

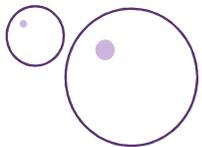


New Zealand Society
for Viticulture & Oenology



An Evolution Of Yeast Autolysis over time

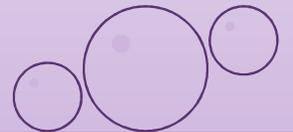
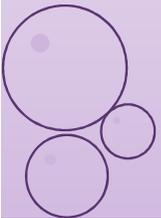
Jane De Witt





Overview:

- Yeast Autolysis
- Maillard Reaction
- Tasting



Disclaimer

- I am not a Chemist.
- Meaning I am not going to go into the detail of the many complex reactions that occur, both physical and biochemical, when looking at yeast autolysis.
- They are fascinating however as I was researching I ended up...
- I decided best to cover what I know



○ As I didn't want this happening



which would be distracting.

What is Yeast Autolysis?

- The term autolysis literally means 'self-destruction'.
- Therefore, self-degradation of the cellular constituents of a cell by its own enzymes following the death of the cell.
- In the process of autolysis, the wine is enriched by the compounds released.
- These yeast constituents (autolysates) have an important influence on the sensory properties and biological stability of wine.
- The autolysates, impart flavours, aromas and surfactant properties which, in turn, affect bubble production and foam stability.
- Yeast autolysis commences once secondary fermentation is complete, and sugar consumed.

Limiting Factors

Secondary fermentation results in an

- Increase in alcohol
- Decrease in sugar
- Increase in CO₂ – 6 atmospheres
- Decrease in nutrients

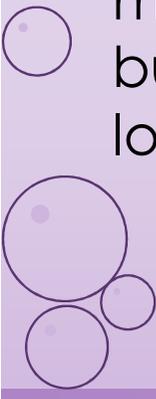
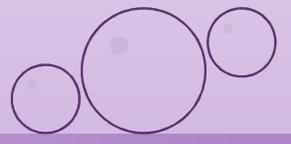
These unfavourable conditions kill off yeast and autolysis commences.

Like any enzymatic reaction, autolysis occurs at faster rates with increasing temperatures. The optimal temperature for yeast autolysis is approximately 60°C.

However, in wine, it must occur at temperatures around 10 – 12°C, a low pH, and high CO₂ levels.



What are the components of Sparkling Wine?

- Sparkling wines contain a wide variety of organic compounds, including proteins, peptides, polysaccharides, monosaccharides, lipids, fatty acids, nucleic acids, and volatile components.
 - Through autolysis a range of flavour compounds are released into the wine. From yeasty through to biscuit and toasty notes.
 - Also as the yeast cells' walls collapse, they release compounds called mannoproteins, which have a very important effect in stabilising the bubbles and helping to ensure that the wine stays fizzy in the glass for longer.
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What do the compounds contribute to wine?

Autolysates from within the yeast cell (Alexandre & Benatier, 2006)

Compound	Contribution to Wine
Lipids	Mousse quality
Proteins	Mousse quality and flavour
Peptides	Aroma, flavour and mousse quality
Amino Acids	Aroma, flavour and mousse quality
Nucleotides	Flavour
Nucleosides	Flavour

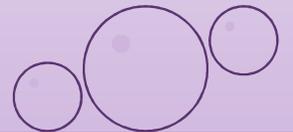
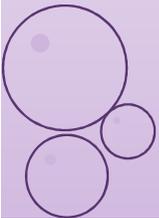
Autolysates from the yeast cell wall (Alexandre & Benatier, 2006)

Compound	Contribution to wine
Glucans	Mousse quality
Mannoproteins	Mouthfeel



Time and Age

- Due to the low temperature that Sparkling wines age at, the low pH and the high CO₂, autolysis takes place slowly.
- It requires time for the autolysates to be released, for the flavour, mouthfeel and texture to evolve, and complexity to be achieved.
- So the time it takes for a Sparkling Wine to evolve relates to age en tirage which equates to the flavour profile of your wine.



YOUTHFUL RADIANCE

2-3 years old

MATURE BALANCE

from 3-4 to 6-8 years old

COMPLETENESS AND COMPLEXITY

more than 6-8 years old



Maillard Reaction?

- The Maillard reaction is a chemical reaction between amino acids and reducing sugars (like glucose) that gives browned foods their desirable flavour. Seared steaks, pastry crusts, breads, toast, malted barley and many other foods make use of the effect.
- Initially described as a part of heat mediated chemical reactions, Maillard reactions can occur at lower temperatures mediated by the acidic environment of wines. The aromas created, (primarily esters categorized as lactones), range from toast, smoke, and baked bread to spicy vanilla. The result is a broad range of aroma compounds creating complexity.
- Therefore at 'dosage' where you are adding sugar, there is the potential for the sugar to react with the amino acids in the wine from autolysis and add toasty, smokey, baked characters.



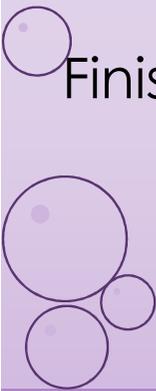
Now lets look at the Evolution of Yeast Autolysis and impact of the Maillard reaction by tasting some wine.

Wine Entrirage = Lindauer Blanc de Blanc – 100 % Chardonnay

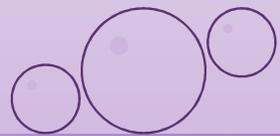
Vintages – 2017, 2015, 2013 and 2010

Also

Base Wine = 2018



Finished Product Predominantly 2015





Order of tasting.

Left to Right

1. 2018 Base Wine
 2. 2017 Entirage
 3. 2015 Entirage
 4. 2013 Entirage
 5. 2010 Entirage
 6. Lindauer Spec Res Blanc de Blanc – Finished Product.
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