



SafBrew™ BR-8

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01

Introduction



Introduction



Brettanomyces

01

Brettanomyces is a non-conventional yeast species initially found early 20th century.

02

It can be isolated from different sources of biological materials (fruit peels, kombucha, kefir, tea, olives,...) and is present in Belgian lambic and derived gueuze beers.

03

It impacts/modifies the organoleptic profile of the beers with specific phenolic notes, esters and aroma compounds.

04

Today its utilization is more and more spread in the craft breweries for the production of novel flavors in new range of products.

Introduction

The table shows the main differences in terms of assimilation and production capabilities between *Brettanomyces bruxellensis*, *S. cerevisiae* (Ale yeasts) and *S. pastorianus* (Lager yeasts)

		<i>Brettanomyces bruxellensis</i>	<i>S. cerevisiae</i> (Ale)	<i>S. pastorianus</i> (Lager)
Assimilation	Glucose	+	+	+
	Maltose	+	+	+
	Maltotriose	+	+/-	+
	Dextrins	+/-	+/-	-
	Cellobiose	+	-	-
	Nitrate	+	-	-
Production	Ethanol	+	+	+
	Glycerol	-	+	+
	Acetic acid	+	-	-
	Volatile phenols	+	+/-	-

02

Objective & Characteristics



Targets of *Brettanomyces* for SafBrew™ BR-8



Type of Microorganism:
Brettanomyces bruxellensis species¹



Suitable for bottle and cask fermentation
(secondary fermentation)²



Robust to re-fermentation
conditions



No off-flavour



Typical flavour expression: funky notes
such as horsy, animal, barnyard, leather...



Fermentation profile and sugar assimilation:
glucose-fructose-maltose-maltotriose
exclusively, no assimilation of dextrins



SafBrew™ BR-8

Specifications

Typical Values¹

Dry Matter
94,0-96,5%
(w/w)

Viable Yeast
 $5.0 \cdot 10^9$
cfu/g

Purity:

Lactic acid bacteria
<1 cfu /10⁶ yeast cell

Acetic acid bacteria
<1 cfu /10⁶ yeast cell

Pediococcus
<1 cfu /10⁶ yeast cell

Total Bacteria
<5 cfu /10⁶ yeast cell

« Wild » Yeast²
<5 cfu /10⁶ yeast cell

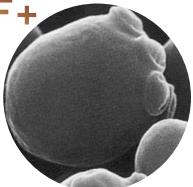




Pathogenic micro-organisms
in accordance with regulation

03

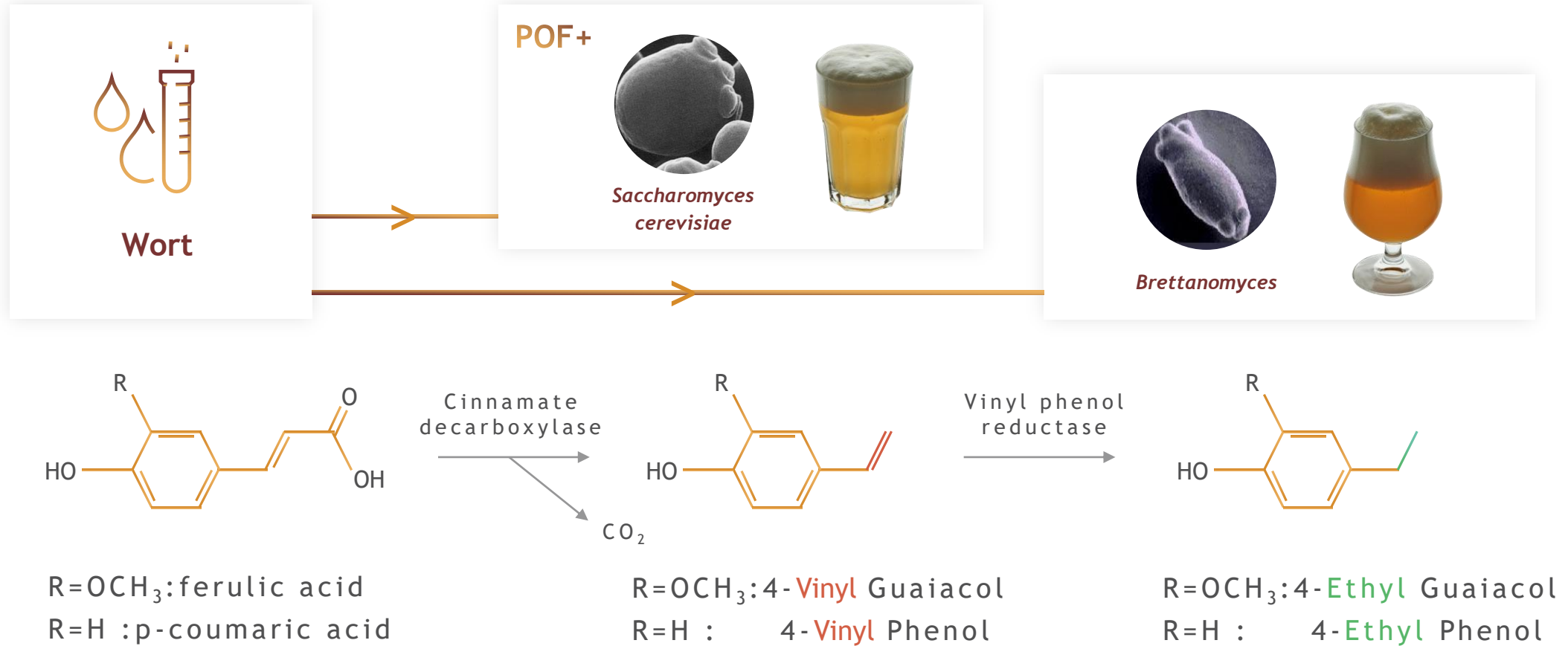
Aromatic Compounds Production



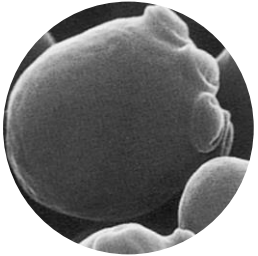
Aromatic Compounds Production

	Production/Threshold	Descriptors
<p>POF+</p>  <p><i>Saccharomyces cerevisiae</i></p>	<p>4-Vinyl Guaiacol (4VG) 300 ppb</p> <p>4-Vinyl Phenol (4VP) 200 ppb</p>	<p>Clove Medicinal</p>   <p>Dentist Smoky</p>  
 <p><i>Brettanomyces</i></p>	<p>4-Ethyl Guaiacol (4EG) 600 ppb</p> <p>4-Ethyl Phenol (4EP) 300 ppb</p>	<p>Horse Animal Leathery Smoke</p>   

Aromatic Compounds Production

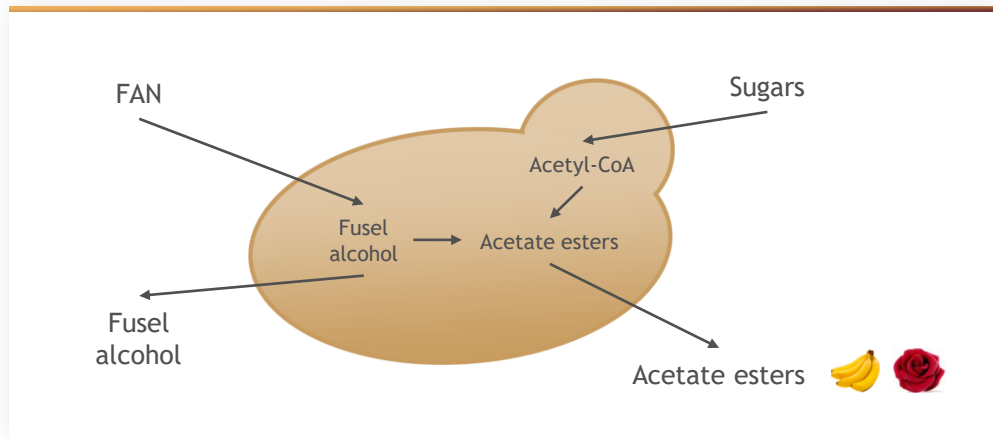


Aromatic Compounds Production



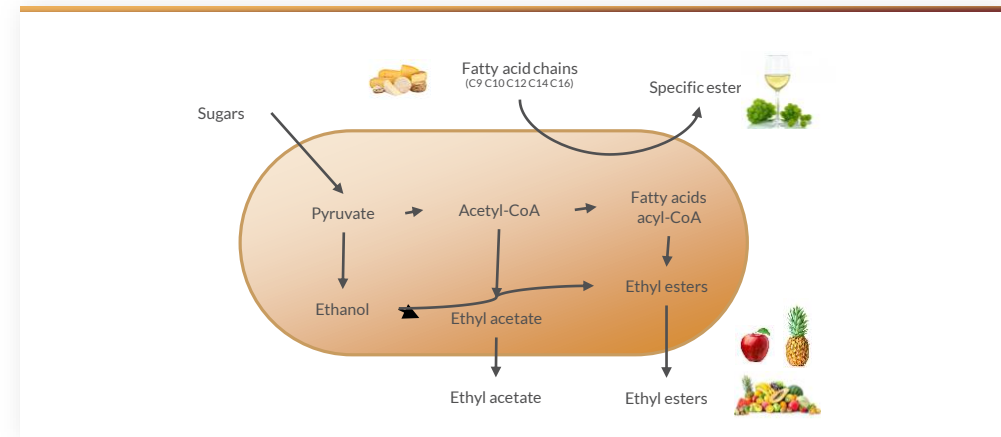
Saccharomyces cerevisiae

Produces acetate ester (banana)
Phenylethyl acetate (rose)



Brettanomyces

Produces ethyl esters:
Ethyl acetate (solvent)
Ethyl hexanoate (Red apple)
Ethyl octanoate acid chains (grape/wine)

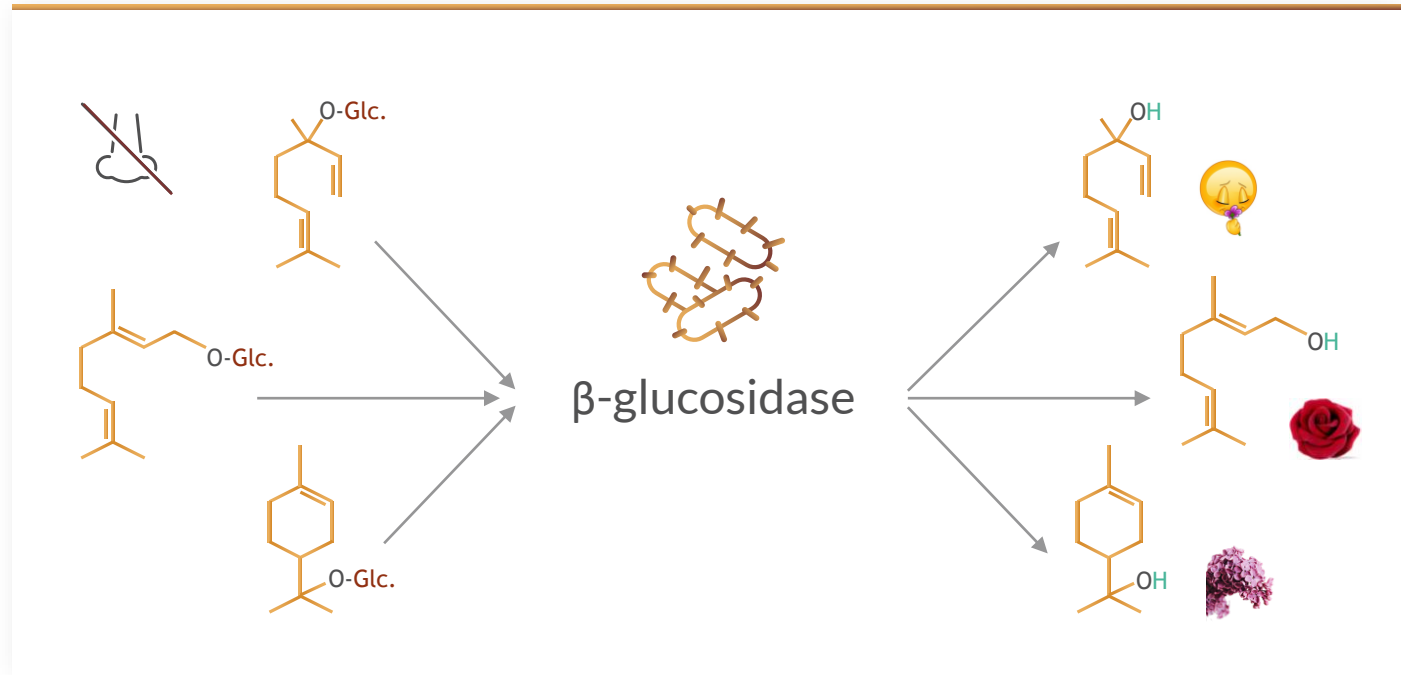


Aromatic Compounds Production



Brettanomyces

Exhibits β -glucosidase activity allowing the release of terpenes, aromatic compounds with a very low threshold in beer



04 |

Applicative Study



Experimental Conditions



Beer Characteristics prior to Refermentation

6,3% ABV by a POF-
yeast

3g/l (0,41oz/gal)
of CO₂



8 dry yeast samples (S1-8) rehydrated

In 10 times the weight
of sterile water

At 28°C (82.4°F) during
30 min

Under low agitation



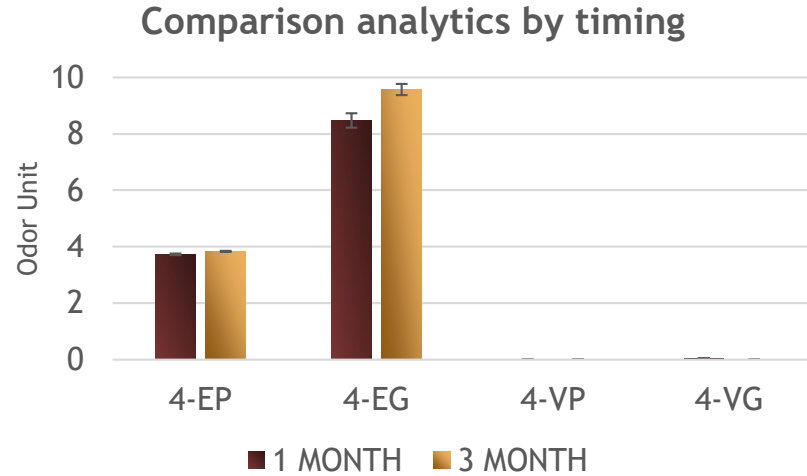
Bottle Conditioning

+10 g/l (1.34oz/gal) of sterile
sucrose

+5 g/l (or equivalent) (0.67 oz/gal)
of SafBrew™ BR-8 vs SafAle™ F-2

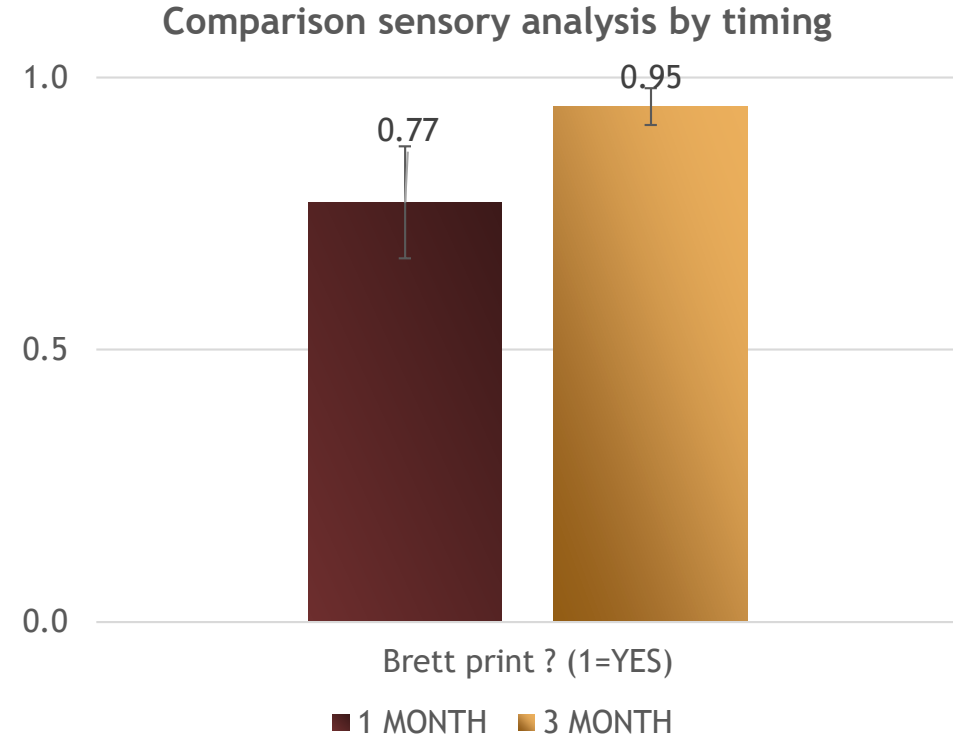
At 24°C (75.2°F) during 1 and 3
months

Analytical & Sensory Data after 1 & 3 Months



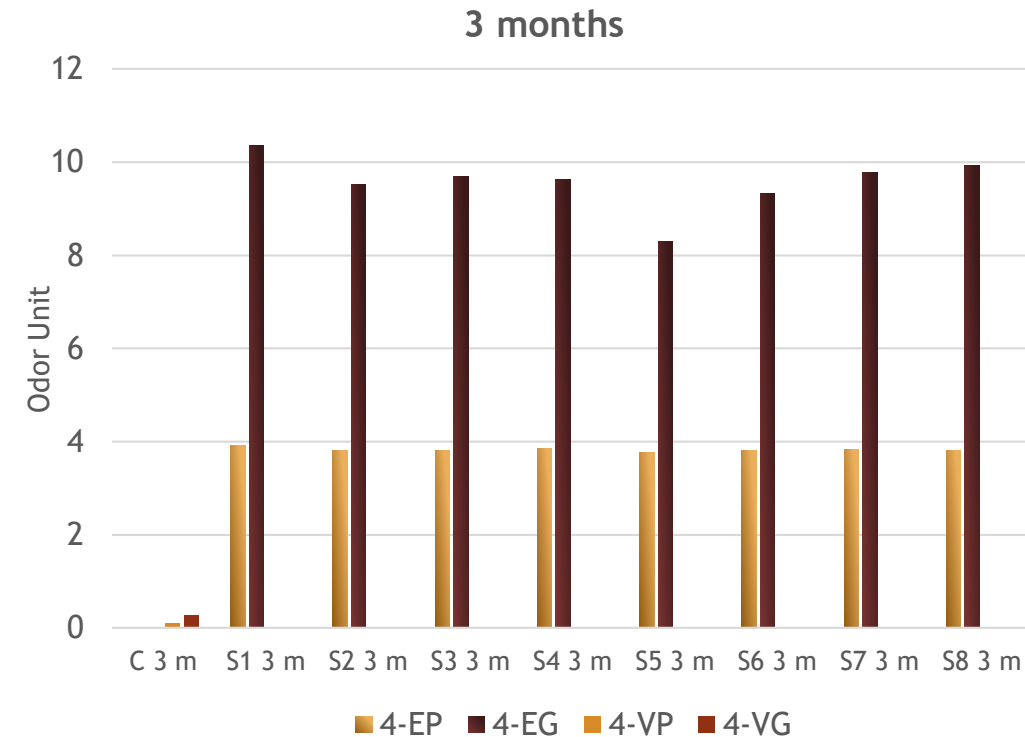
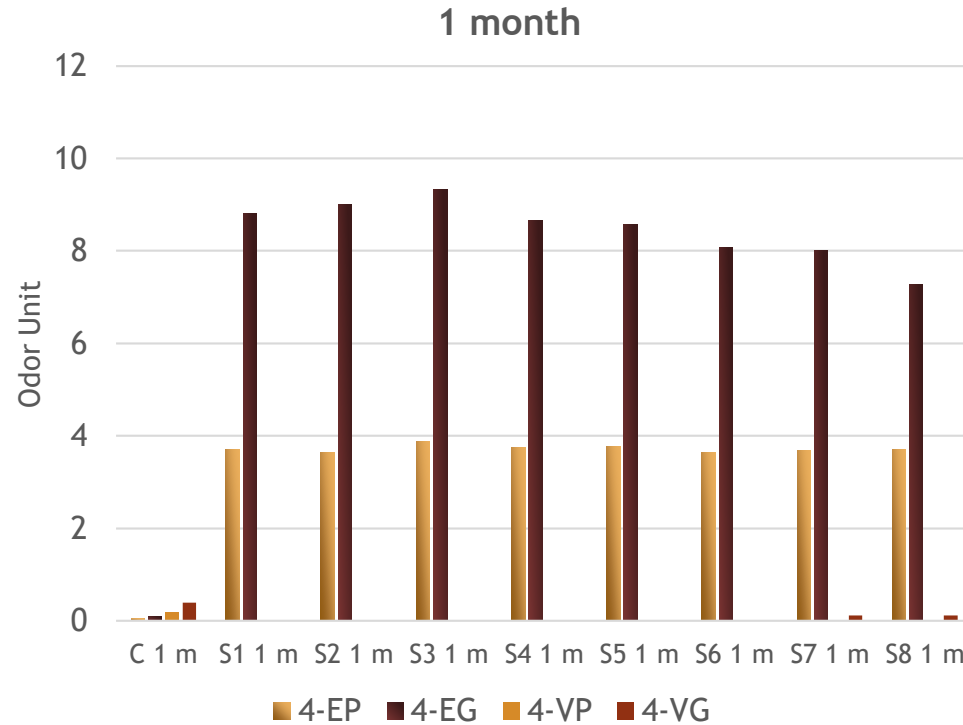
$$OU = \frac{\text{ppm of phenol}}{\text{Phenol threshold*}}$$

All samples refermented with SafBrew™ BR-8 show a concentration in 4-EP and 4-EG >> threshold



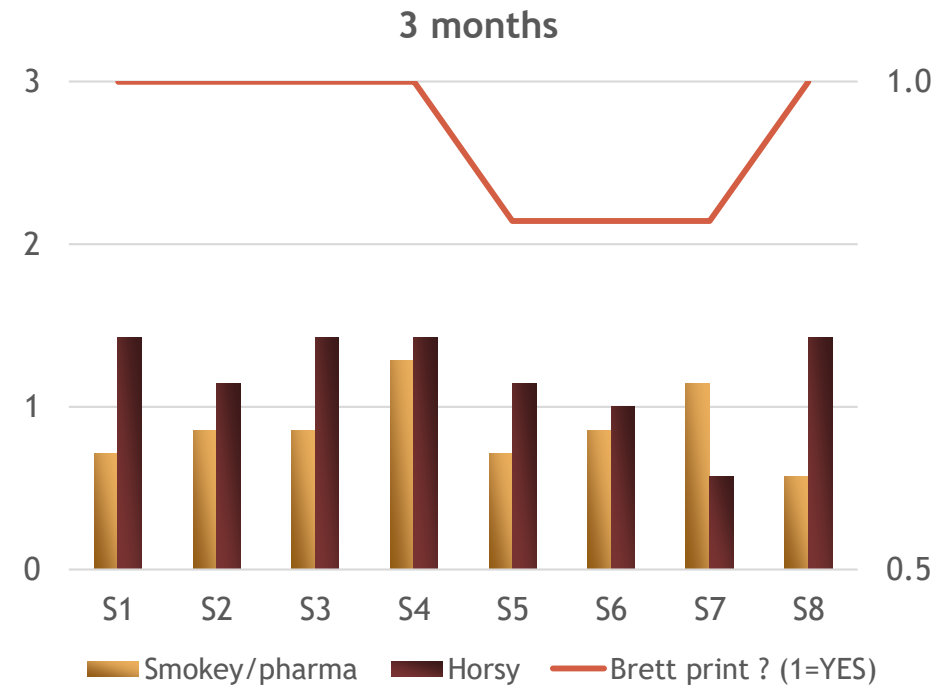
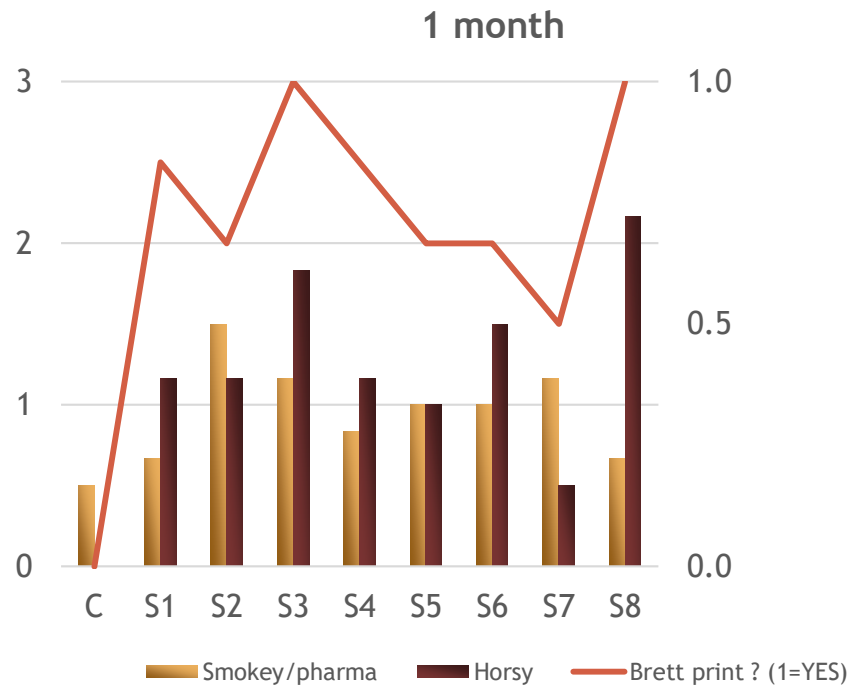
All samples refermented with SafBrew™ BR-8 show a brett footprint after 1 month, increasing after 3 months

Analytical Data after 1 & 3 Months



Higher intensity obtained after 3 months

Sensory Data after 1 & 3 Months



Better footprint homogeneity obtained after 3 months

05 | Key Learnings



SafBrew™ BR-8

Brettanomyces bruxellensis sp.

Usage

Bottle & Cask Conditioning (Re-Fermentation)

Rehydration

10 times

the weight in sterile water
or hopped wort

25-29 °C

(77-84.2 °F)

15-30min under
low/moderate agitation

Dosage rate

5-10 g/hl¹

(0,006-0,013oz/gal)

Refermentation

15 °C-25 °C

(59-77 °F)

1-3 months

Phenols

Production

4-EP & 4-EG

« horsy-funky » character
(after 1 month, increasing over time)

Storage

conditions

≥ 6 months at 4 °C

(39.2 °F)

2 years shelf-life



Thank you for
your attention!



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