Sensory attributes of seaweed
Effects of fat and cultivation

Marcus Johansson, Kristianstad University

Sensory attributes assessed in this study are in some cases affected by fat content and cultivation conditions. Other sensory attributes are more innate to the seaweed and not affected at the studied levels of fat content nor by the cultivation conditions.

Background

The world's population is growing rapidly and is expected to reach almost 10 billion people by the year 2050. The population is also expected to grow older and an increasing amount of the population will be in the age group 65+. To feed this increasing and ageing population better and more sustainable food provision solutions are needed. A product that is cultivated and consumed in large scale in east Asia but very scarcely in the rest of the world is seaweed. Seaweed may be a future protein source even for the western societies of the world. To help implement seaweed as a part of the western diets it is important to understand how the seaweed is affected by western cuisine. One big difference between Asian and Western cuisine is the fat content. To understand how seaweeds sensory attributes is affected by fat content commonly occurring in western diets is one step on the way to understand how to implement seaweed in the diet.

Objective

To investigate how sensory attributes of seaweed is affected by fat contents commonly occurring in the food industry and by different cultivation conditions.

Material and methods

Seaweed cultivated under four different conditions were mixed into emulsions with four different fat contents. This generated a test design with 16 unique samples. The samples were evaluated by a trained sensory panel using Quantitative Descriptive Analysis. The panel generated and evaluated 13 attributes regarding odour, appearance, texture, taste and flavour (table 1). All samples were evaluated in duplicate in a randomised order with three digit blinding codes.

Table 1 Attributes evaluated for seaweed and the scales used for each attribute

Attribute	Scale
Odour Intensity	Little – Much
Odour Seaweed	Little – Much
Odour Fish	Little – Much
Appearance Colour	Yellow/Green – Blue/Green
Texture Adhesiveness Spoon	Little – Much
Texture Oiliness	Little – Much
Taste Saltiness	Little – Much
Taste Sourness	Little – Much
Taste Sweetness	Little – Much
Taste Umami	Little – Much
Flavour Fish Liver Oil	Little – Much
Flavour Fresh Grass	Little – Much
Flavour Ramson	Little - Much

Results and discussion

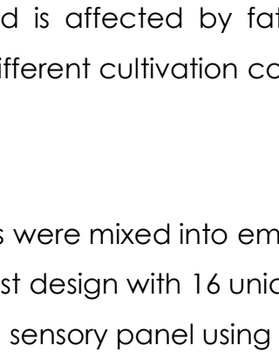
The attributes evaluated are found in table 1. Attributes concerning the odour were found to be affected by cultivation conditions but not by the different fat contents of the emulsions. This indicates that the differences in odour are dependent on the cultivation medium and that the addition of fat in the quantities used in this study did not have any significant effects on these attributes. The colour was affected by both cultivation conditions and the addition of fat. Addition of fat resulted in a more yellow/green colour and for the seaweeds that had more of the blue/green colour when no fat was added to the emulsions, the addition of more fat affected the colour even more towards yellow/green. More added fat tends to make the colour lighter. The texture adhesiveness to the spoon was only affected by the fat content of the emulsions with more adhesiveness with an increase in fat content. The texture attribute oiliness was not found to be affected either by the fat content nor by the cultivation conditions. This may be a result of how the emulsions were made and the oily feel to the mouth may depend on the emulsifier used. Taste and flavour was not found to be affected by neither the fat content nor the cultivation methods. This indicates that the tastes and flavours are dependent on the seaweed itself. The taste of umami is considered one of the signature tastes of seaweed and in this study the umami taste was found to be the most dominant of flavours. Umami was rated with twice the intensity compared to the rest of tastes in these seaweeds.

Conclusions

The results of this study show that the colour can be affected by both cultivation conditions and fat contents applied to the seaweed. Significant differences found in texture are only dependent of the fat content of the emulsions, no difference between cultivation conditions can be found. Odour is affected by cultivation conditions while fat contents at the tested levels only show tendencies to affect the odour. Cultivation conditions and fat content does not affect the taste and flavour in any significant way.

Author biography

My name is Marcus Johansson and I have a background as a professional chef for about 15 years. I have always had an interest in the flavours and aromas of the food I work with. During my education in Food and Meal Science I became very interested in the discipline of sensory evaluation and how the human senses can be used to evaluate food products. Currently I am working as a Laboratory technician with focus on food and sensory science.



Contact: marcus.jc.johansson@gmail.com

Kristianstad University Sweden