



Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Faculty of Landscape Architecture,
Horticulture and Crop Production Science

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Foreword

Since I finished my bachelor's degree in business administration in 2011 I have planned to study a master's degree as well. As life happens I started working and the idea seemed more and more distant. In 2014 when I was working as an economic consultant I started to think more and more about advanced studies and I started to look at different programs. Over the four years I had been working within business and finance I thought there was something missing, the environment and sustainability. I was only looking at the numbers and the business decisions behind it and not how those decisions were made with sustainability in mind. Being the son of a farmer I had distanced myself from that subject my entire life, but suddenly I found myself reading more and more on the subject. I started looking at programs and found the Agroecology master's program at the Swedish University of Agricultural Sciences in Alnarp. The program spoke to me with its content regarding a sustainable system, incorporating ecological, economic and social issues. To be able to study natural science was very appealing and something I thought would broaden my thinking.

When first familiarizing myself with the term agroecology I was in my first few weeks of the master program at the Swedish University of Agricultural Sciences, it was with great interest and fascination that I learned about what had been written by scholars such as Miguel Altieri and Stephen Gliessman. My intention when applying to the program was to explore the possibilities to go into the field of agricultural advisory which also corresponded with my previous education in economics. Over the course of the program my perception changed and I understood that agroecology is holistic and that the term seeks to create the understanding that everything is interconnected within the food production system. From the seeds planted by the farmer to the vegetable consumed by the end-user to the price paid for production of the seed to the price paid for the ready meal in the supermarket. When having this approach, it is hard to go into detail in aspect, the true agroecologist knows everything about the different steps and this person does not exist. When reading the 6 steps of Stephen Gliessman I see the last step as a utopia, comparable with Maslow's pyramid of needs where self-fulfillment is arguably unreachable. I believe the idea and the science of agroecology is needed but the abstract nature of the term makes it hard to pinpoint exactly what constitutes an agroecologist.

I am now at the end of my master studies and I think myself to be more knowledgeable about such a wide range of disciplines, my greatest improvement is within the field of ecology and the need for acknowledgment of the services nature brings to the human kind. After much contemplating, I believe I am ready to go into a sustainability career, to work with the implementation and improvement of sustainability in companies. Something that has not change during my studies but made me more convinced is the role of companies in bringing us closer to living sustainably. This program is very broad and invites students of diverse backgrounds and educational disciplines and this is the strength of the program it opens your mind to new things and teaches you a variety of different skills. Because of the program, I have found what I want to do and what I want to work towards.

Acknowledgment

Writing a master thesis is very time consuming and requires both motivation and self-discipline. When spending a semester on your own writing one of the most important things is to have support and I have been lucky enough to have been surrounded by people that has helped me finish this paper. I have many people to thank for being able to finish this thesis, my girlfriend Karin Petersson has stood by my side the entire time helping me with kind words and finding motivation. Mine and Karins family has also been very kind and understanding as well as opening their doors for me to conduct experiments in their home, something I am very grateful for. My classmates in the agroecology program, especially Robin Meijer, has also given me support and kind words which is something you really appreciate when being knee deep in the thesis.

The idea for the thesis was given to me by JP Alg and the intermediary Miljöbron, I would like to thank them for their continued support during the process. I would also like to extend my gratitude to the ICA Group for sponsoring the seaweed which were used in the experiment.

Finally I would like to extend my gratitude to Fredrik Fernqvist, my supervisor, for all the advice I got and for his enthusiasm during the writing.

Abstract

In a move to create a more sustainable living the government in Sweden has set up sixteen environmental objectives to improve the environment for future generations. One of the objectives is zero eutrophication and is considered the most serious threat to the marine environment. The Baltic Sea to the east of Sweden is at risk of losing large parts of its biodiversity and is considered unhealthy. Seaweed represents a promising mean to mitigate the eutrophication and there are projects in Sweden which aims to convert it into biogas and fertilizer in attempt to close the nutrient cycle. However, there is another use of the seaweed that companies are exploring and the idea is to grow it for consumption. In Asia seaweed is commonly eaten but that is not yet the case in Sweden even if the Asian cuisine has been introduced on the Swedish market. Growing seaweed could have positive effects on the Baltic Sea as it works as an exfoliator that reduces the excess nutrients and thereby improves the health of the sea. Acknowledging the crucial role sustainable food has for the future the thesis aims at investigating key-determinants of consumers' willingness to pay for the environmentally friendly Baltic Sea seaweed, focusing on a sample of 46 individuals from Southern Sweden. An experiment that included sample testing was carried out under three conditions (blind, expected, informed) where the participants received additional information of the product between the sample tests. The first test was only presented as seaweed and the second test as presented as seaweed produced in the Baltic sea. To get a better understanding of the drivers, emotional and sensory terms were also included in the survey where the participants checked those that applied to them. Results showed that the majority of participants used positive emotions to describe the seaweed under both conditions but in all valued the seaweed grown in the Baltic sea less. The more participants knew about the Baltic sea the less they were willing to pay. If seaweed produced in the Baltic Sea was brought to the Swedish market the recommendation would be to promote it as produced in Sweden rather than produced in the Baltic Sea.

Keywords: The Baltic Sea, Seaweed, *Ulva lactuca*, Willingness to pay, Agroecology

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1.Introduction

The world population is growing and by the year 2050 we are estimated to be nine billion people inhabiting the Earth. The population growth in Sweden is no different and on the 20th of January 2017 they reached ten million inhabitants, in 1917 the number of people living in the country was around 5,8 million which means that the population has almost doubled over the past hundred years (Statistics Sweden 2017).

With the increased population some issues have arisen, we need to feed the growing number of people and we have to do it sustainably, without depleting natural resources. The quote below is the third commitment in the World Food Summit Plan of Action from 2006 and includes the key aspects for moving towards a more sustainable food production.

“We will pursue participatory and sustainable food, agriculture, fisheries, forestry and rural development policies and practices in high and low potential areas, which are essential to adequate and reliable food supplies at the household, national, regional and global levels, and combat pests, drought and desertification, considering the multifunctional character of agriculture” (FAO 2006).

Sustainable consumption refers to patterns of consumption that are economically, socially and environmentally compatible within all areas of the food system, including production, processing, distribution and waste disposal (de-Magistris & Gracia 2015). It has been calculated that 25 percent of total greenhouse emissions are derived from the goods production processes and transportation which could be thousands of kilometers before reaching final consumer (de-Magistris & Gracia 2015). The need for development of food production in currently unused areas and close to the market could be viable solutions but it should be done in a way that does not have environmental implications. This thinking is in line with the principle of agroecology that depicts that to be able to move towards sustainable food production one needs to look at the entire system, sharing knowledge between all levels and using the ecosystem to determine what is suitable to grow in particular areas in order to maximize output (Gliessman 2015).

The Swedish government has also acknowledged the environmental problems that face the country. The government has set up 16 environmental objectives with an overarching goal called the generational goal. This goal was set up to highlight and solve the major current environmental issues in Sweden before the next generation takes over. The aim is that with these objectives the goal should be fulfilled by the year 2050. Zero eutrophication is one of these objectives that was set up by the Swedish government. The objective aims to remove any negative impacts that nutrient over-enrichment has on human health, biodiversity, soil and water (Miljömålsportalen 2017). Coastal environments are usually closely associated with intense human activity and are therefore more vulnerable to eutrophication. The coastal marine environment receives water runoff from land and groundwater systems, putting much pressure on the usually shallow depth and narrow range (Fei 2004). Since there could be a restricted water circulation in the coastal environments one of the consequences is the buildup of waste causing serious pollution problems (Fei 2004).

To be able to mitigate eutrophication, actions should be put in place. Harvesting seaweed could be a part solution as it can be used to reduce excess nutrients in the ocean. As the seaweed works as an exfoliator that binds nutrients in the water it could be withdrawn and be made to beneficial use as well as mitigating negative effects such as algal blooming. Experiments regarding seaweed farming is currently being conducted in several places around the world and in Sweden there is a project named *Seafarm*. In this project scientists grow algae with the purpose to convert it into biogas and take steps towards a bio-based society (Seafarm 2016). However, seaweed can also be produced and used for consumption in Sweden, just like it is in many other countries and regions especially in Asia (Capuzzo & McKie 2016). A seaweed is just like land based crops full of vital nutrients such as carbohydrates, proteins and fats. A company in Sweden, *JP Alg*, is currently exploring the opportunities to grow consumable seaweed in the Baltic Sea, which is severely affected by eutrophication, to sell on the Swedish market. The idea of producing regionally has high potential to be environmentally sustainable as it decreases transportation distances, promotes seasonal consumption and utilizing products already available to us (Mithril et al. 2012). By eating regionally produced there is a possibility to reduce several unwanted negative effects on the environment, including greenhouse gases, loss of biodiversity, altering landscapes and environmental toxins among others. Seaweeds produced in the Baltic Sea for consumption in the region can have several positive outcomes, they include:

- Reducing transportation between place of production and consumers
- Food production without the need for chemicals, such as fertilizers and herbicides
- Utilization of the seabed for food production, reducing the pressure currently put on agricultural land
- Remove excess nutrients in the Baltic Sea when harvested

Sweden is surrounded by water and it is only natural that it has always been a source for food for the population living in the proximity. The Baltic Sea is each year providing e.g. cod, salmon, herring and shellfish, however currently no seaweed is being consumed (Mithril et al. 2012). However, as it is a well-known fact that the Baltic Sea is polluted are consumers willing to pay for seaweed produced from this particular sea? Do they want to eat seaweed at all? Statistics has shown that consumers in Sweden value locally produced and healthy food (Livsmedelsföretagen 2015) and the Baltic sea seaweed will do both, but are they willing to pay for a new product such as seaweed and does food neophobia play a part in the money they are prepared to part from?

1.1 Aims and research question

The aim of this master thesis is to conclude if consumers are willing to pay a higher price when receiving positive information in regard to the environmental effects, i.e. a regionally produced seaweed. The original idea is to see if marketing a product as being grown in the Baltic Sea would have a positive or a negative effect on the price on a selection of Swedish consumers. Statistics has shown that Swedish consumers value locally produced food the highest (Livsmedelsföretagen 2015) and the results in this paper explores if this is true for the seaweed *Ulva lactuca*. The research question is “Are consumers’ willingness to pay effected in a positive way when knowing the *Ulva lactuca*, commonly known as sea lettuce, is produced in the Baltic Sea?”.

As there are several drivers when choosing a product or what one is willing to pay for it, questions were asked regarding demography, sensory and emotional terms. By conducting this experiment, the aim is to see if there are differences in the sensory expectations when information of the positive effects is disclosed and if there is a change in the willingness to pay. There will also be the subject of the perception of the Baltic Sea which is well-known to be an unhealthy sea, in this case there is a question regarding the perception of health vs. environmentally friendly Swedish produced good.

1.2 Objectives

In order to retrieve the data to make conclusions regarding these questions a strategy was constructed to be able to generalize and to give results which can be analyzed; including the following parts:

- A review of literature relating to the seaweed aquaculture and their potential as a staple food on the Swedish market
- Seeking out a sensory expectation model which suits the aim of the experiment
- Surveying a diverse group of participants in the experiment to be able to analyze different consumer groups

1.3 Thesis outline

Following this introductory chapter (1), the literature review (2) will be presented after which the theoretical framework (3) is explained. Thereafter, the materials and methods (4) is presented followed by the results (5). The final chapter (6) concludes the thesis with a discussion.

2. Literature review

This chapter starts off with introducing the Baltic Sea, the value of it and the problems its facing. Afterwards comes the relationship between agroecology and growing seaweed, how growing seaweed is in accordance with the principles of the concept of agroecology. This is followed by a section of seaweed production on a global scale and the risk of accumulation of heavy metals when growing seaweed in the Baltic Sea. Section 2.4 will cover seaweed as food over time, the current use and its nutritional value. The following section is regarding market research that is done before releasing a new product and how food neophobia plays a part in novel food. The chapter concludes with a section of the Swedish food market and the growing interest of organic and locally produced food.

2.1 The deteriorating Baltic Sea and zero eutrophication

The Baltic Sea is located in northern Europe and is the largest brackish water ecosystem in the world. It gives great value for all people living by its shores, both as a source for food with fish living in the ocean as well as for recreational activities such as swimming and watersports (SWaM 2013). The Baltic Sea consists of six areas the Baltic proper, the Gulf of Bothnia, the Gulf of Finland, the Gulf of Riga, the Danish straits and Kattegat. The areas differ in quite significantly characteristics, such as depth, salinity and temperature. The Baltic Sea borders nine countries but connects to a total of fourteen with the different drains, this area has a population of 90 million meaning that the catchment area is extensive compared to the size of the ocean. One of the main reasons that the Baltic Sea is susceptible to eutrophication is the limited exchange that the sea has to other seas, in this case the Northern Sea.

The Baltic Sea is also a very complex ecosystem and recent research has shown that there is a higher biodiversity than previously thought (SWaM 2013). Today the sea is one of the most polluted in the world and over the last half century the Baltic Sea has been exposed to chemicals such as DDT, PCB and dioxins and even though many of these toxins are banned today, they still has a negative effect because it was buried in soils or sediments and has not yet disappeared from the ecosystem (Helsinki Commission 2010). The drainage area that comes with the human activities around the Baltic Sea put much pressure on the ocean, examples such as agriculture, sewage systems and industries has negatively affected the water (SWaM 2013). The effects could be seen in algal blooming and dead zones which has detrimental effects on the Baltic Sea.

2.2 Agroecology and the growing of seaweed

New initiatives have been taken in order to fight the eutrophication in the ocean, one of them being to grow seaweed which accumulate nutrients and are then harvested and removed from the ocean (Jarméus 2013). There are companies that have started to see the macro-algae as consumable products. The product is full of nutrients, especially protein which could replace or be used as a supplement to our other protein sources, such as meat, soy beans and legumes (Holdt & Kraan 2011). When producing seaweed the use of land under water and closing the nutrient cycle follows agroecological principles and these principles are important when looking at sustainable food production future. Agroecology looks at the interrelations between agriculture and ecology, meaning that the ability to understand natural ecosystems will help us when producing food (Gliessman 2015). With the ongoing climate change there could be severe, diverse and location-specific impacts that effect the agricultural production (Altieri et al. 2015). Temperature and water availability are key factors in determining crop growth and

availability. Mismanaged fertilizer use could lead to leaching out of the soil and into streams, river and lakes causing eutrophication (Gliessman 2015). From an agroecological perspective the growth of seaweed has several links with the concept of sustainable food production. The food system disruption with fish death, disturbances in the ecosystem, over-fertilization as plants cannot use all the nutrients and finally the changed landscape, which has led to the destruction of natural buffer zones (Gliessman 2015). Fertilizer is one of the causes of algal bloom, oxygen depletion and dead zones which has severe effects on the nautical environment. By using the seaweed to reduce the overflow of nutrients and remove them from the ocean we keep the nutrient cycle closed.

2.3 Production of seaweed

The seaweed industry worldwide provides a wide variety of products for direct and indirect human use at an estimate value of US\$ ten billion annually (Rebours et al. 2014). 83 per cent of the cultivated sea vegetables are used for human consumption while the remaining 17 percent is used as fertilizers, animal feed and medical applications (Rebours et al. 2014). Macro algae, specifically *Ulva lactuca*, increases with 5,7 percent annually and more than 18 million tons were produced in 2011 on a global level (Rebours et al. 2014).

Theoretically, the application of seaweed cultivation for consumption is possible in the Baltic Sea. However, it has yet been put into practice. One of the main concerns of growing seaweed is that they exhibit a high affinity for heavy metals and the environmental parameters of where they are grown play a huge part of their accumulation (Besada et al. 2009). These metals include for example lead (Pb), mercury (Hg), cadmium (Cd), copper (Cu), manganese (Mn) and zinc (Zn) and are toxic even at low levels (Holdt & Kraan 2011). There are a variety of factors that play a part on the accumulation and they are the bioavailability of metals in the water where it is grown and the uptake capacity of the seaweed (Besada et al. 2009). The concentrations of these heavy metals are dependent on their environment and variations can be very local (Holdt & Kraan 2011). The *Ulva* species, which this thesis focuses on, is a green algae that grows quickly under favorable conditions and has in general a lower metal-binding capacity than for example brown algae (Besada et al. 2009). Another parameter which was found was there is a seasonal factor that plays a part in the uptake of these heavy metals, as the levels fluctuate over the year, the levels decrease in agricultural growing season but increase during the winter (Besada et al. 2009).

There are a few ways in which you grow seaweed. It is usually done in a closed off area that has the right conditions, right salinity, depth and currents (San 2012). Small cuttings are put on rope or strings which are then lowered into the water where it is given time to grow, this could either be done on shallow water with floating devices or deeper waters where the lines are attached to the water bottom (San 2012). Different seaweed has different growth rates and some seaweed species can be harvested up to 8 times per year if it is in the right conditions, a cutting of 100 g can weigh up to 1 kg in 20-40 days (San 2012). When the seaweed is harvested, the lines usually extracted with the help of boats it has to be either stored in a colder environment if it will be sold fresh or laid out to dry if it will be used as a supplement (San 2012).

2.4 Seaweed as food

For over a millennia human beings have been consuming seaweeds. For the past fifty years, there has been a growing interest in the capabilities of cultivating seaweed. It is already used as a dietary staple in many countries around the world especially in countries such as China, Japan and the Philippines (Capuzzo & McKie 2016). It is not consumed in a greater amount in Sweden even if many eat it in the form of sushi and salad in Asian restaurants. Historically, seaweed has been considered a poor man's diet in Sweden (Mithril et al. 2012) but that might change now as it has been introduced from the Asian cuisine. There are several types of seaweed and most of them cannot be used directly as human food since they cannot be digested in the human body.

Current research aims at finding a solution to make seaweed more accepted and accessible by opening new possibilities to make it a staple food (FAO 2010). Protein is one of the fundamental pieces of nutrition in the human diet and is seen as one of the biggest factors for malnutrition globally. Some seaweed contains up to 60 percent of protein but this source is currently not reaching its potential as food or food substitute. Furthermore, seaweed and in particular macro algae can contain ten times higher mineral content compared to plants grown on land as well as being rich in vitamins and having low calories count (Capuzzo & McKie 2016). They do also contain bioactive substances such as polysaccharides, lipids and polyphenols, with antibacterial, antiviral and antifungal properties (Holdt & Kraan 2011). Despite this it is not popular and some of the reasons are said to be its undesirable characteristics of algae within the food industry, such as its texture and unpleasant smell (FAO 2010).

The market outside Asia is growing. In 2013 a market analysis showed that the wholesale value for seaweed for consumption in Europe was approximately 24 million euros and had an upwards showing trend (Capuzzo & McKie 2016). Due to the brackish water, there is not the possibility to grow all types of seaweed in the Baltic Sea but there are a few consumable species and one of these are *Ulva lactuca*. This seaweed, known as sea lettuce, is occurring naturally in the south of the Baltic Sea (Andersson, L, 2004).

2.5 Market research and food neophobia

Market research is imperative before releasing a product on the market to increase chances for success. Testing of food usually involves consumer panels who taste and evaluate new products (Mantonakis et al. 2017). According to sensory experts the participants in these panels are typically asked to rate their sensory experiences on scales (Mantonakis et al. 2017). One issue that can arise and need to be taken into calculation are the biases. This issue has received attention in the marketing research and more likely sources of bias have gone unnoticed (Mantonakis et al. 2017). That can affect sensory perceptions from non-sensory information in the form of brand names, product names or prices (Mantonakis et al. 2017). One of these can include consumer food neophobia, i.e. is an aversion toward novel or unfamiliar foods and a "psychological and behavioral tendency that protects organisms from ingesting toxins and other pathogens" (Al-Shawaf et al. 2015). For humans, food neophobia is especially strong for animal products compared to non-animal products, and several researchers have seen a link between disgust and food neophobia, which is in contrast to the original meaning of "protection from toxins and other pathogens" (Al-Shawaf et al. 2015). Most Western consumers frown upon the thought of eating for example insects, horses and rodents (Tan et al. 2016; van den Berg et al. 2016), even though it is highly valued as tasty and nutritious in other cultures. As these animals

are often considered as filth, in the case of insects and rodents, and as domestic animals, in the case of horses, the consumers react with disgust at the prospect of consuming these creatures (Tan et al. 2016). However, even though the food neophobia is stronger in the meat-based products it is also occurring in the non-animal ones. Unfamiliarity of plants such as lentils and seaweed has also shown the reluctance to include them in a daily diet (De Boer et al. 2013). Even though scientists has shown that many of the products mentioned has a high nutritional value and are more sustainable than the current protein sources, such as livestock, Western consumers are still not keen to change their regular diets (Tan et al. 2016). The potential of changing the diet in Western countries to less meat and more environmentally-friendly proteins would mean less pressure on crucial resources (water, biodiversity, energy), food security and human health (De Boer et al. 2013). However, there are deep-rooted attitudes, food-related concerns and socio-cultural norms which proves a hindrance for all novel foods (Tan et al. 2016). There is a need for more information regarding the novel foods and their positive influence on some of the challenges currently facing humanity.

2.6 The Swedish food market

The sales of organic food in Sweden has over the past years increased. In 2013, sales of organic food and non-alcoholic beverages rose by almost 12 percent compared to the previous year (Statistics Sweden, 2014). This figure is even higher in 2015, when the sales of organic food rose by 39 percent compared to 2014 and had a total value of 21,5 billion SEK (Ekoweb, 2016). That implies that there is a strong trend for organic food and the segment takes an ever-increasing share of the total food share in Sweden. According to Ekoweb (2016) the Swedish consumers bought 7.7 percent organic when purchasing food and drinks in 2015, that figure puts Sweden in second place globally only trailing Denmark who is the biggest purchaser at 8.3 percent (Ekoweb 2016).

One of the main drivers behind the increase in organic food consumption is that consumers have become more concerned about environmental, fair trade and health issues (Gauger et al. 2012). What has been seen as an obstacle is high prices for organic produce, but they have decreased considerably during the last years because of the fact that the Swedish retailers keep introducing new organic food articles on the market (Gauger et al. 2012). However, when looking at a survey conducted by Demoskop on account for Livsmedelsföretagen (2015) the single most important trait for a Swedish consumer when purchasing a good is that it is produced in Sweden, 48 percent of the respondents thought that was most important thing when buying a product. On second place in the same survey was that the food was healthy, 42 percent, and on fifth place was that the food was organic, 23 percent. The contradictions between the statistics and the survey could be explained by meat consumption. The statistics showed that buying Swedish meat was more important than organic and the increase of organic meat was only 1,5 percent between 2013 and 2014 (Statistics Sweden, 2014). Another point is the fact that so far only 7,7 percent of all produce sold is organic meaning that 92,3 percent is still conventionally produced.

3. Theoretical framework

This chapter explains the theories used in this study. It begins with consumer choice and what influences purchases. The section introduces the Alphabet theory which can explain the drivers behind organic and local food purchases. The following section brings up the expectancy theory and the two types of expectations, sensory-based and hedonic-based. Finally, the willingness to pay theory is presented and how research can be done in order to determine prices

3.1 Consumer choice

Understanding why consumers make choices on what they buy is a complex issue. Research has been conducted in an attempt to understand the choices behind organic and local foods sales and why it has been growing (Zepeda & Deal 2009). Economic theory would point at the rise of disposable income and consumer preferences, the latter indicating the demographic characteristics. However, studies to develop profiles of purchasers economic and demographic regarding organic and local food has produced conflicting results (Zepeda & Deal 2009). This could be because investigators has found that beyond demographic characteristics are differences in motivations for buying the produce including personal health, the environment, the local economy and interest in cooking (Zepeda & Deal 2009). Theories developed regarding environmentally significant consumer behavior of the reasons behind the decisions, however some findings point towards a gap in the current theories (Zepeda & Deal 2009). The drivers of consumer choice revolve around a consumer's values, beliefs and norms and these are complex to find out. As there are several variables effecting the choice one needs to include not only sensory and emotional but also background and external influencers. A theoretical framework called the Alphabet theory, Figure 1, aims to address some of the gaps regarding organic and local food purchases (Zepeda & Deal 2009). It combines two theories called the Value-Belief-Norm (VBN) theory and the Attitude-Behavior-Context (ABC) theory but has added additional elements to get a better understanding of consumer choices.

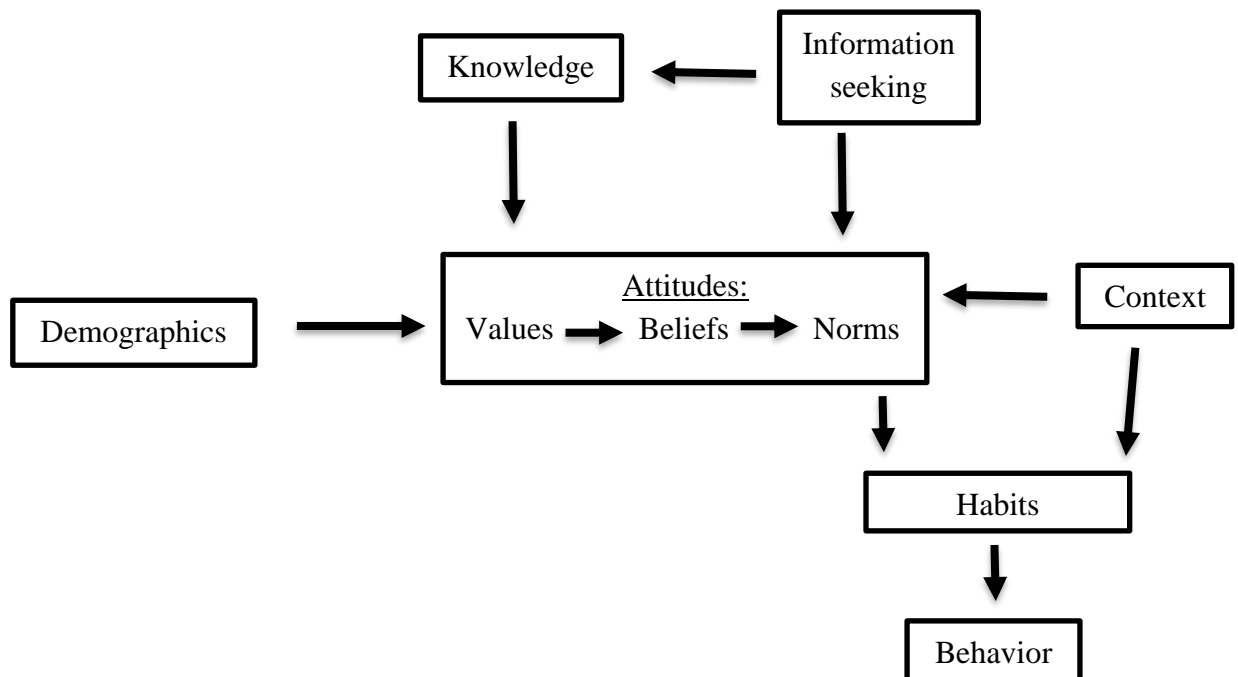


Figure 1. Illustration of the Alphabet theory.

The Alphabet theory has been found to include essential elements and interactions describing organic and local food consumption (Feldmann & Hamm 2015). Zepeda and Deal (2009) successfully used this theory to determine motivations for purchasing behavior and also found that the added elements of knowledge, information seeking, habits and demographics better predicted consumer behavior thus increasing the understanding behind choices.

Demographic characteristics can influence the consumers attitudes and purchasing behavior and can identify the influence of personal characteristics, as some research revealed that for example proximity to produce, education level and wealth influence the preference for organic and local food (Feldmann & Hamm 2015).

Knowledge and information seeking can have an impact on consumers' attitudes. The VBN theory suggests that consumers belief of organic foods being better for their health encourage them to buy this produce (Zepeda & Deal 2009). What it fails to incorporate is the information seeking to justify the higher prices of organic foods and for some the information seeking behavior leads to in-depth knowledge of organic production systems and practices (Zepeda & Deal 2009). The information seeking reinforced pre-existing environmental values increased the purchases because of the belief that an environmental norm can be supported by buying organic food (Zepeda & Deal 2009).

Habits has been revealed to play a key role in food shopping decisions among consumers, a study showed the decision on where to shop supported the conclusion as those buying conventional usually returned to the same supermarket while those buying organic visited several venues, for example famers market and directly from the farm (Zepeda & Deal 2009). The study also showed that cooking habits were linked to organic and local food, where those learning to cook at a young age were more prone to buy conventional while those learning to cook at college-aged or adult were more likely to buy organic and local food (Zepeda & Deal 2009)

One interesting aspect of the ABC theory is that it offers an explanation as to why education is one of the few demographic variables that has a consistent correlation significance with purchase behavior regarding organic and local food (Zepeda & Deal 2009). Education may reflect the knowledge regarding products and the information seeking behavior to increase it (Zepeda & Deal 2009). It indicates that that consumers who make conscious decisions when purchasing their food develop stronger attitudes, and thereby increase their interest and look for more information (Feldmann & Hamm 2015).

3.2 Expectancy theory

When it comes to food consumption, expectation plays an important role as it may influence the perception of a product even before it is consumed (Deliza 1995). Two general types of expectation have been identified, the sensory-based and the hedonic-based. The former leads the consumer to believe that the product possesses certain sensory characteristics which in turn influence the perception when it is consumed. The latter, hedonic-based, is related to the degree of which the product is liked or disliked (Deliza 1995). The expectation is strongly related to the potential satisfaction or dissatisfaction of a product. Expectations can also induce emotions before ingesting if the food reminds a person of something else, or if it something that is not commonly ingested, and this could present itself in both sensory-based and hedonic-based expectations. To be able to get a better understanding of the boom or bust potential for products both of these types of expectation is needed. Prior experience and information of the product influences the perception, it could be that the product from the same brand or a product produced in the same region left an impression which in turn influence the way that the consumer view the good that is about to be tried. That would have implications on selection/consumption/re-selection process (Deliza 1995). To better understand this the need to include extrinsic cues needs to be taken into the calculation, these include price, brand name, label and information. Therefore to grasp the total picture experiments can be done where pieces of information is given at different stages to get a fuller picture (Deliza 1995). By giving no information during the first part in the experiment and later give some disclosure for the second part one can compare the results and see if there are any differences in the expectations.

3.3 Willingness to pay

The concept of economic valuation can be looked as the benefits that is brought to consumers and is dependent on preferences (Prokofieva et al. 2011). What is fundamental within economic valuation is the notion of willingness to Pay (WTP) which means the maximum amount of other goods, for example money, an individual is willing to give up in order to have a another good, for example seaweed (Prokofieva et al. 2011). Despite considerable advances within the pricing research in the past, many actors still make ill-informed decisions regarding prices and without understanding the likely response of potential buyers and the competitors alternative price quotations (Breidert et al. 2006). If knowledge is missing the market actors fail to pursue a pricing strategy that is customized to their market environment meaning that they may lose valuable sources for increasing profitability of the products offered (Breidert et al. 2006). Both researchers and businesses agree that it is important to have valid WTP estimates, and it is essential to develop an optimal pricing strategy that can forecast market response with price changes (Breidert et al. 2006).

There have been different hierarchical classification frameworks proposed to organize existing methods to estimate WTP. In order to illustrate different collection methods a figure, Figure 2, has been inserted which was presented by Breidert et al. (2006). The WTP measurement is divided into two, revealed preference and stated preference. The difference could be made in an example, a respondent is asked what type of music they listen to and they reply that they

only listen to rock and roll that is a stated preference. However, if you see them listening to Spotify and they are singing a Shakira song you have discovered their revealed preference.

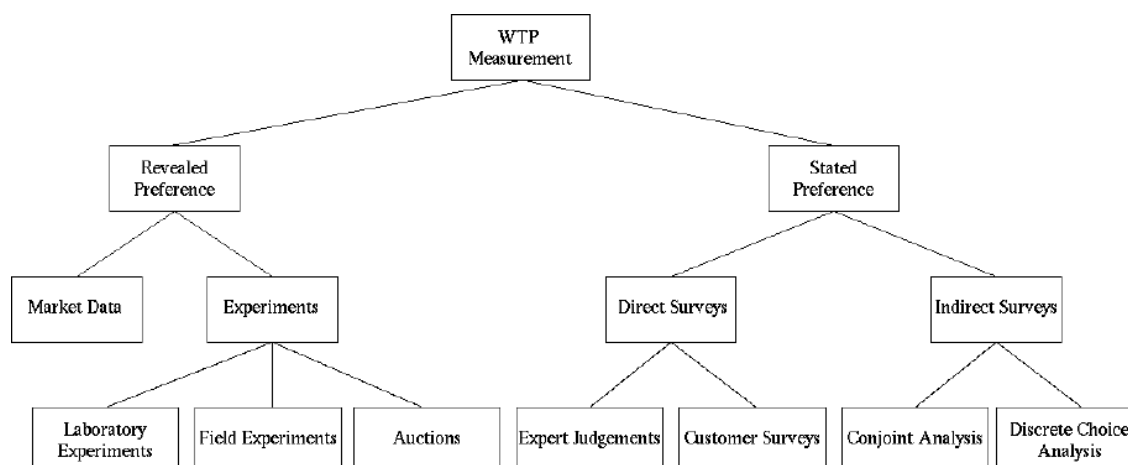


Figure 2. Classification framework based on data collection methods (Breidert et al. 2006).

This thesis will pursue stated preference consumer surveys which is a technique for measuring consumers' willingness to pay (WTP) by directly asking them (Breidert et al. 2006).

To put an economic value on environment has been researched for a long time. The socially responsibly produced products have been on the rise in recent years and many companies and retailers have marketed these kind of products (Tully & Winer 2013). It has been shown that as income grow, consumers' behavior can change and product attributes other than price can play a greater role in consumption decisions (Tait et al. 2016). Studies have been made as to the WTP for these products, if consumers are willing to pay a premium for the products that are socially responsible (Tully & Winer 2013). Sustainable products are perceived to be of higher quality, has higher social and economic value and higher environmental sustainability (de-Magistris & Gracia 2015).

4. Materials and Methods

The material and methods chapter starts with the experimental design and how the survey was constructed and information was presented. It is followed by three sections that explains how the experiment was constructed, it starts with the EmoSensory wheel, followed by an explanation of check-all-that-apply and rating, the next section brings up selection of emotional and sensory terms used in the experiment. After the explanatory parts section 4.5 brings up the limitations in the experiment. Afterwards comes two sections, 4.6 and 4.7 that presents the participants in the study and the taste samples. Finally, there is a section that explains how the data gathered in the experiment is analyzed.

4.1 Experimental design

The experiment is based on a study conducted by Schouteten et al. (2016) which aimed to see the emotional and sensory profiling of three different burgers, insect-, plant- and meat-based. Included in this was EmoSensory profile which will be included in this experiment as well. With the use of this tool combines emotional and sensory profile of the product and obtains it from the consumers (Schouteten et al. 2016). The tool has been developed because there was a perception of lack of information received when doing marketing and consumer research (Schouteten et al. 2015). For this thesis, it was also important to include the willingness to pay in a way that was easy for the respondents to answer, no indication of the price was given and there was nothing to compare it with. The purchase price of the seaweed in the store is 47-48 SEK but this was not communicated to the participants.

The first page of the questionnaire, Appendix 1., that will be answered is about demographics and include gender, year of birth, place of residence, level of education, income and finally rating regarding outlook on algae for consumption. This was done in order to see how different demographic parameters differed in the experiment.

Before the experiment, the participants knew they were going to try seaweed, that information had been given. Before starting the survey, participants were told that they could not speak amongst each other during the test and that they were going to try two different samples of seaweed, the first one was served during the blind condition. When they had tasted the first one they filled in a survey. After the first sample and the surveyed was completed the first sample was removed and the second sample was put in front of them. They were told not to try the sample and that they should fill in the second survey, the expected condition. When that survey was completed they could try the second sample and fill in the third survey.

The participants evaluated the sea lettuce under three different conditions:

Blind test, which meant that the consumers were asked to evaluate the taste without receiving any prior information regarding the product except that it is sea lettuce and that it contains nutrients. This was made to study the sensory attributes. The information given in the blind test was as follows:

“This experiment is concerning seaweed, a specific kind known as sea lettuce. In short it is a new product on the Swedish market, is rich in nutrients and has a low-calorie value. It is a popular product in other cultures, especially Asia.”

Expected test, which meant that the consumers received information regarding the product, however were not permitted to taste it. They learned that it is produced in the Baltic Sea and that it reduces the excess nutrients in the ocean. This was made to determine the effect that information could have on the respondents' expectations. The information given in the expected test was as follows:

“In front of you is a sample of sea lettuce that has been produced in the Baltic Sea on the East coast of Sweden. Sea lettuce grows by using the nutrients already present in the water. The Baltic Sea is an ocean that has an excess of nutrients. The production of seaweed can mitigate the excess nutrients in the Baltic Sea and improve the water quality.”

Informed test, which meant that the participants evaluated the product after receiving the information and tasting it for a second time. This was done to see the combined effects sensory attributes and information of the product.

After this was done the participants had some final questions regarding the environment, buying behavior and knowledge of the Baltic Sea that they had to respond to. This was made to see if there was a correlation between the answers on the various parts.

4.2 EmoSensory wheel

When determining the how well a product would do in the market it is common to use sensory acceptability. By using product trials the product owners can find out what the consumers think about for example taste, color and texture, however recent research has shown that it might not be sufficient when determining the success of newly launched products. Studies has shown that including emotions in trials serve to understand consumers' food choices better (Schouteten et al. 2015). Schouteten et al (2015) constructed an EmoSensory wheel using EyeQuestion Software and included rate-all-that-apply (RATA) and check-all-that-apply (CATA) questions in their survey to gain the necessary data. For the experiment conducted for this research project a wheel inspired by Schouteten et al (2015) was used, Figure 3. This was constructed to visualize the terms which should be included in the surveys that the participants will fill in during the experiment. With the help of the wheel it is easier to grasp the relationship of the sensory and emotional variables. The sub-categorization of sensory and emotion can also provide information that is easier to analyze and to pinpoint the main difference between two products.

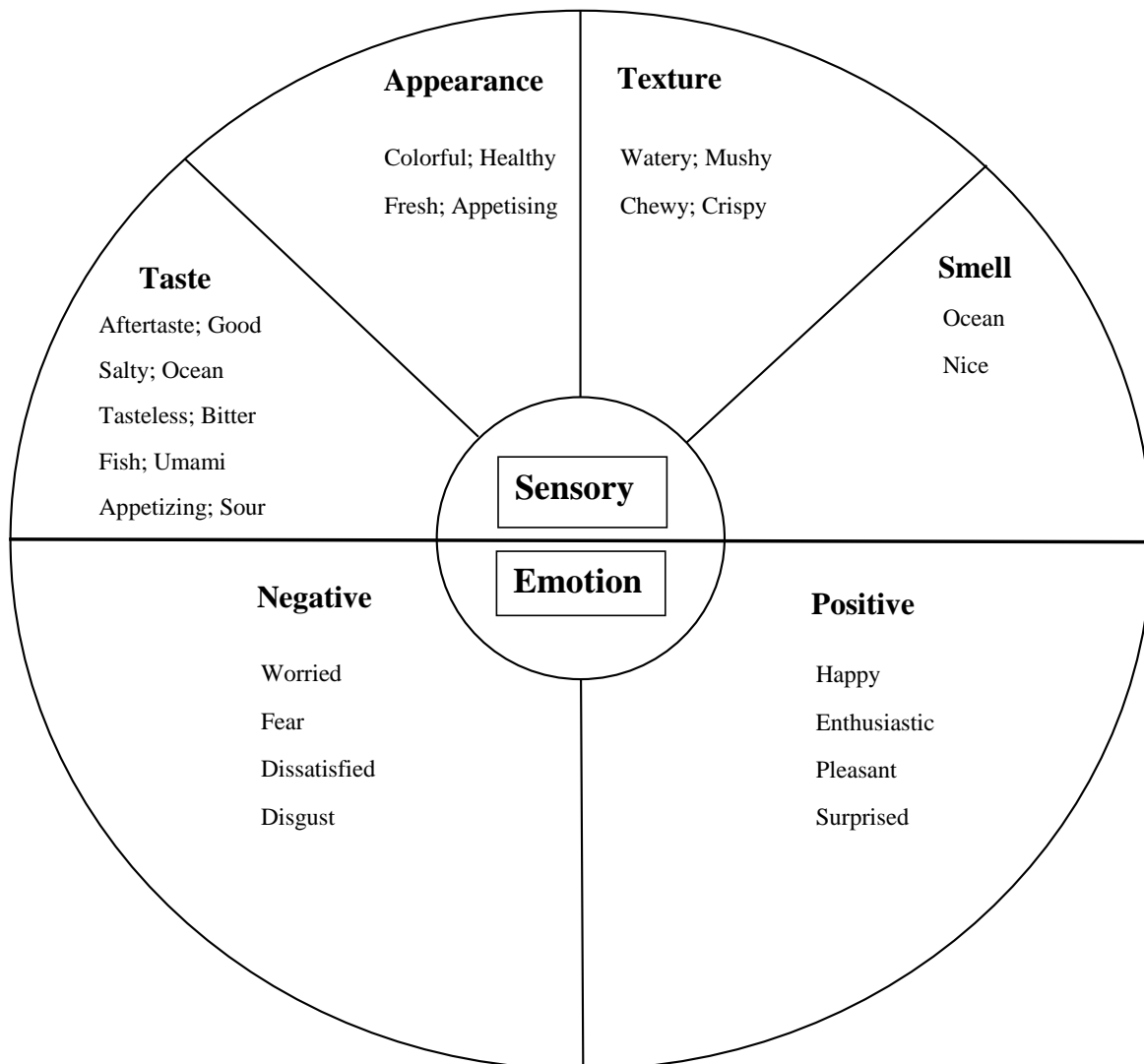


Figure 3. Own interpretation of the EmoSensory wheel.

4.3 Check-all-that-apply and rating

There is a growing interest for consumer-based methods which deliver sensory characterizations and one that has been developed is the check-all-that-apply (CATA) (Ares et al. 2014). With the use of this approach consumers are presented with a list of terms and are asked to select all those that apply to the sample they have tested. Research that has been conducted in the past has shown that sensory product characterizations derived from consumers using CATA questions has been reliable and comparable to those generated by trained assessors (Ares et al. 2014). The use of this method lets the participants choose as many terms that they want to and feels applies to them. One drawback with the method is that they are not ranked in anyway and does not indicate how strong they feel for each term. This could have been solved with rate-all-that-apply (RATA) where the participants would have rated all the terms they had used in CATA (Meyners et al. 2016).

A useful technique for sensory measurements that has been used in this thesis is the rating scale. It is applied in order to measure the intensity of a sensation (Lawless & Heymann 2010). The scale chosen was 1-9 where one is “I don’t agree at all” up until six which is “I agree completely”. The scale was set at a 9-point scale to give a broader spectrum of answers for the respondents.

Besides the product, the emotions towards the Baltic Sea and decision behavior needs to be taken into consideration to get more accurate data on the relationship between the sensory and emotional motivations. Therefore, questions have been added at the end of the survey that the participants rate their knowledge of the Baltic sea and information of products which help their decision making.

4.4 Selection of emotional and sensory terms

As only one product is being used a list containing the most suitable terms for the seaweed was constructed. The terms chosen in this experiment has derived from Schouteten et al. (2015) and their experiment on insect- plant- and meat-based burgers (Schouteten et al. 2016) who used a focus group to determine suitable terms to describe emotions and sensory characteristics. In the sensory selection, the basic tastes were also included as well as taste and smell which can be used to describe sea characteristics, i.e. smell of ocean, taste of ocean and fish. If more time was available a focus group could have been used to identify the most accurate terms in relation to seaweed. Research has also found correlation between food taste (sensory) and emotions, sweet solution is found to cause feelings of happiness and surprise, bitter solution could cause feelings of disgust while salty and sour solution can elicit feelings such as surprise, sadness and fear (Jiang et al. 2014).

The emotional terms are divided into negative and positive terms, four of each sensation, Table 1. The positive and negative valences are chosen to get a wider overview of the participants' emotional association with the seaweed (Schouteten et al. 2015). This will result in either an overall positive or negative sensation that will display the sensory emotions.

Table 1. Emotional terms

Negative	Positive
Worried	Happy
Fear	Enthusiastic
Disgust	Pleased
Dissatisfied	Surprised

The sensory terms used in the experiment were selected based on the seaweed, they include taste, smell, appearance and texture, Table 2. These has been divided into four distinct categories. The rating approach was chosen to rate the sensory expectations and give an overall view on how the respondents experienced the seaweed.

Table 2. Sensory terms

Taste	Smell	Appearance	Texture
Aftertaste	Nice	Colorful	Watery
Good	Smell of ocean	Healthy	Mushy
Salty		Fresh	Chewy
Taste of ocean		Appetizing	Crispy
Sour			
Bitter			
Umami			
Fish			
Sweet			

4.5 Limitations

There will be limitations within the subject specially to make a generalization of the attitudes as well as the demographics. There will also be the issue of getting honest answers when asking about environmental issues, as answers can reflect what they want to do but not what they actually do. When conducting surveys, it is difficult to get a representative sample and could present itself as a limitation in the research, since that would put into question the validity (Breidert et al. 2006). Another limitation can be the lack of knowledge of the emotional or nutritional state the participants were in when attending the experiment, for example thirstiness, hunger, fatigue, that can have an effect on the answers (Jiang et al. 2014).

However, even with the aforementioned limitations the results should be able to find a general tendency. If conducted in a satisfactory manner the methods could also be replicated in order to retrieve more data for further analysis.

4.6 Participants

The sampling strategy aims to include participants of different age, demographics, income and gender, by doing this I can see if there are any differences between the groups regarding their answers. The aim for this thesis was to include between 40 and 50 people in the experiment with different backgrounds to be able to draw any conclusions (Lawless & Heymann 2010).

In total 46 consumers participated in the experiment. They were recruited from the authors extended network and at the Swedish university of agricultural sciences, Alnarp campus. All participants conducted the entire experiment, which means all four surveys and two tastings.

4.7 Samples

For the test, it was decided that the participants knew it was seaweed that was tried and that it would be visible what they ate. The seaweed on trial was fresh and was rinsed for three minutes when taken out of the packaging before being presented. The same sample was used in both tasting tests and are produced in France and was supplied by the ICA group under the brand "*Gott liv*". Each participant was served a sample sufficient to two to three bites and were served in two small plastic cups, one in the blind condition and one in the informed condition. There was also tap water available for the participants to drink.

The experiments were conducted on four different dates and four different locations, one of them were conducted in Östra Greve and one in Karlskrona in a home environment, one were conducted at the Swedish university of agriculture sciences in Alnarp in the student union house and one was conducted at the consulting company ÅF in Malmö in one of their meeting rooms.

4.8 Data analysis

The data collected was analyzed by using MiniTab 17 with ANOVA and Tukey's test in general linear model. There were three conditions used in the overall perception (blind, expected and informed) while two conditions were used in the sensory profiling and willingness to pay (blind and informed). Paired t was used to compare the measures under different conditions. Tests and

comparison were conducted both between and within the different conditions P-values of the analyzed data in ANOVA were corresponded at a significance level $p < 0,05$.

The demographic overview, environmental overview and willingness to pay were sorted and presented with the use of Microsoft Excel.

5. Results

This section will go through the results from the experiment that was conducted. It will start with the demographic overview that provides information of the participants that took part of the experiment. This is followed by the responses of the environmental perspectives, how the participants perceived themselves and what was important for them when purchasing food. After this comes overview of the overall perception of liking and texture of the seaweed from the experiment. Followed by the emotional and sensory profiling, showing which emotional and sensory terms the participants used to describe the seaweed. Concluding this chapter is the participants' willingness to pay for seaweed based on demographic and environmental factors.

5.1 Demographic overview

5.1.1 Gender, age, education and income

The sample demographics are presented in Table 3. The sample had a slightly higher gender distribution towards females (59%). In terms of age, more than half of the participants were aged between 25 and 44 years old (61%), with the largest group being those aged 25 to 34 years old (37%). A majority of the sample had completed a university degree (54%) and 24% was studying a university degree. In terms of income 54 percent indicated that they earned at least 301 000 SEK while 28% indicated that they earned less than 100 000 SEK.

Table 3. Demographic overview

Variables	Groupings	Percentage (%)	No. of participants
Gender	Male	41%	19
	Female	59%	27
Age group	18-24	17%	8
	25-34	37%	17
	35-44	24%	11
	45-54	8%	4
	55-64	7%	3
	65<	7%	3
Highest level of education	Primary school	2%	1
	Secondary school	9%	4
	Certificate or diploma	9%	4
	University degree	52%	24
	Postgraduate degree	2%	1
	Ongoing education	26%	12
Yearly income (SEK)	0-100 000	28%	13
	101 000-200 000	7%	3
	201 000-300 000	11%	5
	301 000-400 000	20%	9
	401 000-500 000	17%	8
	501 000<	17%	8

5.1.2 Attitude towards consumption of seaweed

The attitude towards consumption of seaweed had a total average (n=46) of 7.33 on the 9-point scale, which shows that there was a positive attitude towards seaweed as food. When putting the answers in segments, depicted in Table 4, the results showed that females had a more positive attitude than males, with females scoring 0.88 higher than males on the scale. Within the age bracket those with the most positive attitude was between 18 to 24 (n=8) scoring 7.88 while those with the least positive attitude was between 45 to 54 (n=4) scoring 5.75, a difference of 2.13 on the 9-point scale. In the education segment those with the most positive attitude were those with an ongoing education with a score of 8.17 (n=12) while those with the least positive attitude were Others (including those finishing primary school, secondary school or have a certificate or diploma) (n=9) with a score of 6.08 making the difference between the group 2.09 on the scale. Finally, the income had a result which showed that the most positive were those earning between 201 000 and 400 000 (n=14) had a score of 7.86 while those least positive earned in the excess of 401 000 (n=16).

Table 4. Attitude towards consumption of seaweed

Variables	Groupings	Average	No. of participants
Gender	Male	6.79	19
	Female	7.67	27
Age group	18-24	7.88	8
	25-34	7.47	17
	35-44	7.82	11
	45-54	5.75	4
	55-64	6.33	3
	65<	6.00	3
Highest level of education	At least university degree	7.32	25
	Ongoing education	8.17	12
	Others	6.08	9
Yearly income (SEK)	0-200 000	7.56	16
	201 000-400 000	7.86	14
	401 000<	6.56	16

5.2 Environmental perspective

5.2.1 Gender

The total average of the environmental questions was above seven on the 9-point scale, Figure 4. The two questions with the highest average was where products are produced and locally produced, each rating above 7.6. For females locally produced reached the highest rating with 8.11, while males rated this question 7.11 meaning this was the question with the biggest difference between the genders. The men thought it was most important to eat healthy, with an average of 7.32, the only category where males had a higher rating than females who rated this question 7.22.

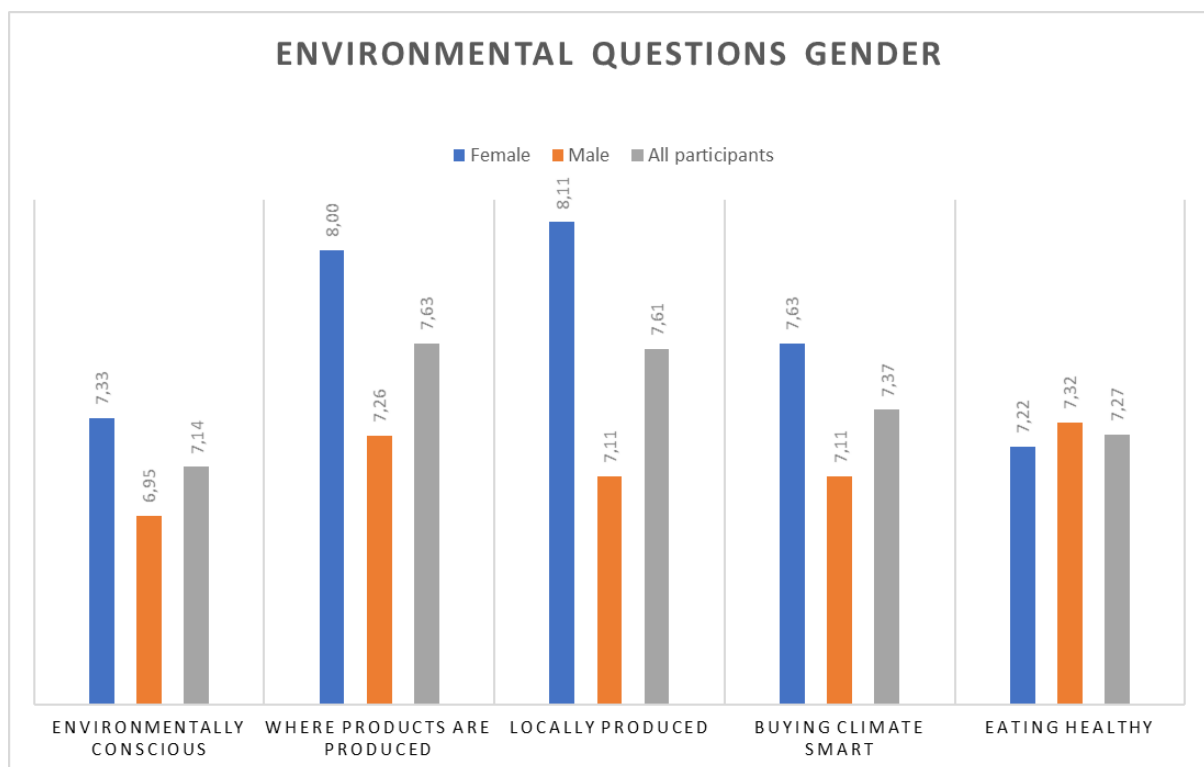


Figure 4. Column of environmental questions gender

5.2.2 Income

Income-wise those with an income between 0 and 200 000 SEK as well as those earning between 201 000 and 400 000 SEK rated locally produced as most important, while those earning more than 400 000 SEK rated eating healthy as most important when buying food, Figure 5. Those with an income of between 201 000-400 000 SEK had the highest rating across the board, with only the eating healthy question receiving a higher average of a different group. Those earning over 401 000 SEK rated lowest on all categories except for the eating healthy question.

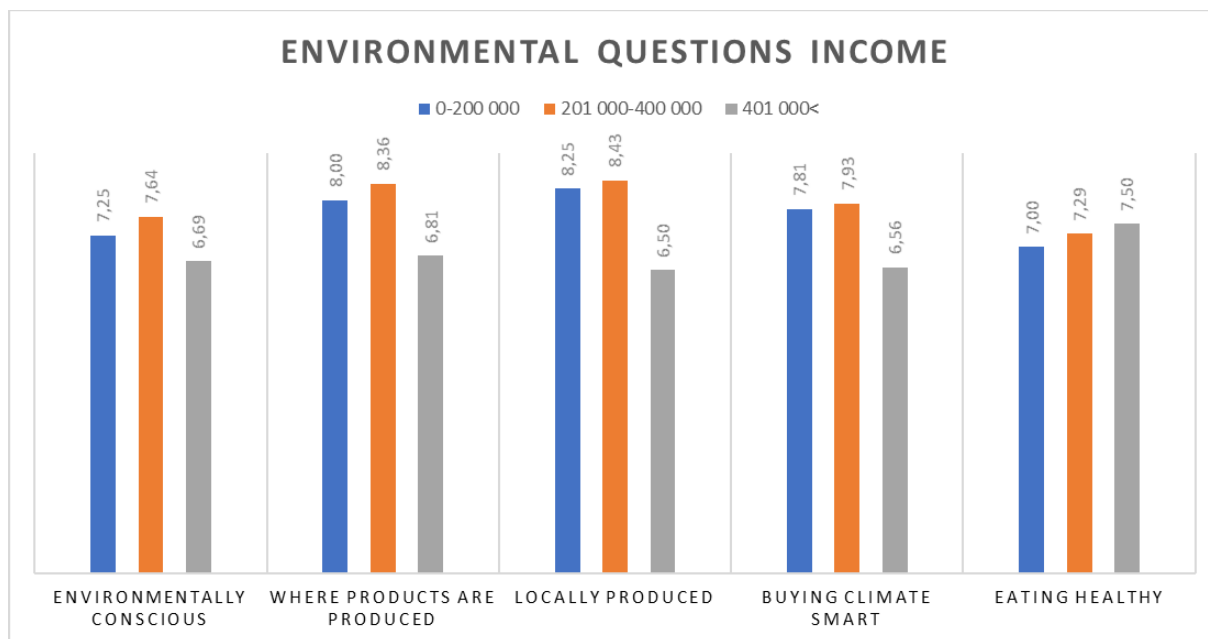


Figure 5. Column of environmental questions income

5.2.3 Education

When it comes to education those with at least a university degree and those with ongoing education rated eating healthy as most important when buying food while others (finished primary school, secondary school and a certificate or diploma) rated buying climate smart the highest, Figure 6. Under the category “Others” lowest on three out of the five categories environmentally conscious, where products are produced and eating healthy. Those with at least a university degree rated highest in three out of the five questions, environmentally friendly, where products are produced and locally produced.

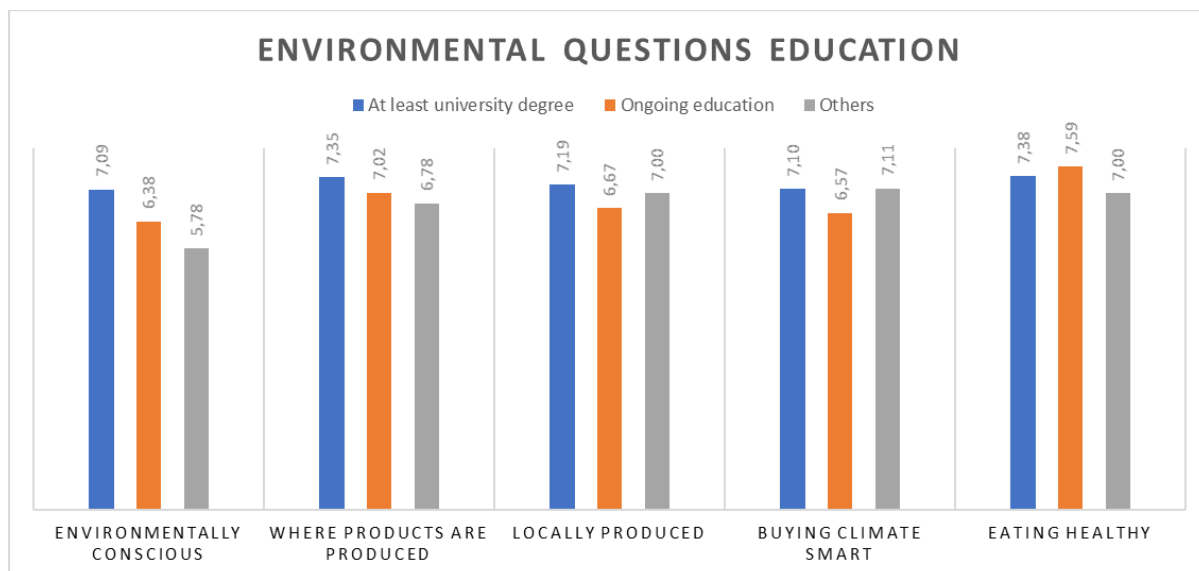


Figure 6. Column of environmental questions education

5.3 Overall perception of liking and texture across conditions

In the taste experiment, the “overall taste” and “texture” no significant differences were found between the blind, expected and informed conditions (p -value= >0.05), Table 5. Each of the different conditions scored just between 5 and 6 on the 9-point scale emerging as just below a liked product (mean liking score above 6=liked slightly). However, there was a significant difference in the “taste of ocean” between the conditions, where the information of the seaweed being produced in the Baltic Sea altering their perception of it. For the “aftertaste” a significant difference was found in the expected to blind condition, where participants expected the aftertaste in the Baltic Sea to be less liked.

Table 5. Blind, expected and informed mean liking scores for the seaweed. E-B denotes expected minus blind liking scores in p-value; I-B denotes informed minus blind liking scores in p-value; I-E denotes informed minus expected liking scores in p-value.

Questions	Blind	Expected	Informed	E-B	I-B	I-E
Overall taste	5.20 ^A	5.46 ^A	5.44 ^A	0.20	0.16	0.92
Texture	5.78 ^A	5.63 ^A	5.78 ^A	0.49	1	0.55
Taste of ocean	7.85 ^A	7.20 ^{AB}	7.26 ^B	*0.03	*0.01	0.81
Aftertaste	5.70 ^A	5.26 ^A	5.39 ^A	*0.05	0.16	0.47

^{A,B} Answers with different letters, within the row, are significantly different for their taste or texture perception during a specific condition (blind/expected/informed) ($p < 0.05$)

* depicts significant difference between the liking scores

5.4 Emotional profiles across blind and informed conditions

In general, the participants favored positive terms when describing the seaweed and there was no significant difference between the two conditions ($p\text{-value} > 0,05$), seen in Table 6. The most used word to describe the seaweed in both the blind (seaweed) and informed condition (the Baltic Sea seaweed) was surprised ($n=54$). In the table a difference between the conditions has been inserted to see the results of those participants who changed their emotions between the conditions where:

- Yes/Yes means they have put the same emotion on both conditions
- Yes/No means that the used the emotional term on the blind condition but not the informed one.
- No/Yes means that they have not used an emotional term on the blind condition but have used it in the informed.

Table 6. Frequency count for emotional terms and the distribution

Emotions	Total count for blind condition	Total count for informed condition			
			Yes/Yes	Yes/No	No/Yes
Worried ^N	7	6	6	4	3
Fear ^N	2	2	2	1	1
Disgust ^N	5	6	10	0	1
Discomfort ^N	12	12	16	4	4
Happy ^P	18	20	34	1	3
Enthusiastic ^P	24	19	34	6	3
Pleased ^P	18	23	29	3	9
Surprised ^P	27	27	42	6	6

^NNegative, ^PPositive classified emotions

For the negative terms only three of them were used by more than 10 participants, worried ($n=13$), disgust ($n=11$) and discomfort ($n=24$). The term disgust was checked by 10 participants on both conditions and only once had it been used on one but not the other. Worried and discomfort on the other showed differences between the two conditions, worried was used four times to express the seaweed in the blind condition while being used three times on the informed decision. Discomfort which was the most used negative term also showed differences between the conditions, were four participants used the term in the blind condition and not the informed one and another four participants who used the term on the informed condition but not the blind.

The positive terms which was more used in the study had two terms which more than 50 percent of the participants used, enthusiastic ($n=43$) and surprised ($n=54$). The terms which participants used differently was pleased where three used it to describe seaweed in the blind condition while nine used it to describe the informed condition, the other term was surprised where six used it in the blind and six used it in the informed.

5.5 Sensory profiling across blind and informed conditions

The frequency count for the sensory term selection under the blind and informed condition varied from 0 to 44, Table 7. In total 310 descriptive words were used in the blind condition and 301 in the informed condition. When comparing the two conditions results showed that the information did not have much influence on the sensory profiling. Significant difference was only found in smell of ocean (smell), bitter (taste), salty (taste), chewy (texture) and mushy (texture).

Table 7. Frequency count of the sensory terms

Descriptions	Frequency blind	Frequency informed
Smell of ocean	40 ^A	32 ^B
Colourful	18	18
Aftertaste	12	13
Watery	5	8
Sour	2	2
Smells nice	2	6
Healthy	21	21
Good	12	14
Chewy	15 ^A	22 ^B
Bitter	1 ^A	6 ^B
Fresh	8	11
Salty	44 ^A	38 ^B
Mushy	40 ^A	32 ^B
Crispy	10	5
Umami	9	7
Appetizing	9	8
Taste of ocean	42	39
Tasteless	3	1
Sweet	0	1
Fishy	17	17

^{A,B} Frequency of sensory terms with different letters are significantly different between the two conditions

5.6 Willingness to pay

There was no significance between the willingness to pay between the different conditions (p-value >0,05). The average willingness to pay, Figure 7, for all participants was 33.8 SEK for the seaweed in the blind condition and 32.3 SEK in the informed condition, a difference of 1.5 SEK. In the experiment, there were three non-buyers, those who put price zero on both conditions. These have been excluded in the statistics. Those participants consisted of two males and one female, one was in the “Others” segment regarding education and two were in the “At least university” segment. In income one earned 0-100 000, one 401 000- 500 000 and one 501 000<.

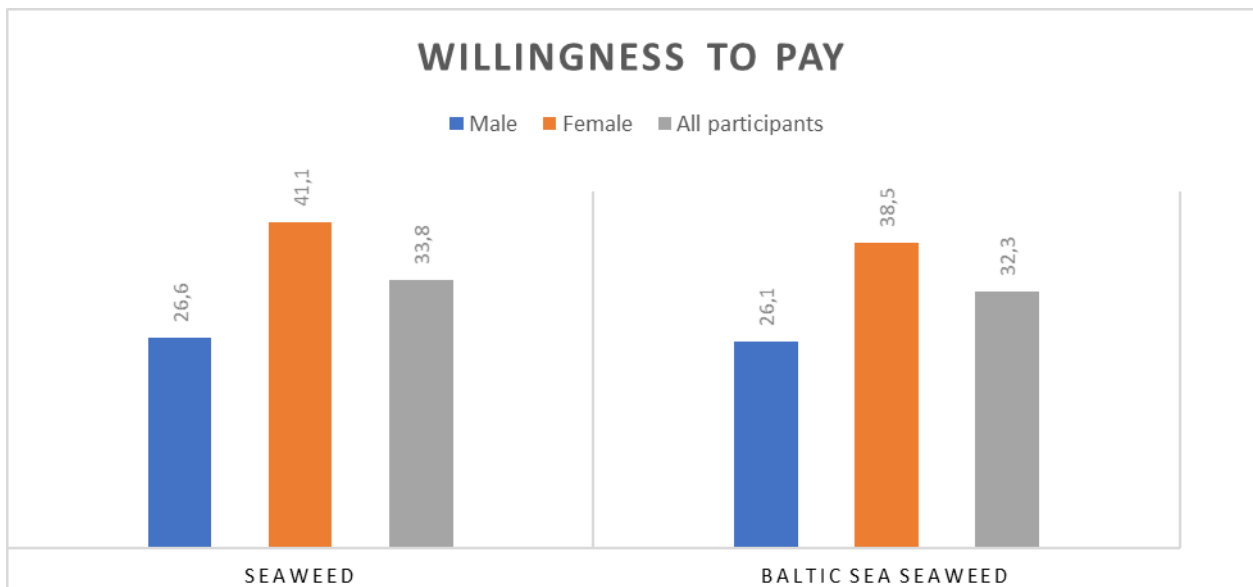


Figure 7. Column showing the average willingness to pay for all participants and the different genders

5.6.1 Gender

Genderwise significant difference were found between the genders in the blind condition, Table 8, females had a higher willingness to pay than males, a difference of 14.5 SEK. In the blind condition, while there was no significant difference between the genders in the informed condition, the difference in price was 12.4 SEK. Within the gender segment male had a difference of 0.5 SEK and women a 2.6 SEK difference between the different conditions, meaning no significant difference between the conditions. Both genders were willing to pay more for the seaweed in the blind condition than in the informed condition where they learnt that it was produced in the Baltic Sea.

Table 8. Average willingness to pay genderwise

	Female	Male	All participants
Blind	41.1 ^A	26.6 ^B	33.9
Informed	38.5	26.1	32.3

^{A,B} Prices with different letters are significantly different between the gender (p<0,05)

5.6.2 Education

For education, the willingness to pay was higher with at least university education (n=23) or on going studies (n=12) compared to those without, with a difference of at least 10 SEK and the ongoing studies had the highest willingness to pay, Figure 8. Worth mentioning was that those with ongoing studies were all students at the Swedish university of agricultural sciences. The results also showed that those labelled “Others” (n=8) were willing to pay more for the seaweed in the informed condition compared to the blind.

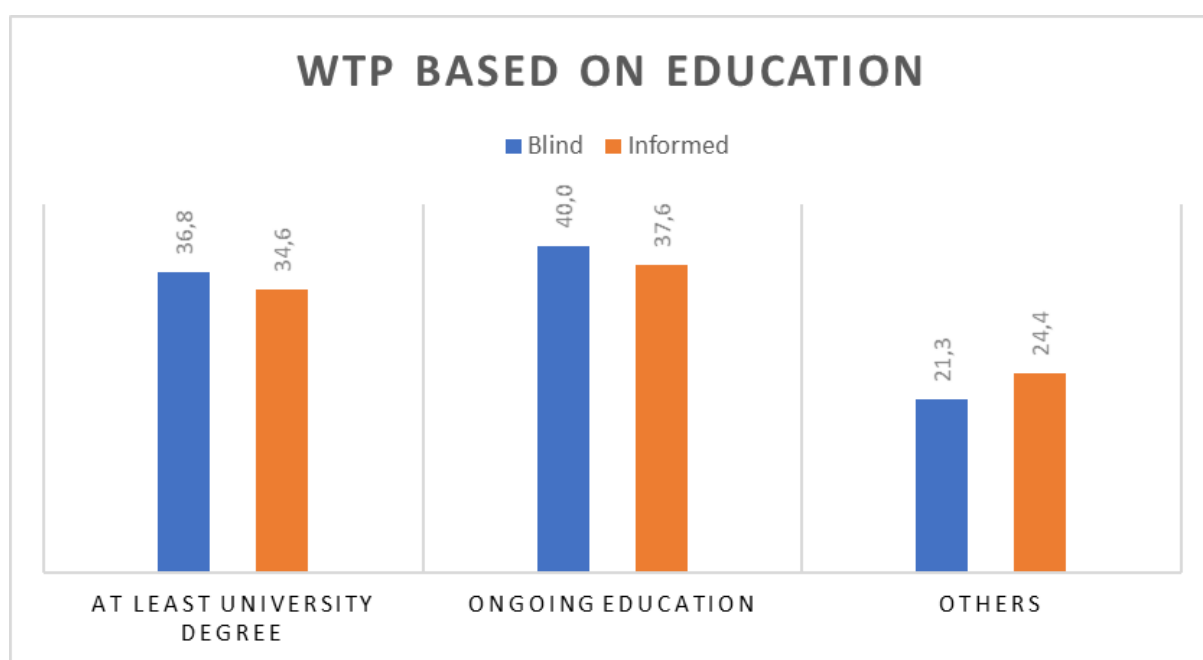


Figure 8. Column showing willingness to pay depending on education

Significant difference was found in the blind condition, Table 9, where those without university degree or currently studying were willing to pay a lower price than those with a university degree or ongoing studies. No difference was found between the conditions in the different segments.

Table 9. Average willingness to pay depending on education

	At least university degree	Ongoing education	Others
Blind	36.8 ^A	40 ^A	21.3 ^B
Informed	34.5	37.6	24.4

^{A,B} Prices with different letters are significantly different between the education ($p < 0,05$)

5.6.3 Income

Willingness to pay in correlation to income showed no significant difference between or within the two conditions. Those with income under 200 000 SEK were willing to pay the most followed by those with an income over 401 000 SEK, Figure 9. The results for the income groups show fairly high differences between the two conditions, with the price differences ranging from 1.4 to 2.3, the biggest difference was in the income bracket of 0-200 000 SEK.

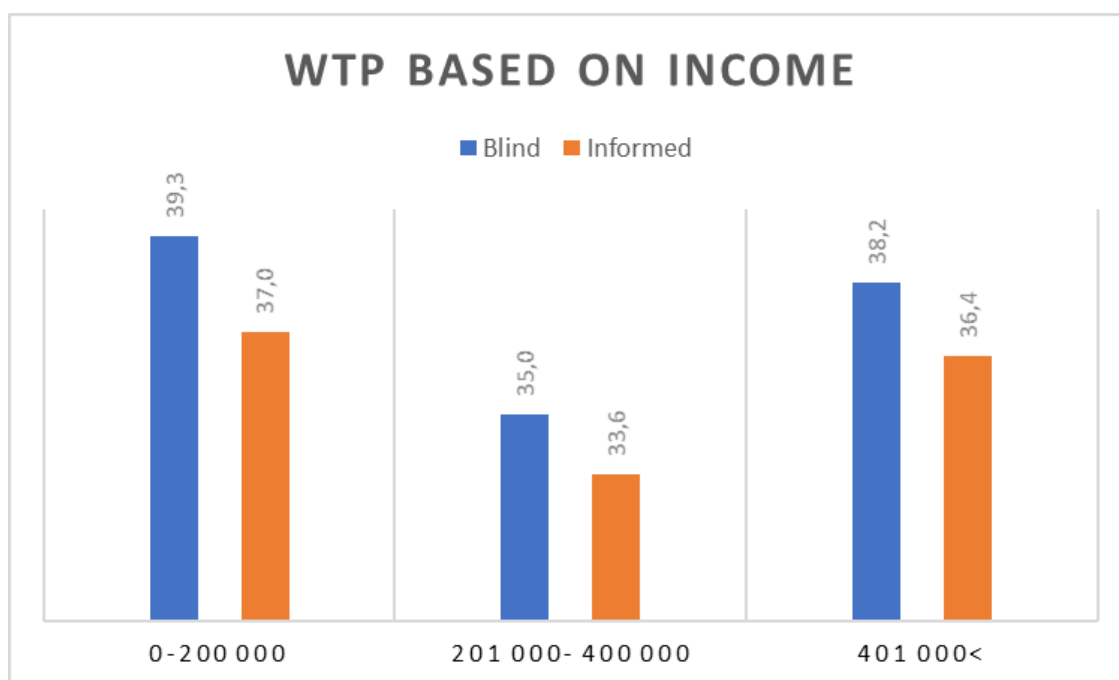


Figure 9. Average willingness to pay based on income

5.6.4 Likelihood of buying seaweed

When taking into account the likelihood of buying seaweed in the future there was a difference in the willingness to pay, Figure 10. In total 33 participants rated the likelihood of buying seaweed in the future at 5 or over, i.e. will likely buy, approximately 72 percent of the participants. They consisted of 13 males, 68 percent of the male participants, and 20 females, 74 percent of the female participants. The average willingness to pay for these participants was 39.7 SEK in the blind condition, an increase of 5.9 SEK or 17.3 percent compared to all the participants excluding the non-buyers, which had a WTP of 33. In the informed condition, the average was 38.3 SEK, an increase of 6 SEK or 18.7 percent compared to all the participants excluding the non-buyers. Within the genders males with a likelihood of buying seaweed in the future were willing to pay 33.1 SEK in the blind condition, an increase of 6.5 SEK or 24.5 percent compared to all male participants excluding the two non-buyers, and in the informed condition 32.7, an increase of 25.8 percent compared to all male participants. Females were willing to pay 44 SEK in the blind condition, an increase of 2.9 SEK or 7 percent compared to all female participants excluding the non-buyers, and in the informed 42 SEK, an increase of 3.5 SEK or 9 percent.

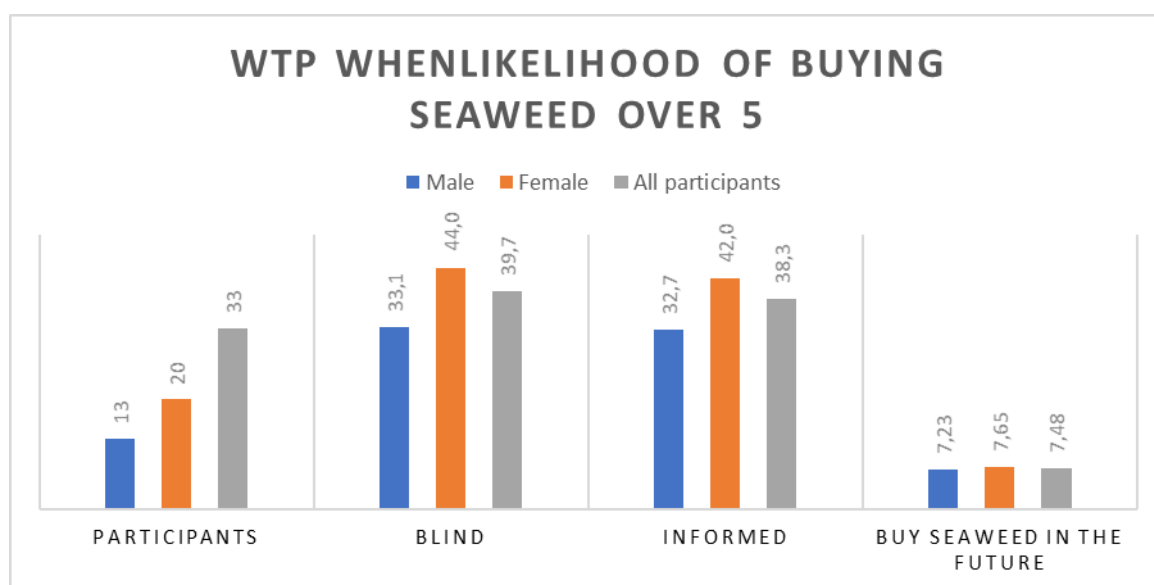


Figure 10. Average willingness to pay when participants rated likelihood of buying seaweed over 5. N=33, 69 percent of all participants

5.6.5 Difference in WTP between conditions

In total 21 participants changed the price of what they were willing to pay between the two conditions, Figure 11 and Figure 12, 10 respondents valued the seaweed in the blind condition higher with a difference of 17.5 SEK between the two conditions. Of all the participants 11 valued the seaweed in the informed condition higher with a difference of 8.6 SEK between the two conditions, 50 SEK for the Baltic Sea seaweed and 41.4 SEK for the seaweed with no information of origin. Those favoring the seaweed in the blind condition rated their knowledge of the Baltic Sea and its water quality higher as well as finding food from the Baltic Sea less safe than those valuing the seaweed in the informed decision higher. The participants with a higher willingness to pay in the blind condition also rated higher on likelihood of buying seaweed in the future. This group had a difference in price between the conditions of 17.5 SEK.

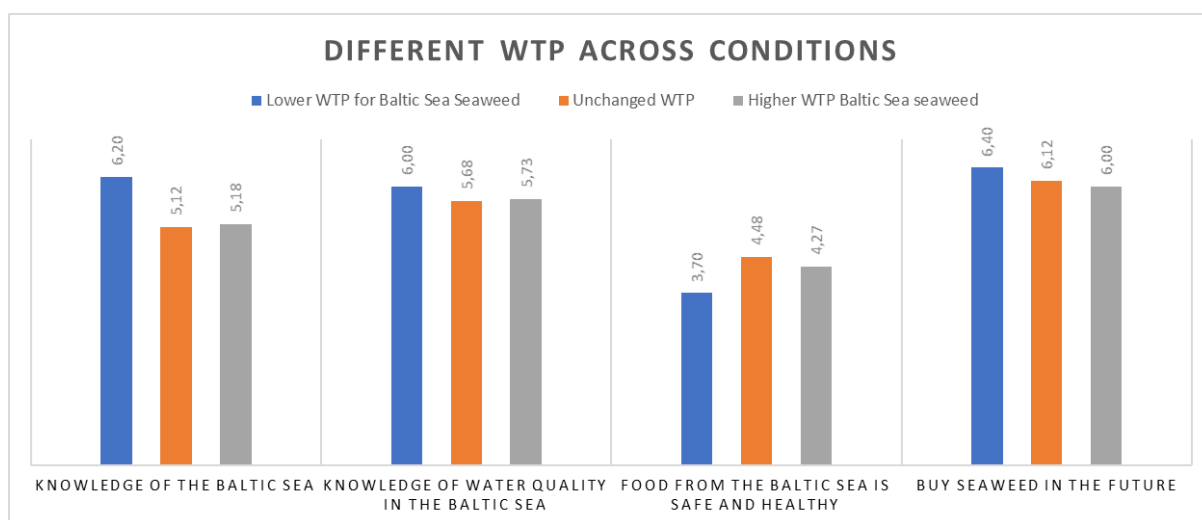


Figure 11. Different knowledge of the Baltic Sea and buying seaweed in the future

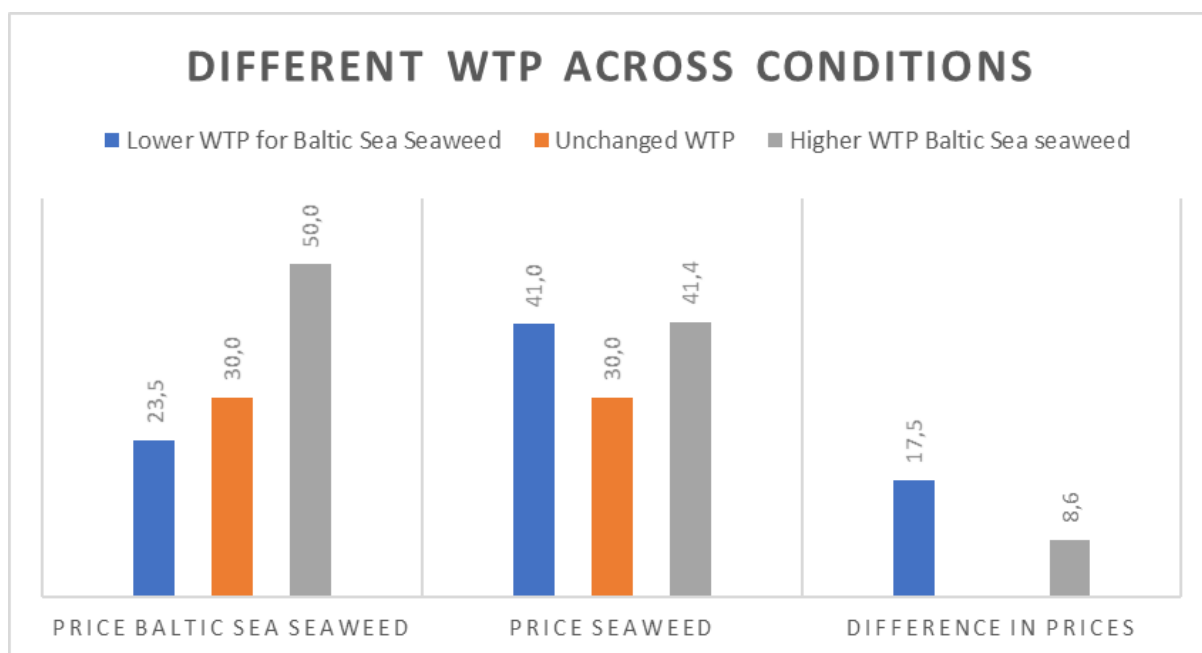


Figure 12. Different WTP across conditions

6. Discussion and conclusion

It has been shown in both this thesis and other surveys (Livsmedelsföretagen 2015; Statistics Sweden 2014), that consumers value environmental variables when purchasing food, as organic and locally produced food is increasing in sales and is being prioritized. The results in the experiment displayed high average rating on all environmental questions with an average of over seven on the nine-point scale. The two questions that rated highest was “where the products were produced” and “locally produced”, which would speak favorably towards seaweed grown in the Baltic Sea. However, one variable which plays a role when it comes to new products is food neophobia, where fear and disgust of unknown food has psychological effects on food choices (Al-Shawaf et al. 2015). This could have influenced the results of this study and the underlying psychological factors for consumer choices and drivers regarding willingness to pay for seaweed.

The participants in this study rated “food from the Baltic Sea is safe and healthy” low, with an average of 4.15 on the nine-point scale. The ocean is considered unwell by not only the participants but on many levels in society, this is shown by the European Union and the Swedish government programs to improve its health, mitigate eutrophication and for it to recuperate. Seaweed has been singled out as a potential mitigating factor with its ability to accumulate excess nutrients and be withdrawn from the Baltic Sea. Projects are in place to make use of seaweed in Sweden, both converting into biogas and to use it as fertilizer (Seafarm 2016), another use of converting it into food is being researched. By looking at the possibility to sell it for consumption would also be a strong beneficial factor for another more global issue, feeding the increasing population. Sustainable food production and consumption is seen as necessary when feeding the world (FAO 2006). To produce food locally and in places not currently utilized will have positive environmental effects. However, as there are risks that seaweed contract heavy metal when grown, the production needs to be monitored closely but by using research already available there is potential for seaweed to be grown in the Baltic Sea that pose no threat to human health (Besada et al. 2009).

In agroecology, a central part is ecosystem, a functional system of complementary relations between organisms and their environment (Gliessman 2015). Agroecology also promotes locality and to bring the food closer to the consumer, limiting the transportation and regional food self-sufficiency (Gliessman 2015). The growing of seaweed would be in accordance of these principles of food production system as there is no need of external inputs in the growing process, the food is produced locally and increase the regional food production output. There could be a discussion if the excess nutrients will be removed in the future then external inputs could be needed to grow the seaweed, however it is unknown if this will be compensated by nature otherwise.

The results in this study with a diverse group of participants indicated that seaweed produced in the Baltic Sea was valued lower compared to the seaweed where there was no information of origin. There was no significant difference found in the overall taste and texture but there was in ocean taste and aftertaste. The significant differences were found in the aftertaste

between the blind and expected condition and for the ocean taste between blind and expected as well as blind and informed, this could potentially be that participants had knowledge of the brackish water in the Baltic Sea which could alter their perception of the ocean taste and aftertaste. Another reason could be the assimilation effect that explains the psychological role, where a product difference, in this case the Baltic Sea, altered the perceived taste rather than the sensory profile of the product (Deliza 1995).

The emotional terms showed no significant difference between the two conditions. The results did show that the participants used more positive than negative terms when describing the emotions connected to the seaweed under both the blind and informed condition, which was in line with other sensory studies (Schouteten et al. 2016). This could be explained by the phenomenon called “hedonic asymmetry” that means that people prefer positive terms rather than negative ones when describing food experiences during or right after eating (Jiang et al. 2014).

The sensory profiling showed that the information did not have much influence on the answers. There was only significant difference in “smell of ocean”, “bitter”, “salty”, “chewy” and “mushy”. The result in “bitter”, “smell of ocean” and “salty” was in line with the significant difference in the question regarding “taste of ocean” which was explained earlier as it was the seaweed in the blind condition which scored higher than the Baltic Sea seaweed. That would potentially have the same explanation with the knowledge of brackish water causing an assimilation effect. The texture of the seaweed in the blind test was also considered mushier than the Baltic Sea seaweed while that seaweed was seen as chewier. The texture was according to a report from FAO (2010) one of the least liked attributes for consumers when consuming seaweed and as the overall liking of the texture barely rated six on the nine-point scale these could reflect the seaweed in a negative way, meaning that the Baltic Sea seaweed was considered less liked.

The average willingness to pay for seaweed was 33.9 SEK in the blind condition and 32.3 SEK in the informed condition. Falling well below the actual price of the seaweed which was 47-48 SEK, however that might have changed if the actual price was revealed in the test or if there was comparison between other similar products (Foreit et al. 2004). In the experiment, there were three non-buyers, meaning that they were not willing to pay anything in either condition. These three participants also rated their attitude towards seaweed for consumption as low and rated the overall taste of the seaweed as one, the lowest on the scale. Females were willing to pay more than males for seaweed, both in the blind and informed condition with a significant difference in the blind condition. This is in accordance with the environmental questions where females scored higher in environmentally conscious and buying climate smart. This could also be that males are more food neophobic, results showed that “attitude towards seaweed” was lower for males, 6.79 for males compared to 7.67 for females. That could point towards a difference in the fear of new foods, where females are more open-minded. The same can be said regarding age where those between 18 and 44 rated the attitude towards seaweed between 7.47 and 7.88 on the scale while those aged 45 and above rated the same question between 5.75 and 6.33. That younger people are more open to novel food has also been shown in other studies

(Zepeda & Deal 2009). The participants were however not willing to pay more for the Baltic Sea seaweed even though all participants valued knowledge of product origin and locally produced products high, the reason could be that the participants rated low on the question “Food from the Baltic Sea is safe and healthy”, an average of 4.27 on the nine-point scale. This could be caused by the participants’ perception that the seaweed from the Baltic Sea is of a lesser quality and could be harmful for the health if consumed.

According to the Alphabet theory (Zepeda & Deal 2009) consumer behavior is linked with the values, norms and beliefs and these are linked with knowledge and information seeking, even though no question were asked regarding the interest in the subject there could be a correlation with the experience of information seeking that university education gives and the interest to know more and the education level showed a significant difference in the willingness to pay. Income-wise those with the income of 0-200 000 SEK were willing to pay more than the other segments followed closely by those with an income over 401 000 SEK but no significant difference was shown between the different segments. Education and income has a correlation here as those with an ongoing education fall under the first category while those over 401 000 SEK usually had a university degree. Other research also found that those with a higher income were willing to spend more food considered sustainable (Lundberg & Niemi 2017). The fact that the experiment included students from an agricultural university could have affected the results of the willingness to pay. It would be beneficial to include students from other non-agricultural universities to see if the results would be different.

A total of 21 participants out of the 46 changed the price between the conditions, these were the results which showed the difference between seaweed produced in the Baltic Sea or somewhere else. The findings were that those who had more knowledge of the Baltic Sea valued the seaweed produced in it lower compared to the seaweed in the blind condition. This also supports the Alphabet theory where knowledge played a part in the decision behavior.

Further research should include a larger group of participants for the experiment but also focus groups. Working with a focus group could narrow down the emotional and sensory terms and make them more fitting to seaweed. I believe it would be beneficial to have semi-structured interviews as well to be able to garner information which cannot be extracted from a survey. Another suggestion would be to have more preparation of the seaweed, as it could be that the participants in this thesis could not visualize the seaweed in dishes but only saw it as served after only being rinsed. Questions regarding more knowledge of the Baltic Sea could also be included, such as knowledge of the brackish water, as some results were difficult to confirm without that knowledge. In order to get a better willingness-to-pay it would be recommended to put other products more known to compare. For example, “Are you willing to pay more for seaweed than this product?”, this would get a better indication of price as prices on seaweed seemed hard to appreciate the price.

In conclusion, it would be recommended that it is better to not sell seaweed that is produced from the Baltic Sea, as the seaweed that did not have origin information commanded a higher price. Labelling the seaweed with country of origin Sweden could possibly increase the price

but there could be a risk that information came out that it would be from the Baltic Sea. This could create associations with pollution and heavy metals which could deter consumers from buying it. The risk would be higher to label the seaweed as produced in the Baltic Sea than other seaweed and can potentially hurt seaweed sales over a period of time, i.e. that seaweed could pose a threat to human health as it can contain pollutants, toxins or heavy metals. It can be seen in the results that those willing to pay more for the Baltic Sea seaweed only had a price difference of 8.6 SEK between the two conditions, while those willing to pay less for the Baltic Sea seaweed had a price difference of 17.5 SEK between the conditions. Thus, making the seaweed more likely to succeed on the market. However, this might change over time if more information is spread regarding sustainable consumption and the need for alternative solutions, such as the growing of seaweed in the Baltic Sea. Using agroecological principles does improve the environment and is starting to be implemented in food production systems. There is a need for more research, not only on the production, but on the marketing strategies and information spreading to get a better understanding how we can present novel foods to new markets. It has been shown in this study that the need is there, even though the work done in this thesis is not conclusive it gives an indication on the issues facing the value of saving the environment. In the majority of the segments research the willingness to pay for the Baltic Sea seaweed was lower, and this indicates the need for change. More information about the positive effects of some products can have on the environment is needed. If this is done there is potential for consumers to see the value of consuming sustainably and in the process, help the Baltic Sea.

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Appendix

Allmänna frågor/ *General questions*

1. Kön/ *Gender*

- a. Man/ *Male*
- b. Kvinna/ *Female*

2. Födelseår/ *Birth year*

3. Postnummer/ *Postal code*

4. Utbildning/ *Education*

- a. Grundskola/ *Primary school*
- b. Gymnasium/ *Secondary school*
- c. Universitet/ *University*
- d. Forskarutbildning/ *Postgraduate degree*
- e. Yrkesutbildning/ *Certificate or diploma*
- f. Pågående utbildning/ *Ongoing education*

5. Inkomst (SEK)/ *Yearly income (SEK)*

- a. 0-100 000
- b. 101 000- 200 000
- c. 201 000- 300 000
- d. 301 000- 400 000
- e. 401 000- 500 000
- f. 501 000<

6. Vad är din inställning till att äta alger?/ *What is your attitude towards consumption of seaweed?*

Väldigt negativ /Very negative										Väldigt positiv/ Very positive
	1	2	3	4	5	6	7	8	9	

Test 1.

Du skall nu få smaka på ett prov med alger. Denna alg kallas för "havssallat" och kan inhandlas i vanliga dagligvarubutiker. Smaka på provet och fyll svara sedan på följande frågor./ *You are now about to taste a sample of seaweed. This seaweed is called "sea lettuce" and can be found in local supermarkets. Taste the sample and answer the following questions.*

Ange på skalan 1-9 hur väl algernas egenskaper tilltalar dig./ *Rate of the scale of 1-9 how well the seaweed attributes pleases you.*

1. Markera med ett kryss på skalan hur du upplever algernas smak./ *Check the box on the scale how you find the taste of the seaweed.*

Inte god alls/ <i>Not tasty at all</i>										Mycket god/ <i>Very tasty</i>
	1	2	3	4	5	6	7	8	9	

2. Hur upplever du konsistensen./ *How do you perceive the texture*

Tycker inte alls om konsistensen/ <i>Do not like the texture at all</i>										Tycker mycket om konsistensen/ <i>Like the texture a lot</i>
	1	2	3	4	5	6	7	8	9	

3. Hur upplever du "smak av hav"?/ *How do you experience the "taste of ocean"?*

Smakar inte alls hav/ <i>Does not taste like ocean at all</i>										Smakar mycket hav/ <i>Has a strong taste of ocean</i>
	1	2	3	4	5	6	7	8	9	

4. Hur bedömer du eftersmaken?/ *How do you rate the aftertaste?*

Inte god alls/ <i>Not good at all</i>										Mycket god/ <i>Very good</i>
	1	2	3	4	5	6	7	8	9	

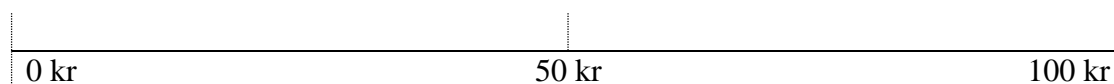
5. a) Nedan följer ett antal ord som beskriver känslor. Kryssa i de uttryck som beskriver din känsla av att äta algerna/ *Below you can find a number of terms that describes emotions. Check the terms which describes your emotion of consuming seaweed.*

Orolig/ <i>Worried</i>	Glad/ <i>Happy</i>
<input type="checkbox"/>	<input type="checkbox"/>
Rädsla/ <i>Fear</i>	Entusiastisk/ <i>Enthusiastic</i>
<input type="checkbox"/>	<input type="checkbox"/>
Avsky/ <i>Disgust</i>	Nöjd/ <i>Pleased</i>
<input type="checkbox"/>	<input type="checkbox"/>
Obehag/ <i>Discomfort</i>	Överraskad/ <i>Suprised</i>
<input type="checkbox"/>	<input type="checkbox"/>

5. b) Kryssa i de beskrivningar du känner efter att ha smakat algerna/ *Check the descriptions you sense after tasting the seaweed*

Havslukt/ <i>Smell of ocean</i>	Färgrik/ <i>Colorful</i>	Eftersmak/ <i>Aftertaste</i>	Vattnig/ <i>Watery</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surt/ <i>Sour</i>	Luktar gott/ <i>Smells nice</i>	Hälsosamt/ <i>Healthy</i>	Bra/ <i>Good</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Segt/ <i>Chewy</i>	Beskt/ <i>Bitter</i>	Fräsch/ <i>Fresh</i>	Salt/ <i>Salty</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mossigt/ <i>Mushy</i>	Krispigt/ <i>Crispy</i>	Umami (metalliskt)/ <i>Umami (metallic)</i>	Söt/ <i>Sweet</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aptitligt/ <i>Appetizing</i>	Smakar hav/ <i>Taste of ocean</i>	Smaklöst/ <i>Tasteless</i>	Fisk/ <i>Fishy</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Antag att algerna säljs i ett paket på 75 gram i butik och det räcker till ca 4 måltider.
 Ange på skalan från 0-100 kronor vad du skulle vara villig att betala för ett paket alger./
Assume the seaweed is sold in packages containing 75 grams in a store and is enough for 4 meals. Mark on the scale of 0-100 what you would be willing to pay.



Ange priset du valt på skalan i siffror/ *Write the price you have chosen on the scale in numbers:*_____

Smaka *inte* på provet förrän du fått instruktioner om det!/ *Do not taste the sample until you have received instructions to do so!*

Framför dig har du ett prov med alger som har producerats i Östersjön på Sveriges östkust.. ”Havssallat” växer genom att använda den näring som finns i vattnet. Östersjön är ett hav som har överskott på näringsämnen. Algproduktionen kan fånga upp överskott av näring i Östersjön och därmed förbättra vattenkvaliteten./ *In front of you is a sample of sea lettuce that has been produced in the Baltic Sea on the East coast of Sweden. Sea lettuce grows by using the nutrients already present in the water. The Baltic Sea is an ocean that has an excess of nutrients. The production of seaweed can mitigate the excess nutrients in the Baltic Sea and improve the water quality*

Ange på skalan 1-9 hur väl du tror smaken tilltalar dig/ *Rate of the scale of 1-9 how well the seaweed taste please you.*

1. Hur förväntar du dig smaken hos algerna? / *How do you expect the taste of the seaweed*

Inte god alls/ <i>Not tasty at all</i>										Mycket god/ <i>Very tasty</i>
	1	2	3	4	5	6	7	8	9	

2. Hur förväntar du dig konsistensen? / *How do you expect the texture*

Tycker inte alls om konsistensen/ <i>Do not like the texture at all</i>										Tycker mycket om konsistensen/ <i>Like the texture a lot</i>
	1	2	3	4	5	6	7	8	9	

3. Hur förväntar du dig smaken av hav? / *How do you expect the “taste of ocean”?*

Smakar inte alls hav/ <i>Does not taste like ocean at all</i>										Smakar mycket hav/ <i>Has a strong taste of ocean</i>
	1	2	3	4	5	6	7	8	9	

4. Hur förväntar du dig eftersmaken? / *How do you expect the aftertaste?*

Inte god alls/ <i>Not good at all</i>										Mycket god/ <i>Very good</i>
	1	2	3	4	5	6	7	8	9	

Test 2.

Du skall nu smaka på provet. Ange på skalan 1-9 hur väl du tror smaken tilltalar dig/ *You should now taste the sample. Rate on the scale from 1-9 how the taste please you*

1. Bedöm smaken hos algerna/ *Rate the taste of the seaweed*

Inte god alls/ <i>Not tasty at all</i>										Mycket god/ <i>Very tasty</i>
	1	2	3	4	5	6	7	8	9	

2. Hur upplever du konsistensen/ *How do you perceive the texture*

Tycker inte alls om konsistensen/ <i>Do not like the texture at all</i>										Tycker mycket om konsistensen/ <i>Like the texture a lot</i>
	1	2	3	4	5	6	7	8	9	

3. Hur upplever du "smak av hav"? / *How do you experience the "taste of ocean"?*

Smakar inte alls hav/ <i>Does not taste like ocean at all</i>										Smakar mycket hav/ <i>Has a strong taste of ocean</i>
	1	2	3	4	5	6	7	8	9	

4. Hur bedömer du eftersmaken? / *How do you rate the aftertaste?*

Inte god alls/ <i>Not</i>										Mycket gott/
	1	2	3	4	5	6	7	8	9	

good at
all

Very
good

5. a) Nedan följer ett antal ord som beskriver känslor. Kryssa i de uttryck som beskriver din känsla av att äta algerna/ *Below you can find a number of terms that describes emotions. Check the terms which describes your emotion of consuming seaweed.*

Orolig/ *Worried*

☐

Glad/ *Happy*

☐

Rädsla/ *Fear*

☐

Entusiastisk/ *Enthusiastic*

☐

Avsky/ *Disgust*

☐

Nöjd/ *Pleased*

☐

Obehag/ *Discomfort*

☐

Överraskad/ *Surprised*

☐

- 5.b) Kryssa i de beskrivningar du känner efter att ha smakat algerna/ *Check the descriptions you sense after tasting the seaweed*

Havslukt/ *Smell of ocean*

☐

Färgrik/ *Colorful*

☐

Eftersmak/ *Aftertaste*

☐

Vattnig/ *Watery*

☐

Surt/ *Sour*

☐

Luktar gott/ *Smells nice*

☐

Hälsosamt/ *Healthy*

☐

Bra/ *Good*

☐

Segt/ *Chewy*

☐

Beskt/ *Bitter*

☐

Fräsch/ *Fresh*

☐

Salt/ *Salty*

☐

Mossigt/ *Mushy*

☐

Krispigt/ *Crispy*

☐

Umami (metalliskt)/ *Umami (metallic)*

☐

Söt/ *Sweet*

☐

Aptitligt/ *Appetizing*

☐

Smakar hav/ *Taste of ocean*

☐

Smaklöst/ *Tasteless*

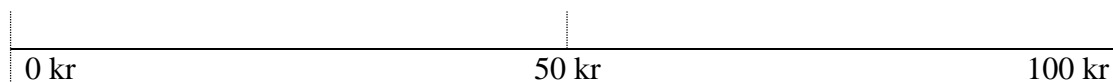
☐

Fisk/ *Fishy*

☐

6. Antag att algerna som är producerade i Sverige i Östersjön säljs i ett paket på 75 gram i butik och det räcker till 4 måltider. Ange på skalan från 0-100 kronor vad du skulle vara villig att betala för ett paket alger. / *Assume the seaweed is sold in packages*

containing 75 grams in a store and is enough for 4 meals. Mark on the scale of 0-100 what you would be willing to pay.



Ange priset du valt på skalan i siffror/ Write the price you have chosen on the scale in numbers: _____

Nedan följer ett antal frågor, kryssa i skalan från 1-9 hur väl du håller med påståendena/
Below is a series of questions, check the boxes in the scale from 1-9 regarding how well you agree with the statements.

7. Jag är miljömedveten/ I am environmentally conscious

Håller inte med alls/ Do not agree at all	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7</td> <td style="text-align: center;">8</td> <td style="text-align: center;">9</td> </tr> </table>										1	2	3	4	5	6	7	8	9	Håller helt med/ Totally agree
1	2	3	4	5	6	7	8	9												

8. Det är viktigt för mig att veta var produkterna är producerade/ It is important for me to know where products are produced

Håller inte med alls/ Do not agree at all	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7</td> <td style="text-align: center;">8</td> <td style="text-align: center;">9</td> </tr> </table>										1	2	3	4	5	6	7	8	9	Håller helt med/ Totally agree
1	2	3	4	5	6	7	8	9												

9. Det är viktigt med närproducerad mat/ It is important to buy locally produced food

Håller inte med alls/ Do not agree at all	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7</td> <td style="text-align: center;">8</td> <td style="text-align: center;">9</td> </tr> </table>										1	2	3	4	5	6	7	8	9	Håller helt med/ Totally agree
1	2	3	4	5	6	7	8	9												

10. Det är viktigt för mig att handla klimatsmart mat/ It is important for me to buy climate smart food

Håller inte med alls/ Do	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> <td style="width: 10%; height: 20px;"></td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7</td> <td style="text-align: center;">8</td> <td style="text-align: center;">9</td> </tr> </table>										1	2	3	4	5	6	7	8	9	Håller helt med/
1	2	3	4	5	6	7	8	9												

<i>not agree at all</i>		<i>Totally agree</i>
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11. Det är viktigt för mig att äta hälsosamt/ *It is important for me to eat healthy*

Håller inte med alls/ <i>Do not agree at all</i>										Håller helt med/ <i>Totally agree</i>
	1	2	3	4	5	6	7	8	9	

12. Jag har stor kännedom om Östersjön/ *I have great knowledge about the Baltic Sea*

Ingen kännedom alls/ <i>No knowledge at all</i>										Väldigt stor kännedom/ <i>Have great knowledge</i>
	1	2	3	4	5	6	7	8	9	

13. Jag är medveten om Östersjöns vattenkvalité/ *I am aware of the Baltic Sea water quality*

Inte alls medveten/ <i>Not aware at all</i>										Väldigt medveten/ <i>Very aware</i>
	1	2	3	4	5	6	7	8	9	

14. Mat från Östersjön (ex. fisk, skaldjur) är säker och hälsosam/ *Food from the Baltic Sea (e.g. fish, shellfish) is safe and healthy*

Håller inte alls med/ <i>Do not agree at all</i>										Håller helt med/ <i>Totally agree</i>
	1	2	3	4	5	6	7	8	9	

15. Hur troligt är det att du kommer köpa alger i framtiden/ *How likley are you to buy seaweed in the future*

Inte troligt alls/ <i>Not likley at all</i>										Väldigt troligt/
	1	2	3	4	5	6	7	8	9	

*Very
likely*