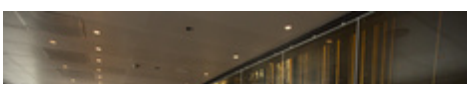
Molecular gastronomy is renowned for using laboratory equipment to create completely new dishes, flavours and textures. Copenhagen's Alchemist is one of the top international restaurants to have applied this experimental approach as part of a unique culinary signature. In its kitchens, this innovative Danish venue has two Memmert incubators for fermenting ingredients.

For several years, rather than New York or Paris, Copenhagen has established a reputation as the ultimate gourmet destination. The city is home to noma, multiple winner of the accolade of world's best restaurant, whose head chef René Redzepi is possibly the best-known name on the new Nordic culinary scene. She works exclusively with regional and seasonal produce from fields, forests and the sea. In the restaurant's own Food Labs, these natural ingredients are fermented, foamed, freeze dried and gelled. The recipes and preparation methods are continuously refined to create completely new flavour experiences.

Memmert incubator IPP for experimental kitchen



Alchemist in Copenhagen

One of Redzepi's mentors, Ferran Adrià, introduced laboratory equipment to fine dining with his molecular cuisine. Rasmus Munk has also been part of this experimental and creative wave in Copenhagen since 2015. Not even 30 years of age, he is one of the most renowned rising stars on the international gourmet scene. He perfects the art of creatively transforming ingredients with his own very distinctive touch. Reflecting this ethos, he named his restaurant Alchemist. Following a two-year hiatus, it reopened in the summer of 2019 with a new concept. Even before the opening, thousands of people were already on the waiting list.

Behind the immensely heavy bronze door at the entrance, diners can look forward to an almost magical assault on all senses: graffiti art, a several metre-high wine rack holding 10,000 bottles, a two-storey dome over the dining area as a multimedia installation displaying continuously changing images, from Northern Lights to jellyfish, and an evening consisting of 50 impressions, most of them edible, presented as a holistic experience with a mixture of performers, waiters, sommeliers and chefs in a larger than life but still intimate atmosphere. Backlit shelves are lined with jars containing unusual ingredients and emphasise this alchemistic approach to cuisine.

Munk describes his concept as holistic and most of his dishes is designed to tell a story. For example, a composition of grilled cod jawbone and smoked bone marrow, topped with pieces of edible plastic film made from cod skin, reminds diners that one third of cod caught in northern oceans contain plastic. A "snowball" of fermented tomatoes, the juice of which is cold-distilled and cryogenically frozen, evokes memories of winter, playing with, according to Alchemist on Instagram, the contrast of childhood experiences in the snow and the pleasure of southern flavours. Diners dip the snowball in Sicilian olive oil and eat it – of course – wearing winter gloves.

A glance into Alchemist's kitchen

Grilled cod jaw brushed with smoked bone marrow and grilled. It is topped with a cream of Comté cheese. The "fantastic plastic" that tops the dish is made from a dehydrated cod skin bouillon.

Fermentation: an essential element in experimental cuisine

Fermentation is not a modern invention; it is a method that has been commonly used for over a thousand years to preserve foods. Its origins date back to Louis Pasteur, who was the first person to prove that fermentation processes are triggered by micro-organisms such as bacteria, fungi and yeast. The metabolisation of sugar, starch and other carbohydrates causes the formation of alcohol, acids or gases. Pasteur built on this principle to develop another form of preservation: pasteurisation. Named after him, this process kills germs that would otherwise spoil food.
As is so often the case in life, micro-organisms can be either good or bad. Lactic acid bacteria, for example, prevent the growth of putrification bacteria and extend the preservation period of pickled vegetables. Alcohol is also known for its ability to prevent spoilage. However, preservation is just one aspect of fermentation, the others being the very special variations of flavours and aromas. From beer to wine, bread, vinegar, tea, yoghurt and sauerkraut – all these foods go through an individual and controlled form of decomposition during the fermentation process. Asian cuisine also features a wide range of fermented products, such as soya sauce, tempeh, miso and kimchi, a pickled cabbage.

Memmert incubator and cooled incubator in Alchemist's kitchen

Memmert incubators in a top restauraunt

Alchemist’s chefs experiment with cultures of Japanese koji, a type of fungus, and lactic acid bacteria as starter ferments. The precise regulation of temperature in the Memmert incubators is crucial to the success of these culinary creations. “An optimum environment is essential for spontaneous fermentation without starter cultures, using the lactic acid bacteria present naturally in the fresh product for fermentation, and for fungal fermentation,” explained Louise Beck Brønnum, Head of Tastelab at Alchemist. Temperature and humidity determine food safety, flavour and consistent product quality. Depending on the ingredient, the temperatures in the incubators are around 20 to 25°C or 30 to 35°C. Koji-fermented products, for example, need to be stored in a chilled environment in the cooled incubator as excess heat causes the mould to die. The time period also varies greatly. Depending on the desired flavour and appearance, and also the pH value, this can be anywhere between 24 to 48 hours.

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Overview of the main topics

- Memmert, incubator
- fermentation
- Alchemist Kopenhagen
- molecular cuisine
- starter cultures

Laboratory equipment for incubation

Incubator I
Cooled incubator ICP
Peltier-cooled incubator IPP
CO_2 incubator ICOmed
Cooled storage incubator IPS

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