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Wasted wines

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This paper reports on a management project, a fourth-year research project at Stenden Hotel Management School, dedicated to reducing wine waste at Landgoedhotel de Wilmersberg in De Lutte (the Netherlands). To do this, the beverage cost percentages were explored for wines that can be ordered per glass, and what the most important causes of wine waste were, followed by an evaluation of possibilities to lower this percentage. During a period of three months, all the wines sold per glass, the wines that were thrown away, and the stock were recorded to be able to determine the wines wasted. Besides that, an interview with six employees was conducted to gather their opinions about the current wine serving procedures and the wine waste that was occurring. The outcomes of the research show that many wines are opened and thrown away after a couple of days because the quality had decreased. All in all, this is an enormous amount of waste. To reduce this amount of waste it is important that every employee is aware and involved with the waste reduction process. Furthermore, it is recommended to look critically at the assortment and to reduce the amount of wine that is served per glass. Finally, different wine systems are noted which can be worth investigation. Wine systems can decrease the amount of wine waste and lead to a more sustainable restaurant.

Keywords: wine wastage, wine quality, waste reduction, wine systems

Introduction

Today's world is facing urgent climate problems. Around 80 to 90 per cent of the energy consumption comes from fossil fuels, which are decreasing in reserves and causing environmental problems (Hamburg & Valdma, 2011). Scientists believe that if global heating goes on, one third of the existing plant and animal types in the world will eventually die out (World Wide Fund for Nature [WWF], 2016). Every company has an impact on the total world energy consumption, so reducing the amount of waste and using fewer energy resources are important. The hospitality industry uses almost five times more energy than other commercial companies (Wang et al., 2013), therefore it is crucial that it becomes more sustainable. The company for this research, "Landgoedhotel de Wilmersberg", a hotel and restaurant in De Lutte (Overijssel, the Netherlands) wished to reduce the waste they create for a positive effect on both the planet and their own profit. A financial overview of 2014 showed that wines provide 52.1% of the total beverage revenue, with an average beverage cost percentage of 25.3%. The goal of the company is to reduce this to 22%. For this reason, we further explored this beverage type. To make the scope even more specific, it was decided to look only at wines that can be ordered per glass, as it is expected that this will create the biggest impact as those wines are the only wines that are stored after opening. Thus, the aim of this research is to provide "Landgoedhotel de Wilmersberg" with information about their beverage cost percentage of wines and the reasons for the occurrence of wine wastage, so as to take action to reduce wine wastage and the beverage cost percentage. This leads to the following problem statement: "Exploring what the beverage cost percentages are for wines that can be ordered per glass at 'Landgoedhotel de Wilmersberg', and evaluating whether it is possible to lower this percentage".

Literature review

Sustainable development improves the quality of life for people who live now and in the future (Cavagnaro & Curiel, 2012, p. 9). This is similar to the definition of Barreto et al. (2003, p. 267), who stated that sustainable development "improves a liveable future world where human needs are met while keeping the balance with nature". Nevertheless, the environment is influenced enormously by the hospitality industry. This industry uses significant volumes of natural resources and it uses almost five times more energy than other commercial companies. In addition to that, restaurants produce 490 tons of carbon dioxide per year (Wang et al., 2013). This proves that the hospitality industry has an enormous impact on the environment, and because of this, sustainable development is needed. However, being more sustainable in hotels and restaurants is not only about using products that are organic and fair trade. There are five other components needed to be a sustainable restaurant. These five components are: culture, health, nature, quality, and profit (Cavagnaro & Gehrels, 2009), which a restaurant needs to create a competitive advantage. Furthermore, guests have an increasing interest in healthy, fresh, biological and sustainable food. Research from CREM (2012) shows that 10% of the total restaurant visitors choose a more sustainable restaurant. Still, restaurant chains in the Netherlands are not improving on sustainability (Rank a brand, 2015). Sloan, Legrand and Hindley (2015) say that a

lack of knowledge and skills are the main reason why people act less sustainably, for example, because they do not consume local food.

Wine waste in restaurants in the Netherlands

Besides causing pollution, waste discards the money spent on purchasing the goods, as well as the resources used for making and transporting those products, and breaking them down again costs a lot of energy (Milieu Centraal, 2015). Food waste from households and restaurants account for 3.5% of the total environmental pollution (Milieu Centraal, 2015). According to Rol (2015), one third of the food in Dutch restaurants is wasted, which comes down to 51 million kilogrammes of food wasted annually (Natuur & Milieu, 2015). However, this is not only food: beverages are a type of waste as well. Causes for this are employees that serve glasses which are too full, forget to note the served drink in the system, or tap beer when their skills are rather low, leading to a lot of beer ending up in the sink (Koninklijke Horeca Nederland, 2015). A part of beverage waste is the waste of wine. A bottle of wine tastes best when it is just opened, and after two or three days, the taste of the wine has decreased and it is not nice to drink anymore (Legebeke, 2013). A similar conclusion was found by Stichting Vakbekwaamheid Horeca (2015), who said that because of oxidation, the quality of the wine will decrease. When wine has had contact with oxygen for a few days, the quality of the wine is reduced. In addition to that, WSET (2014) states that an open wine bottle loses aromas and will develop vinegar tones within a few days. It is confirmed that an open bottle of wine cannot be stored for a long time, but the exact volume of wine waste in restaurants in the Netherlands is not known.

Methods to manage wine waste in restaurants

It is important for a sustainable restaurant that employees are involved with the process against waste and that they are aware of the impact of their actions (Green Key, 2015). This is confirmed by the Integrated Waste Management Board (1992), which stated that by involving employees with the process of waste reduction, they will have different insights and they will support the company more in the approach for waste reduction. It is important that employees are aware of and involved with the waste-reducing efforts of a company. To reduce the amount of wine wastage, a company can take different actions. For example, an opened bottle of wine which is stored in the cooler, including red wines, will oxidise slower and this will result in a longer period in which the wine tastes better (WSET, 2014). In addition to that, there are different wine storage systems that will maintain the quality of the wine after it is opened. One method is "Vacuvin", where the bottle, after removal of the cork, is closed with a rubber lid and a special pump removes the oxygen from the bottle (Stichting Vakbekwaamheid Horeca, 2015). However, this method is only applicable for wines without sparkles, because with this method the bubbles will be removed (WSET, 2014). Furthermore, a blanket system exists which creates a protection layer between oxygen and the open bottle. With this method, the open bottle is protected because of an extra layer of gas, which is heavier than oxygen, and this will create protection in which oxygen cannot reach the wine (WSET, 2014). In addition, there is a wine innovation system called "Coravin". This is a device that can get the wine out of the bottle without removing the cork (Wijnjournaal, 2015). This wine system was invented by Lambrecht (2015), who saw that other systems still added oxygen to the wines. With this innovation, the wines remained "closed" after drinking one glass. To make it more clear: this system makes use of a needle which goes through the cork, and with the use of argon gas, the wine will come through the needle out of the bottle. Because of this system, the quality of the wine will remain high, and an "open" bottle can be used for a very long time. Finally, for the quality of the wine, the storage of the closed bottles is important. A set of advice for the storage of wine exists: the wines need to be stored at a temperature between 10 and 15 degrees; a wine bottle with a cork needs to be stored on its side; strong light needs to be avoided; and the bottles need to lie undisturbed (WSET, 2014). This means that when the storage circumstances are organised in a good way, the wine will stay good until it is served, and it will keep the taste of the wine at its best.

Average beverage cost percentage in restaurants in the Netherlands

In this section, the average beverage cost percentages of restaurants in the Netherlands will be reflected. Bedrijfschap Horeca en Catering (2015) made a comparison of beverage cost percentages between four restaurant subgroups. The definition of beverage cost percentages is the cost of beverage sales divided by the total beverage sales. In Table 1, an overview of the minimum and maximum food and beverage cost percentages calculated for each subgroup is made. Those figures can be compared to the calculation of Van Spronsen and Partners (2009), who say that café-restaurants and luxurious restaurants have a beverage cost percentage of 24 up to 28%.

In addition to that, Bedrijfseconomie voor de Horeca (2015) calculated the different beverage cost percentage per beverage category. In Table 2, the different percentages per beverage type can be seen. It can be concluded that the beverage cost percentages for white and red wines are the highest (23–24%), followed by spirits and liquor (20–23%) and beer (20%). Nevertheless, every company is unique and this means that food and beverage cost percentages can be different for each company, and is it best to calculate the cost percentages for the company itself (Koninklijke Horeca Nederland, 2015).

Table 1: Average food and beverage cost percentages per subgroup

	Beverage cost %
Luxurious restaurant	24–28
Café-restaurant	25–29
Petit restaurant	26–30
Banqueting restaurant	12–17

(Bedrijfschap Horeca & Catering, 2015)

Table 2: Beverage cost percentages per beverage category

Beverage	Beverage cost %
Coffee	5
Soft drinks	13–21
Beer	20
White wine	23
Red wine	24
Spirits and liquor	20–23

(Bedrijfseconomie voor de Horeca, 2015)

Research method

The aim of this study is to explore what the current beverage cost percentages are for wines that can be ordered per glass, and to evaluate whether it is possible to lower this percentage. Therefore, this research has been divided in three different stages.

First, the current beverage cost percentages of the wines that can be ordered per glass was calculated.

Second, the study investigated the biggest waste creator for these wines that can be ordered per glass.

Finally, the opinions of employees and managers were gathered about the current process of dealing with wines, and what they think can be improved or changed.

For the first stage, desk research (a type of quantitative exploratory research) was used to collect financial information to determine the exact beverage cost percentage for the wines that can be ordered per glass. It analyses all the 18 wines (nine red wines, and nine white wines) that were sold per glass between December 2014 until the end of November 2015. Those 18 wines were the wines that guests were allowed to order per glass, and were still on the wine menu of January 2016.

For the second stage, two different instruments were used to find out what the waste creators were for these 18 wines. The first instrument is a counting sheet to collect quantitative data. It was used to register the wines in stock, noting how much wine was thrown away and why, as well as registering how many wines were sold to guests. This instrument will give a clear overview of the amount of wasted wines, and the price of this waste.

Finally, interviews with employees and managers (a type of qualitative exploratory research) was used to get a clear understanding of the opinions of the participants, and insights into what is happening in the company with regard to the current wine procedures. Six out of 12 employees of the serving staff were interviewed. To get insights and meanings from all employee "levels", one manager, one manager/sommelier, one sommelier, and three waiters were interviewed. The outcomes from these three stages will be combined to come up with recommendations for the company on how to reduce the wastage of wines sold per glass.

Results and discussion

This section reports on the outcomes of the different stages of the research. First, the wine cost percentages of the nine white wines and nine red wines are presented. This is followed by the amount and the cause of wine waste. Finally, the outcomes of the employee interviews are discussed.

Outcomes stage 1: Wine cost percentages

First, the wine cost percentages are presented for every white wine and red wine that can be ordered per glass. The wine cost percentages are calculated with the assumption that every bottle can serve five glasses, even though in practice this might not always be the case. Also, fluctuations in the purchasing price of the wine bottles were not taken into account as to allow for an easier calculation process. Figure 1 shows the beverage cost percentages of the nine white wines and Figure 2 shows the beverage cost percentages of the nine red wines. The percentages are calculated with the purchase price (excluding tax) divided by the sales price (excluding tax) multiplied by 100.

The beverage cost percentages differ per type of wine. The white wines have a spread from 17.2 up to 31.4%, and the red wines have a spread from 13.6 up to 25.1%. Furthermore, the average beverage cost percentage of the white wines (24.5%) is higher than that of the red wines (21.6%). This is in contrast with the theory of Bedrijfseconomie voor de Horeca (2015), who stated that white wines have an average beverage cost percentage of 23%, and red wines a higher average of 24%. Besides that, the average beverage cost percentage of those wines is higher than the average of 20% calculated by Koninklijke Horeca Nederland (2015). Nevertheless, the beverage cost percentages of wines is lower than the 24 to 28% stated by Van Spronsen and Partners (2009). This means that the beverage cost percentages of wines at

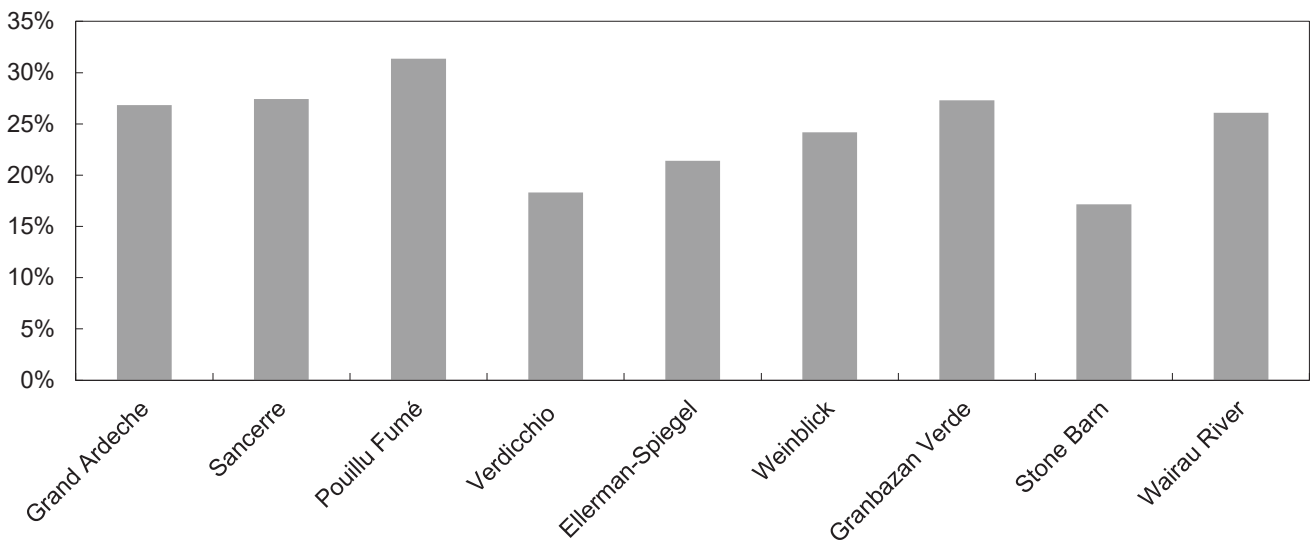

Figure 1: Beverage cost percentages of nine white wines sold per glass

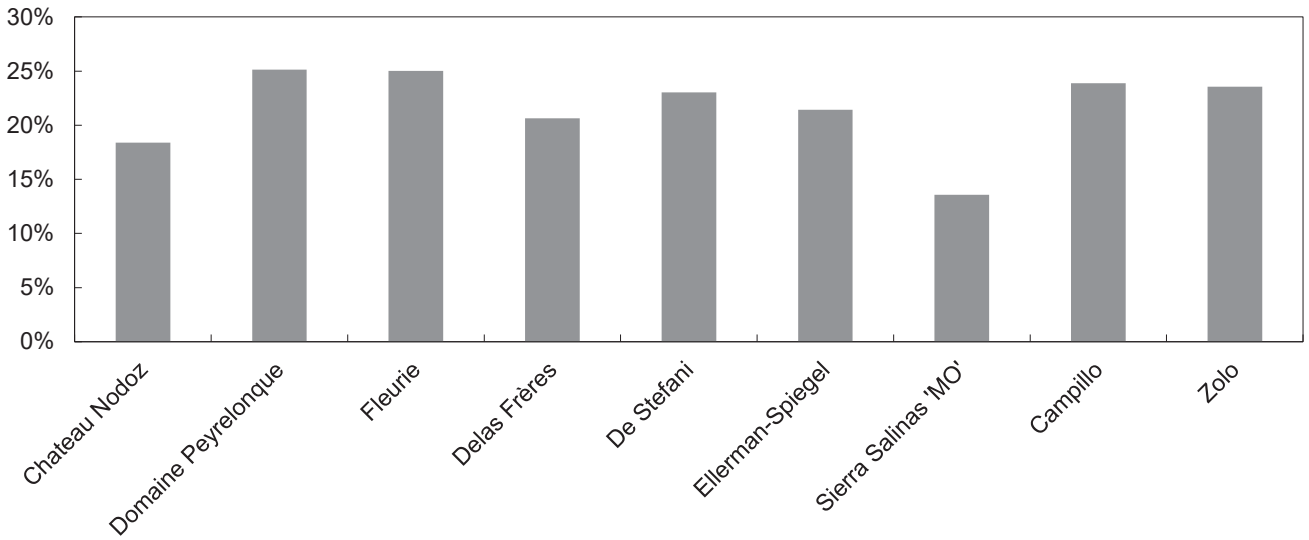

Figure 2: Beverage cost percentages of nine red wines sold per glass

"Landgoedhotel de Wilmersberg" is lower or equal to several theories. However, this percentage is calculated without the amount of waste and thus it remains important to be critical and to look at how this percentage can be lowered and how waste can be reduced.

Outcomes Stage 2: Amount and cause of wine waste

An overview is created of the wine waste of the nine white and nine red wines that can be ordered per glass. Besides that, other wines are opened and served per glass, even though they should be sold per bottle. For each month, an overview of the other wasted wines is presented in Table 3. These are the wines that are different than the nine white and nine red wines that can be ordered per glass. Also, a total overview of the wasted wines per month and the three months together is presented. Furthermore, the percentages of the relation between purchase and waste are shown. In the end, the reasons of the wasted wines are presented.

It can be seen that the amount of wasted wines is high. Within three months, the value of wasted wines had become €906.10. This means that the value of wine waste is estimated to be about €3 624.40 for the whole year. This enormous amount of waste is similar to the theory of CREM (2011), who prove that restaurants pay a high price for waste.

In Table 4, the amount of wine wastage of the wines that can be ordered per glass is presented, and compared to the total purchase price. The percentage of the waste value related to the purchase value in the three months of research is on average 15.8%. This is in contrast with the theory of CREM (2011) who prove that 5 till 10 per cent of purchased products ends up like waste in restaurants. This means that the amount of wasted wines at "Landgoedhotel de Wilmersberg" is higher than one would expect based on the theory.

From the counting sheet for the wine waste, the main causes have been determined by counting the reasons for throwing away the wine, as registered by the employees. The results are shown in the pie chart in Figure 3.

The main cause of wine waste at "Landgoedhotel de Wilmersberg" is that many wines are opened and, after a few days, they are not good to drink anymore, so they need to be thrown away. This is similar to the theory of Legebeke (2013), who proves that after two or three days the taste of the wine

Table 3: Litres and value – wasted wines

	White		Red		Other		Total	
	Litres	Value	Litres	Value	Litres	Value	Litres	Value
February	6.2	€58.98	6.3	€64.68	5.3	€53.58	17.8	€177.24
March	7.2	€73.05	9.3	€91.48	11.03	€121.90	27.53	€286.43
April	10.0	€101.26	7.8	€76.98	27.5	€264.19	45.3	€442.43
Total	23.4	€233.29	23.4	€233.14	43.83	€439.67	90.63	€906.10

Table 4: Relation of wasted wines and purchase – February, March and April

	White			Red			Total		
	Value	Purchase	%	Value	Purchase	%	Value	Purchase	%
February	€58.98	€534.42	11.0	€64.68	€951.00	6.8	€123.66	€1 485.42	8.3
March	€73.05	€462.00	15.8	€91.48	€593.40	15.4	€164.53	€1 055.40	15.6
April	€101.26	€339.00	29.9	€76.98	€68.40	112.5	€178.24	€407.40	43.8
Total	€233.29	€1 335.42	17.5	€233.14	€1 612.80	14.5	€466.43	€2 948.22	15.8

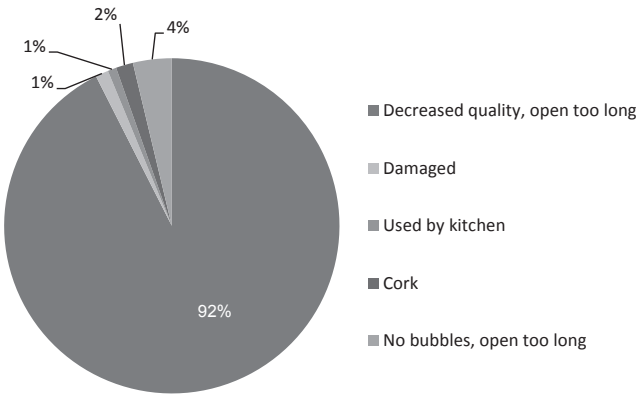

Figure 3: Reasons for wasted wines

has decreased, and it is not nice to drink anymore. Also, this is similar to the theory of Stichting Vakbekwaamheid Horeca (2015), which proves that because of oxidation, the quality of the wine will decrease. Also, WSET (2014) proves that an open wine bottle loses aromas and will develop vinegary tones within a few days. This explains the high waste numbers at this company, as one can expect that when many wines are opened, the amount of waste is high because they need to be thrown away after a few days due to the development of vinegary tones and loss of quality. Nevertheless, it is not proven whether there is more wine waste for other reasons. The theory of Koninklijke Horeca Nederland (2015) proves that employees can serve glasses that are too full, or they can forget to note the served drink. To figure out whether there is more wine wastage for those reasons, more research is needed and a more specific registration system at "Landgoedhotel de Wilmersberg" should be introduced.

Outcomes Stage 3: Employee interviews

In the third stage of the research, interviews were held with six full-time restaurant employees of "Landgoedhotel de Wilmersberg". Those six employees consisted of one manager, one manager/sommelier, one sommelier, and three restaurant employees.

The first question in the interview checked for employee awareness of the amount of wine wastage at "Landgoedhotel de Wilmersberg". Three of the employees said that they thought the wine wastage was high. One interviewee mentioned: "I think the amount of wine wastsge is high, but the exact amount I do not know". Another employee said: "I think the amount of wine wastsge is 10 bottles per month". The answers show that none of the employees knows the exact wine wastage of the company. The managers knew the amount of wine wastage approximately and one restaurant server guessed the amount of wine waste. Nevertheless, all the interviewees knew that the amount of wine waste was (very) high at "Landgoedhotel de Wilmersberg".

The next interview question aimed at finding out whether employees feel that they could have an impact on reducing the amount of wine wastage. Every employee said that they had an influence. One interviewee said: "I have influence on reducing the amount of wine wastage". This shows that all interviewees feel that they have an impact on reducing the amount of waste. The interviewees had different methods to do this. One manager said: "I combine open wines with the menu. I do not always add a wine option at the daily menu, which makes it easier to use different open wines, and I give orders to use open wines first". Another employees said: "I look specifically which wine is open". Nevertheless, some interviewees said: "It is difficult to reduce wine wastage because of a lack of overview of open wines", and "not all the employees are confident about using open wines first".

When asked what the employee thought were the causes of wine wastage, the cause that was mentioned most was "employees are careless". Furthermore, other mentioned causes were: "employees choose to be safe by opening a new bottle of wine", and "they do not risk that the open bottle doesn't taste nice anymore for the guest". Other causes were: "employees do not smell or taste if they can use the open bottle of wine", and "some employees do have a lack of knowledge". Furthermore, they said: "employees are unaware", "employees are not always coding the opened bottles", "there are mostly too many bottles open", "there is not a good storage system", "there is too much choice", and "it is easier to open a new bottle instead of testing the open wines". When asked to mention the biggest wine wastage creator, all employees said that the "arrangementswijnen", the wines that can be ordered per glass, are the biggest wine wastage creators.

The above outcomes show that every interviewee has the feeling that they have an impact in reducing the amount of wine waste. This feeling is important to perform more sustainably (Green Key, 2015), but it also can be noted from the interviews that not every employee was doing so. This means that not every employee was involved and aware of their impact in reducing the amount of wine wastage. Besides this, employees said that waste reduction is difficult to do because there is a lack of overview, and wines are stored in more than one place. In addition, employees mentioned that some of their colleagues were careless with using the open wines first. The Integrated Waste Management Board (1992) stated that to involve employees in waste reduction will give different insights and they will support the company more. This means that it is important that every employee feels involved in reducing the amount of waste. Another thing is that not all the employees have enough knowledge about whether a wine is still good and, to be sure, they open a new bottle of wine. So when every employee needs to be able to check if a wine is still good to serve, they need to get extra explanation or training. Furthermore, what was confirmed by every interviewee was that the "arrangementswijnen" which can be ordered per glass are the wines that were wasted the most. This is similar to the theory of Legebeke (2013), who stated that a bottle of wine always tastes the best when it is just opened, and after two or three days, the taste of the wine is decreased and not nice to drink anymore. Thus, this confirmed that the open wines produce the most waste and cannot be used after a few days. What cannot be proven from the interviews was whether employees were serving too-full glasses or whether they forgot to note the served drink. This is supported by the theory of Koninklijke Horeca Nederland (2015).

Conclusion

In conclusion, it can be said the wines served per glass lead to a lot of waste, especially when there is a wide range of

wines which are served per glass, and that the amount of waste leads to a high price for the restaurant. Also, the lack of awareness of employees about how much is wasted, and what impact that has, leads to a lot of waste. Furthermore, the lack of knowledge about confirming the quality of the wine leads to waste, as well as unclear procedures to correctly label and store wines. This further impedes using opened wine which is still drinkable. Nevertheless, it has not been investigated whether employees serve the right amount per glass and whether they always note the served drink, which can also lead to wine wastage and a higher beverage cost percentage.

The main recommendations for the company would be to involve all the employees in the process of waste reduction, increasing their awareness about the amount of wine wastage by informing them regularly on the topic, and training employees on when they still can use the open wines.

For the storage of the open wines, it is necessary that employees are more consistent in registering when a bottle of wine was opened. Storing all the open wines in one place would also allow for a better overview and thus lead to less waste. With this better overview, the open wines that need to be thrown out can be promoted in various ways.

Finally, it is recommended to look at the wine assortment. First of all, is it necessary to serve 18 different wines per glass? Secondly, next to those 18 wines, are there more wines opened which are served per glass?

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