

## Experiments In Flavour Extraction

Malc Newton, September 2014

There are many flavours, other than the standard malt, hops and yeast that we may wish to impart to beer.

### Objectives

- **Enjoyable flavour additions to beer**  
Examples include fruits, wood, spices, vegetables and roots
- **Avoidance of infection or contamination**  
When we are adding our flavours we don't want to add unwanted bacteria, yeast or contaminants such as chemicals.
- **Safety**  
Flavours should be safe for human consumption.
- **Predictability**  
We want to get a predictable outcome. Goldilocks syndrome – not too much, not too little, just right!
- **Repeatability**  
Having achieved the desired flavoured beer, we want to be able to produce it again.
- **Craft Methods**  
Where possible, use natural ingredients processed at home as we usually do with our beers.

Many commercial brewers achieve the first five objectives by the use of natural or artificial flavours and fragrances. For them, these objectives are key.

Two brewers I have spoken to use bought in flavour extracts. One for a ginger flavoured beer and one to give a hint of apricot. I have also sampled a damson porter which was so overwhelmingly damson flavoured that it was almost certainly artificial.

There are examples where it may not be viable to extract flavours yourself. Rose springs to mind because of the vast amount of petals required and the complex processes required to retain the delicate aromas and flavours.

What follows are my experiments in flavouring beers.

### Wood

Being inspired by David Shiptons talk on wood aged beers I decided to try to produce a wood "aged" export stout. The stout was brewed in the normal fashion with the objective of achieving the wood aged effect during conditioning.

I used Weber Pecan Wood chips having double checked with the manufacturer that the wood was pure with no additives. No contaminants/pollutants. This was selected because I had it in stock and it has been used before, particularly in the US.

The chips were soaked in water and boiled in a microwave to kill any bacteria/yeast. They were dried for ten minutes under a hot grill which also charred them very slightly. These went instantly into a sanitised jar and were covered with rum. The rum functions as a method of flavour extraction, sanitiser/preservative and a flavour in its own right.

After a month the rum liquor was tasted. It had achieved a desirable flavour profile. A sample of the beer was then taken from storage and small quantities of rum added using a pipette in the same proportion as pitching the whole quantity into the beer. The flavour was deemed to be good so the whole jar was pitched and the beer bottled.

Throughout the process, volumes, weight and times were recorded thus giving a repeatable process.

## **Lemongrass & Ginger**

I decided to make extracts of both ingredients. I didn't want to put them in the boil as I felt their flavours were too delicate. Similarly, I didn't want them in the fermentation due to the risk of contamination.

In this case I took a known quantity of each of the fresh ingredients, peeled and chopped them and boiled each separately in sugar syrup of known strength for a set period of time. This has the effect of killing bacteria and yeast and as a preservative. The results went into sanitised jars with some vodka. The alcohol acts as both a preservative and helps extract any flavours and fragrances that are not water soluble.

The jars were stored to allow further flavour extraction.

Extracts were added to a bottle of bitter using pipettes until a desired flavour profile was hit. This was then scaled up for the brew length and added after primary fermentation to ensure the sugar was fermented out.

## **Fruits**

I intend to produce a Belgian style beer with autumn woodland fruits. I have not yet tried this technique but intend to extract flavour from the fruits in the same way a wine maker would then add that to the primary.

The fruits will be frozen to help break down the cell structure. Defrosting will take place in sealed sanitised brewing container. Then a known amount of boiling water will be added along with a Camden tablet. When cool, pectolase will be added to further help juice extraction and help avoid pectin haze in the beer. This process will take place 24 hours in advance of the brew.

The brew length itself will be shorter than usual to allow for the volume of juice to be added.

Before adding the juice to the fermenter I shall carry out a rough taste check by adding some of the juice to an existing Belgian beer in the same ratio as the brew.

This will be the least predictable of the beers I have yet brewed but provided accurate records are kept I can learn from the experience and adapt if required.

## **Dandelion & Burdock**

I wanted to try and produce a refreshing summer beer and settled on a mild flavoured with Dandelion and Burdock.

I researched old recipes for dandelion and burdock and the three main ingredients were dandelion root, burdock root and star anise.

I chose to use dried roots as I was not 100% sure what burdock looked like and where to find it. Also it meant that I had ingredients in stock should I wish to repeat the recipe.

Dried, chopped roots were obtained online and the whole star anise was already in stock. I also decided to add liquorice root because I like the flavour, it adds sweetness and improves head retention.

These are robust ingredients which would benefit from being added to the boil. To estimate the quantities required I took a known weight of each ingredient and boiled it in a pressure cooker with a known amount of water for 15 minutes. That produced four separate flavour extracts.

I then took a pint of water and gradually added small quantities of extracts to get what I thought was a good dandelion and burdock flavour. This took several attempts. Once I was happy with the water test, I opened a bottle of stout, watered it down slightly and added the same proportions of extract. This gave me a good idea what the end result would be like.

I have assumed at this point that the extracted flavour from 15 minutes in a pressure cooker would be similar to that from a 60 minute boil.

Knowing how much extract I used I then scaled it up to the brew length and worked out the quantity of dry ingredients required to generate that flavour. The roots all went in at the start of the boil but I decided to put the star anise in with 15 minutes to go on the basis that it is a very fragrant ingredient and I didn't want to drive off too much of that fragrance.

The resultant brew has been brought along for sampling. You will notice that it has the classic dandelion and burdock nose. Initially it has a slightly bitter hit which is from the dandelion and burdock roots rather than hops. The IBU from hops alone is around 22 which is normal for a mild.

You may also note that there are no chocolate/coffee flavours. I decided that despite being common in milds, chocolate malt would clash with the flavour from the roots.