

Introducing Seaweed as a Part of the New Nordic Diet

Considerations to be taken into account when designing for the introduction of a new ingredient

Henrikke Øijord Haugan
Department of Product Design
Norwegian University of Science and Technology

ABSTRACT

The way in which the human race is over utilizing natural resources makes it necessary to change the way we eat. Seaweed is proposed as a part of the New Nordic Diet, as a sustainable and healthy protein and nutrient source. Except for a few Nordic regions where its use has been traditional, seaweed not a well-known ingredient in the Western world. Utilizing the perspectives of 'social practice theory', 'the behaviour change wheel' and 'nudging', this article explores considerations that should be taken into account when designing for the introduction of a new ingredient, such as seaweed. The article provides an overview of said perspectives, and a case study exploring the attempt to introduce seaweed into the diet of 6 Norwegians in the age 22-32, is described. The case study finds that introducing seaweed in a normalized fashion, and providing enough knowledge for the use and preparation of it, is essential for the will to initiate and continue the use.

KEYWORDS: New Nordic, Seaweed, Social Practice Theory, Design, Behaviour Change, Nudging

1. INTRODUCTION

The way the human race is over utilizing natural resources is not sustainable. Growth in the human population, pollution, overexploitation of land and lack of freshwater is emptying our common food storage, and is thought to encourage the use of alternative food sources, such as seaweeds [1]. There is not enough food to sustain the world's population today, and the problem will only increase with the current development. We need to change the way we consume and eat [2], we need to behave more sustainably.

In 2004, the ten point New Nordic Kitchen Manifesto was drawn up, focusing on sustainability, as well health, gastronomic potential, and Nordic identity [3]. As a result of this, the OPUS (Optimal well-being, development, and health for Danish children through a healthy

New Nordic Diet) project has since 2009 been investigating whether it is possible to develop a healthy diet that bridges gastronomy, health, and sustainability, and aims to define and test a New Nordic Diet (NND). As a part of the NND, seaweed is proposed as an alternative nutrition source, for reasons including sustainability, health and gastronomy. Seaweed as a source of nutrition has been mostly overlooked in the Western world, except for a few Nordic regions where its use has been traditional [4].

The influence of design on human behaviour has been recognised for some time, and there is a common acceptance that design can create both desirable as well as undesirable change, both intentionally and unintentionally. However, design for *behaviour change* has only recently been recognised formally in the last decade [5]. Referring to Fabricant [6], Lockton et al. [7, p.2]

argue that while there is growing recognition that 'designers are in the behaviour business', there is little general guidance available for designers who are aiming for influencing user behaviour.

However, there is increasing recognition that interventions to change behaviour should draw on theories of behaviour and behaviour change in their development [8]. When trying to understand behaviour, there are multiple schools of thought. The main distinctions can be said to be between individualist-rational theories, contextual theories, and the 'middle-ground' theories [5].

This article will look at how insights from two middle ground theories; social practice theory and behavioural wheel model, and one tool from contextual theory (choice architecture); nudging, can provide general considerations to be taken into account when designing for the introduction of a new ingredient.

Firstly, in section 2 and 3, the new Nordic diet and seaweed as food is explored. Next, section 4 provides information about ways of understanding behaviour change. It also explains the reason for choosing the theories described in this article. In section 5, the article goes into some depth describing social practice theory, and how it treats behaviour change. Section 6 explains the behavioural wheel, and the theory on which it is built. In section 7 nudging is given a brief explanation, and section 8 presents the case study. In the case section, an attempt to introduce seaweed (in dried, whole form, not granulated or powdered) into the diet of six Norwegians is described. Lastly, section 9 and 10 provide a discussion and a conclusion, summarizing the findings in this article.

1.1 Methods

This paper reviews literature from various research domains, mainly social sciences research, but also design research on behaviour change. The point of departure for this review was the articles 'Guidelines for the new Nordic diet' [4], 'Practicing behaviour change: Applying social Practice theory to pro- environmental behaviour change' [9] and 'The behaviour change wheel: A new method for characterizing and designing

behaviour change interventions' [10]. Additional articles were chosen based on their relevance, and whether they provided an interesting perspective on the introduction of new ingredients, or on behaviour change. The main keywords that have been used in the search for literature include, but are not limited to: 'new Nordic diet', 'practice theory', 'food habits', 'designing for new habits', 'behaviour change', 'Behaviour change theories', 'nudging'.

To get insight from practice [11], a case study is included. The case study was conducted as part of a student project, and only relevant findings will be discussed in this paper. The goal of the case study was to identify how the subjects felt about introducing seaweed as a part of their diet, and to test how different strategies based on insight from nudging, behaviour change interventions (the behaviour wheel), and social practice theory would affect the result. The case study was performed in two parts; the first part tested whether 15 people would eat seaweed when presented with it as an unintrusive dish part of a tapas table. The next part, tested whether six people randomly chosen from the first part, when equipped with seaweed samples and different kinds of background stories and information about how it could be prepared, would prepare and eat it. All participants were recruited through the author's expanded social network, and aged between 22-32, as this demographic group, the millennials, are the group considered most open to change [12].

2. NEW NORDIC

Over the last twenty years a New Nordic Cuisine (NNC) has been developed in Scandinavia, and has gained tremendous respect throughout the world because of its gastronomically excellent meals based on Nordic foods [4]. In 2004 a five point New Nordic Kitchen Manifesto (NNKM) [3] was formulated. The New Nordic Kitchen Manifesto is based on the key principles (i) health, (ii) gastronomic potential, (iii) Nordic identity, and (iv) sustainability [4]. Based on the five principles of the NNKM, and adding some generalization and popularization, the OPUS project has since 2009 been investigating whether it is possible to

develop a healthy diet that bridges gastronomy, health, and sustainability, and aims to define and test a New Nordic Diet (NND). The NND is a prototype regional diet developed for Denmark, but the principles and guidelines could be applied in any region, including any other specific region within the Nordic countries [4].

As a part of the NND, it is suggested to eat more foods from the sea and lakes, as the Nordic countries are surrounded by water and have vast amounts of seaweed. Seaweed as a nutrition source has been used traditionally in some Northern regions, but is somewhat overlooked in the whole Western world today. However, it is a common food source in East Asian countries [4], and has potential for use as food in Northern countries as well [4, 13].

Suggesting the introduction of seaweed as food is one thing, but as it is not a common food source in the Western world [4], focus has to be placed on consumer investigations and market development, evaluation of food safety parameters, and product development [13] in order to succeed in the introduction of it.

3. SEAWEED AS FOOD

3.1 Health

Seaweed has high contents of essential minerals, protein, dietary fibre, vitamins, and essential fatty acids [14]. However, it is important to remember that there are some safety issues in the use of seaweed in a human diet that still need to be clarified [15].

3.2 Sustainability

Consumption of meat, which is one of the least environmentally friendly foods, has over the last 50 years almost doubled in the Nordic Countries [16, 17]. Alternative protein sources such as seaweeds have a great potential for environmentally friendly production and harvesting in large quantities.

3.3 Taste

Seaweed has a broad application in the kitchen, and can be eaten raw, baked, boiled, roasted, puréed, dried, fried, granulated, or deep-fried. The taste and the texture of it depends on how it is treated, and what species it is. Seaweed also contains the fifth flavour umami [4].

3.4 Economy

A bio economy based on seaweed has been suggested as a promising new economy for Norway [13]. Research in the Western world has mainly focused on developing seaweed for industrial use, such as bio energy, animal feed, and alginate production [1, 13]. However, the value of seaweed food products is more than six times that of the industrial commodities [1].

3.5 European consumption

In Asia, seaweeds are traditionally used as sea vegetables, but in Europe it is rarely consumed. The edible seaweed consumption in Europe is about 70 dry tonnes, while 97,000 dry tonnes are consumed in Japan [18]. However, in recent years there has been a strong movement in France to introduce seaweed into the European cuisine, and already on the market in many countries around the world are cooking books incorporating recipes using seaweeds described as sea vegetables. This movement has had some success, although seaweed is still regarded as an exotic component of the menu, but with the current trend for consumers to embrace organically grown foods and natural foods from clean environments, seaweeds should receive an increasing acceptance [19].

4. UNDERSTANDING BEHAVIOUR CHANGE

As previously stated, we need to change the way we eat and consume in order to have a sustainable future [2]. We need to change behaviour.

There are many different ways to understand behaviour and behaviour change, and these are sometimes divided into three categories: individualist-rational, contextual, and the middle

ground. The middle ground theories integrate elements from individual rational, and contextual influence [5]. The most common are presented and categorized in figure 1.

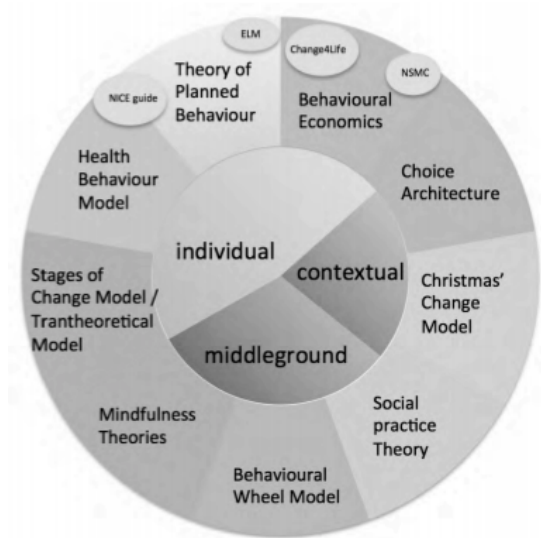


Figure 1: Classification of some behaviour change theories [5, p.35].

It has been suggested as beneficial to understand consumption and behaviour in a broader focus than the individual theories traditionally applied [5, 20]. Therefore, social practice theory has been looked closer into in this article. To get an additional perspective from the middle ground category, the behaviour wheel model has been investigated as well. To get insight from another perspective, nudging, which has been described both as a part of choice architecture and behavioural economics, has been explored as well [5, 21].

5. SOCIAL PRACTICE THEORY

5.1 Consumption as part of a socially shared practice

Choices of food are set and embedded within a social context, and not only the result of an individual's wishes and reasonable evaluations [22]. Previous research done by viewing consumption as rational choice, planned behaviour and consumer sovereignty, tended to treat consumption as an economic and material category focusing on the individual consumer[23,

24]. De Jong, Kuijer, and Rydell claim that broadening the focus from the individual consumer to consumption as part of *socially shared practice*, holds potential for a better understanding of these in the complex reality of daily life, and to find leverage points for changing consumption

5.2 An outline of social practice theory

Social practice theory has its roots in the philosophy of Heidegger and Wittgenstein, and its social roots in the work of early Bordieu early Giddens, late Foucault and Butler [25].

Practice theory is not a commonly agreed upon theory, more like an approach or a turn within contemporary social theory [26]. There are multiple understandings and interpretations of what it is [27], so they are often mentioned in plural. A common denominator, however, is an interest in daily life [27], and the core unit of analysis is practices, such as cooking or consumption, and not the individual performing it [9]. In 2002, Reckwitz developed an overview of social practice theory [27] that in recent years has spread to many research fields, including design studies. According to Reckwitz, practice theorists stand opposed to purpose-oriented, and norm-oriented models of explaining action. He states that practice theorists think it is important to understand actions and social order as 'collective symbolic structures of knowledge' [27,p.246]. In the context of theory of social practices, Reckwitz explains practices as

'A routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion, and motivational knowledge' [27, p. 249]

A Practice is thus 'a routinized way in which bodies are moved, objects are handled, subjects are treated, things are described, and the world is understood' [27, p. 250]. These routines are,

according to Reckwitz, not the deep internal possessions of an individual, but part of the social practice [27].

Carrying out a practice very often implies using particular things in a certain way [27]. In the example of cooking as a social practice, one might need a knife to cook. Knowledge is also important; specific social practices require specific forms of knowledge. For example, one needs to know how to work a knife, in order to use it, or that a dish will burn if you leave it in the oven too long. In relation to the cooking of a novel ingredient such as seaweed, this implies that one needs to have knowledge about how to, and not to, cook it. This knowledge can for example be learned through the introduction of recipes, or by learning from others.

5.3 Social Practice theory and behaviour change

According to Gram- Hanssen, practice theory has emerged within consumer studies as a promising approach that shifts focus from the individual consumer towards the collective aspects of consumption [26]. In practice theory, patterns of consumption are seen as embedded within and occurring as a part of social practices, and not as the result of an individual's attitudes, values, and beliefs [28]. The performance of various social practices is seen as part of the 'routine accomplishment of what people take to be 'normal' ways of life' [29, p.3]. For the introduction on a novel ingredient, such as seaweed, this can present a challenge, as the introduction of something new breaks the routine of 'normal'.

Practice theorists conceive individuals as 'skilled agents who actively negotiate and perform a wide range of practices in the normal course of everyday life' [9, p.83], and patterns of consumption therefore do not depend upon educating or persuading individuals to make different decisions, but on transforming practices [9].

When generating new, or altering practices, it requires the links and elements of existing practices to be challenged and broken, before being replaced and re-made into more desirable

practices [9]. The making and breaking of these links might occur both from the inside by the practitioners; by resisting routines and conventions, also and improvising, and from the outside; as different practitioners come in contact with each other [28]. In relation to introducing new ingredients, this could mean receiving tips from others as to what to cook, or by the practitioner being interested in trying something new, and adding this to their cooking routine.

Social practice theory has in this section provided an understanding of cooking as a social practice that encompasses not only the action of the individual, but of cooking as a part of a cultural whole. It has also been suggested that changes need to be suggested as a part of a practice, and not focusing on single elements and individuals. It has been mentioned that practices can be changed from both the inside, and the outside of the individual.

To attain additional insight as to how behaviour can be described and changed according to the middle ground category, combining contextual and individual perspectives, additional information was sought out in the theory of the behavioural wheel.

6. THE BEHAVIOURAL WHEEL

Based on 19 existing frameworks, Michie, van Stralen and West [10] developed a behavioural wheel, illustrated in figure 3, to help identify and develop behaviour change. This behavioural wheel is based on the COM- B model of behaviour, which is illustrated in figure 2. The COM-B model of behaviour provides a basis for designing interventions aimed at behaviour change [10].

'Behaviour change interventions' are defined by Michie et al. as 'coordinated sets of activities, designed to change specific behaviour patterns' [10, p.1].

In 1991, a US consensus meeting of behavioural theorists identified three factors that were necessary and sufficient for the performance of a specified behaviour: the skills necessary to perform the behaviour, a strong intention to

perform it, and no environmental constraints that make it impossible to perform it [31].

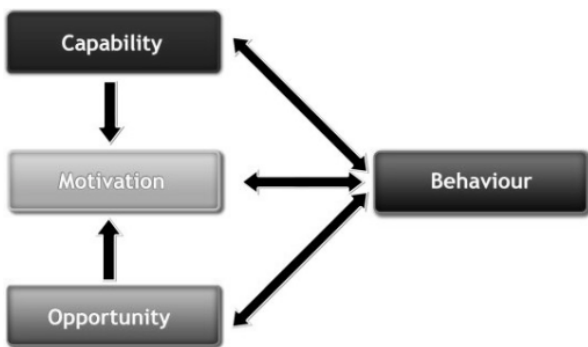


Figure 1: 'The COM-B system - a framework for understanding behaviour' [10, p. 4]

In this system, capability, opportunity, and motivation interact to generate behaviour that in turn influences these components. Capability (physical and psychological) is the individual's capacity to engage in an activity, and it includes having the necessary knowledge and skills to do it. Motivation (reflective: motivation and plans, and automatic: emotions and impulses) is defined as the brain processes that energize and direct behaviour, including habitual processes, emotional responses, as well as analytical decision-making. Opportunity (physical and social) is defined as all the factors that lie outside the individual that can make certain behaviours possible.

This model of behaviour provides a basis for designing interventions aimed at behaviour change [10]. The first task in applying this to intervention design, according to Michie et al., is to consider what the behavioural target is, and what components of the behaviour system would need to be changed to achieve that [10].

According to this model, external and internal factors of the individual have equal effect in controlling behaviour [10].

6.1 The Behavioural wheel explained

Figure 3 illustrates the behavioural, or the behaviour change, wheel. It consists of three key components. Firstly, at the centre of the wheel, are three conditions that are proposed to eliciting behaviour change; capability, opportunity and

motivation for change, just like in the COM-B system. They are further categorized in two sub domains each. Next, moving out from the centre, nine interventions exist which enable those conditions to occur. These are education, persuasion, incentive, coercion, training, enablement, modelling, environmental restructuring and restrictions. Lastly, on the outer sections, there are policy characteristics, which could enable the interventions; environmental/social planning, communication/marketing, legislation, service provision, regulation, fiscal measures and guidelines. Using this approach, the wheel shows interventions and policies that may need to exist to affect behaviour change.

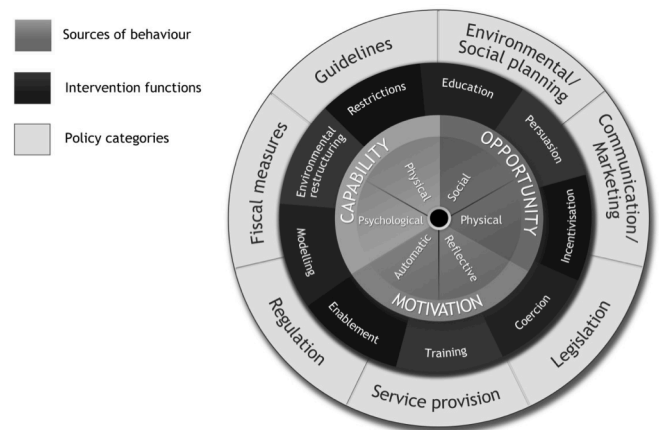


Figure 3: The behaviour change wheel [10, p.7].

One of the key strengths of this framework, according to Michie et al., is that it is derived from classifications already available, therefore covering concepts that have previously been considered to be important, and as it is considered a middle ground theory, it incorporates context. There is a general recognition that context is very important to the effective implementation of interventions [10].

In this section, the behavioural wheel has been investigated and explained. The theory suggests that one first has to identify the behavioural target, before using the behavioural wheel to decide which components are of importance, and how one can find interventions that answer to the identified behavioural target.

To get insights from another domain of behavioural theories, nudging was explored. Nudging has been places in both behavioural economics (individual category) [21], and as choice architecture (context category) [5].

7. NUDGING

Nudging is closely related to behavioural economics, and are by some categorized accordingly [21], but according to Niedderer et al. [5] it focuses more on systems change that leads to an individual's decisions, and is therefore categorized as choice architecture, which is a contextual approach [5]. Nudging aims to gently push people in a preferable direction, and to alter people's behaviour in ways that are inexpensive and that intend to benefit both the user and the society at the same time. These results are otherwise most effectively achieved through laws, regulations and injunctions [21], some of which are encompassed in the behavioural wheel. The original definition of nudging as a method, is set by Thaler and Sunstein. They define nudging as 'any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives' [33, p.6]. In short you can say that a nudge is a tool that intends to actively guide people to live the way they picture themselves living, but fail to achieve due to their own automatic thinking and pre-set biases [31]. In a study on nudging in a design context, performed by Bree Gailbraith, she describes of how design has always been influencing people [32]. When designing for behaviour change, Gailbraith sums up nine tips from several designers on important factors when designing for behaviour change. These are as follows

1. Make it easy
2. Engage people's emotions
3. Make the default option the desired one
4. Use priming to put people in a desired state of mind
5. Make people them feel like they are not alone, if you want them to be benevolent
6. Identify and remove external barriers
7. Emphasize associated gains rather than losses
8. Reduce complexity

9. Draw attention to the sensible behaviour of other people that the consumer feels connected to [32]

8. CASE STUDY: introducing seaweed as an ingredient

8.1 Planning the case study

In order to test whether the insights gained in reviewing social practice theory, the behavioural wheel and nudging could be applied when designing for the introduction of a new ingredient; a case study was planned and performed. The case study aimed to test which of the discovered insights were beneficial, and which were not, when trying to initiate the will to test and to continue to use seaweed in the diet. The case study was planned in two parts. The first part aimed to test general assumptions from the theories; whether people were interested in trying the seaweed when it was presented as something normalized in a social context, where different practitioners came into context with each other, and the setting was informal, open, and implicitly encouraging. The second part aimed to test different specific strategies, suggested by the three theories, on a smaller number of participants, to see which worked the best. All participants were millennials [12] aged between 22-32, recruited from the author's expanded social network.

8.2 Presenting the seaweed

A group of 15 people were invited to a tapas dinner, and seaweed was presented as a non-intrusive, but positively connoted, dish. It was prepared as a salad/wok type dish, and as fried snacks. It was presented alongside with the other dishes, as a natural element of a tapas platter. This setting worked as priming [32], a term known from nudging, for the next phase of the case study, inspiring a positive take on eating seaweed as a socially acceptable thing to do. It was also testing, according to social practice perspectives, whether different practitioners had any effect on each other's will as to testing the seaweed, and if the

social context it was presented in had any affect on the will to try it.

8.3 Implementation of seaweed

After the event, 6 of the people from the tapas event were randomly picked to join in part two of the case study, which went on for a week. All of the people who were picked had tasted the seaweed, and gave positive feedback. None of them had ever prepared seaweed themselves before, and only eaten it as sushi before the tapas event. The participants were equipped with samples of seaweed, and varying amount and quality of information about how to use it. No coercion or explicit incentives were given; there was no pressure to use the seaweed, only if they wished to.

All of the participants, except for two, were handed an informational flyer about why seaweed is a good thing to eat. The flyers had two different angles: one angled towards the old Northern tradition of eating seaweed that is making its way back, that is a part of a growing European trend. Two were handed this flyer. The other angle introduced seaweed as a niche ingredient not many people use, but still highlighted the nutritional and sustainable advantages of it. Two different participants were handed this flyer. The last two were given no particular reason to eat seaweed.

Three recipes were handed out; one per 'angle group'. The recipes handed out were all the same, and easy to understand. The recipe was a wok dish that was easy to make, and the experiment went on for a week. The author interviewed the participants after this week, as they had not been using the diaries they had been handed as a means for self-reflection.

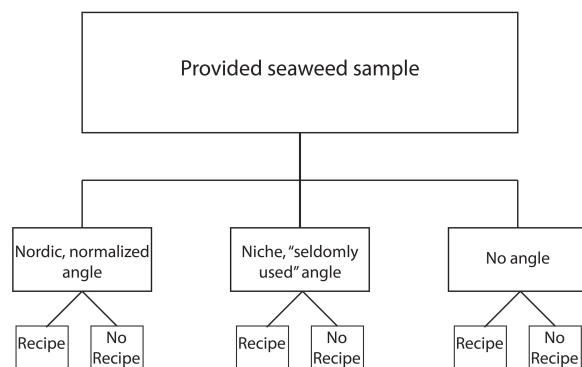


Figure 4: Design of part two of the case study.

8.4 Results

At the tapas event, only two people did not taste the seaweed. The ones who did, unsolicited began conversations about it, and how they did not know it was possible to eat it as something else than sushi. Once some of them started to test it, others followed.

In the second part of the case study, all of the participants who were given detailed recipes prepared and tried the seaweed. Only one of the people that were **not** given a recipe, the one with the Nordic tradition angle, prepared the seaweed after having found a recipe online himself. He stated this was because he liked to stay up to date on cooking trends. As for the angle: the Nordic tradition angle was the one that generated the most positive feedback (and also the only one that was made without being paired with a recipe), and the only one that provided an expressed interest in continuing to use seaweed. The two users of this angle reported that it was great that it was a growing trend, and that it was coming back to the Northern Cuisine, especially since it was environmentally friendly.

Both of the ones with the 'niche' angle gave feedback that they 'were not that sort of people' (health freaks), and therefore probably would not use it, even the person that cooked it during the case study reported this, even though she liked the taste.

The ones who were not given an 'angle flyer', expressed no real interest the continued making of seaweed for themselves, even though the person with recipe made it during the case study. They had both tasted it and liked it at the tapas event.

As for the general palatability of the seaweed, most liked it, but the answers were varying. As the focus was to initiate the trial of seaweed, this is not further analysed.

9. DISCUSSION

Based on the perspectives of social practice theory, the behavioural wheel and nudging, this paper aimed to explore and identify considerations that should be taken into account when designing for the introduction of a new ingredient.

It has been proposed that there is a growing recognition that designers are in the behaviour business, and that behaviour change interventions should be based on theories of behaviour and behaviour change. Although seaweed is not a common food in the Western world, it has been proposed as a part of the NND, and as a response to they way the human race is over utilizing natural resources. There is a vast amount of ways to understand behaviour, three of which have been explained in this article; social practice theory, behavioural wheel, and nudging.

A case study exploring the proposed introduction of seaweed into the diet of 6 young Norwegians has been described.

The social practice perspective suggests that it is important to not only consider the actions of the individual when viewing behaviour, but also how behaviour is a part of a socially shared practice, and how choices of food are set and embedded in a social context. Social practice theory also describes how when practitioners of different practices come in contact with each other, they can affect or inspire each other to change their practices. In the case study, most of the people at the tapas event encouraged each other to try the seaweed, and did. The ones who tasted it, liked it, but not all of them were equally positive when cooking it at home. This could reflect that

practitioners affect each other's opinions when in contact with each other, but that this effect fades after some time, and is not internalized after just a short amount of time, like this tapas dinner provided.

Social practice theory also stresses the importance of certain forms of know-how, and knowledge. In the case study, all of the ones provided with a recipe, made the seaweed. This could indicate that knowledge is indeed of importance in order to change behaviour. The ones presented with the Nordic normalized angle, were the ones most positive to the continued use of seaweed. This could indicate that not feeling alone in an introduced behaviour, and that feeling like the introduced ingredient or behaviour change, is not **that** strange, is a valuable technique to use.

The fact that the people who were not handed an 'angle flyer' were not interested in using the seaweed, even the person who cooked it, could contribute to the theory that knowledge, not only in the form of know-how, but more in the motivational form, is needed in order to change behaviour, and introduce something new.

The behavioural wheel described, provides a tool for changing behaviour, based on a behavioural target, and identifying which means could be taken in order to achieve this. In the behavioural wheel, the need for skills, motivation, and removing constraints are seen as important to perform behaviour. In the case study these were introduced in the form of detailed recipes; which as previously described turned out to be important, flyers motivating the participants to use the seaweed; which turned out to be important to some extent, and removing constraints; providing all of them with seaweed samples. The last statement, removing constraints, turned out not to be valuable in itself, without the aid of knowledge and motivation.

The nudging perspective describes how nudging aims to gently push people in the direction of a desired behaviour. Some of the general outlines provided by Gailbraith in section 7, were utilized in the case study; Point 1 and 6, that one should make it easy and remove external barriers, here accomplished by providing recipes and samples, worked as previously described to some extent.

Being provided with the seaweed did not automatically result in the making of it, except when also being given a recipe, with one exception. The fact that the people who were given the normalized Nordic trend angle to eat seaweed expressed interest in the continued use of it, could give leverage to the fact presented in point 5: If you want people to act benevolent, make them feel like they are not alone, and 9: draw attention to the sensible behaviour of other people that the user feels connected or similar to.

It should be noted that the case study was performed as a student project, with a limited amount of people with a similar cultural background, so excessive generalizations should be avoided. However, the findings presented in this article provide an overview of general considerations that should be taken into account when designing for the introduction of a new ingredient, such as seaweed.

Further research on this theme is should be performed.

10. CONCLUSION

The purpose of this article was to identify general considerations to be taken into account when designing for the introduction of a new ingredient, such as seaweed.

Identified considerations include providing knowledge about the use of the ingredient; motivation for the use of the ingredient; presenting the ingredient in a normalized context; presenting it as generally accepted.

These considerations may help the introduction of seaweed as a sustainable, healthy, and gastronomic part of the New Nordic Diet. This could help us change the way we eat, thus bringing us a step closer to stop over utilizing our natural resources.

REFERENCES

- [1] Jensen, A. (1993). Present and future needs for algae and algal products. In Fourteenth International Seaweed Symposium (pp. 15-23). Springer Netherlands.
- [2] Assessment, M.E., Our human planet: summary for decision-makers. 2005: Island press.
- [3] Manifesto for the New Nordic Kitchen. (01.04.2016). Retrieved from <http://www.nfd.nynordiskmad.org/index.php?id=507>
- [4] Mithril, C., Dragsted, L. O., Meyer, C., Blauert, E., Holt, M. K., & Astrup, A. (2012). Guidelines for the new Nordic diet. *children*, 16, 17.
- [5] Niedderer, K., Mackrill, J., Clune, S., Lockton, D., Ludden, G., Morris, A., ... & Hekkert, P. (2014). Creating sustainable innovation through design for behaviour change: full project report.
- [6] Fabricant, R. (2009) Behaving Badly In Vancouver. (26.07.2010). Retrieved from <http://designmind.frogdesign.com/blog/behaving-badly-in-vancouver.html>
- [7] Lockton, D., Harrison, D., & Stanton, N. A. (2010). The Design with Intent Method: A design tool for influencing user behaviour. *Applied ergonomics*, 41(3), 382-392.
- [8] Michie, S., Johnston, M., Francis, J., Hardeman, W., & Eccles, M. (2008). From theory to intervention: mapping theoretically derived behavioural determinants to behaviour change techniques. *Applied psychology*, 57(4), 660-680.
- [9] Hargreaves, T. (2011). Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. *Journal of Consumer Culture*, 11(1), 79-99.
- [10] Michie, S., van Stralen, M. M., & West, R. (2011). The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implementation Science*, 6(1), 42.
- [11] Gall, M. D., Borg, W. R., & Gall, J. P. (1996). *Educational research: An introduction*. Longman Publishing.
- [12] Taylor, P., & Keeter, S. (2010). *Millennials: Confident. Connected. Open to change*. Pew Research Center, 24.
- [13] Skjermø, J., Aasen, I. M., Arff, J., Broch, O. J., Carvajal, A., Christie, H., ... & Sandquist, J. (2014). A new Norwegian bioeconomy based on cultivation and processing of seaweeds: Opportunities and R&D needs. SINTEF Fisheries and Aquaculture.
- [14] Mouritsen, O. G. (2009). *Tang: Grøntsager fra havet*. Nyt Nordisk Forlag.
- [15] Olesen, P. T., Ravn-Haren, G., Hansen, M., & Pilegaard, K. (2011). *Tang kan indeholde sundhedsskadelige stoffer*. E-artikel Fra Dtu Fødevareinstituttet.

- [16] Groth, M. V., & Fagt, S. (2001). [Trends in dietary habits in Denmark and Sweden since the 1960s]. *Ugeskrift for laeger*, 163(4), 425-429.
- [17] Pimentel, D., & Pimentel, M. (2003). Sustainability of meat-based and plant-based diets and the environment. *The American journal of clinical nutrition*, 78(3), 660S-663S.
- [18] Fleurence, J., Moranchais, M., Dumay, J., Decottignies, P., Turpin, V., Munier, M., ... & Jaouen, P. (2012). What are the prospects for using seaweed in human nutrition and for marine animals raised through aquaculture?. *Trends in food science & technology*, 27(1), 57-61.
- [19] McHugh, D. J. (2003). A guide to the seaweed industry FAO Fisheries Technical Paper 441. Food and Agriculture Organization of the United Nations, Rome.
- [20] de Jong, A., Kuijter, L., & Rydell, T. (2013). Balancing food values: Making sustainable choices in cooking practices. *Nordes*, 1(5).
- [21] Haug, A., & Busch, J. A. (2014). Framework of ethical nudges in the design of consumer goods. In *Proceedings of Design Research Society's 2014 Conference*, Umeå.
- [22] De Borja, J., Kuijter, L., & Aprile, W. (2010). Sustainable systems innovations in households' food acquisition activities: a practice oriented approach. ERSCP-EMSU Knowledge collaboration & learning for sustainable innovation, JQR Wever, A. Tukker, J. Woudstra, F. Boons, N. Beute, Editor.
- [23] Stø, E., Throne-Holst, H., Strandbakken, P., & Vittersø, G. (2008). Review: a multi-dimensional approach to the study of consumption in modern societies and the potential for radical sustainable changes. In *System Innovation for Sustainability 1: Perspectives on Radical Changes to Sustainable Consumption and Production* (Vol. 233, No. 254, pp. 233-254). Greenleaf Publishing in association with GSE Research..
- [24] Liedtke, C., Jolanta Welfens, M., Rohn, H., & Nordmann, J. (2012). LIVING LAB: user-driven innovation for sustainability. *International journal of sustainability in higher education*, 13(2), 106-118.
- [25] Halkier, B., Katz-Gerro, T., & Martens, L. (2011). Applying practice theory to the study of consumption: Theoretical and. *Journal of Consumer Culture*, 11(1), 3-13.
- [26] Gram-Hanssen, K. (2011). Understanding change and continuity in residential energy consumption. *Journal of Consumer Culture*, 11(1), 61-78.
- [27] Reckwitz, A. (2002). Toward a theory of social practices a development in culturalist theorizing. *European journal of social theory*, 5(2), 243-263.
- [28] Warde, A. (2005). Consumption and theories of practice. *Journal of consumer culture*, 5(2), 131-153.
- [29] Shove, E. (2003). Changing human behaviour and lifestyle: a challenge for sustainable consumption. Department of Sociology, University of Lancaster: Lancaster, UK.
- [30] Fishbein, M., et al., Factors influencing behavior and behavior change. 2001.
- [31] Selinger, E. and K. Whyte, Is there a right way to nudge? The practice and ethics of choice architecture. *Sociology Compass*, 2011. 5(10): p. 923-935.
- [32] Gailbraith, B., The Designer Nudge- Defining the Role of Design in Behaviour Change. 2013.
- [33] Hastings, J.S., R.H. Thaler, and C.R. Sunstein, Nudge: Improving Decisions about Health, Wealth, and Happiness. 2009, JSTOR.