

## Alcoholic fermentation

### Overview

Now that the grapes have been harvested, spent a night in a cool environment (remember, we want to avoid "wild" fermentation), undergone quality-control on the selection table, been de-stemmed and pressed, a magical transformation takes place: fermentation. This process takes place in stainless-steel deposits, and is initiated when the winemaking team add an activated cultured yeast to the wine-must. One of Quinta dos Vales' most important principals is to respect the natural characteristics of our grapes, which is why we have only ever used flavour-neutral yeasts. Yeasts are fungi that multiply by shedding cells. The energy for this is supplied by sugar. Thus, alcohol is actually only a by-product of the yeasts' multiplication process. There are two types of yeast we use:

- for red wines - 20g/ hL of LEVULIA T.P.CO. Which is a yeast with a high resistance to alcohol (up to 16.5%) and SO<sub>2</sub>, its ideal fermentation temperature lies between 18 to 25°C; &
- for white & rosé wines - 20 g/ hL of Fermol Cryoaromae. Which is a selected cryotolerant yeast strain, optimised for fermentations at low temperatures (from 6°C).



During the alcoholic fermentation the wine-must is transformed into actual wine, the sugars in the must transform into ethanol and carbon dioxide. The temperature of the liquid (the term "wine" isn't used at this stage, as during the alcoholic fermentation the liquid is somewhere between must and wine) is controlled throughout this process. For white or rosé wine the ideal temperature range is 12-17 °C, whereas the target for red wines is 24-25 °C.

Fermentation is a biological process which generates heat, but the role of the winemaker is to keep this under control. The cooler the temperature of the liquid during fermentation, the slower the yeasts multiply and the slower a must ferments. And the slower the fermentation, the more aromas and flavours are preserved.

### **Methodology**

In the case of red wine the skins remain in contact with the liquid throughout the alcoholic fermentation, which allows the maceration to continue. Maceration is the organic process where the colour, tannins & flavour compounds are extracted from the skins and seeds. This is avoided in the case of white or rosé wines, if a maceration process was permitted with white skins the result would be an “orange” wine, such as our *Dialog Secretum*.

The lids of the stainless-steel vats remain open throughout the alcoholic fermentation, this is because:

- fermentation is a biochemical process which creates CO<sub>2</sub>, and this needs to escape;
- (in the case of red wines) during the alcoholic fermentation the skins naturally rise to the top, and if we did not intervene the consequence would be that only the top layer of liquid absorbs the colour, tannins and flavours of the skins, creating an imbalanced extraction.



Therefore what we do 3-4 times a day is to push (with use of a special shovel) the skins to the bottom of the tank, thereby bringing movement into the liquid, and creating a more balanced flavour and colour extraction.

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## Monitoring the progress

The alcoholic fermentation usually takes around 2 weeks, and throughout this process our winemaking team monitors both the temperature as well as the density of the liquid, twice a day. Temperature is monitored to ensure that the ideal range is maintained, and density is measured as this is the most reliable indicator to monitor the development of the process. Once the density readings drop below the 1000 mark the decreases slow down to level out at around the 995 mark. Once the readings remain the same, or almost the same, for multiple days, that's when the winemaking team knows the alcoholic fermentation has ended. See here such a sheet which is used to track the density progress.

Ficha de Fermentação Alcoólica de Tintos  
Vindima 2021

W19-36L  
Início: 06/01/2021  
Fim: 26/09/2021  
Destino: Votoz-pato-W19

Análise Inicial  
Dens.: 1103  
pH: 3,81  
Ac. Total (g H2T / L): 4,75g/l  
SO2 Total (mg/L): 70mg/l

Acompanhamento Diário		Densidade	Densidade Corrigida
1ª Dia	T (°C)		
1ª Dia	18	1096	
18h	18	1095	
2ª Dia	18	1087	
18h	18	1087	
3ª Dia	18	1082	
18h	18	1062	
4ª Dia	18	1049	
18h	20	1040	
5ª Dia	18	1028	
18h	20	1023	
6ª Dia	18	1020	
18h	20	1015	
7ª Dia	18	1009	
18h	21,5	1002	
8ª Dia	18	995,0	
18h	20	995,0	
9ª Dia	18		
18h			
10ª Dia	18		
18h			
11ª Dia	18		
18h			
12ª Dia	18		
18h			
13ª Dia	18		
18h			
14ª Dia	18		
18h			
15ª Dia	18		
18h			

Adições/Correções:  
Leveduras: Inútila Turra - 60g  
Subst. Nut: F.C. Glu - 15g  
Ac. Tartárico: 1g/l - 300g  
Outros: F.P. Cau - 60g  
F.P. Cau - 158g

Análise após Correção  
Dens.: 110,3  
pH: 3,60

The other indicator of a completed fermentation is that CO<sub>2</sub> is no longer being produced, this results in the skins, seeds and pulp sinking to the bottom of the stainless-steel vat, rather than sitting on the very top, as is the case during an ongoing alcoholic fermentation.



## After the alcoholic fermentation

Once the alcoholic fermentation has ended the wine (post-fermentation it is already a wine) needs to be kept separated from oxygen, which is done by use of pressurised lids.

## White or rosé wines

White & rosé wines do not undergo a second fermentation, which is why prior to the lids being closed we correct the sulphur-levels to 45mg/L, in order to avoid the creation of unwanted bacteria in the wine.

## Red wine

Red wines still need to undergo a second fermentation process, the malolactic fermentation, which we will outline in detail in next month's report.

*"Fermentation may have been a better invention than fire"* - David Rains Wallace