

## TASTING RESULTS – DRINKTEC 2017

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### Hopping Recipe

The base beer (14°P, 6,0 Vol.-% alcohol) was identical for all four samples. The pale ales were dry hopped with pellets type 90 using a different variety for each one. Bravo™ (P90) was used for the base beer in the brewhouse, 70% at boil begin and 30% 20 min. before boil end.

297 tastings were completed and evaluated.

### Relevant Hop Data

Pellets	Base beer	Pale Ale No. 1	Pale Ale No. 2	Pale Ale No. 3	Pale Ale No. 4
Variety	Bravo™	Denali™	Eureka!™	Calypso™	Lemondrop™
Quantity for DH	-	400 g/hl	400 g/hl	400 g/hl	500 g/hl
LCV EBC 7.5	13.7%	12.7%	15.6%	13.4%	4.3%
Total oil EBC 7.10	1.5 ml/100g	2.9 ml/100g	2.5 ml/100g	1.9 ml/100g	0.9 ml/100g

### Analytical data of Pale Ales

	No. 1 Denali™	No. 2 Eureka!™	No. 3 Calypso™	No. 4 Lemondrop™	
Bitter compounds	IBU EBC 9.8	30.4	30.1	41.5	31.1
	Iso- $\alpha$ -Acids mg/l *	22.6	23.1	23.5	22.7
	$\alpha$ -Acids mg/l *	5.8	5.5	8.2	8.4
	Humulinones mg/l *	4.7	3.8	13.7	4.7
Aroma compounds	Myrcene $\mu$ g/l **	486	304	249	267
	Linalool $\mu$ g/l **	149	189	95	159
	Geraniol $\mu$ g/l **	144	52	85	59
	2-Methyl isobutyrate $\mu$ g/l **	35	35	40	16

\* HHV 29 (in house method, HPLC); \*\* HHV 46 & HHV 47 (in house method, GC-MS)

The analytical findings of selected hop aroma compounds in the tasted pale ales are summarized above. These substances characterize different aroma impressions like herbal and spicy for myrcene, floral and citrusy for linalool and geraniol, and fruity for the ester 2-Methylbutyl isobutyrate.

### Tasting Results (mean values of 297 tasters)

	No. 1 Denali™	No. 2 Eureka!™	No. 3 Calypso™	No. 4 Lemondrop™	
Sensory	Ø Bitter quality (0-7)	4.01	4.12	3.98	4.42
	Ø Estimated Bitter Units	30.0	29.3	29.8	30.1

Only minor differences were observed in terms of bitterness like IBUs or bitter quality among the four beers. However, the variety used for dry hopping clearly demonstrates that different flavors can be achieved using the same base beer (see next page ▼).

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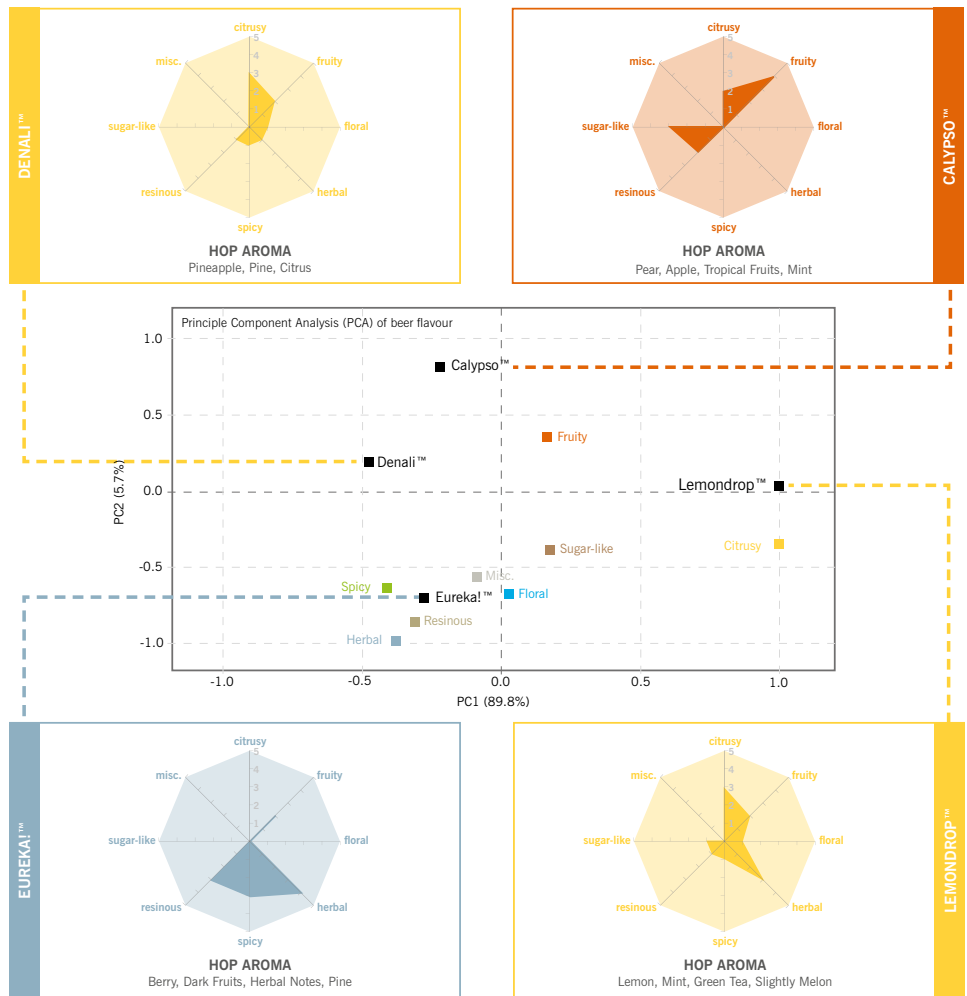
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### Characteristics of Pale Ales and Hop Aroma

The point of the tasting was to show how dry hopping with different varieties can influence the hop flavor in the final beer. The significant variance of all tasted pale ales is demonstrated in the Principle Component Analysis below. The plot indicates that all four pale ales were described differently achieving the initial goal of the tasting.

As an example Eureka!™, with its dark fruity and berry notes was assessed as herbal, spicy and slightly fruity comparable to the aroma found in the leaf hops. This also applies to the other varieties which match the respective hop profiles very well.

The description of the varieties used as shown in the spiderweb coincide with the beer flavor.



Nov. 7<sup>th</sup>, 2017 – Bludenz (AUT)

Nov. 9<sup>th</sup>, 2017 – Regensburg (DEU)

Nov. 14<sup>th</sup>, 2017 – Bochum (DEU)

Nov. 16<sup>th</sup>, 2017 – Wurmlingen (DEU)



We have put together yet another set of interesting topics for the 2017 HOPSTEINERFORUM.

We are pleased to announce that venues in Germany this year will include the **Birretta Bier Bar in Regensburg**, the **Brewery Moritz Fiege in Bochum** and the **Hirsch-Brauerei in Wurmlingen**.

In Austria the event will be hosted by the **Föhrenburg Brewery in Bludenz**.

The topics this year include something of interest for everyone. However, if you have any requests or suggestions, please do not hesitate to contact us. Of course we will try to incorporate any requested topics into the framework and answer your questions.

We look forward to seeing you at one of our events this year.

► For more information, the detailed programme and registration please visit our website <https://www.hopsteiner.com/de/hopsteiner-forum/>

