

Spirit Barrel Aging CCBA Spring Conference 2019

Presented by

Julian Shrago, Owner/Brewmaster

Beachwood BBQ & Brewing (Long Beach)

Beachwood Brewing (Huntington Beach)

Spirit Barrel Aging:
Processes, Procedures, & Techniques For Small-Scale Programs



Where do I start?

1. *Everything is an ingredient, treat nothing as an additive*
2. *The base beer must accommodate and “have room” for barrel character*

Barrel types:

- Bourbon (most common)
- Rye whiskey
- Brandy
- Rum (difficult to get suitable barrels)
- Tequila (also difficult to get suitable barrels)
- Scotch
- Gin barrels (rare)



Some tips for base styles:

Reduce:

- BUs (10-30 is a good range)
 - Using Rager formula
- Roasted grains

Increase:

- Residual sweetness
- Dextrins & “body building” adjuncts, such as lactose, oats, wheat, etc...
- pH (by means of salts, such as chalk)
- ABV (8-11% is a good range going into barrel)

Beer styles:

- Stout
- Porter
- Barleywine (is life!)
- Lightly smoked beers (apparently Rauchbier is *also* life)
- Other strong beer
- Low(er)-gravity beer
 - Can be done, but sometimes riskier to pull off

Positive flavor/aroma contributions from the barrel:

- Vanilla (vanillin)
- Coconut (whiskey lactone)
- Smoke (guaiacol)
- Char/ash
- Tobacco
- Oak – obviously!
- Base spirit (bourbon, tequila, etc...)
- Tannins (minimal in American oak)
- Micro oxidation

Negative flavor/aroma contributions that can occur:

- Hot aroma
- Overly dry/woody
 - Can occur with an “over-staved” barrel
- Infections
- Over oxidation
- Beware dry barrels!



Preparing and inspecting the barrel exterior:

- Get freshly emptied barrels
- Ideally fill right away
 - 2mo max after arrival if properly stored
- Work with a broker that can ensure barrels were not rinsed
- Store in a cool, clean area prior to filling
- Visually inspect exterior
 - Free of mold & dust
 - No loose hoops or visual gaps between staves
 - Bung hole is plugged properly w/plastic plug or soft wooden bung
 - Avoid barrel that is “over staved”
 - A smaller number of wider staves is typically a sign of a good cooper
 - Too many small staves can indicate poor quality wood
- **Quality and condition of the barrel is often as important (or more) than the particular brand of spirit that came out!**
 - You can make an amazing BA beer from fresh Jim Beam barrels and Jack Daniel’s barrels

Preparing and inspecting the interior just prior to filling:

Some don'ts:

- Don't steam a spirit barrel
 - Steaming diminishes all that amazing flavor/aroma from residual spirit
- Don't fill more than once for clean beer
- Don't swell heads with H₂O from the outside
 - This can lead to hydration of "bugs" on barrel exterior and ingress prior to filling
- Don't store barrels in a dusty and unclean place prior to filling
- Don't get wet with water prior to filling



Preparing and inspecting the interior *just* prior to filling:

- Remove plastic bungs with pliers
- Remove wooden bungs
 - Use deck screw into center of bung
 - Do not fully penetrate bung
 - Use prybar to quickly pop out bungs
- Use a bright, narrow-beam flashlight to inspect through bunghole
- “Wet on arrival” (WOA) is good
- Free flakes of char are OK
- Do not breathe into barrel
 - Hold breath and carefully smell barrel
 - Don’t sneeze or cough into open barrel
- Aroma will seem “hot,” but should not be solvent-like or acetic
 - Experience will allow you to smell a good barrel



Preparing beer for barrels:

- Ensure fermentation is truly and fully complete!
 - Good to add a few days to primary to ensure this
- Fully chill beer (32-35°F)
- Bright beer that is free of yeast and haze-causing proteins is ideal
- Clarify beer prior to filling into barrels
 - 2 days on finings in a BBT is ideal
 - Biofine works well
 - Gelatin can lead to gelled proteins after extended aging
- Filtration & centrifugation is OK
- Filling directly from an FV can be dicey
 - Excessive yeast in a barrel can lead to flavor stability issues
 - Umami and soy sauce-like flavors & aromas common

Filling barrels:

- Purge with CO2
 - Use sanitary small diameter hose
 - Purge at 5psi for 5-10 minutes
- Bulldog time!
 - 45 elbow
 - Butterfly valve
 - 6" TC Spool
 - Height screw can be omitted
- Place Bulldog tip at slight angle to barrel to ensure it's not blocked
- Start fill slowly to avoid splashing
- Once barrel is 25% full, you can speed up fill rate
- Carefully watch level in barrel
- OK to overfill and allow some char flakes to flow out
- Close butterfly valve as you're removing the Bulldog
 - Allow residual beer in Bulldog to top off barrel
- Install ventilated bung
 - Carefully pound in about perimeter with rubber mallet
- Barrels can take up to a week to equilibrate
 - Beer will off-gas and expand (1-2% from cellar temps)
- Replace vented bung with solid bung after one week
- No need to top off barrel once it's sealed with a solid bung
- Storage: 60-70°F is ideal



Filling barrels (hardware):



CO2 purge



Vented bung



Bulldog for filling

Emptying barrels:

- Use a “bulldog,” not a siphon or gravity
 - Very light pressure on headspace
 - 3-5psi max
 - Good idea to have bulldog outfitted with mini PRV
 - Set screw for bulldog should be at $\frac{1}{2}$ ” to $\frac{3}{4}$ ” extension
 - A simple coarse filter can be made with a 6” spool & coarse sock-type gasket
 - 10-16 mesh is fine
 - Use a 45° elbow for strain relief and to ensure bulldog stays in place
 - Also have a sight glass inline at the bulldog outlet
- Wipe down area around bung using rag soaked in isopropyl
 - Wipe off top and sides of bung flange
- Spray wood around bung several times with isopropyl
 - 10-15 min between sprayings
 - Allow some isopropyl to soak into wood around bunghole
- Wear nitrile gloves to remove bung
 - May require incremental work along flange to loosen
- Be aware of how fast barrels can empty
 - You can use a hammer to lightly tap the head of the barrel to see how empty it is
 - When moving from one barrel to the next, no need to re-purge transfer line w/liquid

Anatomy of a Beachwood Bulldog:



Butterfly valve

Spool w/sock gasket

Sight glass

Height pin



45° elbow

Expandable bung w/gas inlet and mini PRV

Main tube

Safety

- #1 – barrels are not meant to hold pressure!
- Barrels should always be monitored and checked for leaks and signs of pressure buildup
 - Make a practice of checking barrels weekly for signs of leakage or distention
- Always work in a well-ventilated space when purging barrels with CO2
- Excessive pressure can be relieved by drilling a hole near the bung, then immediately plugging with a stainless screw
 - Screw can be backed out for very controlled venting until complete
- Stacking barrels:
 - Full barrels are heavy!
 - 4 racks high is common, even in seismic areas
 - Higher can be dicey
 - It's best to unstack barrels before emptying
- Stacking/unstacking must be done with a certified & capable forklift operator
 - Always have a spotter!
- Always wear safety glasses!



Sampling

- Samples can typically be taken from barrel without opening things up
- Nail in the head is a practical method
- Use 9/64" drill bit (McMaster part #3203A49)
- Use 16D 316 stainless steel nail, 3.5" length
- Ensure drill bit is clean
 - Heat sani with open flame
- Wash nails and place in sani bath (PAA works fine)
- Spray down head of barrel (area to be drilled) with isopropyl several times and allow to penetrate outer surface
- Drill at high speed and plunge slowly into wood
 - Generating smoke is a good thing
 - Once you fully penetrate, keep drill running and pull back
- Have a glass or container (second set of hands) ready to collect the sample
- Carefully lineup nail with hole and gently tap in
 - Tap to leave 1-1.5" of shank exposed



Plating & testing

- Have your base beer be plated for diastaticus & “bugs” before aging in barrels
 - Diastaticus, including brett can “go to town” during the aging period if present
 - Beer can become excessively dry
 - Bunged barrels can leak or explode!
- Pull sanitary samples prior to racking out of barrels
 - Send to a lab and have them analyzed for microbes, such as pedio & lacto
 - Samples should be pulled from the bunghole, not from a nail in the head
 - Spray bung and surrounding wood with isopropyl
 - Carefully remove bungs and wear gloves
 - Use sanitary/disposable pipette for each sample
 - Replace bungs with clean & sanitary ones



Blending:

- Beer from barrel may be amazing, but blending is a fantastic tool to ensure success!
- Body of beer can be somewhat thin when pulled from barrel
- Blend of 10-25% non-BA base beer can freshen & “fatten” final product
 - Base beer can be reserved for 1yr in stainless and blended when BA beer is pulled from barrels
 - Blended base beer can also be from a fresh batch
- Blend can include other styles to add further depth, body, etc...
 - Imperial stout
 - Milk stout
 - “Pastry” stout
 - Scotch wee heavy
 - Other strong ales & lagers
- Blending beers should be added to BBT first to ensure homogeneity w/final product
- Most adjuncts should be added at or toward the end of the maturation process or in the BBT during blending
 - Vanilla beans
 - Coffee
 - Cacao nibs
- Beer will “bloom” and fatten up 24-48hrs after transfer

Q & A:

- Questions?

Thank you to the CCBA and all of you!