**Article focus: A brainstorming exercise**

In one or two sentences, answer each of the following questions. Please be sure that your answers are appropriate for a general audience.

1) Why is your field important?

*A sensory imbalance often observed in alcohol-free beers is the over-perception of wort flavours [1]. In general it is recognized that these off-flavours are caused by so-called Strecker aldehydes, which are formed by a heat-induced reaction between a reducing sugar and an amino acid [2]. As a result of the complexity of involved reaction pathways, it is difficult to prevent their occurrence [3, 4]. Therefore, new process designs are required to be able to engineer the desired flavour profile and fine-tune the aroma concentration to the respective product.*

2) What has already been studied in your field?

*Some studies have been done on reducing Strecker aldehydes by a restricted or continuous fermentation (biologic removal) or by addition of certain beer constituents (amino acids etc). Drawbacks of these approaches are that the target compounds are not sufficiently reduced and often ethanol is a side product.*

3) What has not been studied? Why is this gap significant?

*Currently, there are no downstream unit operations available to selectively remove (wort) off-flavours without impacting the overall taste and nutritional quality of the product. The application requires a unit operation, which combines a high selectivity at mild operation conditions with low capital investment and operational cost.*

4) How does your research relate to this gap, and what is the goal of the current article? *Be sure to write a sentence that begins “The goal of this article is to […],” followed by a strong and specific verb (“propose,” “theorize,” “develop,” “investigate,” “discover”).*

*The goal of this article is to investigate a selective adsorption step by screening suitable adsorbents and identify a separation media, which is able to facilitate the specific removal under mild conditions.*

5) What have you done, or what are you doing, to achieve this goal?

*Batch uptake experiments with 16 adsorbents were performed in a hopped wort base to screen for the most promising separation medium. The selection for the further process development was made based on a Pugh matrix. Subsequently, multicomponent isotherm data was determined by a mixture-amount design and a suitable model to describe the thermodynamic data was applied. A factorial experimental design was then used to study the impact of the product constitutes on the model parameters to identify potential bottlenecks and propose process concepts circumventing these.*

6) What is the working title of your article?

*“Investigation of multicomponent adsorption behavior of aldehydes in malt-based beverages for selective removal of wort-flavour by sequential statistical experimental design”*

References:

1. Brányik, T., et al., *A review of methods of low alcohol and alcohol-free beer production.* Journal of Food Engineering, 2012. **108**(4): p. 493-506.

2. Schonberg, A. and R. Moubacher, *The Strecker Degradation of -Amino Acids.* Chemical Reviews, 1952. **50**(2): p. 261-277.

3. Saison, D., et al., *Contribution of staling compounds to the aged flavour of lager beer by studying their flavour thresholds.* Food Chemistry, 2009. **114**(4): p. 1206-1215.

4. Baert, J.J., et al., *On the origin of free and bound staling aldehydes in beer.* J Agric Food Chem, 2012. **60**(46): p. 11449-72.