



26th Conference of "Application of Czech Hops in Brewing"



The 26th seminar "Application of Czech Hop Varieties in Brewing" took place on the second Wednesday of April 2024. The event is organized annually by Bohemia Hop, a.s. in collaboration with the Hop Research Institute, s.r.o. (CHI) and this year also with the Research Institute of Brewing and Malting, a.s. (VÚPS).

This brewing event attracted the attention of brewing experts, who gathered in large numbers. More than hundred experts from the brewing industry participated and most of them took part also in the afternoon and evening programs.

The lecture panel highlighted current trends in brewing focused on the behaviour of different yeast strains and the use of hops in whirlpool.

The tasting panel provided an opportunity to sample beers where these trends were utilized in their production. Brewers could compare how the sensory profile of beers changes at different whirlpool hopping temperatures, as well as how different yeast strains alter the taste and aroma of the final beer.

The recipes for the accompanying tasting were prepared by Jan Hervert from CHI and Martin Slabý from VÚPS. Jan Hervert also brewed all the beers at the Experimental Brewery of the Hop Research Institute, s.r.o. The final tasting round compared beers brewed in collaboration with Budějovický Budvar and Dva kohouti breweries.

Whirlpool

Martin Slabý from VÚPS led the lecture on the topic "Whirlpool - How Does It Influence Hop Aroma and the Resulting Taste of Beer?" In the presentation, he described the course and results of an experiment which showed an impact of using the whirlpool at different temperatures on the hop aroma of a lager hopped with Saaz Shine variety and Ale hopped with Kazbek variety. For both types of beers, the highest IBU value was measured when the whirlpool was used at 95°C, both in the wort and in the beer. However, the concentration of iso-alpha bitter acids in the beer, with or without the use of the whirlpool, remained constant. This is in line with other studies where the IBU value in whirlpool hopping or dry-hopping is distorted by various other hop compounds and does not reflect the actual bitterness of the beer. There was a clear increase in the concentration of total polyphenols due to the whirlpool, with the highest at 95°C. It was also demonstrated that the whirlpool does not affect the thermal load of the brewhouse.

The beers were initially evaluated by an expert sensory panel from VÚPS. For the lager hopped with Saaz Shine variety, a statistically significant difference between samples was shown. The sample hopped in the whirlpool at 75°C received the highest ranking in the sensory evaluation, exhibiting herbal, floral, citrus, and fruity aromas along with a subtle bitterness. The sample without whirlpool usage received the lowest rating, with less developed fruity and citrus tones, less intense aroma, and a bit thinner profile, more herbal and floral. For the ale hopped with Kazbek, no statistically significant difference between samples was found by the VÚPS panel; the aroma was fruity, hoppy, citrusy, resinous with a pleasant bitterness.

These beers were evaluated the conference participants - after Martin Slabý's presentation. In both beers, participants rated the beer with whirlpool usage higher; however no statistical difference was observed between temperatures 95°C and 75°C.

The results indicate that whirlpool hopping had a very positive impact. In terms of the expert panel evaluation, a temperature of 75°C was preferred for the Saaz Shine variety. This phenomenon may be variety-dependent, not solely dependent on the spectrum of hop oils and other compounds. This issue requires further investigation. Differences between beers without whirlpool hopping and those with added hops in the whirlpool were noticeable in preferences, intensity, and character of the aroma.

In bottom-fermented beers, the beer with added hops at 95°C was rated the highest. In top-fermented beers, the beer with added hops at 75°C won by a slight margin. The lowest aroma intensity was found in beers where hop addition during boiling did not occur.

Sample	Plato	Wort IBU	Beer IBU	1. Hopping	2. Hopping	3. Hopping	Whirlpool Hopping	Points*
1	11,8	59	37	Premiant	Premiant	Saaz Shine	-	2,24
2	12,0	75	41	Premiant	Premiant	Saaz Shine	S. Shine 95°C-3./g/l	1,85
3	11,2	68	35	Premiant	Premiant	Saaz Shine	S. Shine 75°C-3./g/l	1,91

Sample	Plato	Wort IBU	Beer IBU	1. Hopping	2. Hopping	3. Hopping	Whirlpool Hopping	Points*
1	13	65	36	Vital	Kazbek 45	Kazbek 45	-	2,28
2	13	97	48	Vital	Kazbek 45	Kazbek 45	Kazbek 45 95°C-2,8/g/l	1,87
3	13	85	46	Vital	Kazbek 45	Kazbek 45	Kazbek 45 75°C-2,8/g/l	1,85

* 1 most favourite - 3 least favourite



The morning session was concluded with a lecture by Mr. Kraus on the topic of "Pre-cooling wort and hop application into whirlpool." 3+K Kraus Ltd. specializes in the intensification and improvements of brewery operations. One such modification often includes the option of pre-cooling wort before the whirlpool vessel for subsequent hop addition at a temperature of approximately 80°C. The presentation introduced the two most common technical solutions in operation, namely cooling through pipe duplication or through a special heat exchanger. Mr. Kraus pointed out that the implementation must always be fully functional and fully sanitizable, depending on the specific operation's setup.

Yeast

In the next lecture, Jana Olšovská (VÚPS) explained how brewing yeasts influence the chemical composition and taste of beer. She introduced the concept of sensory analysis, which was used to evaluate the results. Sensomics is a newly emerging field for studying and understanding the sensory properties of food and beverages, based on collecting a large amount of data from the sample (chemical analysis for hundreds of substances) and evaluating them with multidimensional analyses. This provides information about the substances contributing to taste and aroma and their interactions.

Mrs. Olšovská presented the results of an experiment using four different strains of brewing yeasts (RIBM 2, RIBM 6, RIBM 7, RIBM 95) in the preparation of lagers (3-time hopped in a kettle with Saaz hops), describing their behaviour and the chemical and sensory differences in the resulting beer. The conclusion was that the strains differ not only in the degree of fermentation and concentrations of esters and higher alcohols but also in hop aroma, due to various chemical and metabolic transformations during fermentation and maturation.

The lecture was followed by a beer tasting session, where samples brewed at the Experimental Brewery CHI were evaluated. Pale ale-style beers were prepared, hopped twice in the kettle, whirlpool, and dry-hopped during fermentation and maturation. Four yeast strains were selected for this purpose (SafAle 05, Nottingham, Verdant IPA, Tropicale Blend).

The main goal was to show the difference in the final taste and aroma when using different yeast strains, which was confirmed. Despite other factors influencing overall impression, as explained in previous lectures, the demonstration of different tastes using different yeast strains was successful.

Sample	Yeast Strain	Plato	IBU	Points	Ranking
1	SafAle US-05 (Fermentis)	13	30	2,01	1
2	Nottingham (Lallemand)	13	32	2,95	3
3	Verdant IPA (Lallemand)	31,1	35	2,96	4
4	Tropicale Blend (White Labs)	13	35	2,04	2



Whirlpool and Yeast

At the end of the conference, Petr Košín (Budějovický Budvar) and Lukáš Tomsa (Dva kohouti) presented lagers brewed with a common base (2 mashes, hopped with SAAZ hops, Kazbek PE 90 for dry-hopping). The tasting and discussion combined both issues: the influence of whirlpool hopping and the use of different yeast strains. The first batch showed less intensity of Kazbek compared to the other two. The difference in yeast strain was interesting, with Ide W34 (Fermentis) bringing out the hops and other ingredients, while Budvar yeast created its characteristic aroma complementing the hops.

Kazbek Cup 2024

The fourth edition of the Kazbek Cup beer competition saw 30 beer samples entered – 16 in the top-fermented beer category and 14 in the bottom-fermented beer category. Each year, the competition becomes more prestigious. Kazbek variety is becoming popular and is already commonly used by breweries. The quality of beers is increasing year by year. All participants are winners, but the names of the awarded beers and their rankings can be found in the tables below.



Category of bottom-fermented beers

Beer	Brewery	Beer Style	Ranking
Těšba - Dry-Hopped Spelt Lager 11°	Valeč	India Pale Lager	1
Kazbek Cold IPA	Sibeeria	Cold IPA	2
OGAR Kazbek 12°	Ogar	India Pale Lager	3

Category of top-fermented beers

Beer	Brewery	Beer Style	Ranking
Poctivej výčep Mullet hunter	Falkon	West Coast IPA	1
Kazbek Hazy Pale Ale 12°	Sibeeria	Hazy Pale Ale	2
Session IPA Kazbek	Řemeslný pivovar Lomnice n. Popelkou	Session India Pale Ale	3

Conclusion

In the afternoon program, most participants visited the newly renovated synagogue with the rabbi's house in Žatec. This city landmark, the second-largest synagogue in the Czech Republic, was auctioned by Daniel Černý in 2013. Partially funded by his own resources and with support from the EU's IROP grant program, reconstruction began in 2020. In March 2024, the newly renovated Museum and Cultural Space Synagogue Žatec opened to the public. The evening program took place at Pioneer Beer Brewery. The traditional quiz added excitement to the gathering, which lasted until late night hours.