

ALLIES IN ANTWERP

EBC Congress and Brewers of Europe Forum 2019

For the first time, EBC Congress and the Brewers of Europe Forum combined forces from June 3rd to 6th. More than 1,000 experts from all sectors of the brewing industry met in Antwerp, Belgium, for the combined event. Visitors from 59 countries confirmed the international character of this meeting of the minds. The EBC Congress reaffirmed its reputation as one of the most important brewing technology events in the world and offered participants a large number of presentations and posters on topics in the fields of malting, brewing and yeast technology. The Brewers of Europe Forum focused on non-technological aspects of the brewing industry, offering a wide range of opportunities for knowledge exchange and transfer of ideas.

Zoran Gojkovic, Carlsberg, opened the 37th EBC Congress with a plenary session on "Sustainability and Climate Change" after a warm welcome to convention participants by EBC President Tiago Brandão. He focused on the many successes so far, but also on some of the future challenges of barley breeding. The focus at present goes beyond the

influence of barley on beer quality and taste, extending to developing climate-tolerant varieties.

Florian Schüll, HVG Hop Processing Cooperative, highlighted the effects of climate change on the cultivation of hops by citing studies on the yield of hop varieties in the Hallertau region. Based on data from several harvest seasons,

Schüll presented methods to estimate annual harvest quantities of individual varieties. This led to the calculation of a climate factor for each variety. In general, Schüll noted that in terms of α -acid content, aroma hop varieties are more sensitive to hotter and drier conditions than bitter varieties. This knowledge of climatic sensitivity among different hop varieties



allows brewers to adapt their recipes or even to consider replacing some of the more climate-sensitive varieties.

Afterwards, Timothy Hobley, Technical University Denmark, demonstrated ways to further process by-products such as spent grain and trub. In a dual filter drum (pore sizes 100 microns and 300 microns), the solid and liquid components of these by-products are separated from one other. Both filtrate and solids can be used as an ingredient in baked goods, Hobley said. The process is also easily scalable to larger batches.

Andreas Gahr, Hopfenveredelung St. Johann, compared cultivation methods of the hop variety "Saaz" in two different growing regions – the Czech Republic and Germany/Elbe-Saale. He placed particular emphasis on climatic conditions in both growing regions in the years 2016 to 2018. Studies showed that climatic conditions in the months of May to September have a major influence on the content of α - and β -acids as well as aromatics in the Saaz variety, whereas the geographic influence of the growing region on these components is limited.

The future of the European brewing sector

Following the successful first edition of the Brewers of Europe Forum 2018 in Brussels, the organizers decided this year to partner up with the EBC Congress in order to expand the networking and communication platform for brewery scientists and technicians, brewery representatives and stakeholders as well as suppliers. In this manner, key stakeholders will be in a better position to serve and jointly address present and future challenges facing the brewing industry.

Jean-Francis van Boxmeer, CEO Heineken, addressed just these issues in his keynote address entitled "Brewing Forward" at the outset of the Brewers Forum. For one thing, van Boxmeer argues, it's important as an industry to take responsibility for the environment. In addition, the brewing industry must act as an advocate for moderation in beer consumption in close cooperation with lawmakers and society. He praised the craft beer



Round table discussion featuring family-owned breweries (from left): Edouard Haag, Brasserie Meteor (France), Josef Sigl, private brewery Trumer (Austria), Jonathan Neame, Shepherd Neame (United Kingdom), with moderator Tiago Brandão, EBC President



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Pavlos Photiades, President of the Brewers of Europe, kicked off the second edition of the Brewers of Europe Forum.

movement as a trend that brings us back to beer's roots. In general, van Boxmeer is optimistic about the future of the brewing industry, saying that the glass is "half full and not half empty."

According to Paolo Lanzarotti, CEO of Asahi Breweries Europe, the European brewing landscape must accept ever-changing consumer trends. Lanzarotti sees great potential in the development of alcohol-free soft drinks combined with beer as well as non-alcoholic beers for adults.

The final phase of the first theme block featured Paolo Lanzarotti, Charles Leclef (owner of Brouwerij Het Anker) and Ina Versti and was moderated by Tim Webb. It was a look beyond 2020 into the future of the European brewing industry. Climate change and other environ-

mental issues that will influence consumers' purchasing decisions will play a central role in any future scenario.

Cees't Haart, CEO Carlsberg, also has an eye on the future of the brewing industry. He elaborated on the importance of climate protection and presented his company's climate protection goals. According to Haart, CO₂ emissions throughout the beer supply chain need to be reduced in the four areas of agriculture, brewing, packaging and distribution.

Family breweries report

This was followed by several examples of family-run breweries from Europe, all of which have successfully positioned themselves for the future in their own way.



The Flanders Meeting & Convention Center Antwerp provided the perfect setting for the EBC Congress and the Brewers of Europe Forum 2019.

Josef Sigl, CEO of Trumer Privatbrauerei, reported on the development of the family business over the generations. In particular, the company motto "Everything different from everyone else" had shaped the brewery. For example, the Trumer private brewery relies on pils beers, special glass design and targeted sponsorship and will develop this concept further in the future.

Edouard Haag, Managing Director of Brasserie Meteor, reported on the development of this family-run brewery in Alsace in recent years. In the oldest brewery in France, according to its own data, output has increased in recent years to 500,000 hectoliters per year. In 2016, a design relaunch of the brewery's lineup was initiated, something which hadn't been done since the brand launch in the 1920s.

After providing insight into modernization efforts in recent years at the English brewery Shepherd Neame, given by Jonathan Neame, CEO Shepherd Neame, the closing discussion featuring all three speakers focussed on strategies and concepts for the continuation and development of family-run breweries.

Focus on „craft“

What's up with the craft beer scene in the USA? Bob Pease, President of the Brewers Association (BA), provided answers to this question. After a brief presentation of BA's activities, Pease characterized the structure of the U.S. craft beer scene. In 2018, craft beer had a market share of 13.2 percent by volume.

Timothy Cooper, Chief Brewer at Coopers Brewery, presented an Australian perspective of the craft scene. Craft beer has gained a market share of 9.5 per cent in Australia. In general, the Australian beer market is characterized by a consortium of powerful wholesalers and a high tax burden.

Jan Suran, President of the Czech & Moravian Association of Small Brewers, reported on the situation of craft brewers in the Czech Republic. At the end of the lecture block Joana Teresa Carneiro, DSM, explained why the craft beer trend will continue: Craft beer represents diversity, inventiveness, regionality and sustainability – all factors that

serve the wishes and expectations of its faithful legion of consumers.

A closer look at yeast

Non-Saccharomyces yeasts, widely used in the wine-making sector, are already being deployed in breweries. Fotini Drosou, University of Athens, investigated the suitability of *Torulaspora delbrueckii* and *Metschnikowia pulcherrima* strains for beer production. Both strains were used in homogeneous culture as well as in mixed culture with *Saccharomyces cerevisiae* for the fermentation of synthetic wort and a pale ale wort. The yeast strains studied were all able to ferment the main sugars of the wort, with differences evident in the formation of fermentation by-products – and thus in the aroma of the beers produced.

Mathias Hutzler, Research Center for Brewing and Food Quality at Munich's Technical University, took a closer look at the over-fermenter *Saccharomyces diastaticus* during his lecture. For this purpose, Hutzler characterized 19 different *S. diastaticus* strains with regard to their genetic and brewing-technological properties. Widely feared as a necessary evil in breweries, *S. diastaticus* could be used – if targeted with precision – for the production of beers with a dry character and phenolic note similar to that of wheat beers.

Sophie Schwebel, IFBM-Qualtech, investigated the influence of raw brewing ingredients and fermentation parameters on the formation of SO₂. In a first step, the transition of SO₂ from raw material to the wort during mashing was analyzed. The SO₂ transition depends on the chosen grain processing method, Schwebel said. In a second step, various fermentation parameters were closely monitored. Yeast cell count shows a slight influence on SO₂ content when it is added. Higher wort aeration ensures lower SO₂ content, whereas higher original gravity leads to higher SO₂ content.

Filtration and bottling

Evan Evans, University of Tasmania, presented an easy way to predict beer filtration behavior during crossflow filtration. This small-scale wort filtration test (SWIFT) is based

on a nylon filter with a pore size of 0.45 microns. In addition to predicting filtration, the test can also be used to determine activity levels of enzymes that influence filtration performance, such as β -glucanase, xylanase and cellulase.

Roland Pahl, VLB Berlin, took a critical look at sterility levels of cleaned, reusable glass bottles and presented new as well as familiar, though slightly adapted methods for analyzing the cleanliness of bottles after they pass through the bottle cleaning machine. Thus, CSB value, surface tension and anionic surfactants are the central characteristics for assessing bottle cleanliness. For a precise analysis

of particles, which are introduced into the bottles via the cleaning liquor in the bottle cleaner, a combination of membrane filtration and optical analysis of the particles under a high-performance microscope was found to be adequate.

In the recent past, a shift away from the use of diatomaceous earth (Kieselgur) in filtration has been noted. Kieselgur-free filtration systems are being employed in more and more breweries worldwide. Stefan Lustig, President of the German Brewmaster and Maltster Association, gave an overview on the technological advantages and disadvantages of filtration systems currently on the market,



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sharing his insights into the future of beer filtration. From a brewery manager's perspective, the filtration process plays a central role in the entire brewery installation supply chain in many ways, Lustig concludes.

Sustainability and aromatics

David De Schutter, AB InBev, introduced congress participants to the Simmer & Strip technology by ABInBev. In contrast to conventional evaporation during wort boiling, the wort is kept just below boiling temperature in this system and undesirable substances such as DMS and strecker aldehydes are removed by adding inert gas (nitrogen or CO₂) via a ring. Due to the lower thermal load on the wort, TBZ also decreases. Force aging tests confirmed the efficiency of the stripping process on the one hand and beer quality in terms of aging stability compared to conventional systems on the other. According to De Schutter, this system requires 12 percent less energy than conventional systems. Retrofitting of existing systems can be carried out in a cost-effective manner.

Florian Lehnhardt, Department of Brewing and Beverage Technology at Munich's Technical University, spoke about the volatile aldehydes. He compared several analytical methods employed in the laboratory and showed ways of monitoring these substances during the brewing process.

What role do hops play in terms of DMS content in beer? Elise

Salanouve, Nyseos, addressed this question. In addition to the principle entry point of DMS and its precursor substance S-methyl-methionine (SMM) through the malt, it is assumed that hops can also bring SMM into the brew. Salanouve then examined 15 different hop varieties for their DMS precursor content. In addition, DMS and its precursors were detected in high quantities in commercially available IPAs. In brewing experiments, the entry of DMS precursors via hops could be detected during dry hopping. During ageing, there could be DMS formation in the bottle, depending on the quantity of hops, storage time and – in particular – storage temperature.

„Terroir“ and harvesting

A new method for establishing the geographical origin of hops based on Isotope Ratio Mass Spectrometry was presented by Iztok Joe Kosir, Slovenian Institute of Hop Research and Brewing. For this purpose, hop samples from the ten main growing areas were examined for their isotope composition. In early experiments, this method was successful. According to Kosir, the authenticity of a hop sample can be verified with regard to its origin, which should be of interest to the hop trade.

Takeshi Kumagai, Suntory Beer, went beyond terroir and spoke about harvest timing and its influence on hop polyphenols. By means of LC-MS/MS, the distribution of different hop polyphenols was investigated according to the

time of harvest. For example, an increase in proanthocyanidin dimers and trimers was observed at earlier harvest times, whereas at a later harvest time there was an increase in prenylflavonoids. The timing of the hop harvest therefore plays a role in the taste of beer due to the influence of polyphenols, Kumagai concludes.

Glancing back while looking ahead

The 37th EBC Congress in Antwerp concluded with a panel discussion featuring respected brewing scientists on the topic "Milestones of the past, tasks of the future." Guido Aerts, Charlie Bamforth, Kamini Dickie, Sandra Stelma and Ludwig Narziß discussed, among other things, which technological development of the brewing industry should be classified as the most important. Other points of discussion included water supply, the trend towards non-alcoholic and reduced-alcohol beers and the supply of raw materials in times of severe climate change. The final point of the discussion dealt in general terms with the question of what the brewery of the future might look like. The discussion was most competently moderated by Ina Versti.

Conclusion

For the first time, the EBC Congress and the Brewers of Europe Forum held a combined event. The Flanders Convention Center in the heart of Antwerp provided just the right setting for both events simultaneously. Around 1,000 participants descended on the "City of Diamonds" to discuss the future of the brewing industry – both from a technological perspective and from the point of view of marketing and corporate management. Participants found time for networking and mutual exchange during breaks, at the poster exhibition and supplier forum as well as at the ever-popular evening events held in two breweries in the city of Antwerp.

The next edition of the Brewers of Europe Forum will take place in Brussels in June of 2020. The venue for the EBC Congress 2021 will be announced soon. (bm) □



Dr. Sandra Stelma, Diageo, Prof. Dr. Ludwig Narziß, moderator Ina Versti, Prof. Dr. Guido Aerts, Kamini Dickie and Prof. Dr. Charlie Bamforth (from left) took a look back into the past, but also into the future of brewing.



Enjoying a break (f.r): Tiago Brandão, EBC President, Benedikt Meier, Editor BBII, and John Brauer, EBC Executive Officer



Transatlantic meeting: Dr. Urs Wellhoener (left), Boston Beer Company, and Dr. Roland Pahl, VLB Berlin



Brewery meets hops meets filtration (f.l.): Alexander Maier, Bock's Corner Brewery, Cynthia Almaguer, Yakima chief hops, Christoph Föhr, Filtrox



Dr. Martina Gastl, Chair of Brewing and Beverage Technology / TU Munich, Frank Peifer, Hopsteiner, Korbinian Haslbeck, Research Center Weihenstephan for Brewing and Food Quality / TU Munich, and Willi Mitter, Hopsteiner, were probably discussing the use of hops in beer brewing (f.l.).

Impressions from Antwerp



Prof. Dr. Tom Shellhammer, Oregon State University, Dr. Sarah Thörner, VLB Berlin, Laura Knoke, VLB Berlin, and Dr. Christina Schmidt, Hopsteiner, exchanged views on the posters on display (f.l.).



Break time discussions (f.r.): Marius Hartmann, Barth-Haas Group, Benjamin Röttel, Feldschlösschen, Benedikt Meier, Editor BBII



Clearly having fun: Dr. Stefan Hanke (right), Bitburger Braugruppe, and Dr. Michael Kupetz, Chair of Brewing and Beverage Technology / TU Munich



University meets plant design (f.l.): Michael Féchir, Trier University of Applied Sciences, Tobias Becher, Isabel Wasmuht and Nele Bastgen, all Ziemann Holvrieka



Prof. Giuseppe Perretti, CERB/University of Perugia, Michele Cason, Assobirra, Dr. Carsten Zufall, Cerveceria Polar, John Brauer, EBC, raised a glass together (f.l.).



Experts in hops and analytics: Helmut Klein, Brau Union, Willi Mitter, Hopsteiner, Martin Biendl, Hopsteiner HHV (f.l.)



Plant construction meets raw materials (f.l.): Holger Joas, ADM Wild Europe, Christoph Remmelberger, Kaspar Schulz, Fabian Kofler, ADM Wild Europe, Christoph Föhr, Filtrox