

## **Fourth International Contest for Note by Note Cooking**

**Education Category:** Dublin Institute of Technology

Advanced Molecular Gastronomy Module, School of Culinary Arts and Food Technology, College of Arts and Tourism, Dublin Institute of Technology

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\*Sophie Dalton's dishes have been selected to represent the students listed above from the Advanced Molecular Gastronomy Module (D.I.T.)

## **Note by Note Cooking using Methylcellulose and Mint**

### **The Forest Floor**



**&**

### **Coconut, Milk and Mint**



**Sophie Dalton**

**Lecturers: Róisín Burke & Pauline Danaher**

## **MATERIALS & METHODS**

## DISH ONE: THE FOREST FLOOR

The Forest Floor Dish is made up of four elements:





- Mushroom Meringues
- Bacon Soil
- Pea Sponge (contains Methylcellulose)
- Basil & Chlorophyll Leaves (contains Methylcellulose)

Each recipe is presented separately below.

### MUSHROOM MERINGUE RECIPE

#### Mushroom Meringue Ingredients

Yield: 22

Ingredient	Breakdown on Ingredients	Quantity	Picture
Egg White Powder	Louis Francois – Blanc Gallia Powdered Hen’s Egg Albumin, Stabiliser: E415 Acidifier: E330 Expansion Agent: E1505	60g	
Sucrose	Caster Sugar	74g	
Water	Tap Water – Room Temperature	120ml	
Umami Flavour	100% Tomato extract	4.5ml	
Orange Colour	Water, Colour – E110 Acidity Regulator: Citric Acid Preservative: Potassium Sorbate	4.5ml	
Mushroom Flavour	1-Octen-3-ol	1ml	

#### Mushroom Meringue Equipment List

Equipment	Quantity	Model
Steel Bowl (Medium)	2	None
Kenwood Mixer with Whisk	1	Major
Attachments		
Disposable Piping Bags	2	Plastic
Dessert Spoon	2	None



Balloon Whisk (Medium)	1	None
Plastic Pipette	2	Disposable
Rubber Spatula	1	
Weighing Scales	1	
Weighing Scales: mini	1	Mini Scales: 0.1g increment
Silicone Parchment Paper	1	20cm x 40cm
Steel Measuring Jug	1	1ltr Jug
Steel Bowls (Small)	3	None
Deck Oven	1	Tom Chandley Deck- Oven
Convotherm Oven	1	OEB 6.10
Flat Oven Tray (Large)	1	
Office Knife	1	Wustoff 3"

## Mushroom Meringue Method

1. Carefully weigh the ingredients
2. Add the egg white powder and water into a medium steel bowl.
3. Use the balloon whisk to create a smooth mixture and ensure there are no lumps.
4. Place into the Kenwood mixer and whisk on high speed for 20 seconds.
5. Add the sugar and whisk on high speed for one minute. (It should look glossy)
6. Add the mushroom flavour and whisk for 10 seconds on high speed to incorporate.
7. Split the mixture 2:1 into two bowls.
8. The larger portion should then be coloured a deep orange colour and flavoured using Tomami umami flavour.
9. The orange meringue can then be placed into a piping bag.
10. The white meringue should be placed into a separate piping bag.
11. The white meringue is to act as a mushroom stem and the orange as the bulbous top.
12. The piping bags have no nozzle but are cut using a sharp knife. The white meringue piping bag is cut so that the diameter of the hole is 1cm. The orange meringue piping bag is cut to a diameter of 1.5cm.
13. The meringues are piped directly onto parchment paper. The orange mushroom caps were 4cms in diameter and 3cm in height. The white stems of the mushroom were 2cm in diameter and 3cm in height. They were piped so that the base is thick and is pointed at the top.
14. Using a clean plastic pipette gently dab the orange meringues with white meringue to create a polka dot effect.
15. Pipe the meringue onto a small piece of silicone based parchment and place on a microwave safe plastic tray.
16. Microwave the meringues until they have expanded (15 seconds in an industrial microwave at full power). If they are cooked for too long they will shrink and become wrinkly.
17. They then need to be left on the tray to cool. They must not be touched initially as touching damages the surface finish of the product.

## BACON SOIL RECIPE

### Bacon Soil Ingredients

Ingredient	Breakdown on Ingredients	Quantity	Picture
Cocoa Butter	Fat: Cocoa Butter	97g	
Olive Oil Orange Colour	Olive Oil: Extra Virgin Water, Colour – E110 Acidity Regulator: Citric Acid Preservative: Potassium Sorbate	55ml	
Red Colour	Water Carmoisine (E122) 1.7% Recommended Dose 2g/kg	2ml	
Green Colour	Water, Colour: Tartrazine (E102) 0.71% Colour: Patent Blue (E131) V 0.49% Sodium Benzoate (E211) 0.2% Recommended Dose 2g/kg		
Smoked Bacon Aroma	Inverted Sugar Aroma Glycerine (E422) Recommended Dose 2g/kg	0.5g	
Bacon Flavour	Dithazine Trisolutly 2,4,6-tris (2-methylpropyl)-1,3,5 dithiazine	1g	
Salt	NaCl	2g	
Soy Lecithin	Soy Lecithin 12 DE	2g	
Maltodextrin	Maltodextrin 12 DE	40g	

### Bacon Soil Equipment List

Equipment	Quantity	Model
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Steel Bowl (Medium)	2	None
Dessert Spoon	2	None
Balloon Whisk (Medium)	1	None
Plastic Pipette	3	Disposable
Weighing Scales	1	
Steel Measuring Jug	1	1ltr Jug
Small Pot	1	Stainless steel, heavy bottom
Thermo-mix	1	TM5
Vacuum Pack Bags Medium	2	Heat safe
Steel Bowls (Small)	3	None



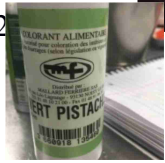


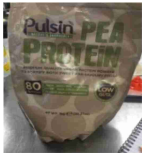

### Bacon Soil Method

1. Weigh out all ingredients, keep maltodextrin separate.
2. Place the fats into a medium metal bowl and melt on a low heat.
3. Once melted add the colours and flavours to the fat and lecithin.
4. Blend in a Thermomix at speed 7 for 2minutes to emulsify the colours and fats.
5. Allow to cool for ten minutes at room temperature in a medium steel bowl.
6. Mix with the Maltodextrin and allow break small crumbles for plating.





## Pea Sponge Ingredients

Ingredient	Breakdown on Ingredients	Quantity	Picture
Water	H <sub>2</sub> O	120ml	
Olive Oil		12ml	
Basil Flavour	Glycerine (E422) Natural Basil Extract Recommended Dose: 0.2g/kg	4drops	
Chlorophyll	Glycerine (E422) Natural Colour: obtained from vegetables Cu-chlorophyllin (E141) Recommended Dose: 0.6g-3g/kg	6.2g	
Green Colour	Water, Colour: Tartrazine (E102) 0.71% Colour: Patent Blue (E131) V 0.49% Sodium Benzoate (E211) 0.2% Recommended Dose 2g/kg	2g	
Egg White Powder	Louis Francois – Blanc Gallia Powdered Hen's Egg Albumin, Stabiliser: E415 Acidifier: E330 Expansion Agent: E1505		
Pea Aroma	Aroma Inverted Sugar Glycerine (E422)  Recommended Dose 2g/kg	6g	
<b>Methylcellulose</b>	Methylcellulose	5g	
Pea Protein	Pea Protein Isolate	10g	
Allyl Isothiocyanate	CH <sub>2</sub> CHCH <sub>2</sub> NCS.	0.1g	
Bacon Flavour	Dithazine Trisolutly 2,4,6-tris (2-methylpropyl)-1,3,5 dithiazine	0.1g	

### PEA SPONGE RECIPE

### Pea Sponge Equipment List

Equipment	Quantity	Model
Steel Bowl (Medium)	2	None
Dessert Spoon	2	None
Balloon Whisk (Medium)	1	None
Plastic Pipette	3	Disposable
Weighing Scales	1	
Steel Measuring Jug	1	1ltr Jug
Plastic Tub	1	<b>Microwaveable</b>
Small Syphon	1	
CO <sub>2</sub> Charges	2	
Microwave	1	<b>Industrial</b>
Small Plastic Tray.	1	





### Pea Sponge Method

1. Weigh out all of the ingredients and place them in a steel bowl.
2. Whisk the ingredients together until combined. The consistency of the sponge batter should be runny.
3. Pour the batter up to the line inside the plastic tub.
4. Close the lid securely and add one CO<sub>2</sub> charge.
5. Shake vigorously for 30 seconds.
6. Test by piping some of the mixture onto a clean plastic tray. The mixture should be highly aerated like a super like mousse.
7. The second charge may be required to achieve this texture. Once added the syphon will require 30 seconds further shaking.
8. The sponge was then microwaved in an industrial microwave a full power for 1 minute.
9. Once cooked the sponge was tipped out of its plastic container onto a clean plastic tray and allowed to cool.



## BASIL & CHLOROPHYLL RECIPE

### Leaf Ingredients

Ingredient	Breakdown on Ingredient	Quantity	Picture
Water	H <sub>2</sub> O	70ml	
Olive Oil		12ml	
<b>Methylcellulose</b>	Methylcellulose F50	4g	
Matcha Green Tea Powder	100% Matcha Green Tea	2g	
Egg White Whey Powder	Whey protein isolate		
Basil Flavour	Glycerine (E422) Natural Basil Extract Recommended Dose: 0.2g/kg	4drops	

## Leaf Equipment List

Equipment	Quantity	Model
Steel Bowl (Medium)	2	None
Plastic Pipette	2	Disposable
Offset Palette Knife	1	Small Size 1cm wide
Deck Oven	1	Tom Chandley Deck-Oven
Weighing Scales	1	
Silicone Parchment Paper	1	20cm x 40cm
Steel Measuring Jug	1	1ltr Jug
Card board	1	1mm Cake board
Steel Bowls (Small)	3	None
Flat Oven Tray (Large)	1	
Office Knife	1	Wustoff 3"

### Leaf Method

1. Carefully weigh all of the ingredients and place in a medium bowl
2. Allow to sit in the fridge for an hour or two or until solid
3. Cut leaf shapes into the card to use as a template
4. Prepare the oven tray: prepare a sheet of greaseproof paper
5. Using the small offset palette knife smooth the paste onto the paper, leaving a leaf shape
6. Place in a 200°C oven for 7 minutes
7. Allow to cool.





## DISH 2: COCONUT, MILK & MINT

Coconut, Milk and Mint is made up of three elements:

- Coconut Parfait
- Milk Honeycomb
- Mint Tuille (contains Methylcellulose and Mint extract)

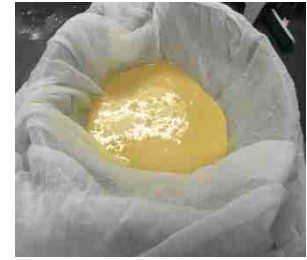
### COCONUT PARFAIT RECIPE

#### Coconut Parfait Ingredients

Ingredient	Breakdown on Ingredients	Quantity	Picture
Egg Yolk Powder	Unflavoured egg yolk powder 100%  Note: May also contain gluten, soy and milk	60g	
Whey Powder	100% whey protein isolate	32g	
Sugar	Sucrose	69g	
Coconut Paste	Coconut 33% Sugar Coconut Milk Powder Sunflower Oil Coconut Oil Maltodextrin Natural Flavour Emulsifier: Soy Lecithin (E322) Preservative: Potassium Sorbate (E202) Aroma	114g	
Coconut Aroma	Propylene Glycol (E1520)	8drops	
Water	H <sub>2</sub> O	403ML	

### Coconut Parfait Method

1. Fill the pot up to a third full and place on a gas ring and bring up to a gentle simmer.
2. Carefully weigh out all of the ingredients.
3. Place the coconut paste, sugar, water and egg powder into a medium steel bowl and place over the simmering water and whisk gently until thick and rich like custard.
4. Once cooked pour into a bowl.
5. Wet the muslin under the tap and wring it out to remove ALL excess moisture.
6. Fold the piece of cloth in half and line the chin
7. Pour the coconut custard into the muslin.
8. Bring all of the edges and corners together and pull the fabric to tighten the muslin to expel the strained coconut custard.
9. Line the loaf tin moulds with Clingfilm and fill
10. Freeze until set.
11. To serve remove from moulds, ensure all Cling




### Coconut Parfait Equipment List

Equipment	Quantity	Model
Steel Bowl (Medium)	2	None
Dessert Spoon	2	None
Balloon Whisk (Medium)	1	None
Plastic Pipette	3	Disposable
Weighing Scales	1	
Weighing Scales	1	Micro scales 0.1g increment
Steel Measuring Jug	1	1ltr Jug
Small Pot	1	Copper Pot 1.5ltr capacity
Small Loaf Tin	1	3cm x 3cm x 6cm
Grease Proof Baking Parchment	1m	Silicone Based
Fine Chinois	1	Fine
Clingfilm	0.5m	Heat Resistant Industrial
Muslin Cloth	2m x 1m	New

## MILK HONEYCOMB RECIPE

### Milk Honey Comb Ingredients

Ingredient	Breakdown on Ingredients	Quantity	Picture
Whey Powder	100% Whey Protein Isolate	7g	
Sugar	Sucrose	150g	
Water	H <sub>2</sub> O	60g	
Baking Powder	Corn starch Sodium Bicarbonate Sodium Aluminium Sulphate Mono-calcium Phosphate	4g	

### Milk Honey Comb Equipment List

Equipment	Quantity	Model
Dessert Spoon	2	None
Balloon Whisk (Medium)	1	None
Weighing Scales	1	
Weighing Scales	1	Micro scales 0.1g increment
Steel Measuring Jug	1	1ltr Jug
Small Pot	1	Copper Pot 1.5ltr capacity
Grease Proof Baking Parchment	1m	Silicone Based
Clingfilm	0.5m	Heat Resistant Industrial
Piping Bag	1	Clingfilm Disposable





### **Milk Honey Comb Method**

1. Set up a clear space on a steel countertop and cover in silicone based greaseproof paper.
2. Place water and sugar in a pot and bring to a light caramel stage (160°C).
3. At this point quickly whisk in the methylcellulose and whey powder.
4. In quick succession whisk in the baking powder.
5. Pour it out onto the greaseproof and allow to grow and cool completely before breaking it into bite sized pieces.



## MINT TUILLE RECIPE

### Mint Tuille Ingredients List

Ingredient	Breakdown on Ingredients	Quantity	Picture
Water	H <sub>2</sub> O	70 mls	
Olive Oil		12 mls	
<b>Methylcellulose</b>	Methylcellulose F50	4g	
Matcha Green Tea Powder	100% Matcha Green Tea	2g	
Egg White Whey Powder	Whey protein isolate		
<b>Mint Extract</b>	Essential Natural Arvensis Mint Sunflower Oil	4drops	

## Mint Tuille Equipment List

Equipment	Quantity	Model
Steel Bowl (Medium)	2	None
Plastic Pipette	2	Disposable
Offset Palette Knife	1	Small Size 1cm wide
Deck Oven	1	Tom Chandley Deck-Oven
Weighing Scales	1	
Silicone Parchment Paper	1	20cm x 40cm
Steel Measuring Jug	1	1ltr Jug
Card board	1	1mm Cake board
Steel Bowls (Small)	3	None
Flat Oven Tray (Large)	1	
Office Knife	1	Wustoff 3"

### Mint Tuille Method

1. Carefully weigh all of the ingredients and place the medium steel bowl
2. Allow to sit in the fridge for an hour or two or until set into a thick paste.
3. Cut leaf shapes into the card to use as a template
4. Prepare the oven tray: prepare a sheet of greaseproof
5. Using the small offset palette knife smooth the paste into the template leaving a leaf shape



the paper.  
 place in a 200°C oven for 7 minutes  
 allow to cool

## **RESULTS FROM 5 TRIALS**

## WEEK ONE

### MUSHROOM MERINGUE

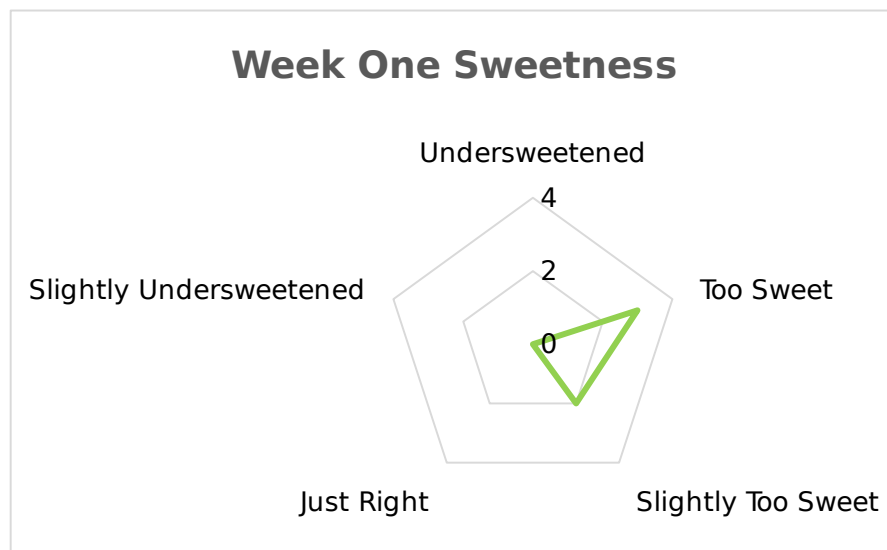
Test 2 of Mushroom Meringues

The first test batch was blown away in Convotherm Oven



### SENSORY ANALYSIS RESULTS

The recipe needs to become more savoury as it is intended as a savoury course. See Appendix Two for full sensory analysis results.



Comments made:

Tastes mushroomy but the sweetness is peculiar, interesting texture, outer skin is slightly unpleasant

## WEEK TWO

Two methods were trialled for cooking the mushroom meringues. The first method was in the oven which caused the meringue to form a skin and wrinkle. The second method was inspired by a demonstration by Hervé This. The meringue was microwaved until it expanded. The meringue was cooked for a little too long.

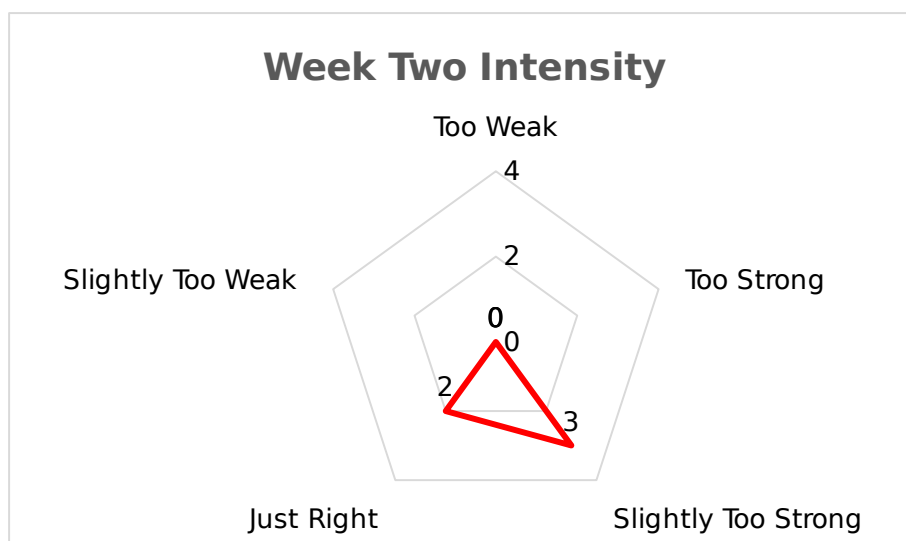


The pea sponge was made using a syphon. The colour was too intense to represent moss in a forest floor. It was recommended to reduce the amount of fat in order to achieve a lighter sponge. The basil aroma changed during the cooking process and became strange.

The method for the bacon soil was based a molecular cooking recipe that uses fat and maltodextrin to make a flavoured powder. Cocoa butter was used for the product because it sets at room temperature which creates a more chunky rough soil. The volume of maltodextrin required to achieve the desired texture was significant. The flavour was strong of smoky bacon. It melts in the mouth to give a rich mouthfeel.

## SENSORY ANALYSIS

The dish was deemed too strong by three of the testers (of five).

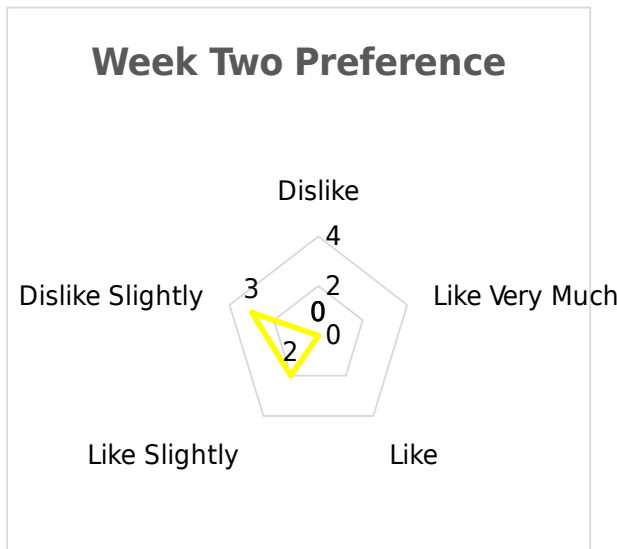


There was an overall

lack of enthusiasm for preference for the dish with “Like Slightly” and “Dislike Slightly” winning the vote. The dish is unusual but aims to present the consumer with familiar flavour

profiles. Further work on the balance and the strength of flavours will be needed as well as textural changes.

Comments made on:



✓

Pea sponge: strange flavour from basil,

little too dense

✓ Mushroom meringue: mushroom flavour a little too strong, meringue better now that it is less sweet

✓ Bacon soil: strong bacon flavour, interesting concept



t dish Coconut, Milk and Mint. The coconut curd

e initial test resulted in slightly bitter honeycomb.

tein changes the normal method for making honey

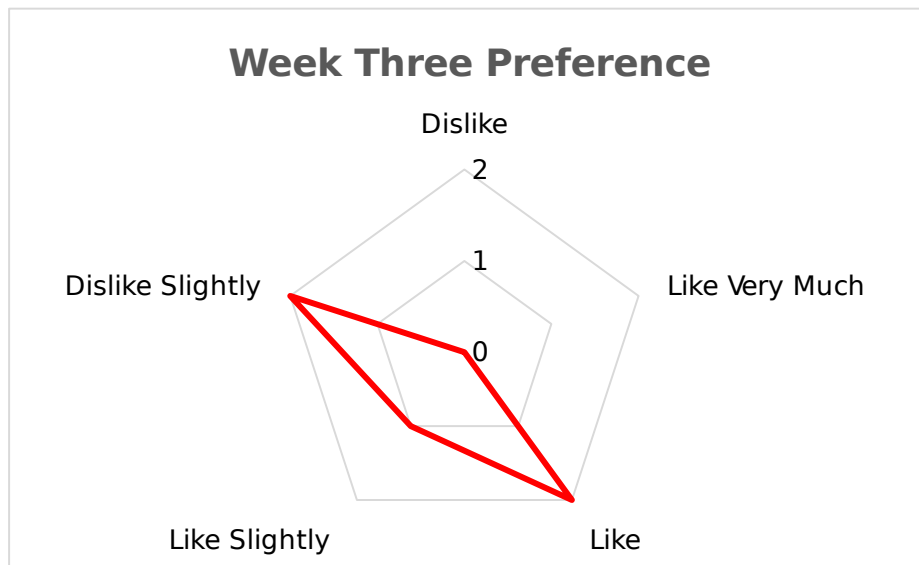
the dish a maltiness and a toasted creaminess. The

first trial identified that the whey protein and methylcellulose must be added when the caramel is at a light stage around 160°C.

The second trial was successful and created a snappy malty honeycomb. The texture is improved.

### SENSORY ANALYSIS

The participants in the sensory analysis liked the dish. They thought the coconut curd was tasty and smooth. The appearance of the curd was highly glossy. The milk honey comb was liked by all and the flavour was toasted and malty. The preference for the dish is shown below in a spider plot diagram.





## WEEK FOUR

Four recipes were tested and improved on week four. The coconut curd recipe was further developed into a coconut parfait. The texture was grainy. This will need to be revised. The freezing process in the loaf tin mould was successful and will be incorporated into the final recipe.



The honeycomb was trialled again with interesting results. The texture was more open and improved however it would have been preferable to be slightly more caramelised.

The Matcha green tea and mint jellies were not chewy. They were totally unpalatable. There was too much agar used to form the gel thus creating a very hard and brittle jelly. The comments on the jelly were dreadful. It wasn't possible to carry out a sensory analysis on the jelly as it was to

A recipe for leaves was developed during the week four trial. A template was made out of card and then a number of different thicknesses in order to determine how the paste would react to cooking. The thinnest leaf was the most attractive and the oven coloured them unevenly giving a realistic autumn leaf effect.



## WEEK FIVE – FINAL DISHES

### THE FOREST FLOOR

The Forest Floor dish is made up of four different elements. The mushroom meringue which tastes like a mushroom and is a similar texture to a poached button mushroom. The bacon soil has a rich smoky bacon flavour that melts in the mouth. The pea sponge wasn't a success due to last minute recipe change. The previous test's recipe is used in materials and methods. It is supposed to be a light fluffy sponge to represent the moss of the forest floor. The fallen leaves are flavoured with basil and are thin and crisp.



## COCONUT, MILK & MINT

This dessert is simply called Coconut, Milk and Mint. The mint crisps are made from methylcellulose, egg white powder and mint extract. They were made using the same method as the basil leaves. The mint helps to cut through the richness and sugar. The milk honeycomb adds a maltiness. A new method was employed to ensure the parfait is smooth. Muslin is soaked in water then thoroughly wrung out. The coconut curd is then passed through the muslin. This has ensured the parfait is smooth. The comments on this dish were that it has developed into a balanced and delicately flavoured dish.



## DISCUSSION

### THE FOREST FLOOR

The inspiration for The Forest Floor concept came from the initial advanced molecular gastronomy classes where the available compounds were presented to the class. A list of compounds was recorded and then further investigated. Due to the lack of familiarity with Note by Note cooking the dish was conceptualised primarily around flavours rather than around rigid processes and recipes.



Figure 1 (Crystal Kiss, 2009)

Mushroom, bacon, pea and basil stood out from the available resources. The concept of an earthy autumnal dish began to develop.

The developer's perspective on the development of the Note by Note Forest Floor was to use familiar flavours and unfamiliar ingredients and make a dish that is both recognisable but challenging. By creating elements that represent or reflect everyday items: mushrooms, soil, leaves and moss it removes some of the alien concept of cooking with 'chemicals' while also showcasing the benefits and endless possibilities for the uses of Note by Note cooking.

The dish gradually evolved each week the recipes were continuously improved and revised. The sensory analysis was very important for the evaluation and changes made to the recipes.

#### Mushroom Meringue

Colour: The colour of the mushroom is vibrant and loud. The purpose of this is to evoke a sense of wonderment and fairy tale like images in the mind of the consumer. The white speckles on the mushroom closely resemble that of the real thing.



Taste: The distinct mushroom and savoury flavours dominate in mushroom meringues. The balance of flavours has been achieved with the reduction of sugar in the recipe.

Texture: The texture of the mushroom is similar to a poached button mushroom: springy but in a pleasant yielding way.

### **Bacon Soil**

Colour: The colour of the bacon soil is a mottled brown with flecks of white. This was intentional to give the soil dimension. The brown colour also portrays the aroma of smoky bacon while representing the Maillard effect that occurs when proteins are browned or caramelised in cooking.

Taste: The taste of the bacon soil is strong and rich. The fat carries the flavour well and delivers it in a melting moment in the mouth.

Texture: The texture of the crumb is rough and quite chunky this was achieved by using cocoa butter which sets at room temperature which caused the maltodextrin and fat mixture to clump like real soil. The soil melts luxuriously in the mouth.

### **Pea Sponge Moss**

Colour: The final dish presented in the photograph shows an unfortunate pea sponge that had been subject to unnecessary last minute experimentation. It turned into a pale pastel green soufflé with a particularly distinct aroma from the addition of basil which was wholly unpleasant.

Taste: Unpalatable. However the previous test of the pea sponge had been successful in terms of flavour. It was slightly dense from too much fat.

Texture: It was slightly dense from too much fat.

### **Basil Leaves**

The leaves were one of the most fun and interesting aspects of the dish to develop.

Colour: The colours of the leaves were exactly how they were envisaged. The cooking process gave an uneven browning which added to the overall theme of forest floor.

Taste: The leaves had a delicate earthy flavour with a hint of basil. The earthiness was provided by Matcha green tea.

Texture: Texturally the leaves were the most successful component in the entire project. Once discovered that the mixture needed to be cold in order to achieve best results the method went from strength to strength. Using a template a palette knife paper thin leaves could be made easily. They were crisp and delicate and felt almost real.

## **COCONUT, MILK & MINT**

The concept for the Coconut, Milk and Mint dessert dish was less clear from the outset. The developer wanted to create a dish with a variety of textures as well as flavours. When using only liquids and powders (compounds) to create the dish it was important to research and experiment with the different ingredients available. Methylcellulose and trigeminal compounds had to be incorporated into the dish this was the starting point for brainstorming the dish.

The developer wanted to use egg yolk powder to make a product called Coconut Curd or Kaya. It is a simple recipe that uses coconut milk, egg yolks, butter and sugar. It produces a thick curd. Kaya comes from Malay-Chinese (Aquino, 2015). Traditionally it is made using palm sugar which gives the coconut curd a rich brown colour. The caramelisation occurs in the cooking process and gives a rich colour (Wong, 2014). Due to the high water content of the rehydrated egg yolk the product didn't develop the caramelised flavour from the sugar. According to McGee (2004) a curd has a higher amount of egg than a traditional milk cream and more sugar (like pastry cream). It is cooked and enriched with butter. This dish was aimed to look natural in colour and flavour.

### **Coconut Parfait**

**Colour:** The colour of this element changed greatly over the development process. Initially too much egg yolk was being used which made it appear dyed. This was slowly controlled and a light natural creamy yellow colour achieved.

**Taste:** The taste of the coconut parfait was delicate and well balanced. Not too sweet. The technique employed to strain the curd made the taste more clean and pronounced due to the clean mouth feel.

**Texture:** Smooth as velvet. Needs to be frozen but not frozen hard. The photo of the final dish shows a lightly flattened parfait.

### **Milk Honeycomb**

**Colour:** The colour achieved is a warm light golden brown with a darker centre. The milk protein gives a cloudy appearance to the honeycomb instead of the glossy golden honeycomb this version has a malty colour and flavour giving it an unusual matt appearance.

Taste: The flavour of the milk honey comb highlights the presence of the toasted whey protein. The caramel toasts the whey protein as it is added to the 160°C caramel. The methylcellulose is added at this stage also. The toasted caramel gives the dish another dimension of the traditional breakfast dish Kaya (coconut curd) on toast.

Texture: The texture of the honey comb in initial tests had been quite tight. The bubbles had been small and too dense. The final recipe for honeycomb gives a more open texture with larger more uneven bubbles which is what was desired.

### Mint & Green Tea Crisps

Colour: Light green with no colour from the cooking process.

Taste: Minty with a hint of Matcha green tea.

Texture: Simple crisps add a wafer like texture to the dish.

## Food Additives Used In Final Dishes

This table includes all of the additives used in the final dishes. Food Additives are closely regulated in the E.U by Regulation 1333/2008.

Ingredient	Names	Purpose	Limits	Further Information
<b>E102</b>	Tartrazine, FD&C Yellow No.5	Colour	Banned in Austria Norway Not Recommended for Children 7.5mg/kg bodyweight/day	Synthetic yellow colour used in drinks, soups, cakes, ice-creams (The UK Food Guide, 2015a)
<b>E110</b>	Sunset Yellow	Colour	Banned in Austria Norway Not Recommended for Children 1mg/kg bodyweight/day	Synthetic yellow food dye found in marmalade, instant sauces and soups (UK Food Guide, 2016c)
<b>E122</b>	Azorubine, Carmoisine	Colour	Banned in USA, Sweden, Norway & Japan Not recommended for children 15mg/kg bodyweight/day	Synthetic red food colour used in confectionary, yogurts and jellies (UK Food Guide, 2016d)
<b>E131</b>	Patent Blue V	Colour	Banned in USA, Norway and Australia Not Recommended for Children 15mg/kg bodyweight/day	Sythetic blue coal tar food dye. (UK Food Guide, 2016e)
<b>E141</b>	Copper Complexes of Chlorophyll and Chlorophyllins	Colour	Can be consumed by all - no adverse effects currently know (UK Food Guide, 2016f),	Dark Green Food colour it is he synthetic version of E140 natural green colour (MyAdditives, 2016)
<b>E1505</b>	Triethyl Citrate	Solvent	2mg/kg	Odourless liquid, oily feel (JECFA, 1984)



<b>Ingredient</b>	<b>Names</b>	<b>Purpose</b>	<b>Limits</b>	<b>Further Information</b>
<b>E211</b>	Sodium Benzoate	Preservative	Not recommended for people with respiratory problems like asthma or aspirin allergy Not Recommended for Children	Antifungal & antibacterial preservative effective in acidic environments found in sauces, sweet and olives (UK Food Guide, 2016h)
<b>E322</b>	Soy Lecithin 12 DE	Stabiliser		Used in the food industry to gel, thicken and stabilise. Most common source in industry soy (UK Food Guide, 2016a)
<b>E330</b>	Citric Acid	Acidity Regulator		Citric acid is an acid found in citrus fruits. Used in metabolism. (Pub Chem, 2016)
<b>E415</b>	Xanthan Gum	Stabiliser, Thickener, Gelling		Natural Carbohydrate used in recent times to replace gluten (UK Food Guide, 2016a)
<b>E422</b>	Glycerol	Thickening		Clear, odourless, thick liquid with a sweet taste: part of the alcohol family of compounds (Encyclopaedia Britannica, 2015)
<b>Maltodextrin</b>	Maltodextrin	Thickener	No official guideline daily intake No side effects currently know in concentrations used in food product (Cuisine Innovation, 2016).	Is a sugar derived from sugar through starch hydrolysis. Can be used to thicken, stabilise, prolong crispiness, help disperse powders, lipid to powder. (Cuisine Innovation, 2016).

<b>Ingredient</b>	<b>Names</b>	<b>Purpose</b>	<b>Limits</b>	<b>Further Information</b>
<b>E464</b>	Methylcellulose	Gelling, Thickening stabilising		Forms a clear viscous gel when hot and melts when its cooled. It is a hydrocolloid derived from plants. (Chef Steps, 2016)
<b>E202</b>	Potassium Sorbate	Preservative	No currently known negative impact on human health	Antifungal & antibacterial preservative found in dried fruit, cheese, frozen foods and tinned products. (UK Food Guide, 2016g)
<b>E1520</b>	Propylene Glycol	Stabiliser	No current evidence that negative side effects exist from consuming propylene glycol (Propylene-Glycol, 2016).	Synthetic hydrophilic liquid. Used to absorb and maintain water content of food stuffs. Odorless, clear and tasteless substance (ATSDR, 2016)
<b>E521</b>	Sodium Aluminium Sulphate	Stabiliser	May affect liver function in high doses. Its usually used in small amount (Food-Info, 2016)	Used to strengthen vegetables for processing. Also used as acidity regulator in is involved in bleaching process of flour (Food-Info, 2016).

## **CONCLUSION**

This project has been a challenge. It required the developer to think in a new way, to approach the kitchen in a new light. This type of “cooking” is initially restrictive because there is no tangible food to cook. Once the developer moved away from what was missing and really looked at what was possible the dishes began to develop. As a classically trained chef it was difficult to step back and think in a new way. Classical techniques applied to very modern ingredients. The Forest Floor dish was by far the highlight of the project; seeing how it developed every week all the way to the final picture. It required lots of refining and adjusting and restarts but it turned out really well.

The Coconut, Milk and Mint dish uses very simple techniques once the recipes were developed it becomes like ‘normal’ cooking. It was simple yet the amount of work that went into finding the balance between the compounds and aromas and flavours was time consuming and new.

The potential for Note-by Note cooking if people are willing to dedicate time to learn and experiment is huge. It is a new and largely unexplored discipline that is exciting and forces innovation.

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