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VENDOR SEMINAR:

In Food We Trust – The Passion of Food Analysis

Advanced beer aroma analysis

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Beer is a complex alcoholic beverage, containing several hundred volatiles and flavor active compounds. The concentrations cover a huge range from picogram to milligram per liter which makes the analysis really challenging. The main constituents of beer are water, ethanol, carbohydrates, proteins and carbon dioxide, but in terms of sensory perception the minor constituents are the relevant ones. They derive from the used raw materials or are formed during the brewing process or storage of beer. The impact of the raw materials (barley, hop) and the processing steps (mashing, fermentation, hop isomerization) and their impact on the final product quality will be discussed in this presentation. Further on analytical strategies from sample preparation procedure to targeted and untargeted analysis of volatile and aroma active compounds using different one and two dimensional gas chromatography based methods (GC-MS, GC-MSMS, GCxGC, MDGC) will be shown. Finally relevant off odor compounds will be discussed in detail in terms of source, formation and analytical determination.

References:
1) C.W. Bamforth, Brewing and brewing research: Past, present and future, Journal of the Science of Food and Agriculture, 80, 9, 2000, 1371-1378
2) L.C.Verhagen, Beer Flavor, Reference Module in Chemistry, Molecular Sciences and Chemical Engineering, Comprehensive Natural Products II, 3, 2010, 967-997
3) M.Meilgaard, Effects on flavor of innovations in brewery equipment and processing: A review, Journal of the Institute of Brewing, 107, 5, 2001, 271-286

Characterization of the Oxygen Heterocyclic Compounds (Coumarins, Psoralens and Polymtehoxylated Flavones) in Food Products

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Oxygen heterocyclic compounds were identified by using an HPLC-PDA/MS/MS system equipped with an APCI source in positive ionization mode, in a single run in less than 10 minutes. The MS/MS transitions obtained at a defined collision energy have been used to build a library. The use of an MS/MS system allowed to achieve limit of detection and quantification (LOD and LOQ) in the ppb range, thus making the method very useful for food industries. Furthermore, the goal of the present research was to propose an easier to use method for the characterization of the oxygen heterocyclic compunds in food, by using a simpler HPLC-PDA instrument and the internal standard/response factor approach. Psoralens are a class of photoactive compounds found in

several plant species and maybe responsible for the observed association between consumption of *citrus* products and the risk of phototoxicity.

How Safe is Safe? Analytical Tools for Tracing Contaminants in Food

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Contaminants like pesticide residues, mycotoxins and heavy metals may occur in our food from a variety of different sources. These are in the focus of European food and safety authorities, and are controlled by national and international regulations. Analysis of relevant chemical contaminants is therefore an essential part of the food safety policy of the European Commission to ensure the highest level of protection of human health. Modern hyphenated analytical techniques such as chromatography (LC-MS), spectroscopy and mass spectrometry can determine these contaminants in complex food matrices with high sensitivity at ultra-low concentration levels in order to keep the food and beverage chain safe.