# Crafting Your Customers Favorite Beer: Using the Right Yeast Strain

Erik Fowler
Education Manager



## Overview

- Working with a new ingredient or creating a new brand requires forethought
  - We'll discuss processes, tips and tricks to consider
- We will look at what White Labs Brewing Co. does when creating a new beer or working with a new yeast strain

# Crafting a Brand

## Recipe Development: Tabberer IPA

| Recommendations | White Labs Brewing Co. |
| --- | --- |
| • Choose a beer style | American-style India Pale Ale |
| • Build a recipe | Pale Malt, Vienna, White wheat Warrior, Chinook, Amarillo, Citra |
| • Consider yeast strain regionality and flavor production | American, English, Belgian, Kviek? |
| • Consider attenuation, ABV, body | Med-high attenuation, Med-high ABV (~7.5%), med-low body |



# White Labs Brewing Co.

## Example: Baseline Fermentation Profile

**Ale Fermentation**

- 19°C (66°F) for 72 hours
- After 72 hours free rise to 21°C (70° F)
- At terminal gravity, drop beer to 15.5°C (60°F), collect yeast then dry-hop

**Tips**

- Start with a baseline profile and ensure your yeast strain is the only variable
- Adjust according to strain performance and manufactures recommendation
- This is one example we've found to work well in house for a variety of strains

# Crafting a Brand

## Strain Selection: Tabberer IPA

**Working with strains that fit a desired criteria:**

- Accurate to style
- Desired flavor and aroma production
- Reliable growth and fermentation
- Suited for wort medium and conditions (pH, sugars, nutrients, temperature)
- High attenuation
- Desired flocculation



# Crafting a Brand

## Understanding Yeast Behaviour

**How does the yeast perform under different conditions?**

- **Nutrients**
  - Nitrogen, Zinc, Calcium, etc.
- **Fermentation temperature**
  - Low - fewer metabolites
    - Phenol forward
  - High - increased metabolites
    - Ester forward
- **STA1+/-**
- **POF+/-**
- **Pitch-rate**
  - Low - increased metabolites
  - High - fewer metabolites

# Crafting a Brand

## Strain Selection: Tabberer IPA

| Recommendations | | White Labs Brewing Co. |
|---|---|---|
| • Choose a few unique strains | → | WLP041 Pacific Ale Yeast \| WLP095 Burlington Ale Yeast<br>WLP515 Antwerp Ale Yeast \| WLP518 Opshaug Kveik Ale Yeast<br>(We've brewed this brand with 18 different strains!) |
| • Brew any batch size | → | 20 bbl (24 hL) |
| • Split batch into multiple fermentations | → | 4 × 5 bbl fermentor |



# Crafting a Brand

## Sensory Trials: Tabberer IPA

- Perform a blind sensory panel with samples
- Administer tests such as Descriptive and Hedonic
  - **Descriptive Test**: Document appearance, aroma, flavor, and mouthfeel of each sample
  - **Hedonic Test**: Rate overall quality of sample on 9-point scale

# White Labs Brewing Co.

## Example: Descriptive Results

### WLP001 California Ale Yeast

WRITTEN DESCRIPTION

This flavor description is the current written baseline target from which all subsequent batches will be compared.

**VISUAL:** Clear dark yellow color with no particulates, moderate white foam, and moderate lacing.

**AROMA:** Med-high grapefruit and orange, moderate pine and resin, med-low water cracker malt with light caramel.

**TASTE:** No lingering sweetness, semi-dry, high bitterness, moderate bitter linger

**MOUTHFEEL:** Medium body, slightly warming, low astringency, medium carbonation

### WLP008 East Coast Ale Yeast

WRITTEN DESCRIPTION

This flavor description is the current written baseline target from which all subsequent batches will be compared.

**VISUAL:** Light orange color with med-high haze, no particulates, moderate white foam, and some lacing.

**AROMA:** Med-high citrus - orange, moderate pineapple/tropical, with underlying floral and stone fruit - berries, med-low white bread malt

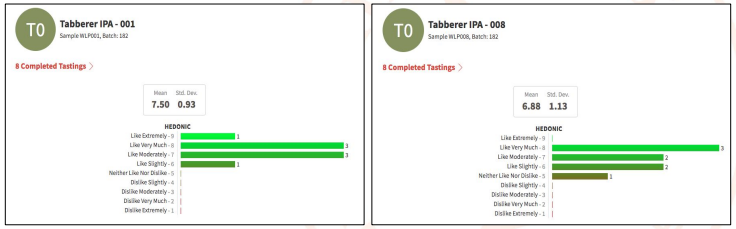
**TASTE:** Subtle lingering sweetness, subtly sweet, moderate bitter linger, med-high bitterness

**MOUTHFEEL:** Medium body, no astringency, slightly warming, medium carbonation



# White Labs Brewing Co.

## Example: Hedonic Results



# Crafting a Brand

## Further Experimentation: Tabberer IPA

- Now, in our example, we have selected WLP518 Opshaug Kveik Ale Yeast for further trials
- Perform experiments testing optimal pitch rates and fermentation temperatures for your specific recipe (Same split batch technique)
- Once optimal fermentation temperature is determined, perform a pitch rate experiment

**Trial 1: Fermentation Temperature**

| | | | |
|---|---|---|---|
| WLP518 | WLP518 | WLP518 | WLP518 |
| 70℉ (21℃) | 80℉ (27℃) | 90℉ (32℃) | 100℉ (38℃) |

**Trial 2: Pitching Rates**

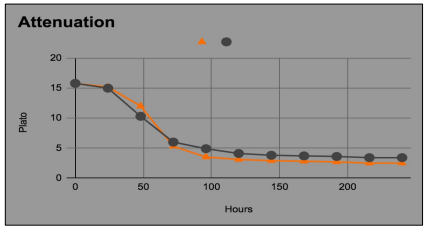
| | | | |
|---|---|---|---|
| WLP518 | WLP518 | WLP518 | WLP518 |
| 0.25 mil/cells/P | 0.5 mil/cells/P | 0.75 mil/cells/P | 1 mil/cells/P |

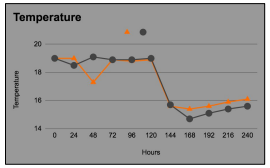


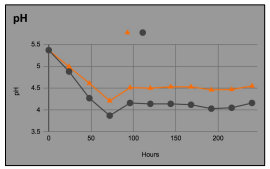
# White Labs Brewing Co.

## Example: Analyzing Data

**Tabberer IPA Batch #192**




**WLP001 California Ale Yeast**
**WLP008 East Coast Ale Yeast**

# Trending Topics

## Lagers: Traditional Method

**Lager Fermentation**

- Start fermentation between 8-12°C (48-55°F)
- At or near terminal gravity , drop beer to 1°C (33°F)
- Collect yeast
- Raise to 10°C (50°F) for diacetyl rest
- Condition at 1-4°C (33-39°F)




# Trending Topics

## Lagers: Pressure Fermentation

- Use a spunding valve as a pressure regulator
- Set pressure to 1 bar (15 psi) as this seems to be the “sweet spot”
- Ferment at ale temperatures (65-68˚F)
- Produce lager-like characteristics, low ester and diacetyl production, in a shorter time period
- Pressure lowers cell wall transport ability leading to lower metabolites in finished beer

**Experiment: White and Blichmann**

**Style**: Munich Helles

**Batch Size**: 20 gal.

**Equipment**: 5 gal. fermentor (4), Spunding valve

**Strain**: WLP833 German Bock Lager Yeast

| | Control (Traditional) | 0 Bar (68˚F) | 1 Bar (68˚F) | 2 Bar (68˚F) |
|---|---|---|---|---|
| Timeline (Filtered/Kegged) | 8 weeks | 2 weeks | 2 weeks | 2 weeks |
| Ethyl Acetate (ppm) | 33 | 40 | 23 | 19 |
| Diacetyl (ppb) | ~10 | ~30 | ~10 | ~10 |
| Most votes | ✔ | | ✔ | |

# Trending Topics

## Co-pitching Clean Strains

- Using yeast blends to create complexity and a unique product
  - How many strains will be used?
  - How often will each strain be used?
  - Can every strain be kept in optimal, healthy condition between brews?
  - How many strains can be optimally used for the brewery production?



# Conclusion

- Experimenting with different yeast strains is the best way to create new, complex flavor profiles
- Different fermentation profiles can allow you to achieve different results
- Production needs aside, does this make the beer taste better?

Thank You!
Questions??
Email: efowler@whitelabs.com