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# ***Seaweed on the table?***

***Research on the potential of seaweed as food among Dutch Consumers***

February 2021



**NORTH SEA FARMERS**

# Preface

**North Sea Farmers work towards positive climate impact with seaweed. We aim to do so by growing a sustainable seaweed sector with improved biodiversity, reduced carbon emissions and circular value chains as a result.**

Since 2014, almost 100 organisations have joined us during our journey. This community and network connects us to all different aspects of the seaweed value chain. It also makes us a driving force of knowledge and expertise: your go-to-spot to make business out of seaweed.

Unfortunately, in Europe and the Netherlands, the availability of quantified and accurate seaweed market data is limited. Monitoring and reporting processes are not (yet) in place in this young sector. Reports from the Food and Agriculture Organization are not always sufficient for detailed market updates and do not cover the entire European Union. Most of the time, other studies build upon these data. This makes it difficult to assess the barriers, drivers and overall progress of the sector. We feel reliable market data is essential for the further development, growth and professionalisation of the seaweed sector in Europe and the Netherlands. This is why we had a consumer research conducted by the independent research company Mountainview Research.

This consumer study illustrates the mind shift of Dutch consumers when it comes to seaweed. North Sea Farmers also see this mind shift within the European Union. As a front runner and sector organisation, North Sea Farmers is therefore taking up the challenge to scale up volumes of local sustainably cultivated seaweed. A consortium made up of North Sea Farmers is currently working on a large scale seaweed farm of 1.6 km<sup>2</sup> to be installed within a wind park in 2023. Resulting in 1.000 tons local cultivated seaweed to be processed for a variety of applications. This could well be the beginning of one of the first circular sectors in Europe.

We believe time is now for the European seaweed sector to shift gear. Who is ready to step into the game?

[www.northseafarmers.org](http://www.northseafarmers.org)

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# ***1. Management summary***

# 1.1 North Sea Seaweed on the table

## Seaweed as an alternative food

North Sea Farmers is committed to stimulate the cultivation of seaweed throughout Europe. Seaweed can be a solution for feeding the growing world population in a sustainable way. The production of seaweed has a positive impact on the planet and seaweed is a healthy addition to our western diet. In Asian countries seaweed is an integrated part of the diet. The question is, if the Dutch consumer is ready to include local cultivated seaweed to their diet.

## Main question

What is the potential of seaweed as food among Dutch consumers and what are ways to reach consumers with seaweed as food?

## Consumer survey

For this research we conducted a survey about knowledge of and experience with seaweed as food among n=1051 Dutch consumers. The sample represents the Dutch population in terms of age, gender, region and educational level.

## Research questions

- What is the public opinion on seaweed as food? What are associations and first reactions?
- What is the current knowledge, use and experience with seaweed as food?
- To what extent would consumers try seaweed as food? In what situations would consumers try seaweed as food?
- What is the potential and attractiveness of several applications? What type of applications are promising?
- What would for consumers be reasons to eat seaweed? What are barriers?
- What is important for consumers when eating seaweed? What are important criteria?
- How do consumers estimate the potential for seaweed as food in their country?

## Reading Guide



This icon indicates the main insight on each page

# 1.2 Summary

**The potential for seaweed on the Dutch plate is large, because consumers are aware of its health and sustainability benefits. However, consumers need inspiration on tasty applications and the availability of seaweed needs to improve.**

## **Dutch consumers are open to eat seaweed mainly because its health benefits:**

- Consumers associate seaweed with food and with health;
- About half of the Dutch consumers have experience with eating seaweed (mostly in sushi or other Asian dishes);
- Consumers see seaweed as a sustainable food solution.

## **Consumers are not sure about the taste of seaweed:**

- Opinions about the taste of seaweed are divided. An equal amount of consumers associates seaweed with tasty, as with unappetizing;
- People who have eaten seaweed are more positive about the flavour, most of them experience seaweed as mostly tasty;
- Consumers who have doubts about the taste would be open to eat seaweed more often if it tastes better.

## **Dutch consumers do not know how to use seaweed themselves and where to find it in the supermarket;**

- Experience with seaweed as food mostly comes from restaurants and take away / delivery food. Not many consumers cook with seaweed themselves;
- Consumers expect to find seaweed in Oriental supermarkets, in common Dutch supermarkets and at fish shops. In common Dutch supermarkets consumers would search for seaweed in the vegetable section, Asian section or fish section;
- Consumers who do like the taste of seaweed would eat it more often when it is more easily available.

# 1.3 Recommendations

**Consumers need to become convinced about the good taste of seaweed. This can be achieved by inspiring them on the possibilities of seaweed, letting them experience tasty seaweed dishes, and by helping them how to use it themselves.**

## **Focus on the health benefits**

Consumers have a strong association with seaweed and health. By promoting seaweed as a healthy ingredient, the sector can benefit from the healthy food trend. Dutch consumers aspire to eat healthier and are looking for healthy alternatives to their diet.

## **Convince consumers about the good taste of seaweed**

Taste is the main barrier for consumers to eat more seaweed. Since seaweed is a fairly new ingredient for Dutch consumers, they need a little help preparing it to their taste. To convince consumers to eat more seaweed, it would help to show consumers how to use seaweed, what to make with it, and explain what seaweed adds as a flavour.

## **Apply seaweed in applications and dishes that have a logical connection with seaweed, like Asian cuisine and fish**

Consumers have strong associations with seaweed as Asian food and as an addition to a fish dish. To inspire more consumers to eat seaweed these are obvious entry points.

## **Inspire consumers via food influencers**

Food influencers can have a huge impact on the popularity of a product. The many food bloggers and cooking shows can be a successful channel to inspire consumers to eat seaweed. But also chefs can be trendsetters in using local seaweed. The local aspect of the seaweed is an extra appealing ingredient to the story.

## **Use restaurants as an entry point where consumers can get familiar with seaweed**

Most consumers eat seaweed in restaurants. Restaurants can play a large role in the first experience with the good taste of seaweed. If restaurants would use seaweed more often and mention this explicitly, this can be the first step for consumers to eating more seaweed.





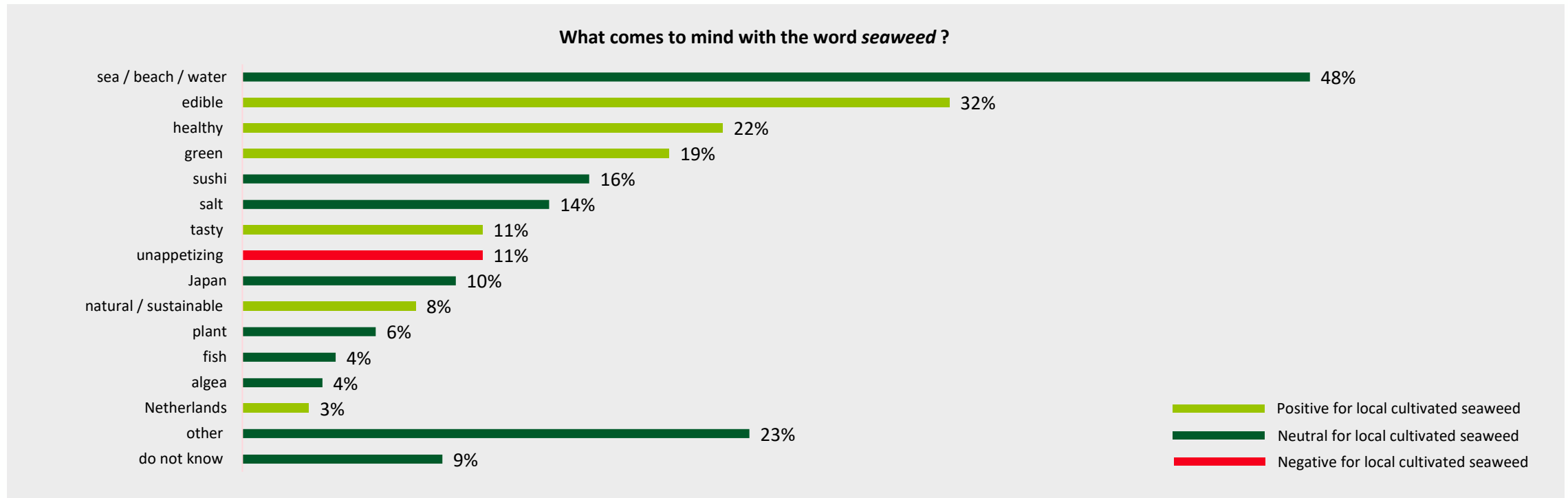
## ***2. Associations and experience with seaweed as food***



## 2.1 Consumer associations with seaweed



Dutch consumers associate seaweed with edible and healthy, but some have doubts about the taste of seaweed. Most associations are positive or neutral.



## 2.2 Associations with seaweed and alternative names



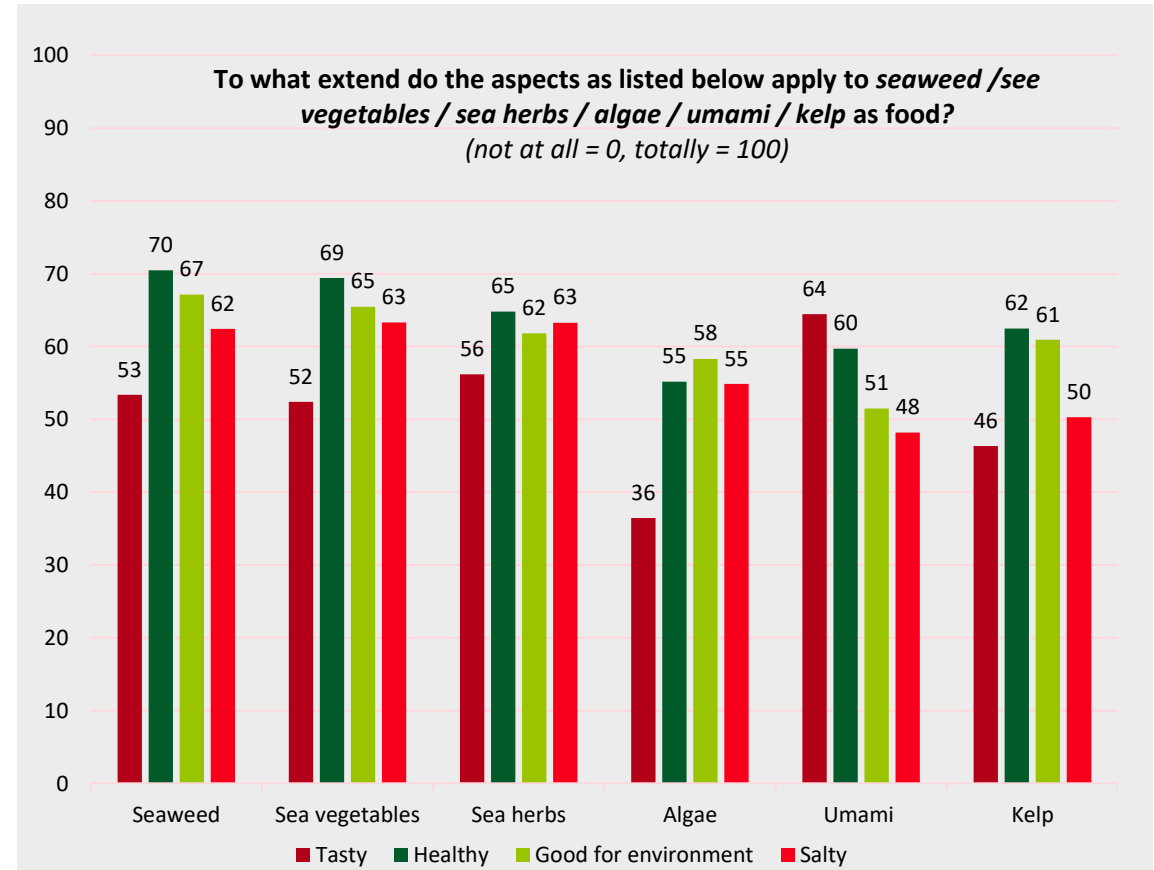
The names *seaweed*, *sea vegetables* and *sea herbs* score similar on taste, health, good for environment and salty.

*Seaweed*, *sea vegetables* and *sea herbs* are perceived similar in terms of tastiness; health; impact on environment; and saltiness. Cleary consumers associated *seaweed* stronger with healthy than with good taste.

*Algae* scores clearly below average on tastiness and health.

*Umami* scores slightly higher on tastiness compared to *seaweed*, but on the other hand, more consumers answered the question with “I do not know” than for *seaweed* (47% for *umami* compared to 26% for *seaweed*).

*Kelp* does not score higher than other names on the four aspects. Besides, *kelp* is also not well know, 45% answered the question with “I do not know”.

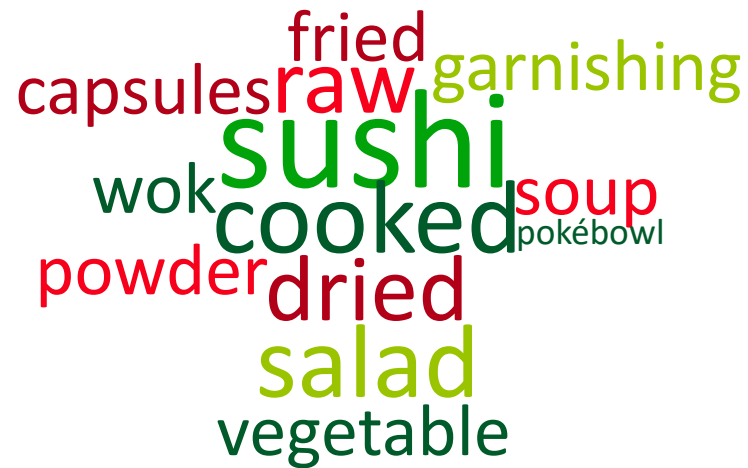


## 2.3 Familiarity with seaweed as food



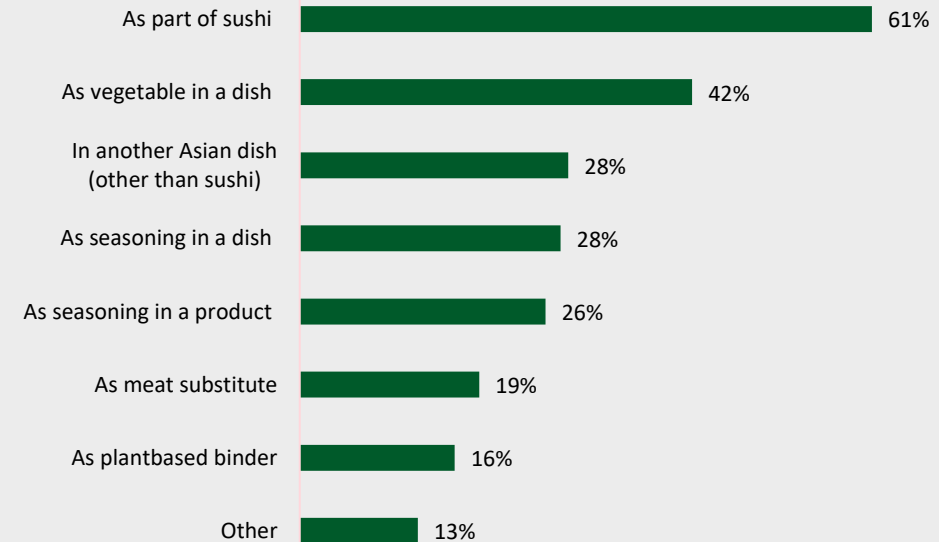
When asked in an open question, consumers name a lot of different applications and forms of seaweed as food. Sushi is by far the most named application.

Which ways of eating seaweed do you know?



Seaweed as food is most known from sushi and as a vegetable in a dish.

Which forms of seaweed as food are you familiar with?

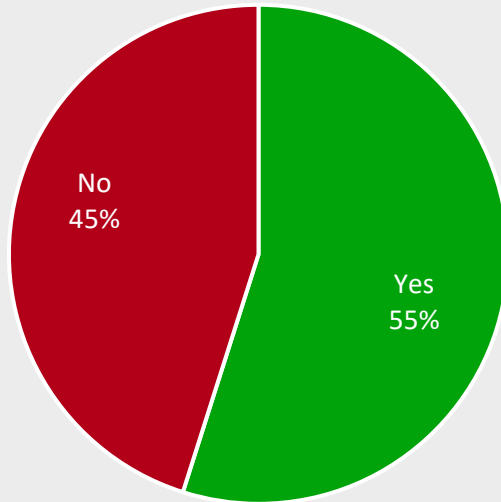


## 2.4 Profile of seaweed consumers



More than half of the Dutch consumers have experience with seaweed as food.

Have you ever eaten seaweed as part of a dish or in a product?



Seaweed-eaters are in general young consumers who pay attention to the environmental impact of food.

Consumers who eat seaweed vs. non-seaweed eaters are in general:



Younger: mean age 43 vs 53



Overrepresented in province of North-Holland (Amsterdam)



Have a bachelor or master educational level



Shop more often at supermarket *Albert Heijn*



Pay more attention to organic food and to the environmental impact of food



More often vegetarian or vegan diet

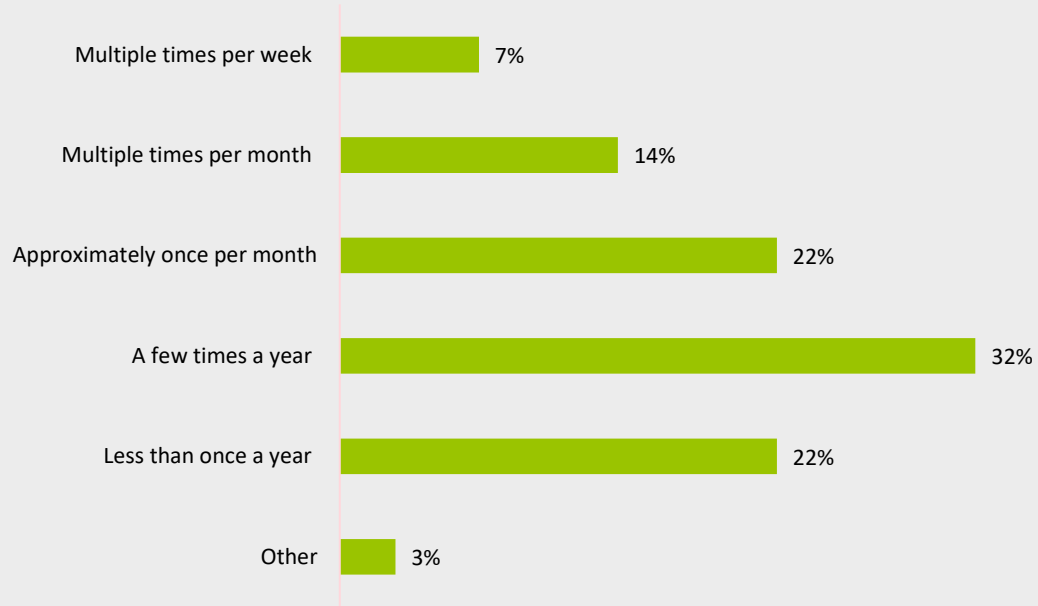


## 2.5 Experience with seaweed as food



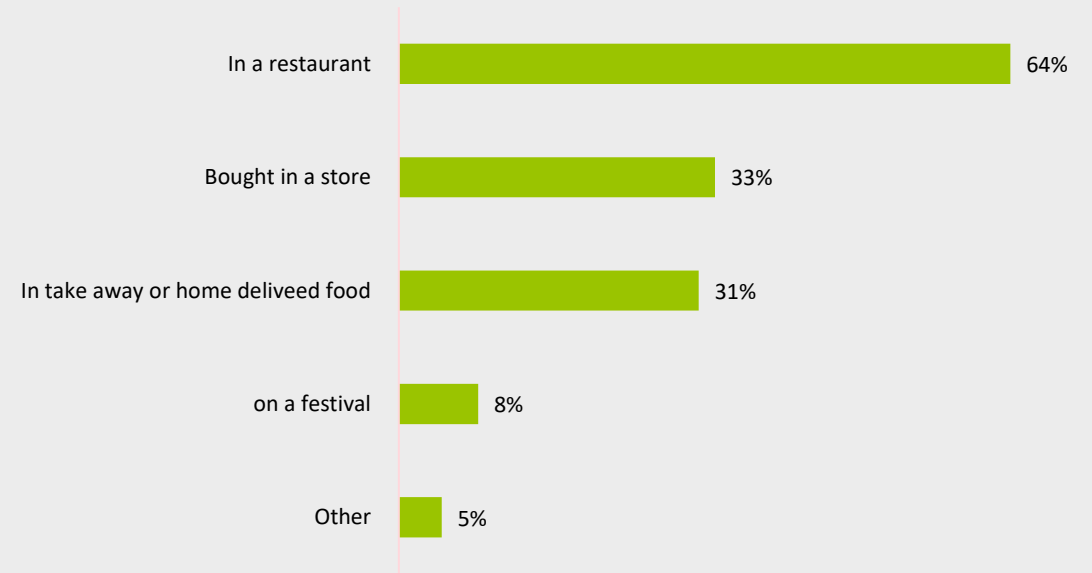
Seaweed is not everyday food. Most consumers who have eaten seaweed, eat it a few times a year or less.

How often do you eat seaweed?



Most consumers eat seaweed in a restaurant. One in three buys it at a store.

Where have you eaten seaweed?  
(multiple answers possible)



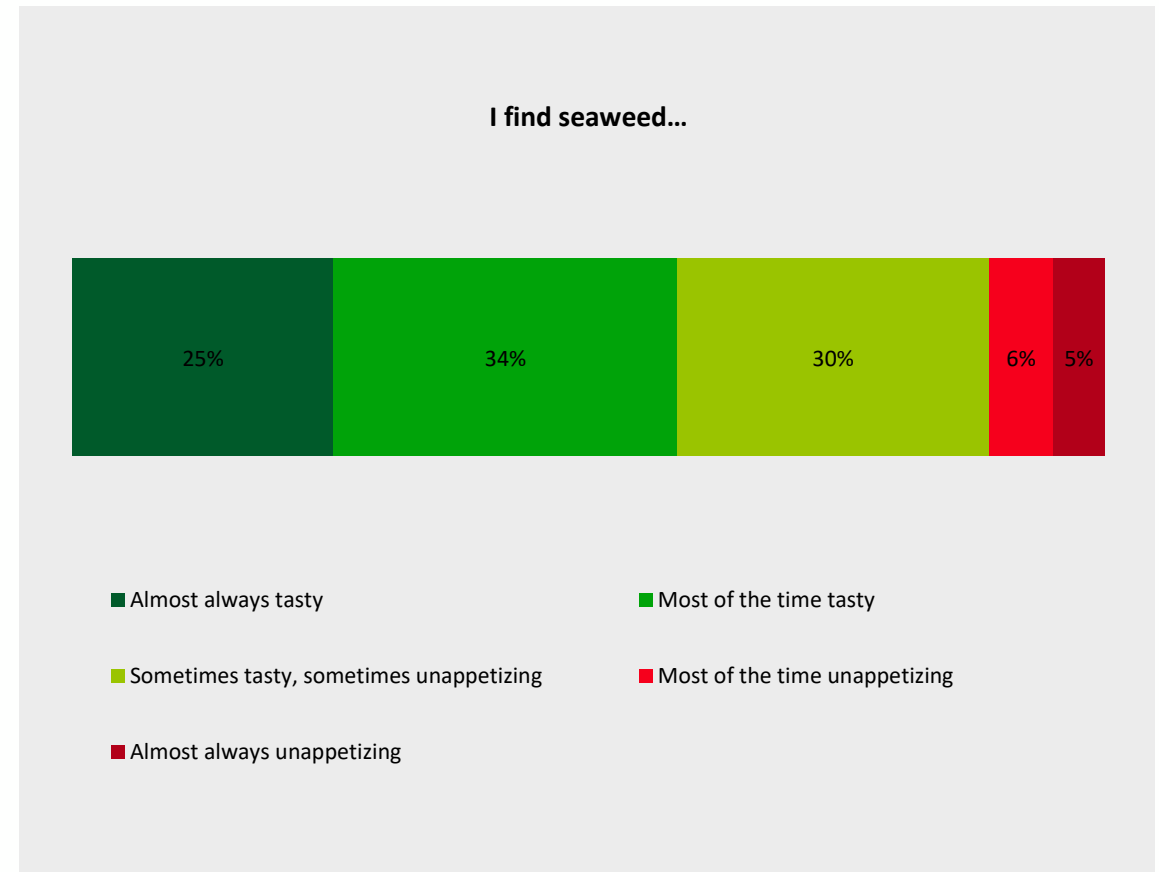
## 2.6 Appreciation of the taste of seaweed



**Consumers who have eaten seaweed mostly like the taste of it. One in ten consumers does not like the taste of seaweed**

Consumers who do not like the taste of seaweed, know less applications for seaweed. They almost only know seaweed from sushi. Obviously these consumers state that they would eat seaweed more often when it tastes better.

Consumers who do like the taste of seaweed know it as part of sushi, but also from other applications like vegetables in a dish and flavouring. These consumers would eat seaweed more often if it is easier available.





### ***3. Potential of seaweed among Dutch consumers***

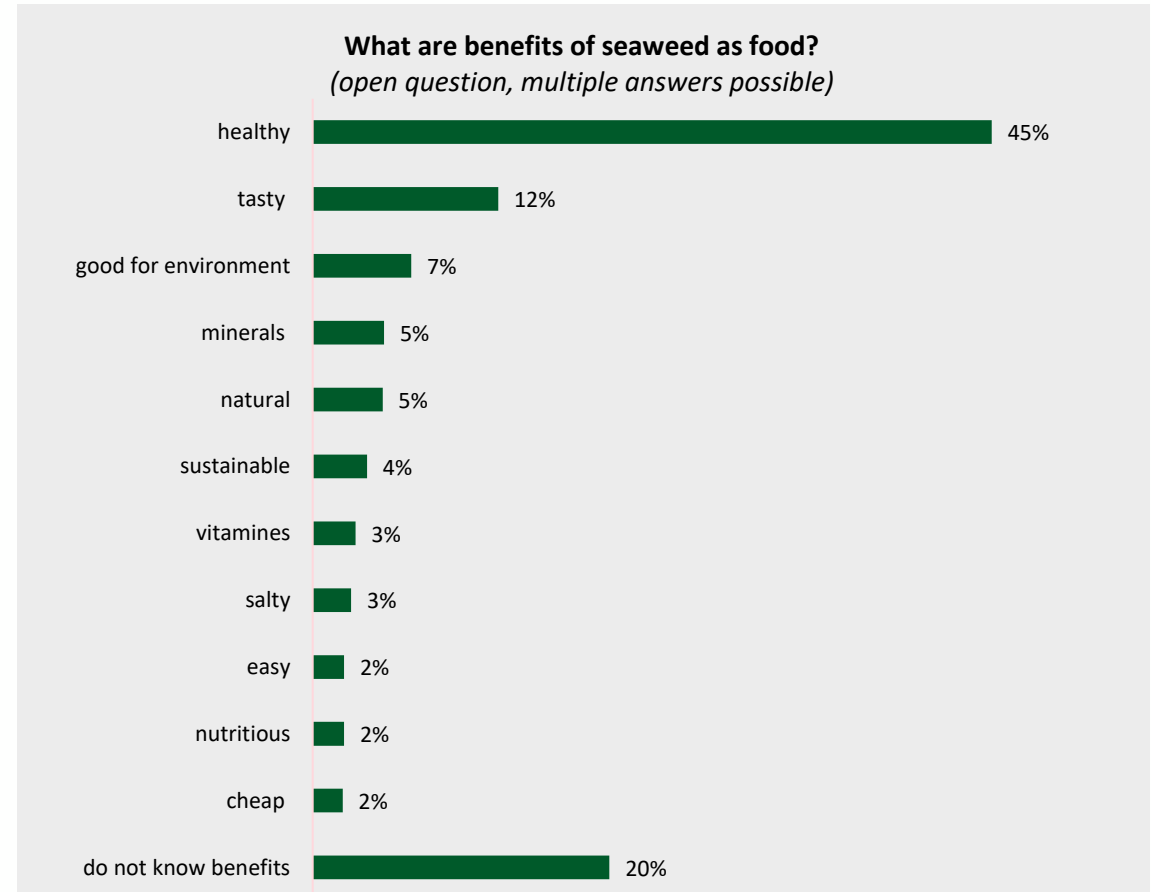
# 3.1 Benefits of seaweed as food



## Dutch consumers are well aware of the health benefits of seaweed as food

By far the most known benefit is the health benefit of seaweed, which is mentioned by almost half of the Dutch consumers. Other mentioned benefits cohere with health: vitamins, minerals, natural, nutritious.

Besides these benefits consumers think of seaweed as tasty, good for the environment, sustainable, cheap and easy.





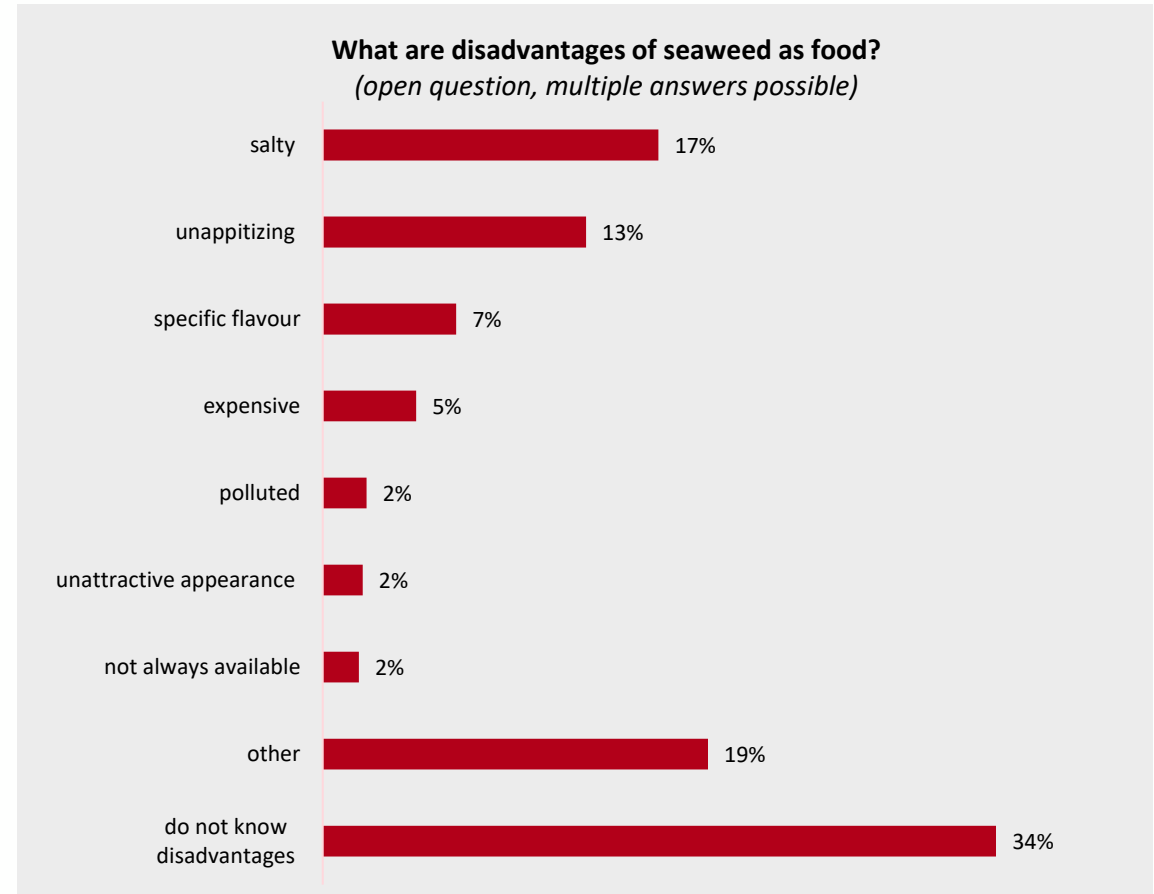
## 3.2 Disadvantages of seaweed as food



**Consumers do not know many disadvantages for seaweed as food. Most disadvantages involve the taste of seaweed**

Consumers who do mention disadvantages, bring up the very salty taste of seaweed. Others describe seaweed as unappetizing or of a specific taste which is not for everyone.

19% of the answers does not fit in one of the categories. This is a variety of answers, about the texture (chewy, slimy, stiff), the smell and other very specific disadvantages (short shelf life, impact on sealife)

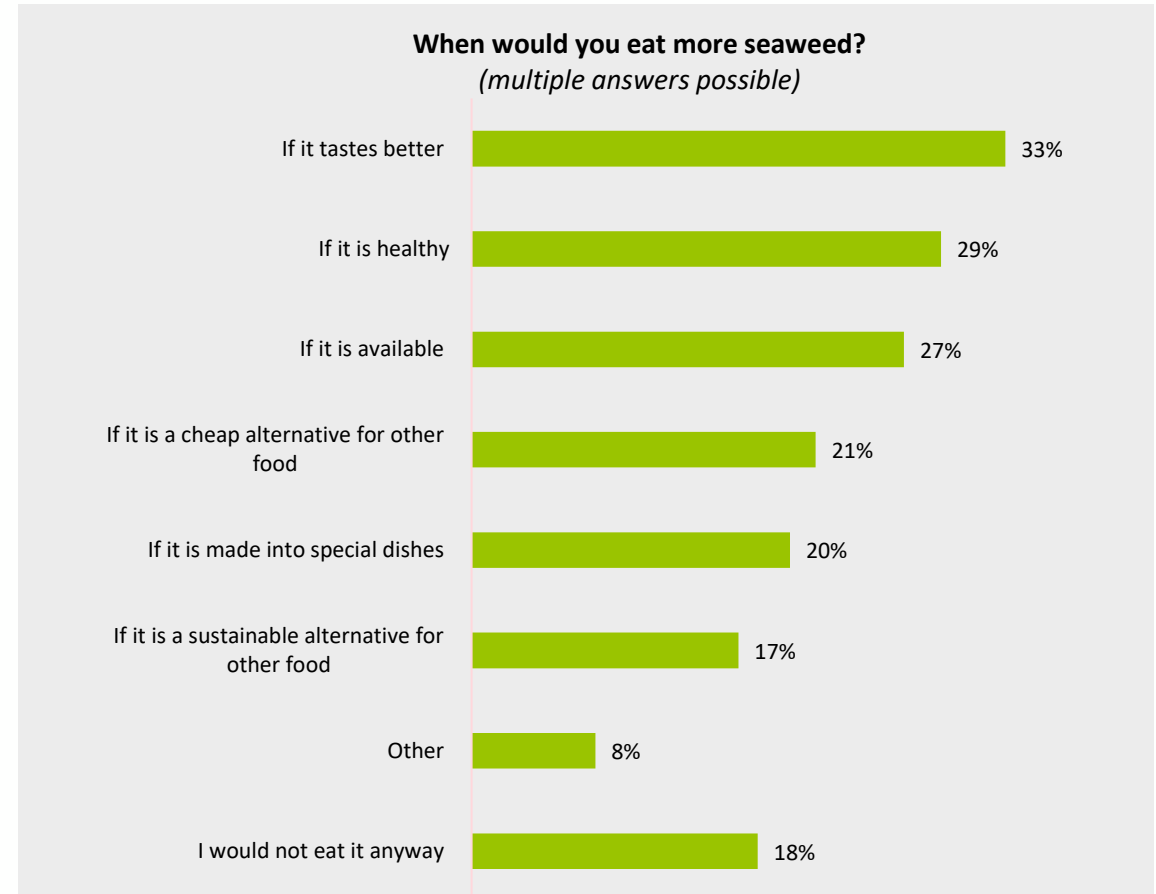


## 3.3 What is needed to eat more seaweed



Consumers would be open to eat more seaweed if the taste is better and to support their health. Besides, better availability would make it easier for consumers to add seaweed to their diet.

It is clear that consumers have their doubts about the taste of seaweed. However, they do believe in the health benefits of it. If seaweed would taste better and if it is healthy, consumers would eat it more often. Other reasons to eat seaweed are mainly secondary reasons. For example, as a cheap or sustainable alternative for other foods.



## 3.4 Appeal of products with seaweed



When asked to choose between several different seaweed products, consumers mainly choose healthy, ready-to-eat meals in which seaweed is a substantial component or a flavouring. Perceived as least appealing are snacks applications that are not ready-to-eat.

- As a salad
- As flavouring in pasta
- As flavouring in a wrap
- As flavouring in a fish product
- As flavouring in a snack (Dutch 'bitterballen')
- As topping on a salad

*Respondents saw pictures of the dishes with this description*

### Most appealing

According to consumers, appealing seaweed dishes are healthy meals like salads or pasta. Furthermore, fish products with seaweed score high among consumers. Besides, a seaweed variation on the typical Dutch snack 'bitterballen', is perceived as appealing.

- As flavouring in cheese
- As flavouring in a meat substitute product
- As flavouring in a meat product
- As filling for a snack
- As flavouring in prawn crackers

*Respondents saw pictures of the dishes with this description*

### Medium appealing

Dishes where seaweed is applied as flavouring in snacks are rated medium appealing by consumers. Also seaweed flavoured meat substitutes and meat products fall within this category.

- As flavouring in bread
- As flavouring in chips
- Flavouring flakes as topping
- As herb paste
- As food supplement
- As tea

*Respondents saw pictures of the dishes with this description*

### Least appealing

The least appealing applications for consumers are seaweed products that are not ready-to-eat, like seaweed flakes. Other less appealing products are nonalcoholic seaweed drinks and seaweed supplements.

# 3.5 Growth expectation of seaweed as food in the Netherlands

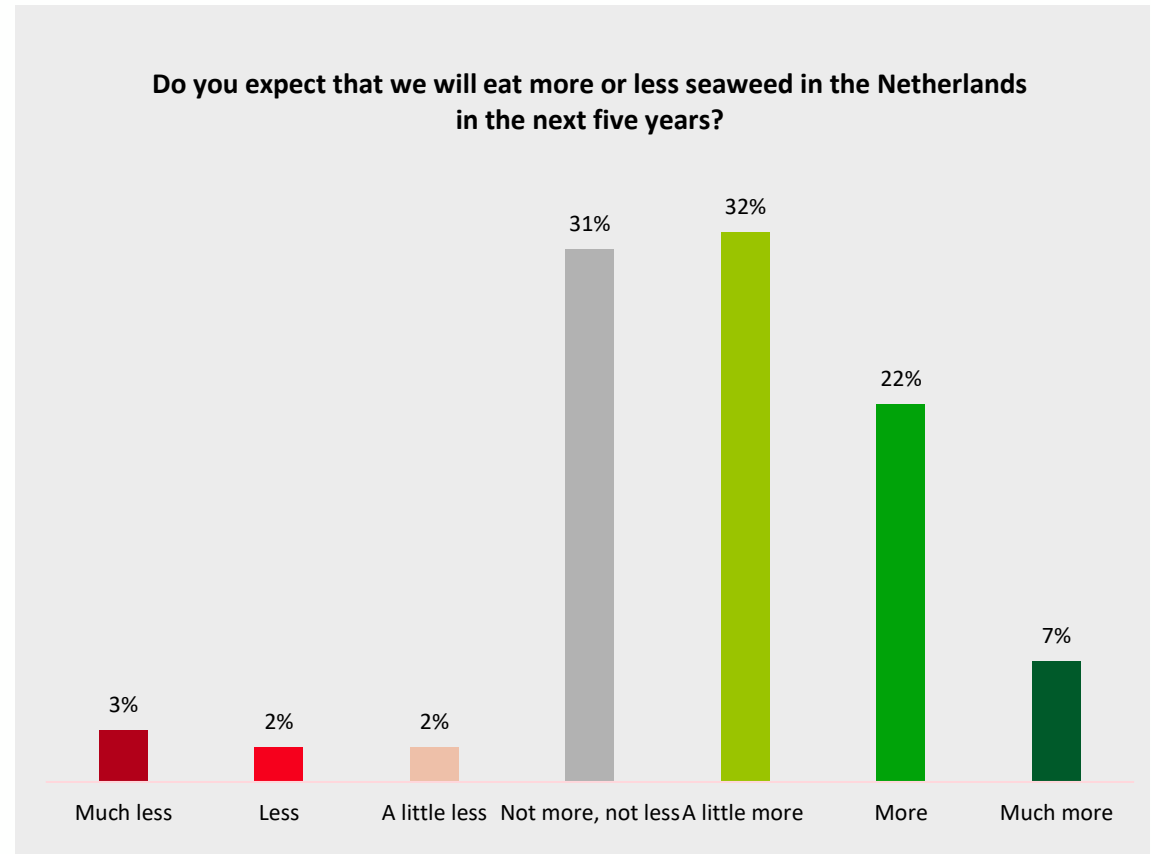


**Consumers expect consumption of seaweed to grow in the Netherlands the next five years.**

By far most consumers expect at least some growth in the consumption of seaweed. One in three expects the seaweed consumption to stay the same, only 7% expects a decline.

The expectation of growth of seaweed consumption is regardless of the experience with seaweed. Even people who do not like the taste of seaweed, expect growth.

Consumers expect growth in eating seaweed as a salad, as a vegetable in a dish, with sushi and as a flavouring in meals and snacks.





## 3.6 Preference of origin of the seaweed



**Most consumers have no preference for the origin of seaweed. Consumers who do have an opinion prefer European seaweed.**

European seaweed is preferred for several reasons. Consumers consider European seaweed to be:

- More reliable in terms of food safety;
- Better for the environment among others, because of less transport;
- Higher quality and more fresh;
- Good for the local economy.

*"I prefer products from close to home because of the environment"*

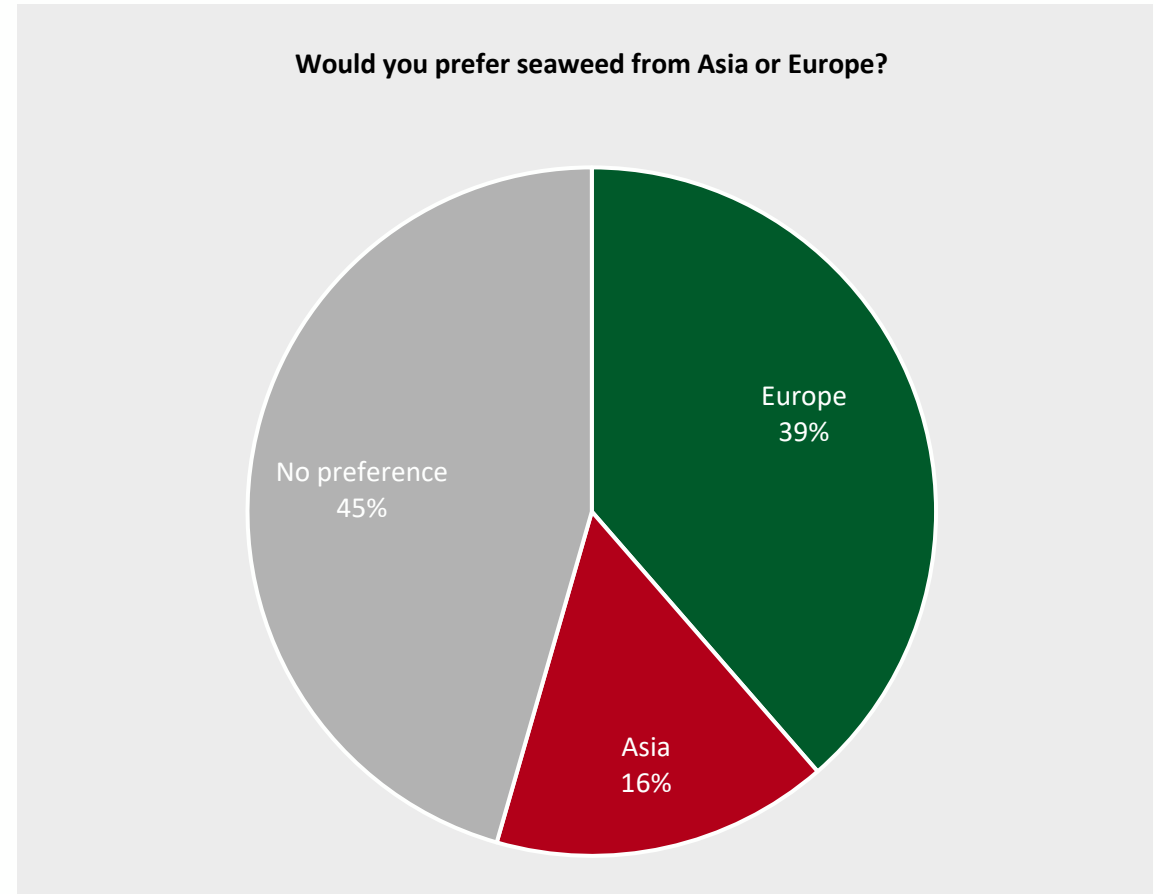
*"I believe Europe has better food standards and regulations"*

**Consumers who prefer Asian seaweed give the following reasons:**

- Asians have more experience with seaweed as food and therefore know how to produce and use it;
- Higher quality in terms of taste when a product comes from the country of origin.

*"Just a feeling that Asians know how to work with seaweed"*

*"I think that it is better when prepared in Asia, because Europe has less experience with and knowledge of seaweed as food"*



# 3.7 Preference for cultivated or wild harvested seaweed



**Most consumers have no preference for the way seaweed is produced. Those who do have a preference, prefer cultivated seaweed.**

**Consumers prefer cultivated seaweed because:**

- More controllable and reliable in terms of food safety;
- Better for the environment because it causes no harm to eco-systems.

*"Seems better to me. You can control the process and don't take everything from natural eco-systems"*

*"I do not fully trust seaweed that is wild harvested"*

**Consumers who prefer wild harvested seaweed give the following reasons:**

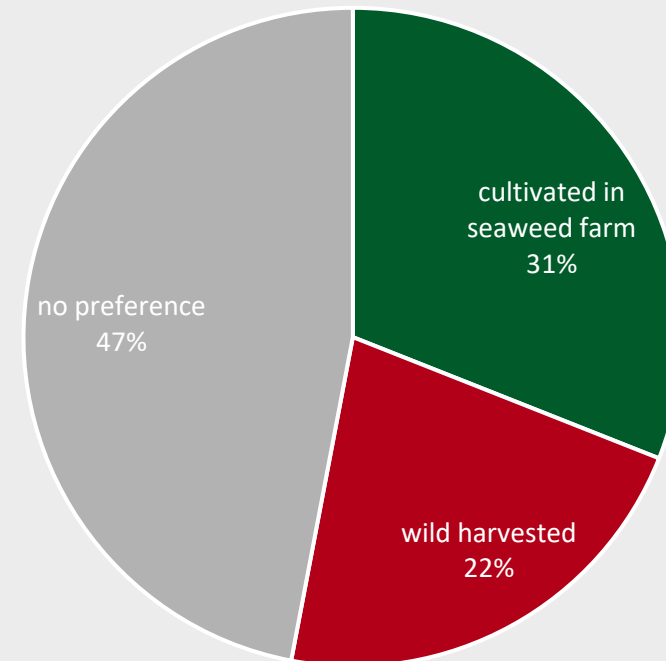
- More natural, more pure;
- Healthier.

Note: some consumers associate cultivation with mass production and the use of fertilizers, pesticides and antibiotics.

*"I think it is healthier and tastier because it is more natural"*

*"With cultivation all kinds of substances can be added which I would rather not eat."*

Would you prefer seaweed from cultivation or wild harvesting?

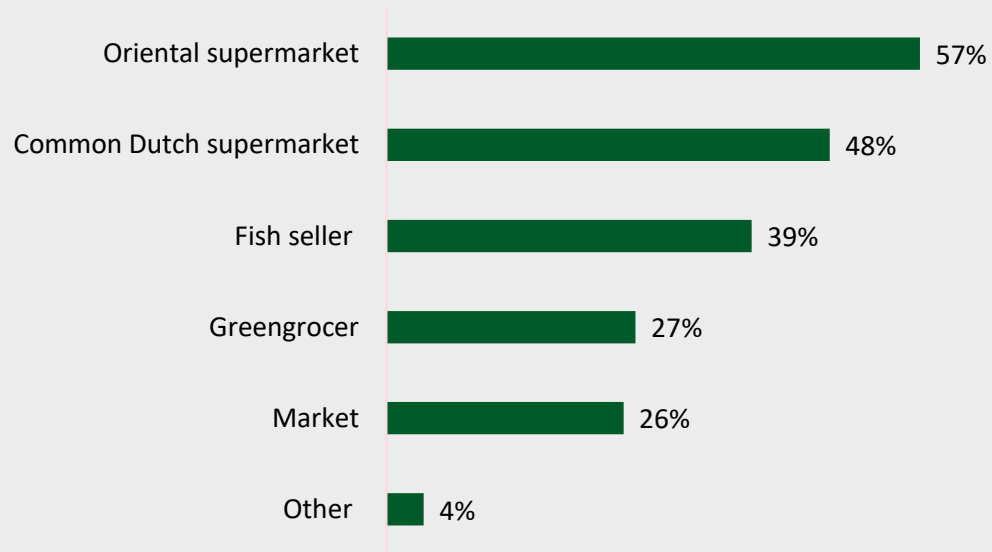


## 3.8 Placement of seaweed in store



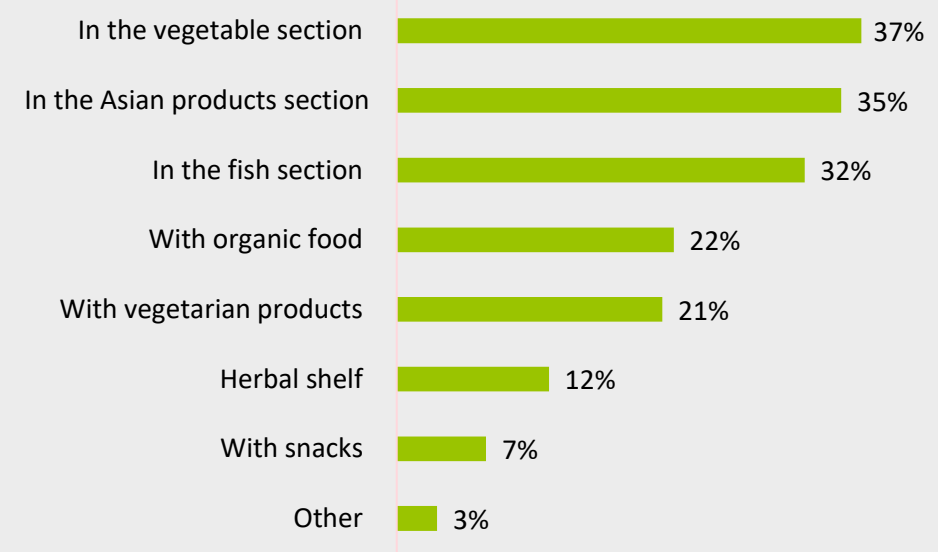
Dutch consumers expect to find seaweed in Oriental supermarkets and in common Dutch supermarkets

In what type of store would you expect to find seaweed?  
(multiple answers possible)



In common Dutch supermarkets consumers would look in the vegetable section, the Asian products sections and the fish section to find seaweed

Where in the supermarket would you expect to find seaweed?  
(multiple answers possible)



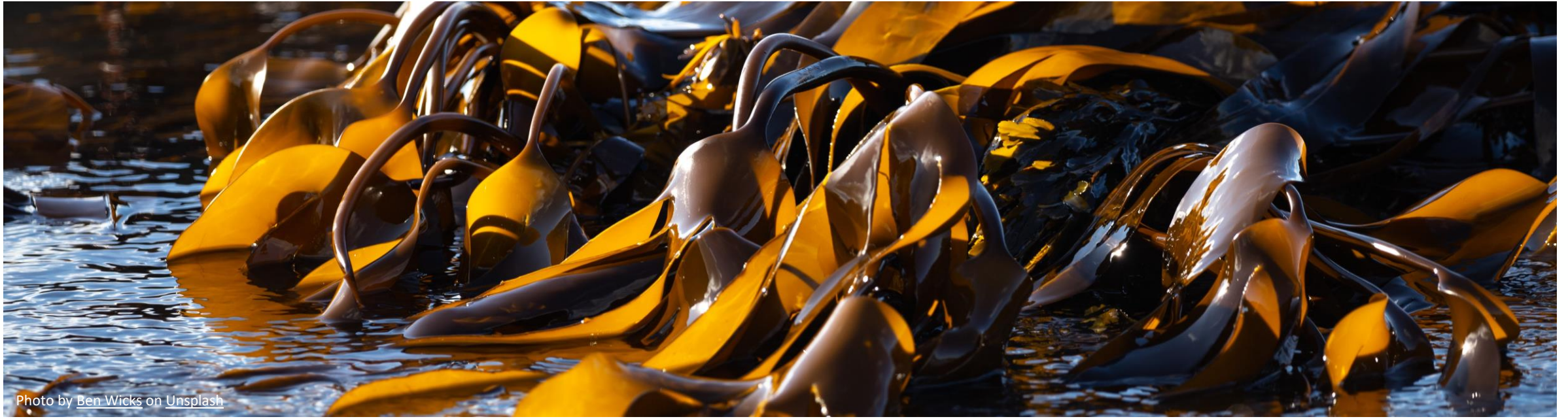


Photo by [Ben Wicks](#) on [Unsplash](#)

## *4. Appendix*



# 4.1 Research methodology

## Research goal

What is the potential of seaweed as food among Dutch consumers and what are ways to reach consumers with seaweed as food?

## Research questions

- What is the public opinion on seaweed as food? What are associations and first reactions?
- What is the current knowledge, use and experience with seaweed as food?
- To what extent would consumers try seaweed as food? In what situations would consumers try seaweed as food?
- What is the potential and attractiveness of several applications? What type of applications are promising?
- What would for consumers be reasons to eat seaweed? What are barriers?
- What is important for consumers when eating seaweed? What are important criteria?
- How do consumers estimate the potential for seaweed as food in their country?

## Methodology

- Survey among Dutch consumers
- Sample of n=1051 Dutch consumers representative for age, gender, region and educational level
- The sample is provided by Dynata

## Survey

The survey consists of these topics:

- Associations with seaweed (and alternative names)
- Knowledge of and experience with seaweed as food
- Expectations of where to buy seaweed
- Appeal of several seaweed products
- Preference for European/asian seaweed and for cultivated/wild harvested seaweed

## Fieldwork

- Fieldwork period: November 30th – December 3th 2020.

## Analyses and reporting

- This report contains the results of the consumer survey. The described results apply to the Dutch consumers in general. Differences between specific subgroups are described.

## Pictures in report

- Unsplash

# *More information?*

## Contact information

Questions and remarks about this consumer study can be shared with Lotte Bronswijk: [lotte@northseafarmers.org](mailto:lotte@northseafarmers.org)

[Click here](#) if you want to become a North Sea Farmer and join our mission working towards climate impact with seaweed.

