

# Carlisle

WINERY & VINEYARDS

Winemaking – part craft, part science, and a whole lot of Mother Nature. Here at Carlisle, we do our best to let the fruit shine, to intervene as little as possible, and to let each wine reflect the best of the vintage and vineyard. But does this mean we simply pick grapes, throw them into a tank, and walk away? No, doing that would more often than not lead to something wholly unpalatable. It would also be ignoring the craft and science of winemaking that has helped create the golden age of wine that consumers enjoy today.

Unfortunately, although quite understandably, a lot of the craft and science of winemaking is unbeknownst to the consumer. This has led some businesses to create deceptive marketing campaigns, touting more natural, healthier versions of wine or, more recently, “clean” wine. These campaigns set up a false dichotomy. If your wine isn’t natural, it must be unnatural. If your wine isn’t clean, it must be unclean (dirty?). A marketing email from one natural wine purveyor went so far as to claim that most wines in the U.S. were toxic and full of chemical additives! (Of course, they claimed the wines they were selling were not.) The favorite bogeyman of these campaigns is the list of 70 federally approved wine additives. Never mind that this list covers any beverage based on fermented fruit (for example, wine coolers, wine seltzers, fortified wines, and non-grape based wines). These campaigns also conveniently fail to mention that 1) most of the items in the list are already naturally present in juice and/or wine and 2) if an item isn’t already present, then it acts upon the juice or wine but does not remain in the final product. Imagine the uproar if dihydrogen monoxide appeared on the list! Oh, the horror!

Joking aside, another unfortunate result of the knowledge chasm between consumers and the craft and science of winemaking has been the push from certain consumer groups and, surprisingly, some wine writers for ingredient labeling on wine bottles. When viewed from the 60,000-foot level, I can understand the appeal of ingredient labeling. Ask any wine consumer, “Do you want to see ingredients listed on the wines you drink?” Clearly, without being made aware of the issues and potential costs, the answer will likely be yes. We all want transparency. But as a producer on the ground who needs to follow labeling regulations, listing ingredients is a slippery slope so fraught with problems and pitfalls that it simply cannot be done.

To discuss why ingredient labeling can’t be done for wine, we first need a definition of an ingredient. According to Merriam-Webster, an ingredient is:

*Something that enters into a compound or is a component part of any combination or mixture.*

There are many reasons to list ingredients on food products. Chief among those reasons is so that consumers can make informed choices as to what they put in their bodies, whether that be for nutritional reasons, medical reasons (e.g., avoiding allergens), or simply wanting a product

that aligns with their beliefs and values. A chocolate chip cookie? Simple. Flour, sugar, butter, chocolate chips, eggs, vanilla, salt, and baking soda. Oh, and I like walnuts! But let's consider the ingredients of wine, a food product much more unique than a cookie. The first and most obvious ingredient that comes to mind is grapes, or perhaps more accurately, grape juice. No arguments with this one. But let's consider the yeasts that ferment the grape juice into wine. If yeast is added, should it be listed as an ingredient? What if commercial yeast was not added, relying instead on the ambient yeasts of the winery to do the work? Should yeast still be listed as an ingredient? In both cases, if yeast cells are present in the bottled wine, then yes, yeast is an ingredient. But what if the wine was sterile filtered, as is often done (especially on larger commercial lots), and all yeast cells are removed? Is yeast still an ingredient? If we apply our definition above, no. Yeasts have acted upon the juice but are no longer in the final product. The exact same questions can be applied to malolactic bacteria, the bacteria responsible for converting malic acid to lactic acid in red wines and some whites. Whether a commercial strain is added or the winemaker relies on Mother Nature, if the wine is sterile filtered and all bacteria are removed, how can malolactic bacteria be listed as an ingredient? If one argues that yeast and bacteria should always be listed, regardless of their presence, that would be quite a departure from current ingredient labeling regulations for food.

Next, consider tartaric acid, the predominant acid of grapes. Occasionally it's added to juice or wine if a winemaker feels the acidity is not sufficient. Should it be listed? If it's listed only when added, how does that help a consumer make an informed decision on what wine to purchase? Imagine a consumer looking for a low acid wine holding two bottles and comparing the ingredient statements. One, a soft easy drinking red, lists tartaric acid while the other, a high acid, lean red from a cool vintage, does not. Which wine would be selected? Likely the more acidic wine that does not list tartaric acid as an ingredient. If tartaric acid should always be listed, how does that help the consumer? And why list just tartaric acid? What about all the other acids found in wine such as malic, lactic, citric, and succinic? Shouldn't they be listed too?

The same conundrum exists with water. Water is the main constituent of grapes. Sometimes, however, a small amount of water is added to tank prior to fermentation to reduce the sugar level. Should water only be listed if added? If so, let's go back to our consumer comparing ingredient statements of two wines. One wine, at 14.5% alcohol, lists water as an ingredient. The other, at 12% alcohol, does not. Which wine has more water? The 12% alcohol wine! And down the slippery slope we go. Is something only listed as an ingredient when it's been added, even though it was already present? If so, then we are not always providing the ingredients to consumers. In fact, as shown by our tartaric acid and water examples, we're actually misleading consumers! But if we simply always list the constituents of grapes (water, glucose, fructose, tartaric acid, malic acid, phenols, ammonium cations, etc.), how does that benefit consumers? We might as well simply state "grape juice" and leave it at that!

There are, of course, additives for wine that are not naturally found in grapes or wine. However, in general, these additives act upon wine but do not remain in wine. Consider, for example, fining agents. One of the most common fining agents for red wine is egg white, also known as albumen. When egg white is added to a barrel or tank, as it settles to the bottom, it

pulls tannin out of solution with it. The fined wine is carefully racked off the sediment leaving no measurable egg white in the wine. Is egg white an ingredient? It was used in the wine but if none can be measured in the bottle, it would be incorrect to list it as such.

With oak, the situation is even murkier. Obviously, consumers are not ingesting chunks of oak in oak-aged wines, unlike the walnuts in my chocolate chip cookie. Nevertheless, oak does add many compounds to wine such as ellagic acid, eugenol, guaiacol, furfural, vanillin, and various lactones. But the specific compounds and amounts added can vary widely from barrel to barrel depending on the source of oak, how the staves were seasoned, toasting technique, and perhaps the biggest factor of all, how many times a barrel has been used. Once a barrel has been filled with wine for enough years, other than the slow oxidation it provides, the barrel essentially becomes a neutral storage vessel, much like a stainless-steel tank. Stainless steel would never be listed as an ingredient on a wine label. Why should neutral oak be? And should oxygen be listed as an ingredient if the wine was aged in oak? It would be incredibly silly to do so but strictly speaking, yes, oxygen is an ingredient.

What's clear from these examples of "ingredients" is that consumers are not really interested in a wine's composition. What they really want to know is how the wine was made. But to mandate that kind of winemaking information on a label would have some serious side effects for producers and consumers alike. First, as mentioned earlier, winemaking is a craft, beginning in the vineyard and ending with the bottle. Given that label printing has to be started at least several months in advance of bottling (and once dates are locked in with a mobile bottler, there's really no chance of changing), if winemaking labeling was required, no changes to the wine could be made once copy was submitted to the printer. Effectively, the winemaker would be handcuffed from doing anything to better a wine in the final stages of *élevage*, the raising of a wine after fermentation but before bottling. Another ill-effect of this kind of labeling is the potential for increased wine prices. First, including all this detail on a bottle will lead to higher printing costs, costs that will likely be passed on to consumers. Secondly, with some states requiring that wine labels be registered and periodically renewed (at a cost), a change to the label could trigger a new registration. Compliance costs could potentially increase, again leading to higher prices. And finally, how will these regulations be enforced? How will the Tax and Trade Bureau (TTB) and/or FDA monitor the millions of wine labels, both domestic AND international, to ensure all producers are being truthful? That effort will take significant resources and concomitant funding, likely from an increase in taxes. Enforcement would also likely lead to significantly more and onerous reporting in what is already one of the most heavily regulated industries in the country. This could lead to fewer artisanal producers and a market dominated by large wineries that have the resources to comply with reporting requirements. Less quality wine, fewer choices, and higher prices. Is this really what consumers desire?

But if ingredient labeling is so difficult, how is it that several wineries are doing it? From what I've seen, the answer appears to be marketing. Ingredient labeling is an easy way to stand out in a crowded and highly competitive marketplace. Also, wine label approval falls under the TTB, not the FDA that regulates food labeling. As a result, most of the ingredient statements are not

strictly about ingredients. They are part ingredients, part winemaking, and, as mentioned, part marketing. Currently, there are no regulations, guidelines, or standards in place for what should and should not be listed in an ingredient statement on a bottle of wine. That provides plenty of leeway for producers to customize their statements to support the message they want to convey.

So, given all the issues with ingredient labeling, what is the solution to this quagmire? How can wineries provide the information that some consumers desire while avoiding the slippery slope of ingredient labeling? The answer is by producers being transparent and listing possible additives in a place conveniently accessible by consumers, for example, a producer's website. With that in mind, here is a list of all additives we might use in our juice or wines, along with what they are, how they work, and why we choose to use them:

**Water** – Water, the main constituent of grapes, can quickly evaporate through grape skins, especially late in the growing season when the weather is warm. The loss of water concentrates the sugar (and everything else for that matter) in the fruit, leading to higher alcohol and potentially a stuck fermentation. Stuck fermentations can result in some very unpleasant aromas and flavors. Hence, if we feel the sugar in tank is a bit too high, we will add a small amount of carbon-filtered well water to ensure a healthy and complete fermentation. In effect, we're replacing the water that was lost through evaporation.

**Tartaric acid** – Tartaric acid is the principal acid of grapes. In fact, it is only found in grapes. In a perfect world, we would never need to supplement our fruit with additional tartaric acid (naturally derived from grapes, not synthetically produced) but the world and most vineyards are far from perfect (despite what many marketing people claim!). So many factors can influence acidity in grapes – soil, rootstock, variety, climate, and irrigation, just to name a few. The amount of tartaric we add varies from vintage to vintage and vineyard to vineyard. Fortunately, since we work with many higher acid sites, many of our wines require no acidification. But if we feel that a small addition of tartaric will be beneficial to a wine, we will add it, but only prior to the start of fermentation. Making the addition prior to fermentation ensures that the acid integrates seamlessly into the wine.

**Potassium bicarbonate/carbonate** – Just as grapes can be too low in acidity, occasionally they can also be too high. Potassium bicarbonate (or sometimes we use potassium carbonate) is a wonderful way to reduce acidity. When dissolved in wine, potassium bicarbonate immediately separates into potassium (already a constituent of grape juice) and carbon dioxide gas. The gas bubbles out of the wine while the potassium binds with tartaric acid and precipitates to the bottom of the barrel or tank as insoluble potassium bitartrate, also known as cream of tartar. Voilà! Acidity is lowered! Potassium bicarbonate is widely used in the food and beverage industries. It can be used as a leavening agent in baking and in bottled water to improve taste. It is also used as a buffering agent in medications to regulate pH. Some of the finest wines we have produced have been de-acidified.

Sulfite – Sulfite, used in winemaking since Roman times and produced by yeasts during fermentation, serves four main purposes. First, it's an antiseptic against non-Saccharomyces yeast and bacteria. Two, it's an anti-oxidant in wine, hoarding oxygen molecules and preventing maderization. Three, it's an anti-oxidase, preventing enzymatic activity that can lead to oxidation in juice. And finally, four, it preserves flavor and freshness of aroma by reacting with acetaldehyde (acetaldehyde, produced by yeast when stressed during fermentation, can smell very unpleasant above certain levels). Sulfite's antiseptic effectiveness is dependent on a wine's pH. The lower the pH (i.e., the more acidic), the less sulfite is needed to be effective. Given our healthy fermentations, stringent cellar practices, and the fact that many of our wines have lower than average pH, it takes very little sulfite in our wines to achieve the minimum effective amount. Other foods such as packaged meats, prepared soups, frozen juices, dried fruits, and even French fries can have orders of magnitude more sulfite than wine.

Yeast – We are not dogmatic about yeast. What's important to us are the fermentation dynamics and kinetics. We have fermented vineyards many different ways and whether it's by cultured yeasts or ambient yeasts (i.e., we don't explicitly inoculate), each vineyard's character seems to shine, regardless of what yeast marketing literature states. Therefore, if a tank appears eager to ferment on its own, we're happy to let it, especially if the vineyard has a good track record of doing so. But if a vineyard is notorious for sticking during an uninoculated fermentation, or we feel we need to turn the tank over for another lot (uninoculated ferments tend to be slower and require more tank time), we will inoculate with one or more commercial strains of natural yeast that have been isolated from other successful ferments. As an aside, there is very little in the way of *Saccharomyces cerevisiae* (the yeast that completes fermentation in wine) in vineyards. Wineries, on the other hand, are teeming with likely multiple strains of yeasts, just waiting for a food source to arrive. Hence, we are never really sure what strain or strains of *Saccharomyces cerevisiae* are finishing an uninoculated fermentation.

Yeast nutrients – To ensure successful completion of fermentation, yeasts need more than just sugar. They need other nutrients such as nitrogen, niacin, magnesium sulfate, pantothenic acid (B<sub>5</sub>), thiamin (B<sub>1</sub>), and certain fatty acids. These nutrients are naturally present in grape juice but sometimes not in sufficient quantity for yeasts to do the job. Hence, based on juice analysis, if needed, we will add additional nutrients to ensure a successful ferment. Since we typically do not filter any of our reds, we are careful to add only the minimum amount of nutrients required. We want our wines to be a nutrient wasteland by the time we're bottling, just to make sure there is nothing that could lead to microbial activity in the bottle down the road.

Enzymes – We eschew the use of enzymes on our red wines but we do use pectinase, an enzyme, on our white grapes to help the juice quickly settle in tank prior to fermentation. Pectinase also aids in press-ability and juice extraction by softening grape skins. Pectinase is a natural compound created by a fungus commonly found on grapes and has been used in winemaking and brewing since the 1960s.

Malolactic bacteria – More precisely known as *Oenococcus oeni*, this bacteria converts malic acid (the principle acid of apples) into the much softer lactic acid (the acid found in milk). Due to wine's low pH, alcohol, sulfite, and storage temperature (less than 60° F), wine is a very hostile environment for *Oenococcus oeni*. Hence, we use commercial strains that have been selected from nature that are proven performers. These commercial strains have also been selected based on their no to very low production of biogenic amines (e.g., histamine, putrescine, cadaverine). Many strains of malolactic bacteria found in nature produce high levels of biogenic amines which, depending on an individual's sensitivity, can cause headaches, flushing, congestion, and other adverse reactions. We'd prefer to not roll the dice with Mother Nature.

Fining agents – As mentioned earlier, a fining agent is something added to a wine that acts upon the wine but ultimately does not remain in the wine. Most of our wines are unfinned but when we do fine a wine (typically just one or two wines a year), we note so in the tasting note along with what fining agent was used. Here are the fining agents we have used:

- Egg white – Also known as albumen, egg white is a negatively charged protein used as a fining agent to soften a tannic and/or astringent wine. Tannin is a positively charged protein so as the egg white settles to the bottom of the barrel, it pulls tannin out of solution with it. Many of the world's greatest wines are fined with egg whites.
- Gelatin – Gelatin is a porcine-derived fining agent used to soften wines. Gelatin acts a bit more aggressively than egg white so we seldom use it. In fact, since 1998, we have used it only three times.
- Patatin – Patatin is a protein found in potatoes. It is a highly reactive fining agent and does an excellent job at removing excess tannin without diminishing a wine's flavor and aroma. Even better, it's vegan friendly!
- Bentonite – Bentonite is a natural clay powder that we add to our white wines to remove certain proteins that can cause haziness after bottling. Any wine that has been fined with bentonite is filtered at bottling to restore clarity and to ensure no bentonite remains in the wine.

Although we'd never market our wines as "natural" (there's not even a legal definition for the term when it comes to wine), hopefully it's clear that all the additives we use are natural or naturally derived and completely harmless. They are not toxic chemical additives as some marketing campaigns claim and have a long tradition of use in fine wine production. Add or swap out one or two of the items above for other equally harmless and approved additives and you will cover the vast majority of artisan wines produced in the world today. Have doubts? Want more information? Have a conversation with the producer. Winemakers are typically more than happy to discuss their craft with eager consumers. Otherwise, buy with confidence and remember, *in vino veritas*.