



## Testing Services Guide

All Analytical Services Offered are Approved ASBC Methods

### Wart, Brite, & Beer Analytical Methods

#### **IBU**

The IBU (bitterness) testing and analytical services offered are performed using American Society of Beer Chemists (ASBC) adapted methods. Our analytical methods are standardized for beer, brite-tank, and wart samples. We perform this test by carrying out an organic extraction of all bitterness compounds and analyze using an Ultraviolet-Visible (Uv-Vis) Spectrometer. All experiments are performed using any desired commercially available beer as an external control/standard. In addition, all experiments are repeated in triplicate with the average IBU value reported with standard deviation. The starting cost per sample for analysis of IBUs in beer is \$15 per sample.

### **Bacterial & Wild Yeast Detection & Identification**

Bacteria contamination can be a major problem, and a fast analysis of your sample can catch it before you spend more time on your batch. We have developed a genetic analysis that allows for sensitive and accurate detection, and can be performed at early stages of bacterial growth. Analysis for bacterial contaminants is made using Polymerase Chain Reaction (PCR) methods and can be performed on wart and bright tank samples as well as the final product. If bacterial contamination is detected, additional testing will be carried out to identify the type bacterial species.

Wild yeast contamination can affect the taste and smell of your beer, and is a common problem in any brewing process. We offer a screening for the presence of wild-yeast, which is carried out using specialized media established from the Siebel Institute. Wild yeast contamination can take up to 3 days to identify colony growth. The cost of analysis for detection and identification of wild yeast and bacterial contamination is \$15 per sample.

## **Total n+ iso-Alpha & Beta Acid Profile**

If you are interested in the total amount of all alpha and beta acids in your beer, wort, or brite tank samples we provide a highly sensitive method for analysis based on ASBC methods with internal/external controls. With our sensitive analytical methods, all desired compounds present are identified along with exact amounts present. This method offers the advantage of also determining your exact IBU value using only the concentrations of all alpha acids present. Our unique method offers higher accuracy and precision over the most common method offered by competitors. Dynamic Biosciences uses high-performance liquid chromatography (HPLC) to quantitatively determine all isomerized and non-isomerized alpha and beta acids present. All acid forms present are quantitatively determined and calibrated against both internal and external standards. The total cost for quantitative analysis by HPLC is \$30 per sample.

The use of such sensitive and accurate methods requires approximately one beer can or equal volume of sample for complete testing per batch/lot. All analytical testing methods offered by Dynamic Biosciences are able to test beer, wort, and brite-tank samples.

## **VDK (vicinal diketone, aka buttery flavor)**

VDKs confer the butterscotch smell and flavor that many brewers try to avoid. If you think your brewing process may be producing these, and are interested in analysis for batch to batch variability, we offer modified ASBC methods of analysis to provide you with the exact amount of VDKs in your beer. Currently we perform the analysis for 2,3 butanedione and 2,3-pentanedione (compounds often conferring buttery and sour tastes) on samples using an accepted ASBC wet-lab method we have modified. We perform this analysis using calibrated external and internal standards. Currently samples for VDK analysis cost \$25 per sample.

## **Polyphenols**

Analysis of total polyphenols present currently includes a wet-lab preparation followed by measurement using UV-Vis. Results are calculated from the signal at a specific wavelength and reported in mg/L. The option for quantitation is available for any specific polyphenol or group of polyphenols requested ahead of time. The cost for the analytical wet-lab method is \$20 per sample.

## **Color, Clarity, pH**

We offer this analytical package grouped together to demonstrate more of the basic characteristics of your beer recipe. In addition, basic monitoring for color, clarity, and pH is a start to maintaining your lot-to-lot consistency. Color and clarity are determined from our adapted ASBC procedure using UV-Vis spectroscopy. The wort, brite, or beer sample pH is determined from our standardized and calibrated pH probe. The cost for this analytical package is \$15 per sample.

## **Alcohol By Volume (ABV)**

Make certain your current values reported to the TTB are accurate and precise using alcohol by volume analytical methods. We offer a variety of techniques available depending on the accuracy/precision needed. Our lowest cost method is a wet-lab based procedure involving our proprietary fractional micro distillation. The wet-lab distillation uses our high-resolution fractional columns to distil your total ethanol content from the sample. The cost for analysis starts at \$65 per sample.

## **Custom Analytical Methods**

We are currently developing a number of standardized ASBC methods of analysis including nutritional label information as required by the FDA, genomic analysis of yeast, identification of additional anaerobic/aerobic bacteria, etc. If you have any interest in identification of compounds not currently listed on our website, please feel free to contact us to begin setting up a process specifically for your needs and requirements with priority.

## **Analytical Hops Services**

### **Moisture Content**

To better dry, package, and brew with your hops, knowing the moisture content can provide an empirical value for consistency between batches. The total moisture content present in hops is determined using modified ASBC methods and reported as a total weight percent. Our modified moisture analytical method is carried out to ensure the removal of water present with no removal of any other component present. Many of the analytical methods offered by competitive labs removes water and semi-volatile compounds present leading to inaccurate results. Dynamic Biosciences has developed a unique method where the removal of only water is ensured. Approximately 30 grams of hops will be needed for complete analysis. The starting cost per sample with any replicate experiments included is \$15 per sample/batch.

### **Total Alpha & Beta Acid Profile**

Knowing the alpha and beta acid content in your hops is critical for different stages of the brewing process. We use ASBC methods for extraction of the acids from your hops combined with known internal/external control standards bought from ASBC. The extraction process can be performed on bushel hops, cones, pellets, etc.

Like our beer HPLC method, we will identify all compounds of interest present as well as determine accurate and precise amounts of each compound as well. The external controls/standards used are the actual molecules of interest themselves. We use a unique set of internal standards including molecular isotopes for the highest accuracy and precision available. Currently all quantitative HPLC methods start at \$40 per sample.

### **Essential Trace Oil Analysis**

If you are interested in knowing any compound that confers a specific taste in your product, we recommend a trace analysis to find out how much is there. With this in-depth analysis, we can provide you with quantifiable amounts of all compounds present, and you can tell if you are getting differences in your product over time or between different drying procedures. Essential trace oil analysis involves extraction of all compounds present then purification and analysis using GCMS. As stated for the VDK analysis, the lowest cost of testing per sample we can currently offer is \$50 per sample.