The Lab Rat of Nordic Gastronomy

How the team behind Noma has established a basic flavor research institution – The Nordic Food Lab – to change society through new flavor.

When Noma opened nine years ago, head Chef René Redzepi and his partner Claus Meyer set out to find a new direction in cooking.

Driven by the pursuit of a sustainable cuisine and the idea that the Nordic landscape should define Nordic food, the two entrepreneurs bent their cooking into a creative framework, only allowing Nordic ingredients, and letting the wild, the herbal, the untamed from the coldest lands of Europe define the language of flavor they explored. It was not as much a rediscovery, a renaissance, as it was an ideology about a whole new food culture, inspired by traditional techniques, refashioned with a modern sensibility. It was something completely new.

This could never be fully realized with processed food picked down from the shelf. There were precious few Scandinavian quality products and suppliers to begin with. From the onset, those who wanted to create a Nordic vocabulary of flavors had to collaborate with farmers and botanists to develop this new vernacular from scratch. A massive amount of work, experiments, travels and studies thus lie behind the gastronomic achievements of Noma, now three times named the best restaurant in the world.

But the aim of the team behind Noma, and the movement they spearhead across Denmark and Scandinavia, is to alter and improve the food culture of the Nordic region. Where good food used to be defined by its French-ness; something that was imported from the epicenter of European food culture south of the Rhine, the Nordic movement is aiming to create a curiosity and self-pride in a region. It is about restoring earth’s riches to the foundation of modern cooking, creating food that
communicates the splendor of biodiversity, of the yet undiscovered and unappreciated aspects of the great, wild vegetation - it is an environmentalism fused with a gastronomic explosion of creativity. The underlying message is that awareness of the beauty and richness of flavor in nature, in itself, will nurture the instinct in modern man to protect and preserve the wild landscape and its biodiversity.

*Flavor notebook – at the Nordic Food Lab*

The team behind Noma created the Nordic Food Lab two years ago to shape the Nordic Food Culture, and spread the knowledge obtained through a scientific and methodological approach to new, natural foods. Very quickly the Nordic Food Lab, situated on a houseboat in the canals of Copenhagen, has become a factor in the movement to cultivate a new, locally based food culture. This has been realized by working with universities, producers and industry to expand the culinary horizon of the entire food community, funneling the knowledge and cultural ideology of Noma, and the two founders René Redzepi and Claus Meyer.

**A quiet American**

At the Nordic Food Lab, the Nordic food revolution is co-driven by a New Yorker, a former music video art director with a degree in literature. Seemingly an unlikely pioneer in the New Nordic cuisine: An American from the cultural class of the East Coast. Like Graham Greene’s “the Quiet American”, he is an ex-patriot with a mission. He is too a mild spoken man, considering the fact that he has been battle-hardened in some of the most intense kitchens in the world, where yelling often seems to be the kindest form of communication.

Now Lars Williams spends his days juicing sauces from disintegrating fish decomposing in large, open glass jars, fermenting cereals, extracting flavors from trees, moss, and flavor mapping old species, now forgotten by modern agriculture.

“Look at the diversity of apples, carrots, horseradish – there are thousands of apple species, hundreds of horseradish species – more than a hundred rhubarb species.”
There is only one or few species in production. Imagine the flavor diversity that lies just behind the horizon if we can open just a little for a larger variety”, Lars Williams explains about the work that includes mapping the flavors of original and wild species.

In the food lab, shelves are packed with herbal vinegars, extractions, infusions, while bags of teas from actual wood occupy the fridges. Williams has storage rooms heaped with aging seaweeds and crates of foraged plants and trees specimens. Opening the polished steel cupboards of the houseboat reveals the herbal and floral collection of a natural museum juxtaposed in the hands of a mad scientist obsessed with magical elixirs. The vacuum machine constantly seethes and hisses. The place is packed with different herbs and plants in saline solutions, oils and teas in clear bags, all being subjected to experiments on temperature, aging and only god knows what, whilst a massive centrifuge stands in the corner used to distill clear liquids.

Woods in foods

Lars Williams explains how the powerful scents of the trees in Scandinavian forests and coastal areas are a big source of inspiration to the food lab. “Trees are an under-researched area of flavor”, he states, noting the massive importance wood has in winemaking. He believes wood is another one of the flavor components that will work its way into fine dining, food production and eventually home kitchens. “We seek to find new ways of using the perfumes of wood in food. Take for example the work we have done with pine. Pine shoots are fresh, mineral, lemon-zesty and can be used straight from the tree in many dishes – whole or minced. Pines can be used in many ways, giving a scent and flavor of the Nordic terroir. These are something that is easily applied by any chef that wants to take a walk outside – by every family too”, Lars Williams says. He explains how pine shoots gives the zing of acidity, often needed in many dishes, how it transports your brain straight to Nordic forest in April or May, and how he uses chunks of juniper wood in butter used to braise and baste.
vegetables, to give scents of summers by the Scandinavian seas.

Wooden tea - juniper

Chasing Umami

The food lab has been established as a foundation with an altruistic objective – to spread as much knowledge and findings as possible with those interested in the agenda. Basically the work done in the lab is a gift to the Nordic food culture.

Among the projects undertaken at the food lab, are large scale works on how to use the unique nutritional qualities of seaweeds in cooking. Seaweeds are often packed with umami – the wholesome richness in flavor we often find in meats, but they are plentiful, sustainable, healthier – much, much healthier.

“Seaweeds are the thing of the future. I can think of no detriment to nature in producing and eating seaweeds. The nutritional properties are magnificent. But we in the Western world are not used to the flavor. Still we haven’t cracked that cultural block open. But now we experiment with aging seaweeds – some of them develop licorice tones, and are actually suited for dessert after some aging”, Lars Williams explains, while pointing to the fact, that umami is one of the flavor components some say lack in a new Nordic diet.
“Actually a constant ambition of ours is to develop umami – richness in flavor – in a lot of the things we do. But in the Nordic and natural flavor catalogue” he says, explaining also how fish sauces and fermentations are areas they look into to find the right umami.

Lars is a battle-hardened chef from the most creative kitchens in New York & London – before ending up at Noma, he worked in the experimental lab at Heston Blumenthals renowned “Fat Duck”-restaurant. Having a degree in literature, he originally worked in music and advertising, yet left that to work with food as he was always drawn towards being a lab-rat, getting a feel for the creative breakthrough in modern gastronomy with the über-creative Newyorker Wylie Dufresne.

Now their audience is much bigger, and much more intangible, than a restaurant. The aim is to move the foundations of a whole region’s food culture.

“We’re not like any other food lab associated with any restaurant. We are not here to develop ad new dish. Although our research of course is available and is being used in the restaurant. But in principle our research is available to everyone. And we work a lot with industry to develop anything that can contribute to the Nordic range of flavor and products”.

An experiment – venison aged in powdered purple seaweed
One of the things being worked on is what the Nordic Food Lab themselves describe as something, that will become the “world’s best chicken”. Today, the best poultry comes from France, from Bresse, where succulent and outstanding chickens are being bred with plenty of space and quality feed. At the Nordic Food Lab, the approach was different. Not aiming at beating the French at being French, they started out testing ancient chicken species, that used to be able to survive in the Nordic climate. After selecting a suitable species of chickens, the process of developing a feeding program for the animal began. When one first tastes chicken from this development program, most would be stunned by the flavor of the meat – the chicken has become a wild animal again. It tastes more game-like, and you intuitively sense that it is a creature bred in the North. More minerals, it is leaner without losing juiciness, and with somewhat herbal notes of flavor.

“I believe we can communicate an experience of the Nordic nature like this”, Lars Williams says. Hoping that project like these – that are designed to hit the shelves of local supermarkets soon, will ultimately create a foundation for a popular change in food habits, and create the awareness of nature and environment that the Noma-funders set out to do.
“In the end – to create a Nordic food culture – people need a better selection of commercially available products to make a better choice in their eating, how they cook with at home. It’s a long haul, but it’s what needs to be done to create a stronger, more sustainable food culture” he says. And when you look at local supermarkets in a city like Copenhagen, all of a sudden seaweeds are packed for sale, and ancient, delicious types of flour are becoming extremely popular: New patterns of production and consumption can be created by gastronomical entrepreneurs.

Facts about the NORDIC FOOD LAB
Nordic Food Lab is a not for profit-profit, self-governing institution established by head chef of Noma, René Redzepi and gastronomic entrepreneur, Claus Meyer with the purpose of scientific exploration of the New Nordic Cuisine and sharing the results.
The Nordic Food Lab is an independent institution fueled by finances from external funds, private companies and government sources. As a start the Nordic Food Lab is based on donations guaranteeing the first three years of research.

Contrary to other existing food labs by well-known restaurants, which are 100 pct. owned labs functioning to produce menus and new techniques strictly for the benefit of a single restaurant, the Nordic Food Lab rests on the Nordic approach to cooperation, sharing knowledge promising open use of the work being done. Contrary to academically funded food labs, that have a strict research purpose, the Nordic Food Lab is committed to showing and sharing tangible results on a more frequent basis and on a slightly lower academic level than would be expected from e.g. a university.

**Purpose**

Explore old and new techniques and raw materials with relevance to the New Nordic Cuisine.

Communicate the achieved results for the benefit of the entire Nordic region and everyone interested in exploring nature and food.

Develop recipes for use of Nordic raw materials and processing techniques with relevance for both restaurants as well as food industries.
Areas of research at the Nordic Food Lab:

New Fermentation: Chasing Umami

Fermentation is an underexplored method of developing taste in the Nordic kitchen. In Asia, especially Japan, fermentation is used in different products such as fish and oyster sauce, soy sauces, miso etc.

Nordic Food Lab is very interested in exploring how microbiological manipulation techniques like aging, fermentation, the use of bacteria cultures could further the possibilities for a range of products.

Experimental fermentation and brewing is the kind of work that is not easily done in a restaurant, and there are no obvious industries that will explore something so remote form the ordinary consumer habits. But biological manipulation is often the secret behind any great flavor: beers, wines, cheeses etc. Then NFL tries to find new and original application for these techniques, also participating in the development of new cheeses and beers.

NFL is currently working with different kinds of fermentation techniques to develop fundamentally new flavors and components for the Nordic kitchen.

NFL is currently interested in fermenting indigenous cereals types such as spelt, emmer, einkorn, yellow peas and barley – cereals high in protein and flavor complexity.

At the same time the NFL explores the fermentation of vegetables, juices and teas and extracts made from wild herbs – such as verbena and woodruff.

Partially inspired by Japanese fermentation techniques, NFL is trying to develop different umami-filled pastes that could become a basic food product, to flavor soups, marinades or other applications. Fermentation of teas and juices is done to pursue either vinegar like liquids or new kinds of beverages.

Another aspect is the process of fermenting liquids very much similar to the soy sauce or tamari – umami-packed ways of flavoring and salting foods. But flavor and overall impression becomes quite different with the use of different raw materials for fermentation.
Can we make the best chicken in the world?

Since the fall of 2010 NFL and Rose Poultry have been cooperating in developing a new poultry product. The ambition is to make the best chicken in the world.

The project is based on a wholesome approach to the chicken as a food product, focusing on the quality of life, space and living conditions, species, age of slaughter, feed and everything that contributes to flavor and texture of a chicken.

Initially the Nordic Gene Bank was consulted for the selection of different species that were ideal for free range production, believing that exposure and an open environment would help to promote the intensity and the game-like qualities in the flesh. But producing free range animals in the harsh conditions of Scandinavia demands a breed of chickens suitable for the conditions, therefore original species is sought out.

Most popular chicken species have been selected for their fast growth and ability to quickly put on weight, but are not suited for outdoor life.

For this project NFL and Rose Poultry have explored chickens with a slower pace of growth, so that they would get a more complicated flavor structure. This also means that age of slaughter is quite different typically around 56 days. Normal age of slaughter for chickens is 38 days.

For feed, the NFL has tried to find a mixture of indigenous types of cereals and vegetables and seaweeds, such as brussels sprouts, broccoli and the seaweed “søl” in combination with more complex cereal types such as rye, barley, kamut and other protein and fiber rich grains. These chickens are being handfed, and have more than 5 square meters living space a head.

First chickens have been delivered to restaurants in Copenhagen, and the aim of the project is to make a product available to the general consumers.
Forest under sea

Seaweeds are an enormous resource, incredibly nutritious and there is no shortage of ocean – and being rich in antioxidants seaweed is a healthy food too. But seaweed is totally ignored in the food culture of Scandinavia, as well as the rest of the world except for Japan. The NFL explores new uses for seaweed with the aim of including seaweed in the general food culture as well as gastronomy.

Currently NFL is exploring 5 different kind of seaweeds, making the best results with the red, Icelandic seaweed “søl”. The work is being done in collaboration with University of Southern Denmark, and professor Ole Mouritzen and seaweed producer Rasmus Bjørgaard.

Initially the work focused on the feasibility of farming seaweeds. After that the project has proceeded to experiment on applications. At the moment the NFL is using seaweeds for developing inspired soups & bouillons, chips, seaweed salts, breads, teas, desserts, fermentations, alcohols and cheeses.

A special aspect of working with seaweed is the results obtained by aging and maturing. Seaweeds are from nature designed to withstand bacteria end dehydration. By aging some seaweeds develop quite different flavors, some obtaining vanilla- and liquoirice-like taste characteristics. NFL is by now one year into at the aging program for harvested seaweeds.

The application possibilities of seaweed seem almost indefinite, already restaurants and food producers have picked up on the possibilities of seaweed, and the first supermarkets have started carrying raw seaweeds.
Flavor mapping with the Nordic Gene Bank

It would be an incredible improvement of the food culture, if a broader variety of species were made publicly available. There are for example more than 7,500 cultivars of apples but only a few are in mass production. NFL aims to help expand the diversity of the Nordic food culture, and tries to maintain and broaden the variety of species available, also restoring original foods, now forgotten by industrialized food production. Also the preservation of original food culture and species that are threatened by an industrial food culture is an end.

NFL works with the Nordic Gene Bank “Norgen” in Sweden on mapping the flavors of several original Nordic species of different foods. The Nordic Gene Bank collects gene samples of the natural diversity in order to protect the natural heritage of Scandinavia. This is also a question of preserving food culture, biodiversity and securing that there are options for future generations regarding the production and cooking of Copenhagen.

The NFL has been mapping the flavor and application value of several types of species like potatoes, turnips, rhubarbs, and peas.

On working with original, old potato-species the NFL initially catalogued 40 different species being about 100 years old. From that, 10 species with excellent flavor characteristics were chosen for full flavor mapping, the results from all mappings will be made publicly available for anyone interested in planting and producing new varieties of potatoes.

The ambition is to inspire producers to plant a larger variety of plants and to provide a tool for small farmers interested in larger diversity. The fact is that potatoes can be a very different experience than most people think.
A recipe from the Nordic Food Lab:

Pike with roasted bone sauce

Serves 4 persons

**Pike**
4 small steaks of pike without skin, 40g each
2 spoons of rapeseed oil
Picked dill leaves
Picked verbena leaves
Salt

**Summer cabbage**
4 big summer cabbage leaves

**Cabbage stems**
4 big summer cabbage leaves

**Butter emulsion**
100g of water
200g of butter

**Roasted bone sauce**
The bones from 1 pike
1 spoon of grape seed oil
1 spoon of butter
4 thyme sprigs
500g of white wine
50g of butter

**Herbs**
Garden sorrel
Small cabbage leaves
Verbena
Ground elder leaves

**Pike**
Brush the fish with rapeseed oil. Season the fish with salt and cover with dill and verbena leaves.

**Summer cabbage**
Blanche the cabbage leaves in boiling water for 10 sec. Refresh in ice water and dry off. Put the fish on one of the sides of the cabbage leaves and fold the other one over. Grill on both sides when serving it.

**Cabbage stems**
Isolate the middle stems of the cabbages leaves and crisp them up in ice water. Cook for 1 min in the butter emulsion when serving. Season with salt on top.

**Butter emulsion**
Cook the water and whisk in the butter so that it becomes creamy.

**Roasted bone sauce**
Roast the rinsed pike bone pieces on a pan in a little oil. Turn and add the butter and roast for an even coloring. Add the thyme and shake the pan. Drain the fat off and put the white wine on and cook it down to 1/3. Strain and add the 50g of butter and hand blend till the texture is creamy and frothy. Season the sauce with salt and reduced white wine.

**Herbs**
Pick and wash the herbs. Keep on paper and cold.