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## What type of Ales ?

- Belgian Ales**
  - Witbier – Bière Blanche
  - Saison
- German Wheat Ales**
  - Weizenbier
  - Dunkelweizen
  - Weizenbock
  - & other german wheat base beers
- Other Wheat Base Ales & Dry Beers – e.g. Strong, Belgian Ales**

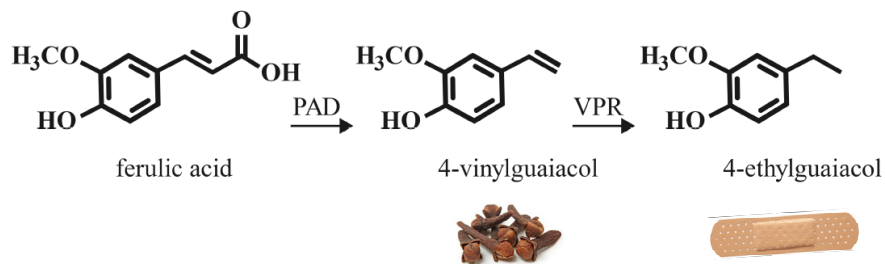



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## Pof<sup>+</sup> yeasts

- Pof<sup>+</sup> yeast = phenolic 'off flavour' positive yeast
- Can be a sign of contamination ('all' *diastaticus* yeasts are *pof<sup>+</sup>*)
- Yeasts that have the *pad* gene, encoding phenolic acid decarboxylase and the *vpr* gene, encoding vinyl phenol reductase) in their genome



- Phenolic flavours have a very low flavour threshold  
 4-vinylguaiacol (4VG): 300 ppb, 4-vinylphenol (4VP) : 200 ppb

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## Content

- 01** The Fermentis yeast baseline
- 02** Make your choice with SafAle<sup>™</sup> WB-06, W-68, BW-20, ...
- 03** Key learnings

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# 01

## The Fermentis yeast baseline








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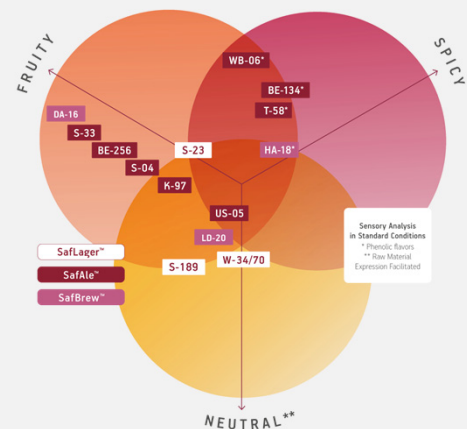
### The SafAle™ Baseline

SafLager™

SafAle™

SafBrew™

-  **Wort density: 15°P**  
(100% pils malt, 3EBC )
-  **Pitching rate:**  
50g/hl (0.06 oz/gal)
-  **Temperature:**  
23°C (73.4°F)
-  **Pressure:**  
atmospheric
-  **Bitterness:**  
25 IBU (iso-alpha extract)



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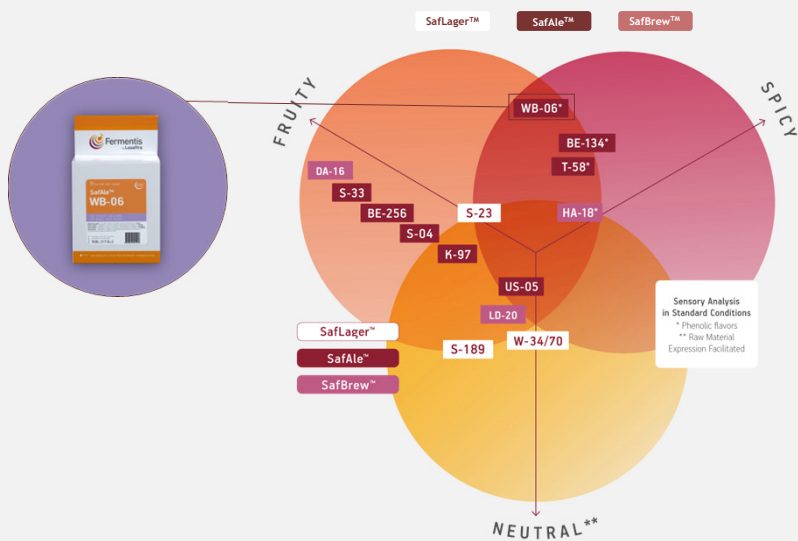
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# 02 | Make your choice with SafAle™ WB-06



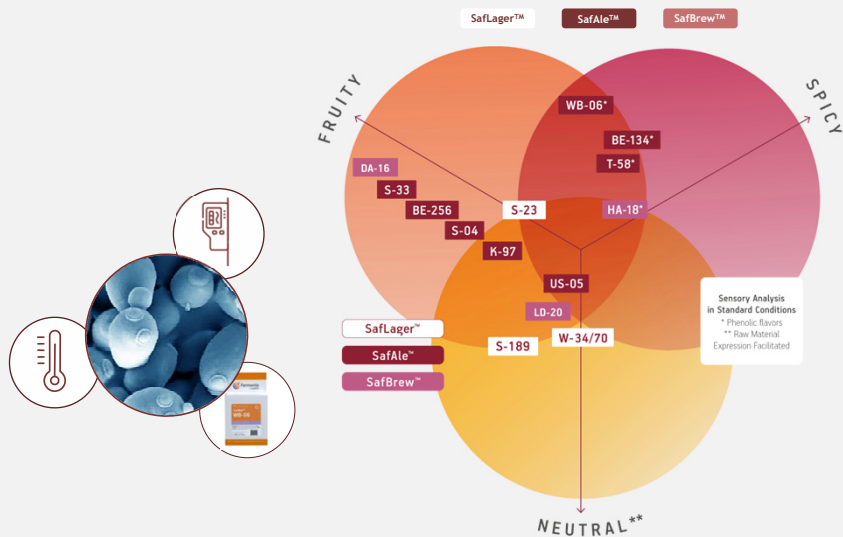
7

## The SafAle™ Baseline



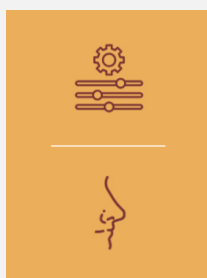
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## What if we change conditions?



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## Objective



Characterize how fermentation process parameters might affect the **flavor profile** of **SafAle™ WB-06**

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## Trials & Analysis

**Fermentation condition**

*Wort density* | 12°P | 16°P | 20°P

*Pitching rate* | 25 g/hl 0.03 oz/gal | 50 g/hl 0.06 oz/gal | 100 g/hl 0.13 oz/gal

*Temperature* | 12°C - 53.6°F | 16°C - 60.8°F | 20°C - 68°F | 24°C - 75.2°F

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**Bitterness** | 25 BU targeted (hop Magnum)

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**Maturation** | 0°C-32°F (14 days)

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
**Filtration** | Sheet filter

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**Wort composition** | 100% pils malt



  
Fermentation performances

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Volatiles compounds

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Sensory analysis
















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## Design of Experiments

 **Wort density**




	12°P	16°P	20°P
<div style="background-color: #8B4513; color: white; padding: 10px; border-radius: 10px; text-align: center; width: 50px; margin: 0 auto;">  Pitching rate                 </div>	<div style="display: flex; align-items: center; justify-content: center; gap: 5px;"> <div style="text-align: left; font-size: small;">25 g/hl 0.03 oz/gal</div>  </div>		
<div style="display: flex; align-items: center; justify-content: center; gap: 5px;"> <div style="text-align: left; font-size: small;">50 g/hl 0.06 oz/gal</div>  </div>			
<div style="display: flex; align-items: center; justify-content: center; gap: 5px;"> <div style="text-align: left; font-size: small;">100 g/hl 0.13 oz/gal</div>  </div>			

**Temperatures**

- 12°C / 53.6°F
- 16°C / 60.8°F
- 20°C / 68°F
- 24°C / 75.2°F




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**Pitching rate**

- 25 g/hl  0.03 oz/gal
- 50 g/hl  0.06 oz/gal
- 100 g/hl  0.13 oz/gal

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**Wort density**

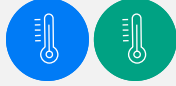
-  12°P
-  16°P
-  20°P

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## Fermentation performances - Conclusions



**Low to very low temperatures** generally will extend fermentation time (up to 3 months for 12°C/53.6°F and unfinished)



The **apparent degree of fermentation** is between 87 & 90% **regardless of fermentation conditions\*** (if enough fermentation time is given for the low temperature conditions)



**Low pitching rates** generally increase fermentation time



**High gravity worts** will slow down total fermentation time but the yeast is able to reach the final attenuation

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## Volatile compounds - Conclusions



**Ethyl acetate**, isoamyl acetate, ethyl hexanoate & 4-VG are nearly always above their thresholds in every condition studied



**Ethyl butanoate & ethyl octanoate** concentration varies between fermentations conditions



**Apart from 4VG**, the condition 16°P, 16°C (60.8°F) & 100g/hL appear to be very neutral in the studied volatiles composition

- **Diacetyl** concentration is always below its threshold in every condition studied



**4VG concentration** was high (4x thr.) and has NO significant variation between conditions. Isoamyl acetate concentration is medium (2x thr.) and constant throughout studied conditions

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## Sensory Analysis

**Sensory analysis** = Science allowing the interpretation of information perceived by the sensory receptors to obtain an objective result.



### FERMENTIS TRAINED PANEL



#### Training

Ensure a descriptive and consensual analysis



#### Rating

Evaluate the intensity of descriptors for each product



#### Statistics & report

Analyze differences between products and correlation with fermentation parameters

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## Sensory Analysis - Conclusions



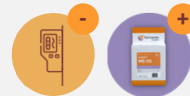
**SafAle™ WB-06** brings clove-like aromas regardless of fermentation conditions



**High densities** increase sensory intensity, solventy, bitterness and sweetness perception



**Low fermentation temperatures** promote fruity aromas, mainly banana notes



**Overpitching** at low densities can increase the risk of sulfury notes\*

\*observed in only one condition  
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## Key Learnings: How to use SafAle™ WB-06



87% < ADF% < 90%



The lower the fermentation temperature for **SafAle™ WB-06** the longer fermentation time, and increased fruity and banana flavor perception.  
Temperatures between **16 - 20°C (60.8 - 68°F)** promotes **fruity and banana notes**.  
**Clove aromas will be present in all conditions.**



Higher density promotes intensity in sensory profile, including fruity, sweetness but longer fermentation time.

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## Objectives and characteristics

Yeast designed for the production of German wheat beers and fruity beers with phenolic character.

<b>01</b>	ADF > 80%, with an ale yeast strain ( <i>Saccharomyces cerevisiae</i> )	<b>02</b>	Fermentation temperature > 20 °C (68 °F)	<b>SafAle W-68™:</b> 1. Origin Germany 2. From Weihenstephan
<b>03</b>	Moderate Phenolic character	<b>04</b>	Intense flavor expression	
<b>05</b>	Different from the other POF+ ale yeasts	<b>06</b>	No off-flavors	

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## POF+ yeast range

 Product	 Description	 POF Intensity	 Typical beer style
SafAle™ T-58	<i>S. cerevisiae</i>	POF+ Moderate to high	Ideal for English & Belgian ales style with low to medium attenuation
SafAle™ BE-134	<i>S. cerevisiae</i> var. <i>diastaticus</i>	POF+ High	Ideal yeast for dry and spicy Belgian styles like Saisons
SafAle™ WB-06	<i>S. cerevisiae</i> var. <i>diastaticus</i>	POF+ High	Ideal for German and Belgium dry wheat beers
<b>SafAle W-68™</b>	<i>S. cerevisiae</i>	<b>POF+ Moderate to high</b>	<b>Ideal for German wheat beers with medium attenuation and fruity notes.</b>

**SafAle W-68™ offers a complex fermentative flavor with fruity, phenolic and bubble gum notes.**

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# 02 | Product performances



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## Experimental conditions in EBC Tubes: Kinetics - ADF



### Wort

Brewing wort with pils malt at 13,5°P and 18°P (15°P + 3°P of Sugar)



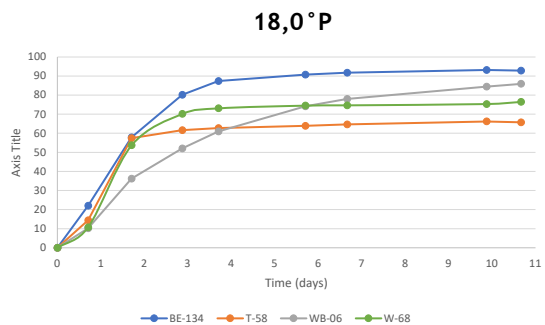
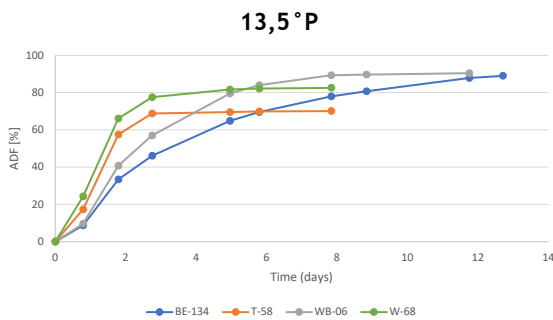
### Pitching rate

50 g/hl (0.08 oz/gal)



### Fermentation

Temperature of 20°C (68°F)







SafAle W-68™ shows fast fermentation kinetics at 13,5 and 18°P with final attenuation close to 80%.

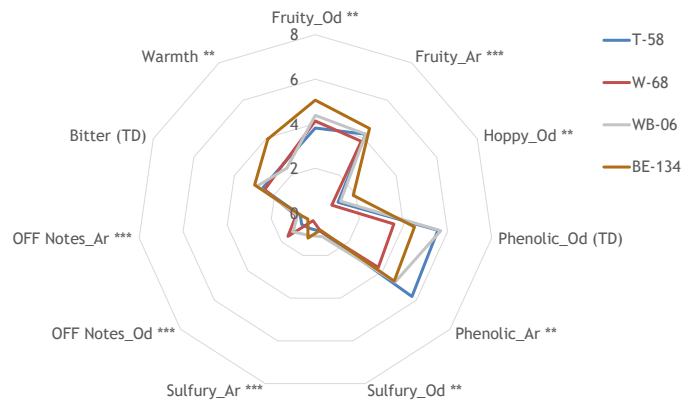


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## Experimental conditions in 50 liters pilot scale Sensory data

-  **Wort**  
Brewing wort with pils malt at 15° P and 25BU (Magnum P90)
-  **Pitching rate**  
50g/hl (0.008 oz/gal)
-  **Fermentation**  
Temperature of 23° C (73.4° F)
-  **Maturation & Filtration**  
Temperature of 0° C (32° F) during 14 days



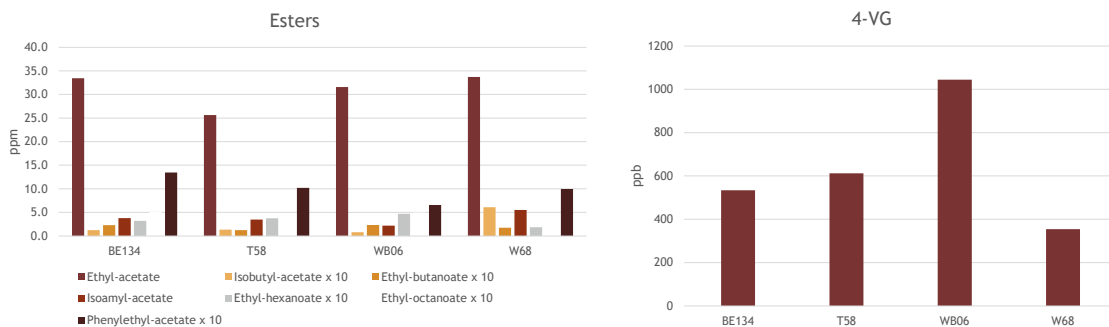
SafAle W-68™ shows less phenolic character which allows the fruity character to express.



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## Experimental conditions in 50 liters pilot scale (Aromatic compounds)



SafAle W-68™ produces more Esters in total and less phenols.



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## Key learnings

### SafAle W-68™



Medium attenuating yeast:  
*S. cerevisiae* (POF+)



Pitching rate: ≈ 50g/hl  
ADF close to 80% on standard wort



Prefers average gravity  
≈ 13,5 °P



Produces  
**Phenolic and fruity flavours**



Complete assimilation of  
Maltotriose



POF+ : production of 4-VG

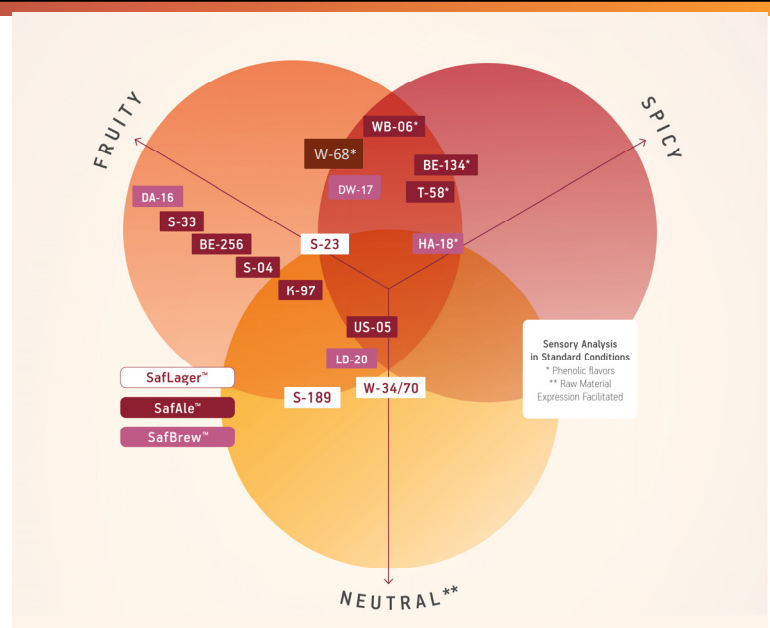


**CAN BE reusable**  
(cropping/repitching)



**NOT for**  
**refermentation**  
(bottle or keg conditioning)

## In the Yeast Baseline, SafAle W-68™ is





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## Objectives and characteristics

Yeast designed for the production of Belgian style wheat beers and fruity beers with phenolic character.

**01** | ADF ≈ 80%, with an ale yeast strain (*Saccharomyces cerevisiae*)

**02** | Fermentation temperature > 20 °C (68 °F)

**03** | Low to Moderate Phenolic character

**04** | Moderate flavour expression

**05** | Different from the other POF+ ale yeasts

**06** | No off-flavors

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**SafAle™ BW-20:** 1. Origin Belgium  
2. From Flanders

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## POF+ yeast range



Product	Description	POF Intensity	Typical beer style
SafAle™ T-58	<i>S. cerevisiae</i>	POF+ Moderate to high	Ideal for English & Belgian style Ales with low to medium attenuation
SafAle™ BE-134	<i>S. cerevisiae</i> var. <i>diastaticus</i>	POF+ High	Ideal yeast for dry and spicy Belgian styles like Saisons
SafAle™ WB-06	<i>S. cerevisiae</i> var. <i>diastaticus</i>	POF+ High	Ideal for German and Belgian Style dry wheat beers
SafAle W-68™	<i>S. cerevisiae</i>	POF+ Moderate to High	ideal for German Style wheat beers
SafAle™ BW-20	<i>S. cerevisiae</i>	POF+ Low to Moderate	ideal for Belgian Style wheat beers

SafAle™ BW-20 offers a rather complex fermentative flavor with fruity, phenolic character that allows the expression of spices typically added to the beer style.



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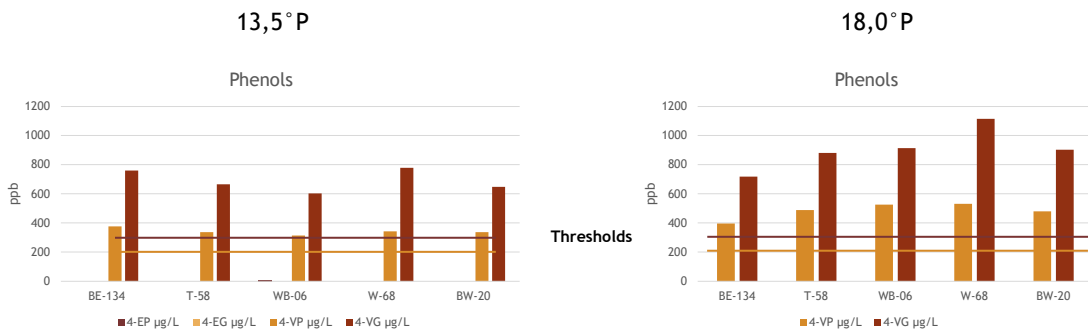
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## 02 | Product performances



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## Experimental conditions in EBC Tubes (Aromatic compounds: Phenols Analysis)



SafAle™ BW-20 produces proportionally more phenols at HG, mainly 4-VG.



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## Experimental conditions in 50 liters pilot scale Sensory data



**Wort**  
Brewing wort with pils malt  
at 15° P and 25BU (Magnum P90)



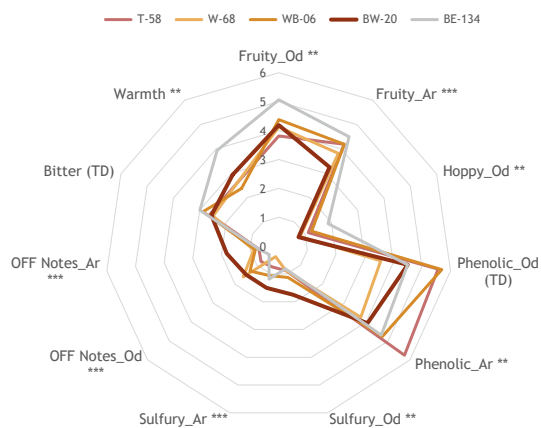
**Pitching rate**  
50 g/hl (0.008 oz/gal)



**Fermentation**  
Temperature of 23° C (73.4° F)



**Maturation and filtration**  
Temperature of 0° C (32° F)  
during 14 days



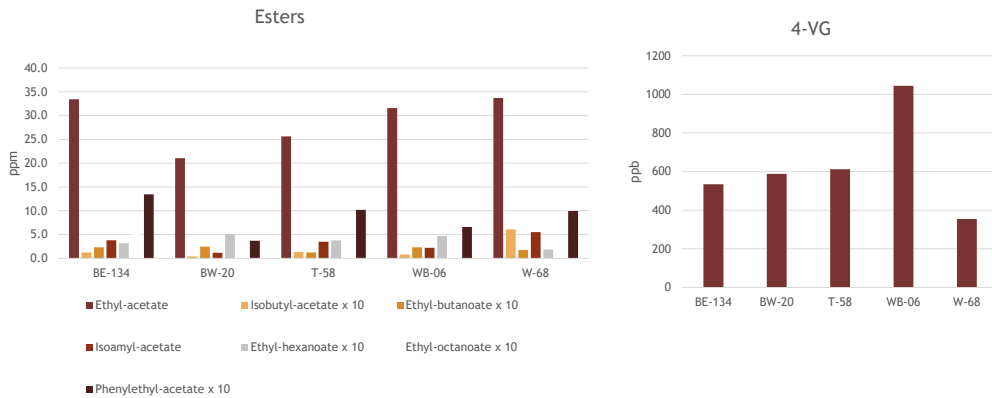
SafAle™ BW-20 shows less phenolic character that allows other characters to express.



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## Experimental conditions in 50 liters pilot scale (Aromatic compounds)



SafAle™ BW-20 produces average level of Esters and phenols.



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## Key learnings

SafAle™ BW-20 is:



Medium attenuating yeast:  
*S. cerevisiae* (POF+)



Pitching rate: ≈50g/hl  
ADF close to 80% on standard wort



Ferments well at 20°C  
(68°F) even at HG brewing



Produces average  
**Phenolic and fruity flavours**



Complete assimilation of  
Maltotriose



POF+ : production of 4-VG



**CAN BE reusable**  
(cropping/repitching)



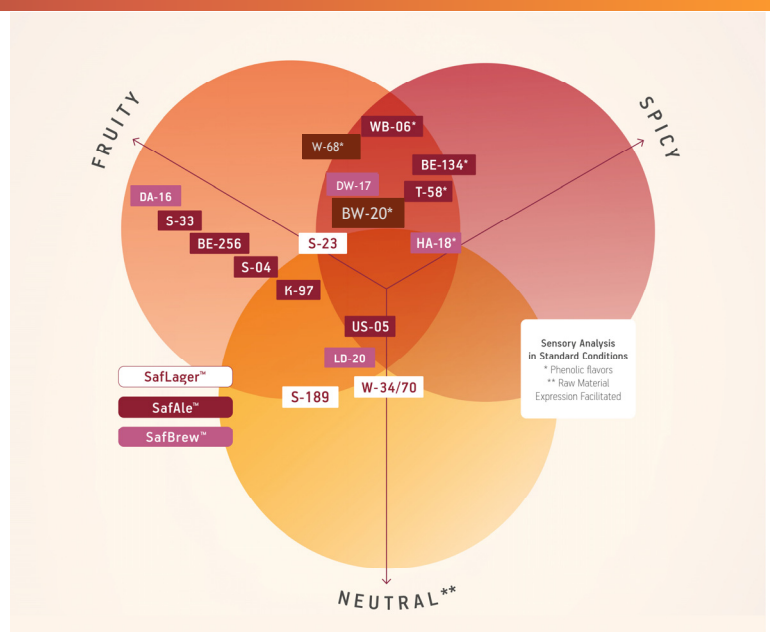
**NOT for**  
**refermentation**  
(bottle or keg conditioning)



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In the Yeast Baseline,  
SafAle™ BW-20 is



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Thank you for  
your attention!



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