



Hop testing at the Applied Genomics Center at KPU

The Applied Genomics Centre at Kwantlen Polytechnic University's Surrey campus is an applied research lab focused on bringing genomic and metabolomic tools to the agricultural sectors, particularly in British Columbia. Founded in 2019, the AGC is a fully equipped research laboratory with state-of-the-art molecular biology and analytical chemistry infrastructure.

<https://www.kpu.ca/agc>

One of the keystone applied research projects is a hop variety development program that is working with BC based hop producers and brewers to develop value added hop varieties. We are pleased to offer the following analytical services to local hop producers and brewers. All methods used are in accordance to standards published by the American Society of Brewing Chemists (ASBC) and/or the European Brewery Convention Analytica (EBC).

Services

Service #	Description	Price/sample
1	Total α -Acids (cohumulone, n-adhumulone) and β -Acids (colupulone, n+adlupulone) and HSI via HPLC. ¹	\$120
2	Hop essential oils - quantitative analysis of: myrcene, β -caryophyllene, β -farnesene, α -humulene ³	\$90
3	Hop essential oils- Relative abundance of all volatile compounds using MS spectra-based identification ⁴	Inquire
4	Steam distillation for total oils (pellets only)	\$110
5	Moisture content of hops and hop products ⁵	\$10
T	Terroir Package (includes services 1 and 2)	\$190
B	Brewing Package (includes services 1 and 4 - for pellets only)	\$210

A 15% discount for will be applied for >5 samples submitted at the same time.

Sample Logistics

100g of hop pellets or dried hop flowers should be prepared in an air proof container. Prefer nitrogen flushed or vacuum-packed bags. Please see the suggested [Sample Preparation Guide](#). Samples will be stored for a period of 4 weeks after testing.

Shipping Instructions

Ship samples to:

Lyndsey Baillie
Kwantlen Polytechnic University
Room: Spruce 214
12666 72 Ave
Surrey, BC
V3W 2M8

Drop Off Instructions

Contact lab staff regarding drop off time and contact info

Email: agc@kpu.ca

Phone: 604-599-2282

Drop off in parking lot at rear of KPU Surrey campus (entrance off 128th St.) Parking lot S1/S2, near entrance to Spruce building ([MAP](#))

Payment Instructions

Invoiced upon release of data and then net 30 days until payment

Invoices will be issued by KPU and GST levied on services

Sample Preparation Guide

This guide outlines the best practices for hops sampling as described in:

Sampling of Hops and Hop Products [2004]. European Brewery Convention Analytica (EBCAnalytica), Brussels, Belgium. Method 7.1

Overview

1.1 The heterogeneity of whole hops is usually substantially greater than that of the processed products, which are always homogenized in a special processing stage.

1.2 In the case of whole hops, attempts are made in the preparation stations to balance out the differences in quality, caused by various growing conditions, by mixing different batches. Nevertheless, quite substantial deviations are often found between and within the individual pockets in a consignment.

1.3 As a rule, therefore, the analysis of a single sample does not suffice to allow the quality of a consignment of hops to be evaluated. The probability that the result of this one analysis will correspond to the actual average value, for the entire consignment, is very slight and hence multiple samples are taken as described below

Procedure

2.1 Unpacked hops

2.2.1 Sampling from heap. Take equal portions from 5 to 10 different parts of the heap. Obtain approximately a 200 g portion by taking samples from the surface as well as from different depths

2.2 Packed hops

2.2.2 Take samples, each of 200 g, from the bales or ballots, sampled at random. Note that only 10% of the samples should come directly from the surface layer.

2.2.3 Number of samples to be taken: the square root of the number of bales or ballots, rounded to the nearest whole number.

2.2.4 There is no place in a bale or ballot where the collection of a sample, which is representative of the entire package, is possible. Accepting the average and maximum values of the heterogeneity index Sp , a normal distribution of the results from the individual packages in a consignment, a statistical confidence of 95%, and a relatively favourable tolerance limit d , it can be calculated that the minimum number of samples required is substantially greater than the previously recommended square root of the number of units. For this reason, the most effective procedure is to take small samples (about 10 to 15g each) from several different points on each package (using an automatic sampling machine, if required).

2.3 Hop powder and pellets

2.3.1 Large packaging units

2.3.1.1 Take samples, each of 100 g, from the packaging units, sampled at random. Note that only 10% of the samples should come directly from the surface layer.

2.3.1.2 Number of samples to be taken: 0.2% of the number of packaging units, rounded to the nearest whole number, at least 3 samples

2.3.2 Small packaging units

2.3.2.1 Sample whole packaging units at random.

2.3.2.2 Number of samples to be taken: 0.2% of the number of packaging units, rounded to the nearest whole number, at least 3 samples.

Packaging and Dispatch

3.1 Dry samples

3.1.1 Samples must be placed immediately in air-tight, antistatic containers (metal cans, glass jars or suitable plastic vessels) protecting from light, which, if possible, should be completely filled. It is advisable to evacuate the containers, and/or flush them with inert gas (carbon dioxide/nitrogen). As an alternative a special laminate foil which is heat sealed after evacuation can be used.

3.1.2 During transit, avoid high temperatures.

3.1.3 Store samples in a refrigerator. Allow the contents of the container to reach room temperature before opening for examination or analysis.

3.1.4 Label the container with full information concerning the sample

Disclaimer

Analytical results are based on the samples as submitted. Following the sample preparation guide is highly recommended in order to obtain reliable data from a sampling perspective. All samples are subjected to in house quality assurance with strict adherence to SOPs and using calibrated instruments.

Analytical Method References

1. ASBC Methods of Analysis, Hops-14, α -Acids and β -Acids in Hops and Hop extracts by HPLC [Release date 1959, revised 1976 and 2008]. American society of brewing Chemists, St. Paul, Mn, U.S.A. doi: 10.1094/ASBCMOA-Hops-14. *Methyl tert-butyl ether is substituted for Diethyl ether
2. ASBC Methods of Analysis, Hops-6, α - and β -Acids in Hops and Hop Pellets by spectrophotometry and conductometric titration [Release date 1959, revised 1976 and 2008]. American society of brewing Chemists, St. Paul, Mn, U.S.A. doi: 10.1094/ASBCMOA-Hops-6
3. Hop Essential Oils by Capillary Gas Chromatography Flame Ionization Detection [2006]. European Brewery Convention Analytica (EBC-Analytica), Brussels, Belgium. Method 7.12 *Mass spectroscopy is used instead of flame ionization as detector
4. Giese MW, Lewis MA, Giese L, Smith KM. Development and Validation of a Reliable and Robust Method for the Analysis of Cannabinoids and Terpenes in Cannabis. J AOAC Int. 2015 NovDec;98(6):1503-22. doi: 10.5740/jaoacint.15-116. PMID: 26651562.
5. Moisture Content of Hops and Hop Products [1997]. European Brewery Convention Analytica (EBC-Analytica), Brussels, Belgium. Method