



Introduction by project coordinator **Johan Robbens**



Dear algae enthusiast,

as the project coordinator of ValgOrize, I received the honour and pleasure of opening this very first newsletter by introducing you to this fantastic project and to ILVO's role in it (find a more detailed introduction in [this presentation](#)). The ValgOrize project is taking on the challenge of feeding the ever-growing world population by bringing macro and micro algae into the equation, which could present a sustainable, nutritional and financially interesting solution. The project brings together twelve partners from The Netherlands, France, Great Britain and Belgium who intend to answer the question of how to cultivate algae that can be used in food for the European market. In each new newsletter, 2 or 3 partners will be presenting themselves. **ILVO, Zeewaar** and **NIOZ** are starting us off.



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Partner presentations

- **ILVO (by Johan Robbens)**



ILVO is the Flanders Research Institute for Agriculture, Fisheries and Food. They perform multidisciplinary, innovative, independent research from farm to fork, aimed at developing safe, healthy and sustainable food for the world's population. Within the ValgOrize project, ILVO not only takes on a coordinating and [communicating](#) role; they are also (together with Zeewaar) in charge of Work Package 3 (WP3); Acceptance of seaweeds and micro algae.

In order to promote this underused resource for food consumption, one of the essential steps to be taken is deciding the flavour profile of the most popular kinds of seaweeds and micro algae. That is why ILVO is training an expert tasting panel, who will then be able to analyse, characterize and assess the flavour of these algae.

Another aspect of WP3 is assessing algal safety. "One of our experts in food safety will analyse this aspect, testing the chemical and microbial criteria to make sure seaweed and micro algae are safe to consume. He will be doing this as part of the work package task, but furthermore, before we let our expert panel taste the algae we obviously need to be sure it is safe to do so."

Besides making sure algae are safe and tasty to eat, ILVO wants to make sure they actually are a sustainable solution for the future challenge of feeding earth's population. That is why they are also doing a sustainability analysis of the existing algae products in the market. Finally, ILVO will also be taking on the challenge of analyzing the residual streams of the algae that cannot be used for food, and to see if they can still be valorized by using them in (chicken) feed, and what effects they might have on the final meat or egg product.

- **Zeewaar (by Rebecca Wiering)**



One of the unique things about the ValgOrize project is the involvement of not only scientific institutes, but also business partners. Zeewaar represents this part of the project and brings its practical and field knowledge to the table (take a look at their [presentation about how to build a business on seaweed](#)).

In 2013 Zeewaar launched the first seaweed farm in the Netherlands, but because of the small scale of the local seaweed industry up until now, they needed to play a part in many other parts of the business chain as well, mainly primary and secondary processing and research. "We got to know the consumer and their wants and needs and began our mission of sustainably producing qualitative seaweed for food and ensuring there is a market for it."

Within the ValgOrize project Zeewaar is working on Work Package 3 (together with ILVO); Acceptance of seaweeds and micro algae. Their practical experience in marketing, customer analysis and market research and their input from a business perspective definitely brings added value to this challenge. Specifically in this work package, first of all they will be focusing on stakeholder involvement. “Our main goal is to get food producers involved in this project at an early stage since they are the ones we are targeting to eventually get to business with seaweed food production.”

Furthermore, Zeewaar is in charge of determining a set of seaweed products for testing that are in line with B2B market demand. Until now it was hard to analyse this demand as there was a lack of professional and qualified/quantified taste coding and mapping. Zeewaar is also partner for many of the other WP3 deliverables and outputs such as the training of a pilot taste panel.

- **NIOZ (by Klaas Timmermans)**



NIOZ (the Royal Netherlands Institute for Sea Research) works on multidisciplinary fundamental and frontier marine research, addressing important scientific and societal questions that deal with the functioning of oceans and seas. They focus on two research themes; “the changing ocean system, past, present, future” & “adaptability of marine ecosystems in a changing world”.

For ValgOrize; NIOZ is in charge of Work Package 1 (WP1), which focuses on all the work with macro algae (seaweed). “In this work package, we are looking at seaweed cultivation step by step. We start by looking into what the best conditions in which to grow macro algae are in order to reach the best food parameters. The next step is upscaling; how do we reproduce these optimal growing conditions on a larger scale while still retaining the same reliability? Finally comes processing; the produced seaweed needs to be handled and processed, so we will be trying to find a protocol for general processed macroalgal food.”

Aside from their leading role in WP1, NIOZ is playing a part in Work Package 2 (WP2), which is focused on micro algae. For the micro algae research, they are helping with the characterization of the biological material of micro algae, with the assessment of taste features of the produced algae, and with looking into the sustainability and zero-waste production of these algae.

“We are looking forward to a promising process to optimize the entire seaweed and microalgae food chain!” If you want to know more, you could start by taking a look at our [presentation on seaweed’s potential for food and feed](#).

Seaweed passport

As a part of every new newsletter, there will be a presentation of one of the algae kinds that are being studied in the ValgOrize Project. First off; sea lettuce!

Sea Lettuce

Ulva Lactuca



Colour: acidic green to deep green

Textures:

- Raw: thin, sometimes transparent
- Baked: melts

Flavours:

When cooked; powerful & balanced

Nutritional benefits:

Rich in vitamin C (8 times more than oranges), vitamin A, calcium, chlorophyll, iron (twice as much as wheat germ), magnesium (10 times more than wheat germ). It is also high in protein and low in fat and iodine.

Update research results

Exciting ValgOrize news: first study results are in!

As a part of and to lay the foundations of Work Package 4 (Valorisation of algae), Noordzeeboerderij has executed a market study that outlines the current European seaweed food market. Their results will help all the project partners in their further research, and move us closer toward achieving the common goal of the ValgOrize project; promoting algae as a tasty nutritional source of food for the consumer and convincing producers to consider them for use in their food products.

In their study, Noordzeeboerderij analysed both the status and supply chain of the current seaweed market, and the general global food trends and how seaweed could fit into them. You can find [the entire report on Noordzeeboerderij's website](#), but read on for a short summary of their most interesting findings.

Noordzeeboerderij found that Europe's seaweed harvest is quite atypical in the sense that 99% of seaweed in Europe comes from wild harvest, where globally 96% of seaweed originates from cultivated sources. Wild harvest can be a damaging practice to the environment, while the effect from seaweed cultivation on most ecosystem services is either nonexistent or even positive.

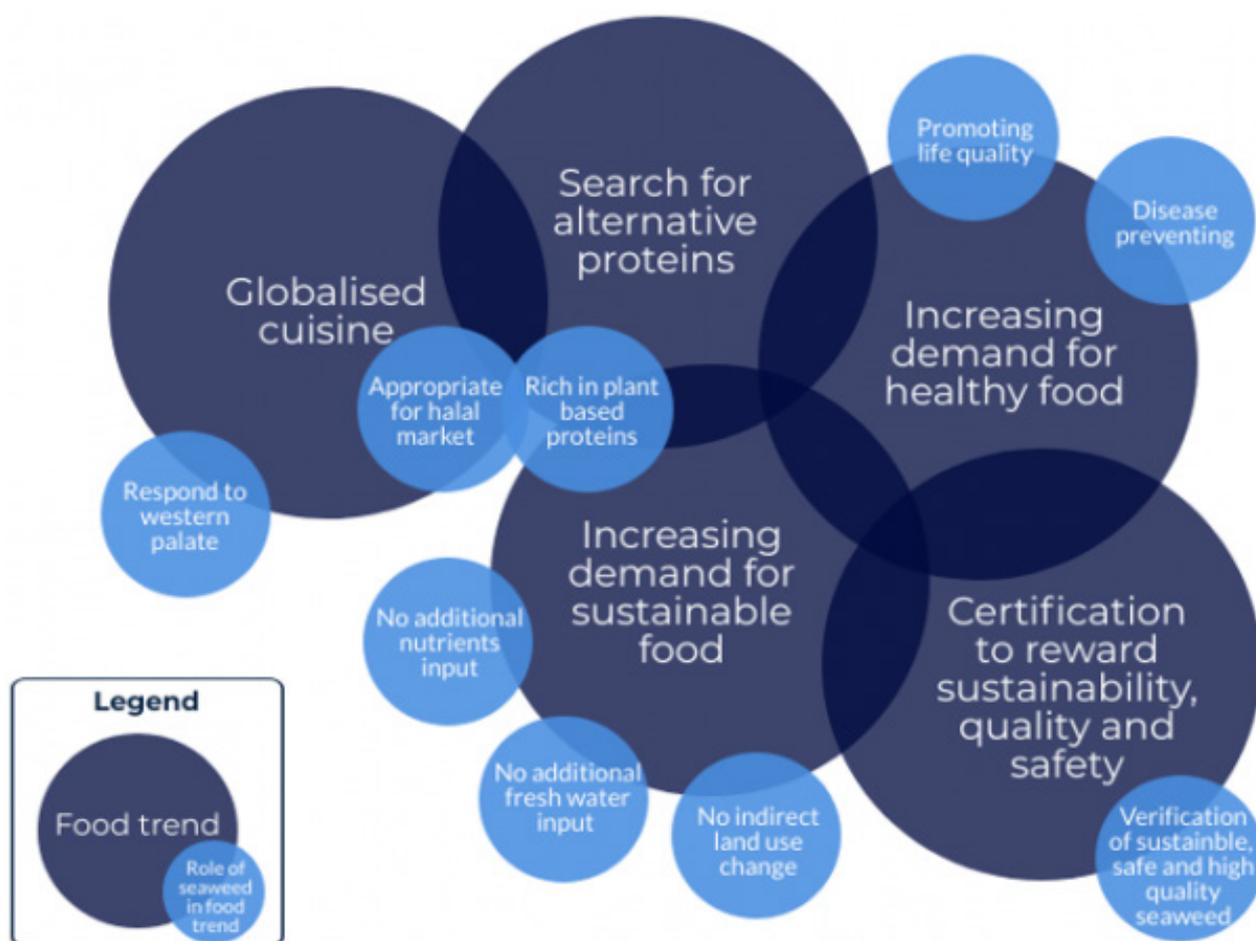
Globally seaweed is used mostly for food, but also for feed, textile, cosmetics, biopolymers, biofuel and fertilizer/biostimulants. Global seaweed cultivation has doubled over the past 5 years. There are more than 10,000 different species of seaweeds, of which 221 are commercially relevant, and 145 are in use in the food market. Right now, Europe's import of seaweed is 3 times higher than its export. Because of this big gap and the shortage of European supply, seaweed cultivation in Europe is expected to grow 7 to 10% annually.

Some species can be eaten raw, but most taste better when processed in some way, be it drying, cooking or toasting. Even though taste is an important factor in popularizing seaweed as food, few scientists have researched sensory profile of individual seaweed species.

A very interesting part of Noordzeeboerderij's study focuses on current global food trends and how seaweed fits into them. The picture below gives a nice visual overview, which is further explained in this summary:

- Trend: **Globalised cuisine**
Place of seaweed within trend: More consumers are encountering seaweed in their daily lives. The next step, since Europeans are still picky eaters, is making sure seaweed can fit into the Western palate.
- Trend: **Increasing demand for healthy food**
Place of seaweed within trend: Seaweeds are rich in polysaccharides, minerals, vitamins and bioactive substances such as proteins and lipids which gives seaweed great potential as a supplement in functional food or for compound extraction.

- **Trend: Search for alternative proteins**
Place of seaweed within trend: The global search for alternatives for animal protein sources is driven by both cultural (halal) and environmental drivers (stimulated by governments). Consumer interest is also growing, which food producers are responding to. Seaweed is being recognized as a very promising plant-based protein alternative.
- **Trend: Increasing demand for sustainable food**
Place of seaweed within trend: (Cultivated) seaweed is recognized for its sustainability by international governments and the European Commission, offering many environmental benefits in comparison to land-based agricultural systems. Among these benefits are the lack of need for additional nutrients input, fresh water or extra land use.
- **Trend: Certification to reward sustainability, quality and safety**
Place of seaweed within trend: In the (seaweed) food industry new certificates and standards are being created and adopted. Place of seaweed within trend: If we want seaweed to obtain the right certifications we need to guarantee that it is of high quality. By developing suitable cultivation techniques within the 2 seas region, a stable quantity and quality of supply can be ensured, focusing more on quality than volume.



It is safe to say that seaweed can offer answers to some of the biggest growing global food trends. In the further process of the ValgOrize project we will show this to food producers and consumers, to help ensure a market for qualitative European seaweed cultivation.

You can read [the entire report](#) or [a short article about the European seaweed food market](#).

In the Picture



R&D room at Nausicaà

The research group of Pr. Sami Souissi (University of Lille) and the Nausicaà aquarium located in Boulogne-sur-Mer has developed an expertise in growing micro-algae at different scales. Since its expansion in 2018, Nausicaà has become Europe's largest sea center. In the new 'Research & Development room' a research team including the University of Lille and their partners studies the optimisation of algae production. *Rhodomonas baltica*, *Tisochrysis lutea* and *Pavlova lutherii* were all selected for the ValgOrize project.

Past events

19/2/2019: Kick off stakeholder meeting in Ostend, Belgium.

The ValgOrize project was launched in the presence of more than 20 Flemish stakeholders, including representatives from the Blauwe Cluster. All participants were eager to learn about the potential of seaweed and micro-algae for food and feed, and vividly discussed some of the facts that were presented in [the partners' presentations](#). Did you know, for instance, that worldwide around 90% of seaweed and algae is used for food purposes, whereas in Europe that is only 9%? More interesting facts and figures can be found in the [kick-off press release](#).

07/08/2019: ILVO visit to Zeewaar and Nioz

On Wednesday 7 August, a delegation from ILVO visited NIOZ (Royal Netherlands Institute for Marine Research) and Zeewaar (two Dutch partners from ValgOrize). Read more on both visits on the next page.



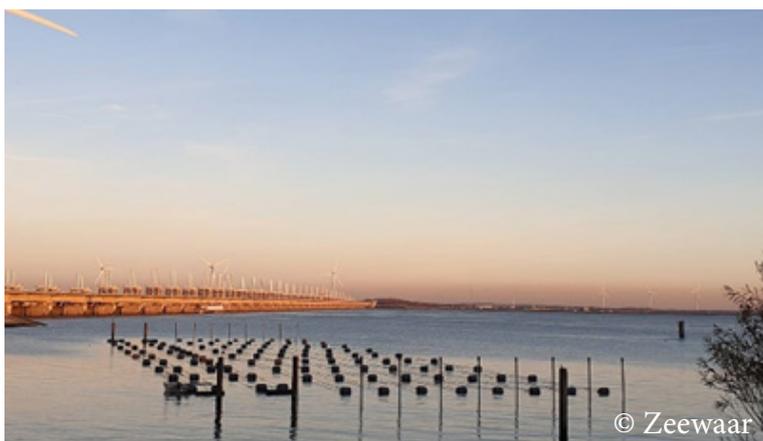
1.Cultivation barrels (NIOZ)

2.Aquariums with bio-reactors (NIOZ)

Visit NIOZ:

1. These cultivation barrels contain 1,500 litres of filtered Oosterschelde water kept at the right temperature and can be covered to filter strong sunlight. By regulating the level of light in these tanks, growth differences between different species of algae can be mapped out. A continuous stream of water, keeps the seaweed moving. By regulating the levels of light, nutrients and water movement in these tanks, the composition of these algae can be changed which may impact their taste.

2. Nutritionally enriched seawater is pumped into these algae bioreactors, while an LED panel provides light to promote growth. Different conditions, i.e. nutrients, light and growth rate, influence the biochemical composition, quality and possibly even the taste of the algae. Taste may be dependent on the levels of pigments, proteins, fats or sugars.



Visit Zeewaar:

Zeewaar's seaweed farm is located in the Jacoba Bay of the Eastern Scheldt., right behind the famous Delta Works that prevent the North Sea from flooding the low-lying Netherlands. The farm's location is ideal for seaweed cultivation, as the area is protected against storms as well as boat traffic and tourism. The seaweed installation is designed to withstand even exceptionally severe storms, with 7-meter-long steel poles sunk into the

seabed. Between these poles, thick ropes are held afloat by buoys, thus forming the “roof” of the seaweed farm. Ropes tied to this surface-level roof form the underwater structure on which the seaweed grows.

29/08/2019: Second stakeholder meeting in Boulogne-sur-Mer, France.

Ten French stakeholders, among which observer partner Aquimer, were introduced to the project and the work package leaders. Together, they visited the aquarium and new research facility at Nausicaá. Pictures of that visit are available at www.valgorize.eu.

Thank you for reading this first newsletter! The next one will arrive in your mailbox soon.

