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Molecular GAstronomy: Glamourising industrial gases

[14 May 2009, Katie Hill, gasworld.com]

Exclusive

gasworld explores a growing trend, which has seen restaurant kitchens the world over turned into science labs.

Michelin star-ridden chefs continue to up their game, trying to create the best tasting, most aesthetically pleasing dish; in recent years this has prompted the introduction of a most unusual ingredient to the restaurant kitchen, gas.

Until recently, the only gas present in a kitchen would be that which burns with a blue flame and heats the base of a saucepan. For many years however, chefs like Heston Blumenthal and Ferran Adrià have been quietly experimenting with industrial gases like carbon dioxide and liquid nitrogen in their kitchens, and media coverage of late has catapulted them into the spotlight, bringing molecular gastronomy to the forefront of the culinary scene.

The term 'Molecular and Physical Gastronomy' was coined by France's most famous Physical Chemist, Herve This, and Hungarian Physicist, Nicholas Kurti, in 1988; 10 years later, This shortened it to simply, 'Molecular Gastronomy.' The name refers to the study of processes that occur in cooking, both physical and chemical.

This spoke exclusively to **gasworld** about the term, he said, "On the 16th March 1980 I was doing a Roquefort cheese soufflé and the recipe said to add the egg yolks two by two. I decided it was an old wives tale, and added all my yolks at the same time – the soufflé was poor. The next time I did the soufflé I came across the same sentence, and decided I would add the yolks one by one – it was better. The next day, I repeated the experiment with the two by two method, opened a notebook, and decided I would collect and test culinary old wives tales."

The soufflé was the beginning of a culinary revolution; This' many books and writings on the subject discuss ingredients as though they were chemical mixtures – clustered compounds reacting together when their environment is changed.

By conducting experiments, often using gases to change the chemical properties of an ingredient, he has been able to either dispel or confirm culinary precisions - the old wives tales, tips and sayings, and provide practical tips for everyday cooking.

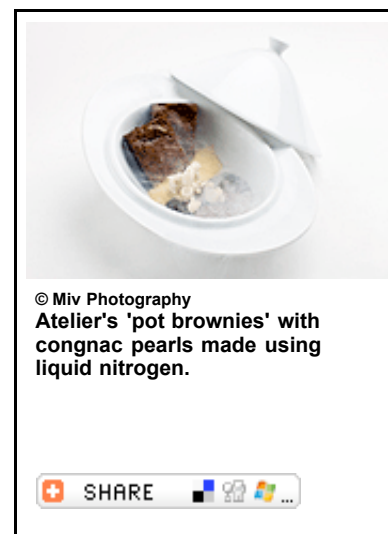
In addition to the practical tips, there has also been some other fascinating, but rather useless outcomes – how to uncook an egg for example, or produce one cubic metre of whipped egg white from one egg.

"Funny results can be obtained when you put gooseberries in a siphon with carbon dioxide cartridges," he tells **gasworld**.

"The gas dissolves in the water that composes the fruits, so that when you eat the fruits, they are sparkling, just as sparkling water."

It is these weird and wonderful results that have inspired chefs to experiment with their food; boundaries have been blurred and deep rooted rules, disregarded; why should something that looks like a frozen pea, taste like a frozen pea? A blob of sweet, green-coloured puree dipped into liquid nitrogen might look exactly the same, but it certainly won't taste the same, and it will have a liquid centre.

It is this confusion of the senses that chefs of the 21st century have thrived upon; it has prompted them to embark on their own experiments, with the end product often being served up in a top restaurant, to a customer who has waited months for a table.



One such restaurant is Atelier in Ontario, Canada, where chef and owner Marc Lepine runs a successful tasting menu.

“The attraction to this particular style of cooking is the new possibilities that have resulted from all the new technique and technology,” Lepine told **gasworld**.

“Chefs can now do so many things that could never be done before, the door has been opened.”

In order to be able to create many of his mind-blowing dishes, Lepine relies on a regular supply of industrial gases; they have become an integral part of the show.

“We use carbon dioxide to carbonate fruit, nitrous oxide to aerate and foam various mixtures, and we use liquid nitrogen for everything – to make ice cream, ‘nitro noodles’, liquid centre truffles and so on.”

The menu is ever-changing, and Lepine and his team are continually working towards creating new dishes to push the boundaries of cuisine even further.

“We have sulphur hexafluoride arriving this week,” he added.

“We will be experimenting with it in an attempt to create a floating dish, something we have worked on in the past with different gases, like helium.”

As well as using the gases in an attempt to dazzle his audience, Lepine also notes the practicality of them, “We use liquid nitrogen (LN2) quite often just to cool things down faster, or freeze something that cannot be frozen in a freezer, like alcohol or maple syrup.”

As useful as it is, he doesn’t consider that this will be something likely to be introduced into the domestic kitchen.

“I can’t see anyone using LN2 in the home, but the other gases with a siphon, sure. LN2 requires a fairly substantial initial investment because of the cost of dewars.”

Lepine’s LN2 is delivered to his restaurant once a week by ‘curbside fill-up’; MEGS Specialty Gases refill the dewar outside Atelier.

His nitrous oxide and CO2 come from iSi, global market leader in producing pressurised gas cylinders and professional whippers.

iSi is continually expanding its culinary equipment range in order to cater to emerging gastronomic trends.

The Gourmet Whip PLUS and Thermo Whip PLUS are two of the most recent additions to its catalogue - a response to the molecular gastronomic craze for foams.

These products use chargers containing nitrous oxide, and enable chefs to discard cream or egg as an emulsifier, therefore producing a foam with a greater intensity of natural aromas, and flavours of key ingredients.

Renowned Spanish chef Ferran Adrià started using iSi Whippers to create his now famous Espuma (foam) cuisine, back in the late nineties.

Leading industrial gas companies are also responding to demand, modifying equipment and containers in order to be able to cater to chefs requiring a relatively small quantity of each gas.

CRYOCOOKING® is a registered trademark of The Linde Group; the company has developed gastronomy sets for the professional kitchen, containing a liquid nitrogen storage tank, which comes in 25, 35, 50 or 120 litres; an open tempering container, special filling equipment allowing direct filling of the working container from the storage tank, and additional equipment like safety goggles and gloves.

Similarly, Messer has manufactured small dewar containers for storage and easy transportation of gas, as well as dewar ‘working containers’, well suited to chefs wanting a small amount of gas for a particular dish.

The art of cooking with gas has added a new dimension to our industry; the gas companies have taken an uncharacteristic step away from practicality, and embraced the fun, creative side to gas.

Linde’s CRYOCOOKING® documentation reads, “If a spoon with a foamed mixture of alcohol and fruit juice is dipped into liquid nitrogen at -196°C, a frozen ball is produced which is hard on the outside. The filling however, remains liquid. The ball breaks on the tongue and releases its content.”

Suddenly, gases which would normally have been associated with a steel works or ship yard are being linked to sparkling white kitchens, where world-class chefs produce artistic creations ablaze with colour, for the finest dining experiences.

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