**Ginger Beer Entry: River City Ginger**

Ginger beer, a light and somewhat effervescent beverage, is an emerging trend in the craft beer world. Tidewater AIChE Local Section focused on this style of beer.

**Indian Pale Ale Entry: Just Sit**

A Black IPA is also referred to as a Canadian Dark Ale (CDA) and its creation is attributed to craft brewery pioneer and patriot: Greg Noonan.[7] The style is supposed to represent the mix of a stout or porter with an IPA, hinting at the myriad possibilities of combinations. We manype cultures with a complex C-type hopping schedule, a 'dry' grist fortified to maintain residual sweetness with an English yeast strain known for its own nature to enhance rich complexity. If you aren’t afraid to ‘jump up’ and mount the Friesian, we are confident your experience will be limited only by your imagination.

**Indian Pale Ale Entry: The Friesian**

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**REFERENCES**

We are nano-brewers that enjoy creative presentation of flavor, visiting breweries, and imbibing refreshing beer while having fun! To us nano-brewing means that we refined our own "small-scale" whole grain brewing process to standardize and explore the characteristics of our own beers. We are interested in continuing to build our expertise, launching our brewery, and incorporating science and engineering to complimen education programs we are a part of.

We entered both a Dark and Malty & a Bright and Hoppy entry to the first AICHE Beer Brewing Competition. Our Dark and Malty entry is a Foreign Extra Stout with a 'scary' variant for the Halloween holiday season. Our Bright and Hoppy entry is a take on the emerging New England style that is argued to belong to either the American IPA or Indian IPA category. This poster presents our Foreign Extra Stout entry: The Fugacity Foreign Extra Stout and a variant we call. "Scary Hot Mess".

**Our ‘Dark and Malty’ Entry**

**Foreign Extra Stout**

**History:** A classic beer in this category is the Foreign Extra Stout. Originally brewed as Guinness West India Porter from the St. James Gate area of Dublin Ireland, the Guinness Foreign Extra Stout has been made since the early 1800s. The category is known for higher hop and alcohol content that promoted stability to be sent abroad. Guinness is reported as establishing the West India Porter to ship beer to workers in the Caribbean markets (and hence, sometimes known as "Tropical Stouts") [1]. Our goal was not to try and clone any one beer but to create our own creamy complex stout in rapid fashion given our experiences. Examples of stouts the we do enjoy include the Guinness Foreign Extra Stout and the Strangeways Imperial Stout: Gourds of Thunder.

**Ingredients (~ 2.5 gal fermentation):**

- Pale and dark roasted malts and grains.
- Grain bill
  - 4.25 lbs. Briess 2-row pale ale
  - 0.75 lbs. Flaked barley
  - 0.19 lbs. Briess Black pils
  - 0.16 lbs. Briess caramel 40L
  - 0.16 lbs. Briess caramel 60L
  - 0.13 lbs. Briess flaked oats
  - 0.13 lbs. Briess chocolate malt
  - 0.13 lbs. Crisp (UK) roasted barley
  - Ale yeast (although some are brewed with lager yeast).
- RVA Yeast Labs #131 Chiswick Ale Yeast
- Hops mostly for bitterness.
- 1 oz. Kent Goldings pelleted hops

**Seasonal Variant**

Our bigger variant adds spiciness and complex sugars intensities in line with the "Caribbean" style of a Foreign Extra Stout.

Our variant utilized post primary fermentation additions:
- Habanero
  - 1 oz. dark Belgian candied sugar
  - 1 tsp yeast nutrient

**Outline of Brewing Process**

1. Clean and Prepare Grain Bill, Including Grin Mill
2. Collect and Prepare Grain Bill, Including Grin Mill
3. Very deep brown to black in color. Clarity usually pelleted hops
4. Roasted grain aromas moderate to high, and can have chiller.
5. Flavours typical varieties can be quite sweet without much roast or bitterness, while export versions can be moderately dry (reflecting impression of a scaled-up version of either sweet stout or dry stout). Roasted grain and malt character can be moderate to high, although sharpness of dry stout will not be present in any example. Tropical varieties can have high fruity esters, smooth dark grain flavors, and restrained bitterness; they often have a sweet, rum-like quality. The roasted flavors may taste of coffee, chocolate, or lightly burnt grain. Little to no hop flavor. Very low to no diacetyl.

**Method**

We kept portions of our spent grains for cooking, and the rest of our spent grains are composted. See sustainability section for more details.

**Balance**

- Water: Mash (2 gallons) + Grain rinse (1.5 gallon) = Final Bottling (2.8 gallons) → loss to evaporation, grains, yeast (0.7 gallons)
- Grains: Mash (5.65 lbs.) = Extract (1.6 lbs.), Bread (1.5 lbs.), Compost (2.5 lbs.)
- Energy: Nexus Estimlated wort cooling load = 3 gal * 4.1 KJ/Kg °C (i.e. 0.89 BTU/lb °F) from 72°F to maximum of 70°F. Tap water at 65°F is available at 1.56 gpm and would take ~ 20 minutes to cool wort (~ 31gal). The use of recycled rain water increases water of beer utilized ratio from 0.08 (2.8/ 2.8 +0.7 +31) to 0.8 (2.8/3.5)

**Review of Our Experience**

Our focus has been to develop repeatable nano brewing techniques while also relating the art of brewing to rigorous science and engineering. As we develop quality recipes we continue to change are practices to make as sustainable and efficient as possible. Style recipes we have developed include a 'bock', brown, and we are refining an approach to new England IPA with strong fruity aroma and a smooth creamy mouth feel.

Our FES is a tropical style with a moderate attenuating yeast strain and high end OG. We also minimize hop additions for minimal bitterness or aromas associated with hops.

**References**

5. RVA Yeast Labs http://www.rvayeastlabs.com/

**Acknowledgements**

We thank the Tidewater Virginia AICHE local section for their support of our participation in the first AICHE beer competition.