

Gastronomy Molecular Cooking Techniques Modern

Saptariana S.Pd, M.Pd

Abstract— *Molecular Gastronomy (molecular gastronomy) is the scientific study of gastronomy or more details is the branch of science that studies the transformation physicochemical from food during the cooking process and sensory phenomena when food is consumed. Science is characterized by the use of scientific methods to understand and control molecular changes, physicochemical, and structural happens to food at the stage of manufacture and consumption. The word "molecular" in reference to molecular gastronomy molecular biology reviewing materials to varying molecular cuisine. Then, the scientific methods used include close observation, manufacture and testing of hypothesis, controlled experiment, scientific objectivity, and reproducibility of experiments. It should be noted that molecular gastronomy is not the same as the type or style of cooking.*

Another term used to refer to molecular gastronomy is the avant-garde cuisine in which the avant-garde is derived from the advance guard, which literally means the vanguard of an army that led to war. The term is used to describe the disciplines that have passed the limits considered normal, such as the discovery of new techniques or the use of other existing techniques.

The basis of the technique of molecular gastronomy is nothing else than to change the shape and texture of a dish. Molecular gastronomy is a cooking technique that uses powder to change the texture of the food. Use of this powder is commonly used by the people of Indonesia, such as the use of starch, corn starch, or flour, to change the texture of the food.

Changes, both in form and texture using molecular gastronomic cuisine in colloidal systems. In physics-chemistry of colloidal systems is a mixture of the two substances form a homogeneous.

Keywords — *molecular gastronomy, physicochemical, molecules, colloids.*

I. PRELIMINARY

In recent years, the trend of culinary art of cooking is growing very rapidly. Many innovative material and process technology invented by the cook (chef) on the world stage. One technology that is quite phenomenal cook uncovered by modern chefs called molecular gastronomy. This technique is a breakthrough in terms of cooking techniques as well as the presentation techniques dish to consumers.

Molecular gastronomy is a technique that combines elements of physics and chemistry in cooking by studying molecular changes groceries. By Murdijati (2007: 12) said that gastronomy is a scientific exploration of the transformations occurring in culinary activities and phenomena in the enjoyment of cooking. One example of the results of the molecular gastronomy technique is caviar "fake" made from a mixture of chemicals such as sodium alginate from seaweed and calcium chloride as a membrane coating. Another example of molecular gastronomy is instant ice cream made from liquid nitrogen.

Molecular Gastronomy (molecular gastronomy) is the scientific study of gastronomy or more details is the branch of science that studies the transformation physicochemical from food during the cooking process as well as the phenomenon of sensory food products are consumed. Science is characterized by the use of scientific methods to understand and control molecular changes, physicochemical, and structural happens to food at the stage of manufacture and consumption.

The modern chef is constantly innovating to develop new techniques in cooking. They assume that a traditional way of cooking is not necessarily ensure the integrity of the nutrients contained in the food after processing. It makes traditional techniques may not be able to guarantee our health because cooking techniques that may be less fit. To answer these problems, the modern chefs seek solutions to continue to develop techniques that make cooking food products produced to be more healthy and exciting.

In culinary science, molecular gastronomy is better known as avant-garde cuisine. By listening to some particular way of cooking food as well as the presentation of a model of healthy dishes, interesting, and unique, will make us amazed.

The word "molecular" in reference to molecular gastronomy molecular biology reviewing materials to varying molecular cuisine. Then, the scientific method is used in the cooking process include: in-depth observations, manufacture and testing of hypothesis, controlled experiment, scientific objectivity, and

reproducibility of experiments. It should be noted that molecular gastronomy is not the same as the type or style of cooking which we see and understand it.

The use of scientific methods to understand the properties of food begin to be considered useful in the 18th century (1783) by Lavoisier and a half centuries later by Brillat-Savarin in his article entitled "Physiology of Taste" (1852). Other scientists emphasize the relationship between gastronomy and science was Nicholas Kurti (Susilo, 2012), low temperature physicists from the University of Oxford, UK.



Fig 1. Ice cream from liquid nitrogen

In terms of terminology is often a confusion between molecular gastronomy, cooking, science, cooking, and culinary. Cooking is a technique (or sometimes art) whose goal is to make the food, which is usually a place in your home or restaurant kitchen.

To be able to cook more, it takes skill to pick herbs for example, based on chemistry or physics. In contrast, molecular gastronomy is science, especially physics and chemistry, conducted in the laboratory (Susilo, 2012). Science uses an experimental method in which the resulting theory after studying the phenomena that occur in quantitative and refute existing models to make predictions and then the theoretical and experiment testing. In essence, the main purpose of science is to find the mechanism of a phenomenon and not related to the purpose of making food. Culinary is a mix between the disciplines of food science and culinary arts. Additionally culinary is a term that has been protected by copyright while molecular gastronomy is not protected by copyright.

With the development of technology of molecular gastronomy, Indonesian cuisine can no longer perform minimally. Utilizing molecular gastronomy, diverse culinary Indonesia proved to be explored with modern and classical approaches, ranging from molecular flow to the "slow food".

Slow food itself is a movement that calls on people of the world back to the local wisdom in the food sector. This movement started in 1986 by Carlo Petrini, the Italian man, as resistance to the globalization of fast food (Kompas, 24-10-2012). In this case, the variety of Indonesian cuisine is certainly very close to the flow of slow food.

II. FORM AND IMAGINATION MOLECULAR GASTRONOMY

Of course, if we remember childhood, we will remember the most delicious stew made our mother. Ripening process takes a long time and also patience. Yet not only the generations before us who could make it as good food. Experts in the field of modern culinary did not want to lose to be able to make food more palatable. First - first, there are some basic things we need to know in the world of cooking. If we cook meat at high temperatures, the meat will release liquid contained in it so that the result will be a tough meat. Of course you are not interested to eat meat with a texture that hard, right? So, a good temperature to produce meat with a perfect texture is at a fairly low temperature. Low temperatures will not make the meat liquid squeezed out.

Although it is difficult and takes patience, true molecular gastronomy makes the cooking process even more enjoyable. Imagine the joy of coffee jelly shaped solid on the outside, but the liquid inside. Or imagine the joy of mango essence egg-shaped fish that can break when in the mouth. Hmm All that can be done by the chefs who apply molecular gastronomy.

The basis of the technique of molecular gastronomy is nothing else than to change the shape and texture of a dish. Molecular gastronomy is a cooking technique that uses powder to change the texture of the food. Use of this powder is commonly used by the people of Indonesia, such as the use of starch, corn starch, or flour, to change the texture of the food.

Changes, both in form and texture using molecular gastronomic cuisine in colloidal systems. In physics-chemistry of colloidal systems is a mixture of the two substances form a homogeneous. The mixture will be very soft, so can not be called late but dispersed. Colloidal system itself, actually lay encountered everywhere. Milk, Ink, clouds, was created by some form of colloidal systems. There are 3 forms of colloids used by molecular gastronomy experts and are found in foods. All three are emulsions, foam and gel. Emulsions are colloidal systems between the two liquids, such as milk. Foam colloid system is the gas with water. While the gel, the result of colloidal systems with semi-solid and liquid forms, such as gelatin.

The forms can be formed manifold. For example, forming a jelly-like coffee that contains coffee water in it. To create this recipe, using only simple tools and materials such as a basin of water with a solution of calcium, a cup of water, a spoon, and espresso that has been given sodium alginate. Espresso has given sodium alginate would be more viscous than espresso in general. Espresso is scooped and poured thick slowly into the water with a solution of calcium. Calcium solution will solidify the outer layer without disturbing the coffee in it. Having silenced for a moment, jelly was removed and rinsed in a cup of water. Once ready, put on a spoon, espresso is ready to be enjoyed.

Not only to make jelly, can also be done experimentally using liquid nitrogen to make ice coffee solid on the outside, but still liquid inside. We do not have to worry about the side effects of any chemicals used, as far as the right dosage. Chemicals such as sodium alginate, maltodextrin, xanthan gum, and liquid nitrogen is actually coming entirely from the realm of natural and naturally. Some of these materials have actually we consume each day through the usual dishes cooked.

To experiment with molecular gastronomy, it is necessary to mixing ingredients in a very precise dose (up to 0.01 grams). As Ronald said before, the use of materials in an improper dosage can cause a fatal thing. Because it is essential for every practitioner of molecular gastronomy to have the proper tools such as electric scales.

Laboratory equipment can be used to facilitate the creation of molecular gastronomy cuisine with, for example, a pH meter to measure acidity, which is a gauge refractometer sugar, or small scales with high accuracy up to 0.01 grams. In addition, using the Thermomix which serves to mix the ingredients as well as heating.

To perform molecular gastronomy in the home kitchen, need not prepare laboratory equipment. Creative dishes simple molecular gastronomy does not require equipment and materials are expensive. Pretty simple to use powders like soy lecithin and sodium alginate. Some powders such as calcium are also needed if you want to activate the colloidal system.

Basically to more quickly master molecular gastronomy, must often imagine and ignorant in developing techniques of molecular gastronomy. Creative approach to molecular gastronomy technique does require imagination and curiosity and always wanted to know.

III. MOLECULAR GASTRONOMY TECHNIQUES

Now, imagine that before we presented the menu like this: meat rolls wrapped salted egg mousse. The meat is served in a bowl, fitted the clear brown sauce, decorated with grains like caviar. Cuisine what's on your mind by imagining the description above? It should be understood, that menu is the cuisine of Indonesia. The menu described above, is actually the result of rawon cooking techniques of molecular gastronomy.

By utilizing the "flow" molecular gastronomy (molecular gastronomy) and the cooking technique called molecular cooking, which usually display rawon black, containing small pieces of meat, bean sprouts, and salted eggs can be turned 180 degrees looks.

Rawon molecular gastronomy can be shown as sukiyaki meat rolls. Eggs salty processed into mousse (foam kind rather dense) are smothering the meat rolls. As a complement, the sprouts are usually shaped sprouts turned into caviar. The papayas, essential spices that make rawon black, made as a topping. Rawon such as molecular gastronomy has been reincarnated, rawon form displayed in a very different form altogether.

Molecular gastronomy techniques can also be realized in the manufacture of herb tea, organic tea from the slopes mixed with tropical fruits, cubeb (a kind of black pepper), cinnamon, and cloves. This herb tea can still be fitted with a "caviar" of the pineapple. Unlike the usual tea tasted a bit bitter, herb tea with molecular gastronomy techniques with dominance feeling fresh fruit flavors and a soda in it.

III.1. Sous Vide

You could say this method is the method of molecular gastronomy are somewhat antiquated. How to cook with this method first pioneered by Sir Benjamin Thompson in 1799 (<http://memantau.blogspot.com/>, 2012: 3). In this method, the meat will be cooked put in an airtight plastic bag. Then the plastic bag containing

the meat is soaked in water with a temperature of 60 degrees for long periods of time. A meat can be cooked for 40 hours with this technique. The result? meat has a very soft texture and reddish as the original.

Sous vide is also called vacuum technology. In addition to producing an amazing flavor and texture is good, this technique also has the advantage. Sous vide is not needed in the processing of oil that is healthier for the body. Nutrients in food was not wasted when processing. This is what causes sous vide technique became the most popular techniques in the chef world.

III.2. Transglutaminase

Let us imagine a bowl of noodles with steamed shrimp as a supplement, but the noodles are not made from flour is the main ingredient noodle maker. Noodles are made from shrimp, too, how can that be? when we cook using the concept of transglutaminase, certainly can. Transglutaminase is an enzyme called meat glue, which the substance will break down the meat cells. Ties meat that has been broken will be converted into a slurry that can be formed. Well, when it is in the form of porridge, then meat shrimp can also be formed into noodle-like. This enzyme is also often used for making meatballs to become more supple. The image below is a plate of prawn noodles are cooked by a professional chef with transglutaminase techniques.



Fig 2. Molecular gastronomy noodles shrimp meatballs

III.3. Methyl Cellulose

Methyl cellulose is one of the very interesting material in the modern culinary world. Methyl cellulose is a compound that can turn into a gel when heated. These compounds are often used by makers of pie. They mix them into the content of their pie so that does not spill out when the pie is cooked. However, the molecular gastronomer had a brilliant idea in its use. With these substances, they can make hot ice cream. To make the ice cream is mediocre, things to do first of all is to mix the basic ingredients of ice, which is cream with methyl cellulose. Cream that is mixed only 1.5% of total prescriptions. After that, drowned a spoon full of liquid into the pan of hot water. Hot water will cause the ice cream to be hard. When it hardened, serve immediately. The result will be a cold ice cream melts.

The image below is an ice cream hot cauliflower result of technical methyl cellulose molecular gastronomy.



Fig 3. Ice cream hot cauliflower

IV. COVER

Traditional cooking that it was actually a lot of health risks. For example, the temperature is too high, causing excessive caramel and damage protein foods, this raises the risk of stroke. In this method of cooking gastronomy molecular myth that cooking will only mature in high temperature soundly refuted, with molecular gastronomy a steak cooked in temperatures of 80 degrees Celsius only, cooked tender and evenly.

V. BIBLIOGRAPHY

- [1] Arumdiani, Adjeng. , 2011. *French Culinary in Indonesia, A Study of Meaning of La Haute Cuisine; Fine Dining French by French Chef Emilie and Amuz Senopati and Sudirman in South Jakarta*. Jakarta: University of Indonesia.
- [2] Kompas. 2012. *Culinary Trends: From Molecular To "Slow Food"*. Wednesday, October 24, 2012 | 20:18 pm. <http://female.kompas.com/read/2012/10/24/20180371/Tren.Kuliner.Dari.Molekuler.Hingga.Slow.Food>. Friday December 28, 2012 07:33
- [3] Murdijati Kartijo. , 2007. *New Directions Education Competence Food Science and Technology for Food Troubleshooting*. Yogyakarta: Gadjah Mada.
- [4] Susilo, Surya Yudha. 2012. <http://suryayudhasusilo.blogspot.com/2012/11/gastronomi-molekuler.html>. Friday December 28, 2012 07:30
- [5] <http://memantau.blogspot.com/2012/07/gastronomi-molekuler-adalah-teknik.html>. Thursday, December 27, 2012 22:00
- [6] <http://memantau.blogspot.com/2012/07/gastronomi-molekuler-adalah-teknik.html>. Thursday, December 27, 2012 22:00
- [7] <http://www.perutgendut.com/media/read/Mengenal-Teknik-Gastronomi-Molekuler/608> #. UNzpOKxDIn4. Friday December 28, 2012 06:00
- [8] <http://intisari-online.com/read/ketika-kuliner-bertemu-ilmu-alam>. Download Thursday, January 3, 2013, 17:50