

# Molecular Gastronomy: The New Age Cuisine

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**Abstract**—*Food is an important aspect of one's culture, and in a country like ours we have different states with their varied cuisines all amalgamated into our one great culture. So cooking is such a routine activity it just gets embodied in our daily lives. We all like to eat what we are comfortable or for what we have developed taste of, but are we ready for a change, is our palate ready to accept the change, something new, which not only affects our senses but also affect our perception about our food.*

*For many years, these molecular transformations were neglected by the food science field. In 1988, the scientific discipline called "molecular gastronomy" was created, and the field is now developing in many countries including India.*

*Food prepared from using these modern techniques does not just look good, but also goes far from the conventional texture that we are used to.*

*Thus this paper attempts to find the scope of this modern cuisine in world city like Delhi NCR, and also put forwards issues and challenges which can be a deterrent in acceptance of this type of cooking.*

## Introduction

Food has always been an important cultural mark in the society. All the developments across civilizations have included food. Be it the stone age where people started developing tools just to hunt animals for food or further civilization where people travelled across continents for spices and fruits. The drive to obtain food has been a major catalyst across all of history, Epicure Jean-Anthelme Brillat-Savarin said it best: "Gastronomy governs the whole life of man." In fact, civilization itself began in the quest for food. Humanity's transition to agriculture was not only the greatest social revolution in history, but it directly produced the structures and institutions we call "civilization." (Professor Ken Albala, 2013). Food all through ages and civilizations have been witnessing changes, changes in the use of ingredients, techniques and flavours generated. As the changes were taking place in cooking period between 1700 to 1900 saw the widening of gap between home cooking and professional cooking where chefs like Careme and Escoffier revolutionised professional cuisine with their new techniques and recipes, they touched new horizons in culinary panorama. Today's kitchens look much different from those of Escoffier's day, although our basic cooking principles are the same. The dishes now we find in restaurant are product of creativity and innovations of the modern chefs who are not afraid to mix

ingredients and are out of the box thinkers. These chefs had left an impact on the classical cuisines, by developing nouvelle cuisine & fusion cuisine.[2] French haute cuisine, nouvelle cuisine sought to emphasize the natural flavours, textures, and colours of foodstuffs. Nouvelle cuisine was also influenced by the Japanese style of food presentation.[3] Fusion cuisine combines elements of various culinary traditions while not fitting specifically into any. The term generally refers to the innovations in many contemporary restaurant.[4].

Following are some of the developments that have changed food production in 20<sup>th</sup> century:

### Development of New Equipment

Basic equipment as gas and electric ranges and ovens and electric refrigerator did not exist until fairly recently. These modern equipments which can easily control heat as well as mixers, processors and food cutters have greatly simplified food production.

### Development and availability of new food products.

Modern methods of refrigeration, freezing and canning, use of preservatives etc have increased the availability of most food stuffs, making it easier for the chef to experiment with various flavours in their kitchens.

The latest development in the food production industry which has taken the world by storm is molecular gastronomy.

The term "molecular gastronomy" was coined in 1988 by late Oxford physicist Nicholas Kurti and the French INRA chemist Hervé This. Peter bar ham in his book molecular gastronomy clearly states the development of this approach "The science of domestic & restaurant cooking has recently moved from playground of few interested amateurs into the realm of serious scientific endeavour. A number of restaurants have started to adopt more scientific approach in the kitchen". (Peter Barham 2009).

Molecular gastronomy is refers to a modern style of cooking, which is a discipline practiced by both scientists and food professionals that studies the physical and chemical processes that occur while cooking. Molecular gastronomy is invested by both scientists and food professionals that occur while

cooking, the current objective of molecular gastronomy is to investigate and explain the chemical reasons behind the transformation of ingredients, also social, artistic and technical are the important components of culinary gastronomic phenomena in general (This, 2006). In the most recent ranking of the world's top 50 chefs—by the British magazine *Restaurant*—the top three chefs were Ferran Adria from El Bulli in Rosas, Spain; Heston Blumenthal from The Fat Duck in Bray, UK; and Pierre Gagnaire from his restaurant in Paris, France (*Restaurant*, 2006). In 2005, Blumenthal was first and Adria came second. What is remarkable is that all three of these talented and popular chefs have been inspired by molecular gastronomy. (Herve This)

## 1. DEVELOPMENTS IN INDIA

Molecular gastronomy is quietly sweeping across top kitchens in India. Aurus in Mumbai started the trend and today you can find the edgy and flamboyant 21st-century culinary style at the Salt Water Caf ½ and Mocha Coffee and Conversations in Mumbai. [5]

Delhi is also keeping up with the pace and many new restaurants have mushroomed up in NCR circle which are serving their guest food which really make them to think. With change in textures, preparation techniques and artistic presentations. Restaurants & bar that are serving molecular cuisine in Delhi are:[6]

Tian , ITC, Farzi cafe, Vault cafe , Smoke house grill, Olives bar & kitchen & Shroom

### Techniques and ingredients involved

The basic techniques of molecular gastronomy are spherification (both basic and reverse), gellification, dehydration, and foaming, powdering, emulsification and so on. Basic ingredients involved are sodium alginate, liquid nitrogen, calcium citrate, citric acid, and lecithin. The techniques all require a lot of expertise and extreme precision; there's a lot of science involved in it. The nutritional value of the meal by infusing various ingredients together. Molecular gastronomy employs equipments like caviar sets, hot silicone moulds, caviar maker, sous vide machine, smoking gun, dehydrator, edible film sealer, etc. Some of the quintessential elements used in such cooking, apart from the equipment are – liquid nitrogen, hydrocolloids such as starch, gelatin, natural gums, etc, carbon dioxide source for making bubbles and such. Apart from above mentioned ingredients natural salts, calcium salts, mineral salts, calcium lactate, calcium chloride, liquid nitrogen, lecithin gum, etc.[7]

## 2. LITERATURE REVIEW

Edward and Ververde, (2008) in their paper quote that emphasis should be given on molecular gastronomy on a culinary front than outlining it just as a scientific transformations, they state in their paper that Molecular

gastronomy should be considered as a part of culinary transformations that occur in home or eating rather than just physical or chemical transformations as researched by food industry. Vega & Ubblink (2008), in their article, states that inspite of all the media attention, molecular gastronomy remains poorly communicated for this reason, it stirs deep among cooks, scientist and lay public alike.

Molecular gastronomy is often measured in media to refer to chefs who apply techniques developed by scientist in their own style of cooking. (Blanck 2007)

Cooking is as much science as it is art. Cooking techniques are not based on arbitrary rules some chefs made up long ago. Rather, they are based on an understanding of how different foods react when heated in various ways, when combined in various proportions, and so on. The chefs who have come before us have already done much of this work so we don't have to. This doesn't mean there is no room for innovation and experimentation or that we should never challenge old ideas. (Wayne Gisslen, 2011) , All sciences are useful for this enterprise, not only chemistry and physics, but also biology, as well as history and sociology. However, for chefs, and hopefully for non-chefs as well, the main aim is to surprise and delight their guests or their family with exciting, tasty and healthy food. (This ,2006)

## 3. RESEARCH METHODOLOGY

The empirical research was conducted using questionnaire as a research tool. The questionnaire had ten close ended questions. The questionnaire was mailed through Google docs as it provides standardisation in creating a questionnaire and its distribution. The respondents were professional chefs working in hotel industry, academic chefs who have worked and are now part of academics, students of hotel Management College and random individuals who are regular diners and critics. There were limitations as it's a new discipline very few studies have been done in this field in our country, most of the literature reviewed for the research were of studies done on Herve This (founders of this discipline) or were of research done outside our country.

## 4. OBJECTIVES OF STUDY

The purpose of the study is to examine the rise of molecular gastronomy in restaurants of Delhi NCR .The main objectives of the study are:

1. Issues and challenges which can be a deterrent in acceptance of molecular gastronomy.
2. Finding the scope of molecular cuisine.

## 5. RESULTS & DISCUSSION

The study used questionnaire to find out the customer perception about molecular gastronomy, 100 respondents were mailed the questionnaire, which included 10 academic chefs,

10 industry chefs, 50 trainee chefs and 30 random diners. Out of which 84 responses were received, which included 6 industry chefs, 10 academic chefs, 48 trainee chefs and 20 random diners

## 6. FOLLOWING WERE THE RESULTS

When asked about whether they know the term molecular gastronomy out of 84 respondents 75 % have heard the term and they know about this recent phenomenon. Fig [1]

Majority of the respondents have heard about this latest phenomenon from visual media, that is TV or internet. All the academic chefs and trainee chefs who have heard about this type of advancement is either through Internet or TV, Only the chefs working in industry have either worked on it or got to know about it from trade journals. Fig [2]

Out of all the respondents only 19 % have visited a restaurant to dine on the menu comprising of dishes in which these latest techniques have been used. Fig[3]

Out of the all 16 respondents who have experienced molecular cuisine in person, 14 have found it good , that makes around 87 % liking percentage , when spoken in person these individuals have found it different with great emphasis on textures and presentations.fig[4]

Only 43% of the respondents had an idea of the ingredients that are being used in processes, like malt dextrin, sodium alginate, agaragar & soy lecithin etc.fig [5]

94 % of the respondents were comfortable with the idea of chemical ingredients being used in their food to change the texture most of them found it interesting , in a way as it changes textures of food. All the respondents who have an idea about molecular gastronomy felt that using these techniques can enhance presentations, Fig [6]

When put a question whether they would like to spend more to experience a cuisine like this almost all of the respondent said Yes, it shows people are eager to spend money on something which is different from the usual food (authentic cuisine).fig [7]

67 % of the respondent still rate authentic Indian food over this new discipline, most of the academic chefs and industry chefs see this as an exciting change but still feels authentic Indian cuisine had withstand longevity of time and will continue to do so. Fig[8]

Most of the respondents believe that lack of information and unavailability of the ingredients as main hindrances, very few restaurants and cost are also hiccups in establishment of this cuisine. All the chefs were open to learn more about these techniques , academic chefs have been laying emphasis to use this cuisine in their curriculum or when preparing trainee chefs for competition, industry chefs feel that use of these techniques have opened new doors in Indian food plating and presentation.

## 7. FOLLOWING WERE THE CHALLENGES THAT THIS DISCIPLINE FACES

### Loss of authenticity

As food is one of the essentials form to depict culture and traditions of a country, the use of molecular gastronomy or modernist technique changes that and does not put up the exact food as associated with the region. Unavailability of the ingredients & equipments As most of the restaurants using these techniques in their menus have been importing ingredients from outside India, so as the investment is on a higher side ROI becomes one of the biggest constraints.

### 8. GOVERNMENT RULES & REGULATIONS

Some years ago, Italian government banned the use of chemicals in their cuisine, their are chances that similar decisions can be followed up in other countries.

### Expensive

As the ingredients are expensive, so will be the dishes made from the ingredients, although restaurants like Farzi cafe are providing dishes that are easy on pocket.

## 9. SUGGESTIONS

### Recognition to Chefs

Proper recognition should be given to young chefs who are trying this art successfully latest example being Chef Sabby awarded with president's award and Ferran Adria being made the tourism ambassador of Spain.

### Change in curriculum

most of the culinary curriculum have not been amended with the changes in the industry this has widened the gap between industry and academics, it can be helped by more guest lectures and demonstrations by the industry experts

### Easy Availability of Ingredients

Additives used in this style of cooking should be easily available.

Would like to conclude with the lines quoted by Chef Neeraj Tyagi on molecular gastronomy

I would say that this type of cooking methodology cannot be applied to traditional Indian cuisine per se, but rather to what we today call 'progressive Indian cuisine and Indo-Western fusion cuisine' which allows the usage of such ingredients and cooking methods. People want to experiment because they are exposed to new flavours and cuisines; they are increasingly well travelled and well aware of the trends. Another advantage of such cooking is the smaller portions which we find are being appreciated by Indians as they become more calorie conscious [12]

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**REFERENCES**

- [1] Professor ken Albala (2013), food a cultural culinary history
- [2] Wayne Gisslen, Professional cooking, 7th edition(2011)
- [3] <http://www.britannica.com/EBchecked/topic/420922/nouvelle-cuisine>
- [4] [http://www.princeton.edu/achaney/tmve/wiki100k/docs/Fusion\\_cuisine.html](http://www.princeton.edu/achaney/tmve/wiki100k/docs/Fusion_cuisine.html)
- [5] <http://indiatoday.intoday.in/story/A+great+chemistry/1/74082.html>
- [6] [www.zomato.com/moleculargastronomy](http://www.zomato.com/moleculargastronomy)
- [7] <http://archive.foodandhospitalityworld.com/columns/3750-the-chemistry-between-india-and-molecular-gastronomy>
- [8] Edward & Stuart Valverde (2008), Food quality, An issue of molecule based science , European food research & technology (965-967)
- [9] Vega, C & Ubbink, J (2008), Molecular gastronomy: a food fad for science supporting innovative cuisine, Trend in food science and technology (19, 372-382)
- [10] Blanck (2007), Molecular gastronomy: overview of controversial food science discipline , Journal of Agricultural & food information (Page 77-85)
- [11] Peter Barham (2009), Molecular Gastronomy : A new scientific discipline
- [12] Chef Neeraj Tyagi ( Executive chef , Claridges New delhi),on the-chemistry-between-India-and-molecular-gastronomy by Kahini Chakraborty
- [13] <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1679779/#b25>
- [14] Herve This (2006), How the scientific discipline of molecular gastronomy could change the way we eat