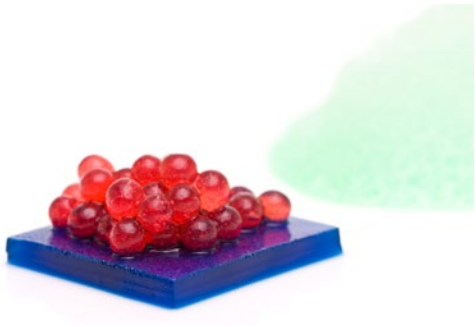
From the lab to the kitchen: molecular gastronomy



Molecular gastronomy dessert - raspberry caviar on blueberry gel with woodruff foam

Molecular gastronomy describes a new style of cuisine in which chefs explore new culinary possibilities by embracing sensory and food science, borrowing tools from the science lab and ingredients from the food industry and inventing surprise after surprise for their diners.

Formally, the term molecular gastronomy refers to the scientific discipline that studies the physical and chemical processes that occur while cooking, observed in professional kitchens as well as in labs.

Molecular gastronomy seeks to investigate and explain the chemical reasons behind the transformation of ingredients, as well as the social, artistic and technical components of culinary and gastronomic phenomena in general. It also refers to a modern style of cooking, which takes advantage of innovations from the scientific discipline. Some chefs prefer other terms such as "culinary physics" and "experimental cuisine".

The term "molecular gastronomy" was coined in 1988 by late Oxford physicist Nicholas Kurti and Hervé This.

New molecular gastronomy experiments have resulted in innovative dishes like hot gelatins, faux caviar, foam, spherical ravioli, crab ice cream and olive oil spiral. The famous chef Ferran Adria creates his system of spherification which gelled spheres that literally burst in your mouth. Heston Blumenthal created a dish that had three flavours -basil, olive and onion - and each of them was perceived in turn. The potential of molecular gastronomy is enormous. It is revolutionizing traditional cooking and transforming eating into a whole new emotional and sensory experience.

When people hear of molecular gastronomy for the first time they often consider it as unhealthy, synthetic, chemical, dehumanizing and unnatural. This is not surprising as molecular gastronomy often relies on liquid nitrogen, syringes, tabletop distilleries, PH meters and shelves of other chemicals. The truth is that the "chemicals" used in molecular gastronomy are all of biological origin. Even though they have been purified and some of them processed, the raw material origin is usually marine, plant, animal or microbial. These additives are also used in very, very small amounts and have been approved by EU standards. The lab equipment used in molecular gastronomy just helps cooks to do simple things like maintaining the temperature of the cooking water constant (water bath) , cooling food at extremely low temperatures fast (liquid nitrogen) or extract flavour from food (evaporator). There is still some debate about the healthiness of molecular gastronomy but I personally believe there are other bigger health issues in everyday food we consume.

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(adapted from *www.molecularrecipes.com*)

Some molecular dishes named after famous chemists.

Some new dishes, produced on the basis of the results of molecular gastronomy, have been named after famous chemists or scientists, so people are now eating 'chemistry'. Here are some recipes:

Shrimp and lemon mousse

Gibbs

When an egg white is whipped with oil, a white emulsion is obtained. If this emulsion is cooked in a microwave oven, water heats and expands. At that time, the temperature is about 100°C, which is higher than the coagulation temperature of egg-white proteins. The emulsion is then trapped into a gel. Of course, oil does not necessarily taste good, but imagine infusing vanilla pods in egg white, dissolving sugar into the mixture and adding very good olive oil before microwave cooking. The product is called a Gibbs, after the famous physicist Josiah Willard Gibbs (1839–1903).

Vauquelin

When an egg white is whipped, a small quantity of foam is formed: about 300 ml for one egg white. Why not more? As whipped egg white consists primarily of water (around 90%), proteins and air, it is easy to discover that adding water will produce more foam. If the foam is cooked in a microwave oven, a chemically jellified foam is formed. To achieve a better-tasting product, use orange juice or cranberry juice instead of water, and add sugar to increase the viscosity and to stabilize the foam before cooking. This new dish is named after Nicolas Vauquelin (1763–1829), one of Lavoisier's teachers.

Baumé

Have you ever put a whole egg into alcohol? If you are patient enough, ethanol will permeate the shell and promote coagulation. After about one month, the result is a strange coagulated egg called a Baumé, after the French chemist Antoine Baumé (1728–1804).

1 **Read the passage, discuss with your classmates and answer the following questions:**

1. What is molecular gastronomy?
2. When was this term coined?
3. Why is molecular gastronomy often considered dangerous and unhealthy?
4. What is the position of EU towards molecular gastronomy?
5. Why do you think some dishes have been named after famous chemists?
6. Have you ever tried a molecular dish? If not, would you like to experiment this new way of cooking?

What do you know about Chemistry?

Choose the correct answer, then check your results with your teacher.

1 **The science that concerns the study of matter, its structure and the changes in composition that matter undergoes is**

A. Biology **B.** Chemistry **C.** Ecology **D.** Physics

2 **When a chemist carries out an experiment, the substance that is being tested is called**

A. sample **B.** law **C.** theory **D.** variable

3 **After making an observation and proposing a hypothesis, the next step of a scientist should be**

A. ask other scientists for advice **B.** carry out experiments **C.** analyze the data **D.** state the conclusion

4 **A famous chemist, who established the science of Modern Chemistry, said: "One may take it for granted that in every reaction there is an equal quantity of matter before and after." Who is this famous chemist?**

A. John Dalton **B.** Alexander Fleming **C.** Robert Boyle **D.** Antoine Lavoisier

5 **Scientists gather information using their five senses. What do they do?**

A. state their conclusion **B.** gather data through observation **C.** formulate hypothesis based on the gathered data **D.** measure the exact quantity compared to the other quantities

6 **The scientific method of solving a problem follows the sequence:**

A. hypothesize, conclude, experiment **B.** hypothesize, experiment , conclude **C.** conclude, hypothesize, experiment **D.** experiment, hypothesize, conclude

7 **The system of measurement used by scientists around the world is:**

A. British System **B.** American System **C.** International System **D.** All of these