



*Godesses
of the sea*



Thank you to all the partners



Scientific content : Nausicaá Centre National de la Mer.

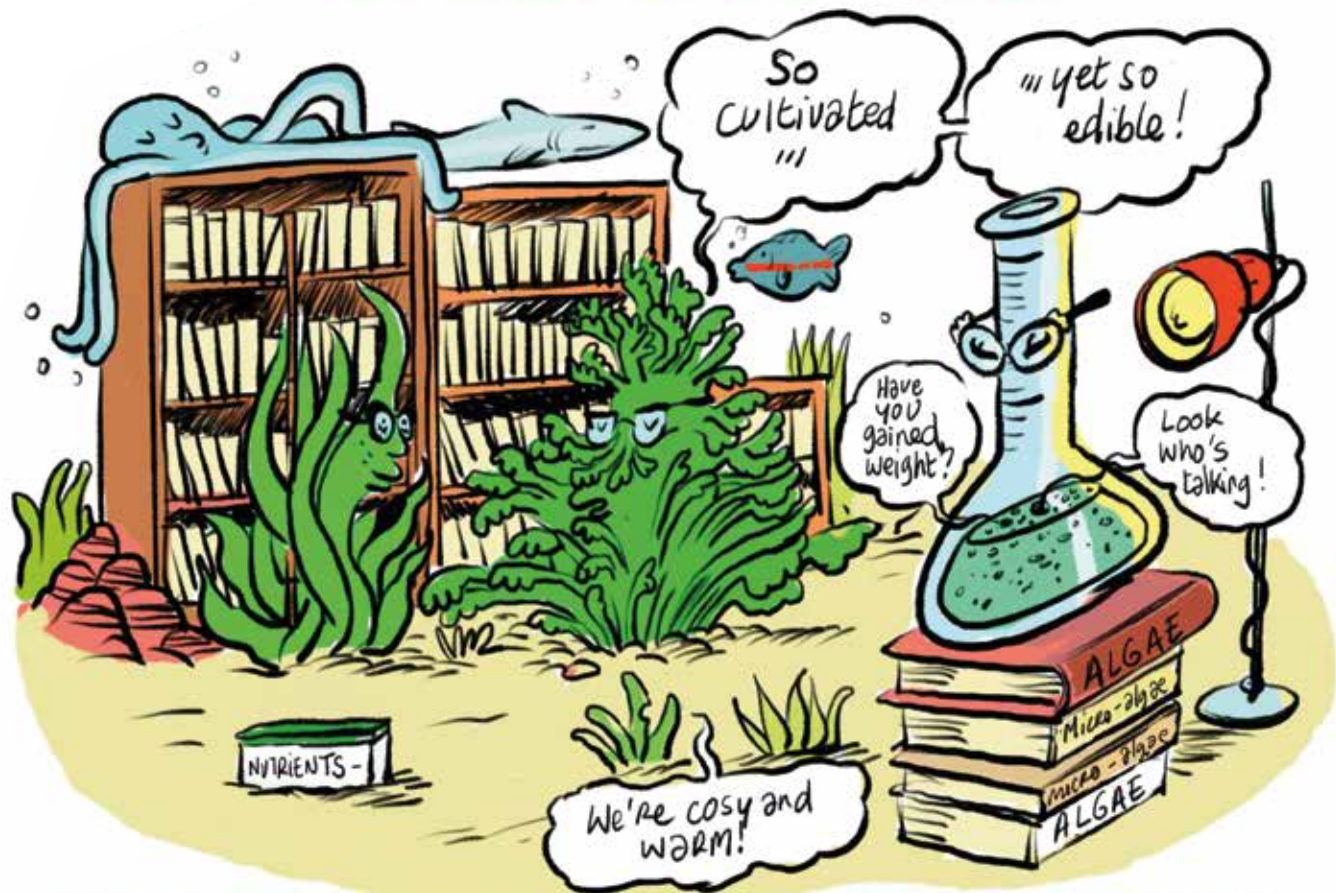
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*A few edible
macro-algae*



CULTIVATION IS SOPHISTICATION!



Believe it or not, most of the algae we eat are cultivated in nurseries and not in the wild

Microalgae cultivation

Also known as seaweed, macroalgae can be foraged in the wild, but 90% of the macroalgae we eat are in fact cultivated. Here's how:

1. The young shoots grown in nurseries are attached to a stake - not as a form of torture, but to help them grow upwards. They are given nutrients to help them grow.

2. The seedlings are then submerged in the calm coastal waters (gloob! gloob! gloob!) of the sea where they grow from 20cm to 4 metres in just a few months!

3. 8 months later they are harvested.



Microalgae cultivation

Measuring only a few thousandths of a millimetre (!), microalgae are cultivated differently:

1. For starters, they are kept safe and in sight in a **photobioreactor** in the form of a cylinder, tube or glass sheet.
2. The photobioreactor is filled with water to the algae's liking in terms of temperature, pH, oxygen, light and nutrients (which goes to show that you can be unicellular AND fussy!).

MONDAY



SUNDAY

3. The algae develop at an astounding rate, doubling their mass every day! By daylight they capture light and fix CO₂ which is what makes them grow. At night, they halve into 2 daughter cells. No other plant on earth grows as fast!

In under a week, they're good to go.

DON'T RIP WHAT YOU SOW!



Capriana Dwyer + Tereasa + Bianca Jacobson

To keep algae harvesting sustainable there are strict rules on size, quotas, and picking seasons.

Wakame Wakayou?

Wild macroalgae is harvested using a seaweed trawler or “scoubidou”. Mechanical arms are plunged into the sea - preferably during high tide - and pull the algae to the surface in a spinning motion.

Cultivated macroalgae are harvested using a knife or scissors, leaving the root intact so that the algae can grow back. Local authorities also help protect these precious resources by requiring trawlers to be licensed and imposing a minimum size for algae.



Nature's rhythm must also be respected: royal kombu seaweed and wakame can be picked at the end of winter, while in spring it's over to dulse, sea spaghetti, nori and sea lettuce. Harvesting ends in summer or autumn, depending on the variety.

Last but not least: microalgae. These little guys are plucked one by one using iddy biddy tweezers... Just kidding! They're collected using a centrifuge!

RUB-A-DUB, SEAWEED IN THE TUB

GULP Are you sure this stuff is edible?

Not until we've dried out!

I'm having second thoughts...



Time for my scrub!

Nothing like a day at the spa!

The salinity is perfect!

I'm getting on nutrient wrap

Look at miss Fancy Plants!

Show off!

We didn't make the cut

It's makeover time, Ladies!!!

Have no fear, algae need a little brush-up before it can be eaten! They are washed in seawater, soaked in salt or vinegar to make a marinade, or dried and ground into powder or flakes to pimp your plates!

A sea(weed) of possibility

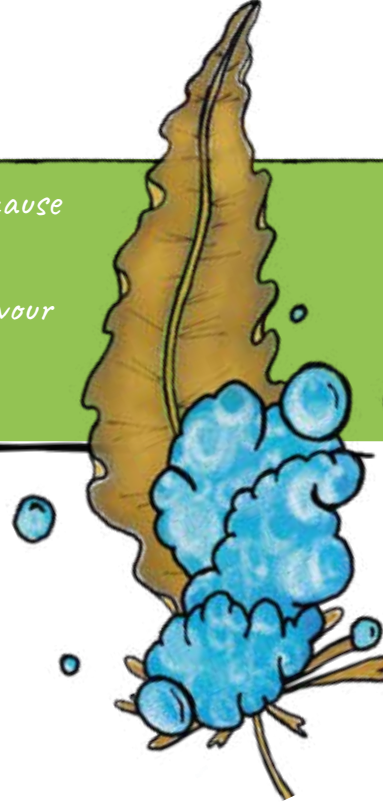
Eating seaweed directly from the collection tank is hardly appetising. That's because macroalgae first needs to be transformed.

First, it is washed – preferably with seawater to preserve its colour, texture, flavour and nutritional value. Like a day at the spa!

For marinades, the seaweed is soaked in salt or vinegar.

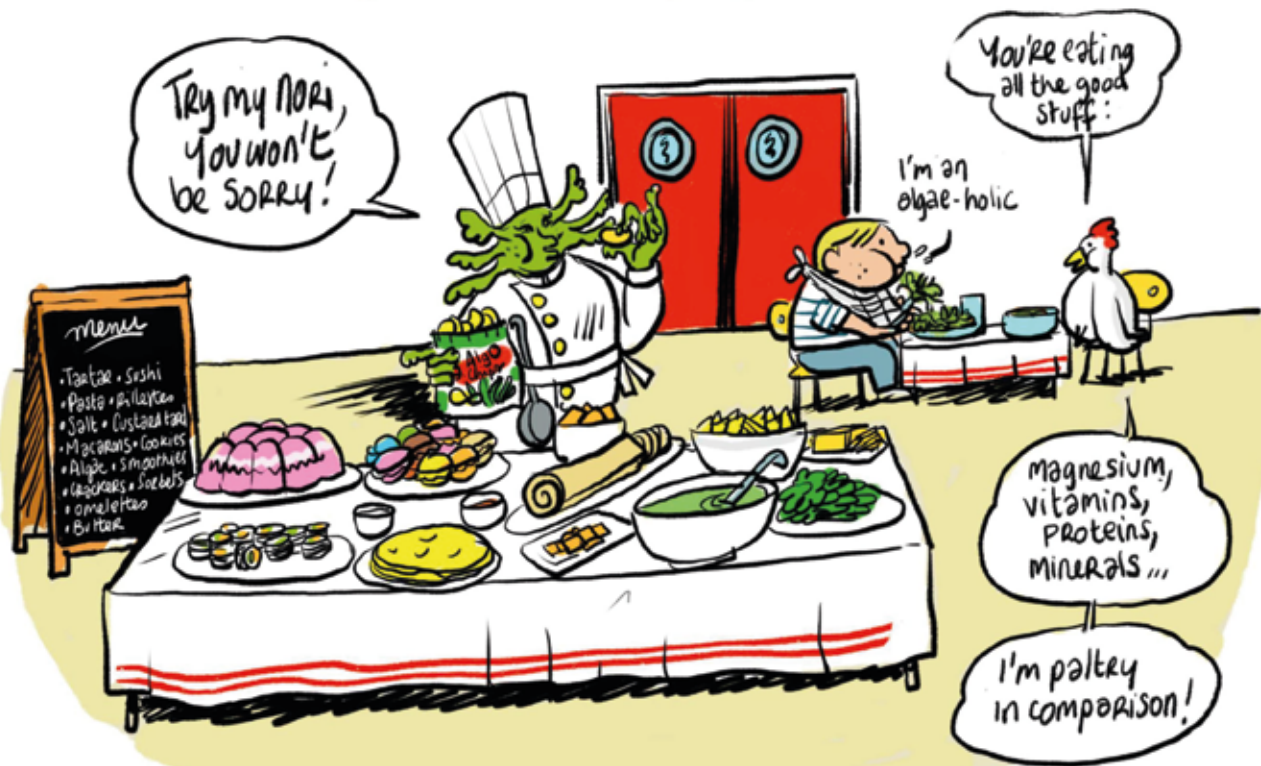
It can also be preserved by covering it in salt or drying it on racks– as our ancestors did in crates.

Two to three days later, the dried algae are ground, pressed or filtered into powder or flakes. Add a few shallots, garlic, lemon juice and other ingredients and you've got yourself a mouth-watering spread!



Thanks to these preservation techniques we can eat algae all year round!

LOVE AT FIRST BITE



Time to tuckin! There are (almost) as many ways to eat algae as there are varieties. And the usual animal fare all agree that eating algae is extremely good for your health!



Yummy!

If you've ever said
« Ew!! I'll NEVER eat algae! »:
you probably already have, and
more often than you realise!

Agar, for instance, which comes from
red algae, is used as a gelling agent
in sweets as it has neither taste nor
smell. It is also used as a stabiliser and
thickener for cakes, icecreams and
ready meals (it's healthier AND has
fewer calories than pork gelatine!).



For those wondering if algae are
prickly, bites, is smelly, needs to
be peeled, melted or beaten into
stiff peaks, or needs sugar to
offset the iodine, you're in for
a treat.

Algae can be rolled, toasted,
ground, sprinkled, dried, chopped
and infused into countless dishes.
With 25,000 species of algae, the
culinary possibilities are endless!

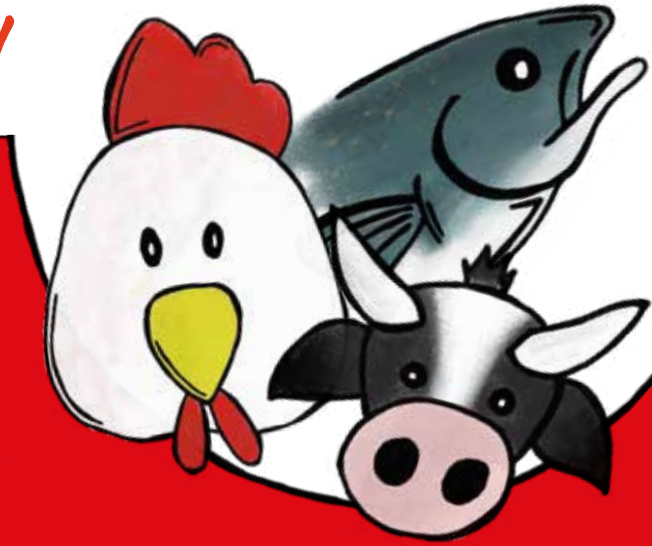
Our ValgOrize chefs will give you a
taste!

Yummy!!

You'd rather test them on animal first, just to be safe?

Go for it!

Feeding your chickens, cows or fish royal kombu and microalgae will boost their immune systems and stimulate their growth.



The same applies to us: these sea vegetables are high in fibre (and we're not talking bandwidth), minerals, vitamins and antioxidants (all the small things that keep us looking younger for longer).



Ready for take-off?

Because algae are also a staple for NASA astronauts!

DECONTAMINATION: TABLE FOR TWO, PLEASE!



+ Bianca Jacobson

Caprice Bupmy + team

What liquid is under pressure, but isn't beer? Clean water! It's in high demand all around the world, so it deserves the BEST treatment.

Cleaning up OUR act



Fresh water: every drop counts!

Fresh water only makes up 1% of the planet's water in liquid form, yet over 7 billion humans need it to drink, irrigate their crops, raise livestock, run their factories, operate their power stations, and more. Other living organisms need it, too!

That's why it is so important not to waste water and to clean up the mess we make: used water discharged directly into natural waterways (which is what happens 80% of the time around the world) is an open invitation to disease.

WHAT'S
BACTERIA'S
FAVOURITE
DRINK?



OXY-GIN!

No power wasted on wastewater treatment

Water treatment plants eliminate contaminants and organic matter from wastewater. How? With none other than Mr Clean's arch-enemies: bacteria!

They work by decomposing organic matter – an impressive feat achieved with the help of water that is rich in oxygen.

To do this we can use big, power-hungry machines, OR we can opt for a solution as clean and green as microalgae.

Cleaning up OUR act

Mini algae, maxi impact

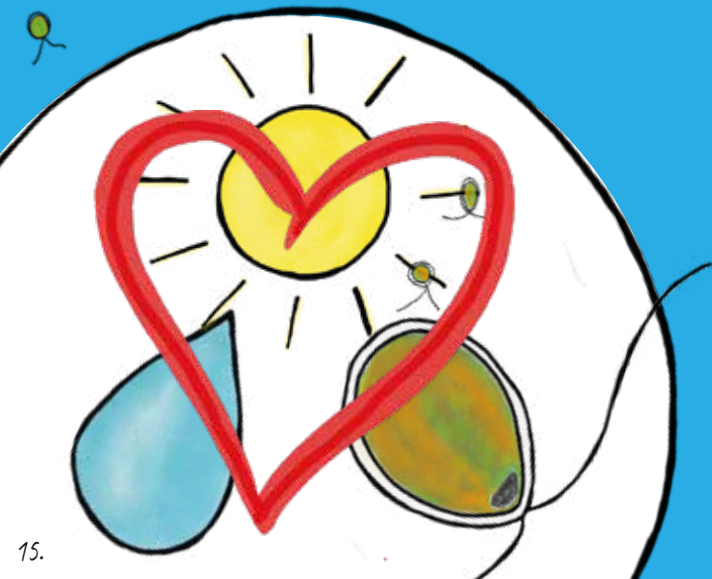
Algae LOVE contaminated water because it's full of nutrients! They gobble them up like soup, topped with a few CO₂ croutons, making them grow and release... oxygen! This is good news for bacteria, which return the favour by releasing CO₂ to keep the cycle going.



Fresh water for all!

Another advantage is that most of the algae needed for biotechnology are found almost everywhere - including countries that lack the infrastructure for treating wastewater.

Warmer and sunnier climates also favour photosynthesis. It's all good!





*Algae passports
and recipes*

SEA LETTUCE

Ulva lactuca



Blade

Colour: lime green to dark green

Habitat: Atlantic coast, North Sea, English Channel and Mediterranean

Textures:

- Raw: thin, sometimes transparent
- Cooked: melt-in-the-mouth, crispy

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.

How to eat it:

In salads with fresh vegetables, fried, sliced into a sauce, soup, pie, etc.



INGREDIENTS :

- 25 cl of water
- 80 g dehydrated sea lettuce (*Ulva lactuca*)
- Toppings: mint leaves, lemon slice
- 125 g sugar
- 15 cl lemon juice
- Lemon peel

Lemon sorbet

Ulva lactuca

Prep time : 50 minutes

Total time: 50 minutes

Serving : 3-4 sorbets

This is a recipe shared by chef Regis-Hubert Clech, partner of the Mr.Goodfish programme, Nausicaá

DIRECTIONS :

1. Bring the water, sugar and lemon zest to a boil. Allow to cool.
2. Once cold, add the lemon juice and dehydrated seaweed.
3. Pour into an ice cream maker and allow to set for 20 to 30 minutes.
4. Pour the mixture into glasses, decorate with some lemon slices and mint sprigs and serve immediatly.
5. Or freeze the mixture for another day.

Bon appétit!



WINGED KELP

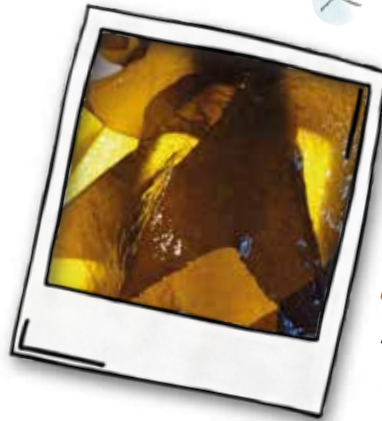
Alaria esculenta



Not to be confused with Wakame
(*Undaria pinnatifida*)

Color: Golden to yellow brown

Habitat: In deep, rough and cold waters of lower shore, on rocks exposed to sea wellwaves



Textures :

- Raw: gelatinous, fine on the edges, crunchy on the inside
- Cooked: melting

Flavours:

- Raw: iodine
- Cooked: soft, slightly sweet

Nutritional benefits:

Rich in omegas, minerals and vitamins (B9, B12, K). Full of beta-carotenes, it's the perfect anti-oxidant.

How to eat it in:

Used in flakes (due to its size between 50 cm and 2 m), in seasoning or in tartar. Also used as a substitute for vegetables.

INGREDIENTS:

- 3 blades of Wakame
- 1 pinch of salt
- 3 tablespoons rice vinegar
- 1 tablespoon sesame & lemon oil
- 3 tablespoons soy sauce
- 1 tablespoon toasted sesame seeds

Wakame salad

Alaria esculenta

Prep time : 10 minutes

Baking time : 5 minutes

Total time : 15 minutes

Serving: 4

This is a recipe shared by Jennifer Breaton and Rebecca Wiering, founders of Zeewaar.



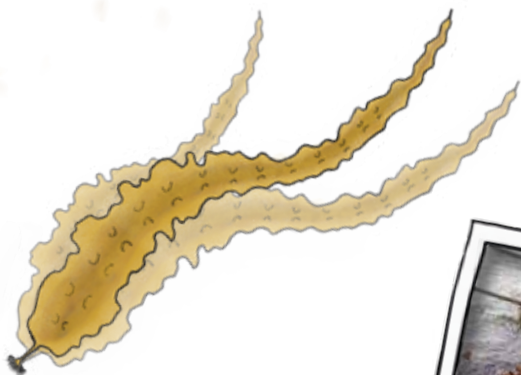
DIRECTIONS:

1. Rinse off the Wakame with cold water.
2. Steam over boiling salt water for 5 minutes, until it is bright green.
3. Slice it thinly.
4. Make a dressing with oil (sesame oil or lemon olive oil, or other), rice vinegar and if you like, soy sauce.
5. Pour the dressing over the Wakame and mix.
6. Serve with toasted sesame seeds.

Bon appétit!

SUGAR KELP

Saccharina latissima



Also known as: sea belt or devil's apron

Colour: Yellow brown

Habitat: In cold waters of intertidal pools, on rocks.



Textures:

- Raw: crunchy
- Cooked: melting

Flavours:

- Raw: iodine, sweet
- Cooked: sweet, with hazelnut flavours.

Nutritional benefits:

Rich in minerals, calcium (8 times more than milk), iodine, magnesium, phosphorus, potassium and sodium. Rich in vitamins (A, B1, B12, C, E, F, K, PP). It is also the richest in sugars.

How to eat it in:

Used as a flavour enhancer, can be added to a dish as a seasoning.



INGREDIENTS:

- 250 g flour
- 1 pinch of salt, 1 pinch of pepper
- 1 tablespoon baking powder
- 40 ml milk
- 1 egg
- 80 ml olive oil
- 40 g dried seaweed
- 80 ml lukewarm water

DIRECTIONS:

1. Rehydrate the seaweed in a bowl with lukewarm water.
2. Preheat the oven to 140°C.
3. Combine the flour, baking powder, salt and pepper in a bowl.
4. In another bowl, mix olive oil, rehydrated seaweed, the egg and the milk.
5. Stir in the dry mixture, beating constantly until you get a smooth batter.
6. Use an ice cream spoon (or a big spoon) to divide the batter in equal parts.
7. Set your cookie balls on a baking paper leaving enough space to let them spread.
8. Bake in the oven for 20-25 minutes.

Algae cookies

Saccharina latissima

Prep time : 20 minutes

Baking time : 22 minutes

Total time : 42 minutes

For 12 cookies



NOTE:

Serve with with tuna or salmon rillettes.
Their iodized taste also goes well with fish.



Bon appétit!

*Learn more about the benefit of algae
and find more recipes on
Valgorize.eu*