Advanced Molecular Gastronomy Report
TFCS9025

Savory Dice and Fibers
“Truffle Sponge”

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Technological University Dublin
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1. Introduction

Back in 1988, a new scientific discipline started to have attention in the culinary field. Molecular Gastronomy is considered the discovery of new phenomena and new mechanisms (This, H. 2009).

According to Roosth, 2013, a professor in the History of Science at Harvard University molecular gastronomy is: "a food movement whose practitioners – chemists who study food and chefs who apply their results – define as the application of the scientific method and laboratory apparatuses to further cooking."

In this definition, the word new stands for what was not available in kitchens of the western countries in 1980. New tools could include siphons, used to make foams; ultrasonic probes, used to make emulsions; controlled heaters or circulators, used for cooking at temperatures lower than 100°C; liquid nitrogen, to make sorbets and many other innovative preparations; rotary evaporators and distillators, used to recover extracts; and many other types of laboratory equipment that can have useful applications in the kitchen.

The term molecular cuisine was sometimes criticized, but the reasons for using it were that innovative cuisine had to be distinguished from science, and in particular from molecular gastronomy. The arguments over the name are unlikely to matter as the term molecular cuisine is likely to die out with the adoption of new techniques. A new idea is now being introduced with the name note by note cuisine (This, H 1999).

In the Note-by-Note cooking method, food ingredients such as meat, fish, vegetables or fruits are not used to make dishes, but instead compounds, either pure or in mixtures, are used (Burke, et.al. 2020)

While creating a dish, the various biological properties of food must be considered. The nutritional content is important, but it would be a mistake to forget that food has to stimulate the various sensory receptors involved in vision, odor, taste, trigeminal system and temperature (This, H. 2012).

During the Advanced Molecular Gastronomy Course (2022) a challenge was proposed based on Note-by-Note Technique: to create a dish that include savory dice/ cube and make use of fibers; Rubik's cube systems are to be avoided.

The dish will be aligned with Note-by-Note Technique and also with Regulation 1924/2006 to guarantee that the amount of fiber to be used is safe and to determine possible nutrition claims.

Aligned with this technical background, the dish followed the methodologies and ingredients learned during the Advanced Molecular Gastronomy Class: use of gelling agents, use of siphon/ nitrogen gas to create foam, use of maltodextrin to create "dust" texture in oil products.

The final dish, "Truffle Sponge" contain mainly three elements: a "sponge" bread flavored with black truffle aroma; an olive oil "dust" flavored with black truffle aroma and an onion sauce that is source of fiber and contains spirulina.

This report will present how Truffle Sponge was created, formulated, and platted.

2. Aim of the Assignment

The aim of this assignment was to create a dish that include savory “dice”/ cube shape and make use of fibers (Rubik’s cube is not allowed). This should be achieved by using note by note method and applying pure compounds on the recipe.

The report will present the main results obtained with this challenge and the main outcome: “Sponge Truffle” dish.

3. Final Material and Methods

To facilitate the didactic of this report, the dish was divided in three elements: cube, sauce/ gel, olive oil dust.

3.1. Materials

3.1.1. Cube

- Potato Starch

Fig.1: Potato Starch. Available at https://leuredasie.com/farine-chapelure/1532-fecule-de-pomme-de-terre-tersol-1kg-3513086000088.html

- Gluten

Artikelnr.: UI00-0002

Weizenkleber reines Weizengluten

Weizenkleber verbessert die Backeigenschaften des Teiges, vergrößert das Volumen des Brotes und verhindert weitgehend das Zusammenfallen des Brotes.

200 g

Preis: 2,30 €
(GP 1000g = 11,50 €)
inkl. gesetzl. MwSt.
zzgl. Versand

Menge: 1

In den Warenkorb | Merkzettel

Fig. 2: Gluten. Available at https://teetraeume.de/Weizenkleber-reines-Weizengluten

- Albumin powder

Albuwhip - albumin powder (500g), Sosa

SKU 38461
Marca: Sosa
Colección: Aireantes
Familia: Texturizantes

Proteína de la clara de huevo.

Propiedades: Sustituto de la clara de huevo, efecto montante.
Modo de uso: Mezclar en frío.
Aplicación: Cualquier tipo de líquido.
Observaciones: 25% más montante y 5 veces más estable que la clara fresca.
Elaboraciones: Merengues / Macaron / Nubes / Souflé / Bizcochos / Mousses

Formato: 500 g
Dosificación: 80-100 g/kg
Modelo: 00200510

Fig. 3: Albumin powder Available at https://www.sosa.cat/en-ww/albuwhip-500g-sosa

- Lecithin

Fig. 4: Lecithin

- Xanthan Gum

Fig.5: Xanthan Gum

- Olive Oil

Fig. 6: Olive oil

- Black Truffle Flavor

Fig. 7: Black Truffle Aroma

- Water
  At room temperature (around 20ºC)

- Salt

3.1.2. Sauce/ Gel

- Xanthan Gum

Fig.9: Lecithin

- Inulin

Fig 10: Inulin

- Spirulina Powder

Fig. 11: Spirulin

- Onion Flavor

Fig 12: Onion Flavor (Sosa)

- Water

At room temperature (around 20ºC)

- Salt

3.1.3. Olive Oil Dust

- Maltodextrin 12DE

Fig. 13: Maltodextrin 12 DE (Sosa)

- Olive Oil

Fig.14: Olive Oil

- Black Truffle Flavor

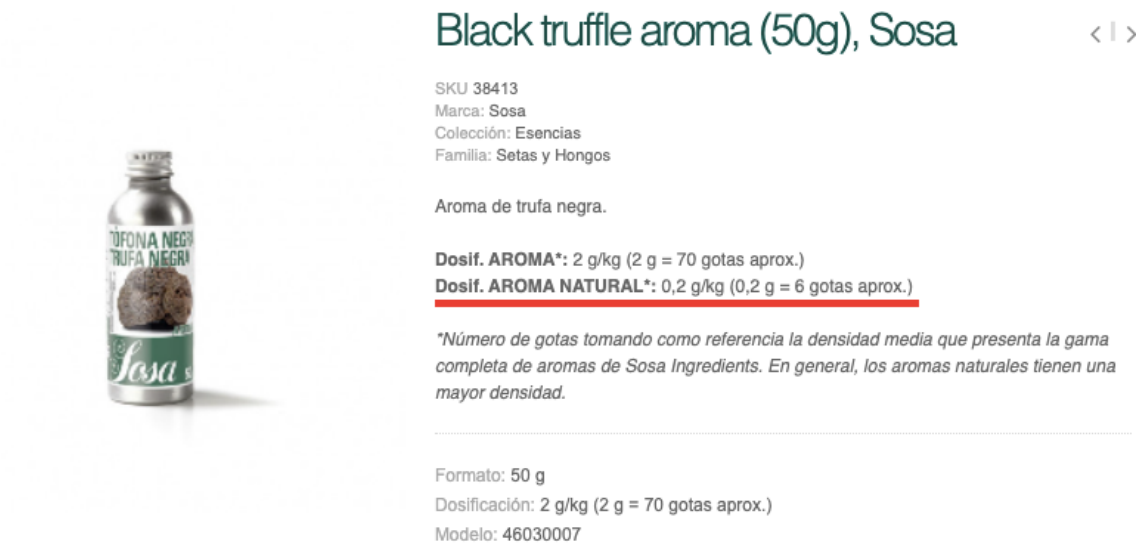


Fig. 15: Black Truffle Flavor

3.2. Methods

3.2.1. Cube

1- In a bowl, mix the water + salt + albumin (that were previously weighted in a scale) with a whisk to create air (2min on hand);
2- In another bowl, mix the remaining ingredients;
3- Add Mix 2 in Mix 1 and continue mixing with a whisk;
4- Add the Mix 3 in a siphon (do not overcome the half of the bottle) and add a Nitrogen capsule in the system;
5- Shake vigorously at least 12 times in axial movements;
6- Dump the product in the Silicon Mold (specification (23.2 x 12.8 x 6.2 cm)), only occupying half of each cavity;
7- Add the mold in the Microwave Panasonic NE-3240, half potency, during 2 min;
8- Take off the cube out of the mold and prepare for plating

Equipments and Auxiliary tools

Fig 16: Whisk

Fig 17: Bowl

Fig 18. Silicon Mold

Fig 19. Scale


Fig 20: Siphon.


Fig 21: Nitrigen capsule


Fig 22: Microwave


Fig 23: Scale

3.2.2. Sauce/ Gel

1- Mix all the ingredients in a bow, with a spoon (that were previously weighted in a scale);
2- Add the mix in a pan and heat it until boils, always mixing with a whisk;
3- Let it cool and prepare for plating

Equipments and Auxiliary tools


Fig 24: Whisk


Fig 25: Bowl


Fig 26. Stainless steel pan.


Fig 27: Scale

3.2.3. Olive Oil Dust

1- In a bow, mix the olive oil + flavor + salt (that were previously weighted in a scale);
2- Slowly add maltodextrin mixing with a whisk until you get a "dust" aspect;
3- Pass the dust into a sieve for plating.

Equipments and Auxiliary tools


Fig 28: Whisk


Fig 29: Bowl


Fig.30: Sieve


Fig. 31: Scale

4. Results

After 4 weeks of trials, the final dish was created based on the formulations bellow (the final formulation for each element is in bold):

CUBE	T1 %	T1 (g)	T2 %	T2 (g)	T3 %	T4 (%)	T4 (g)	T5 (%)	T5 (g)
Potato starch	1,68	3,70	3,56	7,13	2,78	2,67	5,68	**2,77**	**5,55**
Gluten	1,67	3,69	0,68	1,36	2,76	2,65	5,65	**2,75**	**5,52**
Albumin	26,81	59,16	5,71	11,41	24,79	23,84	50,75	**24,74**	**49,59**
Lecitin	-	-	18,77	37,54	0,98	0,94	2,00	**0,98**	**1,96**
Sugar	5,58	12,32	11,84	23,68	-	-	-	-	-
Olive oil	11,17	24,65	23,34	46,67	3,78	3,64	7,75	**3,78**	**7,57**
Xanthan	0,08	0,17	0,17	0,34	0,09	0,18	0,38	**0,09**	**0,18**
Water	53,02	117,00	32,37	64,75	64,28	61,80	131,56	**64,13**	**128,55**
Salt	-	-	3,56	7,13	0,54	0,52	1,10	**0,54**	**1,08**
Gouda flavor	-	-	-	-	-	3,76	8,00	-	-
Truffle flavor	-	-	-	-	-	-	-	**0,22**	**0,45**
TOTAL	100,00	220,69	100	200	100,00	100,00	212,87	**100**	**200,45**
Comments	Mix the ingredients with a fouet, add into the mold (occupy only half the volume of the cube), put in the microwave for 4min, medium temperature		Rebalance with lecitin and more water		Decrease time in Microwave- 2' 15''	T3 + flavor (gouda was in powder) Decrease time in Microwave- 2' 15''		**T3 + flavor (Truffle was liquid)** **Decrease time in Microwave- 2'**	

Fig 32. Cube's trials and Final formulation- T5

SAUCE	T1 (%)	T1 (g)	T2 (%)	T2 (g)	T3 (%)	T3 (g)
Water	91,75	169,74	84,00	184,00	**93,56**	**174,85**
Agar	1,04	1,92	1,05	2,29	-	-
Xanthan	0,21	0,39	0,19	0,41	**0,59**	**1,10**
Salmon flavor	5,00	9,25	-	-	-	-
Red colorant	2,00	3,70	-	-	-	-
Carrot powder	-	-	9,59	21,00	-	-
Inulin	-	-	4,11	9,00	**4,58**	**8,55**
Salt	-	-	0,91	2,00	**0,64**	**1,19**
Onion Flavor	-	-	0,16	0,36	**0,24**	**0,45**
Spirulin	-	-	-	-	**0,40**	**0,75**
TOTAL	100,00	185,00	100,00	219,06	**100,00**	**186,89**
Comments	Mix, boil and cool		T1 proportions, adding inulin, carrot powder and onion flavor		**T2 proportions, substituting carrot powder by spirulin and removing agar**	

Fig 33. Sauce's trials and Final formulation (T3)

OLIVE OIL	T1 (%)	T1 (g)
Olive Oil	**42,68**	**21,34**
Maltodextrin	**54,88**	**27,44**
Salt	**1,52**	**0,76**
Truffle Flavor	**0,91**	**0,46**
TOTAL	**100,00**	**50,00**

Fig 34. Olive oil dust Final formulation

Considering the combination of formulation T5 (Cube) + T3 (Sauce) + T1 (Olive Oil Dust), the final dish was plating as follows:

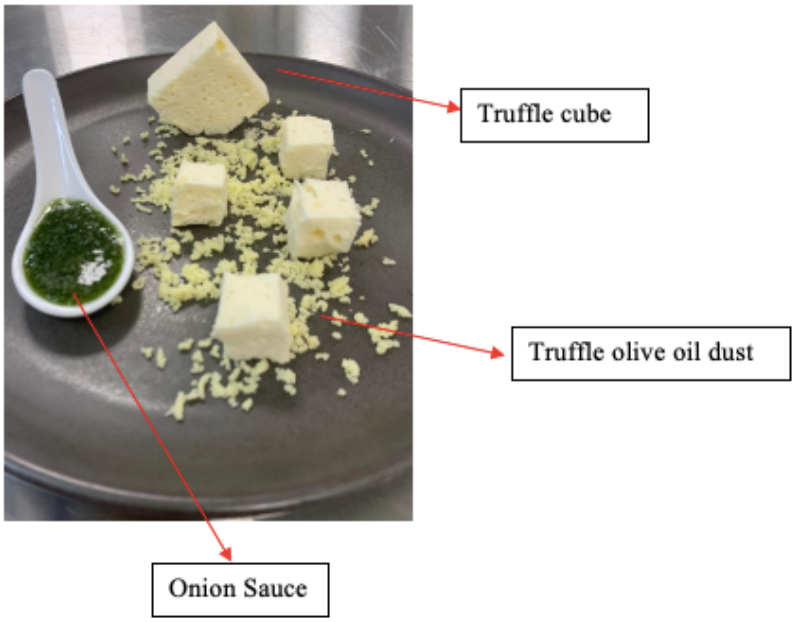


Fig. 35: Final Plating Configuration

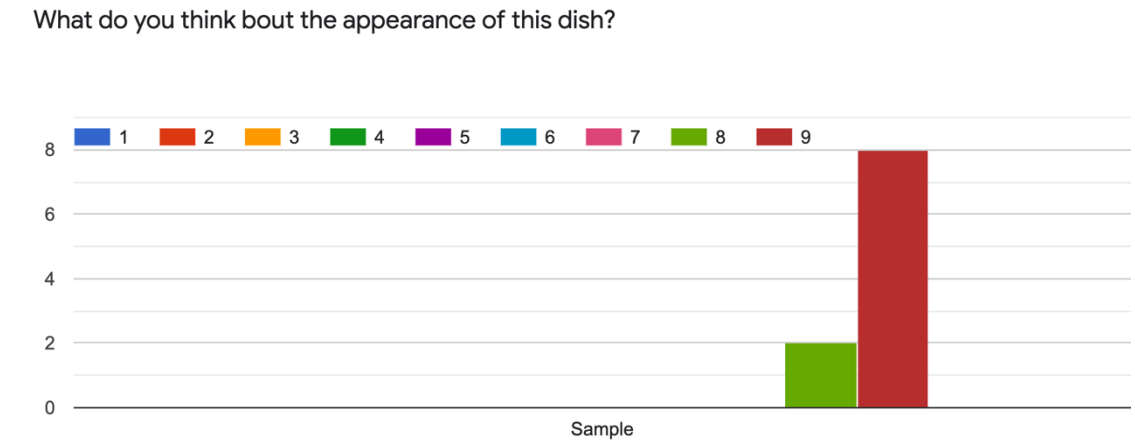
Fig. 36: Details of the structure created

The dish was designed to be served cold.

A sensory evaluation was made with 10 students during the Advanced Molecular Gastronomy class.

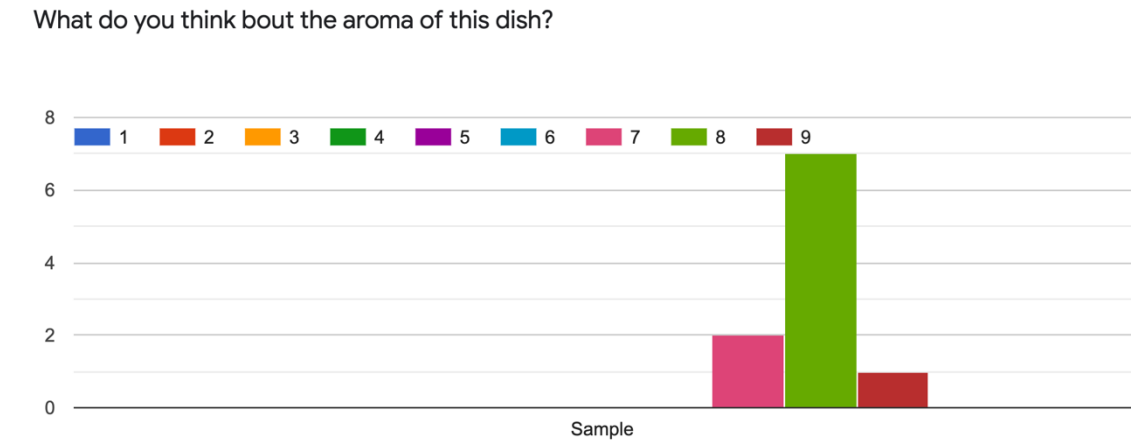
The results are as follow:

- 80% of the participants Liked Extremely the appearance of the dish
- 70% of the participants Liked Very Much the aroma of the dish
- 50% of the participants Liked Moderately the color composition of the dish
- 60% of the participants Liked Moderately the creativity of the dish



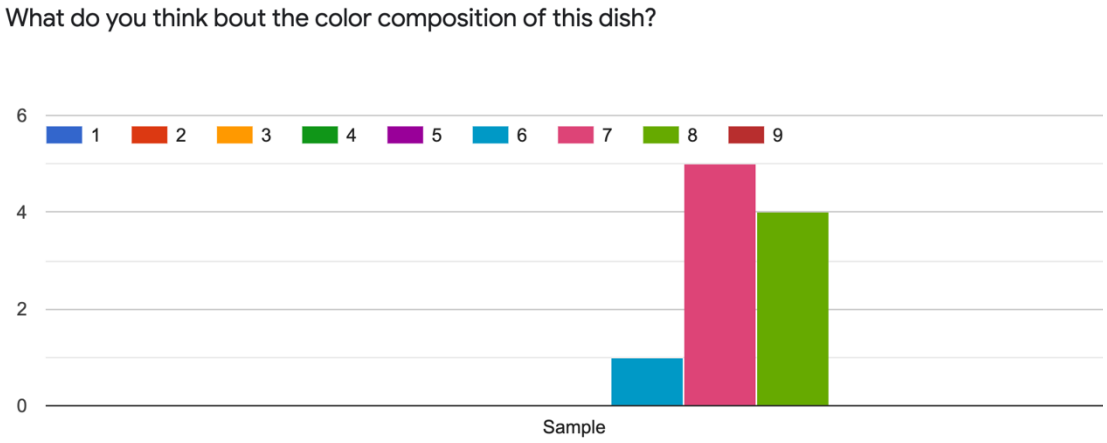
1 = Dislike extremely; 2 = Dislike very much; 3 = Dislike moderately; 4 = Dislike slightly; 5 = Neither like nor dislike; 6 = Like slightly; 7 = Like moderately; 8 = Like very much; 9 = Like extremely

Fig.37: Final Dish Scores for Appearance



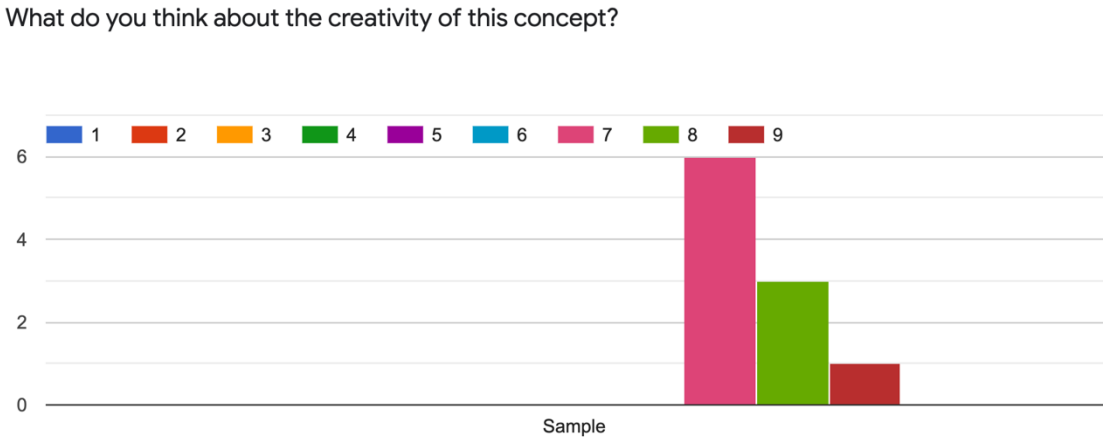
1 = Dislike extremely; 2 = Dislike very much; 3 = Dislike moderately; 4 = Dislike slightly; 5 = Neither like nor dislike; 6 = Like slightly; 7 = Like moderately; 8 = Like very much; 9 = Like extremely

Fig.38: Final Dish Scores for Aroma



1 = Dislike extremely; 2 = Dislike very much; 3 = Dislike moderately; 4 = Dislike slightly; 5 = Neither like nor dislike; 6 = Like slightly; 7 = Like moderately; 8 = Like very much; 9 = Like extremely

Fig.39: Final Dish Scores for Color Composition



1 = Dislike extremely; 2 = Dislike very much; 3 = Dislike moderately; 4 = Dislike slightly; 5 = Neither like nor dislike; 6 = Like slightly; 7 = Like moderately; 8 = Like very much; 9 = Like extremely

Fig.40: Final Dish Scores for Creativity

5. Discussion

5.1. Cube

The initial concept was to create a “sponge” structure to mimic a bread and combine it with a sauce that could deliver a “Bruschetta” idea.

After some trials, the concept started to gain other ideas and features, based on the formulation viability (for instance better results with liquid flavor instead of powder flavor), the concept was concluded as a sponge bread with black truffle flavor, onion sauce and olive oil “dust” with black truffle flavor.

In the first weeks, the sponge structure was a challenge, because it was needed to "deconstruct" the flour and eggs in the regular recipe in the right proportion of pure compounds in Note-by-Note technique.

The main important understanding were the two systems below:

1. Substitution of regular wheat flour used in a "sponge" cake/ bread was done by gluten + water + potato starch
    a. The amount of gluten was based on the findings made by Schiller, 1984, that the ideal amount of protein in bread recipes would be around 20%. Considering mainly the protein content coming from albumin and gluten, the dosage was defined in 24,74% and 2,75% respectively and the final protein content was around 21%.
2. Substitution of eggs by albumin + water + lecithin
    a. Since the system did not contain egg yolk, the emulsifying properties that this part of the egg has, was complemented by lecithin
    b. Albumin + water was added in similar proportions observed in common eggs (70% water, 30% albumin), in regular eggs this proportion is a little bit higher, 75% water (Alamprese, 2009)

With the right proportion, the second step was to define the microwave timing to avoid the dough to be too dry. This was achieved with 2 minutes in medium potency.

The flavor was added based on the supplier's information (Sosa) on their website (the aroma contains inverted sugar, flavor, glycerin – E422) and the % used is safe for consumption. The ideal was to have more information about the ingredients (a more detailed specification sheet) to be able to search in the REGULATION (EU) No 872/2012.

More information about results and discussion of the formulations that did not work out can be seen on section 8. Log book.

5.2. Sauce/ gel

First, two different types of texture agents were tested: agar and xanthan gum. The agar gave a too hard texture for the sauce, not being able to flow. So, the agar was removed from the formulation and then the result was better, xanthan gum gave a good viscosity for the sauce, promoting flowability.

Regarding the fiber aspect required on the aim of this dish, this feature was designed inside the onion sauce.

Considering that:

- REGULATION (EC) No 1924/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 December 2006, Annex: A claim that a food is a source of fiber, and any claim likely to have the same meaning for the consumer, may only be made where the product contains at least 3 g of fiber per 100 g
- Inulin contains 89g of fiber/100g (Supplier Information- My Vitamins),

As a result, the sauce formulation contains 4g of fibers/ 100g and so it can have a nutrition claim as Source of fiber.

Spirulina is a microscopic and filamentous cyanobacterium that has a long history of use as a safe functional food (Dan et.al, 2021).

Many research studies show that Spirulina has numerous health benefits, including antioxidant, immunomodulatory, anti-inflammatory, anticancer, anti-viral, and anti-bacterial activities, as well as positive effects against hyperlipidemia, malnutrition, obesity, diabetes, heavy metal chemical-induced toxicity, and anemia (Lee et al. 1998; Hoseini et al. 2013).

Further research needs to be done to understand the minimal quantity to be used and obtain the benefits bellow, but for the dish, the usage if this pure ingredient is innovative and safe (0,4%).

The flavor was added based on the supplier's information (Sosa) on their website (the aroma contains inverted sugar, flavor, glycerin – E422) and the % used is safe for consumption. The ideal was to have more information about the ingredients (a more detailed specification sheet) to be able to search in the REGULATION (EU) No 872/2012.

5.3. Olive Oil Dust

The olive oil "dust" was made with maltodextrin and had an interesting result with the black truffle flavor.

It also helped to create an interesting effect on the plate, and it contributed to enhance the black truffle aroma on the final dish.

The flavor was added based on the supplier's information (Sosa) on their website (the aroma contains inverted sugar, flavor, glycerin – E422) and the % used is safe for consumption. The ideal was to have more information about the ingredients (a more detailed specification sheet) to be able to search in the REGULATION (EU) No 872/2012.

6. Conclusion

The dish meets the Proposed Challenge: it has a savory "dice"/ cube shape, using fibers and based on note-by-note method with mainly pure compounds and innovative techniques.

"Truffle Sponge" has three simple elements that together created a robust dish, with a pleasant visual aspect and interesting aroma release.

The sensory evaluation shows that it has a good potential, but for the future, more fibers could be added on the dish (maybe in all elements of the plate, not just inside the sauce).

The cube could have an improvement being served warm. This would deliver a different experience for the consumer and probably a better aroma release.

7. References

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8. Log book

MODULE TITLE: Advanced Molecular Gastronomy
STUDENT NAME: Nathália Trunckle Baptista
FOOD PRODUCT: Truffle Sponge

WEEK NO.: 10 **DATE: 28/03/2022**

1. Weekly Aims and Objectives

1.1. Aim

To develop a savory dish, increased in fiber and with at least one of the elements with a "cube" shape.

1.2. Objectives

- Try formulations to create the base of the cube (without flavor)
- Experiment some gums combinations to create a "sauce"

2. Materials and Methods

2.1. Ingredients and Quantities

Cube

	%	g
potato starch	1,68	3,70
gluten	1,67	3,69
albumin	26,81	59,16
sugar	5,58	12,32
oil	11,17	24,65
xanthan	0,08	0,17
water	53,02	117,00
	100,00	220,69

Sauce

	T1 (%)	T1 (g)
Water	91,75	169,74
Agar	1,04	1,92
Xanthan	0,21	0,39
Salmon flavor	5,00	9,25
Red colorant	2,00	3,70

Fig.1 Potato Starch

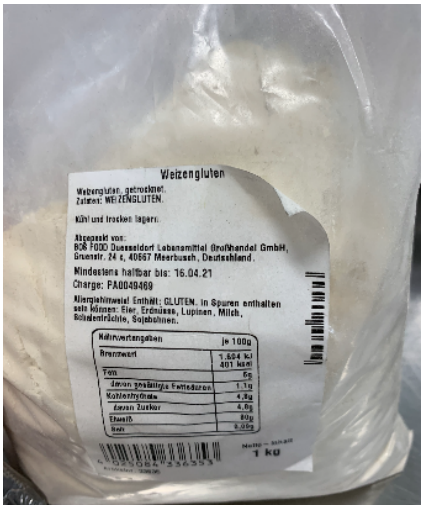


Fig.2 Gluten

Fig.3 Albumin

Fig.4 Xanthan Gum

Fig.5 Olive Oil

Fig.6 Salmon Flavor

2.2. Equipments and Auxiliary Tools

- Scale
- Siphon

-
- Nitrogen capsules

-
- Cube Mold

-
- Microwave

- Mixer

- Auxiliary tools: bows, plates, spoons, whisk, pan

2.3. Method

Cube

1- Mix all the ingredients with a whisk until get a homogeneous dough
2- Add the mix in a siphon (do not overcome the half of the bottle) and a nitrogen capsule in the system
3- Shake vigorously at least 12 times in axial movements
4- Dump the product in the mold
5- Add the mold in the Microwave, half potency during 4 min

Fig. Microwave potency

Fig. Dow after using siphon/ before cooking

Fig. Dow after cooking

Fig, Cube after cooking

Fig. Details of aeration (few bubbles)

Sauce

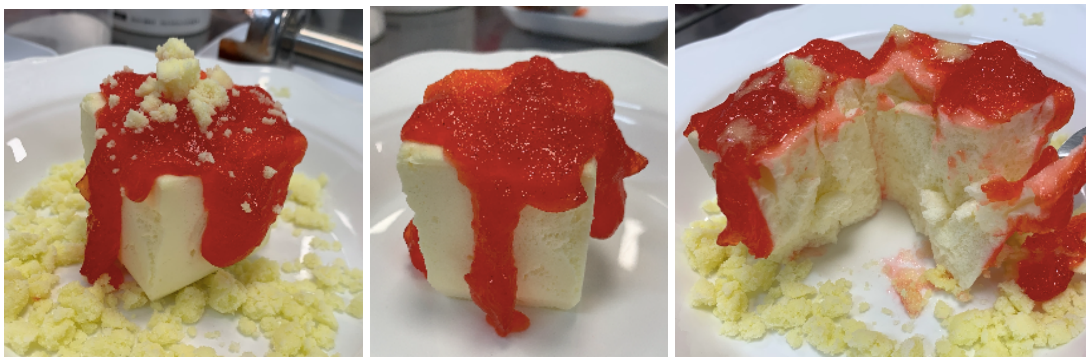
1- Mix all the ingredients in a bow, with a spoon
2- Add the mix in a pan and heat it until boils, always mixing with a whisk
3- Let it cool
4- Blend it with the help of a mixer

Fig. Mix being boiled

3. Results and discussion

It needs to fill less than half of the mold cavity, otherwise after cooking the dow exceeds the mold.
The dow is too hard, not aerated enough.
The sauce seems good, but the texture was not good after the blending step. The salmon flavor is not good, too strong.

Final aspect



4. Conclusions

The cube needs more investigation as the sauce

5. Recommendations for following week.

- Remove sugar from the cube's formulation
- Aerate the albumin before adding other cube's ingredients
- Test other flavors for the cube and sauce
- Remove the blending step to produce the sauce

WEEK NO.: 11 **DATE: 01/04/2022**

1. Weekly Aims and Objectives

a. Aim

To develop a savory dish, increased in fiber and with at least one of the elements with a "cube" shape.

b. Objectives

- Remove sugar from the cube's formulation
- Aerate the albumin before adding other cube's ingredients
- Test other flavors for the cube and sauce
- Remove the blending step to produce the sauce

2. Materials and Methods

2.1. Ingredients and Quantities

Cube

	T2 %	T2 (g)	T3 %	T3 (g)
Potato starch	3,56	7,13	2,78	5,68
Gluten	0,68	1,36	2,76	5,65
Albumin	5,71	11,41	24,79	50,75
Lecitin	18,77	37,54	0,98	2,00
Sugar	11,84	23,68	-	-
Olive oil	23,34	46,67	3,78	7,75
Xanthan	0,17	0,34	0,09	0,18
Water	32,37	64,75	64,28	131,56
Salt	3,56	7,13	0,54	1,10
Total	100	200	100,00	204,67
Process	Rebalance with lecitin and more water		Rebalance and taking out sugar Decrease time in Microwave- 2' 15''	

2.2. Equipments and Auxiliary Tools

- Scale
- Siphon
- Nitrogen capsules

- Cube Mold
- Microwave
- Auxiliary tools: bows, plates, spoons, whisk

2.3. Method

Cube

1- Mix the water + salt + albumin with a whisk to create air (2min on hand)
2- In another bowl, mix the remaining ingredients
3- Add Mix 2 in mix 1 and continue mixing with a whisk
4- Add the mix 3 in a siphon (do not overcome the half of the bottle) and a Nitrogen capsule in the system
5- Shake vigorously at least 12 times in axial movements
6- Dump the product in the mold (half)
7- Add the mold in the Microwave, half potency during 2 min 15 seconds

3. Results and discussion

T2 didn't work very well. The % of oil was too high, and the dough couldn't create a good structure for the bubbles.
T3 worked well. It has a good bubble structure; it is moist and soft.

Fig. Dow T2

Dow T2, after siphon

Cube T2, after microwave


Step 1 (T3)


Step 2 (T3)


Dow T3, after siphon



T3, after microwave. Good bubbles structure

4. Conclusions

T3 delivers a good structure for the cube.

5. Recommendations for following week.

- Maintain T3 for cube, but add flavor
- Remove the blending step to produce the sauce
- Test flavors for the sauce

WEEK NO.: 12 **DATE: 04/04/2022**

1. Weekly Aims and Objectives

a. Aim

To develop a savory dish, increased in fiber and with at least one of the elements with a "cube" shape.

b. Objectives

- Maintain T3 for cube, but add flavor
- Remove the blending step to produce the sauce
- Test flavors for the sauce

2. Materials and Methods

2.1. Ingredients and Quantities

For the cube:

Starting from T3 formulation from the previous week, gouda flavor was tested according to the quantities bellow:

	T4 (%)	T4 (g)
Potato starch	2,67	5,68
Gluten	2,65	5,65
Albumin	23,84	50,75
Lecitin	0,94	2,00
Olive oil	3,64	7,75
Xanthan	0,18	0,38
Water	61,80	131,56
Salt	0,52	1,10
Gouda flavor	3,76	8,00
Total	100,00	212,87

For the sauce, I have added carrots to deliver an interesting color and inulin to deliver the fiber requested on the briefing of this dish.

The formula tested is described in the table below (T2):

SAUCE	T1 (%)	T1 (g)	T2 (%)	T2 (g)
Water	98,75	185,00	79,76	184,00
Agar	1,07	2,00	0,99	2,29
Xanthan	0,19	0,35	0,18	0,41
Carrot powder	-	-	9,10	21,00
Inulin	-	-	3,90	9,00
Salt	-	-	0,87	2,00
Onion Flavor	-	-	5,20	12,00
TOTAL	100,00	187,35	100,00	230,70
Process	mix, boil, cool and blend			

For the "Olive oil dust", the formulation bellow was used:

OLIVE OIL	T1 (%)	T1 (g)
Olive Oil	32,94	14,00
Maltodextrin	42,35	18,00
Salt	1,18	0,50
Truffle Flavor	23,53	10,00
TOTAL	100	42,5
Process	In a bow, mix the olive oil + flavor + salt and slowly add maltodextrin mixing with a twisk until you get a "drier" aspect	

2.2. Equipments and Auxiliary Tools

- Scale
- Siphon
- Nitrogen capsules
- Cube Mold
- Microwave
- Auxiliary tools: bows, plates, spoons, whisk, pan

2.3. Method

Cube

1- Mix the water + salt + albumin with a whisk to create air (2min on hand)
2- In another bowl, mix the remaining ingredients
3- Add Mix 2 in mix 1 and continue mixing with a whisk

4- Add the mix 3 in a siphon (do not overcome the half of the bottle) and a Nitrogen capsule in the system
5- Shake vigorously at least 12 times in axial movements
6- Dump the product in the mold (half)
7- Add the mold in the Microwave, half potency during 2 min

Sauce

1- Mix all the ingredients in a bow, with a spoon
2- Add the mix in a pan and heat it until boils, always mixing with a whisk
3- Let it cool
4- Blend it with the help of a mixer

Olive Oil

1- In a bow, mix the olive oil + flavor + salt
2- Slowly add maltodextrin mixing with a twisk until you get a "drier" aspect

3. Results and Discussion

T4 for the cube worked well and delivered a good “gouda” flavor.

Regarding the sauce, after cooled, it was to “breakable”, not liquid (maybe too much agar).
The onion flavor is ok and the color too (maybe try another color next week).

For the olive oil crumbes, T1 worked well, the texture resembles a “crumble” and the truffle flavor is very nice.

4. Conclusion

Final dish appearance (cube + sauce + olive oil crumble):



5. Recommendations for following week.

- Reduce by half the amount of agar in the sauce formulation
- Test flavors for the sauce and color
- Test the truffle flavor on the cube
- Test the gouda flavor on the olive oil dust

WEEK NO.: 15 **DATE: 25/04/2022**

1- Weekly Aims and Objectives

a. Aim

To develop a savory dish, increased in fiber and with at least one of the elements with a “cube” shape.

b. Objectives

- Remove agar in the sauce formulation
- Test new color for sauce: spirulina?
- Test the truffle flavor on the cube (Maintain the proportion of T4)

2- Materials and Methods

2.1. Ingredients and Quantities

Cube (T5)

CUBE	T1 %	T1 (g)	T2 %	T2 (g)	T3 %	T4 (%)	T4 (g)	T5 (%)	T5 (g)
Potato starch	1,68	3,70	3,56	7,13	2,78	2,67	5,68	2,78	5,55
Gluten	1,67	3,69	0,68	1,36	2,76	2,65	5,65	2,76	5,52
Albumin	26,81	59,16	5,71	11,41	24,79	23,84	50,75	24,79	49,59
Lecitin	-	-	18,77	37,54	0,98	0,94	2,00	0,98	1,96
Sugar	5,58	12,32	11,84	23,68	-	-	-	-	-
Olive oil	11,17	24,65	23,34	46,67	3,78	3,64	7,75	3,78	7,57
Xanthan	0,08	0,17	0,17	0,34	0,09	0,18	0,38	0,09	0,18
Water	53,02	117,00	32,37	64,75	64,28	61,80	131,56	64,28	128,55
Salt	-	-	3,56	7,13	0,54	0,52	1,10	0,54	1,08
Gouda flavor	-	-	-	-	-	3,76	8,00	-	-
Truffle flavor	-	-	-	-	-	-	-	7,5 drops	15 drops
TOTAL	100,00	220,69	100	200	100,00	100,00	212,87	100	200
Process	Mix the ingredients with a fouet, add into the mold (occupy only half the volume of the cube), put in the microwave for 4min, medium temperature		Rebalance with lecitin and more water		Decrease time in Microwave- 2' 15''	T3 + flavor (gouda was in powder) Decrease time in Microwave- 2' 15''		T3 + flavor (Truffle was liquid) Decrease time in Microwave- 2'	

Sauce (T3)

SAUCE	T1 (%)	T1 (g)	T2 (%)	T2 (g)	T3 (%)	T3 (g)
Water	91,75	169,74	79,76	184,00	87,43	174,85
Agar	1,04	1,92	0,99	2,29	-	-
Xanthan	0,21	0,39	0,18	0,41	0,55	1,10
Salmon flavor	5,00	9,25	-	-	-	-
Red colorant	2,00	3,70	-	-	-	-
Carrot powder	-	-	9,10	21,00	-	-
Inulin	-	-	3,90	9,00	4,28	8,55
Salt	-	-	0,87	2,00	0,95	1,19
Onion Flavor	-	-	5,20 drops	12 drops	5,7 drops	15 drops
Spirulin	-	-	-	-	1,10	0,75
TOTAL	100,00	185,00	100,00	230,70	100,00	200,00
Comments/ Process	mix, boil, cool and blend		T1 proportions, adding inulin, carrot powder and onion flavor		T2 proportions, substituting carrot powder by spirulin and removing agar	

Olive oil dust

No alteration from previous week.

2.2. Equipments and Auxiliary Tools

- Scale
- Siphon
- Nitrogen capsules
- Cube Mold
- Microwave
- Auxiliary tools: bows, plates, spoons, whisk, pan

2.3. Method

Cube

1- Mix the water + salt + albumin with a whisk to create air (2min on hand)
2- In another bowl, mix the remaining ingredients
3- Add Mix 2 in mix 1 and continue mixing with whisk
4- Add the mix 3 in a siphon (do not overcome the half of the bottle) and a Nitrogen capsule in the system
5- Shake vigorously at least 12 times in axial movements
6- Dump the product in the mold (half)
7- Add the mold in the Microwave, half potency during 2 min

Sauce

4- Mix all the ingredients in a bow, with a spoon
5- Add the mix in a pan and heat it until boils, always mixing with a whisk
6- Let it cool
7- Blend it with the help of a mixer

Olive oil dust
No alteration from previous week.

3. Results and Discussion

T5 for the cube worked well and delivered a good truffle flavor. It was better than the gouda flavor from the previous week.

Regarding the sauce, T3 (without agar and with spirulina) worked very well. Using just xanthan gum as a thickener created a good “sauce texture”.
The onion flavor is ok and the color too.

For the olive oil crumbes, T1 worked well in the previous weeks, so no further trials were needed.

4. Conclusion

Final dish appearance (cube + sauce + olive oil dust):