



BEST PRACTICES SAISON SOLUTIONS

Saison (French for “season”) is a beer style originating from Wallonia, Belgium, originally produced to provide beer to workers during the farming season. Traditional Saison beers are refreshingly dry with notes of fruit and spice.

The Saison beer style is defined by the yeast strain. Traditional Saison yeast (i.e. **LalBrew Belle Saison™**) is capable of fermenting larger sugars (starch and dextrins) and producing fruity esters and phenolic compounds that impart the characteristic pepper and clove flavors.

The high attenuation of traditional Saison yeast is achieved by the expression of a glucoamylase enzyme expressed by the STA1 gene. *Saccharomyces* yeasts that possess the STA1 gene and express a glucoamylase enzyme are referred to as *diastaticus* variants due to their increased diastatic potential (*Saccharomyces cerevisiae* var. *diastaticus*).



Special attention needs to be paid when using diastaticus yeast strains. If any dextrins are present in the finished product, the yeast may continue to ferment these sugars resulting in overcarbonation, higher alcohol content and altered flavor profile. Sanitation best practices must be followed to avoid cross contamination of diastaticus strains in the brewery.

To avoid potential cross-contamination, some brewers choose to use other non-diastaticus yeast strains to produce “Saison-like” beers. Abbaye ale strains (i.e. **LalBrew Abbaye™**) produce fruity esters and spicy phenols, but have lower attenuation than traditional Saison strains since they do not metabolize dextrins.

Recently, selective breeding methods (non-GMO) have been used to isolate a non-diastaticus Saison hybrid: **LalBrew Farmhouse™**. This new hybrid strain does not possess the STA1 gene while conserving greater than 70% of the genome of the traditional Saison parental strain.

Beer fermented with **LalBrew Farmhouse™** presents flavor and aroma characteristics of traditional Saison beer styles without the over-attenuation and contamination risk of a diastaticus yeast.

*For more information on how to brew with diastaticus strains and detect potential diastaticus cross contamination please refer to our **Best Practices - Diastaticus** document or contact our technical team at brewing@lallemand.com*

QUICK FACTS

FARMHOUSE HYBRID SAISON-STYLE YEAST <i>Saccharomyces cerevisiae</i>	BELLE SAISON SAISON-STYLE ALE YEAST <i>Saccharomyces cerevisiae</i> var. <i>diastaticus</i>	ABBAYE BELGIAN-STYLE ALE YEAST <i>Saccharomyces cerevisiae</i>
ATTENUATION High	ATTENUATION Very high	ATTENUATION High
STA1 GENE Negative	STA1 GENE Positive	STA1 GENE Negative
SUGARS METABOLIZED Glucose, maltose, maltotriose	SUGARS METABOLIZED Glucose, maltose, maltotriose, Dextrins	SUGARS METABOLIZED Glucose, maltose, maltotriose
FLOCCULATION Low	FLOCCULATION Low	FLOCCULATION Medium to high
FERMENTATION RANGE 20 - 30°C (68 - 86°F)	FERMENTATION RANGE 15 - 35°C (59 - 95°F)	FERMENTATION RANGE 17 - 25°C (63 - 77°F)
ALCOHOL TOLERANCE 13% ABV	ALCOHOL TOLERANCE 15% ABV	ALCOHOL TOLERANCE 14% ABV

STRAIN COMPARISON CHART

FLAVOR & AROMA

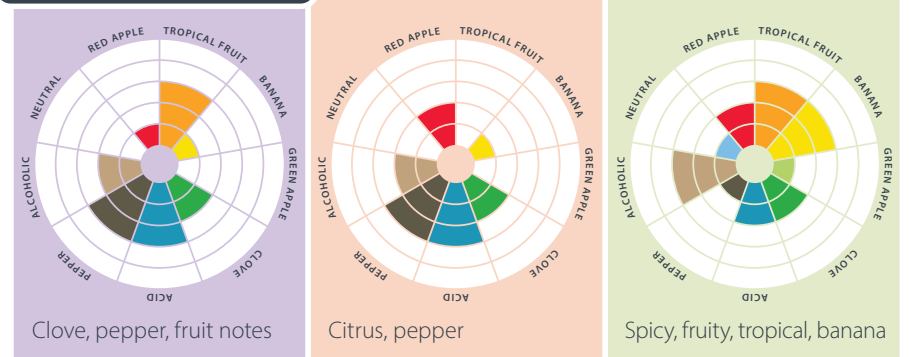


FIG.1: BELLE SAISON v ABBAYE v FARMHOUSE SAISON, 20°C, 100G/HL

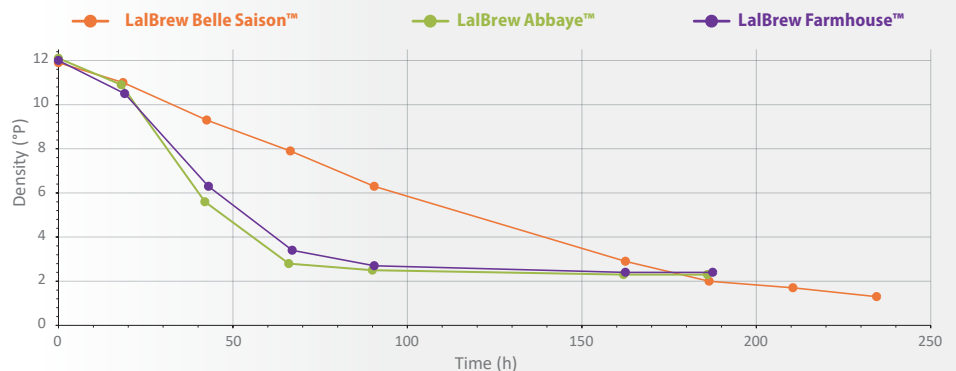
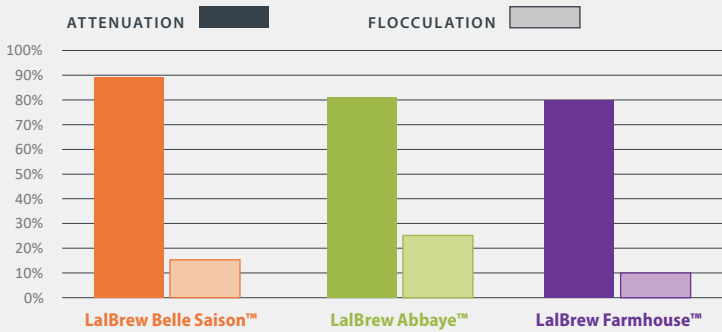




FIG.2: APPARENT ATTENUATION & RELATIVE FLOCCULATION OF BELGIAN YEAST STRAINS

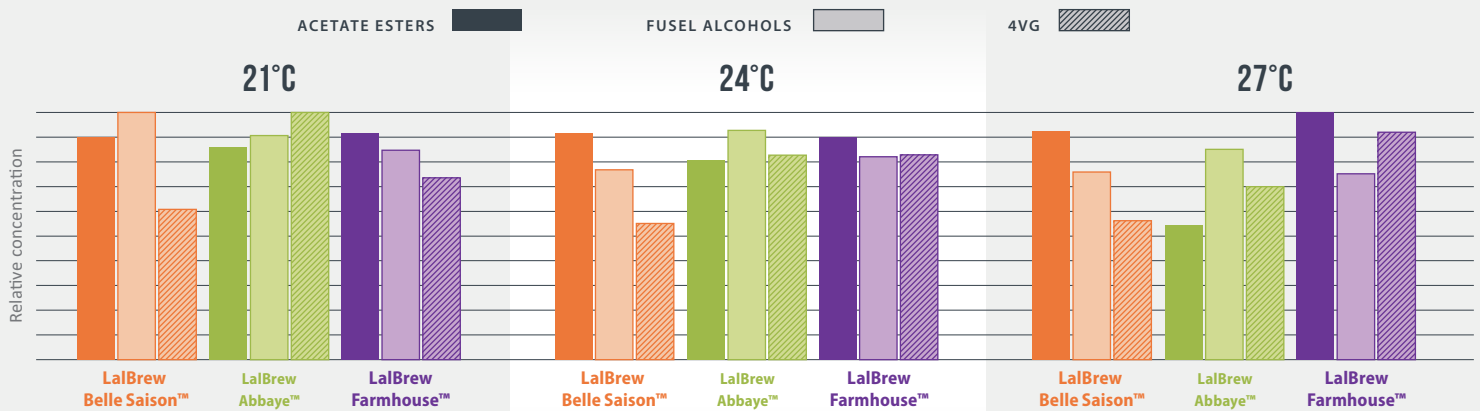


Fermentations were performed using a standard pale 12°P wort prepared from malt extract, pitched with 100g/hL of yeast and fermented at 20°C. Relative flocculation was measured according to ASBC method Yeast-11 (Helm assay).

FLAVOR CONTROL: ESTERS AND PHENOLICS

The yeast-derived flavor profile of each yeast strain is influenced by many factors. In general, higher levels of esters are achieved by pitching less yeast, fermenting at a higher temperature or addition of adjunct sugars. Higher levels of phenolic compounds such as 4-vinyl-guaiacol (4VG) can normally be achieved by using a combination of barley and wheat malts and performing a ferulic acid rest (~45°C) during the mash. Fusel alcohol levels tend to be positively correlated with fermentation temperature. We have provided below a snapshot of the flavor compounds produced by **LalBrew Belle Saison™**, **LalBrew Abbaye™** and **LalBrew Farmhouse™** in laboratory fermentations using a standard wort. Flavor development is complex and there are exceptions to these general rules, so brewing trials are recommended in order to optimize the recipe and brewing process to achieve the desired flavor profile.

FIG.3: RELATIVE CONCENTRATION OF ACETATE ESTERS, FUSEL ALCOHOLS AND 4-VINYL GUAIACOL



Fermentations were performed using an all-malt standard pale 12°P wort pitched with a liquid yeast propagation at a rate of 9 million viable cells/ml and fermented at 21, 24 and 27°C. Relative concentrations were calculated separately for each class of compounds and comparisons should not be made between different compound classes.

ATTENUATION CONTROL FOR NON-DIASTATICUS STRAINS

Despite the inability to metabolize dextrins, it is possible to achieve greater attenuation with non-diastaticus yeast strains in order to better mimic the performance of a traditional diastaticus Saison strain. The goal is to increase wort fermentability using one or more of the following methods:

- Lower the mash temperature
- Add sugars or other adjuncts
- Decrease the amount of special malts
- Avoid the use of unmalted grains
- Add chemically pure glucoamylase enzyme such as ABV Glucoamylase 400 to the mash and/or pre boil wort (the enzyme will be denatured in the boil, so it is not active in the packaged beer)

YEAST STRAIN BY BEER STYLE CHART

A traditional Saison yeast strain such as **LalBrew Belle Saison™** is used to produce dry Belgian beer styles, whereas non-diastaticus Belgian yeast such as **LalBrew Abbaye™** are used to produce malty, full-bodied Belgian ales. When using a modified process and recipe as described above, **LalBrew Farmhouse™** and **LalBrew Abbaye™** can be used to produce beer styles normally produced only by traditional Saison yeast. ☺

STRAINS BY BEER STYLE	BELLE SAISON	ABBAIE	FARMHOUSE
BELGIAN BLOND ALE	☺	☹	☹
BELGIAN DARK STRONG ALE	☺	☹	☹
BELGIAN GOLDEN STRONG ALE	☺	☹	☹
BELGIAN PALE ALE	☺	☹	☹
BELGIAN QUAD	☺	☹	☹
BELGIAN TRIPEL	☺	☹	☹
BERLINER WEISS	☹	☺	☺
BIÈRE DE GARDE	☺	☹	☹
FARMHOUSE ALE	☹	☺	☺
GOSE	☹	☺	☺
SAISON	☹	☺	☺
WITBIER	☺	☹	☹