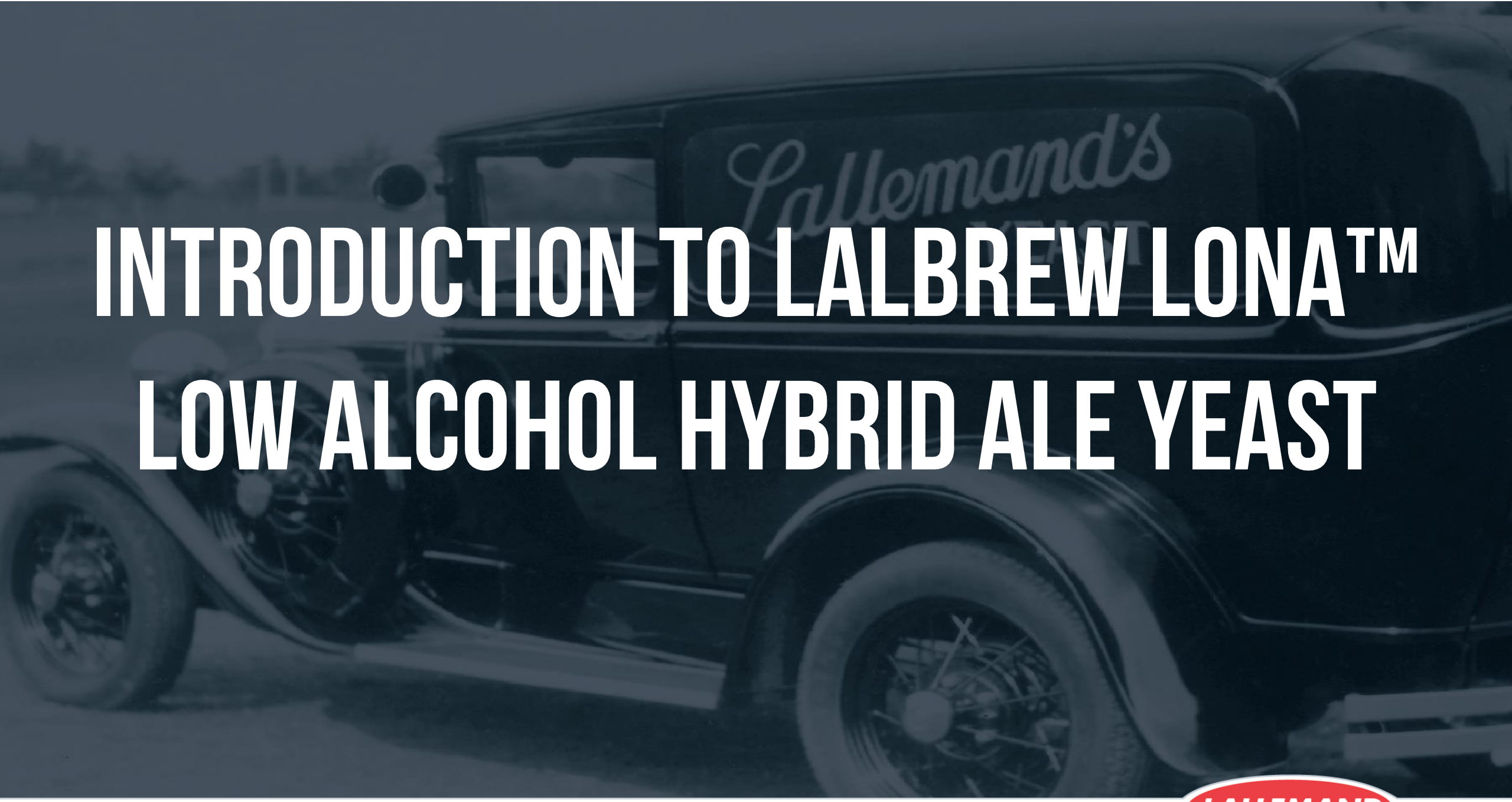



# INTRODUCTION TO LALBREW LONA™ LOW ALCOHOL HYBRID ALE YEAST

# OVERVIEW

1. Brewing NABLAB
2. A Better Approach with Fermentation
3. LalBrew LoNa™ Intro
4. Comparison with other Maltose Neg Strains
5. Trial Data
6. Key Fermentation Points & Summary


# BREWING LOW/NO-ALCOHOLIC BEERS

# OVERVIEW OF LOW/NON ALCOHOLIC BEER PRODUCTION

- **Non Alcoholic Beer:**
  - Defined as beer that is <0.05 - 0.5% ABV (dependent on your region)
- **Low Alcoholic Beer**
  - Defined as 0.5-1.5% ABV
- Non-alcoholic beers can be made in different ways

# COMPARISON OF DIFFERENT NABLAB METHODS

## PHYSICAL

### Alcohol Removal

1. Thermal Processes
    1. Vacuum rectification plant
    2. Thin film evaporators
2. Membrane Processes
    1. Dialysis
    2. Reverse osmosis

## BIOLOGICAL

### Restricted Ethanol Formation

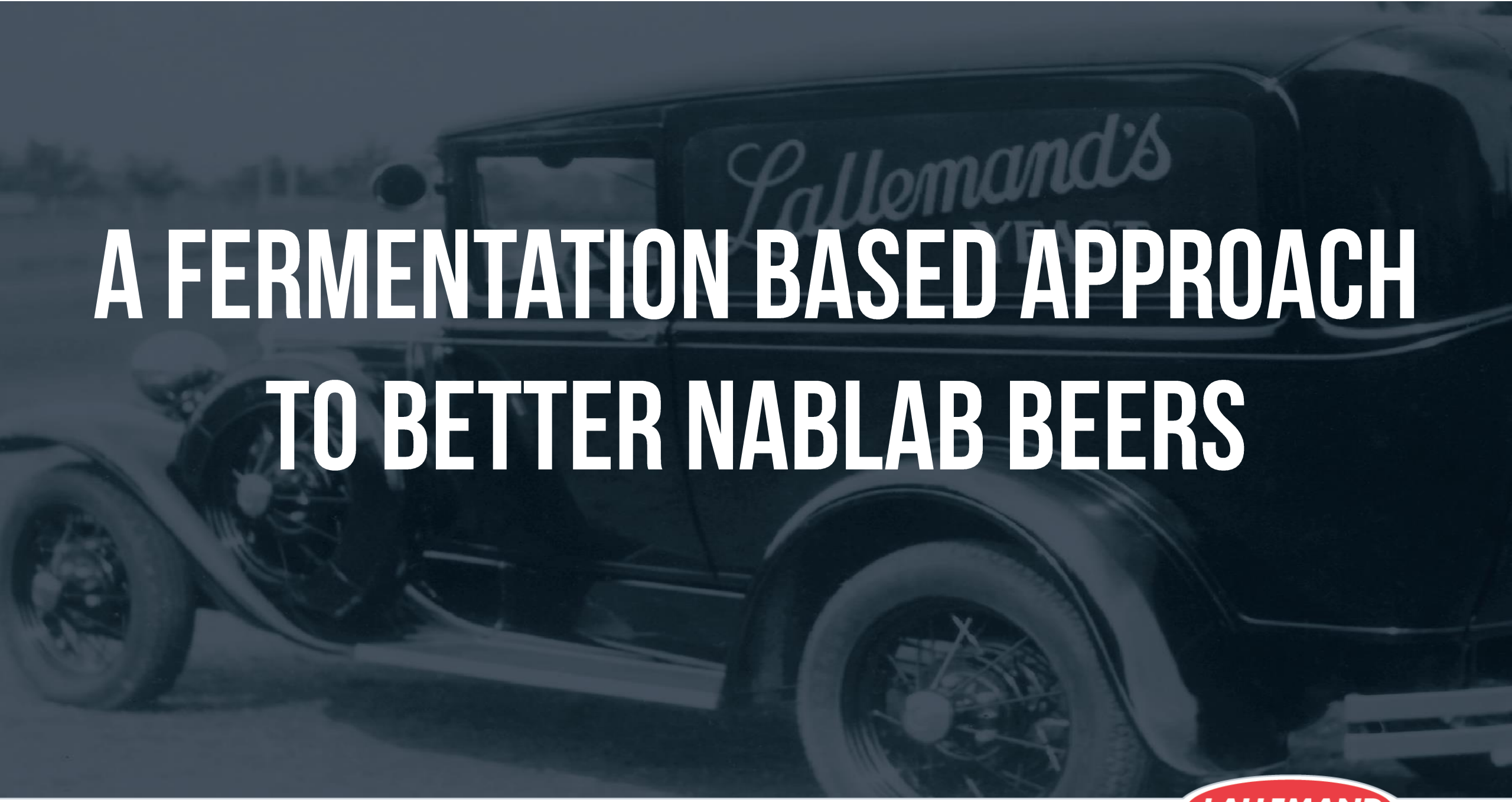
1. Alternative Mashing Process
2. Arrested/Limited Fermentation
3. Special Yeast
4. Continuous Fermentation

# CHALLENGES – PHYSICAL METHODS

1. Costly equipment
2. Significant process optimization
3. Flavor loss by heating
4. Energy intensive
5. Thermal damage
6. Other licensing may be required

# CHALLENGES – BIOLOGICAL METHODS

- Other maltose negative strains
  - Mostly Non-Sacch
  - Almost exclusively wild yeast or food spoilage organism
  - POF+
  - Requires pasteurization
- Maltotriose negative strains
  - Requires very high mash temperatures
- Arrested fermentation
  - Requires close monitoring
  - Inconsistent
  - Worty flavors
  - Risk of overattenuation
- Cold Contact
  - Worty flavors




# A FERMENTATION BASED APPROACH TO BETTER NABLAB BEERS

# THE CHALLENGE: HOW TO MAKE A BETTER NALAB

**Desired Traits:**

- Fermentation solution (no ethanol removal equipment required)
- Cleaner profile
- No POF
- Reduced worty flavors
- Consistent performance
- Simple process
- Versatility for different styles

# LOW OR NON ALCOHOLIC BEER PRODUCTION PROCEDURE

1. Mash a well modified Ale malt at a high mash temperature to limit glucose and maltose production
    1. A very high temperature mash can lead to a very hazy wort and processing problems
2. Target a low OG between 1.020 – 1.027 (5.1-6.8°P)
3. Lauter as normal but ensure pH and gravity remain within normal brewing levels. (5.1-5.4) Acid additions may be necessary.
4. Boil as normal and cool as normal, monitoring the pH
5. The pH should be adjusted to 4.6 prior to fermentation.

# LOW OR NON ALCOHOLIC BEER PRODUCTION

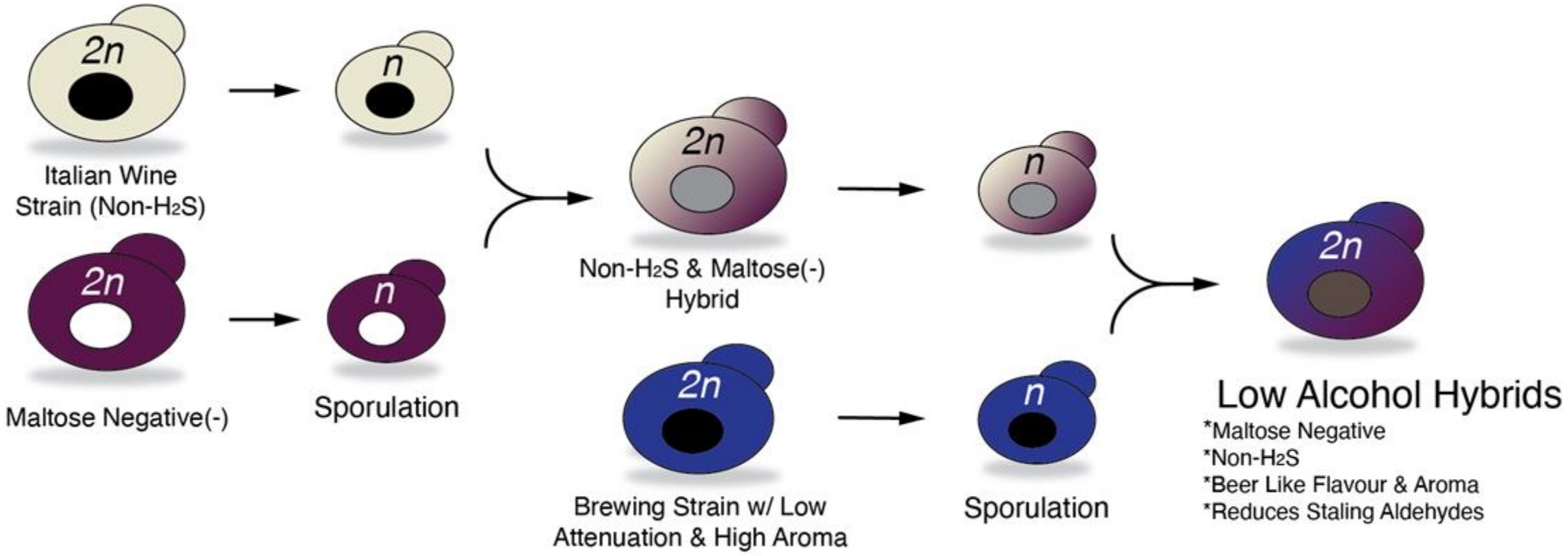
6. Pitch LoNa™ hybrid maltose negative yeast
7. Final pH should be less than 4.4 and ideally between 3.9-4.1
8. Pasteurize to ensure product stability and safety

# INTRODUCING LALBREW LONA™

# LALBREW LONA™ OVERVIEW


- Advanced non-GMO breeding methods were used to select a strain that does not consume maltose or maltotriose resulting in very low attenuation.
- LoNa™ is the first hybrid *Saccharomyces cerevisiae* strain that does not ferment maltose or maltotriose
- LoNa™ does not produce H2S and uses a large proportion of staling aldehydes resulting in a low or non-alcoholic beer that tastes more like beer

# BREEDING CHART – HOW IT'S MADE




All parents are *Saccharomyces cerevisiae*

# FERMENTATION CHARACTERISTICS

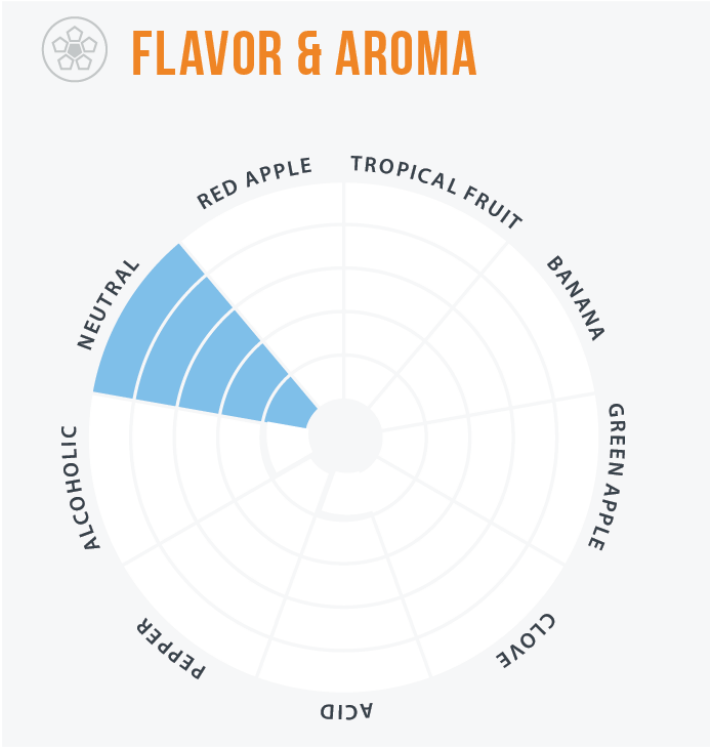
Based on an 8°P wort


**Pitch Rate**: 50-100g/hl
**Fermentation Temperature**: 20-25°C (68-77°F)
**Attenuation:** 16-20% (lower with high mashing conditions)
**Flocculation**: Medium
**Fermentation Completed** in 3-4 days
**Repitchability**: Not repitchable

# FLAVOUR CHARACTERISTICS

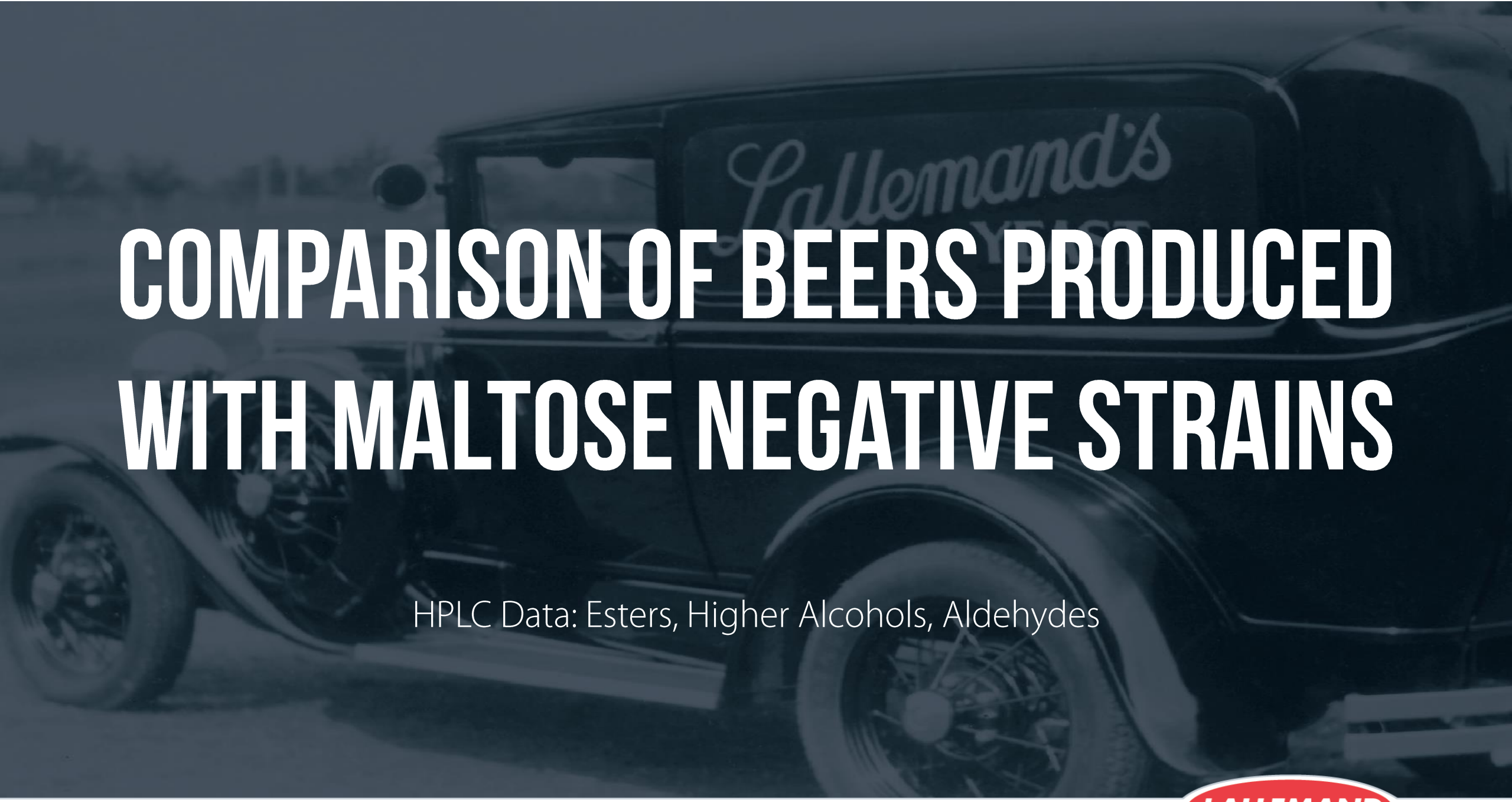

- Has a clean and neutral aroma
- Does not produce H2S and is POF-
- Reduction in aldehydes lends for reduced wort character, similar to a traditional beer fermentation

Technical Data Sheet (English)



# NOTES ON USAGE - PASTEURIZATION REQUIRED

- It is recommended to adjust wort pH to ≤4.6 to limit growth of pathogenic bacteria.
- Repitching is not recommended
- Pasteurization is required when brewing with LalBrew® LoNa™ to avoid refermentation after packaging and ensure beer stability

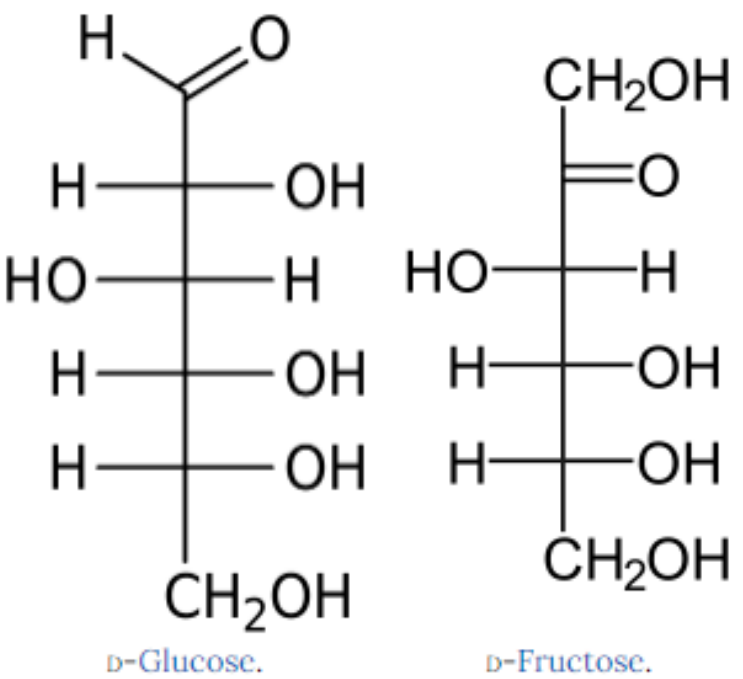


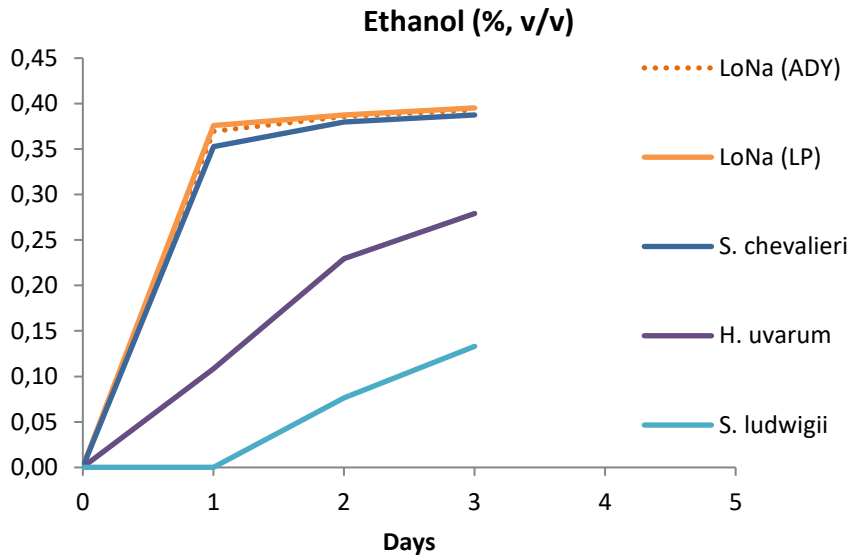

# COMPARISON OF BEERS PRODUCED WITH MALTOSE NEGATIVE STRAINS

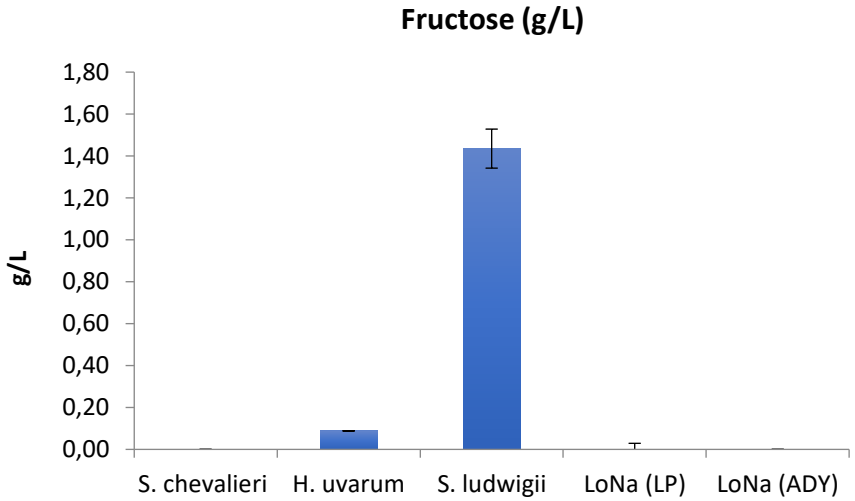
HPLC Data: Esters, Higher Alcohols, Aldehydes

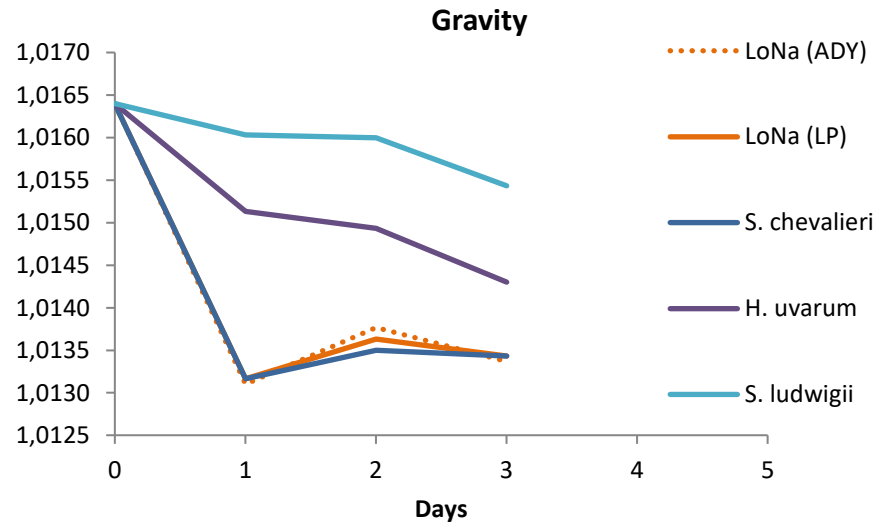
# TYPICAL WORT PROFILE

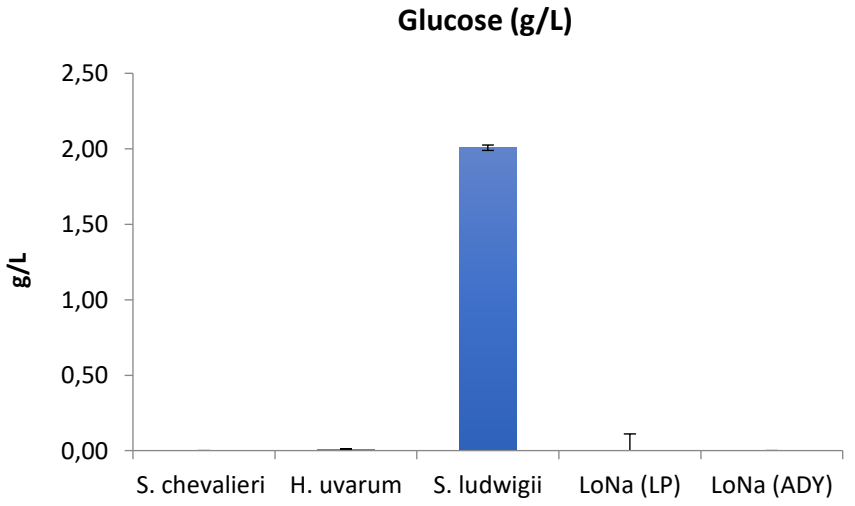
- Typical fermentable profile of wort:
  - 14% w/v monosaccharides (glucose, fructose, other hexoses)
  - 5% w/v sucrose (DP2)
  - **47% w/v maltose (DP2)**
  - 14% w/v maltotriose (DP3)
  - 24% w/v "dextrins" (DP4+)
- DP = degree polymerization



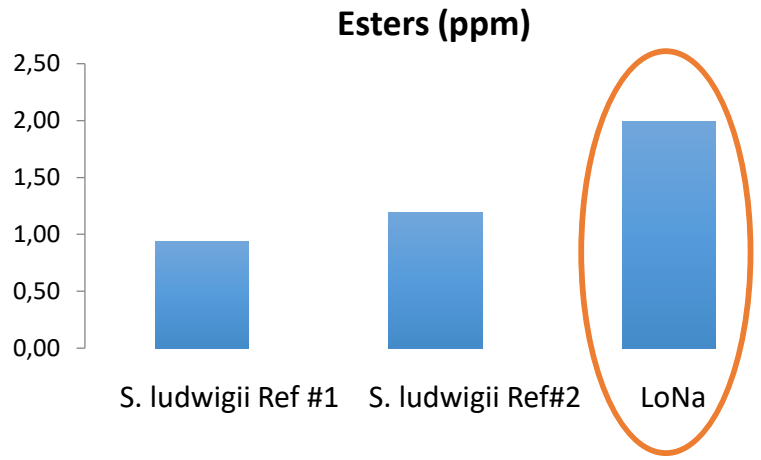

Ethanol (%, v/v)
0,45
0,40
0,35
0,30
0,25
0,20
0,15
0,10
0,05
0,00
0
1
2
3
4
5
Days
LoNa (ADY)
LoNa (LP)
S. chevalieri
H. uvarum
S. ludwigii

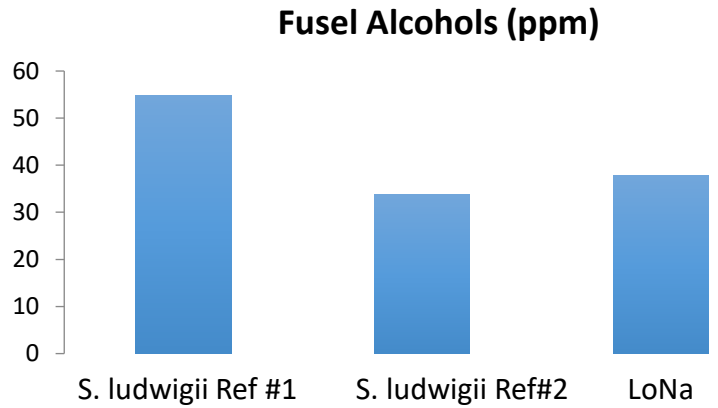

Fructose (g/L)
g/L
1,80
1,60
1,40
1,20
1,00
0,80
0,60
0,40
0,20
0,00
S. chevalieri
H. uvarum
S. ludwigii
LoNa (LP)
LoNa (ADY)

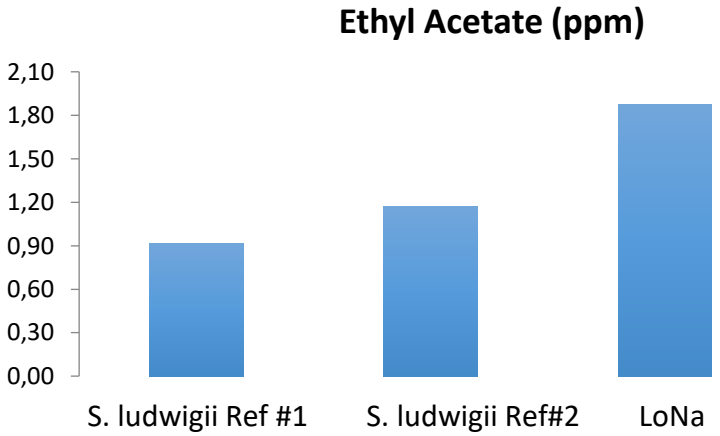

Gravity
1,0170
1,0165
1,0160
1,0155
1,0150
1,0145
1,0140
1,0135
1,0130
1,0125
0
1
2
3
4
5
Days
LoNa (ADY)
LoNa (LP)
S. chevalieri
H. uvarum
S. ludwigii

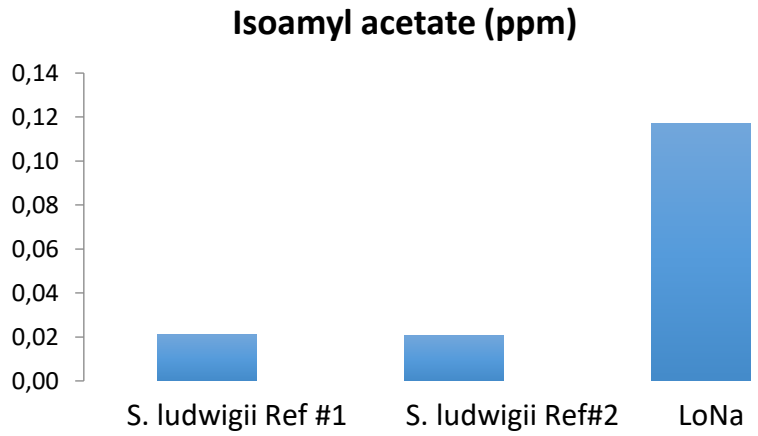

Glucose (g/L)
g/L
2,50
2,00
1,50
1,00
0,50
0,00
S. chevalieri
H. uvarum
S. ludwigii
LoNa (LP)
LoNa (ADY)

# ESTERS AND FUSEL ALCOHOLS



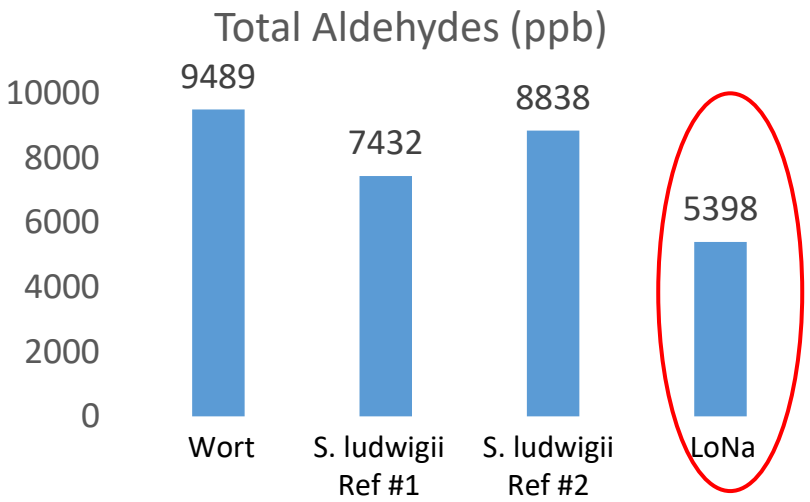

- LoNa™ produces a higher proportion of “beer-like” esters and aromas compared to the reference *Saccharomycodes ludwigii*

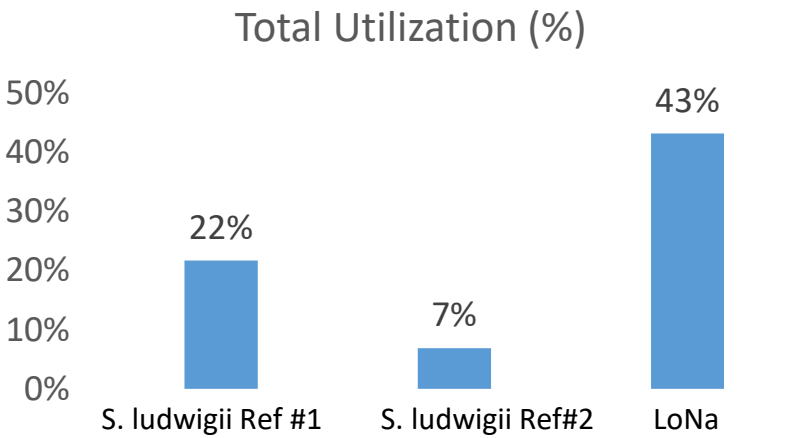
# ALDEHYDES

- Low and no alcohol beers suffer from flavor defects often described as sweet or worty.
- These flavors originate from flavor active aldehydes which are created in the mashing and boiling processes. The most abundant are 3-methyl butanal, 2-methylbutanal and methional.
- Ordinarily these aldehydes are reduced to their primary alcohols through the activity of yeast during fermentation, but in a limited or restricted fermentation this reduction may not happen to the same degree.
- LoNa™ exhibits good aldehyde reduction compared to other maltose negative strains

# UTILIZATION OF STALING ALDEHYDES

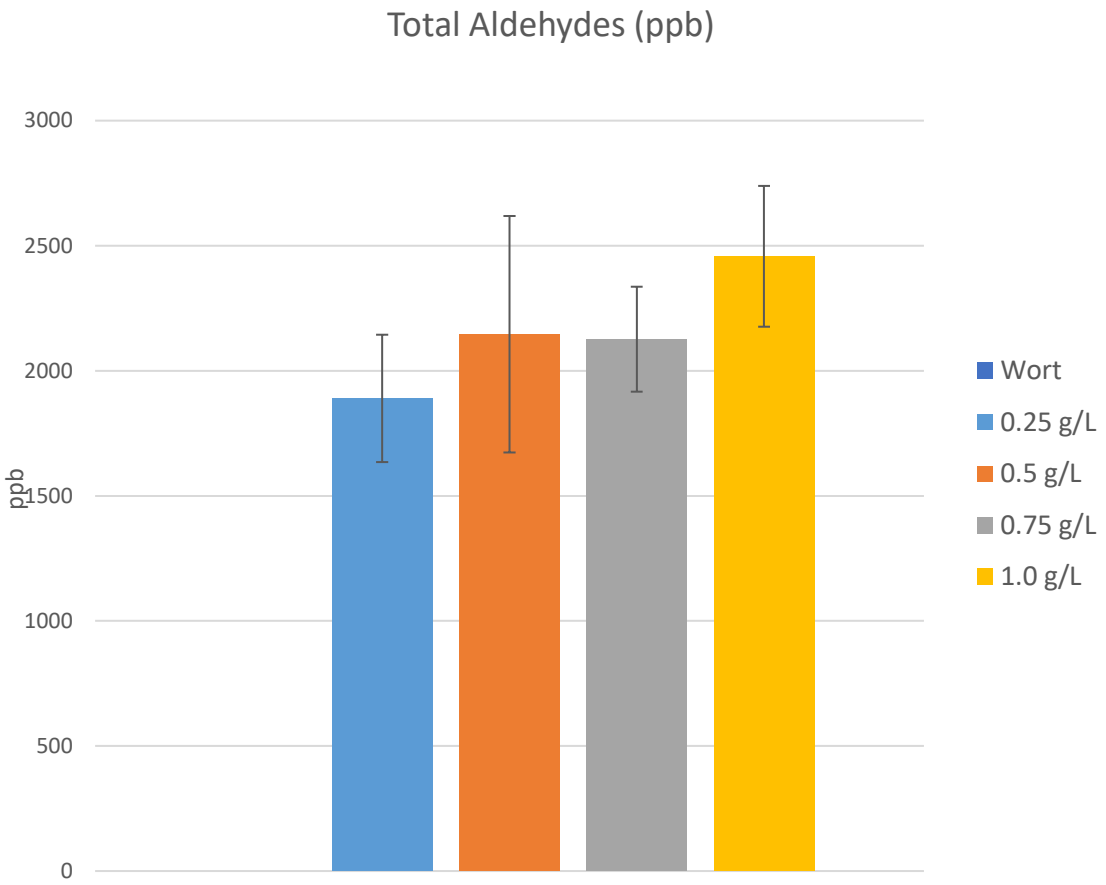
Aged at 42˚C for 3 weeks, Total Aldehydes

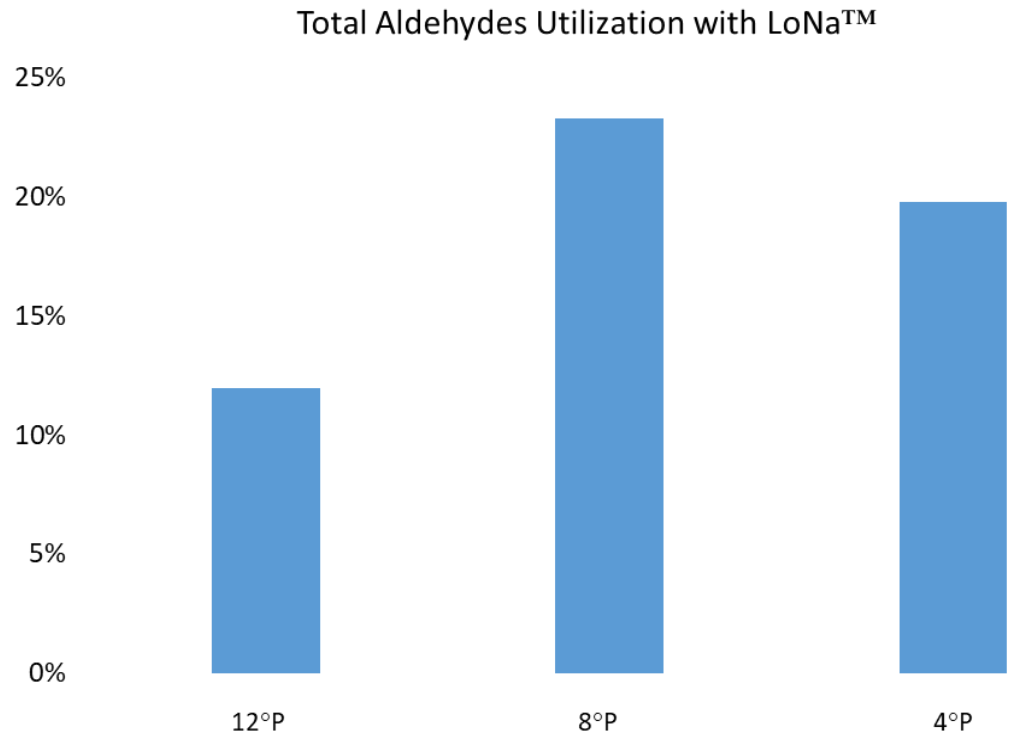


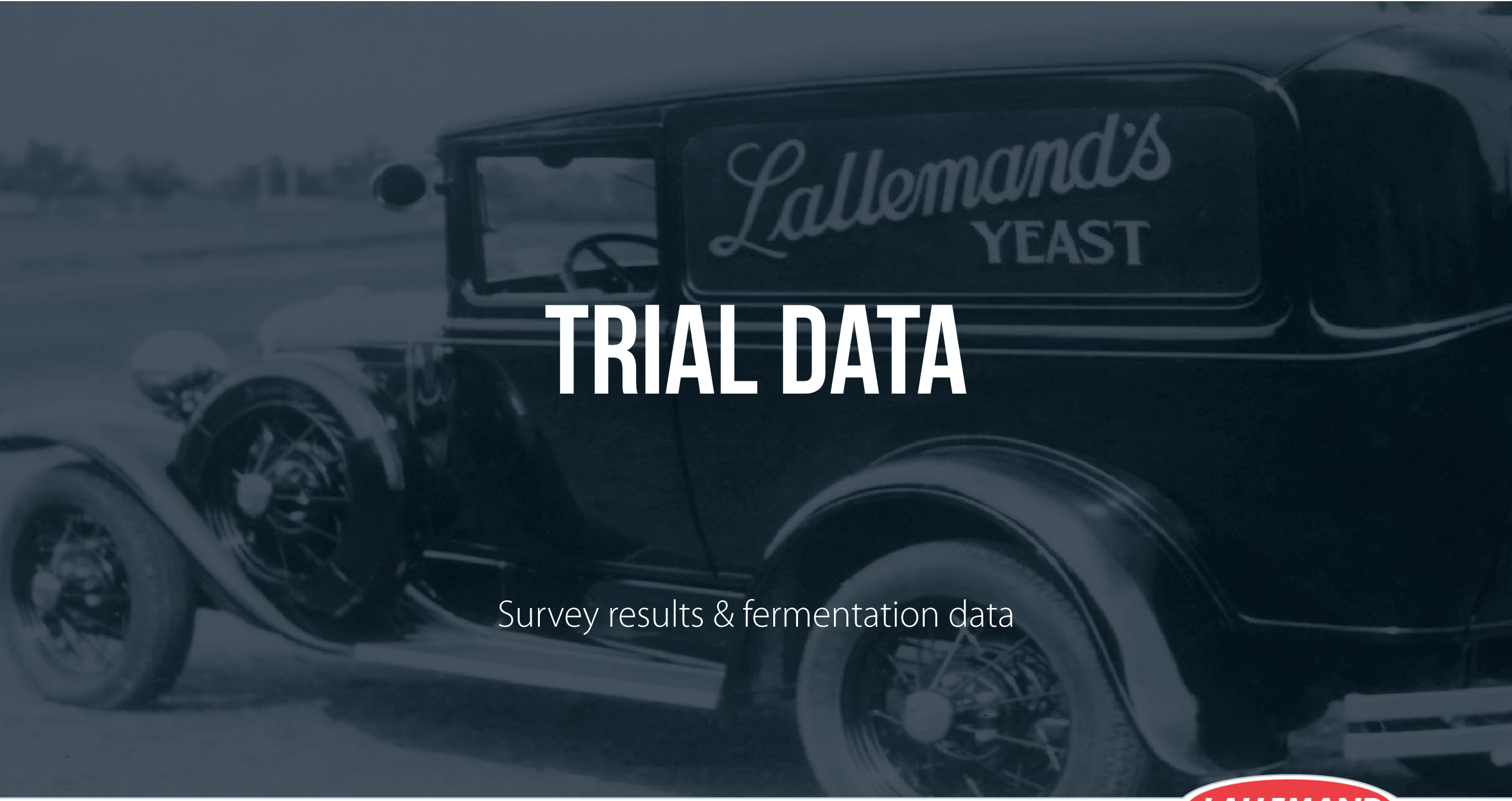

- Low alcohol beers are known to have a high level of staling aldehydes due to the limited nature of fermentation.
- LoNa™ strain utilize a higher proportion of aldehydes when compared to the reference maltose negative S. ludwigii strains.
- Low Alcohol beers fermented with LoNa™ taste fresher and cleaner than other maltose negative strains.

# ALDEHYDES UTILIZATION COMPARISON




- Lower pitch rates yielded lower aldehydes
- More aldehydes were utilized at a lower original gravity



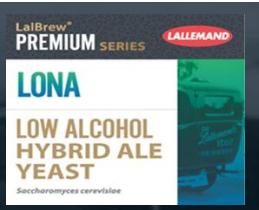

# TRIAL DATA

Survey results & fermentation data

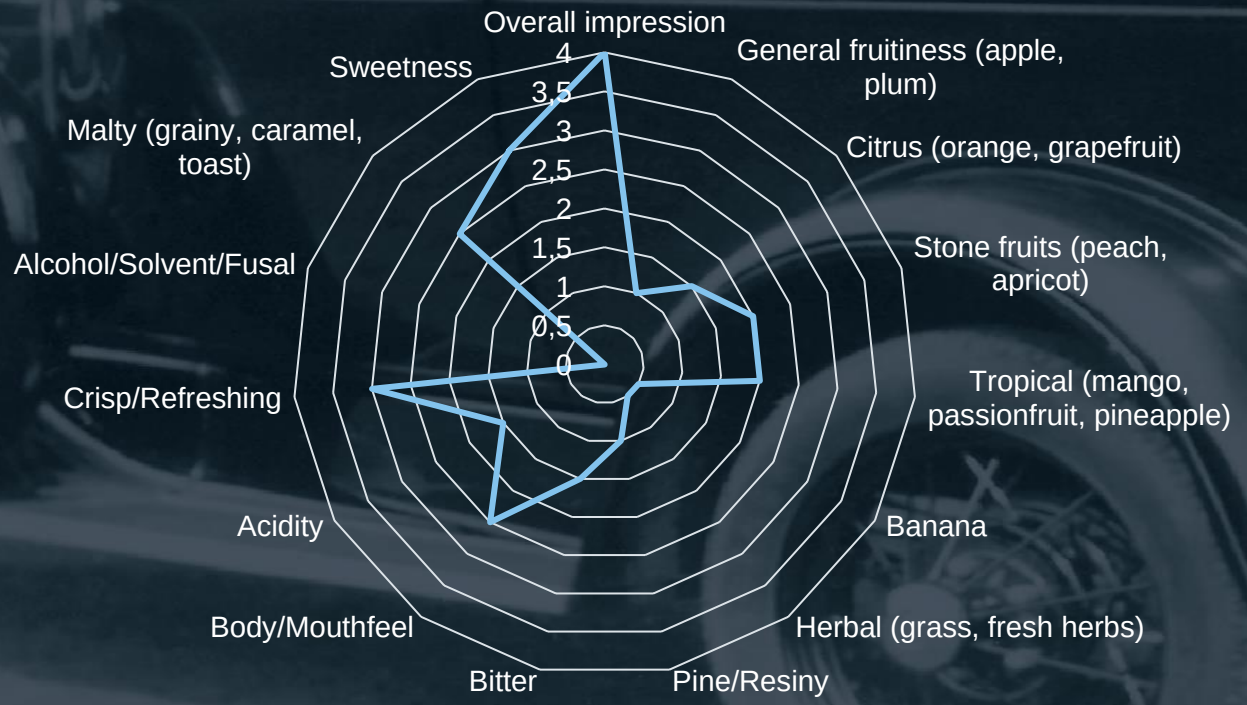
# LALBREW LONA™ TRIAL OVERVIEW


- Feedback is **VERY** positive
- Avg ABV: 0.5%
- Avg fermentation 3.2 days
- Sensory feedback: refreshing and clean with some fruitiness
  - Many tasters noted how similar to a traditional beer fermentation beers made with LoNa™ tasted
- Used for a variety of styles

# AVERAGE TRIAL SPECS




| | Apparent Attenuation | ABV | Start pH | End pH | pH drop | Fermenation Time (Days) | Flocculation |
|---|---|---|---|---|---|---|---|
| Averages | 13.2 | 0.5 | 4.8 | 4.5 | 0.3 | 3.2 | 3.3 / 10 |



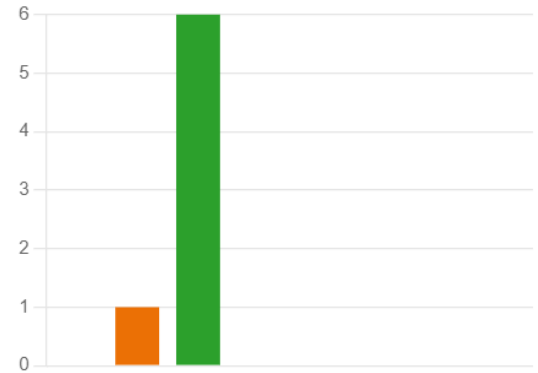
*Survey results from 7 commercial trials

# MASHING

1. What was your mash temperature?

More Details

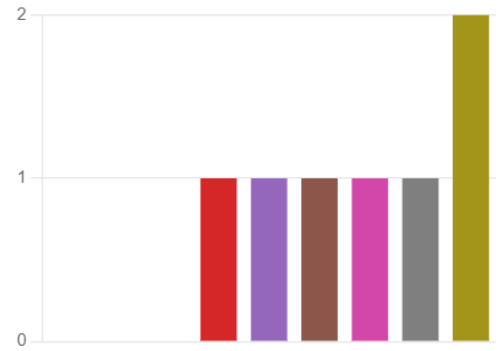
| | |
|---|---|
| Less than 65'C | 0 |
| 65-69'C | 1 |
| 70-74'C | 6 |
| 75-79'C | 0 |
| 80-84C | 0 |
| 85-89'C | 0 |
| 91-94'C | 0 |
| 95'C or greater | 0 |




2. What was the starting gravity?

More Details

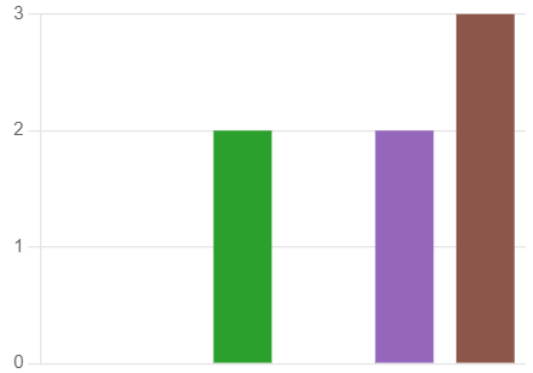
| | |
|---|---|
| Less than 3.0'P | 0 |
| 3.0-3.9'P | 0 |
| 4.0-4.9'P | 0 |
| 5.0-5.9'P | 1 |
| 6.0-6.9'P | 1 |
| 7.0-7.9'P | 1 |
| 8.0-8.9'P | 1 |
| 9.0-9.9'P | 1 |
| 10.0'P or greater | 2 |




3. How long was your mash?

More Details

| | |
|---|---|
| Less than 10 min | 0 |
| 10-19 min | 0 |
| 20-29 min | 2 |
| 30-39 min | 0 |
| 40-49 min 50-59 min | 2 |
| 60 min or greater | 3 |



*Survey results from 7 commercial trials

# ATTENUATION AND ABV

4. What attenuation was achieved using LoNa™ ?

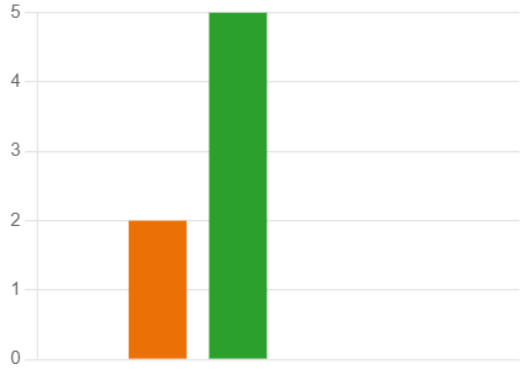
More Details

| | |
|---|---|
| 5% or less | 1 |
| 6-10% | 3 |
| 11-15% | 3 |
| 16-20% | 0 |
| 21% or greater | 0 |

5. What was the ABV of the finished beer?

More Details

| | |
|---|---|
| 0.0-0.3% | 0 |
| 0.4-0.5% | 2 |
| 0.6-1.0% | 5 |
| 1.1-2.0% | 0 |
| 2.1-3.0% | 0 |
| >3.0% | 0 |




6. How did the actual ABV achieved compare to your target ABV?

More Details

| | |
|---|---|
| Much lower | 0 |
| Slightly lower | 0 |
| On target | 5 |
| Slightly higher | 2 |
| Much higher | 0 |

*Survey results from 7 commercial trials

# FLAVOR

7. How would you describe the body/mouthfeel?

More Details

| | |
|---|---|
| Very low | 1 |
| Somewhat low | 3 |
| Medium | 3 |
| Medium-High | 0 |
| High | 0 |

8. Do you have any additional comments about body/mouthfeel?

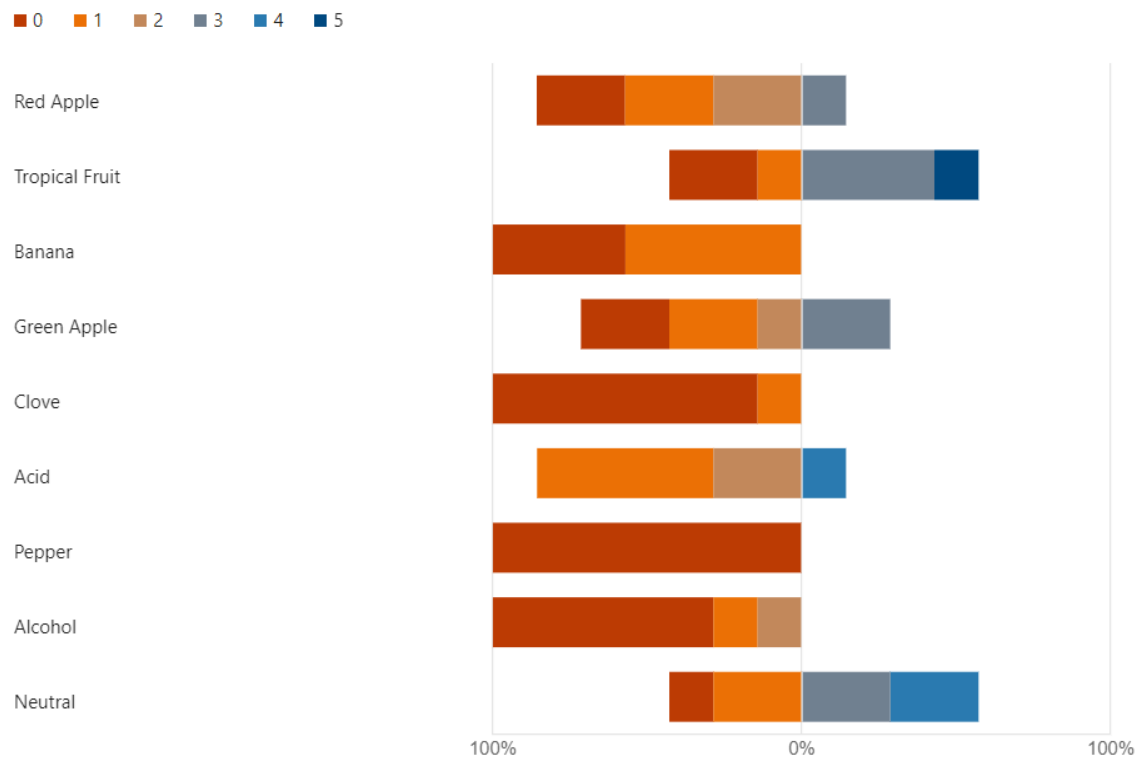
7 Responses

| ID ↑ | Name | Responses |
|---|---|---|
| 1 | anonymous | it could get higher but its not so low bodie as we expected. |
| 2 | anonymous | Is a light beer, no very sweet. |
| 3 | anonymous | The sample was not carbonated so it was a bit tough to tell |
| 4 | anonymous | Body and mouthfeel is appropriate for many of our core NA beers. |
| 5 | anonymous | Clean and on target for what we were brewing with nothing that was an outlier. |
| 6 | anonymous | N/A |

Higher overall body compared to current strain, but less than full strength beer.

9. How would you rank the profile of your beer based on the following flavors?

More Details



*Survey results from 7 commercial trials

# OFF-FLAVORS

13. Was there any wort-like character remaining in the finished beer?

More Details

| | |
|---|---|
| None | 0 |
| Slight wort character | 6 |
| Moderate wort character | 1 |
| Strong wort character | 0 |

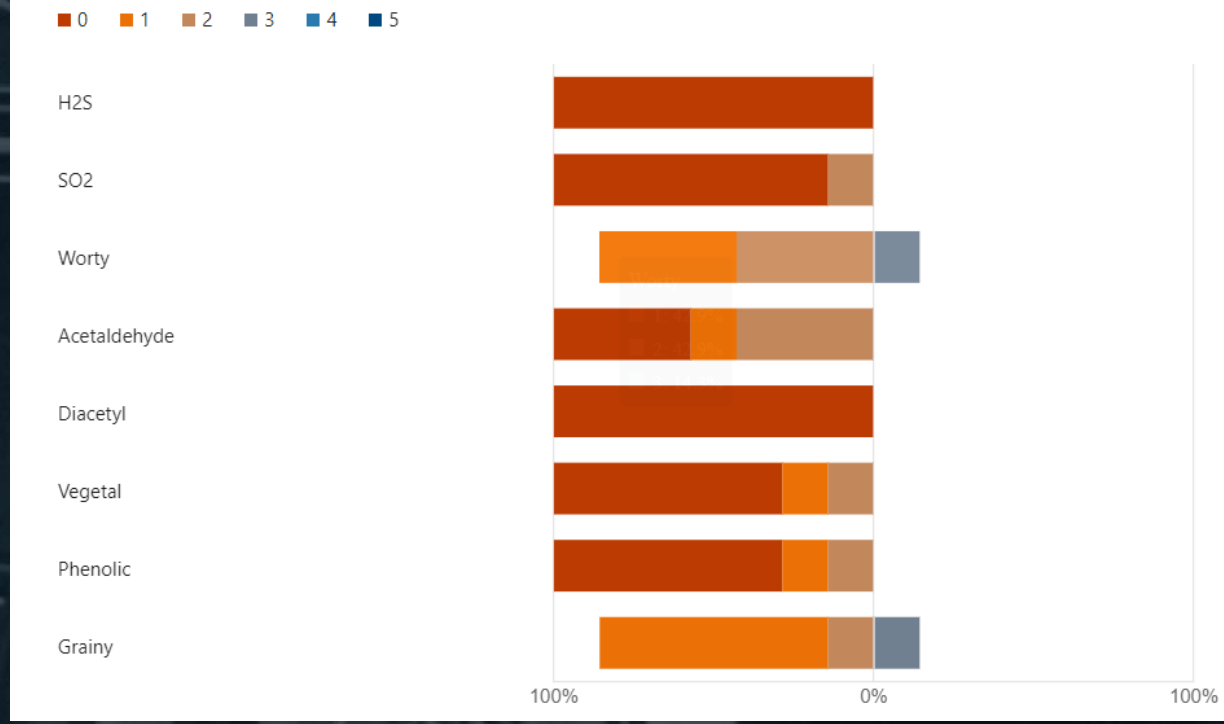
15. Was there anything in particular that you did not like ab LoNa™ ? 4?

7 Responses

| ID ↑ | Name | Responses |
|---|---|---|
| 1 | anonymous | Nothing particular, maybe the dosification ratio for the nutrient it depends a lot of the type of wort. |
| 2 | anonymous | No. But I would like to try with differents recipe to have more conclusion |
| 3 | anonymous | Not at this point! |
| 4 | anonymous | Cleaner and does not mask flavors as much as our current strain. |
| 5 | anonymous | Nothing. |
| 6 | anonymous | N/A |

14. Were any of these flavors detected? (0=absent, 5=high)

More Details



*Survey results from 7 commercial trials

# CLARIFICATION

10. What method did you use to clarify the beer?

More Details

| | |
|---|---|
| Finings | 1 |
| Centrifuge | 1 |
| Filtration | 0 |
| No clarification | 5 |

11. Were you satisfied with the clarity of the finished product?

More Details

| | |
|---|---|
| Yes | 5 |
| No | 2 |

*Survey results from 7 commercial trials

# COMPETITOR COMPARISON

16. Have you used other maltose negative strains for non-alcoholic or low-alcohol applications?

More Details

| | |
|---|---|
| Yes | 6 |
| No | 1 |

17. How does LoNa™ compare to other maltose negative strains you have used?

6 Responses

| ID ↑ | Name | Responses |
|---|---|---|
| 1 | anonymous | it's better because of the fruity flavours and the absence of off-flavors |
| 2 | anonymous | It's by far the winner in terms of ease of use and quality of the finished product. |
| 3 | anonymous | Much cleaner flavour/aroma and a significantly faster fermentation at comparable pitch temperatures (18-20C).<br>LoNa™ was 24 hrs faster than current strain. |
| 4 | anonymous | Far and above exceeds other commercial strains. |
| 5 | anonymous | N/A |
| 6 | anonymous | Same performance (ferm time and attenuation), much cleaner, would need flavour assistance to bring some character back, even if the desired outcome is a clean NA lager |

*Survey results from 7 commercial trials

# PASTEURIZATION

18. Please describe briefly your method for pasteurization (including pasteurization units achieved).

7 Responses

| ID ↑ | Name | Responses |
|---|---|---|
| 1 | anonymous | we pasteurize at an industrial paster achieving 55 UP (60 min at 60°C more or less). |
| 2 | anonymous | We send the bottle to Factory and the paster bottle to 55-60UP (1hour - 60°C) |
| 3 | anonymous | No pasteurization - testing preservatives instead. |
| 4 | anonymous | We used a tunnel pasteuriser and applied about 60-80 PUs on the packaged product. The actual PU units achieved was 62 PU. |
| 5 | anonymous | Tunnel - 40pu |
| 6 | anonymous | N/A |
| 7 | anonymous | tunnel pasteurization (50-110 PU spec) on our commercial products, currently using LA-01 strain |

*Survey results from 7 commercial trials

# GENERAL IMPRESSION

## 19. Would you consider using LoNa™ as a commercial product?

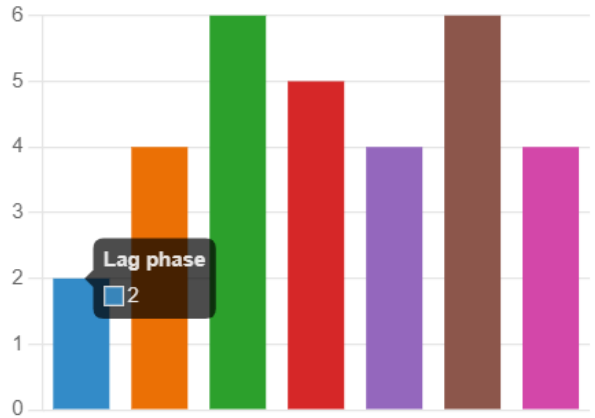
More Details

| | |
|---|---|
| Yes, for core brands | 3 |
| Yes, for occasional seasonal beers | 1 |
| Maybe, not sure | 3 |
| No | 0 |

## 12. What did you like about LoNa™ ?

More Details

| | |
|---|---|
| Lag phase | 2 |
| Fermentation speed | 4 |
| Flavor profile | 6 |
| Absence of off flavors | 5 |
| Dry yeast format | 4 |
| Ease of use | 6 |
| Species (*S. cerevisiae* and not "w... | 4 |




## 20. Do you have any other general comments about this strain?

7 Responses

| ID ↑ | Name | Responses |
|---|---|---|
| 1 | anonymous | Very useful yeast for low alcohol beers, the profile its not as citrics as others. |
| 2 | anonymous | I think is a good strain for low alcohol IPA's and hazy IPA's. For pilsen, I think is a very aromatic strain yeast. |
| 3 | anonymous | We're excited to keep working with it! |
| 4 | anonymous | Easy to use, fast, clean, and excellent quality. |
| 5 | anonymous | Nothing else |
| 6 | anonymous | N/A |
| 7 | anonymous | Clean was the most common comment on our panel of 6 tasters. Can provide individual tasting sheets upon request, scores and comments provided above are averages. |

# HAZY IPA

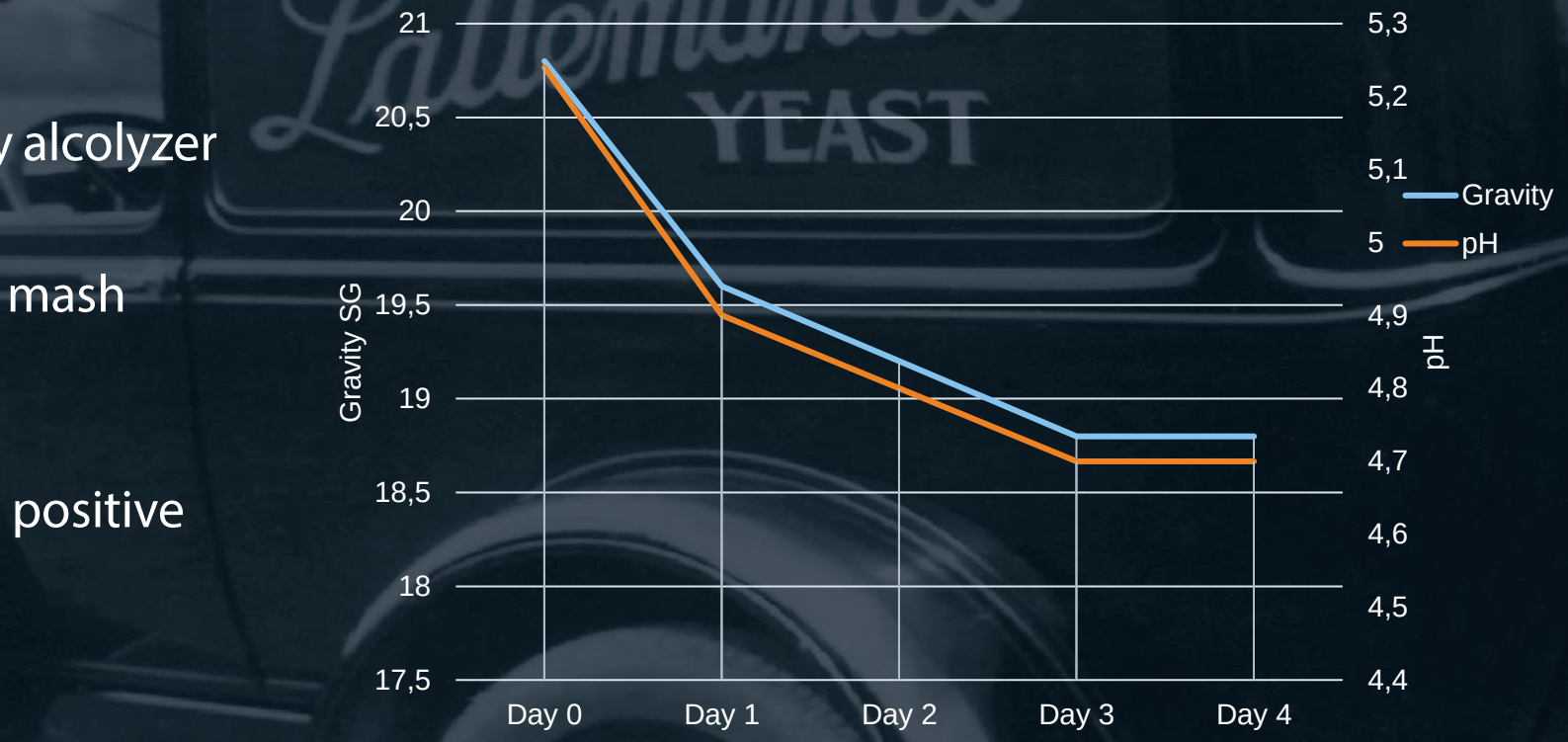
Trial details:

- Batch size: 3.9BBL
- Mash temp: 80$^0$C
- Mash: 100% two row pale
  - Limited sparge – top up kettle with liquor
  - 15BU hop charge plus 3lb/bbl Idaho 7 in WP
- OG: 5.2 plato
- Starting pH:  5.2 (adjusted with citric)
- Pitch rate: 109g/HL (very high)
- Fermentation & package:
  - Crashed to 1.6$^0$C for 7 days, carbonated to 2.6 vol/vol and kegged for consumption on site only

# HAZY IPA

## Trial feedback:

- Final alcohol of 0.23% as measured by alcolyzer
- Final pH 4.62 (not adjusted)
- Attenuation of 9.61% (impact of high mash potentially)
- Very good hop character
- Flavour described as overwhelmingly positive



# AMBER ALE

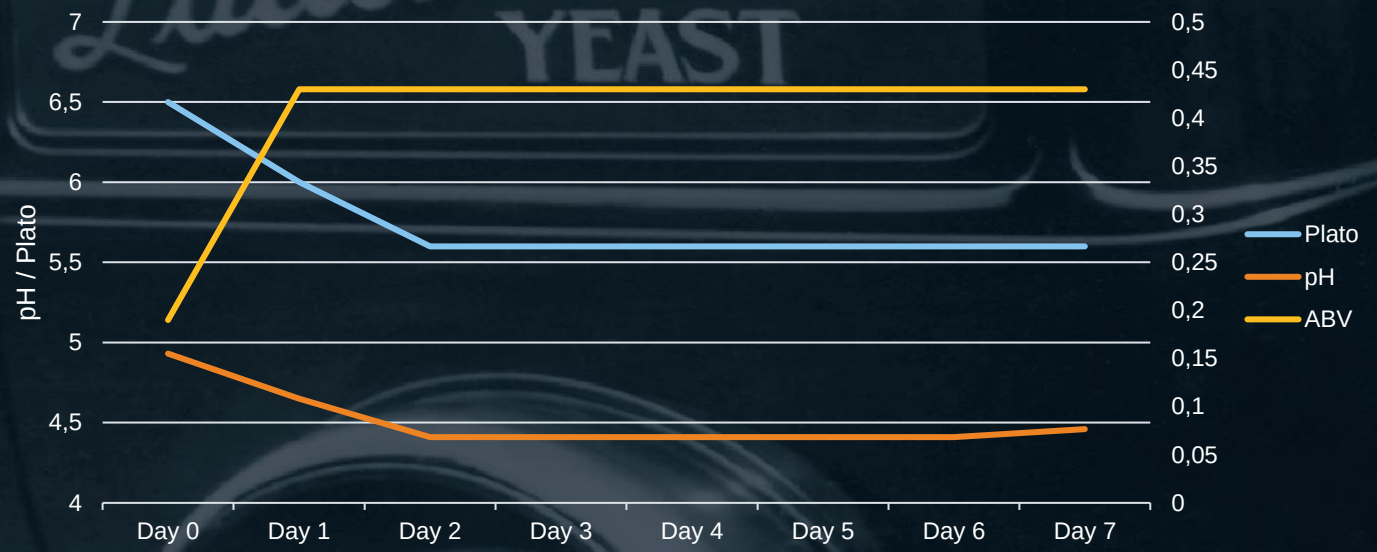
Trial details:

- Mash temp: 77$^{0}$C
- Pitch rate: 33g/HL
- Mash:
  - Pale with small quantities of chocolate and crystal
  - Full sparge, pH maximum of pH 5.7
- OG: 6.5 plato
- Starting pH of 4.93 treated with an acid product
- Fermentation & Package:
  - Target dry hop
  - Crashed to 1 for five days, centrifuge, carbonate to 2.4vol and bottle

# AMBER ALE

## Trial feedback:

- Final alcohol of 0.43% as measured by alcolyzer
- Final pH 4.46 (not adjusted)
- Attenuation of 13.8%
- Flavour reasonably good although a little thin and less hop character than desired. They will try upping the dry hop. Suggest inactivated specialized yeast for body.



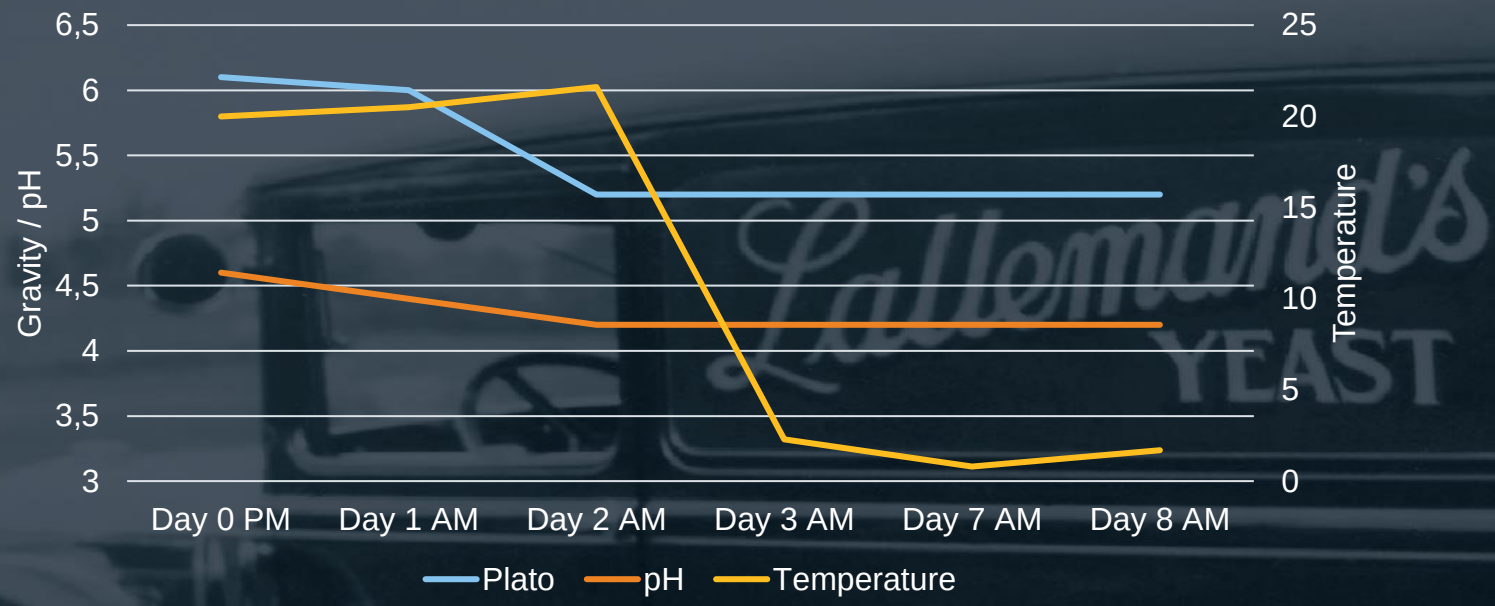
# PALE ALE

Trial Overview:

- 28HL
- Mash:
  - 64% pilsner and 36% malted oats.
- 72$^{0}$C mash for 45mins before rising to 78$^{0}$C for mash out
- 60 min boil with 12 IBU bittering addition
- Lactic acid was added to the boil boil to adjust the pH to 4.6
- Pitch rate: 35g/HL
- Fermentation: 20-21$^{0}$C for three days

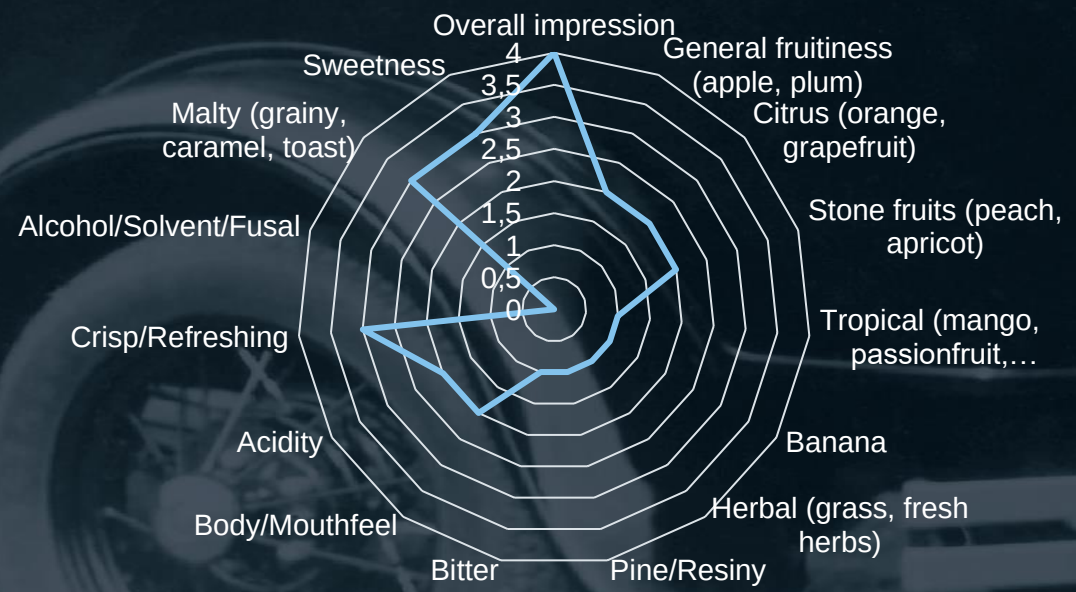
Trial results:

- Terminal gravity reached in 3 days
- Apparent attenuation of 14.8%
- Final pH of 4.2, drop of 0.4 point
- Flocculation rated 2/10




"No off flavours. The resulting beer didn't have the phenolic/plastic aromas that we detect with other strains. Resultantly, the cleanliness of the yeast flavour led to more worty/malty aromas in the finished product."

"Overall, we're really pleased with the results and this trial was a great opportunity and experience for us. We are looking forward to working with you in the future if there are more opportunities."



# IPA & STOUT

Trial Overview

- 6 batches including five different IPAs and one Stout
- 10-13 BBL size
- All pitched at 43g/hL with a similar mash regime.
  - 60$^{0}$C Steep – 70$^{0}$C mill (wet mill) – 71$^{0}$C mash
- Boil times – 30mins simmer – 130mins boil
- Oxygenated at 10ppm

# Trial results:

- Average pH drop of 0.132
- Somewhat variable apparent attenuation with an average of 12.48.
- Average alcohol by volume of 0.42 v/v

| Beer | Apparent Attenuation | ABV | Start pH | End pH | pH drop |
|---|---|---|---|---|---|
| IPA Citrus Wheat | 6.7 | 0.4 | 5.11 | 4.6 | 0.51 |
| IPA Blonde | 12.5 | 0.4 | 4.65 | 4.4 | 0.25 |
| IPA M01 | 19.2 | 0.45 | 4.49 | 4.62 | -0.13 |
| IPA M12 | 9.1 | 0.44 | 4.63 | 4.6 | 0.03 |
| Stout | 14.9 | 0.45 | 4.64 | 4.64 | 0 |

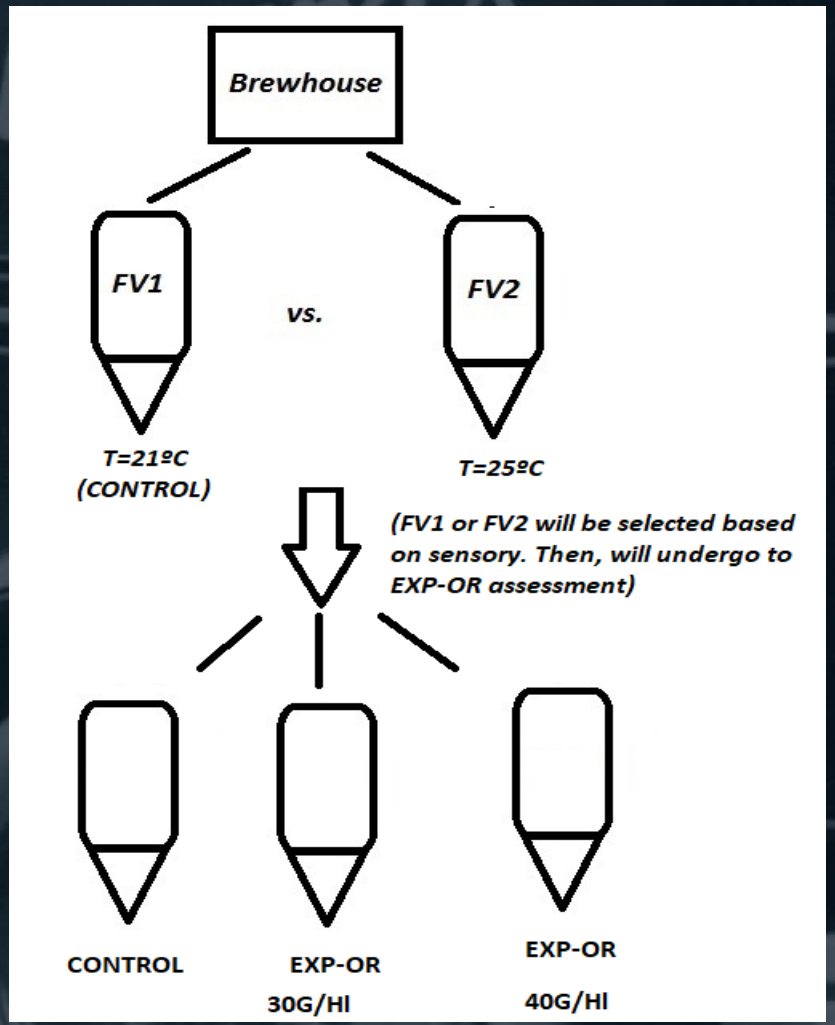
No acid malt in the citrus wheat likely contributing to the greater change in pH

# PILSNER TRIAL WITH INACTIVATED SPECIALIZED YEAST (ISY)

Trial detail:

Double trial looking both at LoNa™ and inactivated specialized yeast product.

- Mashing of pilsner malt took place at 74$^0$C for 1 hour
- Mash pH was corrected to 5.48
- Starting gravity was 8.91 plato down from a desired 10 plato due to a leaky valve. pH was 5.28
- LoNa™ was pitched at 50g/HL
- Initial fermentation was completed at 21$^0$C for three days
- Post fermentation the beer was split three ways and dosed with the inactivated specialized yeast product before sensory analysis

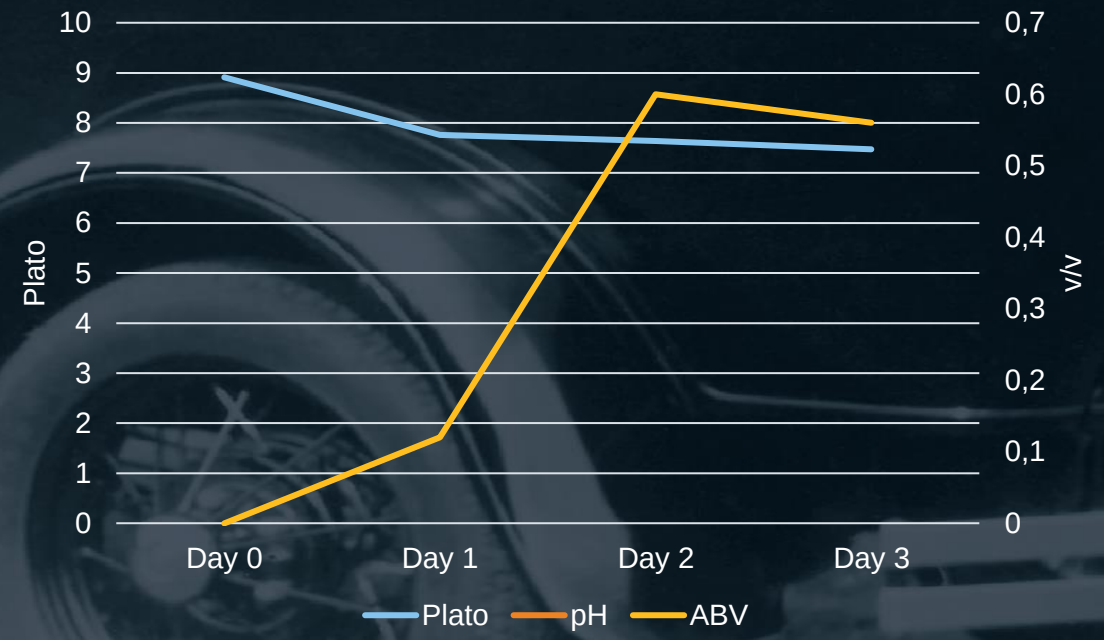


| Date | Day 1 | Day 2 | Day 3 |
|---|---|---|---|
| Original extract (ºP) | 8,01 | 8,78 | 8,58 |
| Extracto real (%w/w) | 7,81 | 7,87 | 7,69 |
| Apparent extract (%w/w) | 7,76 | 7,64 | 7,47 |
| Alcohol (%v/v) | 0,12 | 0,6 | 0,58 |
| Kcal/100ml | 28,85 | 33,02 | 30,9 |
| pH | - | - | 4,84 |
| EBC | - | - | 5,34 |
| Remarks | Measured in the micro | Measured in the micro | Measured at the factory (more reliable data) |

Day 0 not included in table. Start OG of 8.91 , pH 5.28

# Fermentation results:

- Final gravity reached in three days at 21ºC
- pH drop of 0.4 units
- No pH correction after fermentation



# Volatile analysis:

| Diacetilo | 2-3 pentanodiona | Acetaldehido | DMS | Ethyl acetate | Isoamyl acetate | Higher alcohols |
|---|---|---|---|---|---|---|
| (µg/L) | (µg/L) | (mg/l) | (µg/L) | (mg/l) | (mg/l) | (mg/l) |
| 12,9 | 4,9 | 2,2 | 35 | 0,08 | 0,008 | 24,8 |

All volatiles are at or below flavour threshold in regular beer.

## Tasting analysis with Inactivated Specialized Yeast Product

| 1 | 2 | 3 |
|---|---|---|
| No dosage | 20g/hl | 35g/hl |
| Refreshing, citrus and very light non-alcoholic beer | Refreshing non-alcoholic beer, citrus and with some softness in the mouth. Increased palatability.<br>*Preferred dose rate | Beer without alcohol, with much more body. Slightly salty flavor. |

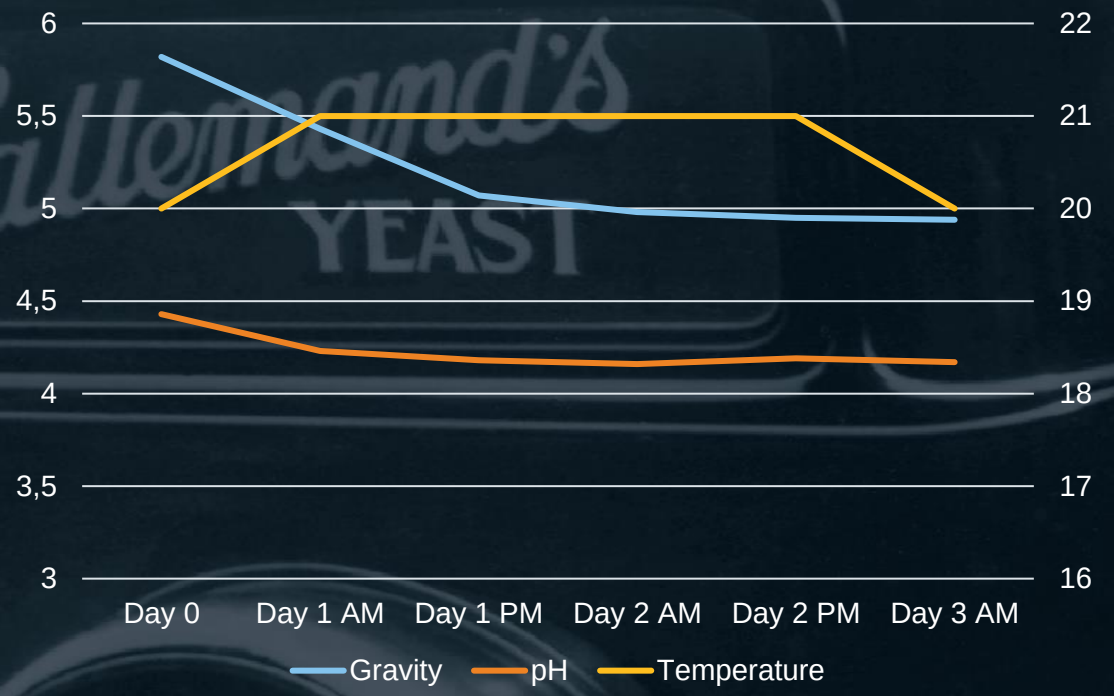
# PALE ALE

Trial Overview:

- OG: 5.9 plato
- Mash:
  - 55% ale malt, 27% Wheat and 18% dextrapils
  - 70$^{0}$C mash for 20mins
- 90 min boil with 9 IBU bittering addition
- Phosphoric acid was added post boil to adjust the pH to 4.4
- Pitch rate: 50g/HL
- Fermentation: 20-12$^{0}$C for three days

# Trial results:

- Terminal gravity reached in three days
- Final gravity of 4.17 plato and pH of 4.17.
- pH drop of 0.23 units
- Flocculation rated 7/10
- Apparent attenuation of 15%



# PALE ALE

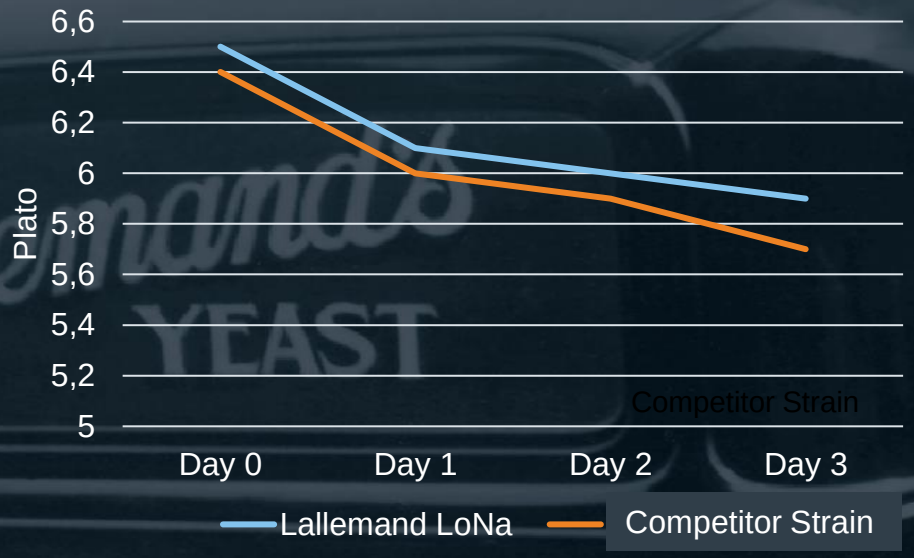
Trial detail:

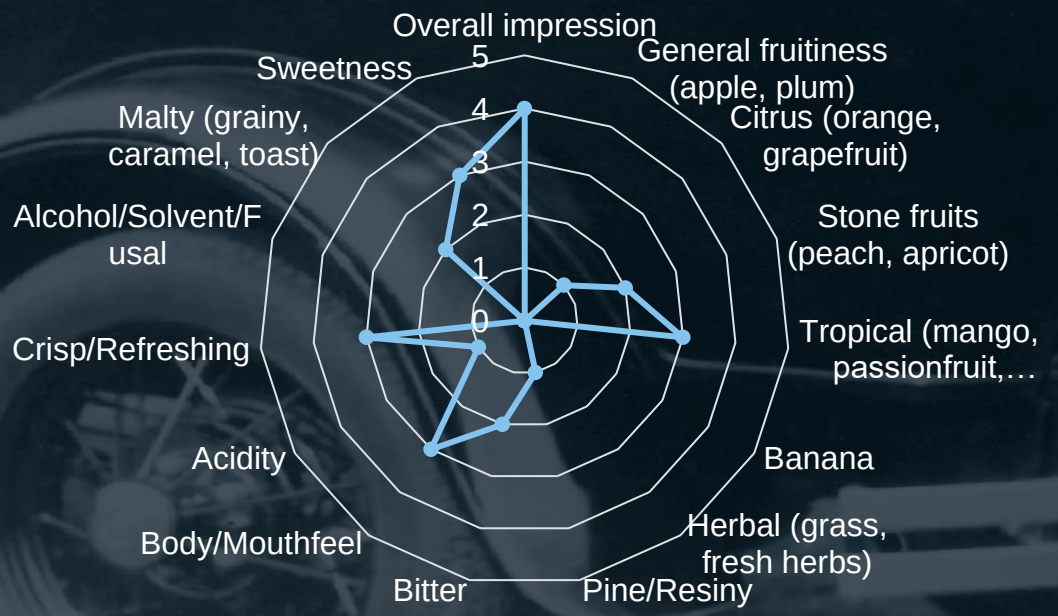
Detailed side by side trials with competitor strain but from different worts

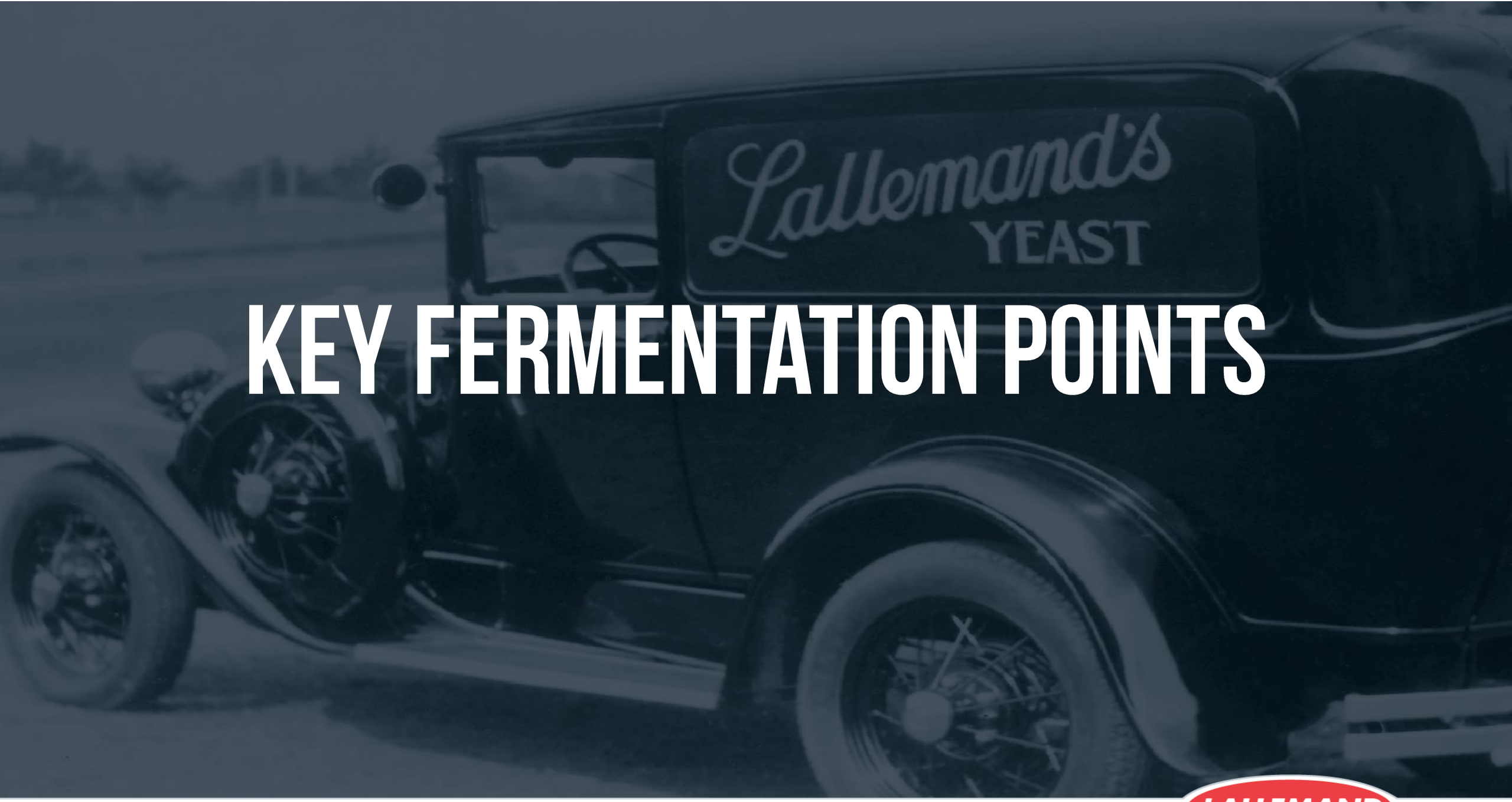
- OG: 6.5 plato
- Mash temp: 68 °C rising to 78°C
- Fermentation at 21$^{0}$C
- Immediate chill to 2$^{0C}$

# Results

- Fermentation in four days
- Apparent attenuation of 9.23%
- A slight difference in final gravity between the two strains
- So far the flavor and aroma of the Lallemand yeast seams more aromatic, cleaner, and less POF compared to current maltose –ve strain.
- Flocculation rated as 1






# KEY FERMENTATION POINTS

# KEY CHARACTERISTICS


- **LoNa™** is a *Saccharomyces cerevisiae* yeast strain

1. Does not ferment maltose
2. Efficiently reduces wort aldehydes, resulting in a beer with reduced wort/vegetable flavours
3. Does not produce H2S and is POF-
4. Expresses a clean and neutral ale aroma
5. Fermentation completed in 3-4 days
6. Able to achieve 0.5% ABV

# FOOD SAFETY

- NABLAB beers are prone to microbiological spoilage due to high pH, low ethanol content, and high sugar content
- Stabilization by pasteurization is recommended when producing these beers to prevent food pathogens
  - Chemical stabilizers may not be enough for complete stabilization
- It is recommended not to serve these beers on draft

- Master Brewers Association Food Safety Page
- Brewers Association Food Safety Resource Hub
- Brewers Association Non Alcoholic Beer Overview

# FAQS

1. What acids do you suggest to use for pH adjustment?
    1. Different acids have different flavor profiles, but all should be food grade when added.
2. How does LoNa™ compare with other maltose negative yeast strains?
    1. LoNa™ is a hybrid *Saccharomyces cerevisiae* strain
    2. LoNa™ is POF- (unlike other maltose negative yeast strains), so the resulting beer is cleaner tasting
    3. Overall brewers have found beers fermented with LoNa™ to have a refreshing taste and a fruity aroma
3. If you do not ferment maltose, does the resulting beer taste sweet?
    1. Maltose is relatively less sweet than other sugars (larger sugar molecules are less sweet than smaller ones)
4. Why is pasteurization required?
    1. Remaining maltose is fermentable by other brewing strains, wild yeast, and bacteria. Pasteurization stabilizes the product and prevents microbial activity in the packaged product.