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Molecular Gastronomy in Ireland

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This article summarizes the activities of molecular gastronomy (MG) in Ireland since the scientific discipline was first introduced in the country. MG has been developing over the last five years, however, the authors of this article have been trying to establish a strong MG infrastructure in Ireland. Indeed, a lot of work still needs to be done, but public interest and positive perceptions of “chemistry” have increased very quickly; consequently, there is great potential for further development. Indeed, we can now say that MG has crossed the rubicon in Ireland.

KEYWORDS *Molecular gastronomy, education, Ireland, DIT*

This article aims to summarize recent developments of molecular gastronomy (MG) and its applications in Ireland. Molecular gastronomy as discussed by Dr. Hervé This in the previous issue of the *Journal of Culinary Science & Technology*, 9(3), was developed in the United Kingdom and France in the 1980s (This, 2011). Although molecular gastronomy has arrived in Ireland considerably later than in some other countries, it is now rapidly developing into a more mature discipline. Considering that carrageenan (or *carragín* in Gaelic) grows in Ireland where the first documented extraction from *Chondrus crispus* (a seaweed also known as Irish moss) was carried out, it is paradoxical that this ingredient of molecular cuisine has not been used more frequently in its culinary tradition. Although initial timid steps were taken in the field of MG, presently it is creating a lot of general interest and consolidation in several of its applications. However, there is still a lot of work to be done and therefore this article aims to review the activities taking place and future areas of work. For example, the creation of a seminar of MG in Dublin or other cities in Ireland as has been done in many other cities around the world (Paris, London, New York, Buenos Aires, Beirut, to name a few) should foster interest and development of the discipline in the future.

SCIENTIFIC RESEARCH

Scientific research on gastronomy has focused on the molecular and historical points of view. In 2009, a PhD thesis entitled “The Emergence, Development and Influence of French Haute-Cuisine in Dublin Restaurants From 1900 to 2000” was written by Mairtin Mac Con Iomaire of the School of Culinary Arts, Dublin Institute of Technology (DIT). The same author has written a series of conference papers and peer-reviewed publications on the culinary history of Ireland. These articles cover the history of several different foods and ingredients in Ireland and in some cases “the absence of evidence is not evidence of absence.” The study of traditions and customs related to gastronomy has been shown to be essential for the exploration of old wives tales. Many of these contribute to gathering knowledge of the culinary history of Ireland and are available free on DIT’s website.

In addition, a research project is currently being undertaken at DIT that aims to investigate innovative methods for producing creative and novel food products using the theories and technologies of MG. This is the first PhD research on MG funded in Ireland. The approach of the project is unique and a proactive response to the modern consumer’s fundamental desires and needs, where the appetite for food is not merely based on nutrition and sustenance but on its source of enjoyment and pleasure. The project utilizes the theoretical and practical knowledge of MG and its applications (technologies and techniques from the laboratory and industry) and applies it to product development with the goal of optimizing multisensory satisfaction. Key aspects of the project include optimization of formulation and flavor release from dispersion model systems, investigation of novel flavour combinations, and utilization of innovative technologies and techniques for modification of textures and appearance.

Some results from this work were presented in a scientific poster presentation at the annual Research Chefs Association Conference in March 2011 in Atlanta, Georgia, and received first prize in the product development category (Traynor *et al.*, 2011).

EDUCATIONAL DEVELOPMENT

The educational applications of MG have proven to be very effective in teaching complicated chemistry or physics concepts to young science students.



FIGURE 1 Dublin Institute of Technology participants at the Sixth Art, Science and Cuisine Meeting, Paris 2011, from left to right: Pauline Danaher, Dr. Roisin Burke, Dr. Hervé This (cofounder of molecular gastronomy), David Smith, David McGuinness, and Dr. Juan Valverde (Teagasc Food Research Centre, Ashtown, Ireland) (color figure available online).

For example, in 2011 the SciFest Intel Best Project Award was given to students from St. Joseph's school in Dublin, who had used MG principles and methodology to understand the impact of different ways of cooking green vegetables (Hosford, 2011). SciFest is a series of oneday science fairs hosted nationwide at the institutes of technology. Each SciFest includes a competition and exhibition of projects, a selection of science talks, science demonstrations, and a prize-giving ceremony. The aim of these scientific fairs is to encourage an interest in science through active, collaborative, inquiry-based learning and to provide a forum for students at the local/regional level to present and display their scientific investigations. The same project is currently competing in the SciFest at the national level.

Roisin Burke and a postgraduate student attended the seminar "When Chefs Meet Scientists" held in Paris, during the Euro Food Chem XIV (the biannual conference of the European Association for Chemical and Molecular Sciences [EuCheMS]). The seminar had a great impact on Dr. Burke, and Dr. Hervé This was then invited to DIT to deliver a seminar on molecular gastronomy (Burke, 2011a), after which DIT launched a validated 12-week module on molecular gastronomy in 2009 (DIT, 2011a).



FIGURE 2 DIT winning entry: Hot lemon and lime shot, sweet and sour apple gum, pear sorbet, chocolate coffee cup with *latte espuma*, and fruit pastille cocktail (color figure available online).

This module runs as an option in year 4 of the Bachelor of Arts in Culinary Arts. It was the first of its kind in Ireland and currently remains so. Participants taking the module must have already studied culinary science, gastronomy, and kitchen and larder and/or have work experience at a level deemed suitable. Since 2009 two more modules have been validated and developed at DIT. One of these modules is running on a DIT Springboard program.

Springboard is about helping those who have lost their jobs in more traditional industries. It aims to build on their workforce skills with new qualifications in areas of potential employment growth. Programs are available at all higher education levels, from certificate to master's degree. It suits people with differing levels of qualifications and backgrounds (Quinn, 2011). One of these programs is the CPD Diploma in Food Product Development (DIT, 2011b). Basic Molecular Gastronomy is a module in the program. It will provide the knowledge and skills necessary for participants to develop innovative and novel food products. A third module, Advanced Theory and Practice of Molecular Gastronomy, is at the master's level and will be part of DIT's MSc in Culinary Innovation and Food Product Development (DIT, 2011c). Participants at this level will be competent in advanced theoretical scientific aspects of molecular gastronomy and their practical culinary applications.

DIT is a partner in the Erasmus Mundus Master's program in Food Innovation and Product Design (Burke 2011a, 2011b). This program launched at the end of August 2011. In 2012–2013 some of the participants will elect to take a transverse module in molecular gastronomy. The module will be taught between AgroParisTech (Dr. Hervé This), DIT (Dr. Róisín Burke), Teagasc (Dr. Juan Valverde), and the University of Naples (Professor Vincenzo Fogliano).

The Dublin Institute of Technology was awarded second prize for their innovative contributions at the Sixth Meeting on Science, Art and Cuisine, which took place at the Paris Institute of Technology of Life, Food and Environmental Sciences (AgroParisTech) in March 2011 (Figures 1 and 2). The whole event was hosted by Dr. Herve This. The meeting takes place every year and its aim is to promote culinary innovation using innovative techniques and ingredients. The event involves a competition in which the scientific, artistic, and culinary skills are applied to create innovative food products. These products were evaluated by judges from academia and industry. The award was given to DIT for the work carried out during the year by students taking the module in molecular gastronomy.

EVENTS

Main events related to MG are held during general public events such as Science Week and the Open Days at the Culinary Arts School at the Dublin Institute of Technology. The annual Open Day of the School of Culinary Arts and Food Technology represents a perfect opportunity to publicize and disseminate the activities of the school as well as the MG program. This is normally carried out by current students and members of the academic staff.

However, every year specific events are performed to divulgate MG and encourage its dissemination in Ireland. After Dr. This's first visit to Ireland in 2008, a workshop on techniques and ingredients used in molecular cuisine took place at DIT. It was delivered by Dr. Paulina Mata and Joana Moura from Cooking Lab (Lisbon, Portugal). In 2011 a seminar for restaurant chefs and students in the hospitality and tourism industry was given by Dr. Hervé This on the concept of "Note by Note" cuisine. The seminar was introduced by the French Ambassador S.E. Mrs. Emmanuelle D'Achon and the event was inspired by two major elements: the United Nations Educational, Scientific and Cultural Organization (UNESCO) declared 2011 as the International Year of Chemistry and French gastronomic art was added to UNESCO's intangible world heritage list. Most recently an experimental workshop for chefs and the food industry in general was given at Ireland's Food and Drink Professional Trade Show on the use of scientific knowledge to improve or develop new dishes.

PUBLICATIONS AND TECHNOLOGY APPLICATIONS

Recently a couple of articles showed the increasing interest of the Irish public in the field of MG. An article appeared in the *Irish Times* (2011), which is considered to be Ireland's newspaper of record, introducing and explaining the principles of MG. In the article the work being carried out at DIT was highlighted, with reference to its courses and the success of DIT students. David Smith and David McGuinness, who won second prize at the Sixth Art, Science and Cuisine Meeting that took place in Paris (Figures 1 and 2).

Another article appeared in July 2011 in *TResearch* magazine, a popular science publication focused on the impact that the development of MG could have not only for culinary progress in Ireland but in the development of Ireland's gastronomic tourism. The article highlighted how the results of several ongoing research projects on food processing could be easily transferred to a small scale in restaurants prior to their incorporation and up-scaling by the food industry.

Further publications included an article in July 2011 in DIT's *Innovation Magazine* (Burke, 2011a). The development of MG at DIT and the Erasmus Mundus program were highlighted. A more detailed article on the Erasmus Mundus program was also published this year in this Journal (Burke, 2011b).

Slowly, applications of molecular gastronomy are being introduced into restaurants in Ireland. Chefs are already using low temperatures to cook meats or are using liquid nitrogen for multiple culinary purposes (i.e. ice cream). Some restaurants in Dublin include Chapter One (Chef Ross Lewis; <http://www.chapteronerestaurant.com/index.html>) and Thornton's (Chef Kevin Thornton; <http://www.thorntonsrestaurant.com>) but there are more affordable places to taste MG applications such as the Ice Bar at the Four Seasons Hotel in Dublin (<http://www.fourseasons.com/dublin/dining/ice/>).

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