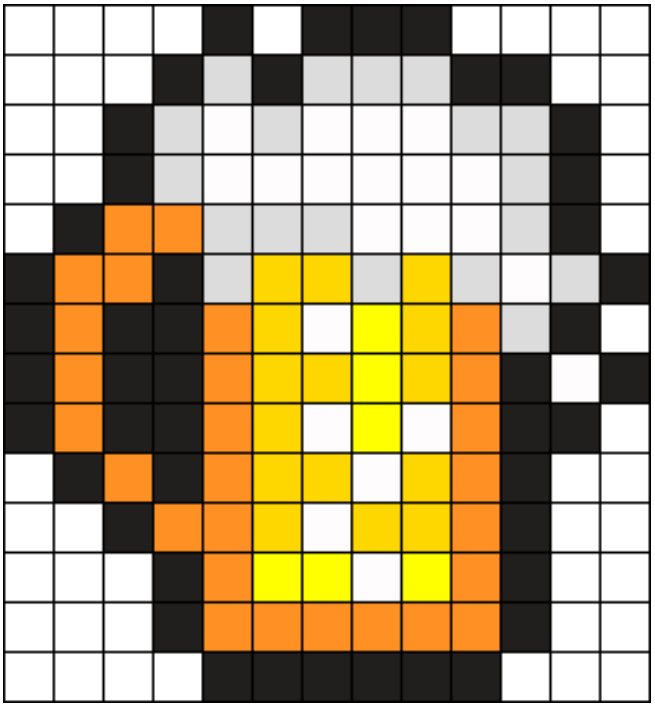

Chel-OH-ta

A Note-by-Note Beer

ABSTRACT

The first Note-by-Note beer ever conceived is unveiled in this document. Spicy alcohol-rich beads will make the difference in this drink!

Eduardo Liza Diaz

Molecular Gastronomy

CHEL-OH-TA

1. DESCRIPTION OF THE IDEA

This Note-by-Note beer has been baptised as Chel-OH-ta, thus highlighting the versatility of alcohol in this specific beverage. Chel-OH-ta is composed of spicy alcoholic beads as the dispersed phase with flavoured water as the dispersed medium. In order to mimic a conventional beer as close as possible, CO_2 is injected in the dispersed medium. The following figure shows the final version of the product.

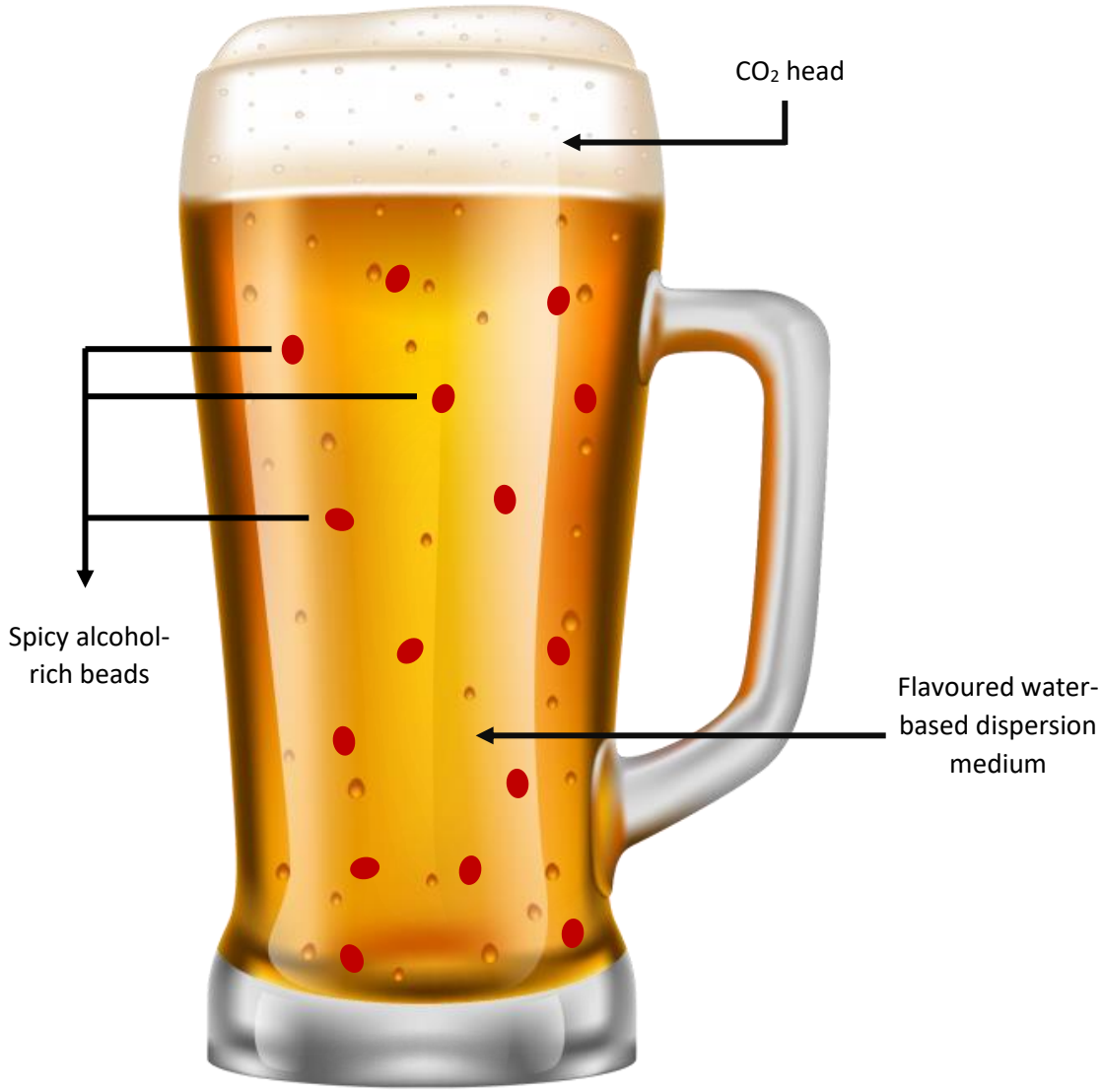

Figure 1 – Schematic layout of Chel-OH-ta.

Chel-OH-ta gives you the option to either choose to chew and consume the alcohol, or not. Besides the fact that this beverage is done with a Note-by-Note recipe, the versatility that this beverage

provides in terms of alcohol consumption is what makes it unique. These beads also have a particular flavour boost, as they contain capsaicin for a more explosive mouth experience.

2. ELABORATION PROCESS

The recipe given under this section is calculated for one pint (473 ml) with the content of alcohol that the consumer desires.

Dispersion medium

1. In a small pot, introduce the water with the vegetal protein, α-humulene, β-lupulic acid, starch, α-amylase, and β-amylase (Table 1).
2. Reach a temperature of 63°C and keep it for 20 minutes (β-amylase rest).
3. Take the temperature up to 72°C and keep it for 10 minutes (α-amylase rest).
4. Increase the temperature up to 80°C for five minutes for enzyme deactivation.
5. Add the ethyl acetate, isoamyl acetate, limonene, and linalool (Table 1).
6. Take the temperature up to 100°C and keep it for 30 minutes. Expect a 10-15% evaporation rate at this point.
7. Cool down at ambient temperature and later store the liquid in the fridge at 4°C.
8. Pressurize with CO_2 in a regular beer keg.
9. Store cold.

Table 1 – Ingredients for the dispersion medium

Ingredient	Quantity
Water	1000 ml
Vegetal protein	30 g
α-humulene	30 mg
β-lupulic acid	13 mg
Starch	40 g
α-amylase	120 mg
β-amylase	100 mg
Ethyl acetate	45 mg
Isoamyl acetate	4 mg
Limonene	12 mg
Linalool	10 mg

Beads

1. Prepare a dispersion of water, ethanol, starch, capsaicin, anthocyanin, citric acid, and sodium alginate with the quantities shown in Table 2.

2. Prepare 200 ml of a solution containing 2% (w/v) $CaCl_2$.
3. Add the dispersion from step 1 to a syringe with a size-22 needle.
4. Introduce the dispersion dropwise, slowly, to the $CaCl_2$ solution being stirred at 400 rpm.

Table 2 – Ingredients for the bead preparation.

Ingredient	Quantity
Water	50 ml
Ethanol	450 ml
Starch	30 g
Capsaicin	1.5 mg
Anthocyanin	50 mg
Citric acid	90 mg
Sodium alginate	12.5 g

Final Chel-OH-ta

The beads have a radius of about 0.001 m, which occupies a volume of 0.034 ml. As the beads are 90% alcohol, approximately ~784 beads (~24 ml) would be necessary to reach the 5% alcoholic content in this NbN beer. Thus, the steps to serve this drink are as follows:

1. In a volumetric flask, measure 24 ml of beads.
2. Add the beads to a beer mug (as Figure 1) and proceed to add the cold and carbonated dispersed medium.
3. Enjoy!

3. CONCLUSIONS

- Considering the beads and the starch particles dispersed in the system, Chel-OH-ta can be considered a suspension following IUPAC definition.
- Chel-OH-ta is a versatile Note-by-Note beverage that can be consumed by all types of consumers.

4. RECOMMENDATIONS

- The recipe of the beads can be modified to match other flavours such as creamy, vanilla, etc, as well as the dispersed medium can have a recipe for other beer styles (stout, brown ale, etc).
- The gas could be replaced by nitrogen, which gives a finer bubble size and, thus, could offer better head stability.
- Develop the prototype experimentally.

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