

THE EFFECT OF ETHANOL CONTENT IN BEER ON HOP COMPONENTS AFTER DRY HOPPING

| TECHNICAL SUPPORT |

The technique of dry hopping is used to produce many different beer styles with various alcohol contents. Information about the alcohol-dependent behaviour of hop components after dosing is crucial to control the resulting flavour and ensure consistent beer quality.

Our systematic pilot-scale [study](#) was therefore performed using standardised procedures by only varying the alcohol content in the beer samples in four steps from 0.5 % to 10.5 % alcohol by volume (ABV). After bottling, the beers were analysed for volatile and non-volatile hop components. Each single trial was performed in triplicate, averaged results are demonstrated below.

An excerpt of the [full study](#) is given in Table 1, showing variations of the bitter substances after dry hopping:

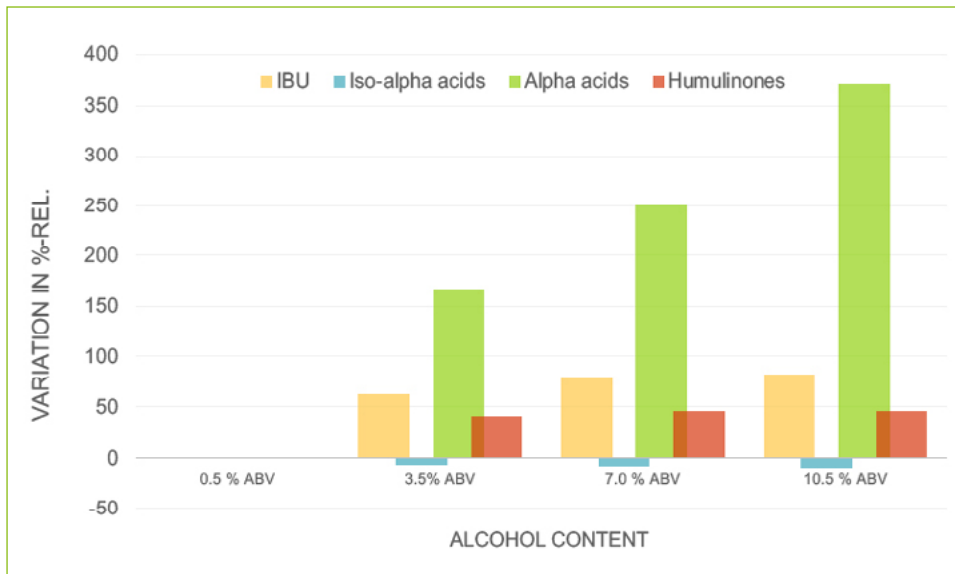


Table 1: Changes in %-relative based on the initial concentration of the dry hopped NAB (0.5% ABV)

It is obvious, that especially the non-polar alpha acids increase drastically with more ethanol added to the beer. As a result of more alpha acids dissolved, the analytical IBUs raise up to roughly 80% of their initial value. After dry hopping, the expected decrease in iso-alpha acids was observed, not necessarily linked to the amount of ethanol added. The polar humulinones introduced by dry hopping remain on a constant level and are therefore unaffected of the beers' ethanol concentration.

Please have a look on [our study](#), demonstrating more results of the ethanol-dependent solubility of hop aroma substances in beer and further attributes, such as foam stability, pH and nitrates.

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S.S. Steiner, Inc.

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