Barrel Aging, Sampling and Blending

Gwen Conley

Types of wood

- **French Oak**
  - Highly porous
  - Aroma & flavor characteristics: tannins, sweet spices, creamy custard, butterscotch, milk chocolate. Different growth environments create different characteristics
  - Split Staves = smoother, tighter seal from stave to stave.
- **North American White Oak**
  - Heavy vanilla and a toasty/char character. Spice characteristics influenced by region / terrior
  - Mostly used for bourbon, whiskey, brandy, and rum
  - Sawn Staves = rougher edge and more surface area of wood to comes into contact with.
- **Hungarian Oak**
  - High spicy peppery characteristics, vanillin, roasted coffee, bittersweet chocolate, and fruit, cotton candy, and coconut

What does toasting do?

- More charred = more flavor impact
- Temperatures ranging from 250°F for light toast to 475°F for heavy toast.
- **Light** toast : coconut, cream, and white chocolate.
- **Medium** toast: coconut present but decreased, vanilla, caramel, coffee, toasted bread, milk chocolate, smoke, spice, and leather.
- **High** toast or medium plus: pronounced spicy, smoky, dry leaves, gunpowder, and black chocolate
- **Heavy** toast: intense smoky and possibly overly roasted character

So Many Sizes

Size and Temperature Does Matter

- Some Sizes: ½ gallon– 160 gallon barrels (1L – 600L)
- Foeders (oak tanks)
- Relationship of Surface Area / Volume Ratio
  - Surface Area-Volume ratio gets smaller as the size of the barrel increases
  - Higher SA/V ratio (small barrel) = faster extraction
  - Faster extraction can mean less complexity
  - As the size of the barrel increases, less liquid actually comes in contact with the wood.
  - Small barrel have thinner stave and thus more oxygen diffusion.
- Temperature
  - Higher temperatures = faster extraction & fermentation

Receiving Barrels

Previous Use

- Condition of the Barrel
  - Inspect for flaws
  - How long has it been empty
- What it was filled with
  - Fresh barrels are general not used for beer aging due to the strong wood characteristics
  - First time use typically is spirits or wine
  - Number of uses prior

Filling Barrels

- **Uncarbonated** Beer
- Safety Concerns
- Sanitize equipment
- Barrel wand
- Barrel filling gun (squeeze lever)
- BullDog Pup Gas Racking Wand
  - Gas pressure to transfer.
  - Control flow (minimize agitation)

Temperature & Barrel Filling Importance

How will you use your barrels?

- **FERMENTATION** –Unfiltered beer completes it primary fermentation in oak barrels. The use of barrels in this way can bring a woody, tannin, and some residual spirit characteristics to the beer.

- **AGING**– (usually non-sour) Finished beers stored in barrels for a undetermined or determined amount of time. Barrel aging can impart flavors of whatever was in the barrel previously (Spirits) as well as vanilla, smoke, spice, mocha, oak (or wood), fruit, coconut, etc.

- **SECONDARY FERMENTATION** of Sour or Wild Beers – Finished beers are placed in barrels with secondary microflora (yeast/bacteria) to aged for usual an undetermined amount of time. French Oak wine barrels are commonly used. The rough and semi-porous surfaces of barrels promote microbial growth.

Most Common Question

- How do you choose what goes in barrels?
  - Standard beer
  - Sour vs Non-sour
  - Special Recipes
  - Occasional “Oops”
  - Experimentation

What About Storage

- Location
  - Safety and Security
  - Temp fluctuations
- Labeling
  - Barrel Number you assign sticks with it
  - How do you record/track
- Racks
  - Different size barrels require different racks
  - How high to stack
  - Leakage

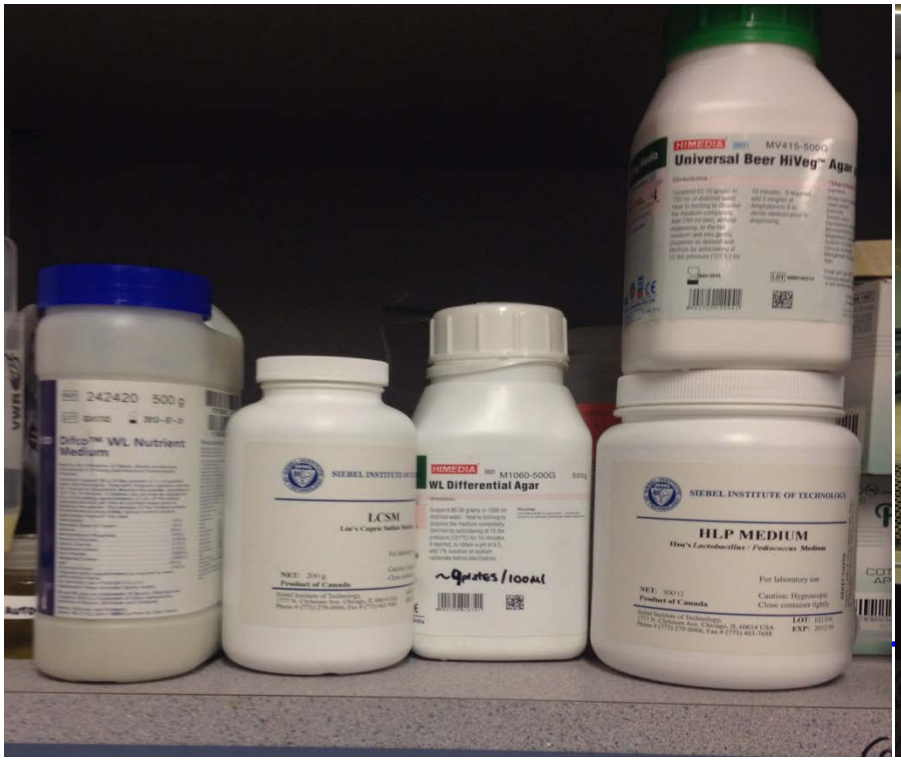
Sampling (not for micro checks)

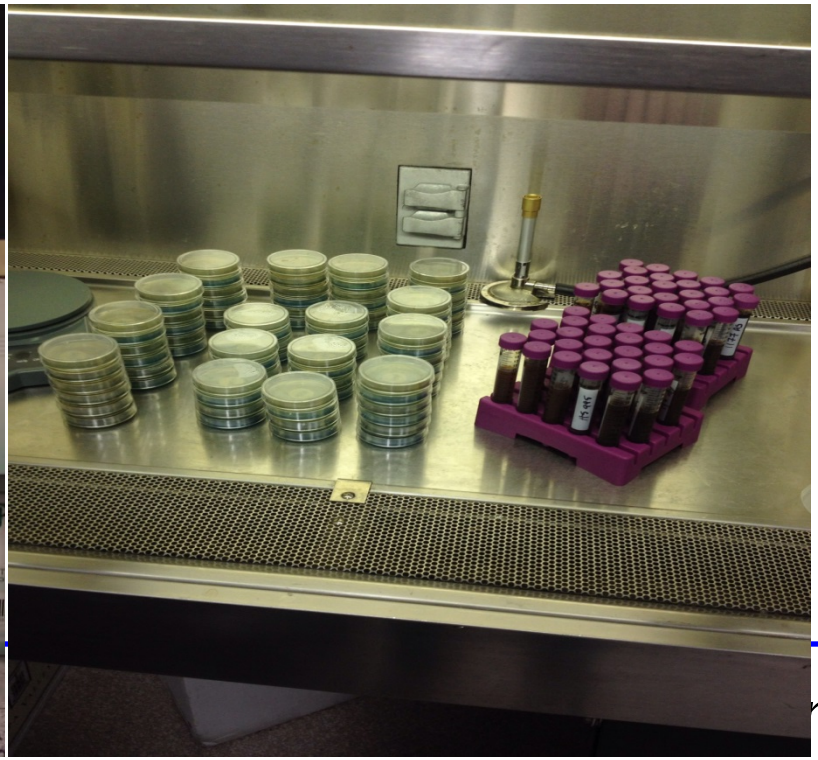
- Using sanitary technique spray head area and equipment with Ethanol (food grade)
- Drill hole near bottom of barrel head using a stainless steel drill bit
  - Positive pressure
  - Not disturbing pellicle
- Plug with stainless nail
  - Extra nails in ethanol

Sterile Samples for Micro Testing

Micro Testing Sampling

- Check every barrel of NON-sour beer for possible contaminates
  - Bacteria (WLD & HLP) and Wild Yeast (LCSM)



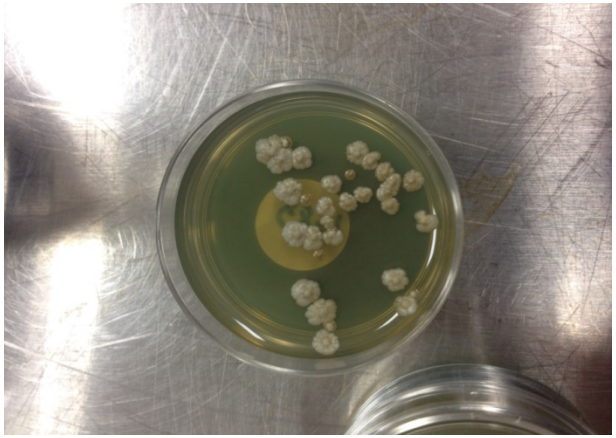


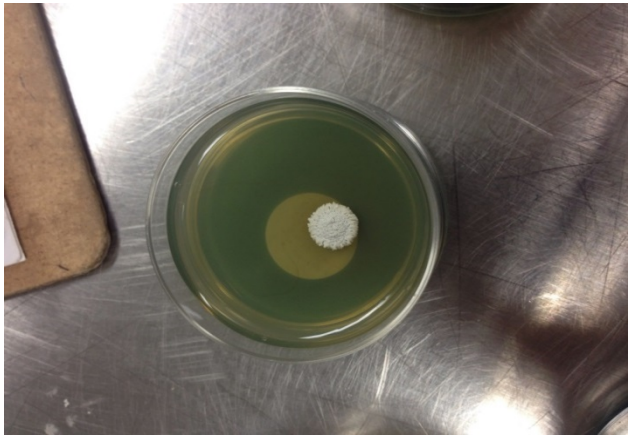
Hard to Detect and Identify

- You are searching for *Needle in a Haystack*
- *Brettanomyces* do not distributed in tanks or barrels uniformly
- Incubation growth can take up to 14 days.
- Similar growth characteristics from different yeast can result in false positives.
- Plating will not detect viable but non-culturable cells (VNC). In other words they are waiting until conditions are favorable for growth

What if it is Micro Positive

- What is the contaminate and how much?
- Is the flavor / aroma acceptable?
- Do you trust a re-test
- Blending or souring possibilities
- Controlled environment – single barrel one off



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Tastings Records

- Keeping records of everything you taste
  - Barrel #
  - Previous Barrel Use
  - Beer Style
  - Time in barrel
  - Flavor & Aroma
  - Possible Uses

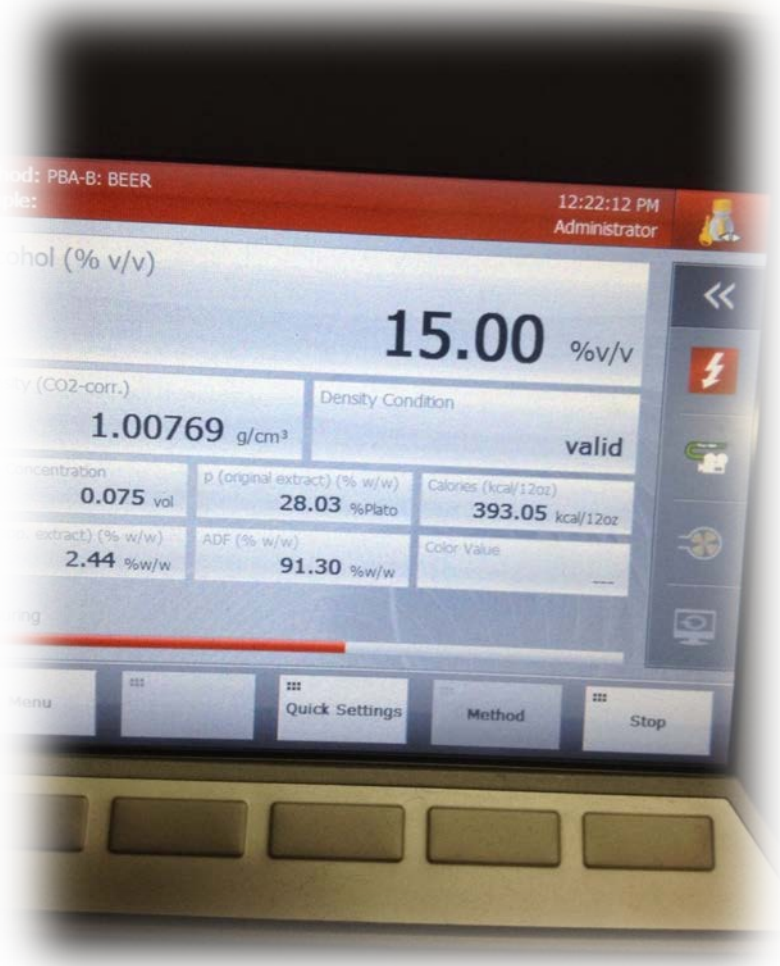
Tasting and Blending

- High wood or spirit attributes?
- Are there any off notes and what is their intensity?
- Does it need to sit longer?
- How do the samples combine or blend together?
- How will it taste carbonated?

Blending

- When is it ready?
- Magic Formula = Barrel will let you know most of the time (could be 6 months but as long as 2-3 years or more)
- Barrel blending for consistency
- Creation of unique flavors
- Each Barrel (non-sour & sour) = A Flavor Ecosystem
  - Barrel to barrel variation
  - Concentration of previous spirit or toast level
  - Different concentrations of wild yeast and bacteria will yield different ratios of attributes. This is why every barrel will taste different.

Prepackage Sampling

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POST PACKAGING & SHELF-LIFE

- How does your barrel beer age or what are the oxidative attributes
- Marketing & Science
- Bottle Storage
  - Cold
  - Room Temperature
  - Hot / Punished

Any Questions?

gwen@lostabbey.com