



# Mount Michael Vineyard: Choosing a High Quality Closure

**John J. Lawrence<sup>1</sup>**

*University of Idaho*

**Karen M. Henderson**

*Cadbury Schweppes Asia Pacific*

**Abstract.** Mount Michael was a small, relatively new vineyard in New Zealand. The case describes the owner's efforts to ensure that the wines produced from their grapes were the highest quality possible and then focuses on the owner's growing concern about cork taint. In particular, the vineyard's owners were considering switching from natural cork to one of several alternative closures as a way to reduce or eliminate cork taint. The dilemma was that consumers tended to associate these alternative closures with lower quality wines. Complicating the owner's decision was the fact that they were set to expand and begin exporting. This case was designed for a quality management class. It was developed to illustrate how a small business implements a strategy based on high quality across its entire value chain, to provide a basis for discussing alternative dimensions of quality, and to illustrate the use of the cost of quality concept.

**Keywords:** quality management, supply chain management, cost of quality, entrepreneurship, and wine production.

## 1. Introduction<sup>2</sup>

**★★★★ Excellent Quality** Fragrant and mouth filling, with raspberry and spice flavours of satisfying depth, balanced oak and tannin, it shows complexity and potential. (Assessment of the Mount Michael 2000 Pinot Noir – *Michael Cooper's 2002 Buyers Guide to New Zealand Wines.*)

**★★★★ Excellent Quality** Weighty Central Otago wine with strong citrus and tropical fruit flavours and (in the opinion of all three judges) very skilful wood handling. Fragrant, ripe, crisp and concentrated. (Assessment of the Mount Michael 2001 Chardonnay – *WineState Magazine.*)

Sue Anderson tasted a glass of one of her highly acclaimed Mount Michael wines. It was . . . awful, with tastes of musty, mouldy old basements, dirty

- 
1. This case was prepared while Dr. Lawrence was a visiting lecturer at the University of Otago and Karen Henderson was a graduate student at the University of Otago.
  2. This case was prepared as a basis for class discussion rather than to illustrate either effective or ineffective handling of a managerial situation. The authors thank Sue Anderson for her cooperation and assistance with this project.

birdcages, and rotting cardboard. It was corked.<sup>3</sup> Sue was frustrated – corked wines, in her view, were such a waste of good grapes and hard work, and they reflected poorly on the vineyard.

Like many other winegrowers, Sue was concerned about the ongoing problem of cork taint in the wines being produced from her vineyard's grapes. Sue, with her husband, Martin, owned Mount Michael Vineyards, a 3-hectare<sup>4</sup> vineyard in the Central Otago region of New Zealand. For the last three years, award-winning wines had been produced from the vineyard's grapes, under the Mount Michael label. Despite Mount Michael's growing reputation as a high quality wine grower, Sue guessed that up to 10% of the wine they sold suffered from cork taint. At best this made the wine taste dull and off-flavoured and at worst made the wine taste downright awful. As such, they deprived the customer of a satisfying experience from the wine and reflected poorly on the vineyard. What made the problem so frustrating to Sue, and other winegrowers, was that many consumers did not recognize a corked wine when they tasted it. They simply attributed the poor taste to low quality grapes and/or poor winemaking, and avoided buying that label of wine again. But the real cause of the problem was with the cork.

As Sue had decided to change the bottle style for the 2002 vintage, it seemed like an opportune time to consider alternative closures that might reduce or eliminate cork taint. The challenge with moving away from cork, however, was consumer acceptance. Corks were the traditional and expected closure method for wines, particularly high quality wines. For many wine drinkers, the pop of the cork, as it came out of the bottle, was an integral part of the total wine experience. A number of other high quality vineyards and wineries in both the Central Otago region and New Zealand's more well known wine growing region, Marlborough, were experimenting with or had switched to other methods of closure. A number of these had switched to using metal screw caps<sup>5</sup> for at least some of their wines. Others were using agglomerate corks, which comprised two disks of high quality cork, laminated to a condensed particle cork mid-section. While not as common in New Zealand, Sue also knew that a number of producers in Australia were switching to synthetic corks. However, many wineries, on both the national and international stage, were staying with the traditional cork and enduring corked wines. In doing so, they hoped consumers would understand and be forgiving of the occasional bottle of corked wine. Sue wondered what was the right form of closure for Mount Michael Vineyard.

---

3. Wines suffering from cork taint were termed 'corked wines'.

4. One hectare is equal to 10,000 square meters or 2.47 acres.

5. Metal screw caps are sometimes known as Stelvins. "Stelvin" is the proprietary name of one particular brand of screw cap, manufactured in France by Pechiney.

## 2. Company Background

Mount Michael Vineyard arose out of Sue and Martin Anderson's desire to live and run a business in Central Otago. They loved the dryness, beauty and history of the area, and wanted to call it home. Aspiring to make their living from the land, they spent time considering different business opportunities that they might pursue. The couple had enjoyed wine for many years and having visited wineries in Central Otago, they were impressed with the quality of wine being produced from the burgeoning wine region. The wine industry in Central Otago was gaining an excellent reputation within New Zealand and vine plantings were increasing (*refer to Exhibit 1 below for background on the Central Otago and New Zealand wine industry*). The couple felt that this industry provided them with opportunities to satisfy their personal motivations to stay in Central Otago.

Having decided to establish a vineyard, they spent nearly two years finding the right site. Based on what they wanted to get out of the business, they concluded that a six-hectare (ha) vineyard would suit their needs. This was purchased and an initial three-hectare vineyard was planted in 1994. Approximately half this land area was planted in Chardonnay grapes and the other half in Pinot Noir grapes. These varieties were well suited to the climate and soil characteristics of Central Otago, as evidenced by other local wineries producing medal-winning wines from both varietals. The first harvest of grapes from Mount Michael occurred in 1997.

In order to focus her initial efforts on the vineyard, Sue sold grapes from the first two years harvest to another local winery. By 1999, Sue felt that the vineyard was well established and the grapes had achieved sufficient quality, and the first wines under the "Mount Michael" label were produced. The winemaker and winery chosen to produce the wine had a reputation for producing outstanding wines. The Anderson's opted to have another winery produce the wines for them because they lacked both the winemaking experience and the necessary equipment to produce the wine themselves. Further, given their relatively small size, it was not economical for them to acquire the needed equipment or hire a full time winemaker. There were a number of other small vineyard owners in the area who also employed the larger wineries or a contract winemaker in the area to produce their wines. A mobile contract bottler was used to put the finished wine into bottles.

*Exhibit 1: Wine Industry Information*

<b>New Zealand Wine Industry</b>	<b>1992</b>	<b>2002</b>
Hectares under vine	5,800 hectares	15,829 hectares
Number of Wineries	166	398
Number of grape growers	Data not collected	638
Average grape price per tonne	NZ\$555	NZ\$1,627
Total crush	55,500 tonnes	118,700 tonnes
Total domestic sales (millions of litres)	43.6 million	32.2 million
Total export sales (F.O.B.)	NZ\$34.7 million	NZ\$246.4 million
<b>New Zealand Wine Market Composition</b>		<b>Market Share</b>
Big Three wine companies: Montana, Villa Maria and Nobilo (8 wineries)		78%
Remaining 390 NZ wineries		10%
Imported wines		12%
<b>World Wine Production Statistics @ 2000</b>	<b>Volume (hectolitres)</b>	<b>Percentage</b>
Old World Wine Producers (6 countries)	155,460,000	60.1%
New World Wine Producers (6 countries)	54,775,000	21.2%
New Zealand (NWWP)	606,000	0.2%
Rest of the World (61 countries)	48,541,000	18.7%
<b>Central Otago</b>		<b>1992</b>
Hectares under vine		46 hectares
Number of Wineries		6
Number of grape growers		Data not collected
Total crush		71 tonnes
Chardonnay sale price range		NZ\$19.00 to NZ\$34.00 per bottle
Pinot Noir sale price range		NZ\$22.00 to NZ\$60.00 per bottle
Pinot Gris sale price range		NZ\$20.00 to NZ\$30.00 per bottle
<b>Average Wine Production Costs in Central Otago (\$ per bottle)</b>		
<b>Item</b>	<b>Cost (\$/bottle)</b>	
Vineyard production costs (includes sprays, frost protection, harvesting etc)	\$1.00	
Contract winemaking (includes vat storage and barrel ageing)	\$2.35	
Contract bottling (see details below*)	\$2.02	
Excise tax	\$2.00	
Marketing cost	\$1.30	
<b>Total</b>	<b>\$8.67</b>	
<b>Central Otago Wine Production costs per tonne</b>	<b>\$850.00</b>	
<b>New Zealand Average Wine Production Cost</b>	<b>\$570.00</b>	
* <b>Contract Bottling Breakdown:</b> Central Otago Flute – 90c; Cleaning, filling with gas – 33c; Cork – 43c; Capping / foil – 12c; label 12c per set, Carton packaging – 12c = \$2.02		

Source: 'New Zealand Winegrowers Annual, 2002' and 'NZ Cuisine, 2001'

Recently the Andersons had decided that the time was right to put the remaining three hectares under vine. The new vines would be planted over the next two years, with the first increase in grape harvest coming in 2005. As part of the expansion, they were also adding a new grape varietal, Pinot Gris, to their wine portfolio. Pinot Gris was another cool climate white wine grape that other growers in Central Otago were increasingly having success with. When the expansion was completed, approximately 60% of Mount Michael's vineyard would be in Pinot Noir, 30% in Chardonnay, and the remainder in Pinot Gris. The expansion would double wine production from its current level of 800 cases/year.

### 3. Making High Quality Wine

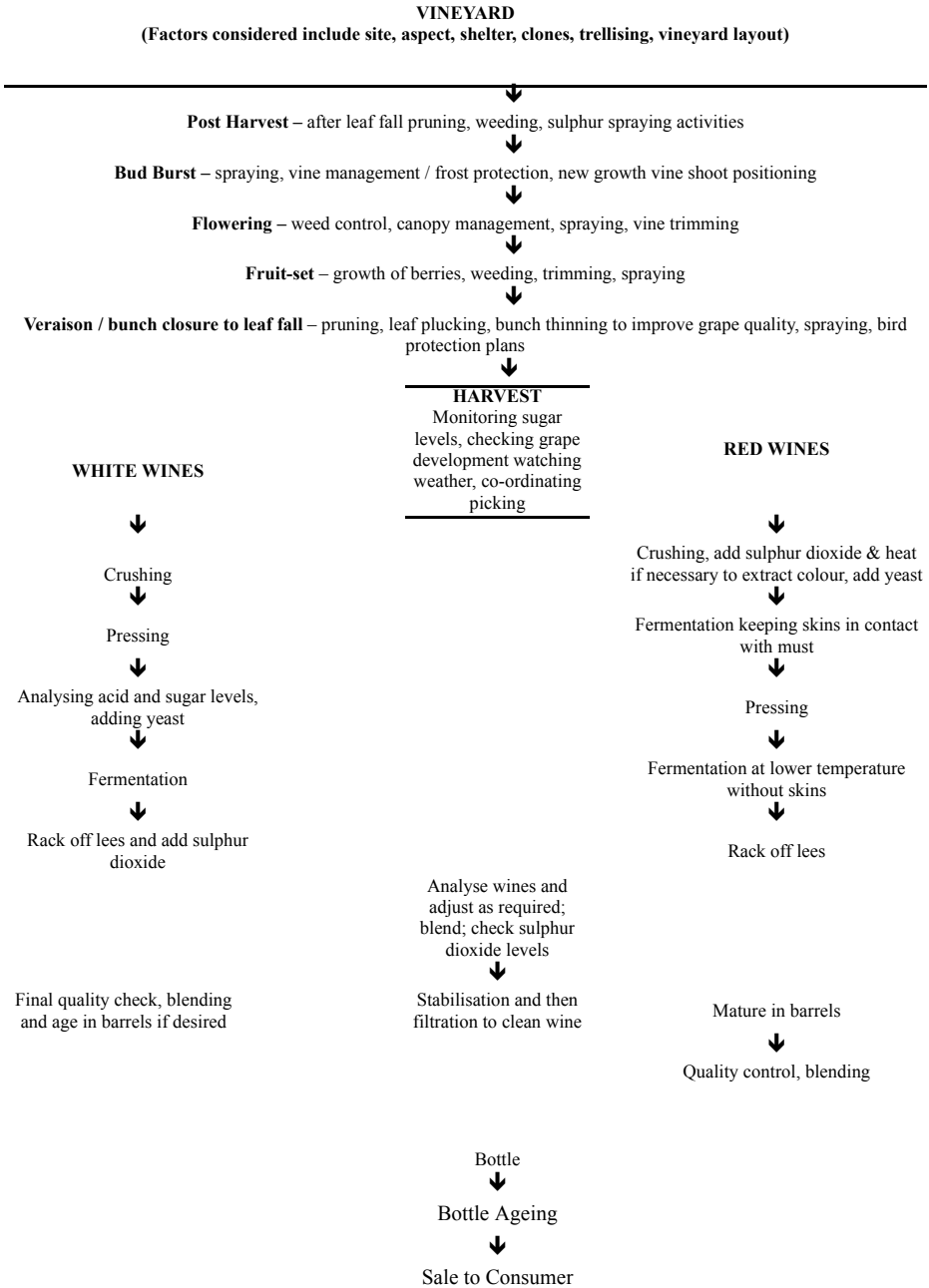
While different varietals produced different flavours, what Sue looked for most in a wine was 'balance'. There needed to be balance between the fruit, the oak, the tannins and the alcohol. These different elements needed to be well integrated, with no one element dominating the wine.

Providing a high quality wine to the consumer was a long process, and almost every step could have a significant impact on quality (*refer to Exhibit 2 below*). The process began with vineyard site selection. The terroir and micro-climates of a particular site were critical, and nearby vineyards producing the same varietal often produced grapes with quite different characteristics. Once a site is selected, specific clones<sup>6</sup> of the desired grape varietal were selected to match the site and the vineyard was then planned to take maximum advantage of the site conditions. This included such factors as spacing of rows and the design of the trellis system to support vines whilst maximizing the amount of sun grapes received. Sue had sought the advice of a viticulture consultant on both clone selection and vineyard layout.

---

6. A clone is the specific type of grape vine variety, which is derived from an identifiable family / parent plant. For example, Pinot Noir and Pinot Gris are but two of the 1,000 types of vines that exist in the 'Pinot' family. Clones have recognised traits that seek to achieve a consistent level of quality and eliminate / mitigate diseases (Halliday, 1999).

Exhibit 2: Vine → Wine Cycle



Source: Synthesized from tables and text in Jackson D. & Schuster, D. (2001). *The production of grapes and wine in cool climates*, (2<sup>nd</sup> ed.). Wellington: Daphne Brasell Associates Ltd. & Gypsum Press

With vines planted, the next process critical to producing high quality wine was vineyard management. This involved decisions about pruning back vines during the winter months, canopy management practices, spraying for weeds and pests, and setting irrigation levels so the vines got just the right amount of water. The quantity of grapes on the vines were strictly controlled through pruning, vine trimming and bunch thinning, a process whereby excess grape bunches were thinned shortly after formation. This produced more intense flavours in the remaining grapes. Uncropped, Sue's vines might produce 7 tonnes/ha, but to insure quality, she thinned the grapes so that the vineyard yielded only 5 – 6 tonnes/ha.

As grapes reached maturity, the vineyard owner, working with the winemaker, tested them daily to analyse sugar levels, flavours and colour density. When the optimal point was reached, the fruit was harvested. All grapes at Mount Michael were hand picked, as was the practice in Central Otago. While this significantly reduced the likelihood of grapes being damaged during harvest, it created an additional challenge of coordinating temporary workers to be available at just the right time. Once the grapes were picked, they were transported immediately to the winery for crushing. At the winery, the winemaker took over the process. Once crushed, the grapes entered the transformation process. The winemaker made decisions regarding the type of yeast to use; the temperature at which to ferment, and the duration of fermentation. All of these decisions could significantly impact on the quality of the finished wine. After fermentation and subsequent clarification of the wines, they were aged. Again, there were a number of critical decisions to be made by the winemaker, including what type of oak barrel to age the wine in, at what temperature, and for how long. All Mount Michael wines were aged in premium French oak barrels.

Just as the vineyard owner was frequently testing the grapes to determine the optimal harvest time, the winemaker regularly tested the wine as it aged, to identify the best possible point at which it should be bottled. A contract bottler usually performed the bottling step for smaller wineries, setting a portable bottling line at the winery site. The bottling process involved cleaning the bottles, filling each with inert gas to minimize the amount of oxygen that remained in the bottle with the wine, filling the bottle with wine, sealing the bottle with either a cork or a screw cap closure, and then labelling and packaging the bottles into cases. Some wines were bottle aged prior to being released by the winegrower for sale – Mount Michael bottle aged all of their wines for seven months. The conditions under which the wine was stored between the time it was bottled and the time it was drunk by the consumer could also impact on the quality of the wine.

#### 4. Marketing Mount Michael Wine

From the first vintage, Mount Michael wines were well received by the marketplace. The wines had won awards in the few national competitions they had been entered in and had consistently received good ratings from the three primary national publications providing wine reviews: *Cuisine Magazine*, *Winestate Magazine* and Michael Cooper's *Annual Guide to New Zealand Wines*. To be included in these reviews, Sue had to send two bottles of each varietal to these publications annually. If the wines were rated highly in either *Cuisine* or *Winestate*, then the winegrower could buy stickers to put on the individual wine bottles indicating that the wine was recommended by the publication. Sue had purchased the *Winestate* stickers, but was selective about which bottles she put them on. She typically had the stickers on the display bottles in the tasting room, and endeavoured to put the stickers on bottles going to a new wineshop. While the stickers themselves were quite inexpensive, at \$25.00<sup>7</sup> per 1000, applying them to each bottle was a time consuming process. This required opening every case, pulling out each bottle by hand, applying the stickers, and then resealing each case.

Sue had only entered her wines into a few wine competitions and was very selective about which awards Mount Michael wines contested for. Wine competitions typically required more bottles, sometimes as many as eight of a given varietal, to be used for judging. Most recently, Sue had entered her wines in the 2001 Bragato wine competition, a New Zealand competition that recognized both wine makers and grape growers. In that competition, her 2000 Mount Michael Pinot Noir had won a gold medal and her 2000 Mount Michael Chardonnay a bronze medal. The most prestigious wine competition in New Zealand was the Air New Zealand wine awards, sponsored by the national airline. Sue planned to enter her wines into this competition for the first time in 2003. Showing well in wine competitions, like good reviews in magazines, made marketing Mount Michael wines easier.

Sue priced her wines to be comparable to wines of similar quality from other Central Otago winegrowers. The Chardonnay retailed for \$24 per bottle and the Pinot Noir retailed for \$33.00 per bottle (*see Exhibit 3 below for price/quality comparisons of Palate New Zealand recommended Central Otago Pinot Noir*).

---

7. All monetary data are presented in NZ\$. At the time of Sue's decision, NZ\$1.00  $\approx$  0.48 Euros  $\approx$  £0.30  $\approx$  U.S.\$0.46.

*Exhibit 3: Results of Palate New Zealand's Spring 2002 Tasting of Central Otago Pinot Noir*<sup>1</sup>

<b>Wine</b>	<b>Rating</b>	<b>Price</b>
Valli Bald Hills Vineyard Pinot Noir 2001	◆◆◆◆	\$45
Valli Colleen's Vineyard Pinot Noir 2001	◆◆◆◆	\$45
Leaning Rock Pinot Noir 2000	◆◆◆◆	\$30
Olssen's of Bannockburn Jackson Barry Winemaker's Selection Pinot Noir 2001	◆◆◆◆	\$38
Peregrine Central Otago Pinot Noir 2001	◆◆◆◆	\$35
Gibbston Valley Central Otago Pinot Noir 2001	◆◆◆1/2	\$37
Mt. Difficulty Pinot Noir 2000	◆◆◆1/2	\$37
Olssen's of Bannockburn Pinot Noir 2001	◆◆◆1/2	\$34
Mount Michael Pinot Noir 2001	◆◆◆	\$33
Black Ridge Pinot Noir 2001	◆◆◆	\$40

<sup>1</sup>Only wines that were recommended (three, four or five star ratings) were called out by name.  
Source: *Palate New Zealand*, Spring 2002, pp. 114-115.

Mount Michael wines were sold through a variety of different channels. There was a tasting room on the vineyard site, where visitors could taste and purchase the wines. About 40% of Mount Michael's sales were through the tasting room. This was open daily during the main tourist season in the area (October – April) and open for casual hours for the remainder of the year. Sue ran the tasting room herself, although employed part time help during times when she needed to be in the vineyard or when she was travelling to promote the wine. There were a total of 46 wineries and 31 vineyards in the Central Otago area in 2002, with many having tasting facilities and offering direct sales. The Central Otago Winegrowers Association, of which Mount Michael was a member, produced a free "Central Otago Wine Map" to help tourists and visitors find the different wineries in the area. Wine tourism in the Central Otago area had grown steadily over the past decade.

In addition to tasting room sales, Mount Michael wines were sold in New Zealand restaurants, wineshops and could also be obtained via the web. About 25% Mount Michael wine was sold to restaurants and an additional 25% to wineshops. The remaining 10% of Mount Michael wines were sold through the Central Otago Wine Cellar, a local web based wine retailer that focused solely on Central Otago wines. Mount Michael did not have its own website.

Rather than use a distributor, Sue managed the sales of Mount Michael wines herself. She had worked hard to establish her wines for sale in a number of regional restaurant and retail outlets, as well as in some of the major New Zealand cities, particularly Auckland. This sales effort took time and money,

but Sue felt this process of sitting down with restaurant and wine shop owners and sampling Mount Michael wines was the most effective way for a small winemaker like herself to market high quality wines. Sue felt the time spent building relationships with these people would create long term customers who would be willing to promote Mount Michael wines to their customers. For high quality wines, it was often the recommendation of the sommelier at a restaurant or an employee at a wine shop that made the difference between a customer trying a wine or not. Sue did not attempt to get her wine placed in regional or national grocery stores, as she felt that smaller wineshops were a much more effective channel for her premium wines. Gaining access to such chains also usually required working through a distributor. Sue thought that after the reputation of her wines were well established in the marketplace and the additional three hectares of vineyard began producing high quality wines, that she would consider using a distributor rather than performing the entire sales task herself.

The approach to marketing that Sue followed was pretty typical for the many small, high quality winemakers in Central Otago and in New Zealand in general. Larger New Zealand winemakers like Montana and Villa Maria could also afford to advertise directly to end customers (usually in magazines selected to reach a particular demographic target) and sponsor major art and/or recreation programs (e.g., the Montana National Jazz Festival or the Montana Heritage Trail). Sue felt that the expense of such efforts were beyond the means of her small business, particularly given the volumes that she produced prevented her from achieving the wide distribution possible by the larger producers. Sue felt it was better to put more of her resources into ensuring the quality of the wine itself and to focus her limited marketing dollars on entering wine competitions, supporting the Central Otago Winegrowers Associations efforts to market the Central Otago region in general (including bringing wine tourism to the region), and meeting one on one with restaurateurs and wine shop owners.

In 2003, Mount Michael would also begin exporting wine to the United Kingdom (UK). A new neighbour of Sue's was establishing distribution channels to export his wines to the UK. His vineyard had only recently been planted and significant wine production would not come on-stream for three years. He had connections in the UK, however, which he wanted to develop ahead of his first vintage. Hence, arrangements were made for him to act as the distributor for Mount Michael wines in the UK. Sue expected to export approximately 300 cases of Pinot Noir next year through this arrangement.

These exporting plans had implications for the bottle style that Mount Michael used. Through the first three vintages, Mount Michael wines were bottled in a bottle style known locally as a Central Otago flute (*see Exhibit 4 for photographs of bottle styles*). The bottle was somewhat taller and thinner than a standard wine bottle, and was similar to the bottle style commonly used

for Rieslings in Europe. Early Cental Otago winemakers had collaborated, deciding to market their wines in this style of bottle as a way to identify Central Otago wines and distinguish this appellation from the many other New Zealand wine regions. When Sue had her first vintage of Mount Michael wines produced, she had used the Central Otago flute as a way to better associate her wines with the growing quality image of the Central Otago region. As with other New Zealand wine producers, the labelling on Mount Michael wines was also distinctive, and provided an additional ‘marketing hook’. The label showed a stylised view of the Central Otago basin where Mount Michael was located. It depicted the vineyard picked out against the hot, dry hills and clear blue skies that were typical of Central Otago and included several prominent local landmarks in the Catholic Church and two Wellingtonia trees.

Exhibit 4: Mount Michael Product Packaging

Burgundy style bottle		Central Otago flute style bottles
Agglomerate cork with printing		Screw Cap
Natural Cork with printing		Synthetic cork with printing
Bottle neck with screw cap closure		Bottle neck with cork closure

While Sue still felt that there was a certain elegance to the Central Otago flute style bottle, it posed somewhat of a liability in export markets. Buyers had different associations with the bottle and it was rare for a Pinot Noir to be bottled in this manner, outside of Central Otago. Sue was concerned about how consumers (and wine competition judges) might evaluate the non-traditional bottle style when considering a selection of Pinot Noir wines from a variety of different producers. In particular, Sue felt that the Central Otago flute might come across as gimmicky, which was not the signal that she or other Central Otago producers wanted to send. As export volumes of Central Otago wines had increased, there had been a shift away from this bottle style, at least for Pinot Noir.

Because of these concerns, Sue had decided to bottle all of her 2002 vintage in a more traditional Burgundy style bottle. Due to Mount Michael's small size and the fact that she currently only produced two varietals, Sue had decided that it was impractical to have two different bottle styles. Consequently, the decision was made to switch both the Pinot Noir and Chardonnay to the new bottle style. Having both wines in the same bottle style made ordering and handling bottles simpler and kept all of the packaging standard across the two varietals (e.g. cardboard case boxes). In addition to being a more accepted bottle style for Pinot Noir, the burgundy style bottle, at \$0.55 to \$0.75 per bottle, was also significantly cheaper than the Central Otago flute style bottle, which cost between \$0.80 and \$0.90 per bottle. Because of slightly different bottle specifications in the neck area of the bottle, Burgundy bottles suitable for screw cap closures cost approximately \$0.10 more per bottle. Bottles came in different quality grades, and Sue planned to continue to buy the highest quality bottles available in the new style. The labels would remain the same, as they were now recognised in the marketplace, and would just be adapted to fit the new bottle shape. It was this bottle change, in fact, that had led Sue to consider whether she should also be changing the type of closure used to address the cork taint problem the company experienced.

## **5. Cork Taint**

Cork taint had been a problem in the wine industry since cork was first used as a wine closure, more than 300 years ago. Natural cork came from the bark of the cork oak tree. Bark could be removed from the trees to produce corks once every nine years. Removing the bark did not damage the trees and the bark grew back. Although cork was produced across the Western Mediterranean region, the majority of cork, and the highest quality cork, came from Portugal.

Cork taint was caused by a chemical compound called 2-4-6 tri-chloro-anisole (TCA). TCA resulted from an interaction between invisible moulds that can grow in the pores of natural cork and the chlorine that is used to bleach

it before it is shaped into wine closures. Much effort had been put forth by the cork industry to find a way to eliminate, or at least detect, TCA in corks, but with little success. Estimates of the amount of corked wine varied widely, and ranged from 1.5% (the cork industry estimate) to upwards of 15% of all wine sealed with cork.

Based on her experience when opening wine for personal consumption or for the tasting room, Sue estimated that 8% to 10% of Mount Michael wines suffered from cork taint. Furthermore, a restaurant would notify her two or three times a year that a customer had returned a bottle of Mount Michael wine because it was corked. When a restaurant did report a corked bottle, Sue either sent them another bottle or refunded them for the corked bottle. In such cases, Sue could claim a refund of excise tax the vineyard had paid on the bottle, which amount to \$2.00 per bottle. Sue knew that restaurant owners understood that an occasional bottle of corked wine was a fact of life for wines sealed with cork. She did not feel that she was at risk of losing any of the restaurants that carried her wine over the issue of cork taint. Sue's concern, however, was that many diners drank tainted wine without recognizing it as being corked. Adding to Sue's concern was that she had never had a wineshop report that a customer had returned a bottle of Mount Michael wine because of cork taint.

When Mount Michael began having its own wine produced, Sue had not given much thought to the type of closure to use – quality wines were traditionally sealed with cork and it was the industry standard. Sue did buy the highest-grade Portuguese cork she could, from a reputable New Zealand cork distributor, in the hopes of minimizing the occurrence of cork taint. The corks cost \$0.43 each, were purchased in bags of 1000 and required approximately a one-month lead-time to obtain. Sue did not have any printing put on the cork, as many of the larger wineries did. Printing added to costs and lead-times, particularly in the quantities she was ordering, and she was unsure that having printing on the cork had any real impact on the consumer.

As there was no simple, reliable test to detect the presence of TCA in cork, Sue did not test the corks in any way before use. Larger wineries, including a couple that Sue knew of, frequently tested batches of cork before accepting them from cork suppliers. The testing process typically involved taking random samples of 50 or so corks from bales of 10,000, soaking the corks in uncorked wine for several days, and then smelling and tasting the wine for the presence of cork taint. If taint was detected in an unacceptable percentage, the batch was rejected. She did not know if the wineries that took this sampling approach had lower instances of cork taint or not, although anecdotal evidence suggested that they did. Sue did know that if some corks in a bag of 1000 were tainted, there was a high probability that others would also be.

## **6. Closure Choice**

While Sue had not ruled out continued use of natural cork, she was quite interested in trying to find a way to reduce the incidence of cork taint in her wines. There were three major alternatives to the use of natural cork: metal screw caps, agglomerate corks, and synthetic corks.

### **6.1. Screw Caps**

The greatest interest and controversy in the New Zealand wine industry focused on metal screw caps. An informal meeting of a number of prominent Marlborough winemakers to discuss ways to deal with cork taint had led to the creation of the “New Zealand Screwcap Wine Seal Initiative”, in May 2001. The initiative was founded on the belief that the use of screw caps resulted in the consumer receiving higher quality wine. Its purpose was to better facilitate the introduction of more high quality wines closed with screw caps. A primary aim of the initiative was to provide technical education and support to member wineries, as well as to educate the wine trade, the wine press and consumers about the benefits of screw caps. Twenty-nine wineries from across New Zealand were members of the initiative, including a number of wineries with well-established reputations for being high quality wine producers. Over twenty of these wineries, representing all of the major wine growing regions in New Zealand, released at least a portion of their 2001 vintage wines with screw cap closures. This was expected to increase significantly for the 2002 vintage.

Screw caps consisted of two parts; an outer aluminium shell, which was rolled to closely fit the bottle, and an inner liner, which actually provided the seal. The liner itself was a three-part poly laminate, consisting of a thin film of a neutral polymer that was in contact with the wine, a middle layer of foil that provided an impermeable gas barrier, and a layer of expanded polyethylene, which provided the liner resilience to maintain compression on the bottle rim. Given that only a layer of a neutral polymer ever came in contact with the wine, screw caps effectively eliminated any chance of cork taint. As screw caps were priced between \$0.18 and \$0.20 each, they were less than half the price of premium cork. Bottles that were suitable for accepting screw caps, however, were about \$0.10 more per bottle. This premium appeared to reflect the fact that worldwide there was much less demand for high quality bottles designed for screw cap closure than for traditional cork closure. Sue had checked with her bottler and he did have the capability to bottle wine with screw caps, as several of his Central Otago customers bottled at least some of their wines in screw cap bottles. Because it took about an hour to switch the equipment over to handle them, there was a nominal set-up charge associated with running screw caps. Additionally, there was a \$0.02/bottle surcharge for screw capped

bottles because the bottling line had to be operated at a reduced speed when screw cap closures were applied.

There were two major arguments being put forth against screw caps. One argument had to do primarily with consumer perceptions. Most consumers viewed screw caps as aesthetically unappealing. First, because screw caps had initially been used on lower quality wines, they would, in the minds of many, forever be associated with cheap wine. Secondly, screw caps were seen as detracting from the true wine experience. These were clearly very real issues that would need to be addressed if Sue elected to use screw caps. There was a significant education process that would have to occur with consumers. Sue knew this was possible with tasting room sales, but would require spending more time with customers to get the message across. It was much harder for wineshop and restaurant sales. Sue knew that some restaurants had concerns about screw caps because of the added time it would take wait staff to explain to diners why their expensive, premium wine did not have a cork. Sue also had to think about potential export markets. Evidence suggested that while New Zealand and Australian wine consumers were beginning to understand and accept screw caps on premium wine, there was much more resistance in the United States and Europe (particularly continental Europe).

The other argument against screw caps had to do with the aging process of wine. Over time, wines change and can improve significantly with bottle aging. One common perception was that cork was needed for the wine to develop and age properly. This perception, however, was the subject of significant controversy. Part of this perception, at least among consumers, arose from the belief that cork, as a “natural” closure, allowed trace amounts of oxygen to get into the bottle and trace amounts of carbon dioxide to escape, and that this small exchange of gases was needed for the wine to age properly. The evidence, Sue knew, was to the contrary. Little, if any, oxygen got into the bottle through cork, and if much oxygen did get into the bottle, the wine would quickly become flat and dull. The aging and maturation process in wine was much more of a reductive process that occurred in the absence of oxygen. In fact, Sue was finding some evidence that the perfect seal obtainable with screw caps resulted in a superior, and certainly a much more consistent (i.e., less bottle to bottle variation) maturation of the wine.

Many winemakers, however, were sceptical of how fine wines would bottle age with metal screw cap closures. Furthermore, winemakers simply had not been sealing fine wines with screw caps for long enough for a consensus to yet emerge across the industry. Because of this uncertainty about the impact of screw caps on the aging process, some wineries were using screw caps only on their white wines, which were traditionally not bottle aged for long periods, while continuing to use natural cork for their red wines. Sue’s conversations with other winegrowers, with retailers and restaurateurs who carried her wine, and with visitors to the tasting room also indicated that New Zealand

consumers tended to be a bit more receptive to white wines sealed with screw caps and had somewhat greater reservations about purchasing premium red wines sealed in screw caps.

## 6.2. Agglomerate Corks

A second alternative to natural cork being used by some wineries in Central Otago was agglomerated corks. Agglomerated corks, also known as 2+2 corks or twin disk corks, consisted of a mid-section of ground or granulated cork, which had a disk of natural high quality cork laminated at both ends. The original concept of the 2+2 cork was developed by a large cork manufacturer as a way to produce a less expensive cork that could better compete cost-wise with synthetic corks. Agglomerate corks cost about \$0.25 each. Since the wine only came into contact with the end disks, theoretically the possibility of taint was lessened. Anecdotal evidence from two other Central Otago wineries, that had been using the 2+2 corks, indicated that they did result in lower incidence of cork taint. Both of these wineries produced wine of comparable price and quality to Mount Michael. The company that bottled Mount Michael wines had informed Sue that as far as the bottling process went, there were no differences between 2+2 corks and natural corks as its bottling equipment accepted either style of cork.

The disadvantages of the 2+2 corks as a solution to cork taint were two-fold. The first disadvantage was that since the wine still came in contact with cork, 2+2s only appeared to reduce, but did not completely eliminate, the possibility of cork taint. Just how much of a reduction in cork taint could be achieved by using 2+2s was unclear. Sue had heard that one local winery felt that it had cut the incidence of cork taint in half, to around 4%, by using the 2+2 corks. Sue had also heard positive reports from her bottler regarding another winemaker in the area who was using 2+2 corks. This winemaker felt that the use of 2+2 corks had reduced the incidence of cork-tainted wine to less than 2%. The second disadvantage of agglomerated corks was that, like screw caps, they had an image problem. Sue had talked to a lot of people about switching closures, and some had suggested that seeing a twin disk cork suggested 'cheapness' to them. She knew this image problem extended beyond her circle of friends. Unlike with screw caps, the use of 2+2s was not evident until you removed the cork from the bottle. At this point the customer was at least committed to tasting the wine in the bottle. Some customers apparently did not even notice a 2+2 cork when used because of its similarity to natural cork. Further, the use of 2+2s could be made less obvious by printing on the cork, which several regional wineries did.

### 6.3. Synthetic Corks

A final alternative within the industry for dealing with cork taint was the use of synthetic corks made out of medical-grade thermoplastics. Synthetic cork, like screw caps, eliminated the possibility of cork taint. Early versions of synthetic corks had resulted in significant problems. Some lost their shape over time, which led to wine leakage and/or the cork would slide into the bottle of wine when the customer attempted to extract it. Others were so dense and tightly inserted into the bottle that consumers either had difficulty getting the corkscrew into the closure or experienced problems pulling it out of the bottle. Synthetic cork manufacturers had made significant improvements in the performance of these closures, to reduce or eliminate these difficulties. However, they still tended to be used primarily on inexpensive wines. In addition to eliminating the possibility of cork taint, synthetic corks were less expensive than natural cork (about \$0.20 each), came in a variety of colours, and were somewhat easier to print on than natural cork. A number of New Zealand wineries used synthetic corks. Notably Montana, New Zealand's biggest wine company, made extensive use of synthetic corks in their lower tier wines that would normally not be cellared. Sue had rejected the use of synthetic cork straight away. She felt synthetic corks implied cheapness and that this would send the consumer the wrong message about the quality of the wine inside. To the best of her knowledge, no premium Central Otago wine producers were using synthetic corks. In talking with her bottler, they confirmed that there was a slow shift towards both 2+2 and screw cap closures within the Central Otago region, but little interest was being shown in using synthetic cork.

## 7. The Closure Decision

Sue and her husband had always strived for high quality in their vineyard operations. They knew that their business's success depended upon maintaining a high quality reputation. Sue didn't like the thought that as many as one in ten of their customers were receiving Mount Michael wine with cork taint. But she also recognized that they were a small operation, and that there were risks associated with going against industry tradition. She needed to make a decision – it was springtime and there was much work to be done in the vineyard. Bottles and closures would soon need to be ordered for the 2002 wines, which would be ready for bottling soon.

**References:**

- Campbell, B. (2001), *Cuisine Wine Annual*, Cuisine Publications Ltd: Auckland.
- Cooper, M. (2001), *2002 Buyers guide to New Zealand Wines*, Hodder, Moa, Beckett; Auckland.
- Cooper, M., Sinnott, J. & Moon, K. (2002), Canterbury, Waipara, Otago & Nelson Regional Tasting, *Winestate Magazine*, 25(4), p. 112
- Halliday, J. and Johnson, H. (1999), *The Art and Science of Wine*, London: Mitchell Beazley.
- Jackson, D., & Schuster, D. (2001), *The production of grapes and wine in cool climates*, (2nd ed.), Wellington: Daphne Brasell Associates Ltd and Gypsum Press.
- New Zealand Winegrowers. (2002), *Annual Report Year Ended June 2002*, Auckland. Chair – P. V. Hubscher.

# Teaching Note

## Case Synopsis

Mount Michael is a small vineyard located in the Central Otago winegrowing region of New Zealand. Sue and Martin Anderson own and manage this private company. The Andersons planted their first grapes in 1994; 1999 was the first vintage from which they had wine produced under the Mount Michael name. Their vineyard, like many of the other vineyards and wineries of Central Otago, was quickly gaining a reputation for providing very high quality wines. The case, in addition to describing the effort the Anderson's put into ensuring that the wines produced from their grapes were the highest quality possible, focuses on the Anderson's growing concern about cork taint. While natural cork was the industry standard closure for high quality wines, it was known to taint the flavour of a small percentage of all bottles of wines that were sealed in this manner. Because of this, a small number of high quality winegrowers in New Zealand had or were in the process of moving away from natural cork as a closure. Sue estimated that 8%-10% of their wines suffered from some degree of cork taint, and she was likewise considering the use of alternative closures, most notably agglomerate corks and screw caps. The dilemma was that while these alternatives reduced or eliminated the incidence of cork taint, consumers perceived them poorly and tended to associate them with lower quality wines. Further complicating Sue's decision was the fact that she was set to expand her operation and begin exporting her wines for the first time.

## Courses and Levels for Which the Case Is Intended

This case was designed for use in a quality management class, at either the undergraduate or graduate level. The average graduate student is a little more likely to associate strongly with the case than the average undergraduate student due to their likely greater exposure to wine. The case, however, is not overly complex and so undergraduate students will find it quite approachable. Because the case provides a description of the planned, incremental approach adopted by the business's owner to create Mount Michael Vineyard and to enter the high quality wine market, it would also be useful for looking at quality management and/or marketing issues in an entrepreneurship or small business management class. There are also strategic implications associated

with the creation and ongoing operation of this business, which are worth discussing.

### **Teaching Objectives**

This case can be used to illustrate and provide the basis for significant classroom discussion of a number of quality management concepts:

- Illustrate how a small business implements a strategy based on high quality. In the case, the student can see how Mount Michael's owners consistently make decisions based on how those decisions will impact quality.
- Provide a basis for discussing alternative definitions and dimensions of quality. It is particularly well suited for illustrating Garvin's multi-dimensional approach to understanding quality, as each of the closure alternatives result in higher quality along certain dimensions, but lower quality along others.
- Illustrate the use of the "cost of quality" concept to understand the extent to which quality is an issue for the organisation.
- Provide a rather dramatic illustration of how all decisions across the supply chain can have a critical affect on the quality of the final product. In this case, the type of closure used would seem to represent a relatively minor step in the overall process, but the decision can lead to upwards of 10% of all bottles being defective when opened by the customer.
- Provide a basis for discussing the proper role of inspection in an organization.
- Provide a nice illustration of the need to integrate marketing and operations thinking about quality into a single decision.
- Illustrate how a small business can take a very planned, incremental approach to successfully enter a market niche that demands extremely high quality levels.

## Discussion Questions & Answers

*1. How important is quality to Mount Michael's success? What decisions has Sue made with respect to quality thus far that indicate her commitment to producing high quality wine?*

Producing a high quality wine and establishing a high quality reputation is absolutely critical to Mount Michael's success. Case Exhibit 1 on the New Zealand and Central Otago wine industry should establish this fact clearly in the student's mind.

Mount Michael is a very small producer. Mount Michael has 3 ha and is expanding to 6 ha. This compares to 15,829 ha in production in New Zealand – Mount Michael accounts for 0.019% of the New Zealand's wine grape production. The three biggest producers in New Zealand control 78% of the domestic market (plus are major exporters). Mount Michael is one of 390 other winegrowers in the country currently sharing the remaining 10% of the market (after imports are factored in). Further, the domestic market, which even with planned exports will likely remain very important to Mount Michael, appears to have reached its peak. Compounding the size factor, Mount Michael is located in a region of New Zealand with a more challenging and higher cost environment to produce wines in. These challenges include terroir requirements (i.e. frosts), logistics (i.e. nearest major city 276km away) and lack of a developed support infrastructure (e.g. skilled staff and wine related support industries such as engineering). The point to establish is that Mount Michael simply can't compete on cost or other dimensions – if it does not produce a very high quality product, it will not survive as a wine producer. This discussion could be linked in with Porter's (1985) three generic strategies. Using this framework, being a low cost producer and differentiating by providing a wide variety of wine styles are not viable options given terroir and location aspects of the Central Otago wine region.

All of Sue's decisions to date have appeared to focus on this need to produce a high quality wine and establish a high quality reputation. Prominent examples of this focus on Sue's part include:

- spending two years selecting a vineyard site
- restricting her initial plantings to two grapes varieties and only 3 ha so she could better focus her efforts and learn more about the site and varieties before planting the remaining acreage
- selling her first two harvest to another producer to focus her efforts on quality in the vineyard

- trimming vines and thinning grape bunches to yield lower volume, but higher quality grapes
- selecting the more expensive, Central Otago flute style bottle to increase the association of her wines with the growing quality reputation of the Central Otago region
- contracting a winemaker based on his reputation for producing high quality wines
- using the highest priced, highest grade of natural cork available in an attempt to minimize the occurrence of cork taint
- immediately replacing bottles of wine or refunding money when a customer reported receiving a cork tainted bottle of wine (customers here being the restaurants, as to date she has had no wine come back via a bottle store)
- providing bottles of her wine for review in prominent wine magazines and books in New Zealand and selectively participating in competitions to obtain independent, informed, evaluations of her wines that would further establish the vineyards reputation for high quality
- spending time one on one with restaurant and retail shop owners to make sure that they have tried her wines and understand the quality of the wines so they can make recommendations to their customers
- making extensive use of informal benchmarking – there is clear evidence in the case that Sue knows what other winegrowers in the region are doing and is keen to learn from their experiences

The point of spending time highlighting these decisions with the class is that they provide a strong example of how a business competing on the basis of high quality achieves high quality by making every decision based on how it will impact quality. That is, the consistency of decision-making provides a good illustration of how a high quality strategy is implemented over time in a small business.

2. *Use a supply chain framework to identify the factors affecting the quality of a glass of Mount Michael wine when finally drunk by a consumer. Who controls each of these steps?*

It is generally considered in the industry that for quality wine to be made, quality practices and decisions must occur in the vineyard. This question seeks to get the students to realise that while quality must be built into the operation internally, external factors must also be considered. The generic Supply Chain Management (SCM) framework discussed by Davis (1993) – supply management, focal / transformation organisation and demand management – is a good way to view quality in Mount Michaels supply chain. Mount Michael is the focal organisation in this particular supply chain, and as such all activities in the grape cycle (Case Exhibit 2) have significant implications for quality. For example, at the start of the grape growth cycle, frosts will inhibit buds forming on the canes, and so must be managed. Further, if pickers can not be sourced when required at harvest, deteriorating weather conditions could result in grapes being picked too early, so that desired flavour levels are not reached, or alternatively too late, whereby mould could negatively impact on crop levels.

From a supply management perspective, receiving the correct clones for the site, as well as the other inputs (e.g. sprays, fertilizers, staff to harvest, etc) all make important contributions to the finished product. Students can link in the phases of the vineyard / wine production exhibit to illustrate this point. At the other end of the supply chain, demand management issues are also apparent in the case. Both first tier (i.e. bottle shops and restaurants) and second tier customers (i.e. final consumer) are mentioned in the case and their views, with respect to purchasing high quality wine, must be communicated back through the supply chain, in terms of the quality of the product and also its aesthetic aspects. At this stage, Sue maintains a great deal of control of these decisions, but the changes occurring at Mount Michael, both in terms of expansion and exporting, may see this control shift. Instructor's Manual Exhibit 1 provides a further breakdown highlighting supply chain quality and control issues.

Finally, the transference of information and knowledge is a key factor in SCM, and is recognised in the case with Sue's exchanges and benchmarking of other wineries and vineyards in the region, as well as support industries. These exchanges can be viewed in terms of continuous improvement and building in quality. Sue's meetings with retail shop and restaurant owners further insures information on the quality of the wine (and the care that goes into making it) is transferred forward in the supply chain to the end customer. An additional factor is the issue of logistics / transportation / warehousing, given the fact that wine must be stored correctly, and also how to get it from Central Otago to its customers throughout NZ and internationally, in a timely and safe manner (e.g. no breakages in transportation). Consequently, when viewed under the SCM umbrella, the "value adding" ideology and quality practices must be achieved throughout all linkages of the wine supply chain if market demands are to be achieved, and the business remain competitive.

*3. How would you characterize the management of growth at Mount Michael Vineyards? What implications does this seem to have for quality?*

Sue and her husband have taken a slow, steady, almost methodical, approach to growing their business. The evidence in the case suggests that they plan ahead and are patient in their implementation of these plans. They decided how large of a vineyard they wanted to have, took their time locating a site, and then planted only a portion of the site initially based on the resources they had available to them and their desire to learn more about the site. They started by selling grapes to another winery before having wines produced for their own label. They are now, 10 years after first deciding on creating a 6 ha vineyard, planting the other half of their site. They initially started with two grape varietals, and are adding a third based on what they have learned about the region. They initially focused on domestic sales, and are now moving toward exporting.

This well planned and controlled approach to growth has an impact on quality. It has ensured that the Anderson's have adopted a proactive approach to decision making, and not a reactive one that could be detrimental in terms of the quality of product they deliver. This has clearly further facilitated the establishment of a high quality product and reputation (as elaborated on in discussion question 1). Entrepreneurs, who are not used to making so many decisions and get too wrapped up in the short-term demands of the business, often overlook this proactive, controlled approach. Failure to plan and act proactively contributes to the high failure rates of small businesses discussed in the literature {e.g., see work by Zacharakis et al., (1999) and also research conducted by Jennings and Beaver (1995, 1997)}.

*4. How would quality be defined in the case of wine and how would the closure choice impact on the quality of Mount Michael wines?*

This question provides a good way to discuss the multi faceted aspect of quality. One could use Garvin's (1984) eight principle quality dimensions to discuss how quality should be thought about in this instance. Instructor's Manual Exhibit 2 provides a detailed analysis of wine quality based on Garvin's definitions and looks at the impact of closure on each of these dimensions. In terms of performance, conformance and reliability, cork clearly results in a lower quality product. However, in terms of aesthetics and perceived quality, cork clearly results in a higher quality product. (The other three dimensions tend to be less applicable to wine.) This discussion highlights the importance of understanding how a business's customers think about the quality of the product and the need for the business to understand the trade-offs between these dimensions from the customer's perspective.

Alternately, one could use more simple definitions of quality in discussing this question, focusing, for example, on “conformance to specifications” and “fitness for use” definitions of quality. While these basic definitions will not provide as rich a framework as Garvin’s multi-dimensional approach, they could be used to lead the student to similar conclusions. Specifically, the “conformance to specification” definition presents a more product focused, operationally oriented view that would tend to suggest that quality would be improved by moving away from cork. The somewhat broader “fitness for use” definition likely better captures the customer experience with the wine and the aspect of aesthetics associated with having a traditional cork closure that might suggest a wine with a screw cap is not fit for use in the customer’s mind (more or less regardless of the quality of the liquid in the bottle). This discussion highlights the limitation of relying solely on the “conformance to specification” definition of quality, although the problem can then be traced back to what should be included in the specifications (i.e., does the customer’s preference for cork, even if based on incomplete knowledge of its impact on the quality of the wine inside the bottle, require specification of cork as the closure choice?). Like in the case of using Garvin’s dimensional framework, the discussion leads the student to realize the importance of understanding quality from the customer’s perspective.

5. *Evaluate the cork taint problem at Mount Michael Vineyard using a ‘cost of quality’ framework.*

Quality costs are typically classified into 4 major categories, prevention, appraisal, internal failure and external failure costs (see Gyra, 1988 or Evans & Lindsay, 1999 for good discussions of cost of quality concepts). Looking at these individual cost categories at they relate to the cork taint problem reveals the following:

1. Prevention Costs – investments made to keep non-conforming product from occurring – Sue purchases the highest grade cork in an effort to minimize cork taint, so the premium she pays for the cork would be a prevention cost. The case does not give details on lower grades of cork, but given twin disk and synthetic corks are in the \$0.20 - \$0.25 range per cork, the student could infer this premium is almost certainly less than \$0.20 per cork (and Sue would not want to buy the cheapest grade of cork for other reasons anyway). If we assume a \$0.10 premium on cork, at 800 cases, 12 bottles per case, gives an annual prevention cost estimate of \$960.00.

2. Appraisal Costs – costs associated with inspection and measurement to detect non-conforming product – Given that cork taint has a significant element of randomness to it, testing wine after it is bottled is impractical. Some wineries do test samples of cork before accepting them from the suppliers, and the costs of doing such testing would be an appraisal cost. Sue does not do this, so with respect to cork taint, her appraisal cost is \$0.00.
  
3. Internal failure costs – costs resulting from non-conforming product found before delivery of the product to the customer – The case indicates that Sue discovers a few bottles of wine each year through her tasting room operation that have cork taint (it is these discoveries which lead to her assessment that 8%-10% of the wine suffers from cork taint). The case does not quantify a few, but it is almost certainly less than a case of wine a year. The cost of these discoveries is the lost revenue from the lost future sale of the replacement bottle she must open (\$28.50 average cost on assumption half are Chardonnay, half are Pinot Noir), plus the costs that were invested in the production of the wine in the bottle that was tainted (\$8.67 based on the average Central Otago wine production costs shown in Case Exhibit 1), or approximately \$37.17/bottle. If one estimates that Sue finds less than a case of tainted wine, the internal failure cost would be no more than \$446.04.
  
4. External failure costs – costs resulting from non-conforming product that reaches the customer – This is the major cost in Mount Michaels situation, as most of the corked wine finds its way to the consumer. However, little of this wine is returned. The case states that restaurants would report a returned bottle “two or three times a year”. Sue would either send these restaurants a refund or a replacement bottle. Sending a replacement bottle is more expensive. Given the lost production cost, the lost revenue associated with the replacement bottle, plus the shipping, this would amount to maybe \$50.00/bottle x 3 = \$150.00.

The greater external failure costs are clearly the intangible costs – the unhappy customers, the lost future sales, and the potential damage that the cork tainted wine could have on Mount Michael’s reputation. It is hard to estimate just what cost to associate with this.

$(800 \text{ cases})(12 \text{ bottles/case})(9\% \text{ cork tainted}) = 864 \text{ bottles to replace.}$   
 One way to estimate a minimum cost figure for this would be to consider what would happen if all customers could recognized cork-tainted wines and took

the time to request a replacement bottle. Since winegrowers, including Sue, indicate that their greatest frustrations from cork taint relates to consumers' inability to recognize it for what it is, one could conclude that the "cost" associated with external failure would decrease if consumers were more knowledgeable. That is, winegrowers would be better off replacing cork tainted wine for consumers rather than having consumers who buy such a bottle go away simply thinking the winegrower makes low quality wine. In Mount Michael's case, that means:

Using the earlier estimated cost of \$50.00/replacement bottle, one arrives at a minimum cost of external failure as \$43,200.00. For a small business, this is a large expense. While the case doesn't provide financial data for Mount Michael, students could quickly estimate revenues at somewhere around

$$(800 \text{ cases})(12 \text{ bottles/case})(\$28.50 \text{ average wine price}) = \$273,600.00$$

This estimate is high since it doesn't include bottles used for tasting, competitions and the like – but it provides a ballpark estimate and allows the student to see that the external failure cost associated with cork taint is at least  $\$43,200/\$273,600 = 16\%$  of Mount Michael's revenues.

6. *What are the advantages and disadvantages of each alternative Sue is considering?*

The advantages and disadvantages of each alternative are described in a straightforward way in the case and are summarized in Instructor's Manual Exhibit 3. Basically, the advantages/disadvantages boil down to quality of the wine itself versus quality of the wine experience and consumer perceptions about the alternative closures. There is also uncertainty about the impact of non-cork closures on the bottle aging and maturation process. Most of these will have come out in discussing how quality should be defined in this context. The potential benefit of quickly summarizing these in the discussion is to push students to move beyond reiterating these primary advantages/disadvantages to consider how Sue should think about them for her particular business in order to arrive at a reasonable solution. Instructor's Manual Exhibit 3 also provides a net change cost summary associated with the three new options in comparison to cork. Students should recognize, however, that the cost implications in this case are, at the most, a minor consideration in the decision.

7. *What factors unique to Mount Michael influence Sue's decision on the choice of wine closure? How should the decisions of other wine producers influence Mount Michael's decision?*

There are a variety of factors about Mount Michael's circumstances that should be taken into consideration in making a decision. One of the points to emphasize here is that not all wineries will make the same choice because of their particular circumstances. The factors that should come out of discussion are:

1. *The newness of Mount Michael wines:* The vineyard is a relatively young one, only having released three vintages of wine to date. It has not had as long as many other wineries in New Zealand or Central Otago to establish its name and reputation among wine drinkers. Lacking knowledge of the vineyard and the brand, consumers would be more likely to use closure method as an important signal of quality (compared to how they might evaluate a bottle of wine from a more established competitor).
2. *The size of Mount Michael vineyard:* As mentioned earlier, Mount Michael is a quite small vineyard. There are two important implications of size on the closure choice. First, Sue feels it necessary for ordering and packaging purposes to use the same bottle and closure style for both of her wines. Screw caps have been more widely used, and are somewhat more accepted because of the issue of bottle aging, on white wines. While a few producers are moving all of their wines to screw caps, many are putting their white wines in screw cap bottles and taking a "wait and see" approach with their red wines. Mount Michael's size effectively eliminates this as an option. And second, Mount Michael's size gives it somewhat less influence with consumers and the wine trade than larger winegrowers might have. This poses greater risks to Mount Michael should it choose to break from industry standard practice.
3. *Mount Michael's move into exporting:* As Mount Michael begins to use a distributor and export out of New Zealand, Sue will lose significant influence on potential customers. Not only does Mount Michael now sell a large percentage of its wine through its tasting room, but Sue manages all of the sales herself, working directly with wineshop and restaurant owners. As Sue's role in the distribution of her wine diminishes, buyers will tend to rely on other signals of quality to decide whether to purchase the wine (i.e.,

awards, reviews, label, and closure style instead of on Sue's salesmanship). Further, while there is significant effort underway by a small number of New Zealand wineries to educate consumers about the benefits of screw caps, the extent to which this educational effort extends outside of New Zealand (and particularly to the UK in the case of Mount Michael) is unclear.

4. *Mount Michael's expansion to 6 ha*: Expansion can be thought to influence the decision in two ways. First, it will double the quantity of Mount Michael wine in absolute terms that could be tainted by cork. This increases the pressure on Sue to do something to reduce the incidence of cork taint. Second, it will likely lead to a further reduction of Sue's direct role in distribution as there will be more work to oversee in the vineyard and less time for her to sell twice the volume of wine. As in exporting, she plays a less direct role in the distribution process; consumers will have to rely on other signals to make their purchase decisions.

In terms of the decisions of other winegrowers and wineries, there are several points worth making. First, the fact that other high quality producers have begun to bottle their wines in screw caps makes this a viable option worth considering. Given the size and short tenure of Mount Michael wines, Sue would not have been in a position to even consider a move to alternative closures if other larger, more established winegrowers hadn't chosen to pursue them. Part of the question for the student to consider in making a recommendation is whether there are enough other producers moving in this direction to create a critical mass to change consumer perceptions, both within New Zealand and in important export markets. In relation to screw caps, it is worth noting that fewer than 10% of all New Zealand winegrowers are members of the NZ Screwcap Wine Seal Initiative. There is less information in the case to indicate how many producers are using 2+2s, but as with screw caps, the evidence available suggests it's a small but growing number. In addition to providing a potential critical mass necessary to change consumer perceptions, the fact that at least some other winegrowers in the Central Otago region have opted to use screw caps means that the contract bottler possesses the capability to seal using screw caps. The decisions of other winegrowers regarding closure choice also provide Sue with a source of information to better evaluate the alternatives. It is evident from the case that Sue is very receptive to learning from other producers. Regardless of what decision she makes for the 2002 vintage, she should continue to try to learn from the experience gained by neighbouring producers.

8. *What closure alternative would you recommend for Mount Michael? What is the rationale for your recommendation?*

This question forces students to take a position and provides a wrap up at the end of the case discussion. All of the alternatives can be defended – what one looks for the student to do at this point is to draw together the preceding analysis into a coherent argument for one of the alternatives.

Risk should also be addressed at this point, if not earlier in the discussion. Students should recognize that there are two types of risks associated with changing the bottle closure. There is a short-term risk of lost sales revenues, if customers stop buying Mount Michael wines because of the closure choice, and a long-term risk to Mount Michael's growing quality reputation if consumers begin to associate "cheapness" with the Mount Michael brand. While the short term risk is clearly significant, particularly because of the size of Mount Michael, the latter is even more significant because of how long it takes to build that reputation and how critical it is for Sue to establish that reputation to be successful (both illustrated by discussion question 1). Screw caps clearly represent the riskiest alternative because they are visible to the customer before purchase and they are significantly different from traditional, natural cork closures. Screw caps, however, also represent the only alternative of the three that Sue is considering that eliminates the root cause of the cork taint. It is also worth noting that the "status quo" alternative of staying with natural cork is not without risk given that many customers may evaluate Mount Michael's quality based on corked wine. The increased levels of production due to impending expansion plans must also be factored into this analysis.

Following from the discussion of risk, it is worth discussing the value of the "middle of the road" solution posed by the 2+2s. On the one hand, the 2+2s appear to cut the cork taint problem at least in half while not being as obviously different to the consumer, and could be argued to represent a reasonable incremental improvement. On the other hand, the 2+2s clearly do not eliminate the root cause of the problem (i.e., either the taint in the cork or the cork's contact with the wine) and hold the potential to imply "cheapness" to the customer, effectively combining the disadvantages of both natural cork and screw caps into a single closure. The first interpretation is probably a somewhat fairer representation of this alternative, particularly given Mount Michael's circumstances (highlighted in question 7).

Related to this "middle of the road" discussion, the point can also be made that there is nothing that locks Sue into her closure choice beyond the 2002 vintage (i.e., switching closures does not require any capital investment on the part of either Sue or her bottler). While Sue would not want to be constantly changing closures with each vintage, she could approach the decision as a planned evolution over several years. For example, she could decide to switch to 2+2s now as a way to reduce cork taint, and then plan to reconsider her

decision after evaluating the performance of the 2+2s on her own wines and assessing how the market was responding to screw caps from other producers. Further, once the second 3 hectares of the vineyard begin producing, the added volume would create the additional option of using different closures for her different wines. She might, at that point, consider switching her white wines to screw caps while leaving her Pinot Noir in 2+2s (or natural cork).

One could frame this discussion in the context of two questions. First, should she change closures? And second, when should she make the change? The timing issue seems to boil down to when Mount Michael's reputation is sufficiently established such that the marketplace will not use closure choice as a method of evaluation. Ultimately Sue wants to reduce the risk of the market evaluating or rejecting her wines based on closure choice. In the name of minimizing the risk to Mount Michael's growing reputation as a quality wine producer, it might be argued that Sue would want to avoid having the market deal with too many changes at one time (i.e., changing bottle style and switching to screw cap closure at the same time). This type of an argument would provide further support for taking a middle of the road type of solution, whilst still laying the groundwork should Sue look to change the closure to screw caps at a later date (the screw cap closure looks similar to a foil and cork closure on the Burgundy style bottle until it is examined closely, as seen in Case Exhibit 3).

The issue of cork inspection could also be addressed in connection with "middle of the road" solutions. Sue does not inspect corks, as some larger wineries do. Clearly modern quality management approaches do not encourage the use of inspection, but cork inspection might be broached as a temporary measure until Mount Michael's reputation has further solidified and/or until there is evidence of broader consumer acceptance of screw caps. An inspection program might be implemented with continued use of natural cork or even in conjunction with a switch to 2+2s. While inspection is a time consuming and inexact process, it would seem justified given the high cost of poor quality, particularly if natural cork was retained.

Finally, it is important to highlight the need to monitor the outcomes of any change Sue does make, both in terms of reduction in cork taint and the market reaction to the change. Deming's (1986) Plan-Do-Check-Act cycle of improvement might be introduced as a way to emphasize the need to gather data on the 2002 vintage to make an assessment of whether Sue's decision achieves the desired results and should be continued. Additionally, she should continue to benchmark / review closure choices and outcomes of those high quality operations around her. Time will tell how the screw cap initiatives and 2+2s solve / negate the taint problem found in natural cork, and also how they are perceived by the market.

## Teaching Suggestions

The discussion questions have been developed so the instructor can use them in the order presented to lead the class through the case. The initial case discussion, focusing on the first three questions, can be used to illustrate how a small company trying to establish itself in a high quality market niche needs to make decisions. The discussion can highlight the Anderson's ongoing focus on quality, the patience they have exhibited in establishing the business, and the interaction with and attention to the entire supply chain in which they operate. The point this portion of the case discussion illustrates is that "high quality" doesn't simply happen – it is the result of ongoing effort across the supply chain. This early discussion also establishes the investment that the Anderson's have made in their vineyard's reputation.

Having established the extent of the effort put into achieving high quality, the discussion can transition to the impact of the closure. Drawing from Case Exhibit 2, the instructor can make the point that despite all of the effort on the part of the Andersons and the other key players in the supply chain, 10% of the product can turn out to be defective because of the failure of a \$.43 cork. As Julie Arkell (1999), writing in *New World Wines* about the use of natural cork, put it, why would winemakers "invest millions of dollars in top-grade vineyard development and high tech winery technology, just to have their efforts – and reputation – ruined by a tiny, miserable piece of bark?" (p. 31).

Discussion question 4 is designed to allow the instructor to bring out the salient issues in the cork versus alternative closures debate in the context of how the consumer perceives quality. Garvin's framework provides a useful tool to do this, and highlights the need to understand the multi-dimensional construct of quality from the consumer's perspective. Question 5 takes the next step and translates the defect rate into a "cost of quality" framework to show that even using minimum costs, the dollar value of this failure is quite significant (particularly to a small business). Depending upon how well the advantages and disadvantages emerge from discussion of Garvin's framework, the instructor may choose to skip explicit discussion of question 6.

Question 7 then provides the instructor the opportunity to highlight those factors unique to Mount Michael that will affect Sue's decision and illustrate that there is not likely to be a "one best answer" for all winegrowers. Discussion of this question is probably more important for undergraduate classes – graduate students would be more likely to explicitly factor these issues into their recommendation if left unprompted by this question. Having laid all of the groundwork for making a decision, the instructor can then ask students for their recommendations and the rationale for these recommendations. The alternative of using 2+2s presents an interesting opportunity to discuss the value of "middle of the road" decisions with respect to quality, particularly given that this alternative doesn't really address the root

cause of the cork taint problem. The instructor can bring closure to the discussion by emphasizing the need for Sue to monitor the impact of her decision, thereby reinforcing the concept of the PDCA cycle of continuous improvement.

Instructors who want updated information on the New Zealand wine industry and/or the use of screw caps in New Zealand at the time they teach the case should refer to either [www.nzwine.co.nz](http://www.nzwine.co.nz), the website of the New Zealand winegrowers association, and/or [www.screwcap.co.nz](http://www.screwcap.co.nz), the website of the New Zealand Screwcap Wine Initiative.

## **Epilogue**

Sue selected the 2+2 corks to close her 2002 wines. She concluded that Mount Michael had not been around long enough and that the brand was not well enough recognized to make the leap to screw caps. She felt the 2+2 were a good intermediate step – they would reduce the incidence of cork taint but not make her wines stand out negatively on the shelf. She left open the possibility that once the additional three hectares were producing, she might reconsider based on her experiences with the 2+2s and the general consumer reaction to the use of screw caps by leading regional and New Zealand wineries. Sue also thought that when the full six hectares were producing that volumes would be such that she could consider different closures for the red and white wines, at which point she might revisit the closure choice for her white wines. Further, the switch to the burgundy style bottle now meant that a later shift to screw caps would stand out less because consumers would already be familiar with the new bottle style.

The New Zealand wine industry overall moved away from cork and toward screw cap closures more quickly than anticipated, with many wineries putting all or most of their wines under screw cap closure by the end of 2004. At the New Zealand new release wine tasting put on by the New Zealand Winegrowers Association in September of 2004, for example, only 18% of the 180 bottles shown were sealed in natural cork (and three of these showed signs of cork taint), while the majority of wines were sealed with screw caps. Similarly, at the Air New Zealand Wine Awards in November of 2004, all of the highest rated wines were sealed with a screw cap (with the exception of the sparkling category).

**References:**

- Arkell, Julie (1999), *New World Wines: The Complete Guide*, Focus Publishing: Seven Oaks, Kent.
- Campbell, B. (2001), *Cuisine Wine Annual*, Cuisine Publications Ltd: Auckland.
- Cooper, M. (2001), *2002 Buyers guide to New Zealand Wines*. Hodder, Moa, Beckett; Auckland.
- Cooper, M., Sinnott, J. & Moon, K. (2002), Canterbury, Waipara, Otago & Nelson Regional Tasting, *Winestate Magazine*, 25(4), p. 112
- Davis, T. (1993), "Effective supply chain management", *Sloan Management Review*, Summer. 35-46.
- Deming, W.E. (1986), *Out of Crisis*, Cambridge, MA: MIT Centre for Advanced Engineering Studies.
- Evans, J.R. & Lindsay, W.M. (1999), *The Management and Control of Quality*, 4<sup>th</sup> ed. Cincinnati, Ohio: Southwestern College Publishing.
- Garvin, David A. (1984), "What does product quality really mean?" *Sloan Management Review*, 26(1): 25-43.
- Gyrna, Frank M. (1998), Quality Costs. in Juran, J. (ed.), *Juran's Quality Handbook*, 5<sup>th</sup> edition, New York: McGraw Hill, 1998.
- Halliday, J. and Johnson, H. (1999), *The Art and Science of Wine*, London: Mitchell Beazley.
- Jackson, D., & Schuster, D. (2001), *The production of grapes and wine in cool climates*, (2nd ed.). Wellington: Daphne Brasell Associates Ltd and Gypsum Press.
- Jennings, P., Beaver, G. (1997), "The performance and competitive advantage of small firms: A management perspective", *International Small Business Journal*, 15(2), 63-75.
- Jennings, P., Beaver, G. (1995), "The managerial dimensions of small business failure", *Journal of Strategic Change*, 4(4), 185-200.
- Porter, M. (1985), *Competitive advantage: Creating and sustaining superior performance*, New York: Free Press.
- New Zealand Winegrowers. (2002), *Annual Report Year Ended June 2002*, Auckland. Chair – P. V. Hubscher.
- Zacharakis, A.L., Meyer, G.D., DeCastro, J. (1999), "Differing perceptions of new venture failure: A matched exploratory study of venture capitalists and entrepreneurs", *Journal of Small Business Management*, July, 1-14.

Instructor’s Manual Exhibit 1: Evaluation of Quality Across the Supply Chain

Process Step	Who Controls	Comments
Site selection	Sue	These decisions were essentially made once, while other decisions are made annually.
Clone selection	Sue	Sought advice to ascertain the most appropriate clones for her site.
Vineyard plan	Sue	Same as above
Vineyard management	Sue	As illustrated in case Case Exhibit 2, many factors associated with vineyard management impacted on the quality achieved in the final product. Using a SCM framework, quality aspects of supply, demand and transformational management can be discussed.
Harvest	Sue / Winemaker	Selecting the time at which to harvest is quite important to achieve best characteristics of the wine.
Winemaking	Winemaker	Different processes required for red and white wines. Other influences brought to bear at this stage, but most winemakers state that while good wine starts in the vineyard, it is their job to capture that essence of quality in the bottle.
Barrel aging	Winemaker	Source premium French oak barrels.
Bottling	Winemaker, Sue & Contract Bottler	The winemaker decided when the wine was ready for bottling, Sue decided the bottle and label styles and the method of closure, the contract bottler oversaw the actual bottling process
Bottle aging	Sue & Winemaker	As Mount Michael is a small operation, Sue must balance aging wine with generating cash flow.
Storage prior to sale	Sue	Storage must be in controlled environment to insure quality. Expansion of vineyard will mean storage requirements will increase.
Storage prior to sale to final customer	Wineshop or restaurant	While Sue can control presentation with respect to bottles used, label designs and stickers, once it leaves Mount Michael, this control is lost. Incorrect storage of wine (e.g. fluctuating temperatures), can impact on quality. Expansion may further limit Sue’s ability to put award stickers on bottles.
Presentation to customer	Either the restaurant waitperson or bottle shop employee	How the 2 <sup>nd</sup> tier customer receives the wine is solely dependent on 1 <sup>st</sup> tier customers actions (e.g. waiting staff promoting it in restaurants or bottle shops displaying the wine on the shelves). As such Sue loses control. Her input would be if she was contacted regarding a corked bottle, and current procedures of quickly providing a replacement will mitigate to a degree, negative quality aspects of this exchange.

*Instructor's Manual Exhibit 2: Garvin's Dimensions of Quality As They Relate to Wine Closure Choice*

<b>Quality Dimension</b>	<b>Applied to Wine</b>	<b>Impact of Choice of Closure</b>	<b>Higher Quality</b>
<b>Performance</b> Primary operating characteristics	Taste	Cork can taint wine, negatively impacting taste, while screw caps do not. Sue believed cork taint affected 8%-10% of her wines, industry estimates varied from 1.5% to 15%. Based on anecdotal evidence, 2+2s reduce taint to somewhere in the 1%-4% range.	screw cap
<b>Features</b> "bells and whistles" of the product	Not as applicable as other dimensions in this example.	Some might argue that the ease of opening and re-sealing associated with screw caps would represent a feature of the wine. Others could argue that the traditional "pop" of the cork being removed from the bottle represented a feature of wines sealed with cork or 2+2s.	same or screw cap
<b>Reliability</b> The probability of a product surviving over a specified period of time under stated conditions of use	The probability that the wine will either improve (or at least not deteriorate) with age; the concept that a buyer can cellar the wine and expect it to be at least as good as when purchased for a reasonable number of years for the given grape variety and the style/intention with which the wine was produced (i.e., made to be enjoyed soon after release or made to improve over time)	Cork taint can occur during aging process. Even without taint, cork-wine interaction over time influences aging process, so different bottles of the same wine will age differently with cork. Given that there is still cork in contact with wine with 2+2s, their impact on variation in aging is likely to be similar to cork. Screw caps eliminate this source of variation in aging process, improving reliability.	screw cap
<b>Conformance</b> The degree to which physical and performance characteristics match pre-established standards	All wine in a given batch is identical when it goes into the bottle, matching the winemakers intentions (i.e., specifications) for the wine. Ideally, all wine from that batch (and of a given age) will be identical and match the winemakers intentions for the wine at that stage of development.	In addition to the potential for cork taint, cork-wine interaction means wine will develop differently and not all match winemakers intentions (i.e., not all conform to specifications). This can occur between the time of bottling and when the consumer buys the bottle (i.e., conformance might be thought about as relating to when the bottle is bought by the consumer, reliability is an issue for those consumers who choose to cellar their wine). Again, 2+2s would likely be similar to cork in this regard.	screw cap

Instructor’s Manual Exhibit 2: (continued)

Quality Dimension	Applied to Wine	Impact of Choice of Closure	Higher Quality
<p><b>Durability</b> The amount of use one gets from a product before it physically deteriorates or until replacement is preferable</p>	<p>Not as applicable to wine. One could make the case that durability of wine relates to the ability to store and move the wine frequently without adversely impacting the wine (i.e., robustness to handling). Note that some students may associate durability with the aging process, but since the wine is not in use during aging, this point is better associated with reliability.</p>	<p>Screw caps create a wine that is more durable (given the preceding interpretation of durability) because the wine can be stored in more ways because it doesn’t have to always be kept so the wine is in contact with the cork (i.e., on its side or upside down). 2+2s would be similar to cork on this dimension.</p>	<p>same or screw cap</p>
<p><b>Serviceability</b> The speed, courtesy and competence of repair work</p>	<p>Not as applicable to wine</p>		
<p><b>Aesthetics</b> How a product looks, feels, sounds, tastes or smells.</p>	<p>The look and feel of the bottle, including its closure and label. The colour and clarity of the wine in the glass.</p>	<p>Cork is the traditional and expected closure. Using a corkscrew and the ‘pop’ associated with pulling the cork from the bottle are, for many, an important part of the wine experience. This is particularly true in restaurants where there is an almost ceremonial aspect to the opening of the wine. Screw caps do not produce the same experience; the aesthetics are lost.</p>	<p>Cork</p>
<p><b>Perceived Quality</b> Subjective assessment of quality resulting from image, advertising or brand names</p>	<p>This is often shaped by a firm’s marketing efforts as well as by independent reviews by wine critics. Historical presentation of wine can also influence the perceived quality.</p>	<p>Traditionally, fine wines have been sealed with cork. Only inexpensive, commodity wines have traditionally had screw tops. 2+2s are also associated with inexpensive wines, although not to the extent of screw caps and they are not as obvious. Hence, many consumers perceive the quality of wine with screw tops (and to a somewhat lesser extent, 2+2s) to be low unless they are aware of strong signals to the contrary (e.g., brand reputation, critic’s recommendation, a <i>Winestate</i> recommended sticker).</p>	<p>Cork</p>

## Instructor's Manual Exhibit 3: Advantages/Disadvantages of Closure Alternatives

Type of Closure & Cost	Advantages	Disadvantages
<p><b>Natural Cork</b></p> <p>Natural Cork: \$0.43</p>	<ul style="list-style-type: none"> <li>• Cork is the traditional closure and contributes to the consumer's wine experience</li> <li>• Cork is expected on high quality wines by most consumers, and signals a high quality wine.</li> </ul>	<ul style="list-style-type: none"> <li>• Cork can taint the wine; industry estimates vary from 1.5% to 15% of all wines affected by cork taint. Sue's estimate was 8%-10% for her wines, although she didn't know for sure, which in itself is disconcerting.</li> </ul>
<p><b>Screw Cap</b></p> <p>Screw Cap \$0.20 Bottle premium \$0.10 Bottling Surcharge \$0.02 Neck Foil Savings (\$0.02) Bottling Setup (unknown) Total \$0.30 Change (\$0.13)</p>	<ul style="list-style-type: none"> <li>• Completely eliminates the possibility of cork taint.</li> <li>• Greater bottle to bottle consistency is achieved with wine closed by screw caps.</li> </ul>	<ul style="list-style-type: none"> <li>• Most consumers associate screw caps with low quality.</li> <li>• Screw caps seen as detracting from the traditional wine experience – there is no pop of the cork.</li> <li>• The impact of screw caps on wine maturation in the bottle is unclear. Some winemakers contend that wine will not improve much with age if sealed with screw caps, but others disagree with this assessment. Time will tell, as this closure method becomes more common.</li> </ul>
<p><b>2+2 Cork</b></p> <p>2+2 Cork: \$0.25 Change (\$0.18)</p>	<ul style="list-style-type: none"> <li>• Reduce the incidence of cork taint. Extent is unclear, but evidence in case suggests to 1% to 4%</li> <li>• Until the bottle is open, it is impossible to tell that a 2+2 cork has been used. Even upon opening, some consumers will not recognize 2+2s as being different from natural cork.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduces, but does not eliminate, cork taint.</li> <li>• Some consumers associate 2+2s with cheap, lower quality wine.</li> </ul>
<p><b>Synthetic Cork</b></p> <p>Synthetic Cork: \$0.20 Change (\$0.23)</p>	<ul style="list-style-type: none"> <li>• Eliminate the potential for cork taint.</li> <li>• Came in a variety of colours and were easier to print on.</li> </ul>	<ul style="list-style-type: none"> <li>• Consumers associated with cheap wines.</li> <li>• Early versions had numerous problems, including being hard to remove from the bottle.</li> </ul>