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# HOP SCIENCE

KNOWLEDGE FOR YOUR SUCCESS

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36<sup>TH</sup> CONGRESS



## This Newsletter covers newest research from the recent EBC Congress

### MORE ABOUT BITTERNESS IN DRY HOPPED BEERS

This German research team developed a method to quantify nine hop flavonoids in a single HPLC-MS/MS run. By doing so they discovered that in dry hopped beer trials, the flavour threshold concentrations for the bitter components co-multifidol glucoside, quercetin glucoside, and kaempferol glucoside (1.8, 0.9, and 0.5 mg/L, respectively) were exceeded, meaning that these compounds may contribute to the bitterness of dry hopped beers.<sup>1</sup>

### A MATURED HOP EXTRACT AS MEDICINAL ELIXIR?

To conserve alpha and oil in hop pellets, we do everything we can – but maybe this is not always necessary, especially in regard to medicinal value! Studies have demonstrated that the consumption of iso-alpha acids helps to reduce obesity, and now these Japanese researchers have shown the same effect for oxidised bitter acids, e.g. humulinones, hulupones, and tricycloxyisohumulones. In this study, hop pellets were stored at 60°C for two days and subsequently extracted for medicinal trials. They were able to show that the addition of 0.2% of this extract to a high fat diet induced fat burning leading to body fat reduction.<sup>2</sup>

### WHAT IS THE ROLE OF YEAST FOR DRY HOP AROMAS

This is a complex question but worth being explored. In this study, these German researchers tested two different yeast strains (German ale yeast vs US ale yeast) using an identical hopping regime for late and dry hopping (during primary fermentation) with varieties US Cascade and German Hallertau Mittelfrüh. Comprehensive sensory evaluation and aroma analytics

showed that the sum of terpenols was independent from the sensory intensity for floral and citrus. The sum of esters correlated well with the intensity of sweet fruit flavours, and higher amounts of 4MMP correlated well with red berry flavor intensity. The final analysis found that the yeast strain can have a significant influence on dry hop aroma.<sup>3</sup>

### COMPLEXITY OF BEER BITTERNESS

This UK research team developed a sensory bitterness lexicon to describe many types of differently hopped beers. With sensory PCA analysis, they concluded that beers low in hop bitter acids and polyphenols were described as having artificial, rounded, and diminishing bitterness. Conventionally hopped beers high in hop acids, e.g.  $\alpha$ -acids, were rated as having a sharp and instant bitterness. While beers bittered with a blend of tetra and pre-isomerised iso- $\alpha$ -acid products were shown to have a smooth and diminishing bitterness. The bitterness of dry-hopped beers high in hop bitter acids and polyphenols was perceived as harsh and progressive.<sup>4</sup>

#### REFERENCES:

1. Schmidt, Ch: LC-MS/MS analysis of hop flavonoids in dry-hopped beers, P008, EBC Congress, Slovenia 2017
2. Yamazaki, T., et al: Development of novel hop-derived bitter acid oxides with body fat-reducing effect, Lecture 5, EBC Congress, Slovenia 2017
3. Matsche, B.: Influence of yeast strain on dry hop aroma and flavor. Lecture 29, EBC Congress, Slovenia 2017
4. Oladokun, O. et al: New insights into bitterness perception of beer. Lecture 34, EBC Congress, Slovenia 2017

### EVENTS



Make sure to attend the **2nd International Brewers Symposium on Hops**, July 26th to 28th, Corvallis, OR, USA. <http://hopsflavor2017.com/>

Visit us at **Drinktec!** September 11th–15th, Munich, Germany <http://www.drinktec.com/>