only used in the traditional 750ml bottles, but are also being introduced in the 187ml bottles used by airlines. Designers are coming up with innovative designs for PET bottles and are even targeting the higher-end brands in the market (Firstenfield, 2016).

This study shows current initiatives used by winemakers to boost the adoption of PET wine bottles as reflected in an article in the Landbouweekblad (2010) which mentions that winemakers are becoming more conscious of the carbon footprint that their wine farms leave and see an adoption to PET bottling as a way to reduce their CO<sup>2</sup> footprint. This initiative can form part of the wine farm's brand strategy to be perceived as a responsible farming operation that cares for the environment.

Furthermore, Petainer (2013) states that winemakers have started an initiative to convince airlines to buy their wine in PET bottles thereby reducing the weight of the packing and reducing the CO<sup>2</sup> emissions of the aeroplane.

There are also global initiatives to promote the use of PET bottles.

Andrew Peller is a Canadian based international import agency and they have introduced 330ml PET bottles for their skinnygrape wine spritzers. Previously, skinnygrape (a low-calorie wine) was only available in a 750ml glass bottle.

The national brand manager for Andrew Peller, Sally Ripley believes that the slender bottle will appeal to their female consumers (the primary purchasers of the skinnygrape wine spritzers) because the slender design makes it easy to hold (Atkin, 2015).

#### Theme 4: Inherent problems with the use of glass bottles

Glass bottles have been used for ages but are not without its problems.

James Fish, chief financial officer of Waste Management Inc, said that glass is hard on equipment and tough to handle. Fish also mentioned that glass does not decompose (NG, 2015).

Erica Harrop of Global Package also identified problems with glass bottles. According to her, bottle weight has a direct effect on the base price because of increased freight costs. Wineries are importing glass bottles from China because it is less expensive, but wineries have to secure stocks long in advance and this adds to the base cost of the bottle (Firstenfield, 2016).

Environmentally it does not make sense to continue with the use of glass bottles. In the production of a glass wine bottle, 89g of carbon is emitted, whilst only 53g carbon is emitted in the production of a PET bottle (Anon., 2012).

According to Le Roux (2012:35), glass bottles are bigger in size (with similar content) than PET bottles and it is therefore possible to load more PET bottles in a truck that would have been the case with glass bottles. The carbon footprint of the truck that transports the PET bottles is thus smaller than the truck that transports the glass bottles (Hu, 2012:35).

## **Conclusion**

Change does not come easily in the wine industry. It took a long time for the wine industry (both winemakers and consumers) to move from cork to screw tops.

The same mind shift will have to take place in the wine industry for them to adapt to PET wine bottles. Fortunately international acceptance has taken place as there is a growing concern for the environment. The gravitas of international acceptance will make it easier for the local wine industry to accept this change.

Entrepreneurs that push the envelope will primarily focus on money saving methods and ways to increase their market share. Environmentally savvy marketers will definitely attract the new generation of environmentally consumers and increased sales of PET bottles is bound to influence the winemaker to consider producing more wine in PET bottles.

# Chapter 3

## Research Methodology

An investigation was conducted focusing on the perceptions that the winemaker and the consumer have of the glass bottle versus the PET bottle. In order to do this, information was gathered through interviews that were conducted with winemakers and consumers in the wine industry with regards to the use and replacement of glass as packaging material. There seems to be a general negative connotation regarding the use of PET bottles in the wine industry. Preliminary assumptions are that consumers will not select to mature wine that is sold in plastic bottle and that wine in PET bottles is considered to be cheap wine and wine of inferior quality.

The research problem was to determine why these two parties struggle to adapt to PET packaging. There are many benefits in using plastic material instead of glass material in the manufacturing process of the wine bottle, but the consumer and the winemaker still struggle to adapt to this material regardless of its multiple benefits.

The following are the research questions conducted to investigate the research problem:

The main research question:

To what extent is the wine industry in South Africa willing to adopt PET containers?

The sub-questions are:

- 1) What is the perception of the winemaker regarding plastic wine bottles?
- 2) What is the perception of the consumer regarding plastic wine bottles?

### Qualitative Research

Qualitative data gathering methods such as collecting verbal data (Wyse, 2011) served this research project because of the interviews and surveys conducted. The qualitative research process was used because the study was focussed on people's perceptions and not on figures and statistics. The data thus gathered was then scrutinised and analysed.

This research study is a qualitative study as it looks at people and their opinions rather than facts and figures.

Relevant results can be generated with a small group using the Qualitative method. Thus the qualitative research method was chosen for this research study, because appropriate results can be generated even though only a small sample size was conducted in my study.

Thus using a qualitative orientation was the most suitable option for this study. The reason for this is because my study research was only conducted in small sample groups and a general trend result was sufficient for this purpose.

### Research Design

Within an interpretivist paradigm, this study interprets perceptions of PET packaging in the wine industry. The nominalist approach looks at different types of consumer relationships. In this study it is important to understand the relationship between the consumer and the product and to interpret why the consumer will or will not buy wine in a PET bottle. In an anti-positivist interrogation of human behaviour and the relationships of human behaviour to the adoption of plastic wine bottles, perception is explored in order to describe how consumers and producers might be swayed by these packaging choices. The basis of the interpretivist paradigm is that people are fundamentally different to objects because objects are inanimate and people are constantly being influenced by the environment which change the way they interpret situations or products. (du Plooy-Cilliers et al. 2014). This applied to the current research study as it is concerned with how the consumer and winemaker associate themselves with the PET concept.

Phenomenologically, the study reflects on perceptions that exist from within the winemaker industry versus the actual PET concept through the individual perception. The researcher tries to understand how individuals make sense of the PET phenomena that has become a possibility within wine packaging industries. This study also looks at how both producers and consumers make sense of the PET concept and how they understand the meaning or value they associate with this concept.

How individuals associate themselves with PET bottles and how they react on human interaction has been hermeneutically interpreted in order to understand these perceptions better. Hermeneutic tools such as qualitative research and non-directing interview techniques were employed.

Symbolic interactionists understand reality as symbolic and constructed. Such a shared meaning system informed this research, since wine producers and consumers all contribute and are influenced by collective meaning making within the context of wine consumption and enjoyment. This shared meaning system then influences individuals as to how they identify with the PET concept (du Plooy-Cilliers et al. 2014).

The essence of the research design is a qualitative approach. Subjective experiences and the meanings associated with phenomena are the core qualities used when doing qualitative research. As the qualitative research deals with emotions (experiences and meanings), it is not easy to quantify and measure them. The qualitative approach allows the researcher to interpret through the participant's viewpoint to understand an individual's subjective experience and the 'why', 'what' and 'how' of these experiences.

The study wanted to determine 'why' consumers identify with the meaning of the PET concept, 'how' they identify with the PET concept and 'what' are the associations made to the different meanings of the PET concept (du Plooy-Cilliers et al. 2014). This applies to the main research question as it allows the researcher to understand and interpret what the PET concept means to the different participants and how they associate with this concept through subjective experience.

Furthermore an application of a voluntarist approach was used as research was done on a broader spectrum of people and not just a specific stereotype. In this study an idiographic approach was used to interpret the individual's own perception of PET bottles and therefore it was important to determine specifically the participants own perception of PET wine bottles. Thus ideographically, human behaviour and participant perceptions played a significant role in this research study (Maree et al. 2016)

## Sampling

Probability sampling allows for the possibility that anyone in the population might be selected for probability sampling and therefore it is more likely that the results of the survey will reflect the opinions of the total population. The researcher relied on non-probability sampling because of the absence of an exhaustive list of the population available, combined with a tight timeframe (Gingery, 2009).

Ideally, an in-depth probability-based sample would have been ideal. However, real world factors such as cost, availability and time had to be taken into account (QMSS, 2016).

Hour-long in-depth interviews were conducted with a sample of five winemakers to obtain their views on ten different questions regarding the main research question and the four main themes covered in the study. Surveys with ten different wine drinking consumers to interpret their perceptions regarding the PET concept were also conducted.

The winemakers, chosen through a purposive sampling method, were initially approached electronically via email. The resultant in-depth interviews were completed personally (face-to face), as this method consists of gaining information through questioning the participants who were identified as they would understand and can relate to the information and questions (Bryman et al. 2014). The reason that the winemakers were approached was to establish the current opinion on the perceptions and theories surrounding the PET concept. These participants were considered as a sample of the population of the wine industry within South Africa, and globally, as they are a representation of those within their own environment, namely the wine industry. Therefore the interviews were conducted to create a space for the participant to openly communicate their opinions and perceptions on the PET concept, qualitatively.

The second dataset consists of semi-structured interviews in the form of a survey that were posted online in a Google Form format. The group consisted of individuals who had a shared interest in wine purchases, with a sample size of ten participants who enjoyed consuming wine.

## Data Collection

In order to collect rich content of opinions so as to give a full picture (Rouse 2016), the interview and survey approach was followed. This approach allowed the researcher to answer relevant questions to both groups of winemakers and consumers, evaluate outcomes and make predictions about future probabilities and trends about the research conducted through the in-depth interviews and surveys that took place. The study made use of ten surveys aimed at consumers which were completed by these ten respondents and four personal in-depth interviews conducted with four winemakers on four different wine farms. The fifth winemaker was interviewed via email. The reason for this sample decision is the very narrow focus that the study was investigating.

Five main questions were put forward to keep the focus on the themes identified in the study and indirectly answer the main question and sub-questions

Data was collected on the perceptions of the winemaker and wine drinking consumer regarding the use of PET wine bottles. Data collected at interviews with four winemakers were recorded on sound files on a mobile device and data collected from the fifth winemaker and the consumers were collected as data text. Thus this data that was collected through the population targeted were defined as the general South African winemaker and wine drinking consumer operating in the Western Cape.

Another set of primary research data was collected outside liquor stores targeting the wine drinking consumer. Interviews were also conducted on wine farms interviewing the winemaker and marketer. More primary research was done by emailing surveys to the participants namely consumers and winemakers who could not be reached personally.

The data collection method used in this study consisted of interviews with open ended answers, allowing the reader to interpret and understand the qualitative side of the study better. The interviews were electronically recorded and transcribed on the same day as a hard copy document. The data analysis process took place through transcribing the sound files of the interviews into a hard copy document and then analysing the data

## Data analysis

Although data can be viewed in different forms, most of the data gathered in this study was textual, being the transcriptions of the audio recordings of the interviews with the winemakers. The analysis period's main aim was to investigate the data collected in order to identify and interpret the different aspects of the data that would be sufficient in answering the main and sub questions.

The unit of analysis were specific words and phrases describing each participant's perceptions regarding the PET concept. The common denominators of specific words and phrases in the answers obtained from the respondents were used as the main themes for the thematic analysis.

The rationale for only interviewing four winemakers was that an in-depth study was done and very specific opinions were sought. The study focussed on opinions and perceptions and thus a qualitative approach was chosen for this study.

Research is deemed to be reliable once responses become repetitive (Heffner, 2016). In this study, 12 responses were selected as responses. Thereafter data became repetitive and the 12 responses indicated a clear trend. These uniform responses gave gravitas to the reliability of the survey.

A thematic analysis was utilised to analyse the transcribed data collected throughout the interviews and surveys. This analysis type requires creating codes for relevant themes, reviewing transcripts and analysing these themes. Certain sections were then identified that were relevant to the research questions and sub questions and then group them into themes. Once the data had been analysed, the researcher then interpreted it to gain an overall understanding that would lead to valuable recommendations and conclusions. (Braun & Clarke, 2006)

Due to the research gathered in this study through open – ended questions, the use of certain phrases were counted in the analysis process. The coding below came to the fore in the study:

<u>Concept / Phrase</u>	<u>Code</u>
PET	Plastic, bottles, recycle, cheap
Perceptions on benefits	Light weight
Resistance to concept	Cheap, Low – Quality
Considerations for the environment	Consumer pressure to use eco- friendly products, trend
Perceptions of winemaker	Innovative
Wine is an upmarket purchase	Cheap, status
Current initiatives	Airlines, Appletizer

Results from coding of the data was done once the interviews and surveys were completed and analysed and will thus be presented in the next chapter.

#### Validity & Reliability

For a study to be valid, it should clearly show what accurately exists by measuring actual opinions, observations and judgements. Consistent and stable results must be produced by an assessment tool to be considered as a reliable tool (Phelan & Wren, 2005-6).

Validity can be applied to the interviews and surveys as it serves to gain research from participants that can be measured. The research methods namely the in-depth interviews that were conducted and the surveys, are valid for the following reasons. Firstly, the researcher of the study is right at the source of the research. Secondly, there were no space for the information to get lost in translation between the researcher and the interviewee as well as on the online survey conducted. Reliability is connected to the outcomes of the research and relates to the concept that different participants are being tested by the same instrument (du Plooy-Cilliers et al. 2014). Reliability is seen in the interview as the same questions and research topic are asked and posed to be discussed. Reliability should be showed in order to compare the different answers given to the same questions. The main criteria to this research study were to approach the most reliable, trustworthy and knowledgeable candidate to participate in this study, and thus the particular winemakers and specific wine drinking consumers were selected to ensure the most reliable information gathered. Trustworthiness can be divided into sections namely

credibility, transferability, dependability and conformability (du Plooy-Cilliers et al. 2014). Dependability is defined as the quality of the process of the research that is obtained from the data collection method phase to the results generated from the findings of the interviews and surveys. Conformability can be defined as how well the data collected from the surveys and interviews supports the interpretations that the researcher gathered (du Plooy-Cilliers et al. 2014).

In this chapter the research problem was highlighted of the perception that exists that wine produced in PET bottles are of low quality. The qualitative research method was deemed the most appropriate method to collect data from winemakers and consumers regarding their perceptions. The sample size consisted of the responses from five winemakers and ten consumers. The data was analysed using a thematic analysis and the data was measured for validity and reliability. The methods described in this chapter combined with the relevant data collection instruments assisted in obtaining the relevant information to make the findings in the following chapter.

# Chapter 4

## Research Findings

This chapter is analysing primary research data qualitatively gathered in an attempt to answer the questions raised by winemakers and consumers around the perceptions of the use of wine in PET bottles. Winemakers and wine consumers are the two main players in the decision making process to decide whether packaging wine in PET bottles is viable. The questions and sub questions used in the surveys were designed to elicit optimum response from these two parties.

Semi-structured interviews were conducted with five winemakers in order to gain a deeper insight into the perceptions of the winemaker and wine drinking consumers. The research questions guided the conversations with the different winemakers and formed the basis of the surveys with the consumers. The objective of the research questions was to gather relevant and credible data from the two main players in the field and to use this data to produce the best outcomes to the main research question.

The research questions for this study were defined as 1) What is the perception of the winemaker regarding the quality of wine in plastic wine bottles and the perception of the consumer's acceptance of wine in plastic bottles? 2) What is the perception of the consumer regarding the quality of wine in plastic wine bottles and how does the consumer experience wine in plastic bottles?

This research journey reports on five interviews with five winemakers from five different wine farms. Four winemakers' were approached personally and an in-depth interview was conducted with each participant on each of the four wine farms. One winemaker's response was obtained via email. The same five questions were put to each winemaker, and the responses of the personal interviews were recorded electronically through sound files which were then transcribed into a hard copy document. The questions were designed in such a way as to make the participants aware of the environmental benefits of PET bottles and then to get their response to the use of PET bottles. These questions were structured in such a way as to ensure precise responses even though they were open-ended questions.

The first winemaker to be interviewed was Jan van Rooyen from Avontuur estate. Avontuur is in the Somerset West/Helderberg area and is in the Stellenbosch wine region (WO). The original farm was established in 1850 and the first wine was produced in 1990. White wine is produced on 17 hectares and red wine on 34 hectares. This wine farm has been awarded the Vitis Vinifera 2016 Gold medal in the annual local wine competition. (Cobbie, 2016)

The second interview was conducted with Estelle Lourens, the winemaker at Uitkyk wine estate since 2000. Uitkyk wine farm is on the slopes of Simonsberg and is also in the Stellenbosch wine region. The farm was established in 1712. The farm is 600 hectares in size, of which 140 hectares is under vine. Her love for nature is apparent in Uitkyk's sustainability initiatives which have led to Uitkyk recently being awarded championship status by the Biodiversity & Wine Initiative (BWI), and thus perfectly aligns with the whole PET concept in conjunction with sustainability initiatives (Uitkyk, 2015).

The third winemaker interviewed was Hardus van Heerden from Welbedacht Estate, in the Wellington wine region. The reason for selecting a wine estate in the Wellington area is that this area is now an upcoming award winning wine area and quite a few cellars have taken wine making to a new level of excellence. Welbedacht has excelled in its first two years of wine production. (Welbedacht, 2016) and has approximately 150 hectares under vine.

Simon Back from Backsberg was the fourth winemaker that was interviewed. Backsberg is regarded as the founders of the PET concept in South Africa and was chosen to get the best research possible from the farm with the most knowledge regarding the PET concept. The farm is in the Paarl wine region and was established in 1916 with the first wines produced in 1970. Backsberg has 130 hectares under vine.

The fifth winemaker, Johan de Wet from De Wetshof in the Robertson area, was interviewed via email. De Wetshof was established in 1949 and has 180 hectares under vine and produces 10% red wine and 90% white wine.

In the interviews conducted, discussions initially revolved around the shift in perceptions towards the adoption of the PET wine bottle from the winemaker's side and from the wine drinking consumer's side.

Winemakers were also asked the following questions in addition to the above questions:

1. Given the knowledge of the advantages of wine in PET bottles, would you consider producing your wine in PET bottles, and if not, why not?
2. What is the general feeling of winemakers regarding the use of PET wine bottles?

When asked why Avontuur Wine Estate does not use PET bottling, van Rooyen commented that Avontuur is not big enough to accommodate the production of PET bottling. He reasons that their focus is mainly on a specific, specialised market. Economically, it therefore would not make any sense for Avontuur to invest in this concept. Another motivation why Avontuur will not use PET wine bottles is that their specialised target market will not adopt to PET, due to the fact that they cannot identify with the packaging. PET wine bottles is not packaged in the well-known classic packaging. The PET bottle differs in size and shape to that of the traditional glass wine bottle in that the PET bottle is slightly smaller than the glass bottle.

Technically, one of the unique attributes of PET bottling is that it seals the bottle, so that no oxygen infiltrates into the bottle. Van Rooyen's concern is exactly this. In his wine making method, it is critical that a miniscule percentage of oxygen comes into contact with the wine in the bottle to enhance the developing and aging process. This is defined as bottle aging.

Another point highlighted during the interview with Van Rooyen, was the importance of marketing and packaging in the wine industry. Classical wine bottle packaging allows for complete recycling, while wine PET bottles cannot be 100% recycled. This is because the PET bottle consists of three layers for preserving the wine, which complicates the recycling process.

The perception of the packaging according to Van Rooyen, is still the 'old school way of thinking'; that plastic equals cheap or inferior.

Van Rooyen concluded with the following statement “The more quality wines are being manufactured in PET bottles, the more consumers will start to adopt to this concept. It’s just a matter of time and educating the consumer”. The concern that a PET bottle does not allow any oxygen to infiltrate into the bottle, still remains an issue for classic ‘old school’ winemakers like Van Rooyen.

“We produce ultra-premium quality wines, therefore we will not make use of the PET bottle concept”, said Estelle Lourens, winemaker at Uitkyk Wine Estate. This statement confirms the universal perceptions that the consumers have of wine in plastic bottles being defined as cheap. The above mentioned statement correlates the statement made by van Rooyen, which clearly confirms the ‘old school’ way of thinking.

The traditional- way of thinking implies that the consumer will always have the perception that wine in plastic bottles are conceived as cheap wine.

The image that Uitkyk Wine Estate portray to their consumers, is that of a high end brand image. Despite this and the abovementioned, Lourens still acknowledges the advantages linked to the PET concept. For Uitkyk Wine Estate, maintaining a low carbon footprint is a key factor in their daily planning and production.

According to Lourens, the PET concept will be of great advantage for the airline industry. The light weight of the plastic bottle versus the classic glass bottle is of great economic benefit. Wine in a plastic bottle can be preserved for quite some time without losing its quality. The South African public have the mentality that image is everything and that it is more important than the comfort aspect. Regarding the point of whether the consumer will accept this concept in the future, the comment was that high quality wines will always be produced in classic glass bottles, but the corporate cellars will have a production line for PET bottles.

Another point was that the black consumer is very status- and image driven and thus will not adapt to the PET concept. “More marketing and information sessions by the producers of the PET concept, is needed to educate the consumer”, was mentioned by Lourens. This statement endorses Jan van Rooyen’s statement that more education is needed on the PET concept.

When asked whether Johan de Wet, winemaker at De Wetshof will consider producing wine in PET bottles, he made the following comments on this question.

Concerning wine quality, PET allows more oxygen penetration than glass, and thus the wine has a shorter shelf-life, losing freshness more quickly. Regarding the possible health implications, whether or not there are problems related to keeping wine in plastic, is a controversial area, which needs still to be explored. Concerning image, plastics have an increasingly negative image in the eyes of consumers: convincing them that plastic is the environmentally friendly option will be difficult, and it will be hard to get away from the cheap 'look' and perception that plastic bottles have.

De Wetshof wines are expected to age for longer than two years and are in a different price segment than PET bottles.

Hardus van Heerden from Welbedacht wine estate stated that the advantages of PET bottling include storage space, its light weight and the environmentally – friendly aspect of it.

When consuming wine, emotions play, without a doubt, a significant role in the consumers' experience (Watson and Spence 2007). Van Heerden's point of view was that the beautiful and enchanting sound of a cork being extracted from a glass bottle cannot be compared to the dull sound of unscrewing a plastic bottle. To him it is part of the classic wine experience. According to him, it all adds up to one concept namely, traditionalism which is defined as wine belongs in a glass bottle.

Research on traditionalism shows that there is a definite hedonic experience when a consumer purchases, consumes or collect quality wines. Campbell's proposition supports this hedonic experience and he formulates this as follows: "Modern hedonism is a construct made of emotions and sensations – whereas what people are looking for, before any other thing, is imagination" (Campbell 1997). Trends that have emerged from the French and other "Old World" wine consumer market, show that it is very difficult to predict consumer behaviour because consumers have much more freedom to make their choices. In the past loyalty to grape varieties, brands, wine blends and vintages heavily influenced consumer's choices. This new trend is confirmed by Bernard Cova who proposes that the post-modern consumer have

more freedom of choice in their private lives than ever before, but they are alone and isolated from their connections in the community (Cova 1997). This suggestion by Cova is significant because the consumption of wine is a combination of an economic transaction and an act of social transmission (Simonet Toussaint 2006).

Several quantifiable studies have shown that the sensory enjoyment of wine and the willingness to pay for this experience, are strongly influenced by the price, origin and brand of the wine (Lange, 2000; Lange et al., 2002; Yegge and Noble, 2000 and Priilaid, 2006; Szolnoki and Mueller, 2009). These studies concluded that extrinsic prompts or cues strongly influences a consumer's informed sensory approval of wine.

Van Heerden was of the opinion that changes may occur in the future where certain wines will be bottled in PET, but your middle class to premium product will never be produced in a PET bottle. A disadvantage he mentioned was that it is not necessarily cheaper to purchase the product, so why bother if you can just as well purchase the glass bottle. Van Heerden is of the opinion that there is merit in the use of PET bottles at festivals, concerts and outdoor picnics. The motivation for using new materials such as PET lies in the production cost. PET is generally more cost effective when the production cost is considered, due to less grams being used in the manufacturing process. In other cases the glass bottle could be more low cost if it is compared to the multilayer PET bottle (Moodie, 2016).

The initial founders and investigators of the PET concept is Backsberg Estate Cellars. They were the first producers of certified wines in PET bottles and the first carbon neutral farm. According to the CEO of Backsberg Estate Cellar, Simon Back, the reason for Backsberg being in favour of this concept, is because of the convenience factor for outdoor orientated lifestyle and thus it is seen as perfect packaging. Simon also mentioned the environmental perspective and its advantages as one of their main reasons for being pro-PET.

When asked how they match Backsberg as a high end brand with a concept classified as low end by the consumer, he commented that they developed a brand specifically for the use of PET bottles. The Tread Lightly brand use a high quality wine in the PET bottles, because they knew the consumer will question the quality of the wine in a plastic bottle. The name of this production line is called Tread Lightly

and it is on a similar trajectory to screw caps. Confirming what the other winemakers said about the adoption of the PET bottle, Back said that it is only a matter of time before the PET bottle will be accepted by the consumer, in the way that the screw cap has been accepted. "The acceptance will grow" said Back.

The consumer's perception is very important to the winemaker and the consumer's perception of screw caps on wine bottles has changed significantly over the last few years. A survey from 2007 indicated that consumers deemed it appropriate to use screw cap wine bottles in casual situations like at a braai. However it was still deemed inappropriate to use screw cap wine bottles for special occasions (Bleibaum, 2011).

In another survey conducted in 2005 in the United States, it was shown that less than 10% of consumers in America preferred screw caps to the traditional closures. Consumers associated wine in bottles with screw caps are deemed to be of a lower quality (Toubia, Hauser, and Garcia, 2007). Interesting research done by Marin, Catherine and Durham (2007) investigated the influence of wine consumers' knowledge of the type of wine bottle closures on their intent to purchase wine as well as their expectation of the price of the wine. The investigation concluded that the type of wine bottle closure did not influence the consumers' perception of the wine or their intent to purchase the wine. However, when it comes to the expectation of the price for the wine, consumers expect to pay substantially less for wine with a screw cap. Finally, the traditional natural cork closure was still the preferred closure method and positively impacted on the price of the wine that the consumer was expecting to pay (Jeter, 2013).

Although the winemaker is the starting point in the whole cycle, the wine is useless unless it is bought by the consumer. It is therefore equally important to obtain the perception of a PET wine bottle from the consumer.

One of Van Heerden's key points in the discussion was that the first thing that should come to mind when the winemaker fills the bottle of wine, is to think how he is going to sell the wine and to which market

The second part of the research study focussed on the consumer.

A online survey was sent to 20 potential participants of which 12 respondents participated in the survey

The following section will analyse the research conducted through the online survey with the 12 respondents and in depth interviews conducted with the four winemakers on the identified wine farms. The survey consisted of open ended questions to ensure a broad spectrum of opinions.

The five questions put to consumers were:

1. Have you heard of PET wine bottles and if so, where did you hear about it?
2. Are you aware of the advantages of wine in PET bottles?
3. What is the general feeling of wine drinking consumers regarding the use of PET wine bottles
4. Have you personally consumed wine in a PET bottle and if so, what was your impression?
5. What is your general perception regarding wine in PET bottles?

Many wine drinking consumers indicated that they haven't heard of, or experienced the product when asked whether the consumer have heard of the PET concept, but 45% indicated that they were aware of the PET concept. The Van Loveren Tangle Tree wine was the only well-known PET wine bottle identified in the questionnaires completed.

33% of the respondents that took part in the survey indicated that they will support wine in PET bottles because of the environmental friendly impact of PET bottles on the environment.

There was a general feeling among the wine drinking consumer that image and status plays an enormous role in the mind of the consumer when purchasing a luxury item such as a bottle of wine and thus a plastic wine bottle does not fit in that mind-set. "I feel that it will be useful for picnics and festivals but I would never take a plastic bottle of wine to a fancy dinner party. Glass is still more classy".

Only two people who partook in the survey confirmed that they had consumed wine in PET bottles and to them it was all about the quality of the wine and not about the packaging.

When asked whether the consumer was aware of the multiple advantages of utilising the PET wine bottle, 75% of the consumers indicated that they were not aware of these advantages. Some advantages which most of the consumers were unaware of, included the light weight of the bottle, the environmentally friendly factor as well as the smaller shape of the bottle.

By answering one of the main themes through one of the sub research questions, a variety of feedback was received. The question under study was to conduct research on what the perception was of the consumer regarding the PET concept. The general trend answer to this theme was that plastic will never replace glass although PET bottles with its smaller carbon footprint, is a more environmentally friendly product than glass bottles.

When asked what the consumer's perception of PET wine bottles were, more than 40% of the participants indicated that they associate wine in PET bottles with wine produced in boxes, which in turn is associated with low-end quality wines.

It is clear that the perception of both the winemaker and the consumer with regard to the use of PET wine bottles, must be seriously taken into account if the noble campaign for the increased use of environmentally friendly PET bottles have any chance of success.

According to the feedback from the winemakers' they are aware of the PET concept but they are not yet convinced that this is the future for bottling of wine. There also seems to be a lack of knowledge and agreement amongst winemakers' as to the aging process or lack thereof in PET bottles.

The responses from the surveys indicate that consumers are generally aware of the environmental benefits of PET bottles, but still associate wine in PET bottles to be of average quality.

In the final chapter the feedback and responses will be analysed and then used to draw conclusions.

# Chapter 5

## Conclusions

An investigation was conducted focusing on the perceptions that the winemaker and the consumer have of the glass bottle versus the polyethylene terephthalate (PET) bottle. In order to do this, information was gathered through interviews that were conducted with relevant players in the wine and packaging industry with regards to the use and replacement of glass as packaging material. Research questions were then conducted in order to answer to the main research problem.

The research problem was to determine why these two parties struggle to adapt to PET packaging. This is clear from the observations that were made both at off-trade (liquor stores, grocery stores etc.) and on-trade (bars, lounges etc.) locations where it was rare to find a PET wine bottle. The consumer's traditional viewpoint is that quality wines should only be produced in glass bottles. The reason for this viewpoint is that the consumer seems to believe that the quality of the wine decreases when produced in PET bottles and they assume that only cheap wine is produced in PET bottles. The motivation and purpose of the study was to conduct research due to the fact that there are many benefits in using plastic material instead of glass material in the manufacturing process of the wine bottle, but the consumer and the winemaker still struggle to adapt to this material regardless of its multiple benefits. One of the main benefits of producing wine in PET bottles are that they are environmentally friendly (Moodie, 2016) in that less carbon is emitted in the production process and less fuel is used in transportation because the bottles weigh less than glass bottles and are smaller in size than glass bottles. The other benefits are that the bottles are less accident-prone, which is ideal for picnics and festivals. This also means that there is no hazard for glass cuts for consumers in supermarkets.

The research questions were structured in such a way as to elicit relevant responses from the participants about their perception of wine in PET bottles. The two main role players that form perceptions are winemakers and consumers. The questions were tailor-made to obtain the reasons for forming their perceptions on this research topic, to test their knowledge of PET bottles and to highlight the positive benefits of

PET bottles. The participants were also prompted to give their views on initiatives in the wine industry to change the perceptions of PET bottles.

Change does not come easily in the wine industry. It took a long time for the wine industry (both winemakers and consumers) to accept the use of screw tops for some products.

The same mind shift will have to take place in the wine industry for adapting to PET wine bottles. Fortunately, international acceptance has increasing, as there is a growing concern for the environment. The gravitas of international acceptance will make it easier for the local wine industry to accept this change.

South African winemakers are starting to change their perception of producing wine in PET bottles. Current literature indicates a growing awareness worldwide of the benefits of using PET bottles in the South African wine industry. Louis Moodie, Sales Manager at Mondi Packaging, reports on encouraging responses from the South African environment. Some winemakers perceive the PET wine bottles as being very innovative and others said that they feel compelled to start using environmentally friendly PET bottles to reduce the CO<sup>2</sup> emissions and thus leave a smaller carbon footprint (Moodie, L. 2016).

The quality of wine is of paramount importance to winemakers and they are therefore carefully bound to scrutinise the effect of PET bottles on the quality of the wine.

The other side of the coin is the perception of the consumer. If the consumer does not accept the PET bottle, market forces will drive the winemaker back to traditional glass bottles. The appearance of the PET bottle seems to be smaller in size than the traditional glass wine bottle, due to it being made of thin plastic and may therefore be less conspicuous and may not attract the consumer's eye (Moodie, 2016). Another obstacle in the consumer buying decision is that plastic bottles are usually linked to soft drinks and the consumers might expect the contents to taste like plastic. Wine is an upmarket purchase and the uninformed consumer may be hesitant to purchase a perceived "cheap" product because it is packaged in plastic (Eedes, 2012).

Research done by Holland Colours (an international top producer of colourants for PET packaging) shows that PET packaging is the preferred packaging option for

younger wines (four to five months old). The packaging company Mondi, on the other hand, disagrees and is of the opinion that some of the well-known wine estates in South Africa are already using Mondipet packaging when exporting some of their wines.

Oxygen increase is seen as a major enemy for wines. Active and passive barriers are used in PET bottles to prevent oxygen ingress. PET bottles are protected against UV light by pigmentation of the bottle. Blind tastings is a good barometer of the quality of the wine and blind tasting research done by Polypet shows that PET bottles has no effect on the taste of wine in the first 24 months of shelf life (Food Review, 2010). However, Jan van Rooyen, the winemaker at Avontuur, alluded to the fact that it is important that a miniscule amount of oxygen enters the bottle during the maturation process. The other four winemakers did not refer to the necessity for oxygen to enter into the glass bottle, except for De Wet who mentioned that PET allows more oxygen to penetrate into the bottle than the amount of oxygen that penetrates into a glass bottle, and thus the wine in a PET bottle has a shorter shelf-life, losing freshness more quickly

According to Landbouweekblad (2010) winemakers are becoming more conscious of the carbon footprint that their wine farms leave, and see an adoption to PET bottling as a way to reduce their CO<sup>2</sup> footprint. This initiative can form part of the wine farm's brand strategy to be perceived as a responsible farming operation that cares for the environment.

Petainer (2013) states that winemakers have started an initiative to convince airlines to buy their wine in PET bottles thereby reducing the weight of the packing and reducing the CO<sup>2</sup> emissions of the aeroplane.

There are also global initiatives to promote the use of PET bottles. Andrew Peller is a Canadian based international import agency and they have introduced 330ml PET bottles for their skinny grape wine spritzers. Previously, *skinnygrape* (a low-calorie wine spritzer produced in Canada) was only available in a 750ml glass bottle.

The national brand manager for Andrew Peller, Sally Ripley believes that the slender bottle will appeal to their female consumers (the primary purchasers of the

*skinnygrape* wine spritzers) because the slender design makes it easy to hold (Atkin, 2015).

### **Limitations of the study:**

This research study limited its geographical area to only include the Western Cape, and thus research was not done on a national level. Interviews and surveys were only focused on the wine drinking consumer and the winemakers` perception regarding the PET concept, not taking into consideration that different ethnic groups may differ regarding this concept.

Validity can be applied to the interviews and surveys as it serves to gain research from participants that can be measured. The research methods namely the in-depth interviews that were conducted and the surveys, are valid for the following reasons namely that the researcher of the study is right at the source of the research. Another reason for this research being valid is that there were no space for the information to get lost in translation between the researcher and the interviewee as well as on the online survey conducted.

Reliability is connected to the outcomes of the research and relates to the concept that different participants are being tested by the same instrument (du Plooy-Cilliers et al. 2014). Reliability is seen in the interview as the same questions and research topic are asked and posed to be discussed. Reliability should be showed in order to compare the different answers given to the same questions.

The main criteria to this research study were to approach the most reliable, trustworthy and knowledgeable candidate to participate in this study, and thus the particular winemakers and specific wine drinking consumers were selected to ensure the most reliable information gathered.

### **Recommendations for further research:**

Considering the fact that one of the main benefits of the PET wine bottle is that there is no chance of breakage, further research should be done on producing specifically ciders in PET bottles. This will ensure that the youth will keep festival environments more environmental friendly.

More research should also be done on the effect of oxygen penetration into PET bottles. This is a very important consideration for winemakers and it seems as if they can benefit by being exposed to more research done on this contentious subject. More research can also be done on how the wine farmer in conjunction with the winemaker can reduce their CO<sup>2</sup> footprint and make the world a more environmentally friendly space.

-0-

# References

## References

- Anonymous. (2012). Mpact PET wine bottles, quality that's economical and environmental/.<http://www.wine.co.za/news/news.aspx?NEWSID=20573> Date of access: 8 May 2016
- Associates, S.H., 2013.Packaging to suit all tastes. A consumer response to PET packaging in beverage markets <http://www.petainerkeg.com/>. Accessed: 7 March 2016
- Atkin, J. 2015. Losing the bottle – alternatives to glass wine packaging. <http://www.pci-mag.com/features/featurelosing-the-bottle-alternatives-to-glass-wine-packaging-4670967/> Date of access: 15 May 2016
- Backsberg, Simon. 2016. PET bottles (personal interview). 28 July., Cape Town
- Beverage Review, 2011. Packaging's role in sustainability is not what you thought. [www.foodreview.co.za](http://www.foodreview.co.za) Date of access: 16 May 2016
- Bleibaum, Rebecca. 2011. Update:Consumer Attitudes of Wine Closures. <http://www.tragon.com/downloads/news/18.pdf> date of access: 19 September 2016
- Botha, L. 2010. Wyn in plastiekbottelsbetervromgewing.Landbouweekblad, 26 March.<http://m24lbarg01.naspers.com/argief/berigte/landbouweekblad/2010/03/26/LB/38/01.html> Date of access: 10 March 2016
- Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3 (2). pp. 77-101.<http://eprints.uwe.ac.uk/11735> date of access: 16 September 2016
- Bryman, Bell, Hirschsohn, Dos Santos, Du Toit, Masenge, Van Aardt, Wagner. (2014). *Research Methodology: Business and Management Contexts*. Cape Town: Oxford
- Caliendo, H. 2012. Wine producers serving greener packaging. <http://www.packagingdigest.com/smart-packaging/wine-producers-serving-greener-packaging> date of access: 15 May 2016

Campbell, C. 1997. The romantic ethic and the spirit of modern consumerism Basil Blackwell, Oxford

Carter, F. 2006. Australian producers continue wine package experimentation.<http://www.decanter.com/wine-news/australian-producers-continue-wine-package-experimentation-92407/> Date of access: 30 March 2016

Chance, K. 2010. 'Plastic' bottles for wine are 'not inferior'.  
<http://www.bdlive.co.za/articles/2010/07/14/plastic-bottles-for-wine-are-not-inferior> Date of access: 27 March 2016

Cobie. Tripple gold for avontuur wines.<http://www.avontuurestate.co.za/news/> date of access: 18 September 2016\

Cova, B. (1997) Community and Consumption. Towards a definition of linking value of product and services. European Journal of Marketing 31 n°3/4 37-45.

De Wet, Johan. 2016. Interview via email. PET bottles. 26 July. Cape Town.

Du Plooy-Cilliers. F. Davis.C. Bezuidenhout.R. (2014). Research matters. First edition. Claremont. Juta.

Eedes, C. 2012. Wine trend: Alternative packaging. <http://winemag.co.za/wine-trend-alternative-packaging/> Date of access: 29 March 2016

Farrow. G. 2015. The rise of the conscious consumer.  
[http://www.nzherald.co.nz/element-magazine/news/article.cfm?c\\_id=1503340&objectid=11382530](http://www.nzherald.co.nz/element-magazine/news/article.cfm?c_id=1503340&objectid=11382530) Date of access: 2 May 2016

Firstenfield, J. 2016. The changing Landscape of Wine Bottles.  
<http://www.winesandvines.com/template.cfm?section=features&content=165547>  
date of access: 17 May 2016

Food Review, 2010. Wine not PET. [www.foodreview.co.za](http://www.foodreview.co.za) Date of access: 16 May 2016.

Gerber, B. 2011. PET wine bottles – Plastic is Fantastic.  
<http://www.newworldwinemaker.com/2011/02/pet-wine-bottles-plastic-is-fantastic/>  
date of access: 8 May 2015

Ghidossi, R. Pouput, C. Thibon, C. Pons, A. Darriet, P. Riquier, De Revel, G. Mietton Peuchot, M. (2012). The influence of packaging on wine conservation. [https://www.researchgate.net/publication/232406211\\_The\\_influence\\_of\\_packaging\\_on\\_wine\\_conservation](https://www.researchgate.net/publication/232406211_The_influence_of_packaging_on_wine_conservation). Date of access: 17 May 2016.

Gingery, T. 2009. Sampling Demystified: Probability vs. Non Probability Sampling. <http://survey.cvent.com/blog/market-research-design-tips-2/sampling-demystified-probability-vs-nonprobability-sampling>

Harrington, R. 2009. PET bottles greener than glass or aluminium – Study. <http://www.beveragedaily.com/Technology/Filling-Packaging-Equipment-Systems/PET-bottles-greener-than-glass-or-aluminium-Study> Date of access: 15 March 2016

Heffner, L. 2016. Chapter 7.3 Test Validity and Reliability. <http://allpsych.com/researchmethods/validityreliability/> date of access: 16 October 2016

Hu, C. 2012. Waste not want not. [www.foodreview.co.za](http://www.foodreview.co.za) Date of access: 16 May 2016

Kalkowski, J. 2008. Winemaker chooses PET bottles for fine wines. <http://www.packagingdigest.com/smart-packaging/winemaker-chooses-pet-bottles-fine-wines> Date of access: 18 March 2016

Lange, C. (2000). Study of the effect of sensory characteristics, expectations induced by information and prices on the acceptability and consumer purchasing behavior. University of Burgundy

Le Roux, R. 2012. Waste not want not. [www.foodreview.co.za](http://www.foodreview.co.za) Date of access: 16 May 2016.

Lourens, Estelle. 2016. PET bottles (personal interview). 22 July., Stellenbosch.

Isle, R. 2014. Rethinking the wine bottle: “ It’s a fascinating moment of possible paradigm shift”. <http://www.splendidtable.org/story/rethinking-the-wine-bottle-its-a-fascinating-moment-of-possible-paradigm-shift> Date of access: 2 May 2016

Jeter, R. 2013. The Acceptance and Adoption of Wine Bottle Closures in the U.S.  
**<http://news.cals.vt.edu/fbm-update/2013/12/10/the-acceptance-and-adoption-of-wine-bottle-closures-in-the-u-s/>** date of access: 19 September 2016.

Maree, K, 2016. First steps in Research . 2<sup>nd</sup> ed. Pretoria: Van Schaik

Marin, A.B., E.M. Jorgensen, J.A. Kennedy, and J. Ferrier. 2007. Effects of bottle closure type on consumer perception of wine quality. Am. J. Enol. Vitic. 58:182-191.  
<http://news.cals.vt.edu/fbm-update/2013/12/10/the-acceptance-and-adoption-of-wine-bottle-closures-in-the-u-s/> date of access: 17 September 2016

McTigue Pierce, Lisa, 2012. Consumer Perceptions influence packaging design.  
<http://www.packagingdigest.com/packaging-design/consumer-perceptions-influence-packaging-design> date of access: 2 May 2016

Moodie, Louis. 2016. PET bottles (personal interview). 11 March., Cape Town.

NG, S. 2015. High Costs Put Cracks in Glass – Recycling Programs.  
<http://www.wsj.com/articles/high-costs-put-cracks-in-glass-recycling-programs-1429695003> Date of access: 17 May 2016

NG, S. 2015. High Costs Put Cracks in Glass – Recycling Programs.  
<http://www.wsj.com/articles/high-costs-put-cracks-in-glass-recycling-programs-1429695003> Date of access: 17 May 2016

Phelan, C & Wren, J. 2005-6. Exploring reliability in academic assessment.  
<https://www.uni.edu/chfasoa/reliabilityandvalidity.htm> date of access: 24 May 2016

Rouse, M. 2016. Data Collection.  
<http://searchcio.techtarget.com/definition/datacollection> date of access: 25 May 2016

Schalk Burger & Sons Wine Estate. 2016.  
**<http://www.schalkburgerandsons.co.za/welcome.html>** date of access: 19 September 2016

Simonnet Toussaint, C. (2006) Social representations of wine in young adults, International Journal of Science of the Vine and Wine, 38 -2, 97-108.

Smith, C. 2010. Alcoholic drinks no barrier to PET.

<http://www.prw.com/article/20100225/PRW/302259985/alcoholic-drinks-no-barrier-for-pet-bottles>. Date of access: 8 March 2016

Toubia, O., Hauser, J. R., and R. Garcia (2007). "Probabilistic Polyhedral Methods for Adaptive Choice-Based Conjoint Analysis: Theory and Application." *Marketing Science*, 26(5): 596 – 610.

Uitkyk wine estate. 2016. <https://www.uitkyk.co.za/> date of access: 19 September 2016

Van Heerden, Hardus. 2016. PET bottles (personal interview). 22 July. Wellington.

Van Rooyen, Jan. 2016. PET bottles (personal interview). 22 July. Stellenbosch.

Watson, M. Spence, M. (2007) Causes and consequences of emotion on consumer behaviour: a review and integrative appraisal theory. *European Journal of Marketing* 41 -5/6, 487-511.

Wyse, S. 2011. What is the Difference between Qualitative Research and Quantitative Research? <http://www.snapsurveys.com/blog/what-is-the-difference-between-qualitative-research-and-quantitative-research/> date of access: 17 October 2016

QMSS e-Lessons .

2016.[http://ccnmtl.columbia.edu/projects/qmss/samples\\_and\\_sampling/types\\_of\\_sampling.html](http://ccnmtl.columbia.edu/projects/qmss/samples_and_sampling/types_of_sampling.html) date of access: 27 May 2016

# **Annexures**