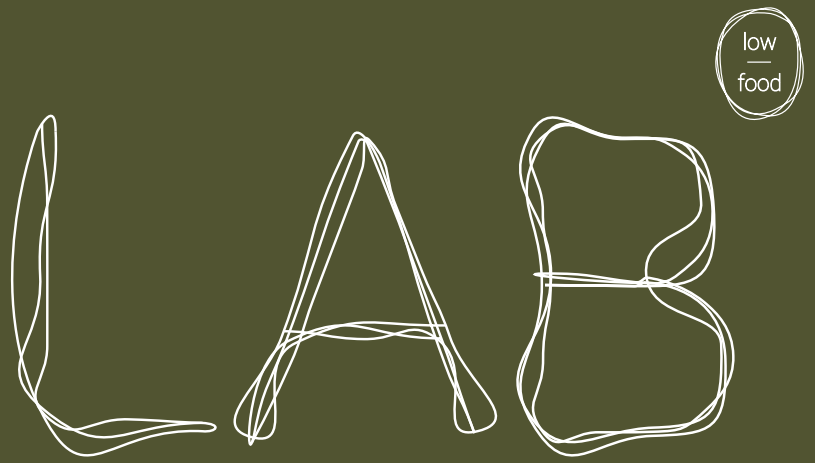
LAB low food

Low Food Lab:

grains

Over the past thousands of years, many different varieties of wheat and other grains have been cultivated, grown and eaten. But today, we remember and use only a small fraction of them. Bread wheat and durum wheat have become the dominant crops in western agriculture, whereas other varieties such as spelt, emmer and einkorn are hardly grown anymore. Current global wheat cultivation consists of 95% *Triticum aestivum* (baking wheat and wheat for animal feed).



About Low Food Lab

The Low Food Movement has set the goal to change Dutch gastronomy. The Low Food Movement was founded by Joris Lohman, Joris Bijdendijk and Samuel Levie in 2018. The movement since then has grown and the goal is to change Dutch Gastronomy and to make Dutch food culture leading when it comes to forward thinking on subjects such as sustainability and inclusion. In a world where food security and the sustainability of the food and agricultural system are two of the world's biggest issues, we believe that the food movement has an important role in changing food culture. Low Food will therefore act as a networking agent and platform where new ideas are created and implemented.
See www.lowfood.nl for more information.

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Introduction
by Samuel Levie

The average consumer who visits the local grocer or bakery seems to have a lot of choices. But is that really true? Most commercially available bread is made from the same variety of wheat. Sometimes a little color is added through roasted malt, or seeds are applied to make it more appealing. But still, it's more of the same .

Low Food wants to challenge this. We had the ambition to research the possible alternatives to commercial grains. Not only because we are strong advocates for more diversity in the use of grains, because there's a lot more to choose from: more colors, more flavour, different textures. But also because diversity on our plates will mean more biodiversity on earth, which in turn will make our food system more resilient.

Therefore we launched the Low Food Lab: Grains. A collaboration between bakers, brewers and fermentation experts who collectively researched the culinary applications of ancient grains. Besides learning and exchanging between different professions, together we have developed a new set of recipes. Some of the results are already tangible: a lovely bread and a non-alcoholic aperitif made with red grains served at Restaurant Wils, but also a new, original beer made from true Dutch grains.

With the insights from this Low Food Lab we aim to inspire you! - the (home)bakers, the fermentation enthusiasts, the foodies, the brewers and the (pastry)chefs everywhere - to use and experiment more with these beautiful ancient grains and to keep discovering new flavours.

About Low Food Lab: Grains

Over the past thousands of years, many different varieties of wheat and other grains have been cultivated, grown and eaten. But today, we remember and use only a small fraction of them. Bread wheat and durum wheat have become the dominant crops in western agriculture, whereas other varieties such as spelt, emmer and einkorn are hardly grown anymore. Current global wheat cultivation consists of 95% *Triticum aestivum* (baking wheat and wheat for animal feed).

There is, however, reason enough not to lose sight of the 'ancient' varieties that modern agriculture seems to have forgotten about. These grains may contribute to agricultural biodiversity and to the preservation of

biocultural heritage. They may have nutritional advantages and they may produce more delicious, healthy, surprising food products - from bread to beer and everything in between.

But if we want to bake, brew and ferment with these grains, we have to understand them first. Much knowledge about growing and processing has been lost. As long as the advantages, flavors and possible uses of these grains remain unknown among chefs and bakers, the grains will not find their way (back) into the kitchen or bakery. Research, experiment and recipes are necessary for further development.

The participants of the ***Low Food Lab: Grains*** have paved the way for a bit. This Low Food Lab has been set up in order to investigate the possible culinary uses of five types of grains relatively unknown to most Dutch bakers - either because the grains have been 'forgotten', or because they are still so novel.

About Low Food Lab: Grains

Method

Led by **Alice den Boer** (baker and product developer at Amarant Bakeries), eight participants have become acquainted with five relatively unknown (either ancient/ forgotten or novel) types of grain: **red wheat** 11 **, naked oats** 13 **, emmer wheat** 16 **, einkorn** 20 and **tritordeum** 23. (See **'Grains'** to read more about this specific selection of grains.)

The participants (or 'laborants') were supplied with a set of all different grains, and were given the time to experiment in their own kitchens. Our laborants were bakers, chefs, brewers and fermentation specialists, so they have been experimenting with various food products: bread, wraps, crackers, cakes, pancakes, tempeh, beers, drinks... (See 'Participants' (page 8) to meet the eight laborants.) We challenged the laborants to collect as much information as possible about the grains and their uses, such as: taste, techniques, methods, uses, and differences with 'regular' grains. This gave us a complete impression of these grains.

In three online Low Food Lab sessions between November 2021 and March 2021, the participants shared their findings. To make the results, as well as some amazing new recipes, known to a wider audience, we have collected all useful research results in this publication.

Low Food Lab: Grains was one of the two Low Food Labs of 2020-2021 (the other Lab being about so called Water Lentils).

Discover the grains

So, what grains did we research in this Lab? Alice den Boer based her selection on the basis of several aspects. Questions she asked included:

- What varieties are already grown in the Netherlands, but are hardly sold to bakers and chefs?
- What varieties improve the soil significantly, but are currently used as animal feed?
- How can we ensure a diversity in grains not only in different races and types, but also in color? (A colored grain is more than just a feast for the eyes: the presence of color indicates a higher nutritional value.)
- What other grain types than wheat can we add in order to give our laborants more variety, and perhaps to discover even more culinary uses?

Eventually, Alice came up with a selection of five grains: red wheat, naked oats, tritordeum, einkorn and emmer wheat. Find out more about the different grains on the next pages!

Flavour matrices

In the next pages, we'll present you **flavour matrices** about the five grains. We use these matrices as a model to visually, intuitively and clearly present the results of our experiments. They provide information, inspiration and ideas for possible culinary applications for each grain. They are summaries of personal experiences, experiments and observations.

We hope these matrices will inspire you to go and experiment with the grains yourself! It would be wonderful if they encourage more people to bring more diversity to the world of grains.


LOAFOOD

Meet the laborants

Who was participating in the Low Food Lab: Grains? Meet the bakers, brewers and other grain enthusiasts, whose grain experiments have led to interesting outcomes.

1 **Alice den Boer** is an artisan baker, product developer, and overall fermentation enthusiast. Alice is experienced both in traditional baking techniques and in the most innovative processes. She is also co-founder of Het Graanschap - a Dutch short chain bakery start-up. Does she have a favorite among the 'forgotten grains'? Alice: "I'm completely obsessed with grains in special colours, such as purple barley, red wheat and inca maize." As the leader of Low Food Lab: Grains, she has encouraged the participants to create and develop new food products on the basis of 'old', ancient, forgotten grains, such as emmer and einkorn.

2 **Sasker Scheerder** is the founder of Manenwolfs foodlab. At Manenwolfs, they turn old preservation techniques such as smoking, drying, pickling, infusing and fermenting inside out. So Sasker knows all about food preparation processes, especially when there's microbes and fungi involved. Thanks to the Low Food Lab he has added ancient grains to his food processing portfolio. Sasker really wanted to get to the core of the grain and create some playing field for fungi.

3 Artisan baker **Alysha Aggerwal** is endlessly fascinated by sourdough. Her baking reflects her love of naturally leavened bread & pastries, and frequently pays tribute to her Indian roots. She bakes bread and other sweet treats at Broodbakkerij Ex and she was already familiar with some of the ancient grains that we have been exploring in the Low Food Lab. "Emmer is one of my favourite grains to work with, because of how flavourful and versatile it is." In the Low Food Lab, she has learned a lot about the use of Dutch grown heritage grain.

4 **Karel Goudsblom** is a true baking artist and the founder of Bakkerij MAMA. Karel's tailor-made breads are on the menu of Amsterdam's best restaurants. At MAMA they are baking bread from organic wheat, spelt and rye. Boundless curiosity, love for strong local food systems and the urge to connect people through food have always been the main ingredients of Karel's bakery career. Karel was especially interested in emmer and einkorn, since they seem to be easier to digest. The Low Food Lab allowed Karel to explore ancient and novel grains in order to create even more delicious baked goods.

5 It was a great honor to have a true 'bread sommelier' on the team as well! **Maxim Rolvink** specializes in pairing the food at Restaurant Wils with the perfect bun, bread or brioche. He normally travels around the country to visit millers and to find new types of grains and flour. Joining the Low Food Lab: Grains felt natural for this young, experimental and creative bread maker - innovation is at the heart of his job as a baker and sommelier. Maxim was already experimenting with a lot of different types of grain, but the Lab has allowed him to discover even more novelties.

6 Don't you forget about the beer... In the beer brewing world as well as in the bakery scene, the hunt for special grains is ON. Our Low Food Lab participant **Tjalling Landman** is brewer and head of production at Brouwerij 't IJ, an Amsterdam based specialty brewing company. Tjalling is known for his collaborations with other brewers, but also with food producers such as Brandt & Levie, with whom he has created sausages on the basis of beer from 't IJ. Tjalling's cooperative attitude was definitely valuable for the Low Food Lab! In his own words: "I love the interdisciplinary approach of the Low Food Lab and the fact that we all have such different backgrounds.

7 **Elin de Jong** opened Ulmus Bakkerij at the beginning of 2021 together with her partner-in-crime Yoeri Joosten. With Ulmus, they strive to be one of the links in a (more) sustainable, transparent food chain. Their philosophy is to use only Dutch grains and other ingredients that are seasonal and sourced locally. Elin saw Low Food Lab as an opportunity to "learn more about local grains, to experiment a lot, and to connect with other bakers, millers, farmers and eaters who want to take care of each other - and of the planet." We were lucky to have her in the Lab!

8 The Low Food Lab: Grains would not be complete without true 'grain nerd' **Frank van Eerd**. At De Bisschopsmolen, the first Dutch 100% spelt bakery located in Maastricht, Frank has been an ambassador for local grains since forever. His love for 'slow bread' and short food supply chains has no limits, and he joined the Low Food Lab enthusiastically, looking forward to experimenting with even more local grains.

9 **Ynze van Hoek**, a.k.a. De Misosoof is an overall fermentation specialist and creates his own kombucha, misos, shoyu and many, many more specialties. Next to running his own miso and kombucha brands, Ynze is also the owner and chef of a restaurant in Friesland. He is really excited about the Lab: "The Netherlands is originally a true 'grain country' characterized by many ancient and forgotten grains that are definitely worth reviving. As a miso producer, I'll be testing the use of these grains for creating miso and shoyu.

Discover the grains

Red wheat

Emmer wheat

Tritordeum

Naked oats

Einkorn

ORIGIN: EAST AFRICA

BACKGROUND:

Red wheat is considered an 'ancient grain', because it has not been cultivated on a large scale for a long, long time. Because of its relatively low yields and its distinctive color, the grain could not find its way into mainstream large-scale agricultural practices. But over the last decade, renewed interest arose in this originally East African grain race (as well as in many other 'ancient grains').

WHY THIS GRAIN?

The first thing that strikes when you see a strand of red wheat is, of course, its color. The unique red color of this wheat is caused by the presence of anthocyanins - a type of natural dye, belonging to the flavonoids. Flavonoids are natural substances well known for their beneficial health effects. They have a direct antioxidant effect - however, there is no scientific consensus yet about the antioxidant properties in the human body. We can't say for certain that the anthocyanins in red wheat cause positive health effects. What we can say, however, is that more color is an indication of more taste. That is definitely the case with red wheat!

1
Red wheat

(Triticum aestivum)

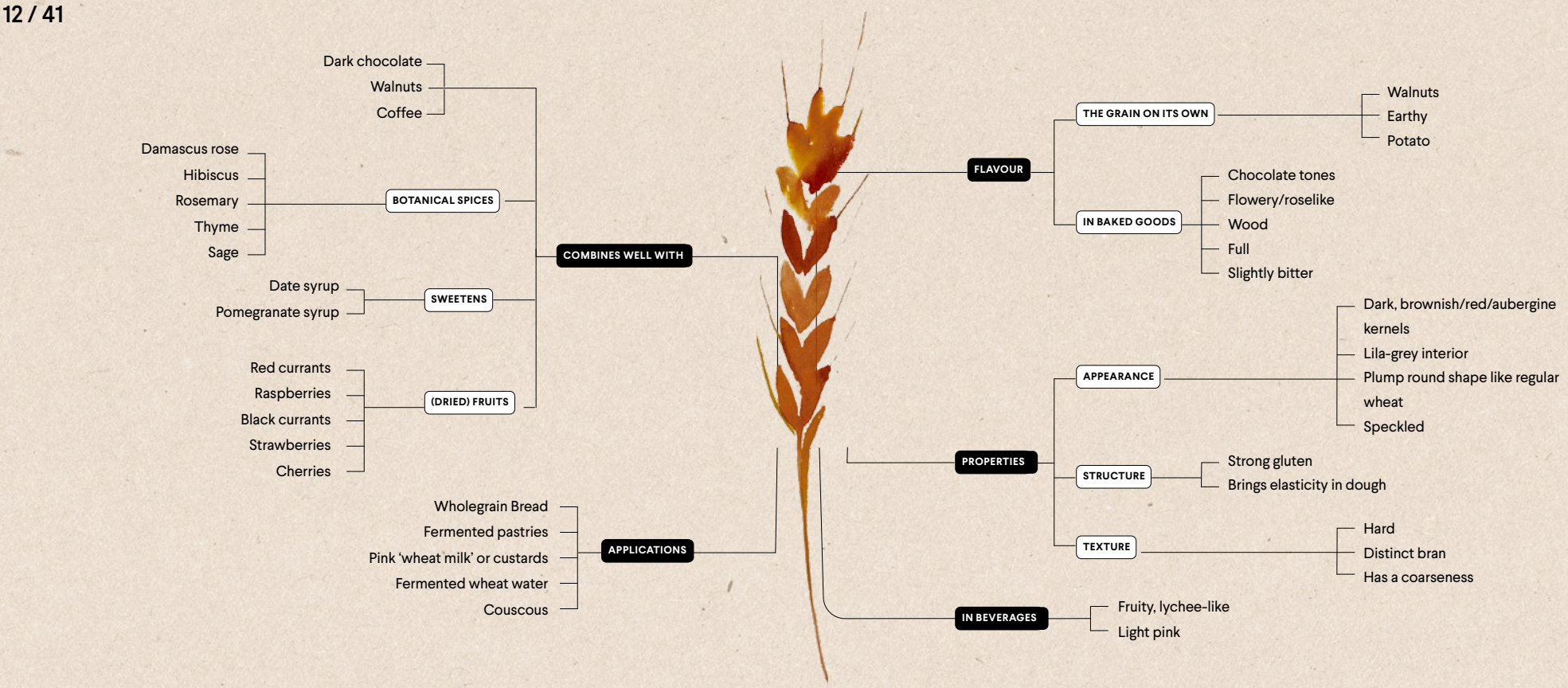
GROWER:

The red wheat in our Low Food Lab is grown by Jan Steverink. He has been growing ancient grains since 2005, in his fields in the 'Silvoldse Slaege'. This enclosed low-lying area in the Dutch Achterhoek is known for its 'primeval banks' (*oerbanken*): very hard layers of swamp iron ore. Moreover, the area was often flooded in the past, leaving layers of fertile sludge behind. This resulted in highly fertile cropland. The river clay combined with the primeval banks offers the perfect opportunity for the cultivation of ancient grains. For the license to grow red wheat, Jan Steverink had to travel to Bavaria in Germany. Here he managed to find a farmer who has the exclusive right to grow red wheat. Jan acquired a special license to grow this variety in the Netherlands.

FIND OUT MORE:

Meet Jan Steverink, the grower of this specific grain

More on flavonoids (in Dutch): Flavonoïden / naturafoundation.nl



Red wheat used in puff pastry:

Elin de Jong: "Red wheat is a bit tougher and therefore lends itself to this dough better for a puff pastry you can shape, such as for a galette or hand pie. Also fun to combine the grains with dried or finely chopped herbs mixed in with the flour.

Red wheat used in bread(s):

Maxim Rolvink (Bread sommelier at Restaurant Wils): "Red wheat has a very full extra wheaty flavour. It's a strong flour and I used it in high percentages in my dough. Up to 70% wholegrain red wheat to 30% white wheat flour. A 50/50 mix worked very well too and handled a longer autolyse of 60 minutes beautifully."

Red wheat used for croissants:

Elin de Jong: "in comparison with the other grains (in this case emmer and einkorn ed.) the dough for croissant needed more mixing, but was more extensible and easy to roll out. The layers were more visible than the layers in the other two variations. Structure of the dough was a little less soft and felt firmer. The flavour of the croissants were a bit earthy and floral-like, especially with the wholegrain version the floral notes of rose came out beautifully. The texture was a bit tough yet airy."

Barley 'water'?

Sasker Scheerder: "'Barley Water' is a forgotten way to create a nutritious, prebiotic and refreshing drink from the cooking liquid of grains. Why forgotten? Because cooked grains such as barley, wheat and kamut were a staple in daily food here in the lowlands of Europe, mainly in the form of porridges and stews. Perhaps this recipe can turn the tables, because this is a 'eat tasty grains, get a luscious drink for free' kind of situation. Or the other way around, of course".

Because Joris Bijdendijk was so enthusiastic about this drink created by Sasker Scheerder of Manenwolfs Foodlab, he will serve this at one of his restaurants. Also, Sasker invites you to create your own version: check out the recipe on page 31

Red wheat shoyu?

Ynze van Hoek (Fermentation specialist), made a red wheat shoyu: "The shoyu is based on red wheat and yellow peas. Traditionally, shoyu is made of koji, cultivated on a mix of roasted wheat and steamed rice. This is the base for most soy sauces. Without making concessions on process and tradition, it's possible to swap and interchange these ingredients for other ones."
Check out his recipe for Red wheat shoyu on page 34

ORIGIN: GREAT BRITAIN

BACKGROUND:

Back in the seventeenth century, naked oats were a popular crop in Great Britain. The oats get their name from the fact that, unlike regular oats (Avena sativa), the ripe grains are not covered by chaff. The grain is therefore naked and does not need to be peeled after threshing. As with many so-called ancient grains, growing naked oats fell out of fashion due to its lower yield. In the current trend where more diversity and taste are considered more important than yield, naked oats are gaining ground again. The increasing popularity of New English Pale Ale, traditionally brewed with naked oats, gives the oats a positive boost as well.

WHY THIS GRAIN?

When it comes to nutritional value, there are some important differences between 'regular' oats and naked oats. Regular oats contain around seven percent of fat, whereas naked oats contain up to fifteen percent. This fat percentage offers many culinary opportunities, but also challenges both in processing techniques and shelf life. Naked oats are more difficult to grind, and the oatmeal of naked oats has a tendency to become rancid.

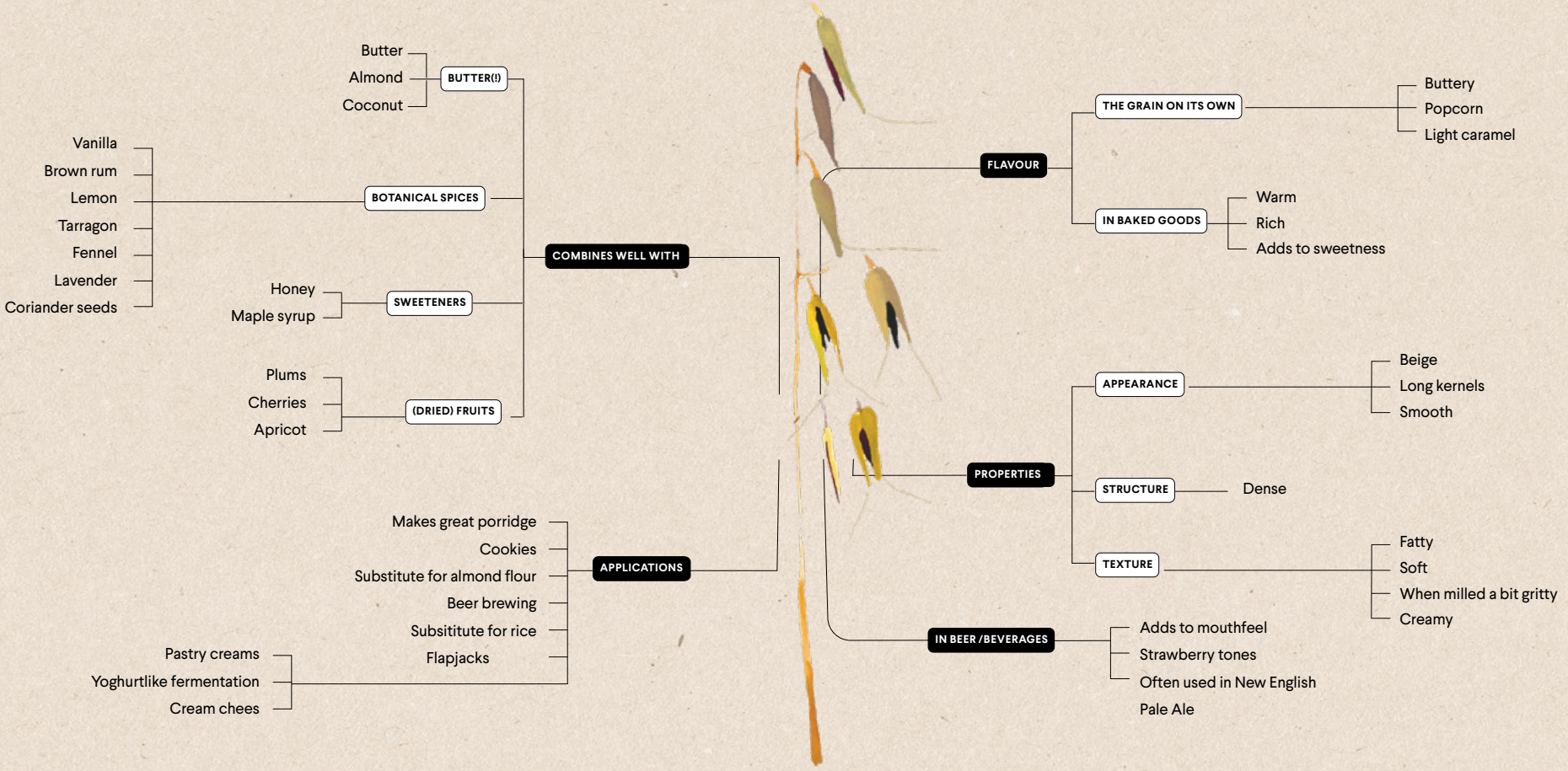
But naked oats have another big nutritional plus. As said, the grain does not need to be peeled, so the oat brans remain intact. These brans contain a lot of fiber, oils and polyphenols. Other than with regular oats, whose brans are usually damaged during the peeling process, these nutrients are retained. This is not only an advantage because of the nutritional value, but also in terms of taste: the more nutrients, the more flavour!

2
Naked oats

(Avena nuda)

GROWER:

The naked oats in our Low Food Lab were organically grown by Jan Buining (Ter Apelkanaal, Groningen). Oats can be grown on relatively poor soil (because they don't need too much nitrogen), which is an advantage for organic farmers.



Elin de Jong (Ulmus Bakkkerij): "Naked oats are very suitable for cookies like a flapjack style bar or oat cookie."

Alice den Boer (Baker at Amarant): "The oats are so soft that even in a normal mill they turned into soft flakes"

How to make a grain 'milk':

Ever wondered how you can create your own nut/grain-style milk like oat milk? Naked oats are really suitable as a substitute milk, because their flavour is buttery and almost toasty like popcorn. Check out the recipe for a grain 'milk' by the Bisschopsmolen on page 32

Nut free financiers:

Alice den Boer experimented with financiers and different types of grains. Financiers are little dainty cakes, traditionally baked with almond flour. Alice used flour from the different grains to replace the almond flour. The naked oats-variety turned out best. You'll find the recipe on 35

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ORIGIN: MIDDLE EAST

BACKGROUND:

Emmer wheat (or simply 'emmer') is one of the oldest types of wheat known to humanity and can truly be named an 'ancient grain'. It originated 8,000 to 10,000 years ago in Southwest Asia, probably out of a spontaneous crossing of wild einkorn and so-called goatgrass. Like many other ancient grains that originated in Asia (such as einkorn and naked barley), emmer found its way in all directions through chain migration: pioneers moving out of their agricultural communities to establish new settlements. These pioneers obviously took the grains with them, so they also migrated.

WHY THIS GRAIN?

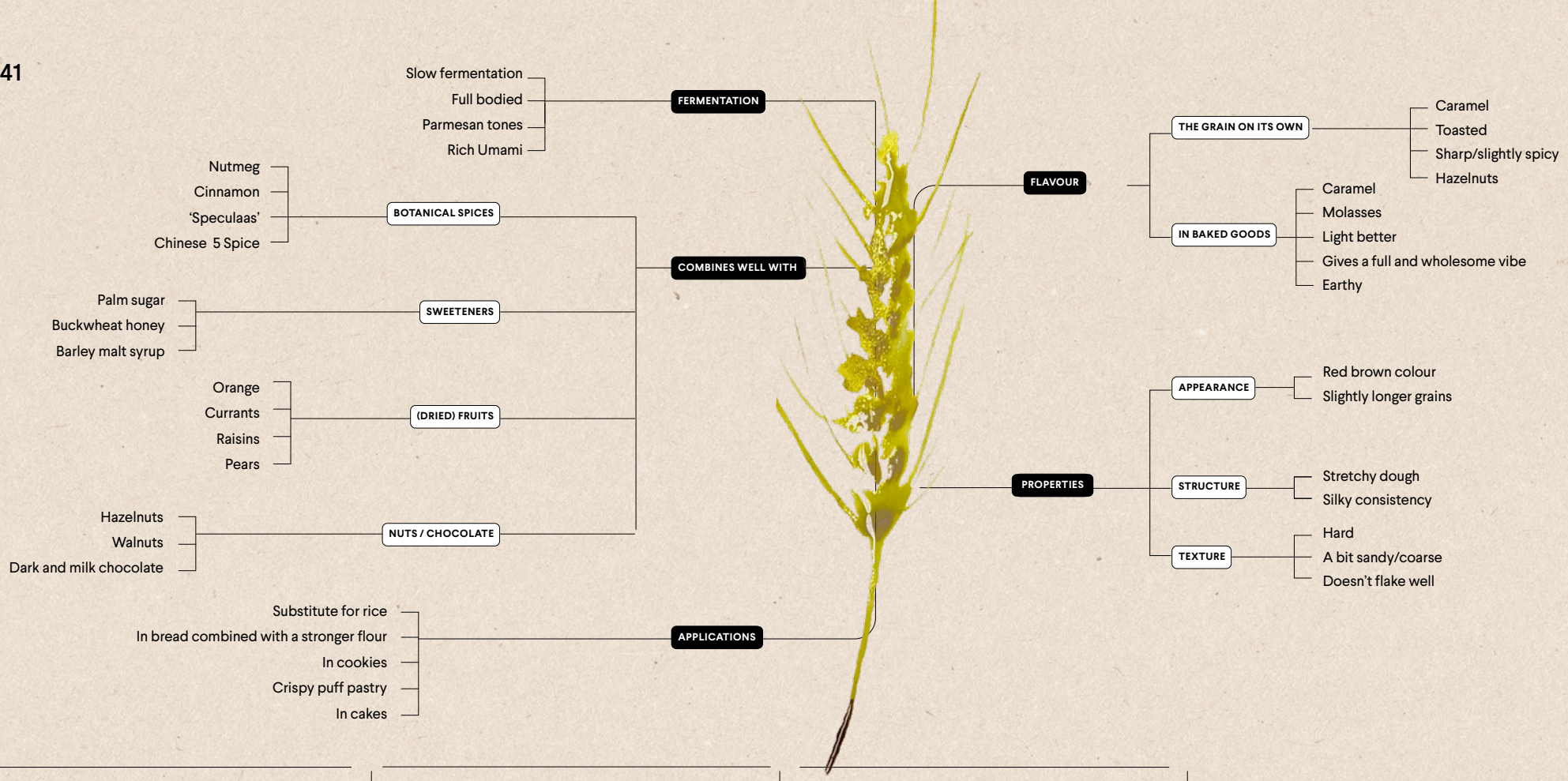
One reason that we wanted to work with emmer wheat in the Low Food Lab, is its nutritional value. Emmer has a high protein percentage, and these proteins are built up differently than in most modern wheat varieties. It's lower in gluten, which is why some people experience fewer digestive problems when they eat emmer wheat products.

3
Emmer wheat

(Triticum dicoccon)

GROWER:

The emmer wheat used in the Lab was organically grown by Pieter Bijlsma, a fifth generation farmer in the Haarlemmermeer (close to Amsterdam). Pieter has created a regional cycle of circular farming, together with an Amsterdam based goat farm and a few bakeries in the neighbourhood (including Karel Goudsblom's bakery). Emmer wheat has brans and needs to be both threshed and peeled.



Bread with emmer:

Maxim Rolvink (bread sommelier at Restaurant Wils): "This emmer had a lot of body and flavours that I associate with hay and grass. In another job I've worked with emmer before. At the time we used a ratio of 70% whole grain emmer flour and 30% sifted (white) emmer flour. This resulted in a very challenging dough which we baked in tins to support the dough and maintain its shape."

"This time I made bread with 40% wholegrain emmer flour and 60% white wheat flour (T65 from the Commandeursmolen). It was packed with flavour and had a beautiful red glow in the crust that a loaf from regular wheat doesn't have. The crumb was very moist and had a nice full bite. If you want to enhance your bite, you can use emmer in a "kookstuk" ('Thang Zhong' or 'water roux' method) as well. For this recipe I experimented with different autolyse times as well. The dough was a bit stronger and could handle 40 minutes of autolyse."

Using emmer in croissants:

Elin de Jong (Ulmus Bakkerij): "The dough wasn't very stretchy and gave some pull back after the third fold. It was doable to roll out and had a very soft structure. Strength is definitely building up during folds. The dough was also a bit more sticky than the others. Emmer croissants didn't have as much volume as regular ones: there was a rise and some structure, but the end result was a very flat croissant. The flavour was sweet, a bit caramel like. And the texture was good: crunchy, with a bit more bite!"

Couscous made with grains?

Couscous is traditionally made with semolina from durum wheat. But you can easily use other grains as well. Semolina is the coarse, purified wheat middlings (intermediate milling stage). As it goes with couscous: no pain no grain, lots of labour & love, but this results in the best couscous! Find Nadia Zerouali's unique couscous recipe on page 32

Interview
Karel Goudsblom

‘I’m not a grain guru. I simply want to bake the most delicious bread’

Selecting the grains for the Low Food Lab, Alice den Boer knew that emmer and einkorn were not to be missed. Karel Goudsblom, artist-turned-baker in Amsterdam, has been baking with these grains for years already. “Not because these ‘ancient grains’ were so cool,” says Karel, “Simply because I wanted to create the most delicious bread on earth.”

“In the bakery world, we tell each other that Dutch grain is ‘difficult’ all the time. And it’s true: most regular Dutch wheat is very low in protein, so not suitable for baking bread. But the funny thing is: when it comes to taste, the Dutch grain has always been very distinctive. Dutch wheat has more flavour than its non-Dutch competitors.” Following his fascination with flavour, Karel went on a quest for tasty, baking-proof Dutch grain. He built up a growing network of Dutch millers, from Groningen to Limburg, and for years he has been experimenting with different Dutch grains. Emmer and einkorn were keepers. “Every single bread is made from flour, sourdough, a pinch of salt, and that’s it.”

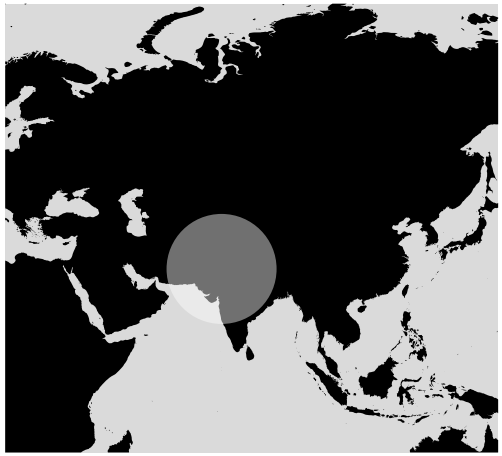
Next to emmer and einkorn, grown in the Haarlemmermeer polder close to Amsterdam, Karel also uses Eastern European wheat, imported by Commandeursmolen in Limburg. “I used to bake with Dutch wheat only, but the quality is too poor. I couldn’t keep throwing away bread simply because I had used Dutch wheat!” But he definitely favors local grains, from growers that he can shake hands with. Don’t assume, by the way, that Karel is some kind of grain guru. He’s not that eager to show his customers where the grains come from.

Interview
Karel Goudsblom

"I might be kind of a weird one for that matter. I love to talk about local grains, but I don't feel the need to educate my customers all the time. Our bakery is completely open, you can see what's going on here. People feel welcome. That's what I think is more important than knowing exactly which grain is in which bread."

Due to the pandemic, Karel had to refocus his activities a bit. In pre-covid times, his bakery mainly supplied restaurants and cafes in Amsterdam. During the pandemic, Karel made a shift and now he sells most of his products directly to consumers. Together with his wife, who is a medical anthropologist, he is currently setting up a dietary coaching practice. "It's hard to break someone's dietary habits. But if you can present them with something really good and delicious, people are more willing to change their diet."

'Every single bread is made from flour, sourdough, a pinch of salt, and that's it.'



ORIGIN: SOUTHWEST ASIA

BACKGROUND:

Einkorn wheat is one of Europe's first grain crops. It originated from wild einkorn and there's an important difference between einkorn and other grains: einkorn was never crossed with wild grass. Like emmer wheat, einkorn found its way to Europe through chain migration. In the Bronze Age (4000 years ago) einkorn was almost completely replaced by other grains that yielded more harvest.

WHY THIS GRAIN?

The reason we wanted to work with einkorn is basically the same as why we wanted to use emmer: einkorn has high nutritional values, is high in proteins and contains relatively lower amounts of gluten - which is beneficial for people with digestive problems.

4
Einkorn

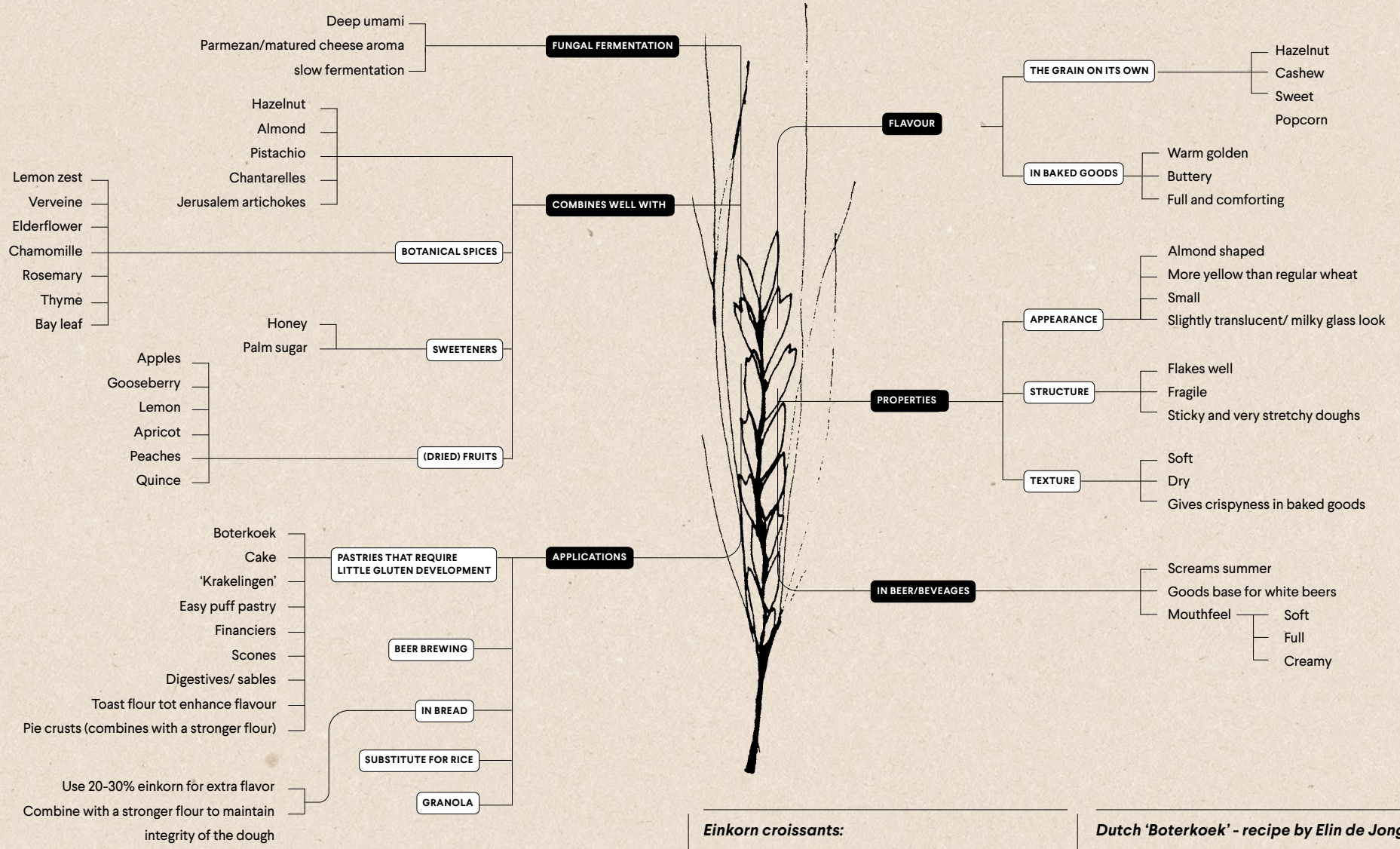
(Triticum monococcum)

GROWER:

The einkorn wheat used in the Lab was organically grown by Pieter Bijlsma, a fifth generation farmer in the Haarlemmermeer (close to Amsterdam), who is also the supplier of our emmer wheat. Pieter has created a regional cycle of circular farming, together with an Amsterdam based goat farm and a few bakeries in the neighbourhood (including Karel Goudsblom's bakery)

FIND OUT MORE:

Einkorn.com



Einkorn croissants:

Elin de Jong (Ulmus Bakkerij): "Einkorn croissant dough was very soft and brittle. It breaks/tears very easily. I had to be very gentle working with this dough. The structure of the dough was very soft and silky. No spring back or building of strength during folding. Eventually, the croissants came out of the oven very flat. They had no body, just crust. However, their flavour was nutty and warm. And the texture was really delicate and tender, no chewyness."

Dutch 'Boterkoek' - recipe by Elin de Jong

Elin also experimented with different grains for 'boterkoek'. Elin: "When it comes to flavour, einkorn was the big winner. The warm and nutty flavour of the einkorn combines very well with the butter". Check out the recipe on page 39

Einkorn in bread:

Maxim Rolvink (bread sommelier at Restaurant Wils): "Einkorn has a stronger nuttier flavour than normal wheat. To get this nice flavour, but at the same time conserve the integrity of the dough, I used a ratio of 70% white flour to 30% whole grain einkorn. I've tested several autolyse times. An autolyse of 20 minutes worked best for me. When I extended my autolyse it resulted in a loaf with less volume."

"Another way to incorporate a special grain and enhance its flavour is by using a "kookstuk". For this I boil the whole grain berry in water (just like rice) until cooked but still firm. After straining and cooling you can fold them into your dough. Make sure to take back some water. The ratio I used was: 70% white flour, 10% boiled einkorn berries, 20% wholegrain einkorn."

Low Food 'Einkorn' beer coming up! How did that work out?

Tjalling Landman, brewer at Brouwerij 't IJ: "I was most interested in the effects of einkorn, naked oats, and tritordeum on the taste of beer. To be able to really measure these effects, we needed a baseline measurement first. So we brewed a type of beer with as little flavour as possible, made from barley malt, a little bit of hop, and a neutral type of yeast (US-05). There was our starting point: a well-brewed, yet quite boring beer, with no pronounced taste. Alcohol 6% vol., bitterness 14IBU, light in color (11EBC) and medium carbonation (4.7g/l).

Next, we brewed new beers, for which a certain part of the barley malt was replaced with one of the experimental grains. At first, we tried to replace around thirty percent of the malt, but this resulted in non-filterable beer. We simply couldn't process it. We then decided to work with eighty percent barley malt and twenty percent 'alternative grains'. That worked out well, and the effects on taste were clearly there. Einkorn beer was definitely the winner when it comes to taste! So we're currently creating the first real Low Food Beer. Isn't that great?!"

Einkorn tempeh:

Sasker Scheerder, fermentation specialist: "Tempeh is usually made by a fungal culture called ***Rhizopus*** that grows on beans, traditionally soy. But ***Rhizopus*** is not very picky: as long as it has access to digestible proteins and/or carbohydrates, it will grow and bind anything it finds on its way together with a white mycelium. Here, a tempeh was created from chickpea mixed with the ancient grain einkorn. Forces combined, chickpea and einkorn provide high-end proteins and all essential amino acids in a tempeh with excellent baking properties. Complementing each other's nuttiness very nicely, together with the umami that was created in the fermentation process it makes either an easygoing, pleasant and nutritious snack, or an addition to any meal."

Want to make your own einkorn-tempeh? Try it yourself and find the recipe on page 29

ORIGIN: SPAIN

BACKGROUND:

Tritordeum is not a typical 'ancient grain' - it's actually a very young variety. The crop is a cross between durum wheat and wild barley from South America, produced in Spain in 1977. The pollen from the wheat was transferred to the stamps of the barley, resulting in tritordeum.

WHY THIS GRAIN?

Because tritordeum is still so young, there is a lot of room for experimentation! One reason to be excited about tritordeum is the fact that it grows in a very water efficient way. Besides, the grain is able to grow with a low input of minerals – meaning it can be grown on poorer soil, with minimum input of fertilizer. It might very well be a useful grain variety for the future of agriculture, in which more extreme weather conditions will occur. And last but not least, tritordeum is very low in gluten, which makes it an interesting grain from a nutritional perspective.

5
Tritordeum

(Triticum durum x Hordeum chilense)

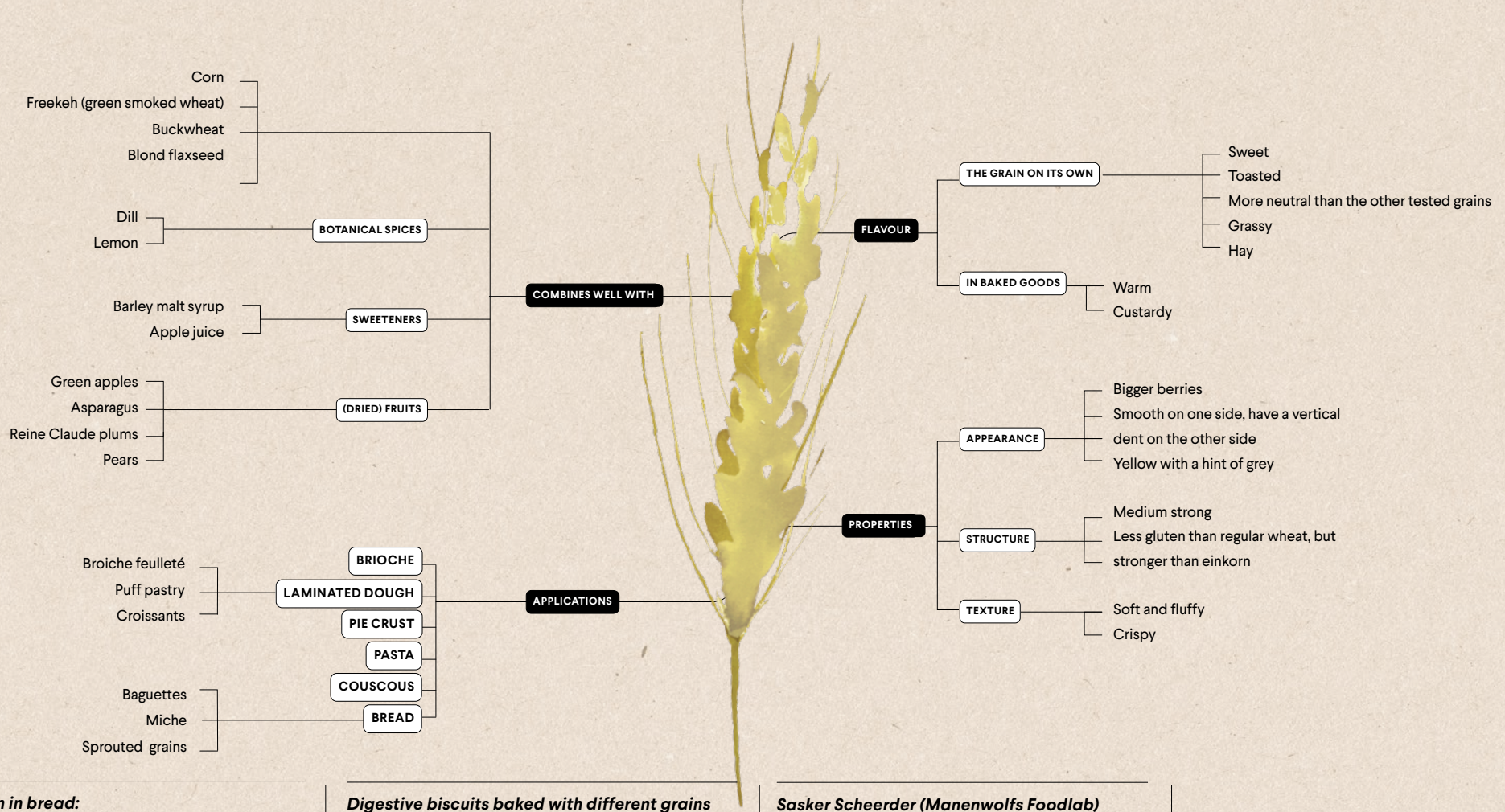
GROWER:

Originally, tritordeum was grown in Mediterranean areas. But for a few years now, it is also grown in Zuid-Limburg, in the south of the Netherlands. This local grain came out of the growing experiments successfully, which is why we happily used it in our Low Food Lab. The tritordeum wheat was grown by the 'Kollenberger Spelttelers'. Wynand Vogels is one of the first Dutch tritordeum growers. "We have had a lot of experimenting going on. In our first year of growing tritordeum, the harvest failed. But last year we tried something different and now the results are much better." The tritordeum of this harvest was used in the Low Food Lab.

FIND OUT MORE:

Oude granen nieuw brood; Noor Bad, Ineke Berenschot, Dion Heerkens, Theo Jennissen.

The Development of Tritordeum: A novel cereal for Food Processing. A Martin, J.B. Alvarez, L. M. Martin, F. Barro, J. Ballesteros



Tritordeum in bread:

Maxim Rolvink (Bread sommelier at Restaurant Wils): "Tritordeum has a very agreeable taste. It's nutty and has a sweet undertone. I've used tritordeum in many different ways. I made baguettes, heart loafs and a tin loaf. Since I liked the flavour a lot, I wanted to use a higher percentage of the wholegrain flour. However, Tritordeum is low in gluten. That's why I decided to bake it in a tin to support the dough. An autolyse wasn't a great option for tritordeum. It made the dough weaker. Instead, I used a kneading pause. I mixed the dough (all ingredients at once) gently for 5 minutes. Left it to rest for 60 minutes and mixed it gently again. This resulted in a nicely developed dough which then followed my standard bread baking process."

Digestive biscuits baked with different grains

Alysha Aggarwal, baker: "Digestive biscuits are one of my favourites to snack on. Because they have a high proportion of whole grain flour, they are nutritious and can be turned into a decadent treat simply by covering them in melted chocolate. I have experimented with digestive cookies made from all the different grains we used in this Low Food Lab." Find Alysha's experience and recipe on page 33

Sasker Scheerder (Manenwolfs Foodlab)

invented another application for whole grains: puffed fermented kernels (dubbed 'Zombie Grains'). The technique resembles the process of making tempeh. The difference is that instead of forming a compact tempeh, you try to break up the mycelium to form individual kernels. These kernels are fried off and puffed, and can be used for extra texture and funky crunch on several dishes. Tritordeum seemed really suitable for this application!"

Tritordeum according to Alysha Aggarwal, baker at Broodbakkerij Ex:

"Overall, I really enjoyed working with this grain and would gladly swap out my regular T65 (white flour with a slightly higher mineral content, ed.) for tritordeum T65! I used it as a substitute for strong bread flour in both bread and pastry applications. I only used the milled, T65 version of the flour and did not experiment with using a whole wheat tritordeum flour."

Compared to my regular T65 flour, I noticed no drastic difference in the gluten formation of doughs made with tritordeum (except when paired with buckwheat, which on its own is gluten free!)."

"The flour has an absorption comparable to a standard T65 strong white bread flour. Depending on which whole grain flour I was combining it with, I reduced the hydration by as little as 2%. In some cases reducing it by up to 7% - more as a function of the other whole wheat flour I was adding to the mix. I used it in combination with red wheat/emmer/einkorn, where the whole wheat component ranged from 20 - 50%."

"I followed the same fermentation process I usually use for sourdough: room temperature bulk rise of 4-6 hours and overnight cold fermentation of 14-18 hours. The doughs were able to withstand these times with no trouble. In pastry, the flour made for extremely silky, elastic doughs. Easy to use in all kinds of pastry applications, including for laminated doughs. For cookies & cake as well, the tritordeum makes for a tender crumb, acting as a good replacement for all purpose flour."

"Loaves (pastry & bread) baked with tritordeum have a richer yellow colour than those with T65, and somewhat sweeter notes than T65."

Interview
Frank van Eerd

‘Tritordeum allowed me to create a truly local grain economy’

Tritordeum might have been a novel grain to some of our participants, but not to Frank van Eerd! Frank, owner of De Bisschopsmolen and co-founder of GrainLabs, has been working with tritordeum since 2017. GrainLabs, not to be confused with Low Food Lab: Grains, is an initiative where bakers and (sport) scientists work together to give insights on how grains (can) work in our daily diets.

Local growers, the ‘Kollenberger Spelttelers’, had asked Frank if he knew a ‘new’ grain to grow in the province of Limburg, in the south of the Netherlands. Fred Brouns, professor of Health Food Innovation at the University of Maastricht, pointed Frank in the direction of tritordeum, which was grown in the region of Catalunya, Spain. He told Frank it was a crossing between durum and wild barley, and that it had interesting nutritional advantages over other grains (especially because of the different structure of gluten, which was supposed to help people with difficulties with the digestion of wheat products). Coincidentally, Frank’s brother was in the area and was able to pick up some bags of tritordeum to take home. Upon his return, Frank started experimenting with it in the bakery.

It turned out that tritordeum was indeed a fascinating new type of grain. Frank’s tritordeum products were soon to be found in Albert Heijn’s supermarkets. Tritordeum gained momentum in 2018, when it won an award for being the most sustainable crop of Europe. Frank: “Tritordeum can keep up with very little water. This makes it an excellent

Interview
Frank van Eerd

crop for areas with drought problems. Due to climate change, these areas are expanding, in Europe and beyond."

After some successful baking experiments, de 'Kollenberger Spelttelers' acquired the license for growing tritordeum in the Netherlands. Now it could be grown even more locally: in the south of the Netherlands. "Not because the Spanish harvest wasn't good enough - simply because I wanted to create a truly local grain economy." And yes, his new favorite grain was doing wonderfully well on the Limburg soil. Frank is now baking with a mix of Spanish and Dutch tritordeum. "There is a persistent myth that you cannot bake bread from Dutch grain, but our Dutch tritordeum breads are just great. They contain a lot of protein, so athletes love it as well." According to Frank, baking with tritordeum (and other ancient or novel grains) fits in with a trend of the change from quantity to quality. "Of course, we can import quinoa and avocados in order to eat healthy in this part of the world. But why would you get it from so far away? We can grow sustainable, healthy crops just around the corner. Local collaboration is key."

Participating in the Low Food Lab is an example of this collaboration, says Frank. Some of the grains were considered 'difficult' by the bakers in the Lab, but turned out to be useful for the brewers and fermentation specialists. Red wheat, for instance, obviously produced red-colored bread, which is "not something the consumer wants to eat", says Frank. But then one of the other participants decided to brew a red colored soft drink from the wheat. Frank: "It looked exciting and tasted delicious. I would love to sell that drink in the bakery."

'It looked exciting and tasted delicious. I would love to sell that drink in the bakery.'

Discover the recipes

Together with the participants we've developed a new set of recipes with ancient grains. With these recipes, we hope to inspire you to be creative and experiment with these amazing grains. Discover new flavours!

Tempeh against the grains

RECIPE BY SASKER SCHEERDER | MANENWOLFS FOODLAB

Tempeh is usually made by a fungal culture called Rhizopus that grows on beans, traditionally soy. But Rhizopus is not very picky: as long as it has access to digestible proteins and/or carbohydrates, it will grow and bind anything it finds on its way together with a white mycelium.

Here, a tempeh was created from chickpea mixed with the ancient grain einkorn. Forces combined, chickpea and einkorn provide high-end proteins and all essential amino acids in a tempeh with excellent baking properties. Complementing each other's nuttiness very nicely, together with the umami that was created in the fermentation process it makes either an easygoing, pleasant and nutritious snack, or addition to any meal.

This recipe consists of two parts. Firstly, we provided an easy, basic recipe for making tempeh. You can experiment with different types of grains and with different ratios. Secondly, we've made a short recipe on how to use the chickpea-einkorn tempeh as a snack.

INGREDIENTS FOR THE TEMPEH:

- 250g dried chickpeas
- 50g of Einkorn, or your favorite grain
- 100ml natural vinegar
- 1 tsp salt
- 1 tsp tempeh starter (buy online)

YOU'LL ALSO NEED:

- thermometer
- 2 ziploc-bags
- thick, sharp needle (or fork)
- a home incubator, or a place that can maintain a temperature of 35°C

DIRECTIONS:

Day 1:

1. Soak the chickpeas for 24 hours in plenty of water (at least double the volume of the peas) and salt.
2. Do the same thing for the grains, but separately.

Day 2:

3. Drain the chickpeas and add them to a cooking pot with enough water to cover them, that should be about one liter, and add the vinegar. Cook them until they are tender, but don't overcook them. This should take about 10 minutes.
4. Do the same with the grains, but be aware that the cooking time is usually longer.
5. Drain the chickpeas and grains (do not rinse with cold water!) and allow to cool. The temperature should be below 35°C before proceeding. Allow the outside to dry, and shake them up from time to time.
6. Bruise the chickpeas, by hand or with a mixer, so they break a bit, but do not crush them.
7. Mix the peas and the grains, and inoculate the mixture by sprinkling the tempeh starter onto it, and mix very well.
8. Add the mixture to the ziploc bags, creating a loose, even layer of 2-3 centimeters thick. Don't press out the air.
9. Use the needle (or a fork) to perforate the bag with small holes, about 2-3 centimeters in between.
10. Incubate in a place that maintains a steady temperature of around 30°C.

Day 3:

11. After 30 to 35 hours, the mixture will be grown together by a white mycelium. Take it out of the incubator and cool. Fresh chickpea tempeh can be kept in the refrigerator for several days.

FOR THE PREPARATION YOU'LL NEED:

- 250 grams of chickpea-einkorn tempeh

This recipe makes a snack for 5 or servings for 2-3 people.

YOU'LL ALSO NEED:

- refined oil (sunflower, rice or peanut)
- shoyu, or: shoyu, garlic, oil and lemon juice

12. Cut the tempeh into thin slices (0,5 cm) and shallow-fry them in the well-heated oil. Turn the slices immediately once they hit the pan to distribute the oil evenly. Bake crispy and golden brown in one to two minutes.
13. Serve as is with some drops of shoyu, or alternatively in a dressing of shoyu, crushed garlic, some oil and lemon juice.

Barley non barley water

RECIPE BY SASKER SCHEERDER | MANENWOLFS FOODLAB

WHICH GRAIN(S)? - ANY!

'Barley Water' is a forgotten way to create a nutritious, prebiotic and refreshing drink from the cooking liquid of grains. Why forgotten? Because once cooked grains such as barley, wheat and kamut were a staple in daily food here in the lowlands of Europe, mainly in the form of porridges and stews. Perhaps this recipe can turn the tables, because this is a 'eat tasty grains, get a luscious drink for free' kind of situation. Or the other way around, of course.

More a method than a recipe, you are invited to create your own version. Next to barley, red wheat and naked oats were our favourites, but any tasty grain will do. Play around with botanicals. Add a sweetener to taste, or leave it out.

This recipe makes 1 liter of 'Barley Water'.

Note: the ratio water-to-grain and the cooking time can vary greatly with the type of grain and its treatment.

INGREDIENTS:

- 100gr of your favourite grain
- 1000ml water, plus more to finish the drink (flat or sparkling)
- 1 whole organic lemon, chopped up
- 15g (small handful) of fresh mint leaves, or 5g dried mint

OPTIONAL:

- honey, or another sweetener

YOU'LL ALSO NEED:

- a fine-meshed sieve

DIRECTIONS:

1. When using whole grains: soak overnight, or at least for a couple of hours.
2. Strain and pour off the soaking water. Rinse the grains.
3. Cook the grains in 1 liter of water until done. In the case of red wheat that was 30 minutes, in the case of naked oats it was 12-15 minutes. Adjust to your grain type.
4. Chop and bruise the mint leaves and put them in a heat-resistant bowl, together with the lemon.
5. Pour off the cooking liquid in the bowl with the lemon, and set this aside to steep and cool down for a couple of hours in a cool place.
6. Eat the grains, or store them to use later. Continue with the liquid: strain the liquid from the solids, pressing out as much liquid as you can.
7. Add honey or another sweetener to taste, but take the next step into account: Use flat or sparkling water, topping the grain juice to make 1 liter of 'Barley Non Barley Water'.

Hand-rolled couscous

RECIPE BY NADIA ZEROUALI | COUSCOUSBAR

WHICH GRAIN(S)? - ANY!

Couscous is traditionally made with semolina from durum wheat. But, you can easily use different grains. Semolina is the coarse, purified wheat middlings (intermediate milling stage. As it goes with couscous: no pain no grain, lots of labour & love, but this results in the best couscous!

INGREDIENTS:

- 1 tsp fine sea salt
- 150g coarse semolina, e.g. red wheat
- 150g fine semolina, e.g. red wheat
- 1 tbsp mild olive oil

YOU'LL ALSO NEED:

- large bowl (earthenware/clay/cane)
- sieve
- fine-mesh sieve
- couscoussier or double-chambered steamer

DIRECTIONS:

1. Dissolve the salt in 100ml lukewarm water.
2. Spread the coarse grains in a big bowl, Sprinkle with some of the saltwater and at the same time make circles with your hand palm and fingers till there begins to form some grains. Dust with some fine semolina. Keep alternating between rolling, sprinkling the salt water and dusting with the fine semolina till you have grains of the same consistency and form.
3. Push through a fine sieve to obtain the same size grains. Sieve through an even finer sieve to get rid of the excess fine semolina. You can use it for the next batch of couscous or to prepare bread like harcha.
4. Oil the upper part of a couscoussier or steamer lightly with some oil. Divide the couscous and steam for 15 min.
5. Pour the steamed couscous in a big bowl and loosen with a whisk. Sprinkle with some water and gently loosen the couscous. Sprinkle with some oil and sprinkle again with some water (100ml). Let it stand for a while so it absorbs all the water.
6. Repeat the steaming for about 10-15 min. Let the steamed couscous rest under a clean cloth for about 15 min. Let the couscous dry well for storage or repeat one steam for the final couscous. The dried couscous needs 2-3 steaming sessions.

How to make a grain 'milk'

RECIPE BY THE BISSCHOPSMOLEN MAASTRICHT

WHICH GRAIN(S)? - EMMER, EINKORN, NAKED OATS, TRITORDEUM

A straightforward recipe for creating a nut/grain-style milk like oat milk which is really popular nowadays. You can use this recipe as well for emmer as for einkorn. We don't recommend using red wheat.

This recipe makes a batch of around 750 ml.

INGREDIENTS:

- 200g of grains (emmer or einkorn)
- 1 tbsp honey (or replace it with agave or date-syrup to keep the drink vegan)
- 750ml water

YOU'LL ALSO NEED:

- blender
- fine-meshed sieve and/or cheese cloth

DIRECTIONS:

1. Soak the grains of your choice for at least half an hour.
2. Discard the soaking liquid and add the soaked grains to a blender together with the water. Mix until homogeneous. Add honey to taste.
3. Put the mixture through a sieve at least two to three times. Additionally you can use a cheesecloth.
4. Bottle the mixture.

You can use the drink for up to five days if stored in the fridge. Shake before use. You can use the spent grains in bread or cookie recipes to prevent food waste.

Digestive biscuits

RECIPE BY ALYSHA AGGARWAL

WHICH GRAIN(S)? - EMMER, EINKORN, RED WHEAT, NAKED OATS AND/OR TRITORDEUM

Digestive biscuits are one of my favourites to snack on. Because they have a high proportion of wholegrain flour, they are nutritious and can be turned into a decadent treat simply by covering them in melted chocolate.

INGREDIENTS:

- 175 g wholegrain emmer/einkorn/red wheat flour
- 100g naked oats flour
- 75 g tritordeum T65 or all purpose flour
- 55 g light brown sugar
- 1/4 tsp baking powder
- 1/4 tsp baking soda
- 1/4 tsp salt
- 150 g butter - cold & cut into cubes
- 2 tbsp thick yoghurt
- 1 tbsp milk

YOU'LL ALSO NEED:

- a stand mixer or a large bowl
- a whisk
- baking paper/parchment
- baking trays
- rolling pin
- cookie cutters

DIRECTIONS:

1. Weigh all the flour, sugar, baking powder, baking soda and salt in the bowl of a stand mixer (with a paddle attachment) or in a large bowl and whisk to ensure they are evenly mixed.
2. Add the cubes of butter, and pulse the mixer until the mixture looks like breadcrumbs. If mixing by hand, rub the butter and flour together in your hands until you have a sandy mixture.
3. Add the yoghurt and the milk and briefly mix until the dough starts to clump together.
4. Turn the mixture out onto the counter, and knead with your hands till it comes together as a smooth dough.
5. Then divide into two equal portions. Place one portion between two sheets of baking paper and roll approx to a thickness of 3 mm.
6. Repeat the process with the second portion of dough. Place the rolled out dough on a baking sheet and refrigerate for 15 minutes, so it can firm up.
7. In the meantime, preheat your oven to 170°C. And line two baking trays with baking paper.
8. Once the dough is chilled, use a round cutter (or any cookie cutter of your choice) and cut out the cookies, placing them on the tray a centimetre or so apart.
9. Prick the biscuits with a fork and chill for ten minutes. (You can re-roll any bits of dough and keep cutting, until all the dough is used up).
10. Bake for 5 minutes, then rotate the trays and bake for an additional 4-5 minutes. When the biscuits are done, they will be firm to the touch and lightly golden underneath.
11. Let them cool completely before placing them in an airtight container.
12. If you would like to cover them with chocolate, Melt some chocolate (any variety that you enjoy eating will work!) while the cookies are cooling. Once they have cooled completely, dip them in the melted chocolate.

Red wheat shoyu

RECIPE BY YNZE VAN HOEK | MISOSOOF

WHICH GRAIN(S)? - RED WHEAT

Shoyu based on yellow peas and red wheat-koji This is a shoyu based on red wheat and yellow peas. Traditionally, shoyu is made of koji, cultivated on a mix of roasted wheat and steamed rice. This is the base for most soy sauces. Without making concessions on process and tradition, it's able to swap and interchange these ingredients for other ones. This recipe uses Dutch grains!

This recipe will yield about 1,5 liters of red wheat shoyu.

INGREDIENTS

- 500g broken red wheat
- 500g yellow split peas
- 1500ml water
- 360g salt
- 1g of koji spores (Aspergillus Oryzae)
- flour

YOU'LL ALSO NEED:

- Koji fermentation room (see below)
- Small (cider) press
- Large glass pot/jar

DIRECTIONS

(please read carefully before you start, some steps require some preparation):

1. Soak the broken red wheat grains in water (make sure there's enough) for at least 4 hours.
2. Cook the yellow peas until you can divide them with two fingers but won't fall apart. This will take roughly one and a half hours.
3. Drain the red wheat and steam for about 40 minutes.
4. Allow to cool. They can't be warmer than 30°C.
5. Take 900 grams of peas and grains each.
6. Mix the wheat and peas together, don't knead. It should be a relatively loose mixture.
7. Use a perforated tray (the one you would normally use in a steamer) and place a lightly wetted cloth at the bodem. Place your mixture in the tray and spread out evenly. Make sure it isn't higher than 2,5 centimeters.
8. Okay! Now it's time to get the koji! You can use your own or buy your spores online, both will work. 'Dilute' your spores with a 1:30 ratio of flour. This process will help you to disperse the koji easier throughout your mixture.
   You can roast the flour first to eliminate any contaminants which might harm fermentation.
9. Mix in three parts. Lightly sprinkle ⅓of your spores onto the wheat and peas. Mix loosely. Repeat two more times. The last time, do not mix.
10. Cover with a damp towel. Make sure the towel won't touch the mixture and leave space on the edge for circulation.
11. Now it's time to grow. This will take 48 hours. The mixture will perform best in a spot with a temperature between 25 and 30°C, a humidity of 85% and with enough air circulation. In most environments this is not possible. Therefore we have to try to simulate an environment as close as possible. Google 'DIY koji chamber' or 'inoculation chamber' for tips and tricks for creating the perfect environment.
12. After 24 hours, mix thoroughly. If needed, you can lightly wet the towels again. You should be able to see the beginning stages of the fungus

working its magic. It should look a bit 'lumpy'. Yes? Great! If not, don't worry: 24 hours to go!
13. After 48 hours the mixture should be 'overgrown' with koji and you're ready for the next step.
14. Use a big, fermentation-grade, glass pot or jar. Mix in your inoculated mixture together with 1500ml of water and 360 grams of salt. This is the moromi; the fermenting mass of a shoyu.
15. Cover the top with plastic wrap or cling film - it doesn't need to be airtight.
16. Cover the top with a towel.
17. After day 1: stir your mixture thoroughly and cover again. Repeat after: 3 days, 1 week, 2 weeks, 4 weeks, 2 months and 4 months.
18. Your mixture will be fermenting into a shoyu. It will take around 3 to 6 months. The colour will be changing slowly and the mixture should split and the liquids will separate from the solids.
19. Keep tasting your shoyu: if you think it's ready then it's time to press the shoyu out of the moromi. Easiest and quickest way is to use a cider press. You could also put the mixture into a towel or muslin bag and hang it. This will take significantly longer.
20. Congratulations, by straining or pressing you've harvested your own shoyu!
21. Store in a bottle and let sit for at least two days. The solids will sit on the bottom of the bottle. Pour the shoyu carefully through a coffee filter if desired.

Nut free financiers

A RECIPE BY ALICE DEN BOER (AMARANT BAKKERS)

WHICH GRAIN(S)? - NAKED OATS, EMMER, RED WHEAT

A more local alternative
In this experiment I'm going to explore the potential of several coarsely ground local grains to replace almond flour in a very traditional patisserie item: financiers. These small cakes are traditionally made with half flour, half almond flour (or sometimes other ground nuts such as pistachios or hazelnuts). My goal is to develop items with similar qualities as the traditional financiers, but locally produced and more diverse in flavour. After testing, we won't recommend using red wheat for this recipe.

This recipe makes around 45 financiers.

INGREDIENTS:

- 400g white castor sugar
- 220g ground naked oats/emmer)
- 180g plain white flour
- 7g baking powder
- 400g egg whites
- 240g brown butter, melted
- A pinch of salt

YOU'LL ALSO NEED:

- mixing bowl
- piping bag
- silicone baking moulds for small cakes (30g)
- spatula
- saucepan

DIRECTIONS:

1. Preheat the oven to 170°C. Melt the butter in the sauce pan and leave the butter on low fire until the milk solids begin to brown. Take from the heat and leave to cool but not set.
2. While the butter cools down, measure all dry ingredients and mix them together in the mixing bowl.
3. Split your eggs and weigh out your egg whites. Mix them into the dry mixture.
4. When the butter has cooled down, pour into the mixed ingredients. Stir to fold in the butter, but don't whip in the air.
5. Transfer the mixture into a piping bag. This makes it easier to fill the moulds.
6. Grease your moulds with soft butter. Pipe the financier batter into the moulds. They should be filled for ¾ as they will rise in the oven.
7. Bake the financiers in the oven (170°C) for about 10-12 minutes until they are golden brown. Baking time varies depending on how big your moulds are.

FINDINGS > SEE NEXT PAGE

FINDINGS

I made these financiers with:

- Coarsely ground **naked oats**
- These were so soft that even in a normal mill they turned into soft flakes
- Coarsely ground **emmer wheat**
- The emmer was quite hard. I decided to mill on a stand where I had coarse flour with some bigger “sharp” pieces.
- Coarsely ground **red wheat**
- Milled almost the same as emmer. Was a little less hard.

All variations absorb the same amount of moisture. The batters had more or less the same consistency.

BATTERS

There were clear differences in the colours of the different batters ee picture). The batter made with oats had a cooler shade and was almost a bit grey. The emmer had a warmer yellow/light orange colour and the red wheat was clearly red/ purple like.

BAKING/OVENSPRING

The financiers made with oats had the most ovenspring and the most volume. The emmer financiers were runner up when it comes to volume, and the red wheat financiers had the least oven spring and almost no sprung bump in the middle.

STRUCTURE

The financiers made with oats had the most tender bite. They were the closest to traditional financiers when it comes to texture. The emmer financiers were also nice but a bit tougher.
The red wheat financiers were too tough in my opinion. The emmer financiers and the red wheat financiers both had a bit more bite. The harder coarser bits from grinding created some more structure. It makes sense that naked oats had the best results since they, just like almond flour, don’t contain gluten and have a higher fat content. The red wheat has the highest gluten level of all the flours and it’s logical that this makes the financiers unable to rise a lot and more dense.

FLAVOUR

We liked the rich flavour of the naked oats best although I would like to test this recipe again and lightly toast the oats before I grind them to enhance its own unique flavour.
The emmer was nice as well and it’s caramel-like flavour suited the recipe very well. We agreed on the fact that the red wheat is more suitable for bread baking or another process that requires fermentation. In our experience this helps to convey it’s flavours better.

Classic puff pastry

A RECIPE BY ELIN DE JONG | ULMUS BAKKERIJ

WHICH GRAIN(S)? - EINKORN, EMMER, RED WHEAT

I made classic puff pastry from finely milled and sifted flour for a lemaire flour (white flour with some fine bran particles). We don't recommend using red wheat for making puff pastry.

This recipe makes 800 grams of puffed pastry (enough for 2 pies/quiches)

INGREDIENTS:

DAY 1

- 70g cold butter in small cubes
- 150g cold water
- 10g white wine vinegar
- 340g flour (emmer/einkorn)
- 10g of fine salt

DAY 2

- 250g butter

YOU'LL ALSO NEED:

- mixing bowl
- scale
- rolling pin
- extra flour to dust the surface
- clingfilm or airtight tupperware
- measuring tape

DIRECTIONS

Day 1:
mix flour and salt. Add the cold butter cubes and work this until they are pea sized and mostly incorporated into the flour. Make sure the butter doesn't melt. When you feel the butter becoming soft and smearing instead of breaking, put your bowl back into the fridge for ten minutes. Mix water and vinegar together and gently add into your dough with one hand while gently mixing it in with your fingers. Mix all ingredients until well

mixed. Don't knead longer than necessary. You don't want the gluten to develop. Shape the dough into a flat square. Wrap in cling film or put in a tupperware box. Store cold until the next day.

Day 2:
Take the dough from the fridge and put it on a lightly floured surface (on a very warm day, take your dough out only 5 minutes before wrapping in the butter).
Beat your butter between two pieces of parchment paper with a rolling pin and shape into a square half the size of your dough.

Make sure you work fast and the butter is cold but pliable. You can check to see if your butter is pliable by denting it with your finger. If the mark is clean it is ready, if it breaks along the edges work it a little longer to make it more flexible.

Put the butter slab on the centre of the dough and fold all 4 corners of the dough inward. If necessary, adjust the shape of your dough square so that the edges will meet. Make an envelope-like-shape by wrapping the butter in the dough.

First fold
Gently and with even pressure roll this square

dough package into a rectangle. Lightly mark into thirds. Dust off any excess flour. Fold the bottom third up to cover the middle third and the top third down. Seal the dough gently by pressing down on the edges with your rolling pin. Give the dough a quarter turn.

Second fold
Dust your working surface if necessary, roll the dough out to a long rectangle (roughly 18 x 38cm), keeping the edges square and the sides straight. Mark the dough into thirds again, fold the bottom third up and the top third down. Seal the edges and give the dough a quarter turn. Repeat one more time, cover and chill for 20 mins.

Third fold
Take the dough out of the fridge and let it rest for 5 minutes. Repeat the process of the second fold.

Fourth fold
Repeat the folding one more time. When you're done folding, you cool your dough until it's firm.

Cut
Roll the cooled dough out until 4mm thick. Cut into the desired shape or line your pie-tin if you're baking a pie or quiche. You can now chill your dough for about half an hour in the fridge before you bake or keep it in the freezer for up to three months. Egg wash before you bake for a nice even browning.

Bake
in a preheated oven at 180°C. The baking time depends on the shape and size of your bake. Watch for an even browning of the crust and for the flakes to become apparent.

FINDINGS:

Einkorn and emmer wheat stay nice and flaky as a dough since there is not a lot of gluten to develop in this recipe, but it prefers a pie tin to hold its shape. Red wheat is a bit tougher and therefore lends itself to this dough better for a puff pastry you can shape, such as for a galette or hand pie. Also fun to combine the grains with dried or finely chopped herbs mixed in with the flour.

Dutch ‘boterkoek’

A RECIPE BY ELIN DE JONG | ULMUS BAKKERIJ

WHICH GRAIN(S)? - EINKORN, EMMER, NAKED OATS

“Boterkoek” is a traditional Dutch baked good with very basic ingredients. The big amount of butter gives the boterkoek a fudgelike consistency. As the name suggests.... Boterkoek is all about the butter. Until now. Now we’re particularly interested in the grains!

This recipe makes one Boterkoek with a 24cm diameter.

INGREDIENTS:

- 300g butter
- 200g of fine white sugar
- Pinch of salt
- 300g freshly ground and sifted flour: einkorn/ naked oats/emmer
- 1 beaten egg, for egg wash

YOU’LL ALSO NEED:

- mixing bowl
- round baking tin with a 24cm diameter
- kitchen brush
- fork

DIRECTIONS

1. Preheat the oven to 180°C.
2. Mix the dry ingredients.
3. Cut the cold butter into cubes and quickly knead all ingredients into a sticky dough. Don’t over-knead. When you feel the butter melting, put the bowl back into the fridge for 10 minutes. You don’t want gluten development, because we’re going for a nice soft inside with a crunchy and crumbly crust.
4. Put the dough into the greased baking tin and push it down into an even layer.
5. Pop into the fridge and chill for 30 minutes.
6. Egg wash the top with the beaten egg and use the fork to create a pattern on the top of the dough.
7. Bake for 17-20 minutes (in a preheated oven, 180°C) until golden brown.
8. Let cool for at least an hour then chill for an hour. The big amount of butter needs to set again.

FINDINGS:

Dough making:
The colors, scents and flavour of the different doughs, raw and baked came out beautifully with this recipe. Einkorn and oats felt more fatty to the touch and wanted to be chilled back more often while mixing in the butter.

Baking:
The einkorn and emmer Boterkoek baked just like a normal boterkoek. The butter ran out a little bit. The naked oats were not able to hold all the butter. Halfway through the baking process the top broke and the soft dough erupted out. The dough didn’t bake into a firm cookie but stayed soft and looser.

Flavour and texture:
When it comes to flavour, einkorn was the big winner. The warm and nutty flavour of the einkorn combines very well with the butter. The dough was pretty soft and wasn’t able to hold all the butter. You can take back 50g of butter to avoid a greasy bottom.

The emmer boterkoek was similar to the consistency of the einkorn one. Its colour was more brown with a reddish tone. The flavour was sharper and sweeter with more hints of caramel. A very nice cookie, but couldn’t beat the warm deep nutty flavours of the einkorn cookie.

The naked oats cookie was a bit gritty and not cooked thoroughly. We didn’t do a proper taste test. Chilled and rested overnight in the fridge, the structure and flavour of the naked oats was wonderful. Not soft like the structure of a boterkoek, but very promising as a base for a flapjack style bar or oat cookie.
The consistency made me wonder if naked oats could be a nice substitute for peanuts in “kletskoppen”, another traditional Dutch cookie.

To enhance the flavour of the grains and to cut through some of the fattiness of the butter, it would be interesting to combine with zest from citrus fruit or dried edible flowers.

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"The Low Food Movement has set the goal to change Dutch gastronomy. The Low Food Movement was founded by Joris Lohman, Joris Bijdendijk and Samuel Levie in 2018. The movement since then has grown and the goal is to change Dutch Gastronomy and to make Dutch food culture leading when it comes to forward thinking on subjects such as sustainability and inclusion. In a world where food security and the sustainability of the food and agricultural system are two of the world's biggest issues, we believe that the food movement has an important role in changing food culture. Low Food will therefore act as a networking agent and platform where new ideas are created and implemented."

See **lowfood.nl** for more information.

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