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# HOP SCIENCE

KNOWLEDGE FOR YOUR SUCCESS

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**BARTH-HAAS GROUP**  
FOR YOUR SUCCESS

## BrewingScience

### BRING YOUR HPLC INTO THE HOP FIELD ...

..because there is a method for fresh hops to analyse alpha acids. This method is applicable for fresh harvested cones, undried, meant for wet hopping. It addresses common problems with HPLC method development and explains general solutions. This makes it an applicable and robust method, using liquid-liquid extraction as sample preparation for also less-experienced analysts.<sup>1</sup>

### ... IN THE SPOTLIGHT: PROFESSOR LUDWIG NARZISS

Every word has already be used to describe Prof. Ludwig Narziss, so I just say: the living legend of Weihenstephan and such a lovely man always full of energy to improve brewing technology no matter when or where. Retirement rather made him even more busy, as he still does a lot of teaching and consulting. This paper by John Palmer, will give you a wonderful insight in his life.<sup>2</sup>

### SPENT HOPS FOR HAZE STABILITY

Well it is not totally surprising that hops might be the solution to another challenge many brewers have, a stable haze! These US researchers looked into the usage of spent hops to increase haze stability. Not only did the spent hop extract show potential to scavenge free radicals; it was also found that haze stability in Pale Ale can be increased by the addition of spent hop extract (0.3-0.5% v/v). Although total protein content in spent hop extract is extremely low to participate in haze stability, Procyanidin B2 and Epicatechin found in spent hops are haze active and antioxidants.<sup>3</sup>

### COME ON, LET'S DIP HOP!

These Japanese researchers introduced this hopping technology already 2013 at the EBC. Dip hopping means the addition of hop after wort cooling before start of fermentation. With this hopping technology they found

the following results: Hop enzymes do not contribute to main fermentation, myrcene levels in finished beers are very low, which was found favourable in this case. Also, the production of 2M3MB an onion type of flavour (derived from iso-alpha acid) is suppressed due to a lower H2S content in the beer.<sup>4</sup>

### THE MICROBIOLOGICAL SAFETY OF DRY HOPPING

This is an important question and on the mind of many brewers. However studies in this context are scarce. These Japanese Researchers have looked into this. Their study aimed to assess the microbial contamination risks associated with dry-hopped beer by investigating the contaminants in raw hop materials and the behaviour of *Bacillus* spp. spores in wort, as well as thermal inactivation rates by pasteurization. And yes, dry-hopping brewers should take into consideration the microbial risk of contamination of the brewing process, cultured yeast, and final beer products by microbes in the hops just because so far we don't know enough.<sup>5</sup>

#### REFERENCES:

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2. Palmer, J: Interview with Ludwig Narziss. MBAA TQ vol. 55, no. 1 - 2018 - pp. 23-26, <https://www.mbaa.com/publications/tq/tqPastIssues/2018/Pages/TQ-55-1-0403-01.aspx>
3. Ravindranath, N: Effect of addition of spent hop extract on haze stability, polyphenol content, and antioxidant activity of Pale Ale beer, poster presentation at the Brewing Summit 2018, M044, <https://www.asbcnet.org/events/archives/2018meeting/proceedings/Pages/default.aspx>
4. Tsuchiy, Y: Effect of hops addition to the fermentation tank to beer fermentation, poster presentation at the Brewing Summit 2018, A 127, <https://www.asbcnet.org/events/archives/2018meeting/proceedings/Pages/default.aspx>
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## EVENTS



### Craft Brewers Conference 2019 in Denver, CO

Come have a beer with us at **Booth #12093**, and celebrate the commercial launch of the hop variety, Sabro®, the newly released Provoak pellet that delivers barrel-aged flavor, and the unveiling of Haas' wholly new, first-to-market 100% natural, varietal-specific hop product.