METHODS OF CREATING AND MAINTAINING 'WILD' HOUSE CULTURES

KYLE KOHLMORGEN

SOUTHHOUSEPILOTBREWERY.BLOGSPOT.COM
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SUMMARY

Who’s This Guy?
Some Definitions and Basics
A Case for Mixed Cultures
Sourcing, Capturing, Maintaining
Mixed Culture Methods
Mixed Culture Alternatives
Wort Production (Time permitting)
Wrap Up / References
Questions
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KOHLMOR...WHO?

Native “Hoosier”; Currently in Indianapolis, IN

Engineer (Process/Controls, Food & Beverage Packaging)

Craft Beer = Future?

Wife (Angela), Dogs (Cooper & Murphy), Colts, Boilers
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A FEW DEFINITIONS

**Mixed (‘Macro’) vs Pure (‘Micro’) Culture**

**Wild – A Bit of a Misnomer**
- Most (not all) microbes (at some point) came from a vial/tube
- Much less domesticated than traditional beer yeast
- Industry deems mixed fermentation “Wild”
- Brew with truly ‘wild’ bugs at your own risk!

**Nomenclature (for this discussion)**
- “Bugs” = Microbes = Yeast + Bacteria
- “Sour Beer” = beer created with microbes other than (or in addition to) Saccharomyces cerevisiae
THE USUAL SUSPECTS

Saccharomyces cerevisiae

Brettanomyces

Lactic Acid Bacteria (Lactobacillus, Pediococcus)

Acetic Acid Bacteria (Acetobacter)

The “Bad” Stuff:

- Oxidative yeasts: Candida, Pichia, etc. (acetic acid)
- Enteric Bacteria (“vomit” & “baby diaper”)
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WHY MIXED CULTURES?

Lower Cost vs. Buying Individual Pure Cultures

Increased depth, complexity, and uniqueness

Excuse to “invest” in commercial sours

DIY

- We’re homebrewers!
- Methods vary in commitment (time/money) and difficulty
- ALL methods are easier than maintaining a sacch. culture
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SOURCING MICROBES

Yeast Lab
- Individual strains/blends (great place to start!)
- Wyeast, White Labs, BSI
- New craft labs: East Coast Yeast, Bootleg Biology, Others?

“Living” Commercial Beers (Online brand listings)
- My favorites: Jolly Pumpkin*, Upland, The Bruery, Goose Island, Jester King (saison yeast), Orval, 3F*, Cantillon*, Perennial, Side Project Brewing*
- * - At least some truly ‘wild’ microbes (from spontaneous inoculation)

Fruit skins
- S. Caligone: [The more rotten, the better...]

“Spontaneous” Inoculation

Communal Cultures
- Yeast Swaps
- Homebrew clubs
SUCCESSFULLY CAPTURING MICROBES

Bottle Dregs

Fruit Skins, Wine Lees
- Truly ‘wild’ yeasts – Good and bad
- Add to lower-pH beer, make a starter, or just go for it!
- Know your grower/process (farmers market, farm -> beer)
- Freezing fruit: inhibits microbes, faster incorporation into beer, freezer burn?
- Whole fruit: Remember tannin extraction (skins), NO PEACH PITS

Lacto From Grain
- “Sour Starter” has been most successful

“Spontaneous” Inoculation
- Test the waters (M. Tonsmire)
- Know collection point!
HARD & FAST RULES IN THE SHPB

Most “Clean” Beer Brewing Rules Apply

Cleaning and Sanitation

- Separate soft parts (tubing, stopper/airlocks, keg poppets/o-rings)

Minimize cold-side oxygen pickup

- MYTH: “Brett will scavenge oxygen during conditioning/in bottle”
- Acetic acid development, Pedio inhibition
- Treat sour beer like hoppy beer

No such thing as the “best” method

Bad beer + brett/bugs ≠ “good” beer

PATIENCE
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METHOD 1: SEPARATE CULTURES

Micro-Zoo

Ultimate flexibility / experiment possibilities
- 100% brett ferment, side-by-side, vary culture makeup/pitch rate

Lots of work

Significantly higher risk of infection

Need a lot of storage vessels (growlers, flasks)

Expensive to start/maintain

Not at all necessary/recommended
METHOD 1: SEPARATE CULTURES

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METHOD 2: MIXED CULTURE STARTER

A Sanitary “Dump Bucket”

One Vessel, Multiple Bugs

Same start-up/maintain procedures as single culture

- Make a yeast starter (I like a one-gallon ‘growler’)
- Pitch yeast slurry, commercial blend or bottle dregs
- “Feed” the culture every 6-8 weeks or after decanting/pitching slurry
- ALWAYS test starter before pitching (decant, smell, taste)

Give dregs a kickstart before pitching
BOTTLE DREGS: PRE-PITCH STEP-UP

Why?
- Verify purity/quality of culture
- Increase survival rate in mixed culture
- Revive dregs from aged, high abv, high acid beers
- Make the rare/expensive dregs count!

Procedure
- Open, sanitize lip (vodka), pour & enjoy beer (leave dregs behind)
- Add ½” starter wort to bottle (or enough to cover bulb on 750)
- Affix stopper/airlock. Wait for activity.
- Wait for activity to slow/stop. Evaluate sample.
- Repeat process (especially if initial activity was limited). DO NOT DECANT.
- Pitch into culture or full batch when active (wait & decant if necessary).
- No start wort handy? Cover w/ sanitized foil, store cold (1 week max).
WHEN DO I PITCH?

Depends on your desired results, process, equipment

Secondary or bottle/keg ("Orval method")
- Result is more controllable; depends on attenuation, grist bill, ABV, pH
- Normally lower overall flavor contribution (Brett WILL dominate over time)
- Minimizes equipment/space requirements (soft parts, conditioning vessels)

Primary (with primary yeast pitch)
- Faster souring/brett activity, more acid produced
- Less consistent results
- Can yield a “Brett Bomb”

Primary (without primary yeast pitch)
- Even more acid produced (even more: no O2 + pedio)
- Culture may have enough Sacch to act as primary yeast
- The most exciting! (total submission to the culture!)
METHOD 2: MIXED CULTURE STARTER
METHOD 3: HOMEBREW HORNY TANK

Suggested by V. Cilurzo in a 2007 NHC Seminar

Mimics common Belgian inoculation process:

- Ferment beer with a mixed culture in one vessel (the “HHT”)
- At some point, rack beer out of HHT, leaving behind a bit of liquid, yeast slurry, and trub.
- Immediately add fresh wort to HHT (racking day)
- Repeat

Conditioning period (“Horny Time”) based on desired results.
METHOD 3: HOMEBREW HORNY TANK

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METHOD 4: KEGS N’ DREGS (SOLERA)

Derived from Sherry production

Keg a sour/funky beer, drink most of it, transfer young beer to keg.

Can use a keg as HHT vessel (see Method 3).

Some bugs will not survive in the kegorator.
- Refresher pitches every few transfers
- Transfer to serving keg before chilling
- Sour young beer first (sour mash, lactic before alcohol ferment)

Base beer selection is important.

Suggested equipment
METHOD 4: KEGS N’ DREGS (SOLERA)

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METHOD 5: FANCY PANTS OAK BARREL

Just like the pros!

Sizes: 5-59 gallons (standard wine barrel)

- Full-size barrel
  - easiest to obtain
  - Most difficult to fill, store, move, clean
- Smaller barrels
  - More ‘feasible’ on the homebrew scale
  - More surface area = more oak/beer contact
    - Faster flavor extraction, oxidation, evaporation
    - Slow down oxidation/evaporation by sealing outer surface with wax

If there was such a thing, probably the “best” way

My opinion: If you can do it... DO IT!

Disclaimer: I’ve never used an oak barrel
METHOD 5: FANCY PANTS OAK BARREL

*reused without permission
METHOD 6: FAUX BARREL (OAK CUBES)

Inoculate just like an oak barrel
- Expose to mixed-fermented beer!

Use funky cubes to inoculate new batches

Less microbial load = longer conditioning time
- Perfect for adding a small hint of oak/funk

New oak may give too much oak character
- Especially for BJCP styles (I enjoy more oak than ‘in-style’ per BJCP)
- Boil, soak in wine/spirits, add in small doses

Also available: chips, spirals, oak table legs
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ALTERNATIVE TO MIXED CULTURES

‘Pitchable’ Culture Blends
- Great option for diving into sour beer / mixed cultures!
- Limited control / “standard” flavor profile
- Add complexity: Split/Blend, dregs, mix blends

Separate Cultures (“Method 1”)

Mix of Separate and Mixed Cultures?
- Separate bacteria and brett
- Separate lacto culture (or just start from grain)
  - lactic ferment before primary yeast (berliner weisse, tart fruit beer)
- Separate “rare” strains

Hot-side Sourcing (Mash/Kettle Sourcing)
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WORT PRODUCTION

No Process/Equipment Changes Necessary

Mashing for Brett. metabolism/attenuation

- Build body with beta glucan: wheat/oats/rye/spelt
- High Sacch. Rest Temperature ≠ More Body
  - Also not necessarily more complexity from brett (but it helps)
  - Brett can metabolize more than malt sugars/carbohydrates
  - Decrease in primary attenuation = decrease in lacto inhibition (less alcohol)
- Traditional methods: Turbid Mash, Flanders Mash

In the Kettle

- Traditional: Long boil (reduce Turbid liquor) – otherwise not necessary
- Aged Hops?
  - Keeps lactobacillus “in check”
  - Substituting fresh pellets (low %AA, <15IBU) is perfectly OK
- NO HOPS = NO PROBLEM
  - Increased lactic production from lactobacillus
  - No hops = no boil (heat to 170F, cool, pitch. Cool QUICKLY, lid off.)
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WHAT NOW?

Brew! (Learn, Repeat)
- Be PATIENT
- Temper patience with full pipeline

More Research and Experiments
- Make your own method!
- Dig deeper: Biochemistry
  - Yeast Blogs
  - Post-grad studies
REFERENCES AND RESOURCES


Yakobson, Chad. “Pure Culture Fermentation Characteristics of Brettanomyces Yeast Species and Their Use in the Brewing Industry.” Available at http://www.brettanomycesproject.com

Yakobson, Chad, Interview by *The Brewing Network*. Available at: http://thebrewingnetwork.com/shows/866


Blogs:


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