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“Summer with sustainability”: note by note cooking utilizing food waste

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Abstract

This study addresses the pressing issue of food waste in the context of contemporary food production, which is strained by population growth, urbanization, and climate change. The introduction of synthetic cooking, a technique dating back to 1994, offers a novel approach by using pure compounds or mixtures instead of traditional food tissues and presents a potential solution to global food scarcity. Molecular cooking technique “gelification” is explored for their transformative potential in food preparation. Inspired by the flavours of summer, a dish named “Summer with Sustainability” is presented, featuring mango pudding, spirulina lemonade noodles, watermelon discs, and beachy cola petals. By incorporating ingredients such as whey protein, carrageenan, agar-agar, and dietary fiber cellulose, this dish embodies the principles of food waste reduction and sustainability, offering a promising way to address contemporary food challenges.

Keywords

recipe, note by note cooking, International Contest for Note by Note Cooking, 2023

Introduction

Food production, which has become a significant problem in contemporary society due to population growth, urbanisation, and climate change, is one of a country's main economic pillars (Vittuari *et al.*, 2016). The loss of food has increased over time and is now a major contributor to climate change. As a result, reducing food waste is essential to creating a sustainable and resource-efficient food chain.

Synthetic cooking is a method of food preparation that was introduced in 1994 (This, 2013). It was defined as making foods and dishes without using the tissues of meat, fish, vegetables, or fruits; instead, it uses pure compounds or mixtures of them. This suggested that this idea could be used to end world hunger (Precup *et al.*, 2021).

The structure and texture of food can be reformulated using various molecular cooking techniques, fruit and vegetable by-products, and cutting-edge food production techniques. With the help of molecular cooking methods like lyophilization, spherification, gelling, and sous-vide cooking, we can see how food

preparations are done from a fresh perspective (Precup *et al.*, 2017).

The dish proposed was inspired by the dishes and drinks made in summer. Since I was raised in a tropical nation (India), summer also meant eating mangoes, sipping lemonade, or enjoying tasty watermelon and coke on the beach with my family. This dish consisted of mango pudding made with note by note beverage, spirulina lemonade noodles in lemonade, watermelon discs and film and beachy cola petals. By utilising ingredients like additional whey proteins, carrageenans and corn flour in the pudding, spirulina and agar-agar in the noodles, agar-agar and dietary fibre cellulose in the watermelon discs and film, and agar-agar in the beachy petals, this dish combines the ideas of food waste and summer with sustainability.

Materials and Methods

1. Note by note beverage

Ingredients:

- 174 g water
- 5.4 g casein protein (unflavoured) (by "Mycoprotein")
- 3.5 g whey protein (unflavoured) (by "Bulk")
- 9.6 g lactose (by "MSK")
- 8 g refined sunflower oil (by "Mediterrani").

Process:

- Weigh the water and add it to a bowl.
- Weigh casein powder, lactose, and whey powder and add it to the water.
- Mix everything with the help of whisk.
- Weigh and add sunflower oil and blend it using hand blender for 1 minute.

2. Note by note "mango" pudding

Ingredients:

- 30 g sucrose (table sugar)
- 200 g note by note beverage (above)
- 20 g corn starch (by "Gem")
- 0.2 g kappa carrageenan (by "MSK")

- 8 g mango powder (by "Sosa")
- 0.2 g yellow colour (food grade) (Yellow colour Gel colouring by "Punto Italiana")
- 0.05 g orange colour (food grade) (Orange colour Gel colouring by "Punto Italiana")
- 0.5 g mango flavourings (by "Sosa").

Process:

- Stir corn starch and kappa carrageenan into 50 g of note by note beverage.
- Into remaining note by note beverage, add sucrose and mango powder and bring it to boil.
- Remove from heat and stir corn starch and kappa carrageenan mixture into hot beverage.
- Start heating again and stir constantly. Let it heat for 3 minutes and remove from heat. Add mango flavouring and mix.
- Pour into the moulds and leave it to set in refrigerator at minimum 4°C for half an hour.

3. Note by note spirulina lemonade noodles

Ingredients:

- 0.5 g spirulina powder (by "Bulk")
- 0.5 g citric acid (citric acid monohydrated – E330 by "Louis Francois")
- 140 g water
- 1 g salt (table salt)
- 3 g sucrose
- 2.4 agar-agar (by "Sosa")
- 0.2 g green colour (food grade) (Green colour Gel colouring by "Punto Italiana")
- 0.5 g lemon skin natural flavouring (by "Sosa").

Process:

- Weigh spirulina powder, citric acid, salt and sugar and mix in its water.
- Stir everything and add it to saucepan. Dissolve agar-agar and start heating.
- Keep stirring while heating the mixture and bring it to boil.
- Take off the heat and add green colour and lemon aroma and mix it again.
- Fill the syringe and with it fill the silicone tubes. Submerge the full tubes in ice-water bath and let the mixture set for few minutes.
- With an empty syringe, inject air into the tube to get the noodle out of the tube.

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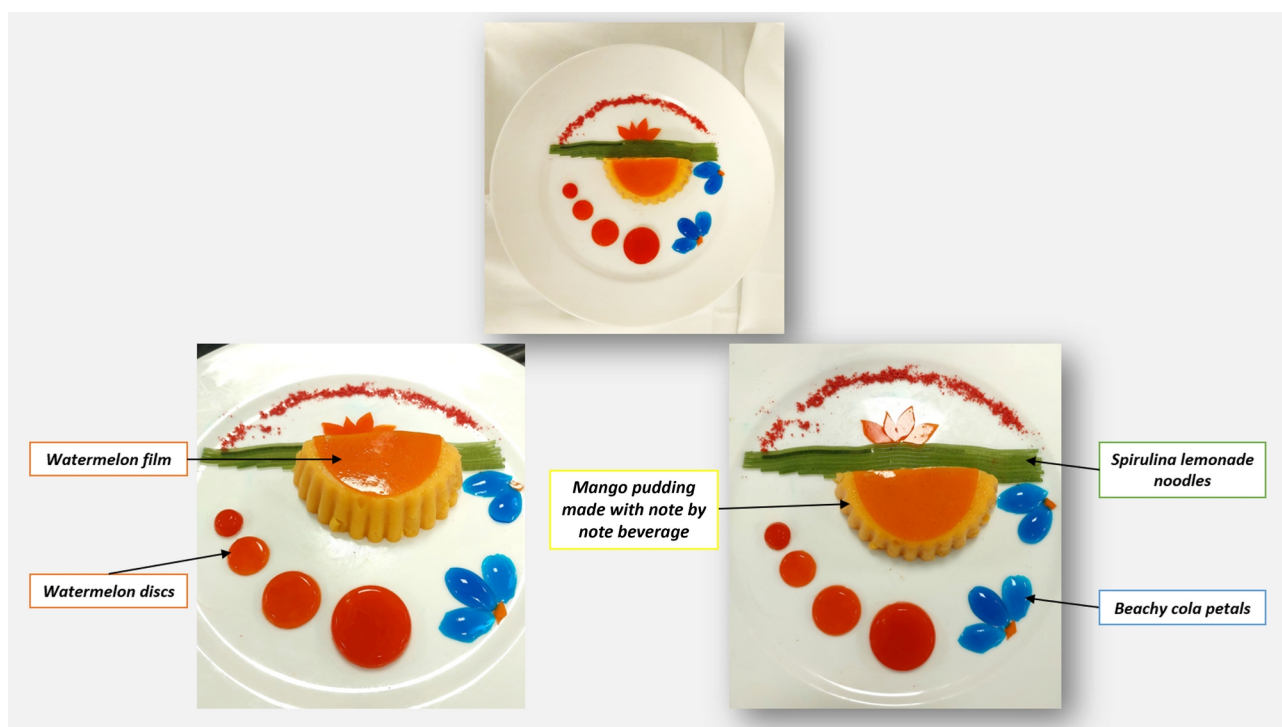


Figure 1. “Summer with Sustainability” plate combining all the elements.

4. Note by note watermelon discs and film

Ingredients:

- 100 g water
- 1.5 g agar-agar (by “Sosa”)
- 2 g dietary fiber cellulose (by “NutriCology”)
- 0.2 g orange colour (food grade) (Orange colour Gel colouring by “Punto Italiana”)
- 0.5 g watermelon flavouring (by “Sosa”)
- 10 g sucrose (table sugar).

Process:

- Add dietary fiber cellulose, orange food colour, sugar and agar-agar to water. Mix well.
- Bring it to boil. Stir well. Take out from heat and add watermelon aroma.
- Pour into measuring spoon set of 4 and also on a plate (spread evenly).
- Set aside and let it cool down.
- After half an hour, demould from spoons and cut the film on a plate.

5. Note by Note beachy cola petals

Ingredients:

- 100 g water
- 10 g sucrose (table sugar)
- 2 g salt (table salt)
- 0.3 g citric acid (citric acid monohydrated E-330 by “Louis Francois”)
- 1.5 g agar-agar (by “Sosa”)
- 0.2 g blue colour (food grade) (Blue colour Gel colouring by “Punto Italiana”)
- 0.5 g cola flavouring (by “Sosa”).

Process:

- Add citric acid, sugar, salt, blue food colour and agar-agar to water. Mix well.
- Bring it to boil. Stir well. Take out from heat and add cola aroma.
- Pour into 8-10 small plastic spoons.
- Set aside and let it cool down.
- After half an hour, demould from spoons.

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Discussion

To sum up, the goal of creating a note by note dish (Figure 1) in accordance with the food waste brief provided was accomplished with a dish called "Summer with Sustainability". A wholesome dish was created where each component attempted to share its personal experience with food waste. Whether it was the mango pudding, watermelon discs or spirulina lemonade noodles, every component of the dish had some connection to reducing food waste and promoting sustainability. The main ingredients in the dishes were agro-industrial waste and functional ingredients. There was no injustice in the dish's flavour even after it had been broken down note by note. The presentation included a tasty dessert, lemonade in the shape of noodles, coke in the shape of petals, and watermelon fresh feel in the shape of a disc and a film.

Conclusion

In conclusion, "Summer with Sustainability" successfully addressed the food waste challenge through innovative culinary techniques. The dish's harmonious blend of agro-industrial waste and flavours showcases the potential of molecular gastronomy, note-by-note cooking, and biotechnology in promoting sustainability. It stands as a compelling example of how gastronomy can play a role in mitigating today's food waste problem.

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