



Advanced Molecular Gastronomy

Note By Note

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Table of contents

- 1) Introduction
- 2) Molecular gastronomy
- 3) Note by note cooking
- 4) Aim
- 5) Materials and methods
- 6) Drinks Materials and methods
- 7) Results
- 8) Discussions of results
- 9) Final conclusion
- 10) Reference

Introduction

Note by Note cooking is an application of Molecular Gastronomy. It was first proposed in 1994 by French Physical Chemist and Molecular Gastronomy Co-founder, Hervé This. Traditional foods are not used to make dishes but pure compounds or mixtures of pure compounds. In doing

so the potential for the creation of new foods is enormous. Hervé this estimates through mathematical calculation that it is possible to create in the region of 1,000 to the power of 10 (or 10³⁰) new recipes, and this is without factoring in compound concentrations. The chef has to design the various parts of the dish, the colours, tastes, odours, temperatures, trigeminal stimulation, consistency and nutritional aspects.

Chefs at the Cordon Bleu school in Paris served the first Note by Note meal in 2010 and since then continue to do so each year. Other countries are creating dishes including in Ireland where students from the Molecular Gastronomy modules, taught at the School of Culinary Arts and Food Technology (DIT), have done so since 2013. Following entry to the popular Note by Note competition in Paris in 2014 and in 2015, the DIT students have demonstrated that they are producing award winning dishes by gaining first prize in each of those years, in the student category. Note by Note dishes are also being created as part of Ph.D. research in DIT.

Molecular Gastronomy

Molecular gastronomy, the scientific discipline concerned with the physical and chemical transformations that occur during cooking. The name is sometimes mistakenly given to the application of scientific knowledge to the creation of new dishes and culinary techniques.

The scientific discipline—which was introduced under the name molecular and physical gastronomy and later shortened to molecular gastronomy—was established in 1988 by Hervé This, a physical chemist, and Nicholas Kurti, a former professor of physics at the University of Oxford, who were interested in the science behind the phenomena that occur during culinary processes. Although food science had existed for some centuries, its focus had historically been on the chemical composition of ingredients and the industrial production and nutritional properties of food. Molecular gastronomy, on the other hand, focuses on the mechanisms of transformation that occur during culinary processes at the level of domestic and restaurant cooking, an area that had historically tended to rely heavily on tradition and anecdotal information. Molecular gastronomy seeks to generate new knowledge from the chemistry and physics behind culinary processes—for example, why mayonnaise becomes firm or why a soufflé swells. One side goal is to develop new ways of cooking that are rooted in science. These techniques are called molecular cooking, whereas the new culinary style based on such techniques is called molecular cuisine.

A program was proposed for molecular gastronomy that took into account the fundamentally important artistic and social components of cooking as well as the technical element. A distinction was also made between the parts of recipes: “culinary definitions”—descriptions of the objective of recipes—and “culinary precisions”—the technical details of a recipe. Thus, a program for molecular gastronomy emerged: first, to model recipes, or culinary definitions; second, to collect and test culinary precisions; third, to scientifically explore the artistic component of cooking; and, finally, to scientifically explore the social aspects of cooking.

In giving a name to the new study, Kurti and This looked to the definition of gastronomy given by Anthelme Brillat-Savarin, author of *Physiologie du goût* (1825; *The Physiology of Taste*): “the intelligent knowledge of whatever concerns man’s nourishment.” The adjective molecular was added to define further that branch of science, which includes elements of physics, chemistry, and biology.

Beginning in 1988, research teams were established in the field of molecular gastronomy at universities in several countries—including France, the Netherlands, Ireland, Denmark, Italy, Spain, and the United States—and the number of such nations continued to increase, reaching more than 30 in the early 21st century. New research laboratories were being created often for scientific research or university education. Educational initiatives were also introduced within the main framework of physical chemistry education, such as the Experimental Cuisine Collective, launched in 2007 at New York University. Molecular gastronomy was shown to be an excellent educational tool, allowing students in chemistry, physics, and biology to observe and understand the practical use of the theories that they learned. In fall 2010 Harvard University debuted a new course on science and cooking taught in part by Catalan chef Ferran Adrià.

History

Molecular gastronomy has famous ancestors. These include 18th-century chemist Claude-Joseph Geoffroy, who studied essential oils in plants; 18th-century French chemist Antoine-Laurent Lavoisier, who studied meat stock and is celebrated as one of the founders of modern chemistry; American-born British physicist Sir Benjamin Thompson, Count von Rumford, who developed

modern theories regarding heat and was also interested in meat cooking; German chemist Friedrich Christian (Fredrick) Accum, whose *A Treatise on Adulterations of Food and Culinary Poisons* (1820) raised awareness of food safety; and 19th-century French chemist Michel-Eugène Chevreul, who analyzed the chemical composition of animal fats. In the 20th century, French microbiologist Édouard de Pomiane published best-selling books on cooking, notably the influential *La Cuisine en Dix minutes; ou, l'adaptation au rythme moderne* (1930; French *Cooking in Ten Minutes; or, Adapting to the Rhythm of Modern Life*), though some criticized the work for confusing science, technology, and technique.

Molecular gastronomy developed very quickly after its creation in 1988, but about 1999 it was determined that different names had to be applied to distinguish the scientific activity on the one hand from the culinary enterprise on the other. The name molecular cooking (and its variations molecular cookery) was introduced to refer to the technologically oriented way of cooking that was developed by some of the world's top chefs. Proposed just before 2000, this new terminology gained momentum, and by 2010 it was established that the term molecular gastronomy should only be used to designate the scientific discipline that investigates the mechanisms of phenomena that occur during culinary transformation, whereas the term molecular cooking and its variations should be used to describe the culinary trend in which chefs use “new” tools, ingredients, and methods developed through research in molecular gastronomy. Molecular cuisine is used for designating a culinary style using the new techniques.

Note by note cooking

Herve, this is a leading French physical chemist and the 'Godfather' of Molecular Gastronomy. He is also the man behind the development of 'Note by Note' cooking which involves preparing dishes using pure compounds, or more practically; mixtures of compounds obtained by fractioning plant or animal tissues,

instead of using these tissues themselves. The following passage is from an article written by this for the Flavor Journal entitled “Molecular Gastronomy is a Scientific Discipline and Note by Note Cuisine is the Next Culinary Trend.”

Note by note cuisine was first proposed in 1994 (in the magazine Scientific American) at a time when I started using compounds in drinks and dishes, such as paraethylphenol in wines and whiskeys; 1-octen-3-ol in sauces for meat; limonene; tartaric acid; and ascorbic acid among others. The initial proposal was to improve food, but surely an obvious next step was to make dishes entirely from compounds.

To put it differently, note by note cuisine does not use meat, fish, and vegetable or fruits to make dishes, but instead uses compounds, either pure compounds or mixtures. An analogy would be in the way that electronic music is not made using trumpets or violins but using pure waves that are mixed into sounds and music. For the various parts of the dish in note by note cuisine, the cook has to design the shapes, the colors, the tastes, the odors, the temperatures, the trigeminal stimulation, the textures, the nutritional aspects and more.

The feasibility of this new cuisine has already been shown. On 24 April 2009, the French chef Pierre Gagnaire (who has restaurants in a dozen cities of the world: Paris, London, Las Vegas, Tokyo, Dubai, Hong Kong...) showed the first note by note dish to the international press in Hong Kong. Then, in May 2010, two note by note dishes were shown by the Alsatian chefs Hubert Maetz and Aline Kuentz at the French-Japanese Scientific Meeting in Strasbourg. However, the first note by note meal was not served until October 2010, by chefs of the Cordon Bleu School in Paris, to the participants of the 2010 courses at the Institute for Advanced Studies in Gastronomy. On 26 January 2011, at a banquet before the launching event of the International Year of Chemistry at the United Nations Educational, Scientific and Cultural Organization, Paris, a whole note by note meal for about 150 people was served by Potel et Chabot Catering Company. This meal was again served in April 2011 to about 500 chefs receiving Michelin stars in Paris. And since the number of note by note initiatives is becoming too big to be tracked.

Aim

The aim of the project is to create a Diarc dish and a cocktail accordance to the 7th international contest of note by note cooking.

Materials and Methods

Garlic mud

Ingredients

- 1) Olive oil
- 2) Abzorbit MSK
- 3) Salt
- 4) Onium 3 drops IQEMUSU
- 5) Thain 3 drops IQEMUSU

Preparation

- 1) Take 25ml of olive oil add salt and 4 drops of onium mix it well
- 2) Take 10g of Abzorbit and then add the oil slowly and whisk it till you get the desired texture like mud.

Equipment

1. Whisk
2. Mixing bowl
3. Spoon to plate

Tomato soup

Ingredients

1. Water 25ml
2. Agar 1g texturas
3. Tomato flavor 3 drops Sosa Alphabet Of Flavours Box
4. Thain 3 drops IQEMUSU
5. Basil 2 drops Sosa Alphabet Of Flavours Box
6. Onium 3 drops IQEMUSU
7. Salt

Preparation

1. Boil the water then add 3gms of Agar to it then add Tomato, Garlic, Basil Onium and salt in the specific measurements.
2. Mix properly and let it cool.
3. You should get a red liquid once it cools it will turn into a jelly.

Equipment

1. Sauce pan
2. Mixing bowl
3. Wooden spoon

Balsamic gel (stones)

Ingredients

1. Balsamic vinegar 100ml
2. Agar 1.5g
3. Olive oil 250ml cold (oil bath)

Preparation

1. Heat the balsamic vinegar in a pan then dissolve the agar in it.
2. In a container or a measuring cup put the olive oil and cool it for the oil bath
3. Once the agar is dissolved let the temperature drop of the liquid.
4. By using a dropper drop the balsamic liquid from the dropper into the cold olive oil.

Equipment

1. Sauce pan
2. Spoon
3. Measuring cup
4. Blast chiller
5. Dropper

Brown Rice Quenelle

Ingredients

1. Brown rice whey protein 50gm Bulk powders
2. Oil 20ml
3. Salt
4. Onium 3 drops IQEMUSU

Preparation

1. Take oil and add 3 drops of onion and mix thoroughly
2. Take 50gm of brown rice whey protein and then add 20ml of oil to it.
3. Mix thoroughly there should be no lumps in it
4. Spread it on paper and put it in the oven for 15mins at 150 ° c.
5. Remove it from the oven don't dry it up let some oil be there and let them cool.
6. Make quenelle out of the paste.

Equipment

1. Mixing bowl
2. Whisk
3. Parchment paper
4. Oven tray
5. Oven

Drink methods and materials

Black Berry and Peach Margarita

Flavored water

Ingredients

1. Blackberry 3drops Sosa Alphabet Of Flavours Box
2. Peach 3 drops Sosa Alphabet Of Flavours Box
3. Tarragon 3 drops Sosa Alphabet Of Flavours Box
4. Water 250ml water

Preparation

1. Take 250ml of water add Blackberry, Peach, Tarragon drops equally.
2. Mix well and cool

Syrup

Ingredients

1. Basil 3 drops Sosa Alphabet Of Flavours Box
2. Mint 3 drops Sosa Alphabet Of Flavours Box
3. Sugar 20gm
4. Water 250ml

Preparation

1. In a saucepan melt the sugar in water and cool it down.
2. Add basil, mint, and sugar and make a basil mint syrup.

Balsamic gel (stones)

Ingredients

1. Balsamic vinegar 100ml
2. Agar 1.5g
3. Olive oil 250ml cold (oil bath)

Preparation

1. Heat the balsamic vinegar in a pan then dissolve the agar in it.
2. In a container or a measuring cup put the olive oil and cool it for the oil bath
3. Once the agar is dissolved let the temperature drop of the liquid.
4. By using a dropper drop the balsamic liquid from the dropper into the cold olive oil.

Blackberry and Peach Margarita

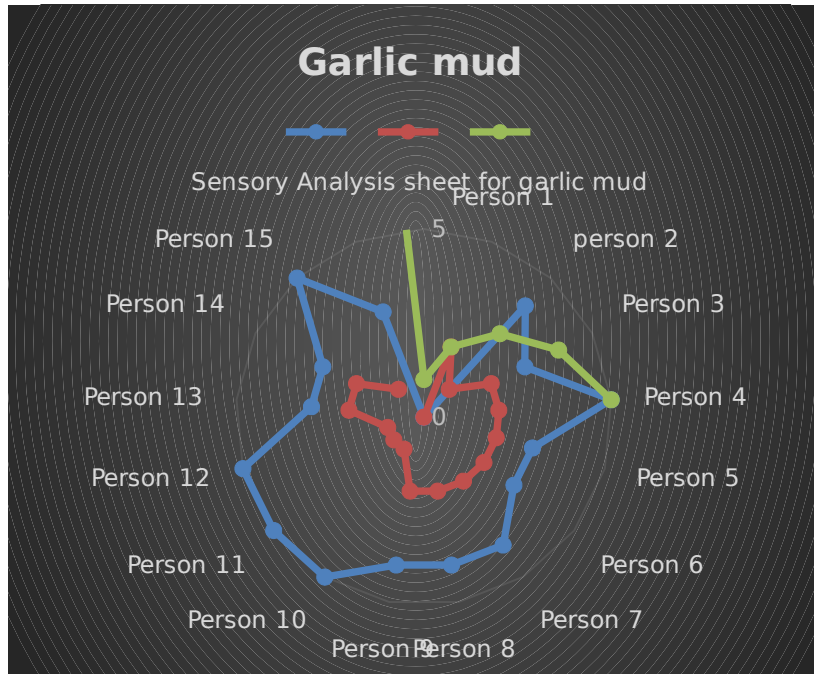
Preparation

1. Add the flavored water and the syrup together in a measuring cup.
2. Remove the balsamic spheres from the oil dry them and remove the extra oil.
3. Once the syrup is ready drop the balsamic balls into the liquids.

Results

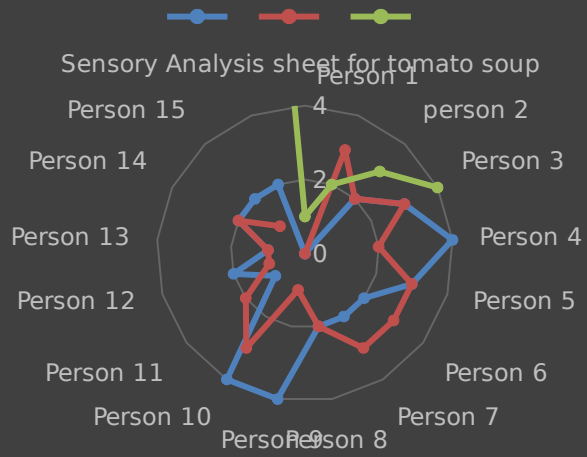


Garlic mud

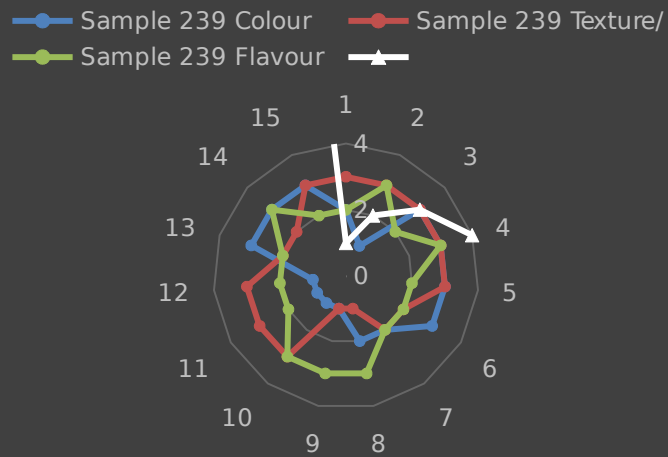


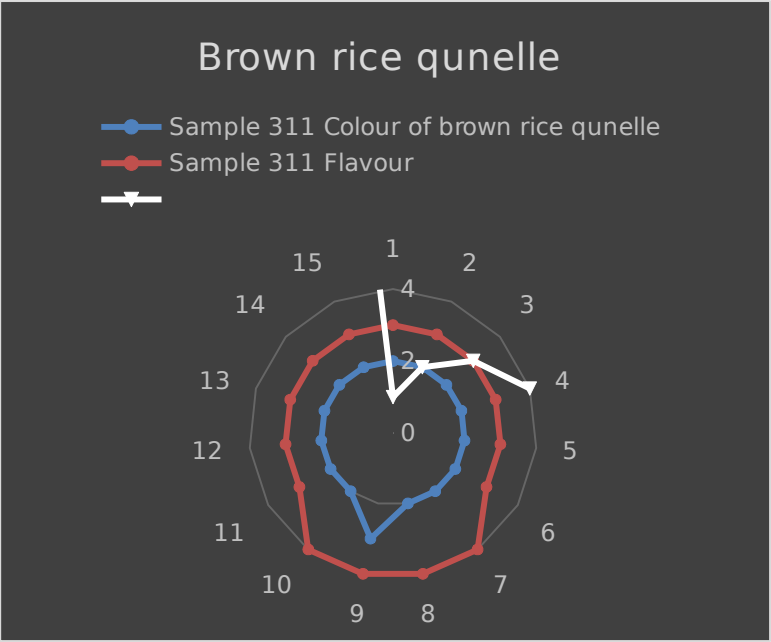
Tomato soup, Garlic mud, Balsamic stones, Brown rice quenelle

Tomato soup

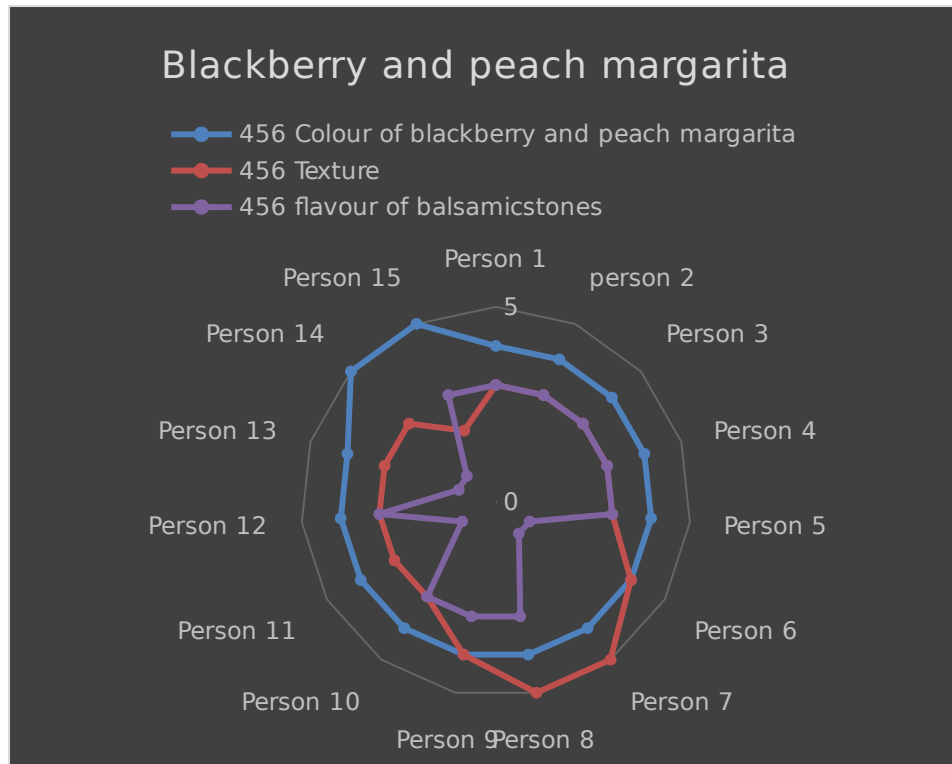


Balsamic stones





Black Berry and Peach Margarita with Balsamic Stones



Discussion of Results

The initial concept was to create an autumn forest like to pick up all the elements from there but by the end of week five I only could replicate the colors from the picture I had in my head. I thought it would be easy task to work with pure compounds but it's not. It's just pure imagination and the knowledge of using it properly. I started with the garlic mud which is basically abzorbit, oil, garlic and onion IQEMUSU just whisk the oil in the absorbit powder and you get garlic mud.

The tomato soup is based on only Water 25ml, Agar 1g texturas, Tomato flavor 3 drops, Garlic 2 drops, Basil 2 drops, Onion 3 drops IQEMUSU, Salt. The water was heated with agar then everything was added equally to get the desired flavor. Balsamic stones recipe for the dish and the drink is the same which was replicated from what we had learnt in class. It's a very simple recipe just heat balsamic vinegar let the temperature drop a bit and then add the agar to it mix thoroughly and then with the help of a dropper drop it into cold vegetable oil which will do the rest of the work. After that just strain the balls from the oil and you are ready with it. The flavor it has is very amazing it gives it a sour taste to the dish. Finally the brown rice quenelle it was the hardest part to make because I was going for something totally different in week 5 I wanted to make it look like trees in the autumn but it did not dry up enough, there was a lot of oil in it and I could not get the desired outcome so I improvised and gathered all the brown rice paste and made a quenelle out of it which made it look better than what I had thought but anyway it looked good so iam fine with it.

Cocktail

This was replicated from one of my personal favorite drinks which is a peach and tarragon margarita. The love for margarita made me think for an alternative for this drink which is blackberry and peach margarita with balsamic stones in it and no alcohol. It is very easy to make just make mint basil sugar syrup and add the blackberry and peach water in it. But this makes it very fresh and sweet tasting hence come in the balsamic stones which gives it a sour taste. When you sip it first you get the fresh mint and blackberry flavor and then the balsamic balls burst with flavor in your mouth it's like a party in your mouth without the alcohol.

Final conclusion

It was very interesting to work with pure compounds and very tiring because you can't find a lot on this subject it's just your own imagination but you can use the methods and ideas from a lot of other chefs. The Diarc dish was made by keeping the autumn forest in mind but I could only replicate the colors in it but it was a good experience of working only with pure compounds. The cocktail was a success in my point of view because it tasted the way I wanted it. Which gave sweet taste at first then the burst of sour taste from the balsamic stones.

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