

Advanced Molecular Gastronomy
TFCS 9025

2023 International Contest for Note-by-Note Cooking

Trash Island: An Ecological Étude



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8 May 2023

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With the support of the
Erasmus+ Programme
of the European Union

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Introduction

Molecular Gastronomy

Cooking is generally thought to be an art, combining ingredients to concoct a dish please to both the eyes and palette. Molecular gastronomy turns that notion on its head: it principally uses scientific techniques to create intriguing flavours, textures, and visual effects. It is concerned with the physical and chemical changes that occur during cooking and manipulating them to achieve the desired result. A main component of this type of cooking is understanding the "why" rather than relying on anecdotal evidence (Myhrvold, 2019). Molecular gastronomy is firmly rooted in science, requiring quantifiable evidence and demanding precision in its execution.

Note by Note

Note-by-Note takes molecular gastronomy a step further in innovation. Hervé This, a pioneer in Molecular Gastronomy, proposed Note-by-Note cooking in 1994 (Burke and Danaher, 2016). The main principle of Note-by-Note cooking is the use of pure compounds. This means that no whole food can be found in a Note-by-Note dish--this includes fruits, vegetables, meats, and cheeses. The idea behind this culinary technique is that all aspects of the dish can be specifically designed, from the taste to the aromas to the nutritive properties. An important aspect of Note-by-Note is to create novel food items, with new tastes, aromas, textures--not recreate a dish already in existence (Burke and Danaher, 2016).

While this may seem fanciful to some, the Note-by-Note project strives to disrupt the food industry to create a more sustainable way to feed a rapidly growing global population. By creating nutritious food using just constituent chemicals, pressure is alleviated from having to produce enough food using traditional agricultural methods (Thomson, 2014). Only using molecular compounds requires far less energy and it much more sustainable (This, 2014). Precision cooking cuts down on waste as only the necessary components of a material are used. Take a potato, for example. Often the skin is peeled off and put into a waste bin--in molecular gastronomy, only the flavour, odour, or macronutrients necessary from the potato would be included in the dish. This means everything is used and the dish leaves behind no waste (This, 2022).

The Note-by-Note project aims to help fight food spoilage and waste and conserve water, energy, and the environment as a whole. With the understanding that the world population will be around 10 billion people in 2050, Note-by-Note wants to update cooking technology and the scientific understanding of food in order to meet this demand (This, 2022).

Theme

This objective of the Note-by-Note project leads to this year's theme: "Food Waste". More than 25% of food produced globally is wasted, even though many people around the world regularly face food instability. This wasted food contributes to 10% of greenhouse gas emissions, along with a significant use of scarce natural resources like water, energy, and land (Environmental Protection Agency, 2022). Beyond the negative toll it takes on the environment, food waste is expensive, with consumers spending money on food they don't eat in the face of a global financial crisis (This, 2022).

The image that pops into my head when I think of waste, in general, is the "Great Pacific Garbage Patch". It was discovered in 1997--just a few years after the proposal of Note-by-Note cooking--by a French sailor who discovered miles of trash littering his route from California to Hawaii. This floating "island" is made of non-biodegradable plastics and other trash items trapped in the calm zone of the North Pacific Subtropical Gyre (Snowden, 2019). Photodegradation of these plastic items creates tiny pieces of microplastics which are highly toxic to marine life--but no country is willing to take responsibility to clean it up (National Geographic, 2022).



Figure 1: The Great Pacific Garbage Patch

My take on "Food Waste" stems from this mental image I conjured. While Note-by-Note precludes the recreation of already-existing food items, my dish takes this "Great Pacific Garbage Patch" physical phenomenon and manifests it in a food form.

The title of my dish is "Trash Island: An Ecological Étude". The word 'étude', which roughly translates to 'study', pays homage to the French origins of Note-by-Note cooking (Cambridge

Dictionary, 2022). This dish is meant to be more than a novel culinary experience--it is an opportunity to educate the consumer about food waste, plastic, and sustainability. Each individual element of the dish was created with symbolism to impart specific takeaways to encourage the person consuming it to make strides towards personally reducing their impact on the environment.

Aims and Objectives

The aim for this year's competition is to create a novel Note-by-Note dish that fits the 2023 theme "Food Waste" by using as close to pure compounds as possible.

In order to achieve this objective, I cordoned my creation into several small parts with their own aims:

- Create a multi-colored "ocean" crème that mimics the color depth of the deep Pacific
- Formulate a chocolate mousse "island"
- Produce a "microplastics" tuille
- Fashion green colored "glass shards" from isomalt
- Construct an educational experience on a plate

This report discusses the semiotics, materials and methods, results, discussion, conclusion, and recommendations for this dish.

Semiotics

The overall goal of this project was to create a novel dish representing the theme "food waste". To me, this dish is a way to educate and empower the people who consume it and call on them to bring about positive change. "Trash Island" takes inspiration from the "Great Pacific Garbage Patch". Each component of the dish is one component of the floating monstrosity and teaches the diner different lessons about plastics and food waste.

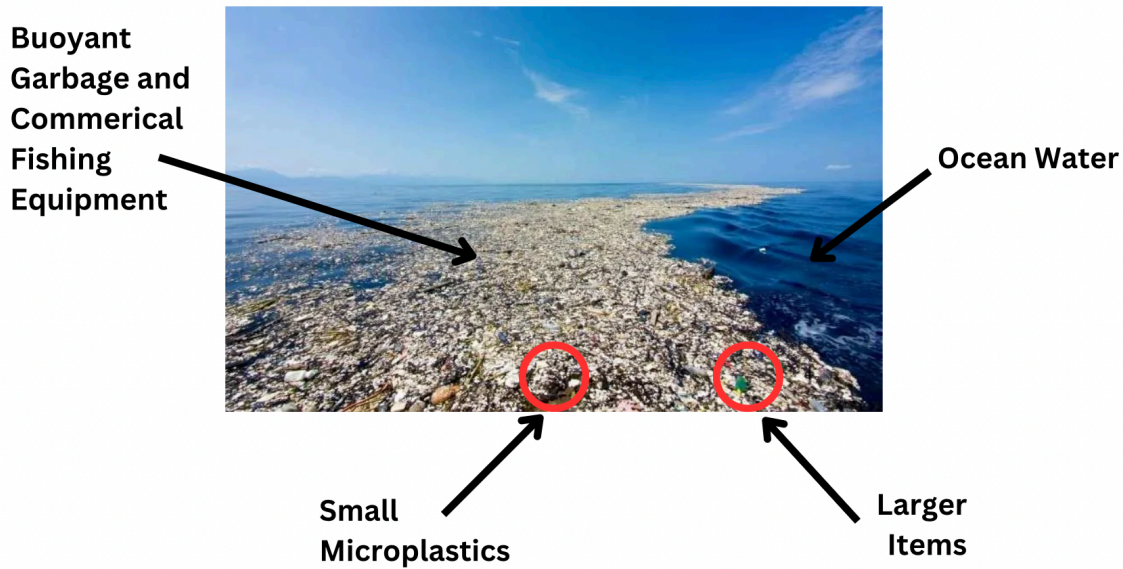


Figure 2: Components of the Great Pacific Garbage Patch

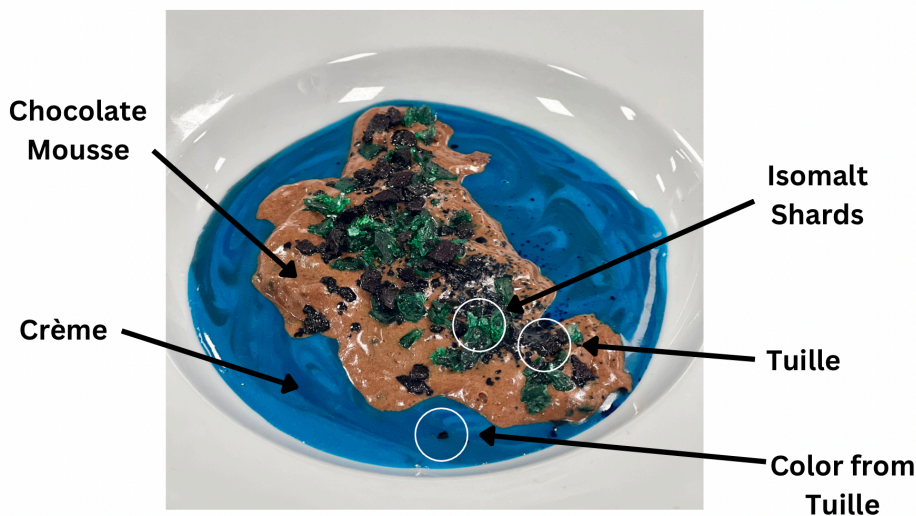


Figure 3: Explanation of "Trash Island" components

Isomalt Shards

The isomalt shards represent larger plastic items floating in the Great Pacific Garbage Patch. The photo of the Great Pacific Garbage Patch, found in the introduction of this report, has easily identifiable green plastic items floating on top of the ocean. These items are at the beginning of their life on the water, not having been broken down into microplastics yet. Usually made of polypropylene and polyethylene, these "floater plastics" are just a bit lighter than water (Earth Island, 2006). Polypropylene is generally used for microwaveable packaging because it is resistant to high temperatures. Polypropylene is generally used for packaging nuts, rice, and sauces (SP Group, n.d.). The United Nations Food and Agriculture Organization estimated that

in 2019, 12.5 million tons of plastic was used in food production alone (Uffelen, 2021). Large food companies, such as Nestle, Unilever, Kraft Heinz, and PepsiCo, are leading the way—using virgin plastic for single-use applications (Martino, 2022). Plastic is very useful in the food industry, even helping to reduce food waste by extending shelf life and protecting food items from safety threats. But after just one use, it often ends up in landfills or in the ocean. These shards represent the beginning of the life of plastic after it is thrown out—a harsh reality that consumers generally don't think about but need to be aware of in order to engender change.

These "floaters plastic" isomalt shards are coated in banana aroma, giving the consumer a taste of the valuable lesson that needs to be learned about water, fresh fruits and vegetables, and food waste.

Bananas are abundant, but frequently wasted at the slightest sign of imperfection. Over a third of consumers say that they throw away bananas if it has just a small bruise. This amounts to a massive amount of waste: in the United Kingdom, 1.4 million edible bananas are thrown away every single day (Smithers, 2017). This costs British consumers over \$100million every single year, highlighting food waste as a sustainability concern but also a real economic problem. The problem extends across the pond: in the United States, over 5 billion bananas are thrown away each year (Bereket, 2022). While bananas are the example I chose to highlight for this dish, the issue extends to other produce. Fresh produce comes right after bakery products as the most frequently wasted food. Almost 40% of vegetables and 25% of fruit that are purchased are thrown out (Stop Food Waste, 2023). The issue doesn't even end with food waste—water pays the price as well. It takes 270 days for a tree to produce bananas, requiring 1,300 gallons of water. Each plant produces around 240 bananas, which means the bananas thrown out by Americans each year wastes over 27 billion gallons of water (Bereket, 2022).

The flavor of this component shows the diner the true cost of produce and implores them to keep it out of the bin, even if it isn't perfect.

Tuille

While a tuille is generally a beautiful decorative piece in molecular gastronomy, I chose to break it into small bits to represent the "microplastics" on the Great Pacific Garbage Patch. The larger "floaters plastics" are broken down into smaller pieces over time. It would take thousands of years to decompose, rather, these items become microplastics. To understand the magnitude of the problem: there are 5.25 trillion pieces of microplastic in marine environments and overall plastic is expected outweigh fish in the world's oceans by 2050 (Eriksen et al., 2014).

There are a few spots in the crème where I placed bits of the tuille powder. The moisture in the crème dissolved the powder, leaving dark, almost black spots in the water. This is representative

of when the microplastics making up the Great Pacific Garbage Patch are broken down: they start leaching out BPAs and colorants into the ocean. These are toxic to both marine life and humans (McCarthy, 2018).

As for food waste, this dish component's flavor magnifies bakery items with a baked bread flavor. Bread is the most commonly wasted food item in Europe--41% of people report throwing away bread (Environmental Protection Agency, 2020). Bakery and bread as a whole are wasted at a rate of 20% (Stop Food Waste, 2023). This valuable food is going to waste, especially in the face of hunger across the world. Even in high-GDP countries like the United States, nearly 10% of the population struggles with food insecurity when almost 108 billion pounds of food is wasted each year (White House, 2022). Food waste and food scarcity go hand in hand, a symbiotic relationship where minimizing one can minimize the other (The White House, 2022).

Chocolate Mousse

The flavor of the "island" is chocolate, representing the snacks and candy wrappers than end up in landfills and oceans. When looking at food waste, it is imperative to consider packaging. While recycling is more prevalent now than ever, tons of food packaging is still getting tossed in the garbage. Crisps packaging is the worst offender and chocolate wrappers come in second. The reason is two-fold: one, most candy wrappers are not recyclable and two, even if they are recyclable, there is no attention-grabbing verbiage on the packaging to indicate to the consumer that they should be recycled. The result of both of these scenarios is that the wrappers end up in the trash (Rubicon, 2021). Consumers should be more vigilant regarding the recyclability their food packaging materials--and demanding more sustainable packaging from food companies for the future.

With bread and produce already considered with the toppings of the dish, I want to use the color of the "island" to highlight food waste related to protein. The light brown shade, representing old sun-degraded industrial fishing nets, imparts a striking lesson about fish related food waste.

Fish is important to consider with regards to food waste--more than 3.2 billion people have fish account for at least 20% of their protein intake. But more than 27% of what is caught is thrown away or rots before it ever even gets sold, meaning the actual waste rate of fish is higher. What doesn't even make it to grocery store shelves adds up to around 50 million tons of potential food just gone (McCarthy, 2018). Not only are the fish themselves being wasted, but the common practice of discarding old gear in the ocean, rather than proper disposal, contributes to up to 50% of the Great Pacific Garbage Patch (Snowden, 2019). These nets do not decompose--they turn brown in color and break down into smaller microplastics that endanger marine life. While not food themselves, this fishing gear is responsible for the entanglement and killing of up to 300,000 whales and dolphins each year (McCarthy, 2018). Inefficient fishing practices are

wasting millions of tons of fish each year--and bad disposal practices will dwindle the supply of this important protein for the future.

Crème

Everything above the surface of the crème "water" magnifies the glaring problem of food waste and single-use plastic. But like water, which is the basis of all life on Earth, the crème represents sustainability, resilience, and hope for the future. The base of "Trash Island" depicts the ocean. There are three shades of blue used to show the depth and beauty of the Pacific Ocean, where the Great Pacific Garbage Patch is located.





The coconut flavor gives a nod to the resilience of the coconut. This tough little seed can survive years of travel in sea before making landfall and growing into a new palm tree. It is a survivor--through trials and tribulations of rough sea conditions, it has the fortitude to thrive. The adaptations of the coconut tree aid this species in many different facets of coastal living. These trees weather harsh tropical storms, survive in unwelcoming environments where other trees fail to thrive and spread their seeds widely and effectively at a greater distance than most other plants can manage (Pham, 2016). Coconuts are also a symbol of sustainability: the palm tree is a carbon offsetting plant that removes greenhouse gases from the atmosphere (Nguyen, 2022).

While food waste and environmental destruction seem like Goliathan problems to overcome, there is still hope. The crème is a message to make a difference: the world is resilient, but it comes down to each and every person living in it do their part. Activism influences corporations to make positive change and governments to implement more sustainability-oriented legislation. While the goal is for the person who eats this dish to have a novel culinary experience, Note by Note cooking is all about sustainable development and making a difference in the fight for a better planet. This educational dish obliges the diner to learn, think, and take action--propelling forward the mission of the "Note by Note Project" (This, 2022).

Materials and Methods

The exact recipes for the dish components are listed below. Appendix 1 contains more detailed information about the ingredients and suppliers. The specialized equipment required for this dish is found below in Table 1.

Table 1: Special equipment used in Note-by-Note Dish

			
SkyLine Premium Electric Combi Oven 10GN1/1	Electrolux Modular Cooking Range Line 900XP 6-Burner Gas Range on Gas Oven with Cupboard	Vowerk Thermomix® TM6	Sirman Panasonic Ne1840

Crème

Ingredients

Table 2: Ingredients used in the crème portion of the dish

			
Orange Gel Color ⁶	Blue Gel Color ⁴	Whey Protein ¹⁰	Sucrose (from bulk) ²
			
Micellar Casein ¹¹	Coconut Flavor ¹²	Xanthan Gum ¹⁵	Water (from tap)

Equipment

- Small bowl (x2)
- Plate
- Palette knife
- Spoon (x4)
- Spatula
- Ramekin (x3)
- Weighing scale

Method

- 25g Sucrose
- 70 ml Water
- 1g Xanthan gum
- 5g Whey powder
- 15g Micellular casein
- 5 drops Coconut flavor
- Blue gel dye
- Orange gel dye

Mix xanthan and sucrose in a small bowl. In another bowl, mix whey powder and casein with water. Add xanthan/sucrose and mix until homogenous. Add coconut flavoring (Figure 4a). To color, create three different shades of blue using blue gel dye and orange gel dye on a small plate with a palette knife (Figure 4b). Add 30g of the crème mixture into two ramekins, leaving the remaining crème in the bowl. Add one shade of blue to each container (Figures 4c and 4d).

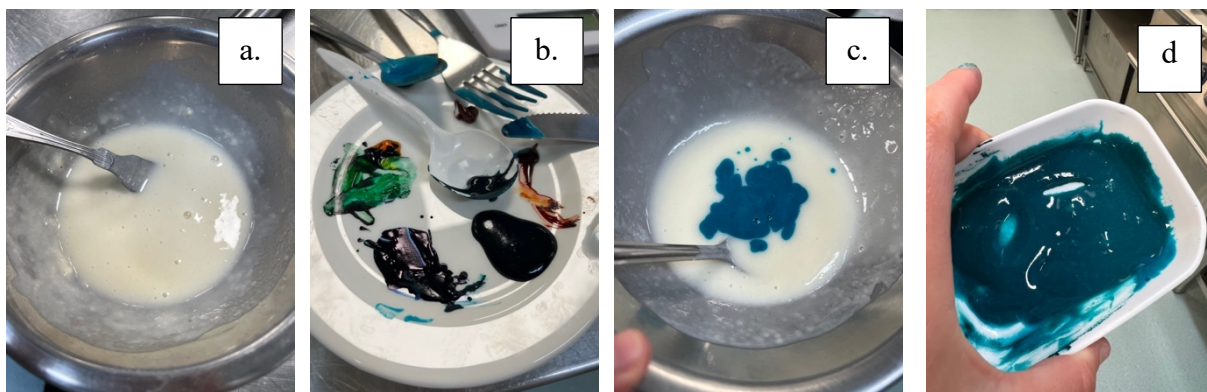









Figure 4: Stages of crème making

Chocolate Mousse

Ingredients

Table 3: Ingredients used in the chocolate mousse portion of the dish

			
Pectin ⁸	Micellular Casein ¹¹	Sucrose (from bulk) ²	Egg White Powder ¹⁶
			
Cocoa Powder ¹⁴	Coconut Oil ¹³	Water (from tap)	

Equipment

- Small pot
- Spatula
- Microwave
- Ramekin
- Weighing scale
- Medium bowl
- Whisk

Method

Ganache

- 2.5g Pectin
- 6g Casein powder
- 15g Coconut oil
- 10g Cocoa powder
- 20g Sugar
- 45g Water

Mix pectin and sugar together in a small pot. Hydrate with water. Place on stove and heat to a boil. Once boiling, remove from heat. Microwave the coconut oil in a ramekin for 30 seconds until completely melted. Add the casein, cocoa powder, and coconut oil to the pectin mixture (Figure 5a). Stir until smooth and well-mixed

Meringue

- 10g Egg white powder
- 30g Water

Add egg white powder and water to a medium-sized bowl. Using a whisk, whip until stiff peaks form (Figure 5b)

Mousse

Using a spatula, lightly fold ganache into meringue. Cover with plastic wrap and place in to fridge for at least 20 minutes.

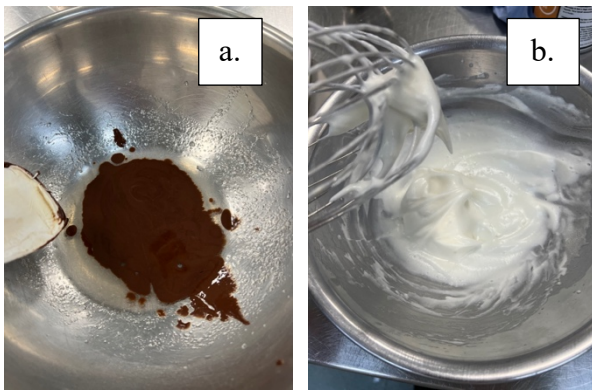


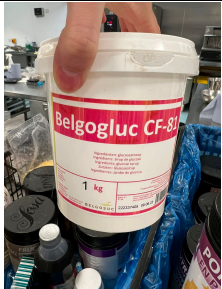



Figure 5: Stages of chocolate mousse making

Tuille

Ingredients

Table 4: Ingredients used in the tuille portion of the dish

			
Baked Bread Flavor ⁹	Blue Dye Powder ⁵	Glucose Syrup ³	Water (from tap)

Equipment

- Small pan
- Spatula
- Spoon
- Weighing scale
- Oven
- Grinder
- Baking tray
- Parchment paper
- Spoon

Method

- 15g Water
- 30g Glucose syrup
- 2g Powdered blue color
- 5 drops Baked bread flavor

Mix the water and glucose syrup in a small pan. Heat until the mixture starts to brown on the wall of the pan. Stir gently until the mixture is brown throughout the pan. Pour onto a parchment paper covered baking sheet. Let cool until hard. Grind the hard disks until powder forms. Spread powder on a parchment paper covered baking tray in small circles (Figure 6a). Add 0.2g of blue powder dye to each circle and mix. Add a drop of brown bread flavor to each small circle. Bake for 7min at 180 deg C with the fan completely off. Crumble into small pieces.

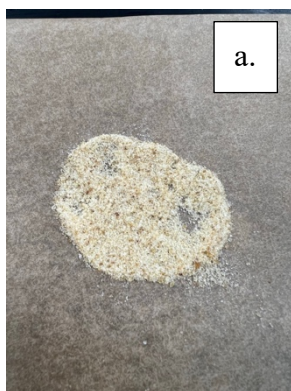


Figure 6: Tuille making

Isomalt Shards

Ingredients

Table 5: Ingredients used in the isomalt shards portion of the dish

			
Banana Aroma ¹⁷	Yellow Gel Color ⁷	Blue Gel Color ⁴	Isomalt ¹

Equipment

- Small pot
- Spoon
- Weighing scale
- Plate
- Palette knife
- Baking tray with parchment paper
- Small plate
- Food brush

Method

- 50g isomalt crystals
- 2g water
- 4 drops blue gel dye
- 1 drop yellow gel dye
- 5 drops Banana aroma

Melt isomalt in a small pot over medium high heat. Add water. Stir occasionally to ensure even melting. Once bubbles are even in size and the isomalt is clear, remove from heat. Let stand for 20 seconds. Pour isomalt onto a parchment paper covered baking tray. Let sit to harden (Figure 7a). On a small plate, mix a dark green color using the blue and yellow gel dye. Paint onto the hardened isomalt and allow to dry. Spread banana aroma on the isomalt and allow to dry. Use a hard object to crush into shards (Figure 7b).

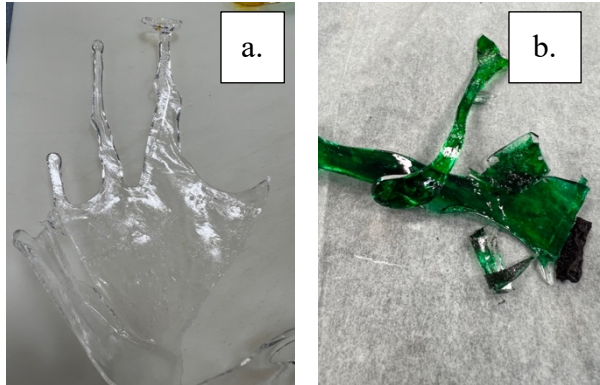


Figure 7: Isomalt shard recipe steps

Results

Plating

This dish is plated from the bottom up in a shallow bowl. First, add the three shades of blue crème to the bowl. Mix around to allow the colors to mix slightly. Next, add a layer of the chocolate mousse. Spread it to create a large area but leave it thick enough to maintain the 3D effect. Next, spread the isomalt shards on top of the chocolate mousse. Lastly, add the tuille crumble to the top of the chocolate mousse. Drop in a pinch of the smallest pieces directly into the crème and allow to dissolve.

Final Dish







Figures 8a and 8b show different angles of the final dish: “Trash Island: An Ecological Étude”.



Figure 8: Bird's eye and side views of "Trash Island"

Images of each of the final components of the dish can be found below in Table 6.

Table 6: Components of the final dish

		
<p>Chocolate mousse "island"</p>	<p>Crumbled tuille "microplastics"</p>	<p>Larger "floating plastic" isomalt shards</p>
		
<p>Crème blue shade #1 (deep blue)</p>	<p>Crème blue shade #2 (light blue)</p>	<p>Crème blue shade #3 (dark teal)</p>

Sensory

A small sensory test was conducted on the final dish to understand acceptance of color, adherence to theme, originality, and flavor. 100% of participants thought that the dish was "very original" and 75% said that "well represented" the theme. 75% of the participants "slightly liked" the flavor. However, the overarching comment was that while the chocolate and coconut flavors shined, the baked bread and banana flavors were too light.

With regards to color, 75% of the respondents "slightly disliked" the color of the dish. This result surprised me, but all respondents commented that they "tasted blue". In the United States, where I am from, artificially bright colors including blue are commonplace in food. However, that is not the case in Europe, where this sensory test was conducted. Though Note-by-Note is meant to be innovative, according to research, 'food neophobia' is still a hurdle to overcome. By combining traditional concepts with Note-by-Note methods to create bespoke dishes, the anchor

of familiarity can increase consumer acceptance (Burke, Danaher and Hurley, 2020). By using a color that has no air of familiarity for my tasters, the color proved too different for widespread acceptance.

Discussion

Evolution from Original Concept

This dish was created over the course of three kitchen sessions. Based on trials of the original recipes, the dish evolved to achieve its final form. Two of the original components of the dish proved unfeasible to create in the allotted experimental time. The first was a vauquelin, which was the initial idea for the "island". It never created quite the right texture and the additives required to make an airy foam were absolutely detrimental to the flavor. A chocolate mousse replaced this component. The second component that did not make the final dish was edible cellophane. Made from glycerin and gelatin, this clear material has a drying period of 48 hours after which it should resemble a candy wrapper. Due to time constraints, this recipe was only tested during the second kitchen session and the trial was unsuccessful. Because it took so long to set, leaving very little time for experimentation, I decided to swap this out for isomalt shards.

For more detailed information on the ideation and development process, logbooks are included in Appendices 2-5.

Ingredient Technology

Crème

The crème for this dish is based on a recipe from a TCFS 9025 Advanced Molecular Gastronomy class. That recipe used xanthan gum to thicken a banana milkshake, but included milk, which is not Note-by-Note. To adapt the recipe for this project, I included whey protein, micellar casein, and water. These are the main constituents of skim milk and worked well as a replacement. Xanthan gum is a powerful hydrocolloid that disperses in liquid and raises the viscosity of the solution. This allows for a crème that is mostly water and protein, because the xanthan gum provides the expected rheological properties. Because xanthan gum is soluble in both hot and cold water, I was able to have the crème be cold, creating a fun sensation for the tongue while allowing for greater stability for the cool mousse that rested on top of it (Ptaszek et al., 2015).

Mousse

Chocolate mousse is generally made from chocolate, cream and eggs--all of which are prohibited in Note-by-Note cooking. A mousse recipe is often broken up into two parts: a chocolate

ganache and a whipped egg white foam. The foam provides the air to the dish and the ganache provides structure and stability (Judson, 2021).

The first part of chocolate mousse required recreating the functional properties of a ganache, without using chocolate or cream. Dark chocolate is just a mix of cocoa butter, cocoa powder, and sugar. While not a pure Note-by-Note ingredient, I used cocoa powder in this recipe since it was the only available chocolate flavor. Cocoa butter is a fat that is solid at room temperature--similarly to coconut oil, making this an easy substitution choice. Sucrose was used to provide sweetness, and presto: chocolate substitute! To create structure for the mousse that would normally come from heavy cream, I used rapid set pectin. This is a polysaccharide that create thermo-reversible gels in the presence of sugar, acid, and calcium (Judson, 2021). The sucrose in the ganache provides the sugar and the cocoa powder provides both the calcium ions and the requisite acidic pH (Miller et al., 2008).

The ganache provides a fat structure, which at cooler temperatures hardens around air bubbles to keep them in place. Egg whites are easily whipped due to their albumin protein content. Tangled proteins make up 10% of an egg white. Whipping inflicts such a force that the proteins stretch out and expose hydrophilic and hydrophobic amino acids. The water in the egg white is attracted to the hydrophilic amino acids while repelled by the hydrophobic ones. The hydrophobic proteins are attracted to available air pockets and eventually link together, creating the bubble structure of a foam (IFST, 2017). The more whipping that is done, the more air can be incorporated which makes the foam larger. However, overwhipping is a distinct possibility. Ovomucin, 50% of the protein found in albumin, becomes too insolubilized and the bubbles are too elastic, which degrades the quality of the foam. In commercial egg white products, additives are included to mitigate overwhipping and create an egg white foam with higher stability and air capacity than just an egg white on its own. Additionally, these products are more sustainable, negating the possibility of wasted egg yolks and requiring less energy to transport because they lack water.

In this dish, egg white powder was used to create the foam. However, pure egg white powder was unavailable—the only substitute also included stabilizer E415, acidifier E330, and expansion agent E1505. Unfortunately, the actual make-up of the egg white powder was not listed, so it cannot be known how much of each additive was present relative to the albumin.

E415 is also known as xanthan gum. It is a polysaccharide generally used as a thickener or emulsifier. It is a cream-colored powder with a neutral taste and soluble in water. It is a very powerful hydrocolloid that should be used sparingly, but dissolves easily and without lumps (Liu, 2019). Foams are a dispersion of gas in a liquid continuous phase (Ozcan and Yavuz, 2018). In this application, it thickens and stabilizes the egg white foam by acting as an emulsifier that increases the viscosity of the continuous phase of the dispersion (Ptaszek et al., 2015).

E330 is citric acid and is used to increase foam stability. According to research conducted on egg white foams, the use of acids and acids salts lowers pH, which protects α -ovomucin and increases the stability of a foam. E1505 is triethyl citrate, which is an ester of citric acid and similarly used in commercial applications to stabilize foams (Ozcan and Yavuz, 2018).

Because this is a powder ingredient, water must be added to hydrate the product and create the tension between the hydrophobic and hydrophilic amino acids. With the water added, this egg white powder mix created a thick, stable foam, so I did not add anything else. When this foam was folded into the ganache and then refrigerated, it created a nice mousse, albeit a bit delicate. In the future, I would trial more stabilizers for the foam to create a more rigid mousse.

Tuille Crumbles

The main component of the tuille crumbles is glucose syrup. This is cooked on a stove, where at temperatures above 160°C, it caramelizes. Adding water to the mixture increases the boiling point of the sugar and adds time to the cooking process, but allows the heat to spread evenly throughout the glucose to stave off burning. Once the heated glucose allowed to cool, it has a hard texture compared to the original viscous syrup (Chef's Studio, 2020). The powder that comes from these hard disks can then be cooked to form bubbly, decorative pieces. Normally added to a dish in that final form, I preferred to crumble them into smaller pieces, which better resembles the desired “microplastics”. This allows them to dissolve more easily on the tongue and they can be integrated into each bite of the dish. Because the glucose powder easily dissolves in water, it is the perfect representation of microplastics that leech toxic colorants into the ocean as they break down as a result of photodegradation (Greenburg, 2006).

Isomalt Shards

Isomalt is an ingredient used mainly in sugar-free confection applications due to its low glycemic index and caloric content. However, it is only 45-65% as sweet as sucrose, making it a good addition to a dessert that is already loaded with sweetness from other components. The main reasoning behind using isomalt was the low melting temperature, which allows the crystals to melt without browning to form similarly to clear glass. This can easily be broken into shards, which more easily eaten (Frechette, n.d.). The clear glass can easily be painted with color and flavor without dissolving, holding form and providing a differentiating texture.

Taste and Texture

A major goal of Note-by-Note cooking is to create an exciting dish with novel flavors and textures.

The goal of each flavor used in this dish is to instill a lesson about food waste in the consumer and the textures were determined by the materials that could be used to replicate the real-life Great Pacific Garbage Patch. That being said, the flavors in each component of the dish complement each other. Chocolate and coconut dominate the dish, just like the commercial fishing nets make up a majority of the garbage patch and water is the most abundant resource on Earth. The baked bread and banana flavors provide flavor notes that do not contradict the chocolate or coconut, rather, they give a perceptible hint.

The isomalt shards provide a crunchy texture to the dish to contrast the soft, smooth textures of the crème and chocolate mousse. The tuille dissolves easily in the mouth, providing a pop of sweetness and interesting color incongruity. The airy nature of the mousse provides a pleasant mouthfeel that feels distinct against the denser, creamy base of the dessert. The chocolate mousse showed stability right from the fridge, but started to wilt slightly after some time at room temperature, indicating a need for further development of its texture.

Conclusion and Recommendations

The objective of the 2023 Note-by-Note International showcase was to create an innovative dish that dealt with the theme "Food Waste". My dish, "Trash Island: An Ecological Étude" used almost exclusively pure compounds to create an educational dessert that embodies the mission of the "Note-by-Note Project". This project aims to contribute to the fight against food waste without detrimental impacts to the environment (This, 2022). "Trash Island" educates the diner about many of the most important issues regarding food waste, including packaging and plastics in food manufacturing, to inspire them to join the fight for more sustainable food development.

Isomalt shards, with their clear glassy nature, represent the large plastic items floating on top of the Great Pacific Garbage Patch. The dark tuille crumbles show what happens as a result of photodegradation, where tiny microplastics endanger marine environments and release toxic colorants into the ocean. Glucose syrup made a perfect vehicle for this: it is easily broken down into tiny piece and because it is soluble in water, it releases color easily. The "island" portion of the dish is a mousse constructed from pectin and egg white powder with stabilizer, adding an airy texture and dominant chocolate flavor while educating the consumer on the downsides of commercial fishing and fish waste. Lastly, the crème made from water, xanthan gum, whey, and casein acts as a vehicle of hope and resiliency. The creamy base made from hues of deep blue is coconut flavored, which reminds the consumer that even in the face of the harshest outlooks in food waste and the environment, humanity has the ability to overcome and prosper.

More development time would be necessary to perfect the texture of the chocolate mousse, as it was less stable than desired at warmer temperatures. Additionally, I would be remiss if I failed to mention the food waste created as a result of this project. Though Note-by-Note is meant to be a

more sustainable way to produce food, the precise nature and required experimentation does result in the wasting of ingredients during recipe development.

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Appendix

Appendix 1: Full List of Ingredients

1. Isomalt Specific for Décor Neutral
 - a. Supplier: La Rousse Foods
 - b. Code: 89103
2. Granulated Sugar
 - a. Supplier: La Rousse Foods
 - b. Code: 80032
3. Glucose Syrup
 - a. Supplier: La Rousse Foods
 - b. Code: 80056
4. Blue Gel Color
 - a. Supplier: Il Punto Italiana
 - b. Code: 13364
5. Blue Indigo Powder Color
 - a. Supplier: Mallard Ferriere SAS
 - b. Code: 13564
6. Orange Gel Color
 - a. Supplier: Il Punto Italiana
 - b. Code: 13362
7. Yellow Gel Color
 - a. Supplier: Il Punto Italiana
 - b. Code: 13361
8. Rapid Set Pectin
 - a. Supplier: Louis Francois
 - b. Code: 150 SAG
9. Baked Bread Flavor
 - a. Supplier: MSK
 - b. Code: MSK-1628/45657
10. Pure Whey Protein
 - a. Supplier: Bulk
 - b. Link: <https://www.bulk.com/ie/pure-whey-protein.html>
11. Micellular Casein
 - a. Supplier: Bulk
 - b. Code: <https://www.bulk.com/ie/micellar-casein.html>
12. Coconut Flavor
 - a. Supplier: Foodie Flavors
 - b. Flavor Reference: F13125
13. 100% Pure Coconut Oil

- a. Supplier: KTC
 - b. SKU: 1187P
14. Plein Arôme Cocoa Powder
- a. Supplier: Barry Callebaut
 - b. SKU: DCP-22PLARO-89B
15. Xanthan Gum
- a. Supplier: Bulk
 - b. Code:
16. Albuwhip Egg White Powder
- a. Supplier: Sosa
 - b. Reference Number: 38461
17. Natural Banana Aroma
- a. Supplier: Culinaide
 - b. Reference: FE002

Appendix 2: Ideation Logbook

Concept: dessert representing the Great Pacific Garbage Patch



Components:

- Blue "crème anglaise" with green tuille micro pieces --> water with microplastics
- Floating "island" of Vauquelin topped with edible "plastic" pieces

Flavours:

- Banana --> frequently wasted food
- Chocolate --> difficult to recycle packaging
- Coconut --> sustainability, resilience
- Baked bread --> top wasted food

Colours:

- Blue --> water
- Green --> microplastics
- Brown --> floating island, use cocoa powder
- Clear --> plastic

Ingredient Order:

- Coconut flavoring
- Lemon flavoring
- Baked bread flavoring
- Chocolate coloring
- Banana flavor
- Blue coloring
- Brown coloring
- Water-soluble green liquid coloring
- Sucrose
- Xanthan gum
- Whey powder
- Micellular casein

- Vegetarian unflavored gelatine powder
- Food grade glycerine
- Egg white powder
- Glucose powder

Initial Recipes:

Crème

- 2g Coconut flavoring
 - 2g Lemon flavoring
 - 2g Blue coloring
 - 8g Sucrose
 - 150 ml Water
 - 1g Xanthan gum
 - 5g Whey powder
 - 5g Micellular casein
 - *ice cubes?
- Grind xanthan and sugar. In blender, mix milk while adding xanthan and sugar. Add banana, vanilla and ice cubes. Xanthan gives a richer mouth feel

Edible Plastic Wrap

- 400g water
 - 10g gelatin
 - 2.5g glycerin
 - 5g banana flavour
- Whisk all the ingredients together, bring to a boil, and then simmer gently. Mould on something non-stick and very flat, and leave to dry for at least 48 hrs.

Island

- 72g water
 - 8g egg white powder
 - 5g chocolate flavor
 - 5g brown colour
 - 13g glucose (liquid?)
 - +more water?
- Put some egg white powder in water (10 percent by mass), then add a teaspoon (5 ml) of citric acid, and a soup spoon (10 ml) of glucose. Beat the preparation until stiff and spoon it out into individual "meringues," then heat them in a microwave oven (or not)

Tuille

- 50g glucose powder
- 21g water
- 5g baked bread flavor
- Green coloring

- Spread glucose syrup (glucose powder, water, baked bread flavouring) on baking mat. Add drops of color (water soluble) onto the glucose circles. Bake for 1hr at 150 degrees C.

Sources:

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Appendix 3: Logbook March 20

Link to sensory quiz: <https://forms.gle/EG3hAVS2HAtREop59>

MODULE CODE: TFCS 9025

MODULE TITLE: Advanced Molecular Gastronomy

FOOD PRODUCT: "Trash Island"

WEEK NO.: 1

DATE: March 20

Weekly Aims and Objectives

Aim: Note-by-note creation of trash island with food waste overtones.

Objectives:

- Understand feasibility of "water" recipe
- Understand feasibility of "island" recipe
- Understand feasibility of "microplastics" recipe
- ~~Test colour and flavour levels with sensory quiz for water, island, and microplastics recipes~~
- Test the microwave method for the vauquelin recipe

Materials and Method (Ingredients, Equipment and Method)

Materials Ordered:

- Coconut flavoring
- Baked bread flavoring
- Chocolate coloring
- Banana flavor
- Blue coloring
- Brown coloring
- Water-soluble green liquid coloring
- Sucrose
- Xanathan gum
- Whey powder
- Micellular casein
- Vegetarian unflavored gelatine powder
- Food grade glycerine
- Egg white powder
- Glucose powder

Recipe Breakdown:

"Microplastics" Tuille

- 50g glucose powder
 - 21g water
 - 5g baked bread flavor
 - Green coloring
- Spread glucose syrup (50g glucose powder, 21g water, 5g baked bread flavouring) on baking mat. Add drops of color (water soluble) onto the glucose circles. Bake for 1hr at 150 degrees C.

DID NOT HAVE TIME TO COMPLETE

~~"Water" Coconut Flavored Crème~~

- ~~2g Coconut flavoring~~
 - ~~2g Blue coloring~~
 - ~~8g Sucrose~~
 - ~~150 ml Water~~
 - ~~1g Xanthan gum~~
 - ~~5g Whey powder~~
 - ~~5g Micellular casein~~
 - ~~*ice cubes?~~
- ~~Mix xanthan and sucrose. In blender, mix whey powder and casein with water while adding xanthan/sucrose mix. Add flavoring, coloring, and ice cubes~~

"Island" Vauquelin

- 72g water
 - 8g egg white powder
 - 5g chocolate flavor
 - 5g brown colour
 - 13g sugar
 - +more water?
- Put some egg white powder in water, then add a 5g of chocolate flavor, 5g of brown color, and 13g of glucose. Beat the preparation until stiff and spoon it out into individual "meringues," then heat them in a microwave oven

Expected Equipment Needs:

Tuille

- Spoon
- Scale
- Bowl
- Silicone baking mat (or parchment paper)
- Oven

DID NOT HAVE TIME TO COMPLETE

Crème

- ~~Blender~~
- ~~Small bowl~~
- ~~Scale~~

- ~~Serving glass~~

Vauquelin

- Bowl
- Spoon
- Scale
- Whisk
- Microwave

Results and discussion

What could be accomplished:

Based on the time available, I was only able to work on the tuille and meringue recipes. These represent the microplastic and island part of the concept. Because I didn't have a viable meringue, I decided to nix the sensory quiz that I had created.

The recipe that I used was different than the one I anticipated for the tuille. Pauline demonstrated for the class how to make the glucose syrup powder for tuilles and had extra material. Keeping in line with the theme "Food Waste", I incorporated this otherwise waste material into my dish. I only need to work on the baking, flavoring, and coloring part of the tuille recipe for the future.

"Microplastics" Tuille

- Pauline's glucose syrup/water mixture
 - 2 drops baked bread flavor
 - 3 drops Green coloring
 - Water
-
- Spread the sugar on parchment paper on a baking sheet. Mixed two drops baked bread flavor, green color, and some water together. Added drops of color onto the glucose circle. Bake for 5min at 190 degrees C.

This recipe worked for the smaller pieces of sugar, but the main blob was a bit stretchy rather than glass-like. I loved the color of the tuille, but the texture needs some work. In the future, I think that cooking it for longer (maybe 8min vs. 5min) and using less water in the color will help to improve the texture. I will also try to make smaller circles of the sugar rather than one large one so that the cooking process is faster.



Glucose powder circle on parchment covered baking sheet



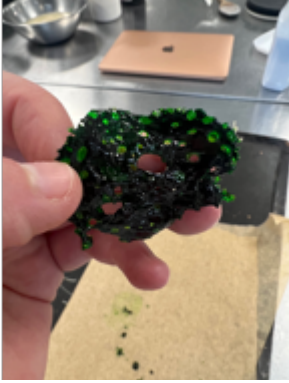
Gel food coloring was too thick, so I added water



Thinner mixture of gel food coloring, water, and baked bread flavor



After baking



After baking--looks ok but the texture is too flexible

"Island" Vauquelin

- 72g water
- 8g egg white powder
- 3 drops chocolate "aroma"
- 1 drop red color
- 1 drop green color
- 13g sugar

- Put some egg white powder in water, then add chocolate flavor, red color, green color, and 13g of sugar. Beat the preparation until stiff.

I followed this recipe and the peaks were nowhere near stiff. I decided to add some "hi foamer"(1.5g), but it really was just more foamy rather than stiff like meringue. Regarding the color, it was a pretty light brown, so I may try to use a little bit more green and red to get a darker color. The flavor was terrible, but I'm hoping some of that was due to the hi-foam ingredient. I added an extra 13g of sugar, but I'm not sure that was enough to really make it taste sweet. I was finally able to achieve the texture I wanted by adding quite a bit of extra egg white powder.



Dry ingredients for vauquelin



Before adding the hi-foamer



After adding the hi-foamer

I did try the microwave method, and it failed miserably. I will not continue testing this. The texture of my meringue will be based solely on the texture achieved through whipping and egg white powder.





Results for the microwave method for making vauquelin

I think because the texture of this product is difficult to obtain, my first step next time will be to get a good "base" recipe. From here, I can then work on flavor and color. I will also be trying cocoa powder in the next recipe because the chocolate aroma did not do enough for the flavor. This will also help with the color of the product, which was pretty light after all of the egg white powder was added. In order to waste less, I will use less water and more egg white powder next time so I can get the stiff "meringue" like texture. Another idea presented was to add a carrier flavor like vanilla to help smooth everything out, so I may try that as well!

Recommendations for following week.

As indicated above, I need to focus on the vauquelin because I am nowhere near having a viable recipe. The taste was not good, the color was a bit too light, and the texture was quite poor. Taking inspiration from an "Île Flottante", I will try to quickly poach the meringue in boiling water rather than microwaving it. I think that the texture of the "island" of an "Ile Flottante" is much closer to what I am looking for than the more bread-like texture of the vauquelin. I think that the fewer additives I can add, like hi-foamer, will really improve the taste of the meringue. Additionally, cocoa powder has a very powerful color and flavor that should really help to cover up any off notes from the stabilizers.

For the tuille, I will cook it at a higher temperature for longer (i.e. 7 minutes at 190 deg C). This should help to dry out the water enough to leave a disk that can crumble.

Appendix 4: Logbook March 27

MODULE CODE: TFCS 9025

MODULE TITLE: Advanced Molecular Gastronomy

FOOD PRODUCT: "Trash Island"

WEEK NO.: 2

DATE: March 27

Weekly Aims and Objectives

Aim: Note-by-note creation of trash island with food waste overtones.

Objectives:

- Understand feasibility of "water" recipe base (and color/flavor if possible)
- Understand feasibility of edible "plastics" recipe
- Create viable texture and taste of "island" recipe
- Optimize texture of "microplastics" recipe

Materials and Method (Ingredients, Equipment and Method)

Materials Ordered:

- Coconut flavoring
- Baked bread flavoring
- Chocolate aroma
- Banana flavor
- Blue coloring
- Red coloring
- Green liquid coloring
- Sucrose
- Xanthan gum
- Whey powder
- Micellular casein
- Cocoa powder
- Food grade glycerine
- Egg white powder
- Glucose syrup
- Sugar

Recipe Breakdown:

"Microplastics" Tuille

- Glucose syrup/water sugar
- 3 drops baked bread flavor
- 3 drops green coloring

- 2 grams water
- Spread sugar on baking mat. Mix baked bread flavor, green color, and water together. Add drops of color (water soluble) onto the glucose circles. Bake for 7min at 190 degrees C.

"Water" Coconut Flavored Crème BASE

- 25g Sucrose
- 75 ml Water
- 1g Xanthan gum
- 5g Whey powder
- 15g Micellular casein
- Mix xanthan and sucrose. In bowl, mix whey powder and casein with water while adding xanthan/sucrose mix.

If base recipe goes well, add coconut flavoring and blue coloring

"Island" Vauquelin BASE RECIPE

- 36g water
- 15g egg white powder
- 25g sugar
- 5g cocoa powder
- 1g cream of tartar
- Put egg white powder in water and add sugar. Beat the preparation until stiff. Add in cocoa powder and cream of tartar. Poach small blobs in boiling water for two min per side.

Plastic

- 100g water
- 3g gelling agent
- 2g glycerin
- 3 drops banana flavour
- Whisk all the ingredients together, bring to a boil, and then simmer gently. Mould on plastic lid and lay very flat, leaving to dry for at least 48 hrs.

Expected Equipment Needs:

Tuille

- Spoon
- Scale
- Bowl
- Silicone baking mat (or parchment paper)
- Oven

Crème

- Blender
- Small bowl

- Scale
- Serving glass

Vauquelin

- Bowl
- Spoon
- Scale
- Whisk
- Microwave

Results and discussion

Once again, most of my recipes failed miserably this week. I had enough time to try all of my potential recipes, but I did not achieve the final form for any of them.

What could be accomplished?

Crème

The crème recipe was successful in terms of taste. Rather than using the blender, I just mixed everything with a spoon and that worked quite well. I added five drops of coconut flavor and it actually tasted quite good. The problem arose with the coloring--I'm looking to make a dark blue like the ocean. The first color, when I added the blue, was incredibly bright. I decided to add some yellow to make it a bit darker--big mistake. The whole batch turned bright green and was absolutely unusable. I believe I got a comment from Roisin saying, "Don't you know that St. Paddy's Day already happened?" My takeaway from this is that I need to learn some color theory to be able to make a dark blue.



Crème base



Crème base with coconut flavor

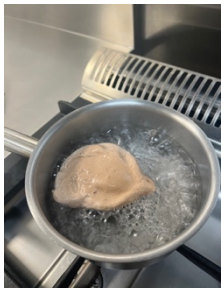


Initial color of crème

Meringue

The vauquelin was once again quite bad. I decided to take a page from the French and use the cooking technique for the island part of an "île Flottante". This is a typical French dessert with a poached egg white meringue over a crème anglaise. I tried poaching it according to a recipe I found for "île Flottante", which suggested two minutes per side. This was absolutely too much. I tried one minute per side and thirty seconds per side, both of which were too much. When bringing the time down to a brief ten seconds per side, the outside was very cooked and the inside was raw. The texture was not at all similar to the island part of an île Flottante--rather than a stiff foam, it was more similar to dense bread. I will not be able to use this recipe in my final dish.

On the bright side, the taste was much better with the addition of cocoa powder. The color definitely needs to be a bit darker, but more cocoa powder should fix that. Without hi-foamer, the terrible off notes disappeared as well.



Meringue being poached in boiling water



Meringue after poaching for two minutes per side



Cross section over overcooked meringue



Meringue after cooking one minute per side



Meringue after cooking for thirty seconds per side



Meringue after poaching for just 10 seconds per side

Tuille

The tuille was once again very sticky coming out of the oven. The color and flavor mixture is dissolving the powder before it even goes into the oven, which I believe is impacting the final texture, making it impossible to achieve a tuille with a crisp texture.



Mixing color for tuille



Drops of flavor and color mixture on glucose powder circles

Unpictured is the "edible plastic" recipe. I followed the recipe precisely and left the mixture to set for 48 hours in a flat, cool, dry place. After two days, I checked on the material. It did not set up the way it was supposed to--very flimsy and wet still. It did not resemble cellophane in the slightest.

Recommendations for following week.

Crème: the base and flavor of the crème were quite good and I don't plan on changing that at all. The issue was the color of the crème, which went from a bright blue to a bright green--neither of which is ideal for representing the deep Pacific Ocean. I plan to color the crème blue next week, but make three different shades to mimic the depth of the ocean. Additionally, dark blue can be formed from bright blue by using orange, so I will try that color method instead.

Tuille: once again, the tuille was quite sticky after baking. I think the issue is the addition of so much liquid to the glucose powder from the gel color, water, and flavor. I will change the color to blue to be able to use powder dye, which should color the tuille without adding water. Then I will add just a little baked bread flavor to the tuille--this small amount of moisture should not have the same detrimental effect as the large amount of water I was adding previously.

Edible plastic: This recipe was very time intensive and did not work at all. I will scrap this in favor of another way to achieve the clear "plastic" look--isomalt.

Meringue: Once again, this did not work. I think part of the reason may have to do with the stabilizers that are in the egg white powder, but there is no pure product available. With not much time left, I will also scrap this recipe. I need the flavor and texture of the "island" to be right for the dish to work, so I will switch gears and try a chocolate mousse instead.

Appendix 5: Logbook April 17

MODULE CODE: TFCS 9025

MODULE TITLE: Advanced Molecular Gastronomy

FOOD PRODUCT: "Trash Island"

WEEK NO.: 3

DATE: April 17

Weekly Aims and Objectives

Aim: Note-by-note creation of trash island with food waste overtones.

Objectives:

- Optimize "water" recipe color
- Create isomalt "plastic" recipe in both green
- Optimize tuille texture with powder blue color
- Optimize texture of "island" recipe --> change from vauquelin to mousse

Materials and Method (Ingredients, Equipment and Method)

Materials Ordered:

- Coconut flavoring
- Baked bread flavoring
- Chocolate aroma
- Banana flavor
- Blue coloring (powder)
- Orange gel coloring
- Yellow gel coloring
- Sucrose
- Xanthan gum
- Whey powder
- Micellular casein
- Pectin
- Cocoa powder
- Coconut oil
- Glucose powder mix
- Egg white powder
- Sugar

Recipe Breakdown:

"Microplastics" Tuille

- Glucose syrup/water sugar
- 5 drops baked bread flavor
- 2g blue powder dye

- Spread sugar on baking mat. Add powdered blue color onto the glucose circles. Add small drops of baked bread flavor. Bake for 7min at 190 degrees C.

"Water" Coconut Flavored Crème BASE

- 25g Sucrose
- 70 ml Water
- 1g Xanthan gum
- 5g Whey powder
- 15g Micellular casein

- Mix xanthan and sucrose. In bowl, mix whey powder and casein with water while adding xanthan/sucrose mix. Add coconut flavoring and blue (mixed with orange is ideal) coloring to create three different colors.

"Island" MOUSSE BASE RECIPE

- Ganache
 - 2.5g Pectin
 - 6g Casein powder
 - 15g Coconut oil
 - 10g Cocoa powder
 - 20g Sugar
 - 45g Water
- Meringue
 - 10g Egg white powder
 - 30g Water

Ganache: Mix pectin and sugar together. Hydrate with water. Heat to a boil. Remove from heat and add the casein, cocoa powder, and melted coconut oil.

Meringue: hydrate the egg white powder in the water. Whip until stiff peaks form. Fold in ganache.

Mousse: cover and refrigerate for at least 20 minutes.

Equipment Needs:

Tuille

- Spoon
- Scale
- Bowl
- Silicone baking mat (or parchment paper)
- Oven

Crème

- Blender

- Small bowl
- Scale
- Serving glass

MOUSSE

- Bowl
- Spoon
- Scale
- Whisk
- Microwave

Results and discussion

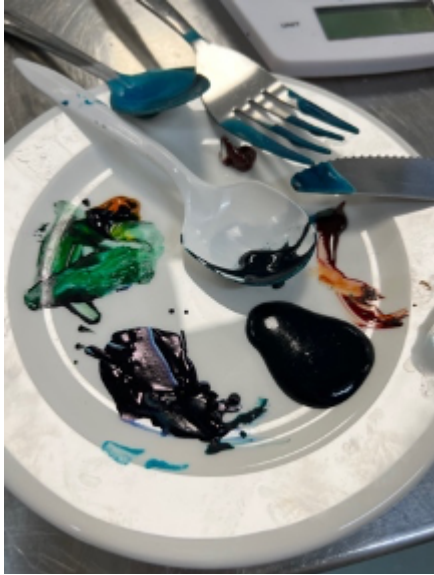
What could be accomplished:

Crème

The crème base recipe was finalized last week, so all I was working on this week was the color. Instead of using yellow, I used orange to darken the blue. I was able to create three different shades of "ocean blue" using the blue and orange gel dyes. The taste and texture were both quite good--not at all different from last week.



Base crème recipe



Color-mixing palette



Blue color #1



Blue color #2



Blue color #3

Chocolate Mousse

The first time I tried making the mousse, we got called into the other kitchen for about 10 minutes--after I had added water to the pectin. This caused a massive problem with the texture of the ganache, which ended up very lumpy instead of smooth. I decided to re-do it, and had no problems. It tasted great, the foam held up nicely, and the color was great.



Ganache before mixing, adding "chocolate" to the cooked pectin



Egg white foam



Mousse remaining in bowl after plating final dish

Tuille



The recipe worked perfectly and created the exact color and texture I was looking for to create "microplastics". The only issue I ran into was not turning off the fan in the oven to start. After a couple minutes, the parchment paper had flown off the baking tray and folded up. I immediately flattened it out and turned off the fan for the remainder of the cooking time. Because the tuille was to be crumbled anyway, it made no difference in the final product.

Isomalt Shards

While I was disappointed my edible cellophane recipe didn't work out, I think the glass shards actually ended up being the better choice. They add another texture to the dish, being crunchy rather than another soft element. They were easy to paint green (which I mixed on the same palette that I made the crème colors on).



Hardened isomalt piece



Painted isomalt pieces, crushed but not yet their final size



Crushed isomalt shards

Conclusions

What was I able to do?

I could actually create the entire dish today, everything worked out perfectly.

While the texture of the crème was determined last week, I was amazed that the color changes worked as well as they did. Adding the orange instead of yellow helped to create darker blue shades that more accurately reflect the ocean. I think using three shades also elevated the color because now the dish isn't monolithic, just like the ocean.

The chocolate mousse worked out super well. I had inulin and tapioca starch on standby in case the texture wasn't great, but it actually worked out very well and it tasted superb!

The tuille was amazing today and I think the dark blue looks much better than the green did. Some of the crumble had more of a powdery consistency, which I added directly to the crème to create spots of dark dye. The baked bread flavor was difficult to detect, but adding more flavor would have had an extremely detrimental impact on the texture of the tuille (as discovered the last two weeks).

The isomalt shards worked quite well. The banana aroma imparted a very light taste, but the color and texture were exactly as anticipated.

Here are some of the pictures of the completed dish:



Sensory:

A small panel of people tried the dish in its entirety. They said that the coconut and chocolate flavors stood out, as did the texture of the crème and chocolate mousse. The biggest issue identified for the dish was the color--it was hard to get past the blue of the ocean. This is interesting--many of the Note-by-Note dishes created for this competition used colorants to create unnatural looking shades of various colors. I think the main issue is that blue is not a color that food naturally occurs in. While a bright red is unnatural, food does come in red shades quite often. Perhaps because I am from the United States, I am used to blue colored food items and therefore it was not an issue for me in the same way it was for my panelists from European countries.

Comments to improve:

The dish was completed this week. Future development work should focus on the mousse texture, to help firm it up a bit more. Additionally, the color of the ocean could be better mixed to better reflect the ocean's beauty.

Sources:

Mousse Recipe Inspiration

Judson, D. (2021). *Mastering the Vegan Chocolate Mousse*. [online] DANIELLE JUDSON. Available at: <https://www.daniellejudson.com/mastering-the-vegan-chocolate-mousse/> [Accessed 8 Apr. 2023].

Isomalt Recipe

The Crumb Cake Kitchen (2020). *Isomalt Sail Tutorial | Sugar Sails*. [online] [www.youtube.com](https://www.youtube.com/watch?v=VQUwvVkJkQs&t=1s). Available at: <https://www.youtube.com/watch?v=VQUwvVkJkQs&t=1s> [Accessed 16 Apr. 2023].

Appendix 5: Logbook April 21

MODULE CODE: TFCS 9025

MODULE TITLE: Advanced Molecular Gastronomy

FOOD PRODUCT: "Trash Island"

WEEK NO.: 4

DATE: April 21

Weekly Aims and Objectives:

- Completed and photographed final Note by Note dish last week
- Did not attend class due to TU Dublin Volleyball tournament

Release Letter



21st April 2023

Release Letter

To whom it may concern,

This letter is to confirm that Katharine Cox, D22126818, has been selected to represent the TU Dublin Women's Volleyball team on 21st April 2023 at the Volleyball Campus Cup Tournament in Sport Ireland Campus so is unable to attend lectures/labs that day.

If you have any questions on this matter, please contact us at sport@tudublin.ie

Regards,

Matthew Lysaght

Administrator

TU Dublin Sport