CASE STUDY

Alchemist

Lab for Food

ALCHEMIST 2020 Case Study

BUCH HOLM

Interior - photo by Søren Gammelmark

Photo by Jon Angelo

Food for THOUGHT

Back in 2018 we had a pleasant meeting with Rasmus Munk and together we defined needed laboratory equipment for the new Alchemist Restaurant 2.0.

Laboratory equipment for a restaurant, and in this scale, is not an everyday request and it has therefor also been a very interesting and unusual case.

As Alchemist, aiming to be the best in the world, we have also supplied the laboratory equipment from absolutely leading manufactures in the world.

To finish the project with style, we had a company excursion to Alchemist and had the most amazing evening. An evening in great company with the best food magicians and alchemists in the world.

A unique and unforgettable experience that left a deep impression on all of us.

We thank Rasmus Munk and his team for this outstanding experience and congratulate with the two deserved Michelin stars.

Andy Warhol - photo by Søren Gammelmark

Photo by Torben Åndahl

Holistic CUISINE

New Kitchen

Oxford Dictionary defines the word 'Holistic' as "considering a whole thing or being to be more than a collection of parts" and 'Cuisine' as "a style of cooking". When combined, the two words draw upon elements from the world of gastronomy, theatre, and art, as well as science, technology and design in order to create complete sensory dining experiences.

The holistic dining experience is multi-layered starting on the plate with tastiness, high-quality ingredients and skilful preparation. It then extends beyond the plate to the immediate surroundings; the physical appearance and presence of the room and its interior. And finally, it transcends time and space and is likely to initiate and support the debate on social and ethical issues.

When designing holistic dining experiences, the creator is required to focus beyond the plate and take the tangible and intangible factors that together make up the entire meal into consideration. The most distinguished task of the Holistic Cuisine is to provide guests with moving and extraordinary dining experiences.

Holistic Cuisine was initially conceived and formulated by Danish Chef and Restaurateur Rasmus Munk during Spring 2018. Still, the Holistic approach has been growing in Rasmus' mind since before he opened his Copenhagen based restaurant Alchemist.

Amber - photo by Søren Gammelmark

Rasmus' motivation for formulating Holistic Cuisine now comes from a personal desire to articulate the approach he has cultivated at Alchemist for the past two years that extends further than techniques, (food) culture and traditions.

Redefining Dining

In the same way as the ancient alchemists sought to fuse philosophy, natural science, religion and the arts to create a new understanding of the world order, the aim of Holistic Cuisine is to redefine and broaden our understanding of the concept of dining.

Holistic dining is per definition multi-layered. It draws upon elements from the world of gastronomy, theatre and art, as well as science, technology and design, in order to create an all-encompassing and dramaturgically driven sensory experience.

Flavour, high quality ingredients, skilful preparation and the process of eating forms the foundation, but the experience is designed to extend beyond the plate, seeping into both the immediate physical surroundings as well as tran scending time and space. Holistic Cuisine is meant to be experienced.

Welcome. Rasmus Munk, Alchemist

Think Outside the Box - photo by Søren Gammelmark

Tastewall - photo by Søren Gammelmark

Laboratory consumables

Let Buch & Holm supply you with all the lab supplies you need to outfit your laboratory, and the consumables and disposables to keep you working efficiently day after day.

In our range you a.o. find a huge assortment of bottles and jars for general handling, transporting, and storing liquids and solids. We offer these versatile containers in a wide variety of materials (glass, plastic, stainless steel), sizes, shapes, mouth styles, and closures.

On the picture above you see a wall in the Taste Lab with 125 ml glass bottles with a white lid from our assortment. The picture on the left is a cylinders glass with knob lid from DURA.

The crystals

It is very simple - the crystals that propagate in a -86 degrees freezer are much finer in structure and thus give a completely different feeling in the mouth. In addition, durability is of course also better and the crystals are formed faster, which also affects both taste and texture.

Snowball - photo by Claes Bech Poulsen

Photo by Torben Åndahl

Personal -86°C

Ultra-low temperatures preserve the quality and freshness of food. The food will look and taste if it was taken from the sea or farm same day.

When you store food at temperatures lower than -60°C it stops all intra-cellular biochemical processes and denaturation of proteins, so it doesn't damage tissue cells and prevents the formation of large ice crystals as it would occur when you store at -18°C.

At Alchemist they use both our -86°C upright freezers , 93 liter and our small -86°C chest freezer, 71 liter with castors for moving it around.

NORDIC LAB

Photo by Torben Åndahl

Photo by Torben Åndahl

Storage -86°C

PHCbi Biomedical freezers are designed to meet the demands of the pharmaceutical & biotechnology industries providing reliability, accuracy, and sample security to facilitate cutting-edge research and drug discovery.

The VIP ECO upright freezer is one of the most energy efficient ultra-low temperature freezer currently available on the market. The VIP ECO combines field-proven reliability, natural refrigerants, and innovative cabinet design to improve overall performance.

Ultra-low temperatures preserve the quality and freshness of food. The food will look and taste if it was taken from the sea or farm same day.

At Alchemist they have two VIP ECO 728 liters -86°C freezers for storage. The freezers offer reliability, a very low noise level, low energy consumption, and a very low heat output.

PHCbi

Photo by Torben Åndahl

Centrifugation

Laboratory centrifuges play a major role in food analytics for testing and ensuring the quality of foods.

Typical applications involve suspended matter or microorganisms in juice, beer, wine or milk, or processes for determining harmful substances or nutrients in meat, fruit, vegetables, spices or preparations.

Various centrifuge capacities and a wide range of containers, from 1,5 ml to 1,5 litre, are necessary depending on the application.

At Alchemist they have got the Sigma 4-5L with containers for 4 x 750 ml and adaptors for 15 ml and 50 ml tubes.

SIGMA

Ultrasonic homogenizer

The method, in other words the direct application of ultrasonic power to the sample, has proven its worth as a complement to the old, familiar, laboratory ultrasonic baths, which have proven themselves in practice for decades.

Foodstuff is one of the fields in which the ultrasonic homogenizer is already in use. Whenever the task involves homogenizing, suspending or emulsifying the use of the ultrasonic homogenizer is of interest, as long as a liquid medium is available.

We can supply units starting at 0.5 µl and up to 2 liter volume in batch.

BANDELIN

Designed to tell a STORY

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.

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.

Every evening, 30 chefs work behind a glass wall, visible simply as shadows to the 40 diners. The restaurant allowed AtmoSAFE a glimpse behind the panel. As well as conventional kitchen appliances and a great deal of laboratory equipment, the experimental kitchen also has a Memmert I incubator and an IPP cooled incubator which are used to ferment many ingredients for its dishes.

Continue on page 16..

The Pigeon - photo by Søren Gammelmark

Photo by Torben Åndahl

Fermentation

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 origin dates 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 incubators in a top restaurant

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.

Mushroom - photo by Søren Gammelmark

Incubator

Applications and appliances for food and beverage

Rely on the fact that, within the entire interior of a Memmert incubator, microbiological cultures are incubated gently and without any temperature overshoots. Trust in "made in Germany", because we manufacture all components which are vital for the precise temperature control of our incubators, ovens and climate chambers ourselves.

Last, but not least, count on their reliability and precision - for decades.

Alchemist chose two 108 litre incubators, one IPP110plus with cooling 0-70°C and one IF110plus without cooling to 80°C. Both with a plus controller for making temperature cycles.

memmert

Photo by Torben Åndahl


Photo by Torben Åndahl

pH

We measure pH for a lot of different reasons, such as: To produce products with defined properties – Why do we classify vinegar as being acidic? - during production it is important to control the pH to ensure that the product conforms with the desired specifications. The pH can dramatically alter the properties of a product such as appearance, color, or taste.

Alchemist have selected The Seven2GO Pro from Mettler Toledo which they chose to be able to get around the whole production and make necessary pH checks.

METTLER TOLEDO

Photo by Torben Åndahl

Sous vide

Low temperature cooking, increasingly known as sous vide cooking, has firmly established itself in haute cuisine due to the perfect, reproducible and aromatic results. Meanwhile, this method has made its way into other culinary areas.

The reason for this is the compelling advantages of sous vide cooking and always perfect results, exact reproducibility and a low loss of food volume.

For many years Julabo has been combining successful, professional temperature control technology with the art of cooking.

Today acclaimed professional chefs from around the world swear by the sous vide method with Julabo sous vide units.

Julabo

Think Outside the Box - photo by Søren Gammelmark

Lyophilization

Gentle drying processes are just as important for quality foods as for pharmaceutical production. Freeze drying enables especially gentle preservation and retains the colour, texture, and aromas of the foods. If they are subsequently stored in airtight containers and protected against moisture, light, and oxygen, they can be kept for years at room temperature.

Consumers enjoy freeze-dried fruit in their muesli or – for epicures – in molecular cuisine, which focuses on biochemical and physico-chemical processes in the preparation and consumption of foods. Applied molecular cuisine utilises devices and methods from the laboratory world, including lyophilisation, to create dishes with completely new properties.

From Martin Christ we offer a wide range of freeze dryers. At Alchemist we have supplied a Freeze dryer with 4 kg ice condenser to -50°C with a Lyocube chamber with 5 shelfs each 256 x 300 mm.

CHRIST

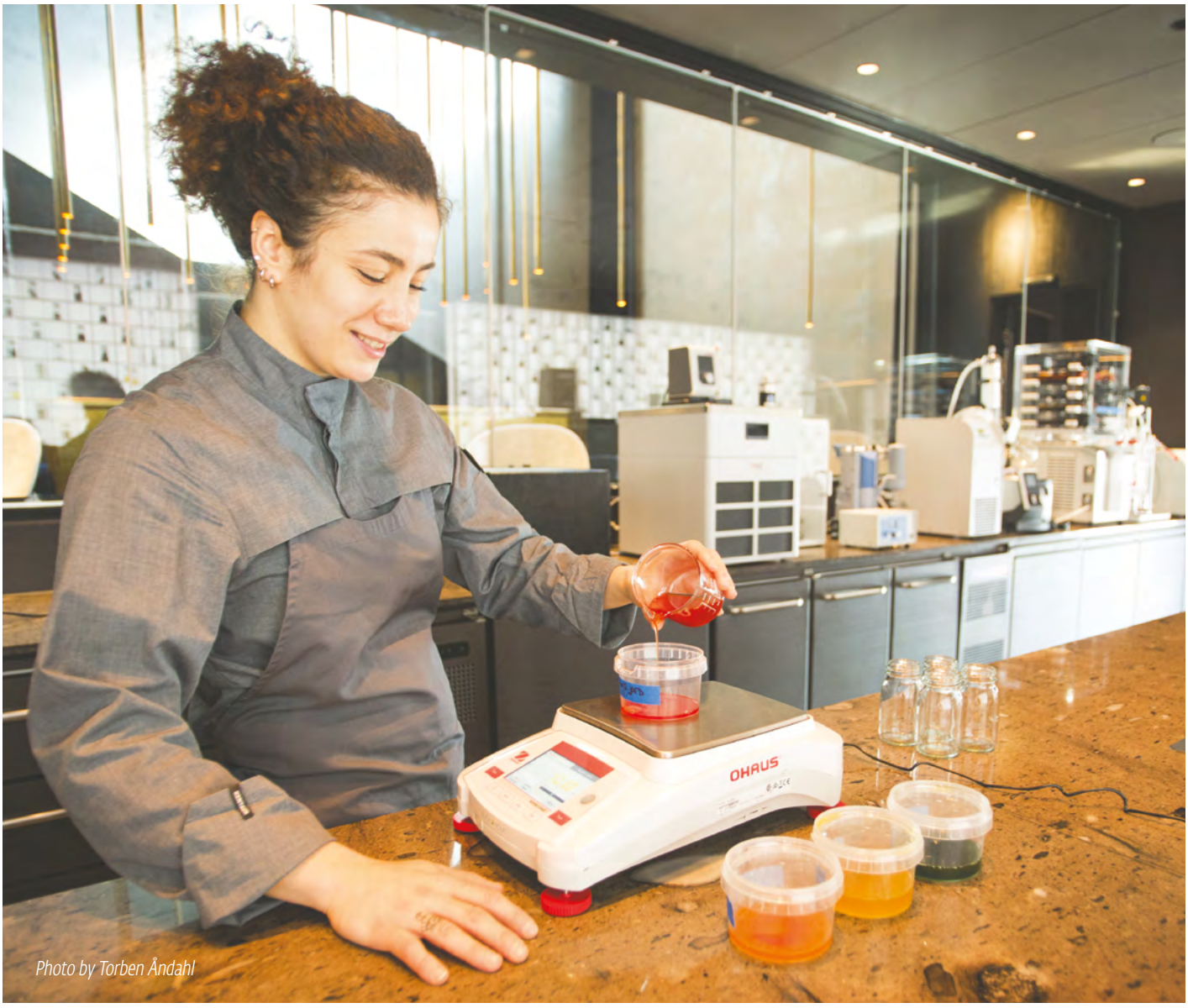

Photo by Torben Åndahl

Reference balance

No matter what you are weighing - if it is truffles, saffron or solvents, we always find the right solution for your specific needs.

The long OHAUS history and extensive industry knowledge have resulted in a comprehensive line of high-performance balances and scales that continually meet our customers' weighing needs at economical and cost-effective prices. OHAUS products offer the highest level of quality and value in their class.

Our portfolio cover balances and scales from 0,1µg to 1500kg.

Alchemist chose a 2200g/0,01g Ohaus balance as a reference for most demanding weighing applications.

OHAUS

Interior - photo by Claes Bech Poulsen

Bioreactor

Bioreactors in Molecular Cuisine for Flavors and Food Sciences Laboratories. Molecular cuisine utilizes devices and methods from the laboratory world, usually for physical or chemical processes such as encapsulation, drying or accurate temperature control.

The aim is usually to produce new flavors, taking inspiration from traditional fermented foodstuffs like miso or kimchee.

The next phase is already underway, with bioreactors being added to the list. Many of the same capabilities which make bioreactors key to pharmaceutical research and production can be applied to gastronomy and food sciences.

Alchemist chose the bench-top bioreactor Minifors 2 to explore this exciting new area.

INFORS HT

Photo by Torben Åndahl

Rotary evaporation

In recent years, rotary evaporation applications have spread to cooking industry in molecular cooking and bars.

The rotary evaporator is used to evaporate liquid gentle via a non-heating method and will maintain aromatic substance which is easy lost by heating. The rotary evaporator principle is to lower the boiling point by using vacuum and distillate at low temperature, as low as room temperature.

Alchemist have got a Heidolph HEI-VAP with 24/7 continuous flow option and the vacuum source is the PC3001 system – where boiling points are detected and the pressure is continuously adapted throughout the evaporation. A Julabo chiller is used for cooling the condenser.

heidolph
research made easy

Photo by Torben Åndahl

Photo by Torben Åndahl

Our Company

The company was founded in 1935 and is still family owned. We aim to satisfy the needs of our customers through a complete range of exclusive products, effective logistics, and after-sale service at competitive prices. In order to optimize our performance, we keep in constant dialogue with our business partners.

We co-operate closely with customers and manufacturers, securing all parties full advantages and benefits through dealing via one source. Our wide range of products, all highest quality, is manufactured according to international standards. Creative thinking in close co-operation with all our partners is a natural part of our daily work. We want to give our customers a good experience and know that small things make a difference.

We believe that innovation is fundamental to successful business and great ideas are generated when people work together to reach mutual goals.

www.buch-holm.dk

AAA
Highest creditworthiness
© Bisnode 2019

BUCH HOLM

Buch & Holm A/S - Marielundvej 39 - 2730 Herlev - tlf.: +45 44 54 00 00
e-mail: b-h@buch-holm.dk - www.buch-holm.dk