



Yeast Fact Sheet (White Labs)

- White Labs stores their yeast at 34F before shipping it out. This helps to keep the yeast dormant and the viability up.
- Yeast is only kept for 2-4 weeks before being sent out the door.
- Once a year, the yeast cultures are checked for any possible mutations. This keeps the yeast strain consistent.
- During yeast production, bacteria and wild yeast tests are performed. Cell counts and viability tests are also performed right before packaging and distributing.
- Zinc promotes enzyme activity, which help the yeast to break down sugar. Servomyces is a great source for zinc when brewing.
- Free Amino Nitrogen or FAN is very important when maintaining yeast health and growth. Fermaid K is a good source of amino acids. Fermaid K is not as necessary in All-Grain brewing as the grain contains a good amount of FAN. It is recommended that FAN is added when extract or mini-mash brewing.
- Oxygen is a must for yeast. It helps build up energy “reserves” for yeast health.
- Viability - The amount of living vs. dead yeast cells. A “stain” is used to determine viability. Dead cells let the dye in and living cells keep it out. Test is not accurate under 90% viability.
- Vitality – How healthy yeast cells are. This test is accurate down to 2% vitality. A healthy yeast cell will be able to push the dye out of the cell wall.
- Wheat strains tend to die quicker than ale or lager strains.
- 3 Stages of Yeast Metabolism
 - Lag Phase – Yeast gets used to environment. With oxygen present, respiration occurs. Enzymes are activated and breakdown sugar. Without proper nutrients, oxygen, etc, the Lag Phase may be increased from a couple hours to a couple days.
 - Log Phase – Reserves promote cell replication. Sugars, nutrients and oxygen help to encourage lipid and protein production for rapid growth. Cells build up more reserves. Metabolic byproducts contribute to the flavor of the beer. Once oxygen is gone, anaerobic metabolism (fermentation) begins.
 - Stationary Phase – Little or no fermentable sugars are left. Alcohol and Co2 reach toxic levels. Cells begin to use their energy reserves (other byproducts form). Yeast flocculate and fall out of solution.
- Yeast health is affected by:
 - The length of storage –
 1. 1 month – 95% viable
 2. 2 Months – 90% viable
 3. 3-4 Months – 50% viable (A yeast starter is recommended. Living yeast cells are still just as healthy.)

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- Temperature of storage – White Labs recommends storing the yeast as Yeast close to 34F as possible. Putting vials in the refrigerator help to keep yeast dormant.
- Nutrients – Zinc, FAN and phosphates help the yeast to build their cell walls.
- Oxygen – Very, very important to help yeast to build energy reserves.
- Number of generations – White Labs recommends 10 maximum. After 10 generations, yeast is more susceptible to mutations and “off” flavors. Lager yeast is more susceptible to mutation.
- Gravity of propagation or wort – Yeast will always do better in a low gravity environment (1.030-1.040). High gravity wort can stress yeast out, always use nutrients and oxygenate well if your gravity is over 1.060.
- Vials are 35ml. The cell count in each vial depends on the strain. On average there are 70 – 120 billion cells in each vial. Some strains have bigger cells than others so this affects how many can be stored in one vial.
- Yeast that is 2nd or 3rd generation will usually start fermenting faster as they have already gone through the Lag Stage.
- Over pitching yeast may create “lazy” yeast that doesn’t ferment as vigorously due to the number of cells. The yeast cake may also be too large and hard to rack off of. It is generally difficult to over pitch but it is possible.
- Under pitching yeast may stress yeast out which can result in estery flavors (fruity) or yeast that doesn’t finish out all the way. Under pitching is sometimes done on purpose for beers that traditionally have fruity flavors such as Hefeweizen.
- It is recommended that the fermenter be “rocked” after pitching to mix the yeast in.
- If the starting gravity of wort is very high, oxygenating will help the yeast. This may make up for having to pitch more than one vial.
- It is always recommended that yeast be pitched at room temperature (68-72F) and then adjusted to the optimum fermentation temperature. This will give the yeast a good head start. It takes at least 24 hours for yeast to start producing flavors.
- When making a Yeast Starter, allow yeast to grow for 48 hours, this should double yeast cells. A stir plate is helpful, but do not use for more than 48 hours to reduce the risk of over-aerating.
- Yeast starters should have a gravity of 1.030 – 1.040. Going over 1.040 will most likely stress the yeast out and inhibit them from growing as much as possible.
- Diacetyl is a flavor byproduct that yeast creates and then “absorbs”.
 - Diacetyl will leave a buttery or butterscotch flavor if the yeast is unable to properly “clean up” the diacetyl.
 - A diacetyl rest is helpful to get rid of those buttery flavors, but is not always necessary, especially for ales. At higher ale temperatures (68-72F), yeast easily absorbs the off flavors. It is recommended that a diacetyl rest is done when lagering.

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Notes on Yeast Culturing

- Always work closely to a flame source when capturing yeast.
- Select several colonies when propagating. This helps assure that you will have healthy yeast to choose from later on.
- When selecting yeast colonies, choose ones that are smooth, creamy and opaque.
- Always choose average sized colonies to work with. Smaller colonies could be a sign of mutation and larger colonies could mean the yeast is overworked.
- Use slants for long-term storage (up to a year) and plates for short-term storage (4-6 months).
- Always wrap plates well with saran wrap to make sure no nasties get in.
- Always flame equipment or sanitize well with isopropanol or rubbing alcohol. Regular brewing sanitizers such as Star San or Iodophor work as well.
- Always work in a secluded area where you will be unbothered. Avoid opening doors or windows to minimize drafts.

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