

# Pitching Rates

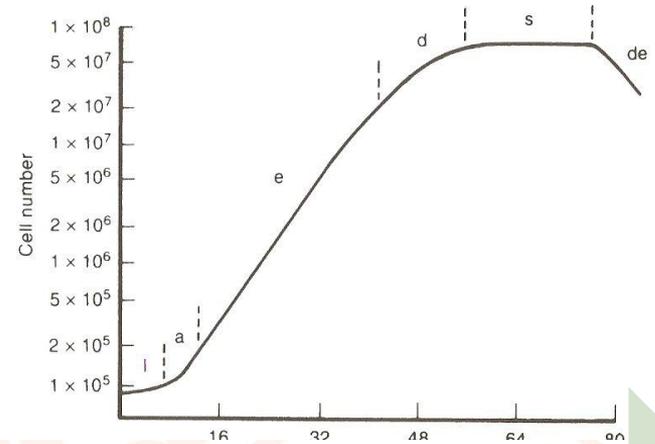
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# Pitching Rate

## Overview

- The most important thing is CONSISTENCY
- Standardize methods for pitching, repitching, and verifying yeast health that work for your brewery - then do the same thing every time
- Pitch rates are only valid when healthy, viable cells are being introduced into the correct environment (DO, Nutrients, etc)



Lag Phase

Exponential  
Phase

Stationary  
Phase

# Pitching Rate

## Concept

- Measurement to document how many yeast cells are pitched in a given batch (concentration in a given volume, i.e cells/mL or cells/mL/Plato).
- This is a measurement just like any other important measurement in brewing (we would argue one of the most important)
- Changes in pitching rate can affect flavor production, length of fermentation, health of future generations, flocculation and harvesting

### Pitching Slider

0.1 IDEAL 3

Pitching rate in million cells per mL per degree Plato  
In cases where a fraction of a pouch is listed, we recommend pitching to the next whole number. You may choose to use partial pouches at your discretion.

**Recommended Number of Pouches:**  
2.24

**Pitching rate in million cells/mL:**  
10.25

**Pitching rate in million cells/mL/°Plato:**  
0.82

[RETURN TO WHITE LABS RECOMMENDATIONS](#)

[RESET](#)

Select Strain ▼

# Pitch Rate

## Concentrations

- Measurement of a sub-unit (solute) in a given solution (i.e. cells/mL)
- Volume itself does not provide the necessary information for pitching rates
- Need to know the concentration so you know how much you are getting in that given volume

Volume: 1.75L of liquid yeast.

(The concentration is 2.06 billion cells/mL)

Total Cells:  $3.6 \times 10^{12}$  cells.



Volume: 1.75L of liquid yeast.

(The concentration is 2.67 billion cells/mL)

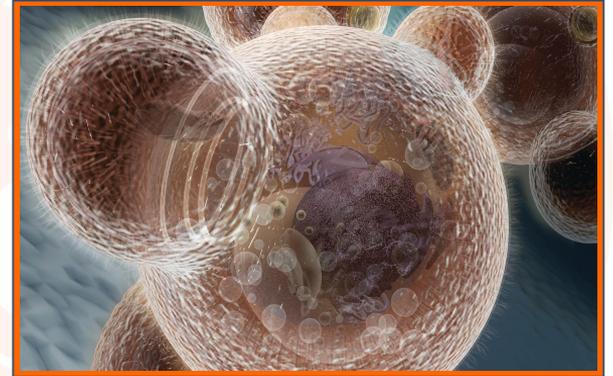
Total Cells:  $4.67 \times 10^{12}$  cells.



That is a difference of 1.07 trillion yeast cells!

# General Yeast Concentrations

Dry Yeast	5-15 billion cells/g
Liquid Yeast	1-3 billion cells/mL
Beer Inoculated w/ Yeast	5-10 million cells/mL
Beer at Peak Fermentation	25-60 million cells/mL
Yeast in the Cone	1-3 billion cells/mL



# Pitching Rate

## Style

- Brewers often change pitching rates based on style in order to achieve different levels of aroma & flavor
- Underpitching is more common in beer styles that feature a significant amount of yeast-derived flavor

**Low Pitching Rates**

High cell growth

Increased flavor  
compounds

**High Pitching Rates**

Low cell growth

Decreased flavor  
compounds

# Pitching Rate

## Gravity

The starting gravity (OG) of the wort is essential when determining a proper pitching rate!

### Lower gravity

- A less stressful environment on the cell than higher gravity beers
- Adequate cell growth at lower pitching rates

### Higher gravity

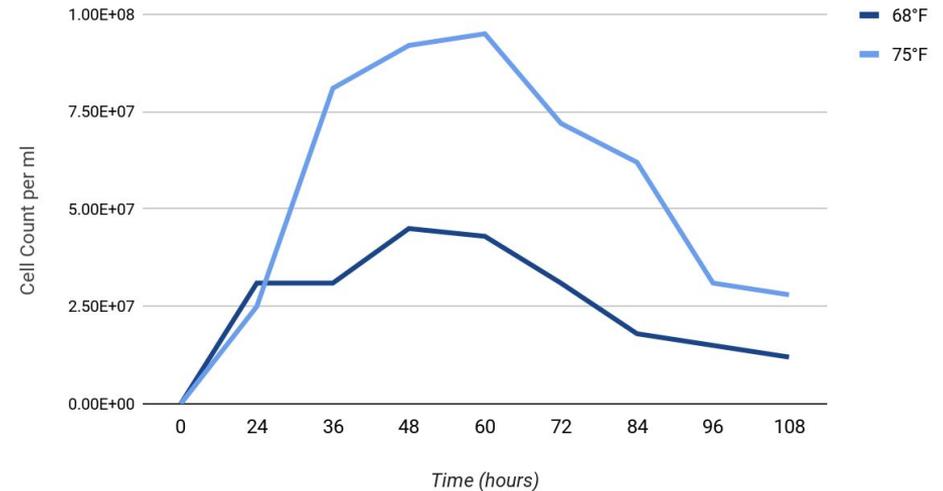
- Higher stress on the cell during fermentation
- Less cell growth leading to higher pitching rates
- Viscous and difficult to reach proper DO (dissolved oxygen)

# Pitching Rate

## Temperature

- Important to consider when discussing pitching rates
- Colder temperatures will require more yeast and a higher pitching rate
- This is due to there being less cell growth in colder temperatures during the exponential phase

Temperature Trials - Cell Growth



# Pitching Rate

## Common Ranges (Lab Pitch)

### Standard Pitching Rates

(0.40 - 0.75 million cells/mL/P OR 5 - 10 million cells/mL)

- Low-moderate gravity (<18P), >61F pitching temp
- Low end for yeast-forward beer styles

### Higher Pitching Rates

(1 - 1.5 million cells/mL/P OR 12+ million cells/mL)

- Moderate-high gravity (18P+), <61F pitching temp
- High end for extremely high OG

PurePitch Next Generation  
Pro Pouch Results

Recommended Number of Pouches:  
1

Pitching rate in million cells/mL:  
6.41

Pitching rate in million cells/mL/\*Plato:  
0.46

This reflects our recommended number of pouches based on your batch size, temperature, and gravity. Customize your pitch rate by clicking the "Advanced" button below and adjusting the Pitching Slider.

ADVANCED

14P  
68F  
5BBL

PurePitch Next Generation  
Pro Pouch Results

Recommended Number of Pouches:  
2

Pitching rate in million cells/mL:  
12.83

Pitching rate in million cells/mL/\*Plato:  
0.71

This reflects our recommended number of pouches based on your batch size, temperature, and gravity. Customize your pitch rate by clicking the "Advanced" button below and adjusting the Pitching Slider.

ADVANCED

Select Strain

18P  
68F  
5BBL

# Yeast Pitching Numbers

## Example Yeast Pitching Rate Calculation

$$(1.0 \times 10^6 * 12.5 * 1,120,000) / 2.15 \times 10^9$$

↑  
Desired  
pitch rate  
(cells/mL)

↑  
Degrees  
Plato of  
wort

↑  
Volume of wort  
in milliliters

↑  
Cell count of  
slurry (cells/mL)

= 6,511 milliliters

= 6.51 liters of yeast slurry for a 1 mio/mL/P pitching rate  
in 11.2 hL

# Pitching Rate Calculator

Determined based on: Batch Size,  
Pitching Temperature, Starting Gravity

**No estimates or ranges!**

Exact pitching rates (cells/mL or  
cells/mL/P°) with the ability to adjust the  
rate to match the recipe.

The screenshot shows a web-based calculator interface with a navigation bar at the top containing tabs for 'CALCULATOR', 'RECIPIES', 'FAVORITE REC', 'ULTIMATE', 'CLAYTON', and 'BIBERTECH NEXT GENERATION'. The main form is divided into three sections:

- Enter Volume:** A dropdown menu for 'UNIT' is set to 'BBL', and an 'Amount' input field contains the value '5'.
- Enter Pitching Temperature:** A dropdown menu for 'UNIT' is set to 'Fahrenheit', and a 'Degree' input field contains the value '68'.
- Enter Starting Gravity:** A dropdown menu for 'UNIT' is set to 'Plato', and a 'Value' input field contains the value '12'.

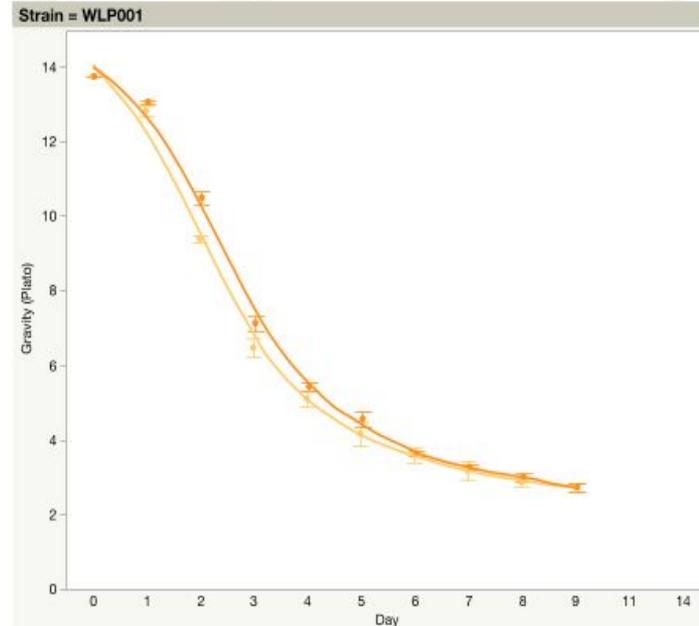
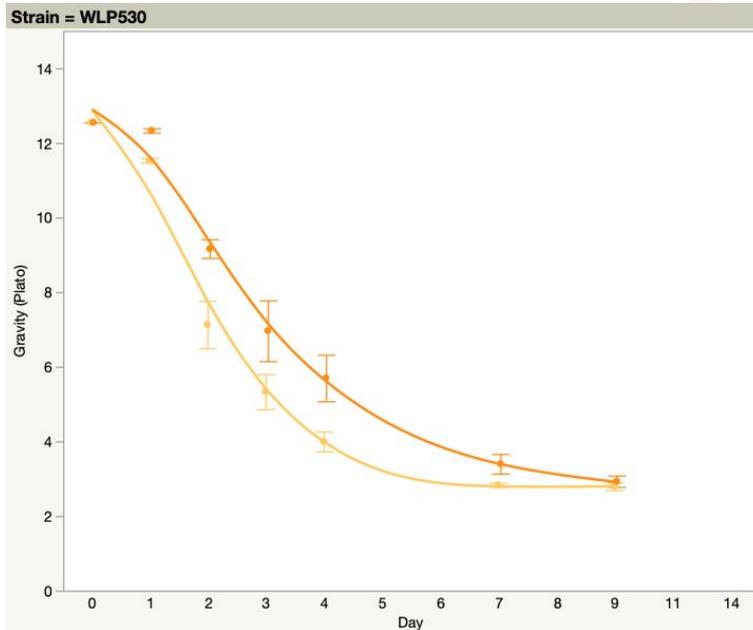
A large orange 'CALCULATE' button is positioned at the bottom right of the form.

# Yeast Pitch Rate Effects on Fermentation

USE **ONE** POUCH → **PER** **5 hl** (4.2 Barrels) = **7.5** MILLION CELLS/mL PITCH RATE OF

**2** Pouches When Fermenting: Cold, ≤ 61°F (16°C) or High Gravity, ≥ 18°P

**3** Pouches When Fermenting: Cold, ≤ 61°F (16°C) & High Gravity, ≥ 18°P

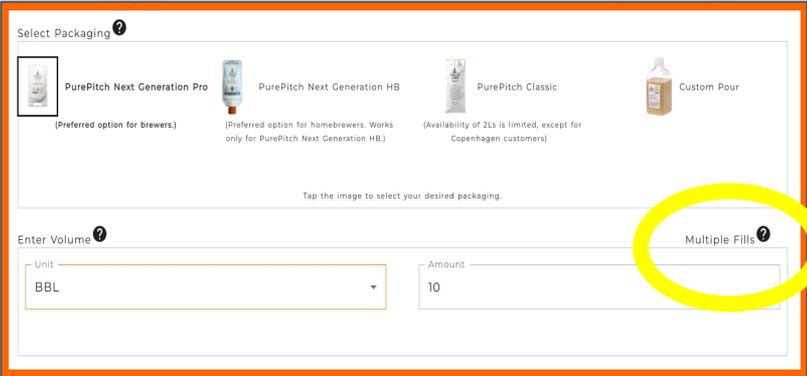


Pitch Rate  
--- 7<sup>e6</sup>/mL  
--- 3.8<sup>e6</sup>/mL

# Double Batching

1. If tank is filled in a single brew day then pitch yeast based on the total fill volume
2. If tank will be filled the consecutive day then pitch based on the amount of wort added the first day

↓  
Wort and oxygen from first day will allow yeast to grow, only additional wort and oxygen is needed on second day



The screenshot displays the 'Select Packaging' and 'Enter Volume' sections of the PurePitch app. The 'Select Packaging' section offers four options: PurePitch Next Generation Pro (Preferred option for brewers), PurePitch Next Generation HB (Preferred option for homebrewers), PurePitch Classic (Availability of 2Ls is limited), and Custom Pour. Below this is a 'Tap the image to select your desired packaging.' instruction. The 'Enter Volume' section features a dropdown menu for 'Unit' (set to BBL) and a text input for 'Amount' (set to 10). A yellow circle highlights the 'Multiple Fills' toggle switch, which is currently turned on.

# Repitching Yeast

## Rates

### Guidelines to follow:

- Repitching requires accurate and consistent cell counts
- Harvest should be tested for cell count and viability
- The most important factor is maintaining consistency in processes and methods
- Repitching rates: 0.75 - 2 million cells/mL/P°
- Requires proper harvest and storage techniques



# Repitching Yeast

## Methods

### Cone-to-Cone

- Yeast transferred directly from FV to FV
- Great at reducing risk of contamination
- Eliminates use of storage vessel
- Stratification of yeast makes accurate cell counts difficult
  - No visual inspection of yeast
  - Color, trub, concentration

### From Brink

- Transfer from brink to FV
- Healthier conditions on yeast slurry due to lack of hydrostatic pressure, hot spots, and ability to release pressure
- Easy to homogenize and take samples of the yeast to determine slurry concentration, viability, etc
- Visually inspect yeast through eyeglass during transfer



Thank you for listening!

Questions?