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HOP SCIENCE

KNOWLEDGE FOR YOUR SUCCESS

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THE BENEFITS OF CO₂ EXTRACTION

The CO₂ extract of hops is a well established hop product, where extraction takes place under supercritical conditions. It contains all hop compounds with brewing value, is easy to use and to store and the shelf life is exceptional. These Japanese Researchers looked into using CO₂ extraction for other botanicals that can be used in brewing. Using gentle conditions (temperatures of 40°C), they performed supercritical CO₂ extraction of lemon peel and coriander seeds. Changing the pressure of the CO₂ resulted in different yields in hydrocarbons and oxygenated sesquiterpenes. These extracts were used in the conditioning phase of the brewing process and yielded better flavour results than using the corresponding raw material in the whirlpool. This demonstrates that CO₂ extraction is a powerful technology to make flavour compounds from different kinds of aromatic raw materials more accessible.¹

POURABLE HOP EXTRACTS

Speaking of extracts... This article from our colleagues at JIH provides a very good overview of the hop extract product range. CO₂ extraction offers a wide range of conditions to produce products with slightly different properties. What can make CO₂ hop extract difficult to use, however, is its consistency, as conventional CO₂ extract has to be warmed up before dosing to make it flowable. Throughout the past few years, we have developed flowable hop extracts that are easy to dose. They can be used on the hot side or cold side of the brewing process, for bittering or aromatic purposes. In this context, visit our tastings at Brau where we will be showcasing these products.²

NO OXYGEN WITH HIGH TEMPERATURES PLEASE!

We have to breathe and to sweat to live but beer doesn't and shouldn't. Intensive research has been carried out to identify the staling mechanisms in lager beers. However, the impact of dissolved oxygen on dry-hopped beers is poorly investigated. These US researchers evaluated the impact of dissolved oxygen

on the sensory and hop volatile profiles of dry-hopped beer during storage. Commercially-brewed dry-hopped beer was dosed with oxygen in a controlled fashion to create beers with a range of dissolved oxygen concentrations from approximately 40 to 250 mg/L and then stored under chilled or accelerated storage conditions. Sensory results identified storage temperature as having the greatest effect on aroma during storage. Dissolved oxygen concentration was observed to have a lesser, but significant, impact at both high and low storage temperatures after only two weeks of aging. Higher temperature and dissolved oxygen concentrations resulted in decreased tropical, citrus, and hoppy characteristics and the expression of malty, dried fruit, and cardboard aromas. However, by chemical analysis it was observed that hop-derived monoterpenes were not significantly affected by treatment temperature or dissolved oxygen, suggesting that the stale character expression comes from alternate sources such as lipid oxidation or Strecker aldehyde formation.³

REFERENCES:

1. Inui, T et al: Development of Supercritical CO₂ Extract for flavoured beer, *Brewing Science* 2019, Sept/Oct Vol 72, 147-156
2. Byelashov, A. et al: Pourable Hop Extracts: Innovations in Reducing Beer Loss and Maximizing Flavor, *MBAA TQ* vol. 56, no. 4 · 2019 · pp. 130-132
3. Barnette, B., et al: Evaluating the Impact of Dissolved Oxygen and Aging on Dry-Hopped Aroma Stability in Beer, *Journal of the American Society of Brewing Chemists*, 77:3, 179-187, DOI: 10.1080/03610470.2019.1603002

EVENTS



Hop Flavourist Course – Level 1, German/English, Nuremberg 25/26th of November:

A FEW PLACES LEFT!

The Hop Flavourist Course aims to train your sensory memory and language for hops. Get to know the most important hop varieties from an aroma point of view and learn our aroma language

of hops – Hopsessed. You will gain in-depth knowledge about the relevant varieties and learn to train and to use your sensory skills to describe hop varieties and hop forward beers in great detail. This will help you to create exciting hop flavours in the brewing process yourself. <https://www.barthhaas.com/academy/aktuelle-termine>

Brau Beviale – Guided Tasting: Join us in our Guided Tasting this year at Brau Beviale. We will show you how to create maximum hop flavour with minimum beer losses. The tastings fill up quickly so make sure you reserve a spot for you and your colleagues: <https://www.barthhaas.com/academy/aktuelle-termine>