Maple Beer Capstone Project

By: Blake Huber, Gwendolyn Pieper, Miranda Sannino, Marete Seymour and Allyson Wentworth

May 20, 2020

Introduction

From bumper stickers to signs in storefronts, the words “buy local” are plastered everywhere you go. In New York state alone there are approximately 400 breweries. Combining the “buy local” movement with the beer industry creates the perfect pairing for the craft breweries to make an entrance. While craft beers are generally known for their small-scale, more traditional production, they also are non-traditionalists. Craft breweries often have a “something for everyone” approach in their taprooms which means creating unique flavors and styles in their beers. One emerging style with room for development and growth, is maple beer. With over 2000 maple producers in New York state, a partnership between these two industries could be beneficial. Such a partnership would fit in with both the buy local and the craft beer movements. This report is intended to provide some examples of how a quality maple beer could be produced and give insights into the potential marketing towards brewers, maple producers and consumers.

There are many ways a partnership between maple producers and brewers could be beneficial. The goal of this project was to focus on maple-flavored beer. Within this scope, there are many options including maple extract, fenugreek, maple syrup and maple sugar. We focused on the use of fenugreek, maple syrup and maple sugar for aroma and flavoring in this experiment.

When selecting the styles of beer to use to showcase maple flavor and aroma, we considered what would be complementary with maple syrup. It was evident that a style like double IPA would not be complementary. We settled on two darker styles of beer: an American amber ale and a nut brown ale. Such beers already have a maple-like flavor due to the malted grains and would be very complementary with maple syrup. The following sections go over the production process, results of the experiment and marketing research.

Maple Beer Production

The goal of each beer was to produce a product which imparted true maple flavor and aroma for consumers to enjoy. Production of each beer was going to be a key step in crafting a product which stood out amongst other maple beers. Through prior tasting of some accessible beers that are brewed with maple syrup, the group found strong maple aromas but a lack of any flavor resembling maple, in addition to poor quality products. Determining the styles of beer was

going to be the first step in the process to achieving the maple flavors. With consumers associating color with aromas, such as a rose wine smelling like strawberries, a darker style of beer was chosen to help enhance this perceived feeling. The nut brown ale was a perfect choice with it's mash bill containing specialty malts such as english chocolate malt, belgian biscuit, Briess special roast and caramel 120. The amount of each grain used was 7.5 lbs of the English Maris Otter, 0.25 lbs of the english chocolate malt, 0.25 lbs of the belgian biscuit, 0.25 lbs of the Briess special roast, 0.25 lbs of the caramel 120. Each of the specialty malts would help to enhance the maple aromas with their malty, fruity and sweet flavors which are characteristic in nut brown ales. The other beer chosen was an amber ale for its malty aromas and well-balanced flavors. This beer contains a simpler recipe with caramel 60 being a defining specialty malt in the mash. The mash bill consisted of 6.5 lbs of the Rahr 2-row pale, 2 lbs of the german munich malt, 1 lb of the caramel 60. For this trial, the amber ale would be a perfect style to still complement some of the richness of the maple, without overpowering the flavor that was being added.

Research was completed on the best ways to brew a maple beer in order to perceive the most flavor and aroma in the final bottle. The original brewing process consisted of a single infusion mashing step with a standard saccrification step held at 153 degrees fahrenheit for 60 minutes with a 170 degree mashout. The beer was lautered, taking the sweet wort away from the spent grains into a 60 minute kettle boil. The first trial of maple syrup additions was made after the primary fermentation had ceased. Adding the syrup after the primary fermentation was one of the key ways that was discovered through research to retain a lot of the maple aroma. If the maple was added during the mashing step or before primary fermentation, the aromas tended to be lost as shown by past brewers. Additions were made at 70.25 grams of maple syrup per one gallon of beer to 2.8 gallons of beer for each style.

After the 'secondary' fermentation had completed, the beer was racked from the gross lees and bottled using maple syrup and maple sugar as the priming agent. Maple sugar produced by the Cornell Maple Program located in the Arnot Forest presents a very interesting option with a coarse dark sugar that can be used in future trials. The maple sugar, unlike others, is produced from a darker grade of syrup producing a highly aromatic amorphous sugar. This sugar in conjunction with the maple syrup would again help to aid in the maple aroma. Different priming additions were made to affect the volumes of CO2 in the bottle. The pressure can make a

difference on factors like the foam head on the beer in addition to changing the aromatic profile when a consumer is enjoying the drink.

The last trial intended to impart more maple syrup aroma was the addition of Fenugreek. Fenugreek is an annual plant which has a heavy maple aroma coming from a compound called sotolon (https://en.wikipedia.org/wiki/Fenugreek). The addition of this powdered spice was made at bottling in order to lift the aromas of other maple additions which were made. This could be a very easy addition for producers to make in future experiments of maple beers and something that could enhance the perception of maple beers in the marketplace.

The fermentations from both the nut brown ale and the amber ale were clean with no stuck or sluggish progress. Each produced a clean beer with no apparent off-aromas from the fermentation coming from sulfhydryl compounds or microbial contamination. A metallic flavor did arise in some of the bottled nut brown ale leading the group to believe that the grains were old and possibly caused by lipid degradation. This was not found in the amber ale during the sensory trials. Some of the beers had a problem with a rotten egg aroma after bottle conditioning which most likely was a result of stressed yeast in the bottle but this aroma should blow off due to the high volatility of hydrogen sulfide. A final problem that arose was bottle overflow upon opening most likely due to the nucleation sites created from the rice hull present in the fenugreek powder. This would likely not arise in a larger manufacturing setting due to filtering the beer prior to bottling and purchase of pure fenugreek powder, which dissolves completely. Overall, the trials went very well and the results offer a great stepping stool for beer production with maple.

The extra addition of alcohol was considered with the additions during the maple trials. Maple Syrup has a points per pound per gallon (PPG) of 31 meaning that every pound of maple syrup added to one gallon roughly adds 4.1% alcohol to the beer (Palmer 2017). This would be too much considering we are going for a clean, not imperial, dry style of beer. Based on the addition of 70.25 g/gal of maple syrup, which is 0.15 lbs, the addition of 0.63% of alcohol was made for the beers with the addition after primary fermentation. The addition with the priming sugar will be very small and was not considered as heavily.

Maple Addition Trials

Tables 1 and 3 outline the maple beer addition trials for both the Nut Brown Ale and American Amber Ale. Tables 2 and 4 show the gravity readings for each beer, respectively. According to the Northern Brewer priming sugar calculator, the recommended volumes of CO2 for both the nut brown ale and American amber ale was 2.3 (https://www.northernbrewer.com/pages/priming-sugar-calculator). We decided to complete the trials using 2.3 volumes of CO2 as the "mid-range" value and experimented with 1.5 volumes of CO2 as a lower range and 3.0 volumes of CO2 as the upper range. We selected multiple volumes of CO2 to experiment with to determine if the amount of maple priming syrup/sugar added would have an effect on the flavor or aroma of the final product. The maple syrup and sugar used were classified as "very dark."

Half of each beer underwent a "secondary fermentation" for a week using maple syrup with the hope that the beer would be able to absorb and trap the volatile maple aroma and flavors before bottling.

Since 2.3 volumes of CO2 was the recommended amount according to Northern Brewer, we decided to only run maple sugar addition trials in that category along with the upper range of fenugreek and ensured that the largest number of bottles were included in the 2.3 volumes of CO2 trials. The priming sugar addition rates were based on the results of the Northern Brewer priming sugar calculator with "turbinado sugar" values used for the maple sugar additions.

Fenugreek capsules were used for the fenugreek addition. Each capsule was broken in half to release the powder inside. The powder from each capsule weighed 0.73 grams and each capsule contained 16% rice hull powder with the remainder being fenugreek. Addition rates were based on a bench top trial. Three glasses containing 12 ounces of water were mixed with 0.18 grams, 0.37 grams, and 0.55 grams of fenugreek respectively. These numbers were determined based on ¼, ½, and ¾ the weight of one fenugreek capsule. It was determined that 0.37 grams and 0.55 grams of fenugreek had the strongest aroma in the water and would be used for the fenugreek additions to the maple beers at bottling.

Table 1. *Nut Brown Ale Addition Trial - Temperature at first bottling: 66°F, temperature at second bottling: 68°F.*

Secondary Fermentation	Priming sugar (Volumes of CO2)	Priming Sugar Type	Fenugreek (g/12oz)	# Of Bottles	ID #
No	1.5	Maple Syrup (1.04g/12 oz)	0	2	1
			0.37	2	2
	2.3	Maple Syrup (2.38g/12 oz)	0	3	3
			0.37	3	4
			0.55	3	5
		Maple Sugar (1.84g/12 oz)	0	3	6
			0.37	3	7
	3	Maple Syrup (3.55g/12 oz)	0	2	8
			0.37	2	9
Yes (70.25g/gal Maple Syrup Addition) or (12oz/5Gal). 2.8 gallons remained so 197g of MS was added.	1.5	Maple Syrup (1.09g/12 oz)	0	2	10
			0.37	2	11
	2.3	Maple Syrup (2.43g/12 oz)	0	3	12
			0.37	3	13
			0.55	3	14
		Maple Sugar (1.88g/12 oz)	0	3	15
			0.37	3	16

	3	**Maple Syrup (3.60g/12 oz)**	**0**	**2**	**17**
			0.37	**2**	**18**
				Total	**46**

Table 2. Nut Brown Ale Gravity Readings

Date	Event	Specific Gravity	Approximate ABV%
3/21/20	Brew	1.05	0.00
3/30/20	Gravity Check	1.012	4.90
4/10/20	1st Bottling	1.01	5.15
4/11/20	2nd Bottling	1.01	5.15

Table 3. *Amber Ale Addition Trial - Temperature at first bottling: 71 ℉, temperature at second bottling: 71 ℉.*

Secondary Fermentation	Priming sugar (Volumes of CO2)	Priming Sugar Type	Fenugreek (g/12oz)	# Of Bottles	ID #
No	1.5	Maple Syrup (1.16g/12 oz)	0	2	19
			0.37	2	20
	2.3	Maple Syrup (2.50g/12 oz)	0	3	21
			0.37	3	22
			0.55	3	23
		Maple Sugar (1.94g/12 oz)	0	3	24
			0.37	3	25
	3	Maple Syrup (3.67g/12 oz)	0	2	26
			0.37	2	27
Yes (70.25g/gal Maple Syrup Addition) or (12oz/5Gal). 2.8 gallons remained so 197g of MS was added.	1.5	Maple Syrup (1.16g/12 oz)	0	2	28
			0.37	2	29
	2.3	Maple Syrup (2.50g/12 oz)	0	3	30
			0.37	3	31
			0.55	3	32
		Maple Sugar (1.94g/12 oz)	0	3	33
			0.37	3	34

	3	Maple Syrup (3.67g/12 oz)	0	2	35
			0.37	2	36
			Total	46	

Table 4. Amber Ale Gravity Readings

Date	Event	Specific Gravity	Approximate ABV%
3/26/20	Brew	1.055	0.00
3/30/20	Gravity Check	1.01	5.80
4/11/20	1st Bottling	1.01	5.80
4/17/20	2nd Bottling	1.01	5.80

Post-fermentation Sensory Analysis

ID #	Sensory Notes
1	Muddy brown color, clear, nutty, oaky aroma, a bit stale, dry, flat
2	Slight maple aroma, light maple aftertaste, soy sauce, slightly metallic
3	Nutty, caramel, oaky, stale (cardboard?), hint of maple flavor
4	Strong maple aroma, metallic, nutty, caramel, slight maple aftertaste
5	Slight maple aroma, still metallic but not as much as #4, nutty flavor, soy sauce
6	Molasses and slight maple aroma, nutty, caramel, high carbonation
7	Strong maple syrup aroma, slightly stale, slightly metallic, light maple flavor
8	Light maple aroma, nutty, caramel, bit of an off flavor (musty)
9	Strong maple aroma, little maple flavor, drying on the palate

10	Molasses and maple aroma, caramel, nutty, coffee flavor, sweet, thick but not heavy
11	Slight maple aroma, coffee, chocolate, caramel, slightly sweet maple flavor, smooth, silky on the palate
12	Darker caramel color, coffee aroma, nutty, caramel , little maple flavor, drying on the palate
13	Strong maple aroma, chocolate, slight maple flavor, sweet, slightly metallic
14	Light maple aroma, very metallic, sweet, light maple flavor
15	Strong maple aroma, coffee aroma, nutty, caramel, dry, high carbonation
16	Slight maple aroma, high carbonation, slightly metallic (the carbonation seems to mask any flavor present)
17	Bitter, sour flavor, high carbonation, no maple aroma or flavor
18	Slight maple aroma, sweet, brown sugar aroma, light maple syrup flavor, slightly metallic, drying on the palate
19	Honey gold color, honey aroma, sweet, slight maple flavor, lightly metallic
20	Light maple aroma, smooth, lightly metallic, strong maple candy aftertaste, chocolate, slightly sweet
21	Honey aroma, slightly maple aroma, peach aroma, sweet
22	Light maple aroma, very sweet, slight maple flavor, a bit earthy, tastes like a wet rope
23	Light maple aroma, light maple flavor but bold at the same time
24	Honey aroma, slightly maple aroma, vanilla, strong maple sugar flavor but not sweet
25	Strong maple aroma, sweet but bitter maple flavor, menthol-effect on the palate
26	Strong maple syrup aroma, slight maple flavor and heavy on the palate

27	Strong maple aroma, slight earthy aroma, sweet maple flavor, robust
28	Very strong maple aroma with a strong, earthy, vanilla, robust maple flavor
29	Slight maple aroma, slightly antiseptic, under-ripe apricot aroma and flavor
30	Strong maple aroma, sweet, strong maple flavor, honey, cotton candy-like aftertaste
31	Dark brown sugar aroma, molasses, robust maple syrup aroma, raisin-like, prune, not a strong maple flavor but strong dark, dried fruits
32	Prune-like aroma, dark maple or brown sugar, thick, deep molasses flavor, slightly metallic
33	Boiled egg that's been left in the fridge aroma (not sulfur-like), sweet, strong maple flavor
34	Dark brown sugar aroma, dark maple syrup aroma, light maple flavor, slightly tangy
35	Highly carbonated, musty basement aroma, boiled egg in fridge (not sulfur-like), higher carbonation seems to mask the flavor, earthy aroma, slight maple flavor
36	Light maple syrup aroma, sweet, slightly metallic, light maple flavor

Conclusions

Based on the results of the experiment, trial numbers 11, 24, and 28 were determined to be the most successful at producing a strong maple aroma with a light maple flavor that was present but not sweet. For the nut brown ale, #11 was the most successful, producing the flavors and aromas we were expecting for a maple nut brown ale: light maple aroma with deep chocolate, coffee, and caramel notes with a robust maple flavor that was smooth and silky on the palate. #11 underwent the "secondary fermentation" and had a maple syrup addition for the level of 1.5 volumes of CO2. It also had the low range fenugreek addition which may have aided in creating the light maple aroma present in the beer. #24 and #28 were the two American amber ales that stood out the strongest for producing maple flavor and aroma without being sweet. Both had strong maple, honey, and vanilla aromas with robust maple flavors. #24 did not undergo the

"secondary fermentation" and had the maple sugar addition at 2.3 volumes of CO_2. #28 underwent "secondary fermentation" and had the maple syrup addition at 1.5 volumes of CO_2.

This experiment concluded that fenugreek powder did not necessarily enhance the maple aroma of the beer. Further experimentation should be completed using fenugreek seeds, whole and cracked, and fenugreek tinctures to determine if fenugreek is useful in maple beer production. This experiment also determined that overall, the American amber ale succeeded at creating a stronger maple beer. This is most likely due to the complementary malts present in the American amber ale compared to the darker, chocolate and coffee notes present in the nut brown ale that mask the flavor and aroma of maple. Using dark, coarse maple sugar may also enhance the flavors and aroma of a maple beer when compared to using maple syrup but further experimentation and blind sensory analysis would need to be completed to validate this assumption.

Commercial Beer Production

When it comes to a niche product like a maple beer, marketing is key to a successful product. There are several aspects to consider when marketing a product like this. Sticking to the four main marketing principles: price, product, promotion, and place, makes it easier to develop a marketing strategy for this beer. Starting with product, we have a special beverage that is not common in the marketplace. This means that it will either be completely obscure or wildly successful. By evaluating all aspects of marketing we can ensure to be in the latter group. When assessing similar products on the market, the trend seems to be toward darker, heavier styles of beer i.g. stouts and porters. It does make sense that these styles do well in the market because they lend themselves to maple flavors. These styles of beer have darker flavors from the malt such as coffee, chocolate and deep roasted characteristics. These beers are also a heavier style, making them a perfect canvas for a rich flavor such as maple. However, by using a lighter style of beer, the maple flavor stands out, showcasing the uniqueness and complexities. A medium bodied beer such as an amber ale or a nut brown ale has more caramel and butterscotch notes rather than darker chocolates and bitter coffee. These notes complement and showcase the maple flavor rather than masking it with heavier flavors. Using a lighter style of beer also allows us to tap into an unreached market. Because the dominant styles are porters and stouts, there is a lot of

room for a medium body maple beer to find a place in the market. We become a stand alone product rather than competing for visibility on the shelf.

Promotion is another major factor in the success of the beer. When looking at the current line up of maple beers, the majority of the labels have the recognizable maple leaf as the prominent image. Other labels introduce pancakes and breakfast foods to add whimsy. These seem to translate well to the customers as it directly states the flavors to be expected with a maple beer. These components are important but they are overused and frankly, tired. Rather than following the status-quo, breaking from the mold is how a beer will sell. It is true that consumers are more likely to purchase a product based on the labeling and packaging. For this reason, the label is everything. Other trends in the market indicate brown glass to keep with the theme of maple. What was also noticed was reds, oranges and mustard yellow that indicates autumn and a certain time of year that is appropriate for maple. These are merely trends in the market but they seem to be identifiers of the style. Unique names are common for craft beers because they are another way to identify a beer and create brand recognition.

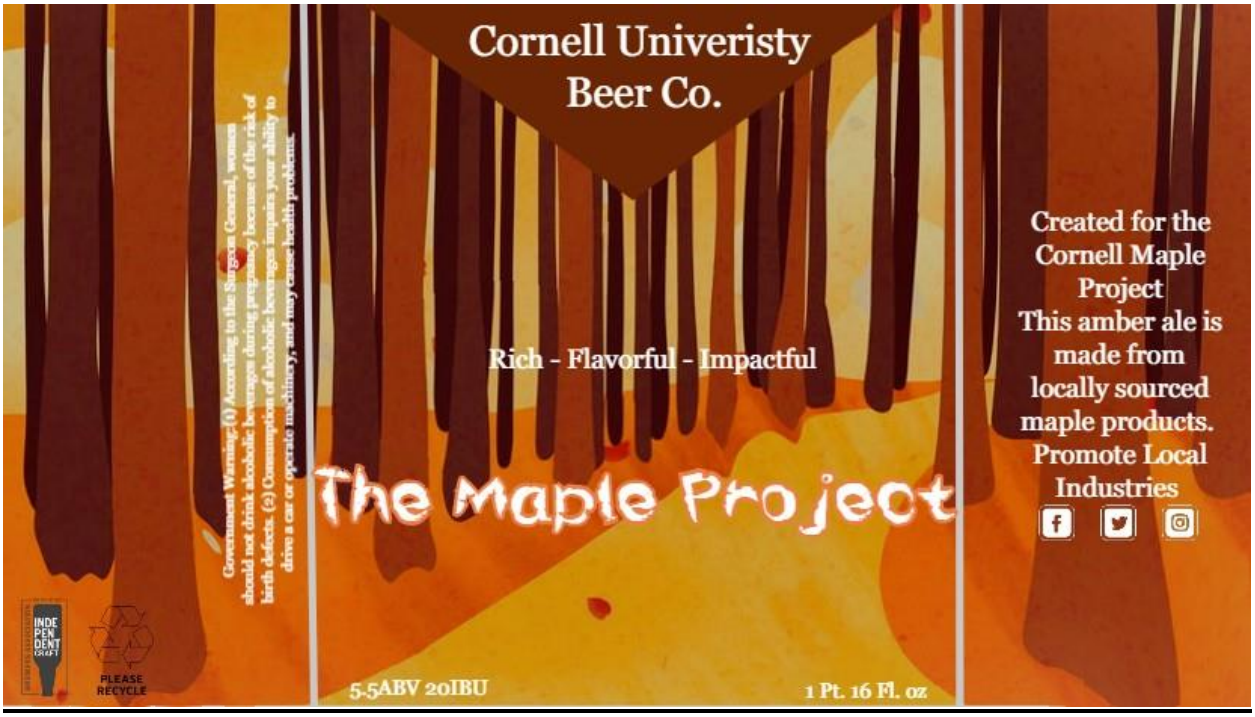
Price is a key component to promoting a successful product. Because this is a new and unique beer with no comparable maple amber ales already on the market, it is essential to price the beer right. If priced too high, people will be less inclined to try a new product they know nothing about and the beer will never gain the traction or exposure it needs among consumers to become a popular product. But the price should also convey some indication of its quality, so it also shouldn't be priced too low. The brewer should assess their costs and choose a price that both covers their expenses and produces revenue while not being inaccessible or dissuading to consumers. The brewer should also consider the price points of other maple beers already on the market and price this product on the lower end of that range in order to entice consumers to try this maple beer over others they may already be familiar with. Pricing a new product is a tricky balance, but by considering production costs alongside the range of maple beer prices on the market, the brewer can determine what a competitive price may be and how to use price to make this product attractive to consumers.

Next, it is important to consider placement and how the product will reach the consumer. How will they buy it and where will they buy it? We are marketing this beer as a local product and using the growing "buy local" movement as an avenue through which to grab consumer interest. Thus, it is important to form relationships with local retailers and bars where this

product can be promoted as a local craft beer. We see local markets as being the most important and potentially profitable means of selling and marketing the product. Once the beer has gained traction and consumer interest locally, the brewery can look to expanding distribution. It is important to form strong relationships with the local retailers and bars in order to ensure that it is placed well and promoted to consumers as an exciting local craft beer. Price and placement are key, but the product must also have eye-catching packaging to really grab the consumer's interest and be competitive with other beers.

Using what is traditional for maple beers as well as adding new components, we were able to make a mockup label for our beer. Some of the components of the label include a catchy name: The Maple Project, a traditional color pallet and an eye-catching simple design. We used the color pallet that is most identifiable with maple beers: browns and oranges. This wrap around label will work well for both cans and brown beer bottles. Additionally, the quasi-abstract design as the background allows for packaging to be cohesive. Meaning 6 packs and cases can also bear the design. A unique function of the label is that the design is both reminiscent of a maple forest but also maple syrup dripping down.

We were able to avoid the trope of using maple leaves and pancakes on the label that will make the beer blend in with every other maple product on the shelf. We added some descriptors to the front label of the beer to grab the attention of the consumers. These words are quick reads and pique the interest of a potential buyer. Other information on the label includes the mandated government warning as well as the alcohol percentage and volume of the container. The bitterness or IBU is also added to the front label for beer consumers that are looking for a certain mouthfeel from a beer. The last component of the label is a short description of the beer to give the consumers a story, enhancing brand recognition. The main purpose of the project is of course to promote local industries so that is proudly represented on the label as well. Social media icons were added to the label as well to create a following and encourage consumer's loyalty.



Beer and food pairing is a growing trend among consumers. According to Foresight Company's market research on beer drinking trends on social media, as of 2017, conversations around beer and food pairings had grown by 147% over the preceding two years (Arthur 2017). We can assume that this trend has continued to grow. They found that consumers perceive beer and food pairings to be less strict and more relaxed than wine and food pairing, allowing them to feel more comfortable experimenting to find their own preferences. Popular pairings tend to include more informal foods like chicken, burgers, barbeque, curry, or pizza. Therefore, beer and food pairing seems more approachable to many consumers than wine and food pairing. Based on this research, Foresight Company recommends that beer brands explore foods that pair well with their beers and communicate that to their consumers (Arthur 2017). An important component to promoting this beer is its pairability with certain foods, thus demonstrating the exciting breadth of flavor combinations that maple beer can achieve. Some ideas for pairings include:

•Bacon wrapped dates with cheese and walnuts as an appetizer

•Butternut squash soup

•Hamburger with bacon, brie cheese, fig compote, arugula and sweet potato fries on the side

•The perfect companion to breakfast for dinner

•Fried chicken and biscuits

•And for something sweet, apple cider donuts or creme brulee

These are just some possibilities. Partnerships with local restaurants should be formed in order to explore more pairings and promote the complementary addition of the right food to highlight the maple flavor of the beer.

Industry Reference

An interview was conducted with President of the Long Island Brewers Guild and co-owner/ master brewer, Pete B., of the craft brewery North Fork Brewing Company, located in Riverhead, NY. The style of beer that is produced at the craft brewery is a traditional porter around 6% ABV. The tasting notes include bitter chocolate and dark coffee that is rounded out with the maple syrup sweetness. This beer is on the sweeter side to give the porter a smoother and rounder mouthfeel. The name of the beer is "Dark Side of the Maple" in reference to the Pink Flloyd album, Dark Side of the Moon, and as such, the label reflects this as well. The label is black with a red maple leaf and rays of a prism coming through it. This is a simple yet eye catching design. It is easily recognizable as both a maple product and a pop culture reference. The label becomes an easy talking point in the tasting room, further emphasizing the need for a catchy label to sell products.

In the brewing process, maple syrup is added after the boiling step as a “dry hop” or adjunct addition. This was explained to be the optimal time to add the syrup to allow for maximum flavor impact and sweetness. Pete explained that he went through many trials to master both the flavor of the maple syrup and the sweetness. Adding syrup at bottle conditioning did not impart enough maple flavor and adding the syrup to the boil enhanced the flavors but it was not as impactful as expected. Eventually the final recipe was created with the dark malts and maple syrup. Pete prefers natural products to extracts as the extracts may impart artificial flavors to the beer.

All of the maple syrup that is used for the beer is sourced from several New York and New Hampshire maple farms to help support multiple local farms. What was grade B syrup is the syrup used in the beer because it is a darker amber syrup and adds body to the beer. Maple sugars and flavorings are bypassed for this style. The maple beer is produced seasonally for a few reasons. The major reason for the beer being seasonal is that the maple needs to be fresh from the farms. The beer is introduced to the North Fork Brewery line up at the end of August and continues through the colder months. The brewery has the facilities to store the maple syrup while they brew the beer for the season. Additionally, the beer is most representative of cooler seasons because of the maple flavor and the porter being a darker style of beer.

The beer is sold at the tasting room and through distributors. In the tasting room the beer is sold for consumption on premise, in a four pack of cans and in a 32oz crowler. Through distributors the same options are available depending on the location. The price of the beer is on par with the rest of their line up: $16/4-pack. The expense of the beer making is mitigated by working directly with the maple farmers rather than going through wholesale or retail outlets. Working with farmers directly also allows for fresh and in season maple syrup.

In the tasting room, Pete hosts food and beer pairings with local restaurants to promote both businesses. For this beer, heavier dishes are recommended, preferable meat dishes and rich desserts. Because of the layers of flavor in the beer, it also lends itself to cooking. Pork belly was suggested, glazed with the maple beer. Stews and rich soups are also a good foundation for the beer to be showcased. Desserts such as cheesecake and tres leche cake are solid options to pair with the beer. It was advised to steer clear of light and acidic appetizers and dishes. The maple flavors are too bold and mouth-coating for a light plate.

Pete also suggested some new styles to try that would complement the flavor profile of the maple and beer. Lighter styles like an amber ale or cream ale will give the maple a platform to shine. Rather than competing with dark malt flavors in a porter or stout, a lighter style will open up and present the maple on the forefront of the beer. Barrel aging is another suggestion; however, this must be combined with an imperial or double style for higher ABV. Ex rye and bourbon barrels will also give the beer spicy flavors and characteristics that will complement the maple flavors. Adjuncts such as bacon were discussed; both smoked and candied bacon are good options.

References

Arthur, Rachel. “Five Emerging Beer Trends: From Beer Tourism to Experimental Food Pairings.” *Beveragedaily.com*, William Reed Business Media Ltd., 5 Dec. 2017, www.beveragedaily.com/Article/2017/12/05/5-emerging-beer-trends-From-beer-tourism-o-experimental-food-pairings.

Palmer, J. J. (2017). *How to brew: Everything You Need to Know to Brew Great Beer Every Time*. Boulder: Brewers Publ.