TIPPECANOE HOMEBREWERS' CIRCLE

Yeast Starters - Harvesting - Storing - Banking

May 2022 Monthly Meeting: Ted Rimstidt

Announcements

Upcoming Events

5/8: Big Brew Day - Ted
5/22: Parilla @ Lloyd's
TBD: Brewery Bus Crawl
(Lloyd) 1 hr radius
Indy Brewers Cup
6/23: 25 Homebrew Con

Upcoming Meetings

5/3: Yeast Wrangling – Ted
6/7: English Bitters - Lloyd
July: Lagers - Todd/Mark

2022 Festivals!!

- 1/22 Winter Warmer – Tom Miller
- 2/12 Winterfest – Todd Cogswell
- 4/9 Tap and Go – Hugh Gardner
- 8/6 Brews Cruise - Tom
- 8/27 Beer Across the Wabash - Jarrod
- 9/10 Hops and Coasters – Todd Cogswell
- 9/24 Broktoberfest – Ted Rimstidt
- 10/8 Homebrew Palooza - Todd
- 11/12 Indy Brew Battle – Todd Cogswell

- When: May 8, 11:00-5:00
- Where: Ted Rimstidt's House - 1937 Greenbrier Ave West Lafayette, IN
- Garage/Driveway "Tailgate Style" open to anyone to come brew or hang out
- Ted will provide pulled pork and hot dogs for lunch, encourage others to pitch in
- 240V 30A plug available for electric brew systems
- More details to follow, look for email and Facebook event this week

Topics In This Discussion

- Yeast Starters
- Yeast Harvesting For Reuse & Storage
- Yeast Banking With Agar Plates & Tube Slants

Note today we will not cover yeast pitch rates, growth models, details on petri dish biology (contaminants), but there is a list of links for further learning at the end

Liquid Yeast Starters

A starter is essentially a small batch of wort inoculated with yeast and is used to multiply and grow those cells into the final desired pitch count

Benefits

- Establishing correct pitch rate for any batch size
- Under-pitching can lead to stuck fermentation/off flavors
- Save $$$ by purchasing fewer packs/vials of yeast
- Allows you to utilize samples from your own yeast bank
- Revitalize older yeast samples (new or stored)

How To Make A Liquid Yeast Starter

Materials/Tools

- DME/LME (100g/1liter Starter)
- Yeast Nutrient (2g/1Liter Starter)
- Water
- Erlenmeyer Flask (optional)
- Stir Plate with magnetic stir bar (optional)
- Gram scale
- Funnel (optional)
- Sanitizing agent (StarSan)
- Boil pot

How To Make A Liquid Yeast Starter

Steps To Follow (Example 1L Starter - Use Calculator For Actual)

Target 1.030-1.040 starter

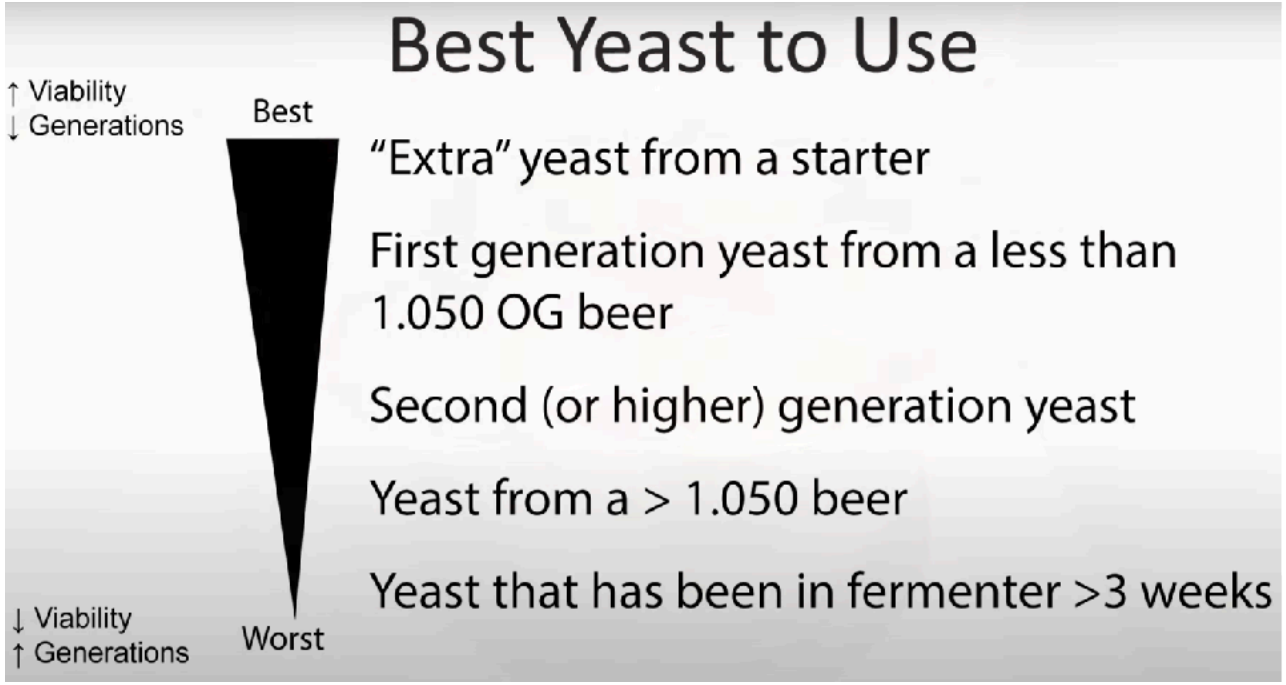
1. Mix in pot 100g DME per 1L water
2. Heat to low boil for 10 min
3. Sanitize flask, 4-6 inch square piece of aluminum foil, magnetic stir bar, and funnel
4. Chill wort to pitching temp and with funnel add to flask/container
5. Add yeast to flask and cover opening tightly with foil
6. Place flask on the stir plate and turn on to start mixing (or mix periodically by hand to maintain yeast suspension)
7. Pro tip place container under flask to catch any overflow
8. Allow to sit at room temp for 24-48 hours until activity has stopped
9. Use immediately for full beer batch, but can store for a few days/week in fridge if needed before pitching
10. Remember to use a magnetic stir bar retrieval tool or pour yeast slowly into fermenter

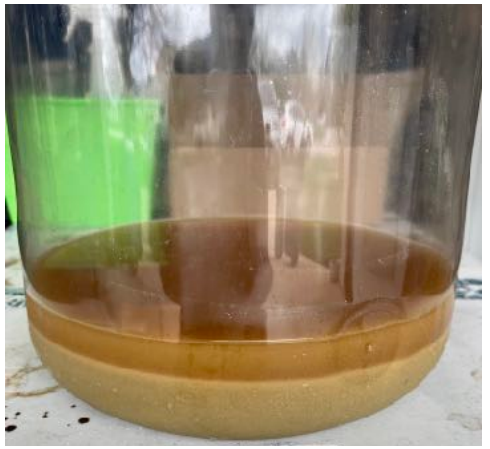
Harvesting & Storing Yeast

Harvest yeast slurry from Carboy/Bucket/Conical Fermenter

- Storage: Fridge/Freezer (2 Weeks - 2 Years)

1. Pour slurry into sanitized jar and top with sterile water
2. Allow largest particles to settle out
3. Can decant off healthy yeast to another sterilized jar and top with water or store smaller sample in tube for banking (see next slide for video or link at end)
4. Can re-pitch slurry in new beer immediately or follow fridge freezer storage techniques





Basic Yeast Slurry Harvesting Process

Harvesting & Storing Yeast (Fridge/Freezer)

*see link at end for PDF version without embedded video

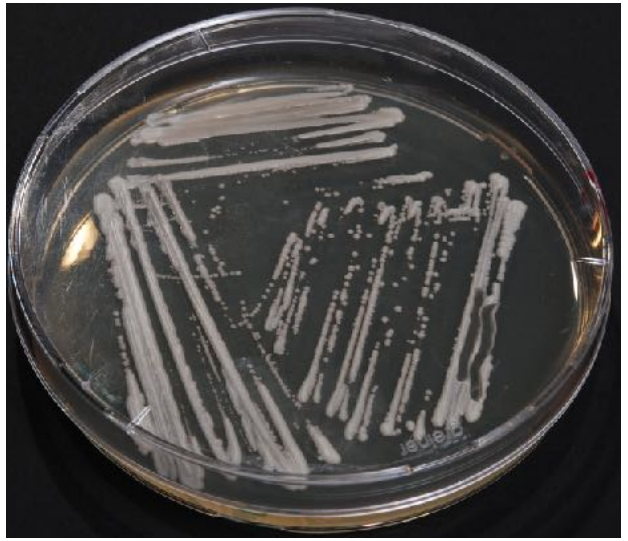
Yeast Banking With Agar: Plates

Agar Plates

- Thin layer of nutrient gel in Petri dish
- Can selectively grow fungi & bacteria
- Agar Agar is a polysaccharide derived from cell walls of red seaweed
- Gel is made with mixture of Agar powder and nutrient source e.g. DME

Why Use Plates?

- Isolate single target colonies of yeast from mixed samples on 2D surface
- Streak method shown allows you to “dilute” the sample and spread out the organisms
- Colonizing on a plate helps identify unwanted organisms and “clean” your sample (bacteria/mold)
- Provides source to build up starters and move to tube slants for long term banking



Agar Petri Dishes aka Streak Plates

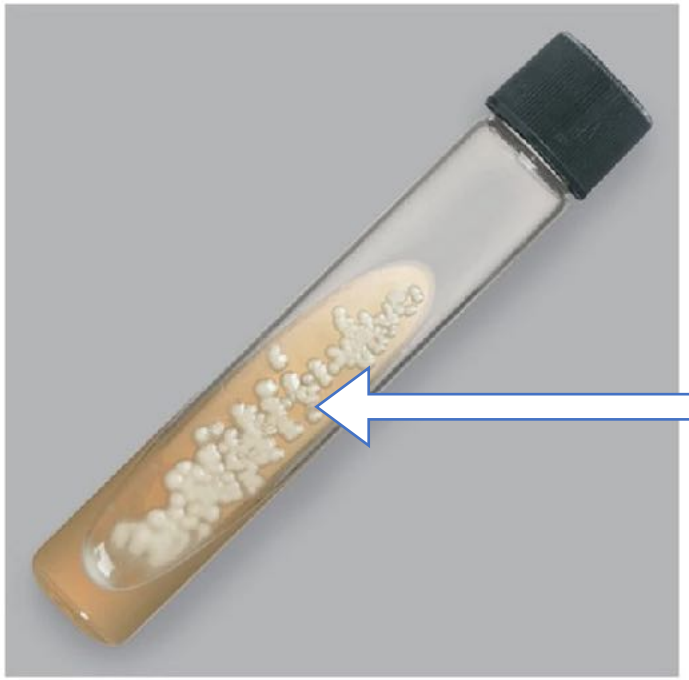
Yeast Banking With Agar: Tube Slants

Agar Tube Slants

- Supply of nutrient gel for long term storage
- Gel is made with mixture of Agar powder and nutrient source e.g. DME and same as used for Petri dishes
- Media can be sterilized in the tubes using pressure cooker or autoclave

Why Use Tube Slants?

- Long-term refrigerated yeast storage (up to 3 years!)
- Sealed with air (3-6 months)
- Sealed with water (1 year)
- Sealed with mineral oil (2-3 years)
- Build your own yeast bank
- Easy to make and little storage space required



Tube Agar Slant

Making Agar Media

Materials/Tools

- Dry Malt Extract (also see Potato Dextrose)
- Agar Agar Power
- Yeast Nutrient
- Gram Scale
- Media Bottle (borosilicate glass for high temp)
- Funnel
- Cooking pot
- Pressure Cooker

Supplies For Making Agar

Making Agar Media For Plates

***Make sure you fully understand pressure cooker operation**

Steps To Follow (Example 1L Agar Media)

- Water (1L) (*10 plates needs about 300ml)
- DME (20g)
- Agar (20g)
- Yeast Nutrient (2g)

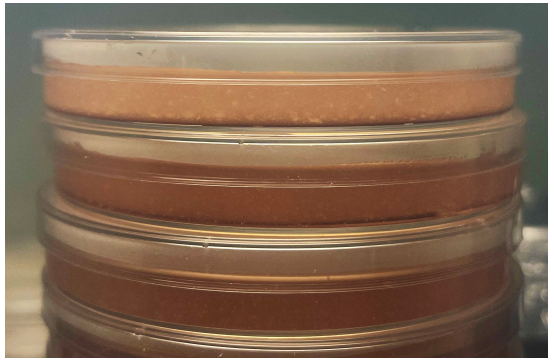
1. Combine ingredients in pot and simmer to melt agar, boil isn't needed at this step. Whisk works well here. *can use microwavable container here as well
2. Use funnel to pour into media bottle and loosely screw on lid and cover in foil as shown. ***DO NOT TIGHTEN LID**
3. Add bottle to pressure cooker and run at **15 psi for 15 min**
4. After 15 min turn off PC and let cool and depressurize fully
5. Allow media to **cool to roughly 120F (50C)**
6. Laser thermometer works great for monitoring the temp

!Pour plates before media cools below this point to avoid the media setting up to soon

Making Agar Media Plates

Pouring Agar Plates

- Best to pour plates in SAB (Still Air Box) shown right
- SAB reduced chance of airborne contaminants (bacteria, mold, wild yeasts, etc.)
- Pour media approximately 1/3-1/2 way in dish
- Pour one at a time and stack as you go
- Stacking helps reduce condensation as the media cools and gels
- Best to leave plates in SAB for 72 hours to monitor for contamination
- Once plates are verified clean either use right away or wrap them with Parafilm to prevent contamination and drying out
- Store sealed plates in the refrigerator until needed
- Always store plates upside down to keep condensation off of agar media



Making Agar Media For Slants

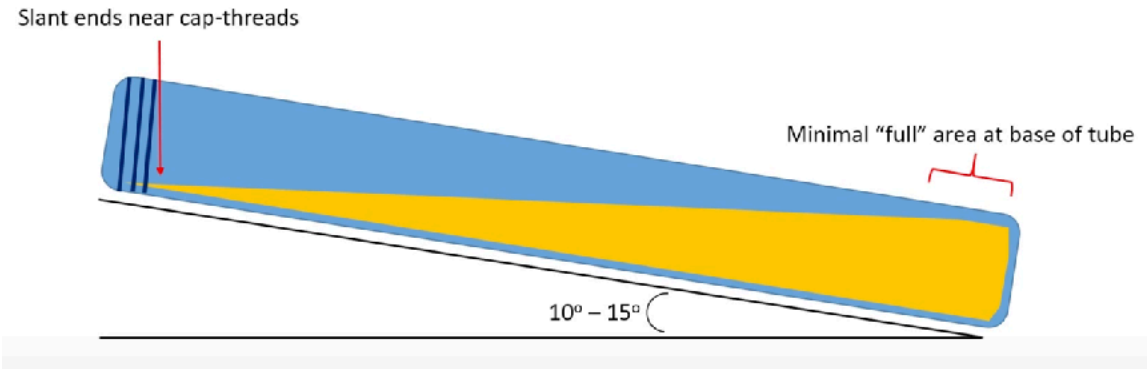
***Make sure you fully understand pressure cooker operation**

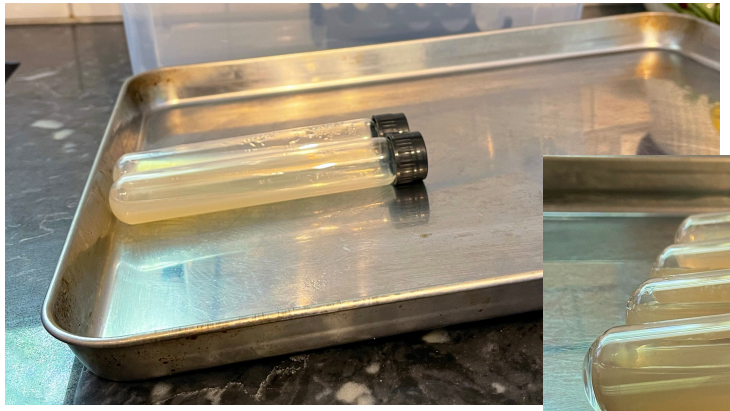
Steps To Follow

1. Follow recipe and step 1 from previous slide
2. Fill a tube with some water and mark the right fill level for your slant
3. Place glass tubes in tube rack and fill to level found above with media
4. Loosely screw on lid and cover in foil as shown. ***DO NOT TIGHTEN LID**
5. Add rack to pressure cooker and run at **15 psi for 15 min**
6. After 15 min turn off PC and let cool and depressurize fully
7. Allow media to **cool to roughly 120F (50C)**
8. Tighten lids and lay tubes on slant holder or inclined cookie sheet
9. Allow media in tubes to fully setup before moving to rack for storage

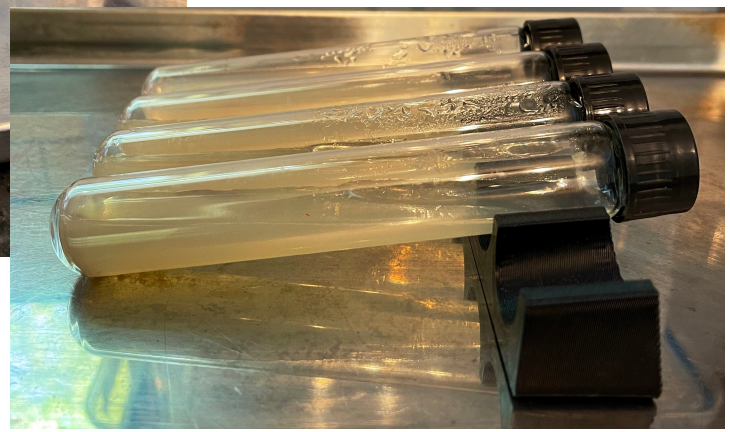
Making Agar Media Slants

- Media in tube should provide the most surface area for growth
- Correct angle and media volume is important
- Can use cookie sheet method or slant holder (see below Ted's Slant Rack custom 3D print)

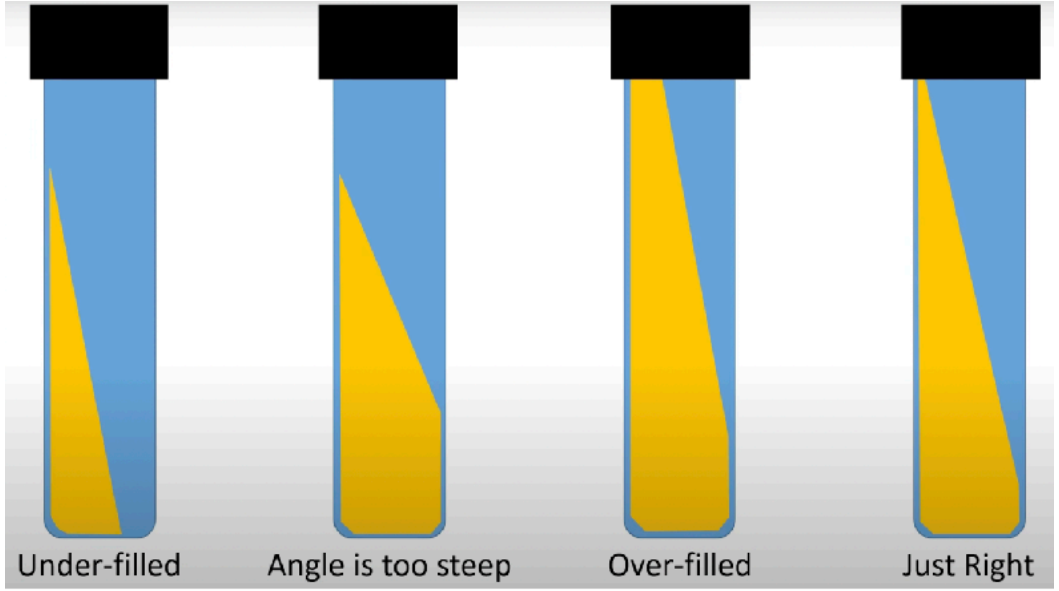




Inclined Baking Sheet

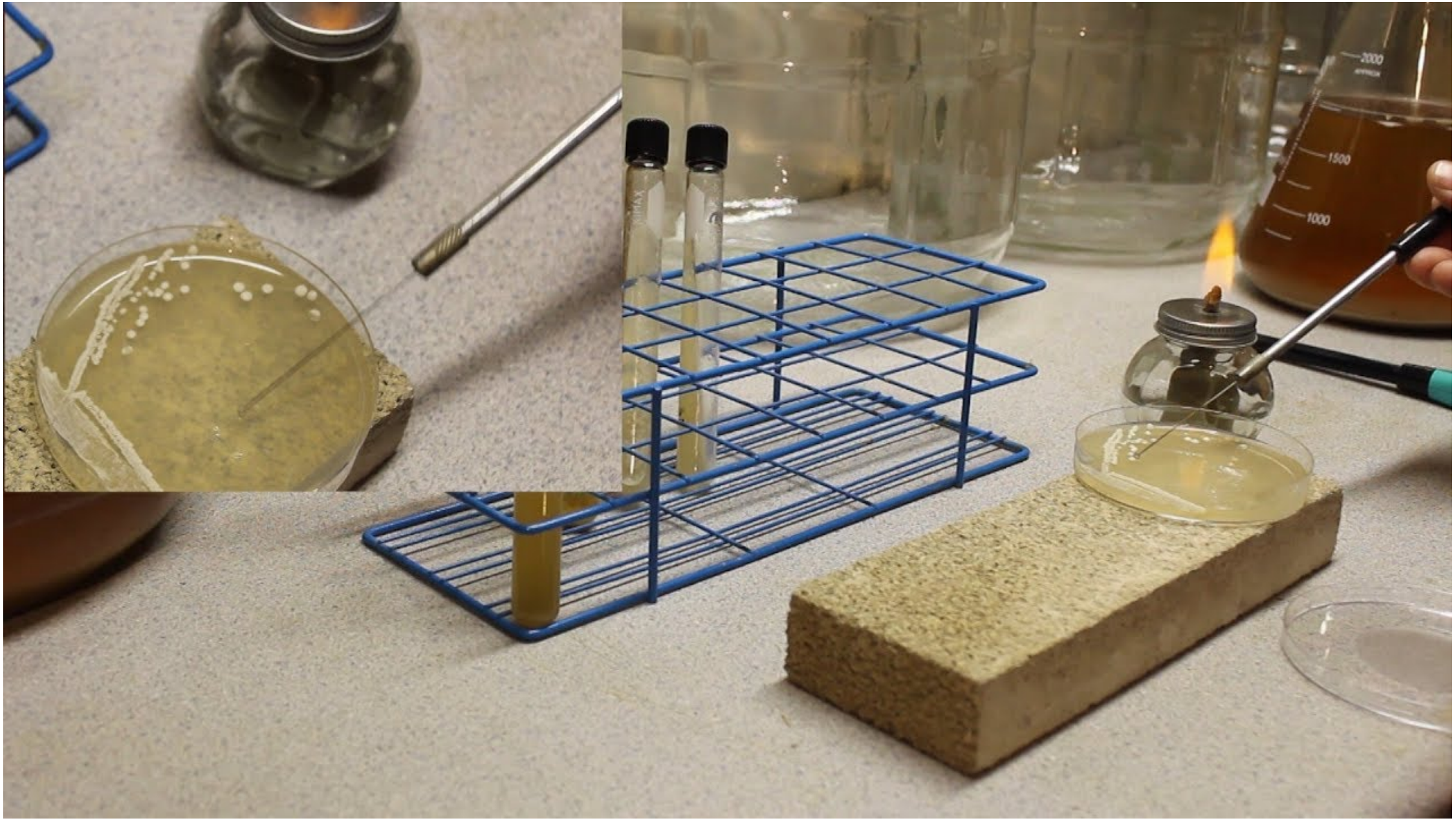


3D Printed Slant Holder



Making Starters From Tube Slants

*See link at end for PDF version without embedded video



Yeast Wrangling Learning References

Yeast Starter Calculations
http://beersmith.com/blog/2011/01/10/yeast-starters-for-home-brewing-beer-part-2/

Yeast Starter Calculator
https://www.brewersfriend.com/yeast-pitch-rate-and-starter-calculator/

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Yeast Starter Process
https://www.northernbrewer.com/blogs/brewing-techniques/why-you-should-always-brew-with-a-yeast-starter

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Yeast Harvesting and Storage - Freezing & Refrigerating
https://youtu.be/o0zluMPcwrY

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Aseptic Techniques
https://youtu.be/g0GE3oTMZrY

Making Streak Plates
https://youtu.be/mCOtWztCObY

Yeast Banking With Slants
https://youtu.be/EMFWHm61NEU

Making Starter From Slants & Plates
https://youtu.be/76xnhjkt5bA

Yeast Wrangling Supplies

ULAB Stainless Steel Test Tube Rack...

12PK Test Tubes, 50ml -...

20 Pack Sterile Plastic Petri Dishes...

Edu-Labs Bacterial Inoculating Loop...

Erlenmeyer Flask (2000 ml)

5 Pcs 30mm(1.18 inch) PTFE Magnetic Stir Bars...

Bel-Art F37772-0000 Spinbar - Stir Bar Retrieval Tool...

[LENITH] Agar Agar Powder |...

Parafilm M PM992 All Purpose...

Inkbird Laser Thermometer Gun,...

Thank You!