

# FERMENTATION OF REFINED SUGAR



## Best Practices Series #1

### ■ Targets

Fermentation of **WHITE SUGAR** and other refined sugars for **NEUTRAL** distilled or non-distilled products such as ready-to-drink base.

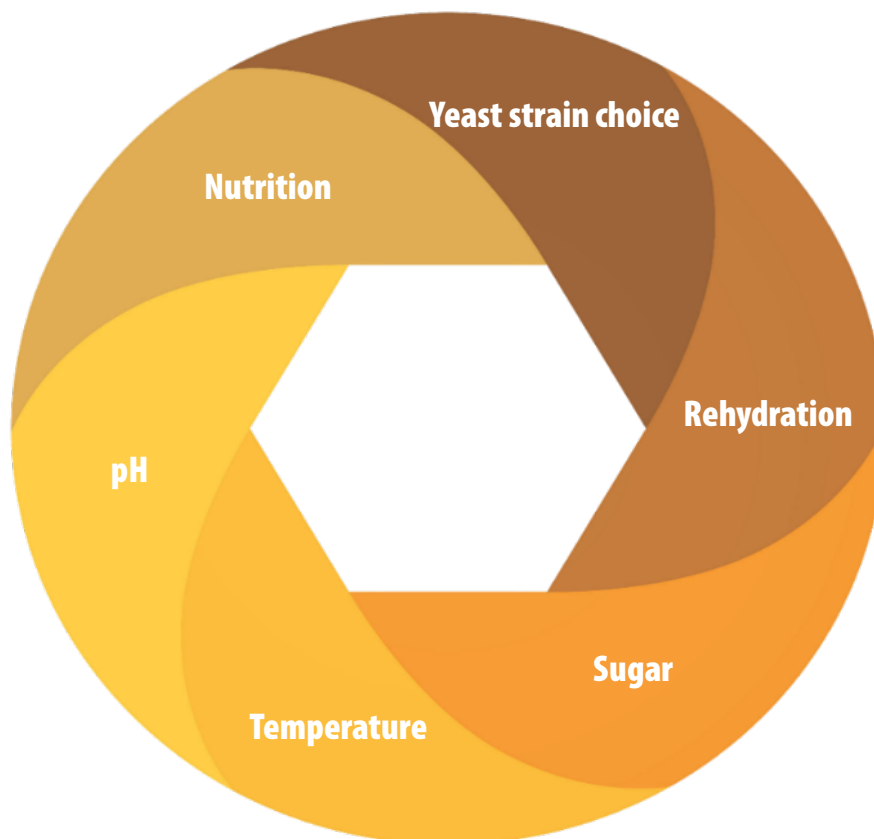
### ■ Features or sugar fermentations

Refined sugar fermentations may look easy to accomplish and appear to offer several advantages based on little time and energy required for the substrate preparation steps, however, there are several parameters that should be considered for a favourable fermentation outcome. The choice of the parameters will impact the challenges to obtain a final product with a good yield and no off-notes.

Some important fermentation parameters to consider are:

- Different sugar sources are available: pure sucrose, HFCS, dextrose, etc.
- Virtually no nutrients are found in any of these various sugar types.
- Will the goal be to get a very high % abv, over 12 %?
- What fermentation timing is best suited to your production schedule?
- Are you targeting a very clean aroma and neutral taste (especially when the wash is not distilled)?

### ■ Key points to consider for a successful fermentation



## ■ Lallemand Distilling recommendations

### Yeast strain choice

Fermentation of refined sugar requires a yeast strain resistant to high osmotic stress, high alcohol levels and low pH. Lallemand Distilling recommends working with **DistilaMax® HT**, **DistilaMax® SR** or **DistilaMax® ML**, to help with a faster fermentation start to manage stress factors and high yeast dosage is recommended: 1-1.5g/Litre (per final volume).

### Rehydration

The higher sugar concentration and the higher final ethanol % abv you are targeting, the more critical this step is. Lallemand Distilling recommends rehydrating the yeast following the protocol of rehydration that can be found on the technical data sheets, alternatively please contact your technical sales representative if you have any questions.

### Sugar

People tend to add all the sugar at the start of their fermentation, which creates HIGH osmotic stress on the yeast. Lallemand Distilling recommends adding sugar in 2-3 steps, in order to achieve no more than 15-20 Brix at each addition.

### Temperature

Temperature is a stress factor that usually is able to be managed easily. Lallemand Distilling recommends working at a temperature between 25 °C and 30 °C.

### pH

Because there is no buffer in sugar fermentations, the pH tends to drop quickly to levels that are considered high stress on the yeast. Lallemand Distilling recommends using either sodium bicarbonate or potassium bicarbonate at 1g/Litre (per final volume) to help buffer your fermentations.

### Nutrition

During fermentation, yeast needs: nutrients, vitamins and minerals. Refined sugar is a poor substrate and doesn't contain any nutrients. To keep your yeast working properly, Lallemand Distilling recommends using **DistilaVite® GN** at 1g/Litre (per final volume), and 1g/Litre (per final volume) of diammonium phosphate (DAP). Both nutrients, should be added at the start of fermentation.

## ■ Summary

Fermentation of refined sugar is challenging due to its very stressful environment for the yeast and therefore requires a lot of attention:

- Use a robust yeast: **DistilaMax® SR**, **DistilaMax® ML** or **DistilaMax® HT** at high dosage.
- Rehydrate the yeast to make sure it will work properly.
- Perform multiple sugar additions.
- Control the fermentation temperature.
- Add potassium or sodium bicarbonate to create a buffer.
- Balance the yeast nutrition with **DistilaVite® GN** + DAP.



Regarding the usage and dosage of products, Lallemand Distilling recommends consulting local regulations to ensure you comply with your product category approved processing aids. Lallemand Biofuels & Distilled Spirits (LBDS) is proud to supply distillers with a "one stop shop" format. Visit our website [www.lallemanddistilling.com](http://www.lallemanddistilling.com) to find out more about our products or contact your local LBDS representative.