



NABLAB brewing conference FLAVOR INNOVATION OF NON-ALCOHOLIC BEERS

March 08 – METAROM BENELUX

YUMMY INDULGENT CREATION ETHICS NATURE DELICIOUS YUMMY TAILOR-MADE SUSTAINABILITY INSPIRATION HEALTHY
TAILOR-MADE CREATION INDULGENT DELICIOUS YUMMY NATURE HEALTHY SWEET LOVE FLAVOR CARAMEL INDULGENT
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YUMMY TAILOR-MADE FLAVOR CARAMEL INDULGENT SUSTAINABILITY HEALTHY INDULGENT DELICIOUS SAFETY INDU



Impact of NABLAB process on the flavors

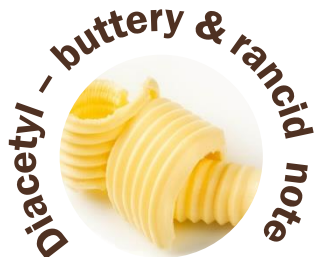
- **Effect of dealcoholizing**

Loss of almost all the volatile compounds (esters).

All the aroma from the hop and yeast fade out.



Deformation of the aromatic profile:



comments from brewers:

"Beers are waterier. The mouthfeel is flat. There is a lack of aromatic"



The taste of beer is drier and astringent.



Impact of NABLAB process on the flavors

- **Effect of nonalcoholic fermentation**

Aromatic compounds produced by nonalcoholic yeast can be different.

Consumption of the starch/sugar is not the same: it can result a difference on sweetness.

Fermentation stop prematurely so glucose is not entirely consumed.

comments from brewers:

“Beers are sweeter, taste more like the beer mash. The mouthfeel is heavier.”

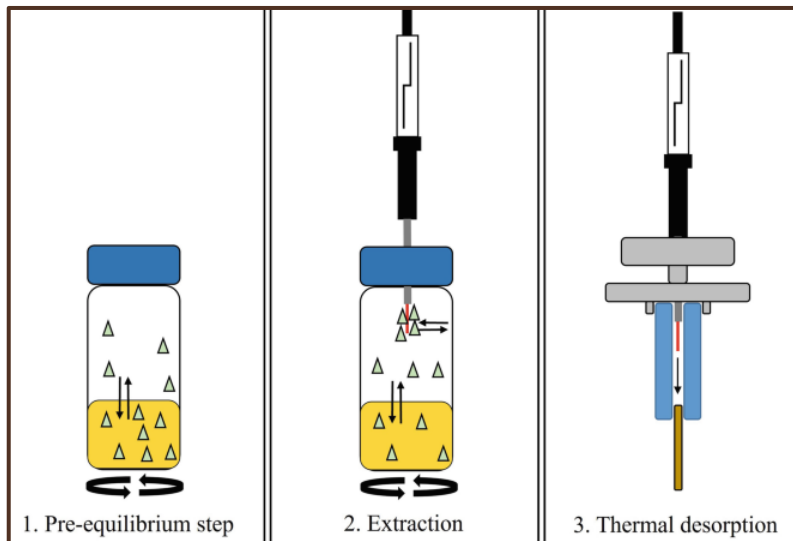




Bibliography research, what we have learnt and what we have concluded

Toru Kishimoto, Shigekuni Noba, Nana Yako, Minoru Kobayashi, and Tetsuya Watanabe, 2018
Simulation of Pilsner-type beer aroma using 76 odor-active compounds

Molecules detection by Gas chromatography analysis



Precise determination of
the concentration of 76
odor active compounds

Odor threshold

A chemical's odor threshold is the lowest concentration of that chemical in water that people can smell.

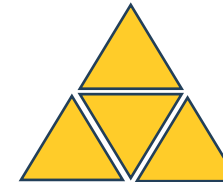
If concentration is **under** the odor threshold



If concentration is **above** the odor threshold



10 µg/L



40 µg/L

Same aromatic power but
different concentrations.

High odor threshold means a high concentration is
need to be smell.



Odor activity value OAV

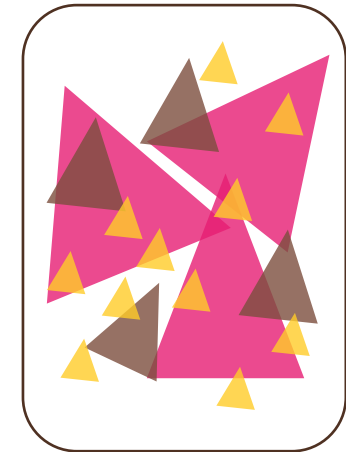
Toru Kishimoto, Shigekuni Noba, Nana Yako, Minoru Kobayashi, and Tetsuya Watanabe, 2018
Simulation of Pilsner-type beer aroma using 76 odor-active compounds

concentration / odor threshold → odor activity value OAV

Odor activity value (OAV) is the ratio of a component's concentration to its odor threshold

	Odor threshold in water (µg/L)	Concentration in water (µg/L)	Odor Activity Values (OAV)
▲ (E)-β-damascenone	0,004	2,3	575
▲ (R)-linalool	0,14	44,94	321
▲ acetaldehyde	25	5100	204

Example of values for 3 of the 76 odor active compounds



Effect of OAV on the mix



Development of a beer flavor



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What's a flavour

• The composition

Flavoring preparation:
essential oils,
infusions
extracts...

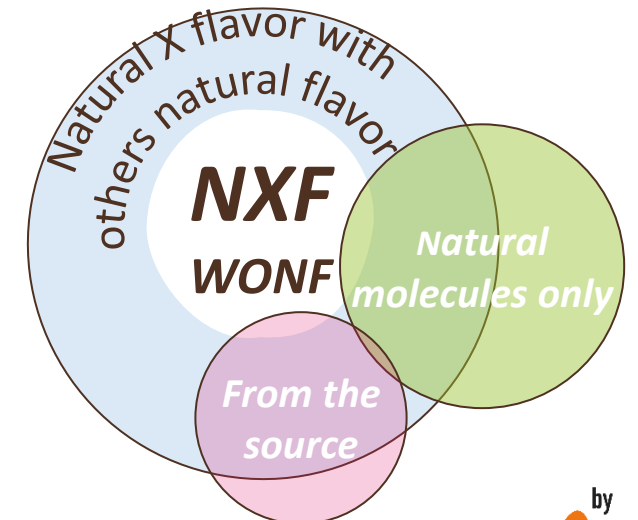
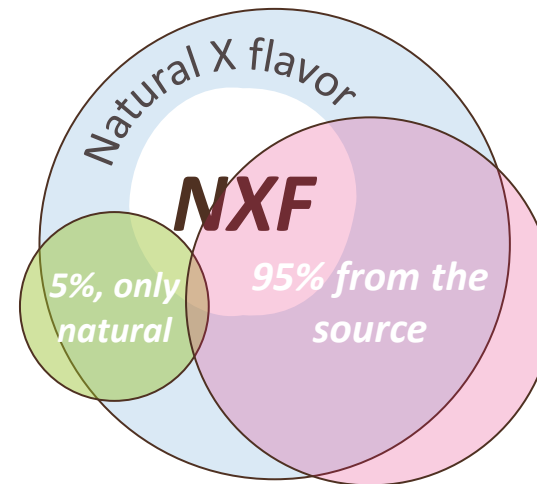
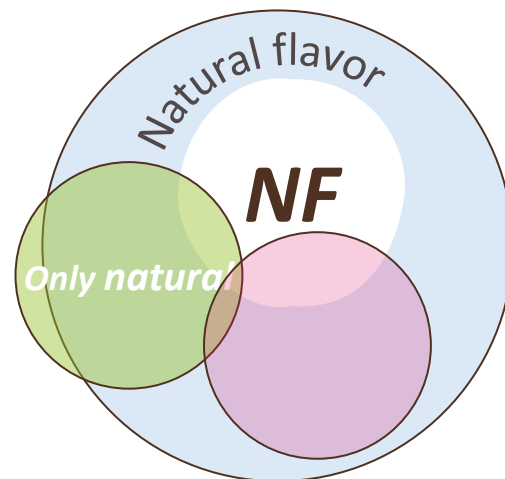
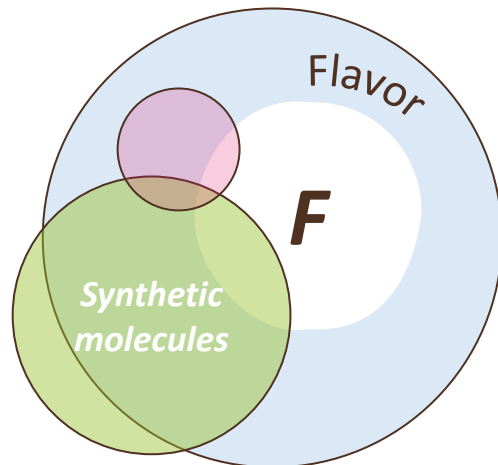
and/or

Pure molecules:
They can be synthetic
or natural

and

Carrier:
depends on the application
specification or flavoring's
solubility

• The regulation

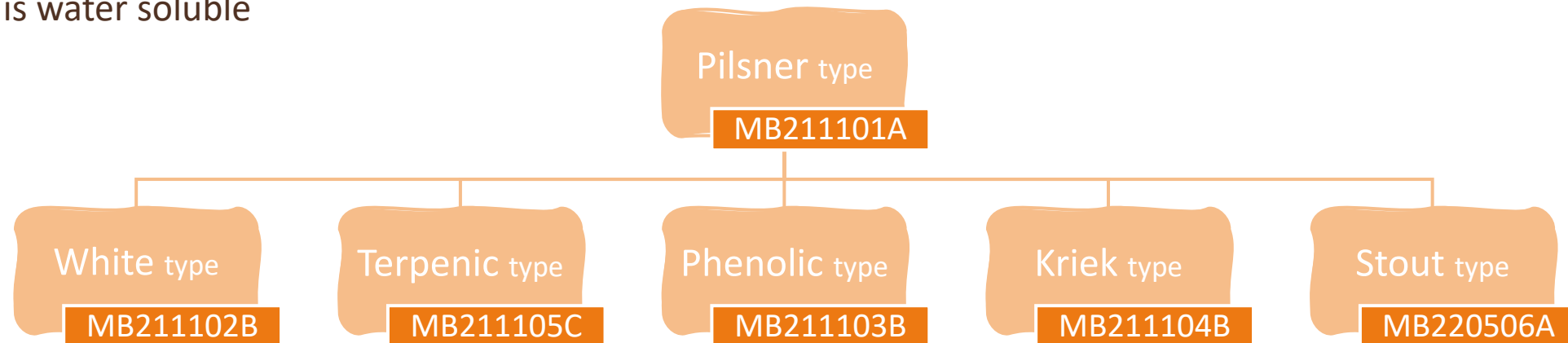




Our range of beer flavors

Our range

- suits with 0,0% alcohol beer
- is water soluble

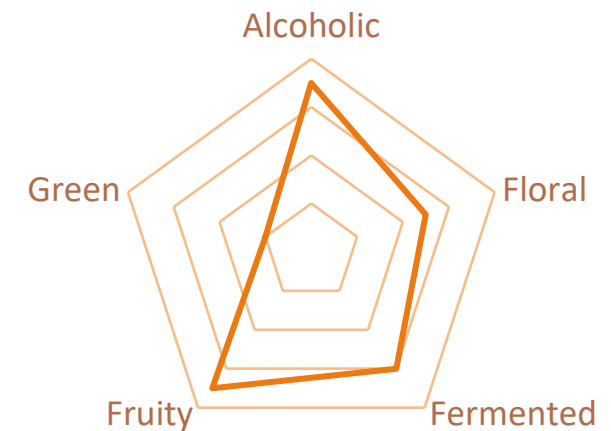




Formulation by aromatic note

Toasted & caramellike Furaneol Maltol	Acid Butanoic acid	Spicy Eugenol
	Rancid	Floral Linalool (E)- β -damascenone
Fruity Isoamyl acetate Ethyl butyrate Ethyl caproate Ethyl caprylate Isovaleric aldehyde	Fusel & alcoholic Ethyl isobutyrate Isoamyl alcohol Isopropyl alcohol	Fusel oil Ethyl acetate
	Green Acetal	

Pilsner type



Examples of molecules that can be used by aromatic notes

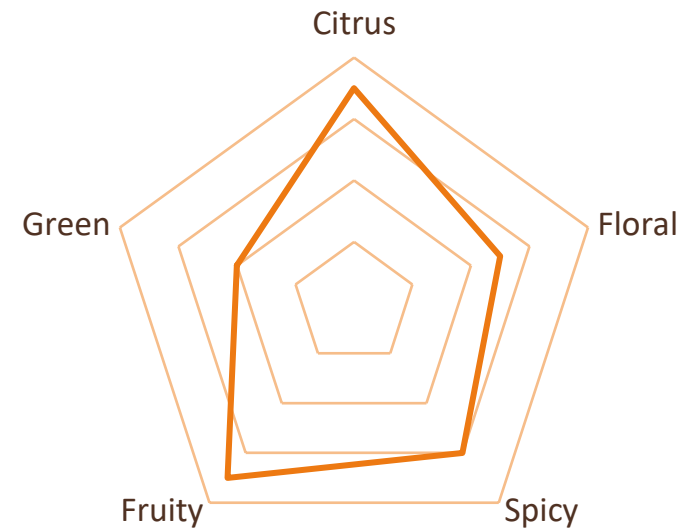


White type

MB211102B



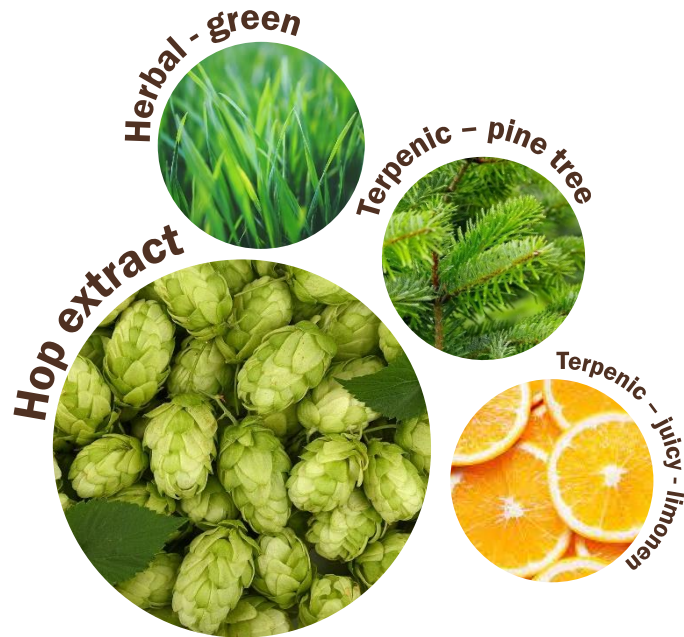
White type



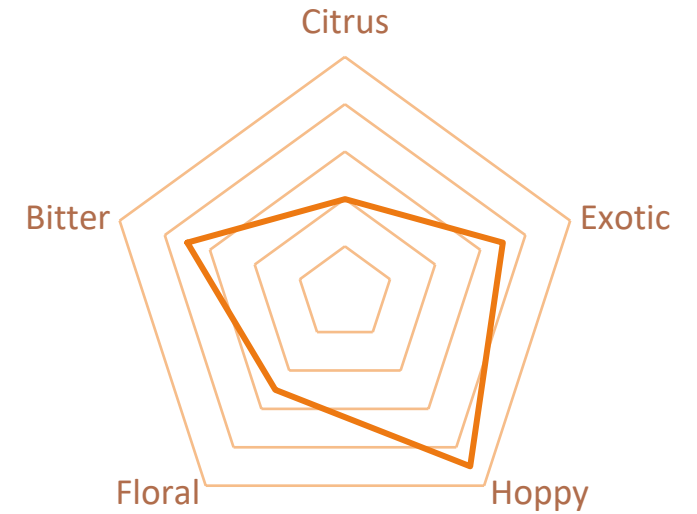


IPA type

MB211105C



IPA type




and more...

Abbey type MB211103B

+

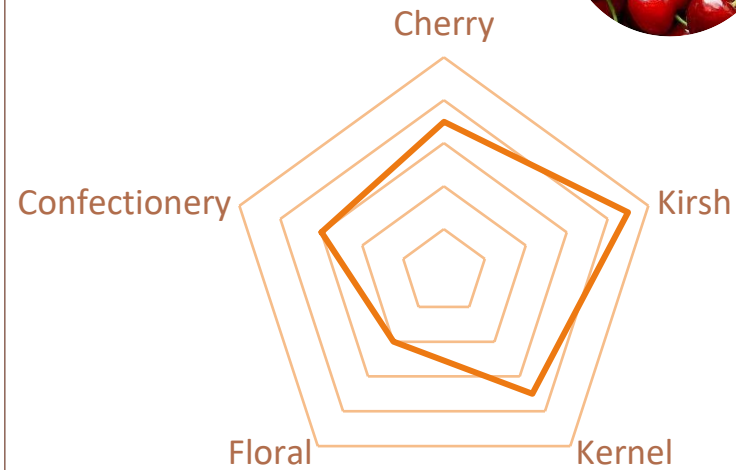
- Clove E.O.
- Guaiacol
- Vanillin




Kriek type MB211104B

+

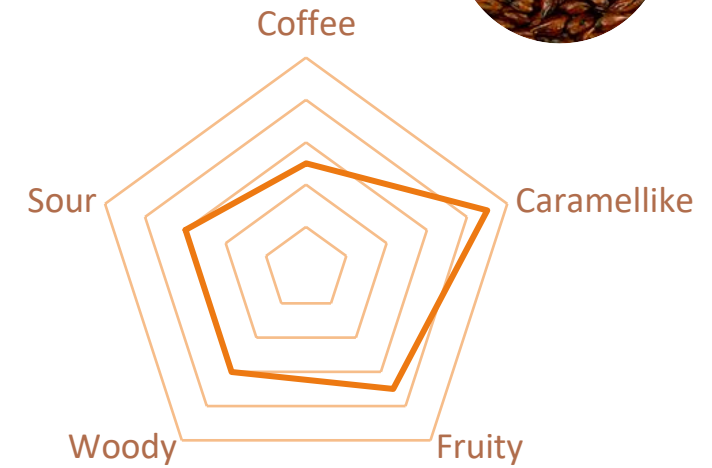
- Benzoic aldehyde
- Red fruit extracts
- Raspberry ketone

Stout type MB220506A

+

- Furfuryl mercaptan
- Methyl cyclopentenolone
- Furaneol



Introduction of the alcohol booster

Beer flavors are nice,
but we miss the
sensation of alcohol!



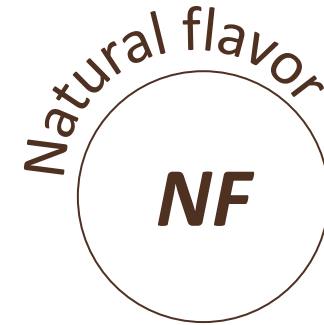
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About the alcohol booster

What do we want ?

- A flavor who brings the sensation of alcohol
- As neutral as possible, no typicity
- No ethanol



How does it work ?

- Primary alcohol balance
- Alcoholic/solvent notes
- Aromatics molecules that can induce **trigeminal sensations*** and reminiscent of alcohol

Trigeminal sensation is perceived through the trigeminal nerve. It can be activated by physical stimuli and by chemical agents, and evokes sensations of touch, temperature, and pain.



Aromatic compounds that produce a trigeminal sensation



Spicy & burning
sensation



Cooling effect



Hot & burning
sensation



Bitterness



Fresh, solvent
taste



What are the possibilities

- **The flavorist can be the brewer's support**

Complete the gap induced by NABLAB processes

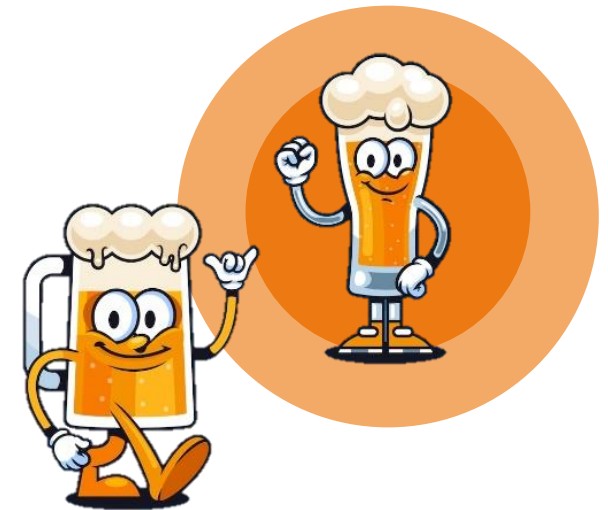
Flavors are easy to use

Endless possibilities: reaching every beer style from one single brew

- **A tailor made with brewers**

Development directly on your beer

Adjust the taste based on your feed back





You're welcome to visit our booth

come and taste...





www.metarom.com

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