



Cannabis legal context – The food perspective

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June 2018

Abstract

The aim of this thesis is to investigate what cannabis food products (edibles) we can expect in a legal context in Denmark. Furthermore, to study the cannabis users as consumers. The methods used for empirical data were semi structured interviews with cannabis users in Denmark. Furthermore, a case study where conducted in California in order to observe and analyze a legal cannabis market from the inside. Both observations and interviews were conducted at ten different dispensaries. The most prominent themes from the case study were the business aspect, the community aspect, the variety of edibles and the change from patient caregiving to consumerism. The latter being the greatest impact from the legalization of recreationally cannabis use from 2018

The semi structured interviews were analyzed with Grounded theory in order to understand the need of cannabis users concerning edibles. The analysis provided an insight into the function of cannabis, both recreationally and medically. The 360-perspective design model were used to analyze edible products in a Danish context, which concluded that beverages with cannabis would be better accepted than sweets with cannabis. Partly due to the alcohol culture in Denmark and the concern for children

The four realms on an experience model from the experience theory provided insight into relevant experiences for cannabis users, that could be both active and passive participation. The theoretical framework of the thesis was based on path dependence and path creation which were able to analyze the context of cannabis on multiple levels. The path dependence and path creation theory revealed the many interacting processes which lead to prohibition of cannabis worldwide and also provided an understanding of how locked paths in our societies can be changed by entrepreneurs cooperating.

Furthermore, was it revealed that countries and states that legalize cannabis, has a greater variety of scientific cannabis studies. The thesis concludes that path dependence is a natural process, which occurs everywhere and has to be taken seriously and investigated as it has a great impact on our life's and society. Nevertheless, is it possible to create new paths and doing research in less obvious fields, can possibly provide a new framework for change.

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1.0 Introduction

Cannabis has been illegal in Denmark and most of the world, since it became illegal in the UN in 1961. Cannabis has nevertheless become the most consumed intoxicant after alcohol, which has created illegal markets all over the world in order to supply the demand. According to the Danish Health Agency, the strength of the illegal cannabis products available in Denmark has increased in the last couple of years. Both politicians and health authorities in Denmark are arguing that strong cannabis products leads to increased mental illness and abuse, especially for teenagers and young men.

Cannabis has been acknowledged as a medicine by several countries and states, which open up for a legalisation of cannabis for patients, while few cases of legalisation of recreational cannabis use, are occurring. Despite the widespread use of both illegal and legal cannabis, the global UN ban on cannabis, as well as prejudices, has historically been a barrier for certain scientific research on the effects of cannabis use. The drug abuse and the criminal markets has been the object of attention for both scientific studies and public discourses. Most of the information about the effects and experiences with cannabis is therefore found and distributed among the cannabis users themselves and from the legal or illegal cannabis distributors.

In Denmark the government has allowed doctors to prescribe medical cannabis to patients, since January 1. 2018, as part of the four-year trial period.

The Danish doctor organisation has recommended all of its members not to prescribe medical cannabis to their patients, based on the lack of evidence and proper research about the effects and health hazards from cannabis use. Since the 4-year trial started on January 1. 2018, only 200-300 patients have been prescribed with medical cannabis from a Danish doctor.

In the Danish public debates, cannabis is most often mentioned in negative contexts of dangerous drug abuse and health hazards among young people. But maybe cannabis have the potential be used in a more positive way, if the population had access to better information and help and other cannabis products and sales channels than the illegal markets can offer. With tools from my education and background in a Danish cannabis environment, I should be able to contribute to a new cannabis culture, which should benefit both the Danish consumers and the economy.

Since cannabis is becoming legal around the world, it seems plausible that Denmark will legalize cannabis for both medical and recreational purposes in a near future. As mentioned above most scientific studies about cannabis has been focusing on drug abuse and crime. If cannabis becomes legal, the cannabis users become consumers, which open up for consumer analysis and product development. My focus is therefore to understand the cannabis users as potential consumers at a legal cannabis market and to investigate what cannabis products they might demand from a legal market.

Illegal drug markets are underground and stressed by both police and other criminals, which result in less sophisticated, and less appealing products for a large part of the population. In a legal context cannabis has the potential to

appeal to other segments with products designed to each specific segment. As part of a food education, this report will investigate how cannabis can be used in food products and as supplements to culinary events, e.g. as a supplement to a “wine menu”.

Cannabis has been legal for medical purposes in the state of California for 22 years and legal for recreational purposes since January 1, 2018.

In order to make a qualified prediction of how the Danish cannabis and food market can evolve, the legal cannabis market in the San Francisco Bay Area will be used for inspiration, as well as their history toward legalization will be analysed.

2.0 State of the art

This chapter will provide a scientific insight into the subject of cannabis and food. A literature search was performed to gain an overview of the many different aspects of cannabis and food and furthermore to provide an idea about what subjects that hasn't been studied scientifically yet.

2.1 Literature search method

The literature search is performed on PubMed, which is a scientific database developed and maintained by the National Center for Biotechnology Information at the National Library of Medicine in the US. PubMed contains more than 28 million citations for biomedical literature from MEDLINE, life science journals, and online books ([PubMed 2018](https://pubmed.ncbi.nlm.nih.gov/)). When using PubMed as a search engine, it is not possible to limit the search results to only to include peer-reviewed articles, but most journals indexed for PubMed are peer-reviewed or refereed.

(<https://www.nlm.nih.gov/services/peerrev.html>)

From previous browsing through grey literature on the Internet it was discovered that cannabis in food is called edibles in the US, where also the largest legal markets for cannabis food products is situated. Previous Internet searches had shown that cannabis could be referred to as marijuana and marihuana in America due to cannabis' Mexican origin. In order to find only the most appropriate search result regarding the use of cannabis and food, the following search words were developed:

(Edible [Title/Abstract] OR USE [Title/Abstract] OR consumer [Title/Abstract])
AND (cannabis [Title/Abstract] OR marijuana [Title/Abstract] OR marihuana [Title/Abstract])

This search provided 112 results on PubMed on February 8, 2018. It is worth mentioning that 71 of the 112 results were from 2010 to 2018, which show that edibles have first become a public concern or subject of attention in the last decade. By using the “Full Text” filter the results came down to 97 and again down to 84 results when “OR USE [Title/Abstract]” was removed. The 13 results

removed were briefly checked, and were not found useful in order to understand the cannabis users as consumers or the market and culture of edibles.

By adding “OR digestion [Title/Abstract]” the search was provided with 17 new results, but these 17 result were not relevant for this study and were removed again from the search.

By adding “OR eat [Title/Abstract]”, the search was provided with 15 new results. But only one of the results was relevant to the study and used.

When adding “OR recreational [Title/Abstract]” to the search, 874 new results were added! But a brief look through did not find any relevant new studies and they were all removed again.

The Final search with the words (Edible [Title/Abstract] OR consumer [Title/Abstract] OR eat [Title/Abstract]) AND (cannabis [Title/Abstract] OR marijuana [Title/Abstract] OR marihuana [Title/Abstract]) with the full text filter activated, provided 99 search results, of which 17 studies were included in the state of the art.

(Edible [Title/Abstract] OR USE [Title/Abstract] OR consumer [Title/Abstract]) AND (cannabis [Title/Abstract] OR marijuana [Title/Abstract] OR marihuana [Title/Abstract])	“Full Text”	OR USE [Title/Abstract]	OR digestion [Title/Abstract]	OR eat [Title/Abstract]	OR recreational [Title/Abstract]	(Edible [Title/Abstract] OR consumer [Title/Abstract] OR eat [Title/Abstract]) AND (cannabis [Title/Abstract] OR marijuana [Title/Abstract] OR marihuana [Title/Abstract])
	Filter added	Words Removed	Words Added	Words Added	Words Added	
	Used	Used	Not used	Used	Not used	“Full Text” Filter
112 results	-15 results	-13 results	+17 results	+15 results	+874results	99 results

Figure 1. Literature search words and results

Another search was performed at EBSCOhost to see if there were other interesting papers that the PubMed search had leaved out. The following search words were used:

(Edible Abstract] OR Eat [Abstract] OR consumer [Abstract]) AND (cannabis [Abstract] OR marijuana [Abstract] OR marihuana [Abstract])

The search provided 984 results but went down to 381 results with filter showing peer reviewed journals only. By adding the full text filter the search came down to 97, which appeared to be just 59 search results when duplicates was removed automatically by the search engine

Some of the search result were already found and used at the PubMed search, while no new relevant journals were found at the EBSCOhost search and therefore not included in the state of the art.

2.2 The scientific findings

As cannabis has become legalized in different places in the world it has become more easy to conduct scientific studies among cannabis users. The studies following studies were primarily conducted in countries and states where cannabis is legalized medically or recreationally.

Patterns of cannabis use

In a peer-reviewed paper from 2016 it was found that the two groups of medical and recreational cannabis users show considerable overlaps. Though recreational use is defined as use with no medical purpose, self-medication is occurring among some recreational users. Furthermore, some medical cannabis patients report of prior recreational use of cannabis. The paper discusses that cannabis contain multiple cannabinoids and other chemicals including terpenes and cannflavins, which can be the reason why some patients prefer smoking of cannabis over oral intake of THC-only medicine, like Dronabinol. The paper furthermore argues that though there have been registered almost five million units of edible sold in Colorado in 2014, which is about 45% of total cannabis sales in the state, the actual use of edibles is unlikely underestimated since direct purchase of cannabinoid-infused oil or cannabis used to make home made edibles is not tracked. Furthermore almost 1/3 of the cannabis users in the US, has tried cannabis in the form of edibles or beverage ([Barrus et al 2017](#)).

A study conducted among cannabis users on Facebook revealed that people living in North American states that allowed home cultivation of cannabis plants, were more likely to grow at home. Regardless of any state regulations, people that grow cannabis at home were more likely to make their own edibles at home. People from states with no legal access to cannabis were also more likely to make their own edibles at home, than states with legal access. The study also mentioned that home growers of cannabis are more likely to make their own cannabis concentrates of their plant leftovers, which together with home-made edibles, can cause a risk of too high doses ([Borodovsky and Budney, 2017](#)).

One of the few non-American studies used from the PubMed search, were a study from Israel conducted in 2016 with anonymous questionnaires (IP address registration) on Israel's most visited cannabis website. The study found that recreational users were in general more likely to be male and less likely to eat cannabis or use it frequently, alone or before midday than medical cannabis users. Licensed medical cannabis users were older, having fewer hours feeling stoned and having much less cannabis use problems, than the unlicensed medical cannabis users. The unlicensed medical cannabis users were more likely to eat cannabis than the two other groups. Nevertheless were the licensed cannabis users in general more health consciousness about avoiding smoking by using vaping and edibles instead ([Sznitman 2016](#)).

Cannabis and appetite

In a review paper on human and animal studies of cannabinoids and appetite from 2003, it was found that cannabis in low doses could stimulate appetite,

especially for sweet tastes, while higher doses of cannabis can inhibit appetite. This knowledge has been common in India since year 300 AD, while the western world became aware of it during the 19. Century and had the first study on a strict scientific basis in 1973. Overconsumption of food and especially sweets after cannabis intake, seem to be more occurring in social groups, than in isolation. Therefore social facilitation have to be taken into consideration in order to effect appetite stimulation, since recreational use of cannabis is more often occurring in a social setting, than the medical use ([Cota et al 2003](#)).

In a review paper about cannabinoids and appetite it was argued that cannabinoid receptors agonists, which is part of the human endocannabinoid system, might increase food intake by making food taste better, while antagonist might reduce the intake by making the food less pleasant. THC might thereby be affecting the desire to eat, through the reward system and from enjoyment of eating. Rats under experimental condition, which has been feed a large meal, have shown to decrease the time before the next meal when either THC from cannabis or the body's own endogenous agonist Anandamide and 2-arachidonoylglycerol are present. The stimulating actions that occur from the cannabinoids, including THC, are similar to the body's own reaction to food deprivation which include greater food satisfaction, shorter time feeling full and binge eating. Dopamine is also released when consuming tasty food or any food upon deprivation, which THC and Anandamide stimulate further. The release of dopamine from food can be blocked by the synthetic cannabinoid receptor antagonist Rimobabant, suggesting that cannabinoids may be essential to the dopamine reward system that increase appetite and behaviour towards food seeking and eating initiation. Cannabinoid activity also seems to render food more pleasurable, especially palatable foods but also less tasting foods, while an antagonist blockade will do the opposite. Finally, opioid antagonist, like Naloxone, can reduce the cannabinoids effects on appetite and when combining both opioid antagonist and cannabinoid antagonist they synergistically produce a profound anorectic reaction much greater than if given separately. Thereby the human body's endocannabinoid system seems to be closely linked to the opioid system, concerning food and morphine has also shown to increases the liking of sweets ([Kirkham 2009](#)).

A consumer study from 2018 had tested how cannabis users perceive the aromas from different cannabis strains. They found that strains in a cluster of citrus/lemon/sweet/pungent created higher expectations of potency and a higher interest to pay more for the strains than in the cluster of woody/earthy/herbal strains. Since THC is odourless, the study find that marketing and branding of recreational cannabis might have to take into consideration the impression of product quality from specific odours ([Gilbert & Diverdi 2018](#)).

Reason to use edibles

A study conducted eight focus group interviews in Denver in 2016 to understand how consumers of cannabis edibles perceive eating compared to the smoking of

cannabis. The study found that most participants preferred to consume edibles at home or at a friend's house and would do it around once or twice a week. The participants preferred edibles over smoking since it is smoke free for them self and their surroundings, its more discrete, last longer, have a less intense high, is more convenient, aids relaxation, reduce anxiety and they enjoy the taste. On the downside they mentioned the edibles delayed effect, too much variation and uncertainty of the high, which can be unpredictable and hard to control. Furthermore, were uneven dosing within the products and inappropriate serving package- or serving sizes also downsides. None of the participants mentioned edibles as harmful, but some did recognize a risk for overdosing for beginners or unintended use by children. ([Giombi et al 2017](#)). Edibles are also among medical patients often chosen due to the convenience, discretion and avoidance of smoke. But though edibles can provide a longer and stronger effect than smoking, edible are also the main reason for cannabis hospitalization due to its long onset that can lead to accidental overdoses. Test have furthermore shown that most edible products do not have the exact THC content as labelled on the package and only half read the label when they buy a new edible product for the first time.

([Barrus et al 2017](#))

Unintended risk from edibles

A study from 2017 performed an online survey among adults in Colorado and found that more than 70% of past year cannabis user had tried a new cannabis product after the legalization, while 50% had tried and edible. Participants that had tried a new cannabis product or tried an edible had increased odds of experiencing unexpected high compared to those who did not. The most common response to an unexpected high was to go to sleep, while others decided not to drive or to change or cancel plans. Only few reported unintended sex or going to a hospital or emergency room ([Allen et al 2017](#)).

A systematic review study searched PubMed, OpenGrey and Google Scholar, for articles from 1975 to 2017, about unintended cannabis ingestion by children below 12 years old. The overall sign of unintended cannabis use by children were lethargy, followed by lesser cases of ataxia, hypotonia, mydriasis, tachycardia, and hypoventilation. Most common ingestion was from cannabis resin, and then followed by cookies and joints. Other exposures to a lesser degree were from passive smoke, medical cannabis, candies, beverages, and hemp oil. Based on the American Association of Poison Control Centers' National Poison Data System, there were 496 cases in non-legal states, 93 cases in transitional states, and 396 in decriminalized states. The poison Control Center call rate in the non-legal states did not change, while in the decriminalized states it increased by 30.3% and in the transitional states there were an increase of 11.5% per year. The study argues that "not for kids" warning labels might not be understood by children that cannot read or understand English, while literate children might be more interested in the food content than in the warning labels. Since homemade edibles are under no legal mandate to be stored safely, the study recommend that regulation, public health campaigns and information from health care providers to parents, could prevent unintended digestion by children ([Richards et al 2017](#)).

Edible use among young people

An American study conducted with anonymous participants age 14-18 on Facebook using cannabis, found that Young people would have an earlier onset and higher use of edibles in states with legal cannabis and legal home cultivation. A higher dispensary density was furthermore associated with an earlier onset and higher use of vaping. The present analyses indicated that longer state legalization duration and higher dispensary density were related to a higher likelihood of lifetime vaping and edible use. The current study extended those findings by showing that provisions for recreational cannabis use and for permitting home cultivation were also related to a higher likelihood of lifetime vaping and edible use ([Borodovsky et al 2017](#)).

While the anonymously Facebook study had mostly Caucasian participants another study collecting public accessible tweets had much fewer Caucasian participants which could indicate an uneven distribution of fear of stigmatizing in the US. The study conducted in 2015 collected all tweets for one month mentioning cannabis edibles and the data analysis showed that young coloured people in the age group of 20-24, followed by the age group 17-19, were more likely to write about eating cannabis and 20% of the tweets mentioned cooking the edibles at home ([Cavazos-Rehg et al 2017](#)).

Labelling of edibles

A research paper presented relevant findings for regulations of edibles in the states of Alaska, Colorado Oregon and Washington from the worlds largest legal databases LexisNexis. The research paper found the states varied greatly in how they regulate labelling and packaging, since not all states required: a Universal Symbol to be affixed to edibles, the use of pesticides be disclosed on the label, a warning about the delayed effect of edibles or that the packaging for edibles bear a Nutrition Facts Panel on the label. The states had also set different levels on how much THC an edible product and serving size could contain. Though all four states did prohibit the manufacture or packaging of edibles that appeal to youth and require a child-resistant packaging for edibles. All four states were also requiring edibles to be labelled with warnings about marijuana's intoxicating effect, health risk and that it is against the law to drive intoxicated ([Gourdet et al 2017](#)).

A small study conducted in the Bay area of San Francisco, California collected 20 different edibles from two different dispensaries. The study found that none of the edible products labelling met all of the requirements of the Assembly Bill No. 266. The requirements labelling in California were the following statements: Schedule 1 controlled substance, keep out of reach of children, for medical use only, the intoxicating effect of this product may be delayed up to two hours, this product impair the ability to drive or operate machinery please use extreme caution and a clear indication that this product contain medical cannabis. But subjective criteria's such as: that packaging and labelling has to be made unattractive to children, were not evaluated in this study ([Tsutaoka et al 2017](#)).

Another study conducted at nine dispensaries located in San Francisco, Los Angeles and Seattle in 2014 collected 75 products from 47 different brands. Only 17% of the products were accurately labelled with respect to the THC content, while 23% were under labelled, and 60% were over labelled. CBD were detected in 59% of the products even though only 17% of the total products had a CBD content labelled, which were all set to high or too low ([Wandrey et al 2015](#)).

A study from 2017, held 12 focus group interviews in the states of Colorado and Washington in which both edible users and non-users were asked about their experience with the warning labels on the cannabis edibles packaging. Most participants would just read the information about potency and serving size and found the large amount of information confusing and too much. Some non-users believed the consumption advice were not clear since they were in doubt about how high they would actually get from a 10 mg THC portion size. Some participants were also confused about warning labelling informing about a two-hour delayed effect, since the manufactures informed about a 75-minute delay. Participants from Washington were concerned about the lack of labelling indicating cannabis content, since a universal symbol is not required by the state. Labelling about a product contain cannabis is required in Colorado, but the non-users from here were surprised about the less obvious indication on the products. Most participants believed there were no need to have special requirements for the place, size and colour of the warning labels as long as they were there, but some suggested a standardized drug fact label on the back, peel-back label or pamphlets. Many participants suggested adding a url on the label to link to a website for more information and education about risk of edibles ([Kosa et al 2017](#)).

Testing of cannabis

A study from 2017 analysed a seed-to-sale traceability dataset from the Washington state containing measurements of cannabinoid content of the legal cannabis products from state-certified laboratories. The study found discrepancies between labs measurements, which might be caused by systematic differences in their testing methodologies. Since there is no common federal regulation of cannabis laboratories due to the federal schedule one classification of cannabis, a possible solution could be to develop common ISO standards for all cannabis labs. The study found no significant THC content or THC:CBD profile difference, regarding if the strains were labelled under Indica or Sativa. But the Hybrid labelled flowers did have a slightly higher overall level of THC. The study did not test for other phytocannabinoids or terpenes, which are aromatic cannabis compounds that are supposed to modulate the effect of the cannabinoids ([Jikomes and Zoorob 2018](#)).

2.3 Summarize

The scientific review provided a proper insight into the use of cannabis and edibles. It seems that the group of medical and recreational cannabis users shows considerable overlaps in reasons to use cannabis and that aspects of other

substances than THC is an important factor when people choosing between eating or smoking cannabis. While some of the studies were very scientific about how cannabis can stimulate the appetite, there were also more observational studies regarding the labelling of edibles and studies about how the states are regulating differently and how it affect the use of cannabis. Furthermore, have focus group interviews have been arranged to understand the users and non-users experience with edibles while social media has been included as a new tool to understand how people use cannabis and edible. Overall it seems that countries and states with a legalization of cannabis, are able to provide a much greater variety of subject to study scientifically, regarding cannabis. More diversity in the scientific studies can contribute to a safer use of cannabis and a better understanding of cannabis use in general.

3.0 Problem are

Though medical cannabis is planned to be a new economic adventure for the Danish industry, the recreationally use of cannabis seem to be locked in a pattern of negative discourses rather than scientific curiosity. The recreationally cannabis market in Denmark is still in the hands of the criminals, while cannabis users in California has been able to buy legal and customized cannabis products for the last 22 years. A greater understanding of how cannabis users in California went from drug criminals to cannabis consumers could contribute to a more nuanced picture of what to expect from a future legal cannabis market in Denmark. Nevertheless, there is limited interest and motivation to study the cannabis culture in Denmark, besides the aspects of abuse and mental illness. Therefore, this thesis will investigate and compare how the legal status of cannabis has evolved in both California and Denmark, as well as examine the context of legal cannabis products.

3.1 Research question

In order to structure the thesis, the following research question and sub questions has been formulated:

“What edible cannabis products can we expect in a legal context in Denmark?”

- What factors contributed to the legalization of cannabis in California?
- Why do people use edibles?
- What are the actual needs of cannabis users in Denmark?
- Can we ensure safer products and a safer consumption, with a legalisation of cannabis?

3.2 Aim

The overall aim of the thesis is to provide an understanding of what edible cannabis products we can expect in a legal Danish cannabis market. Danish regulations and norms and the needs of the cannabis users will be investigated from a consumer perspective. A Case study with the experience of a legal cannabis market from another part of the world will be used to provide a better

understanding of legal cannabis markets in general. Research and design processes from the academic toolbox shall be used to answer the research question and sub questions.

3.3 Delimitations

Since this thesis is related to food and entrepreneurship, the focus will be on cannabis use from a consumer perspective. The criminal and abusive perspectives of cannabis are also interesting fields but will not be the main focus of this thesis. Furthermore, are the suggestions of this thesis not being tested since cannabis use is still illegal in Denmark, except from doctor prescriptions in the four-year trial period. The medical properties of cannabis is a controversial subjects which will be evaluated historically and empirically. The thesis will not perform a thorough investigation of the scientific evidence on cannabis' medical effects on the human body.

3.4 Structure of the thesis

The following parts of the thesis will first include an explanation of the methodology and theoretical framework. The following part will provide empirical observations from the cannabis culture and business in the San Francisco Bay Area, in California, US. The largest part of the thesis will be a thorough investigation of the historical environment and incidences, which has led to the criminalisation and legalisation in California. The theoretical framework will be the theory of path dependence and path creation, which will be used to understand and compare the processes in both Denmark and California. Qualitative methods with semi-structured interviews will be coded and used to understand and define the needs and context of the cannabis user in Denmark. How to legitimize cannabis with food is also suggested as well as how to ensure a safer use of cannabis edibles. Finally, all the data will be used to understand what kind of edible product we can expect in Denmark.

4.0 Methodology

This chapter will provide an overview of the methods used as well as arguments and reflections for the research design. This thesis is aiming to answer a research question, which is best solved with an inductive approach. The philosophy of science is therefore based on the interpretivism, which is close to the inductive approach. (Bryman 2008).

Interpretivism believes that:

“The social world is constructed of meaning observable in symbolic human acts, interactions and language. Reality is subjective and multiple as seen from different perspectives” (Tolley et al 2016)

As the thesis is trying to understand and describe the cannabis users and their culture, the subjective reality aspect is very essential. Furthermore, is the researcher also aware of his influence on the study. The opposite belief in philosophy of science is positivism, which denies any kind of social interacting between humans, while using deduction to prove hypothesis objectively, with quantitative methods.

From an ontological consideration, interpretivism is related to constructionism that sees social reality as constant changing and interacting with humans by focusing on the processes of how the social world is constructed (Bryman 2008). Another aim of the thesis is to investigate and compare how the legal status of cannabis has evolved and what human actions that has been involved.

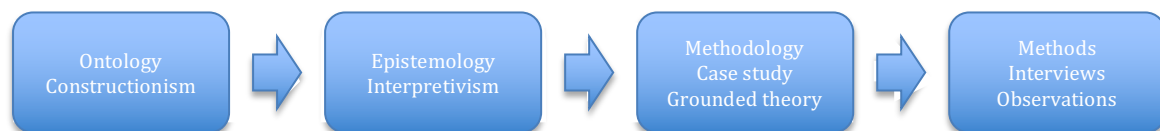


Figure 2. Overview of structure

4.1 Semi structured interviews

Methods of interpretivism are semi structured open-ended questions and observations, which belong to the social science, which let the participants, express themselves spontaneously and naturally. The participants are aware about their impact on the investigation and may gain insight into their own perspectives (Tolley et al 2016). In order to investigate the Danish participant's real need for products they might not even know exist, it is important to let them express themselves freely and spontaneously. By using a quantitative method like questionnaires, the participants would be less free to express themselves beyond the exact questions, as quantitative methods only produce numbers instead of words. Therefore, the semi-structured interviews with open-ended questions, were chosen in order to understand the participants and their culture. The semi-structured design provides the participants enough space to open up and reflect more on the questions than even expected by the interviewer or the participants, when writing the questions.

4.2 Selection of participants

Some of the Danish participants were chosen randomly, by advertising for the study in a Facebook group for cannabis users, while others were found through personal networks. Though only four participants signed up for an interview about their cannabis use, there were sufficient data to locate certain patterns and similarities between the cannabis users. A specialist interview was also included, which was arranged by sending a personal request. An interview with an edible

manufacture in the San Francisco Bay Area was also chosen randomly by advertising for the study in a Facebook group for cannabis users in that area. By a coincidence all of the participants except one were men, which could be explained by the fact that the study wanted people with recreational use of cannabis and not medical. Since a little more adult men than adult women use cannabis recreationally in Denmark, while medically it is the opposite.

4.3 Interview guide

The four Danish cannabis users were asked the same questions from the same interview guide. Though the conversations could be so long that the participants sometimes forgot the actual question. The interview guide were made before the theory was chosen and therefore it was an exploratory approach ([Zainal 2007](#)) that included many different topics in order to have sufficient data, regardless of what direction the study would go. The guide included questions about the participant's first use of cannabis, their perception of the illegalisation, their positive and negative experiences and about the future perspectives of legal cannabis products in Denmark. Besides the structured questions in the interview guide, there were many extra question, which could be used more dynamic than the thematic questions (Kvale 2009). One of the participants was a medical cannabis patient, which the interview guide didn't fit well as it was more or less made for recreationally cannabis users. In this case it become a very open interview. There were made other customized interview guides for the specialist and manufacture interviews.

4.4 Ethics

The role of the interviewer can provide a tension between the professional distance and a personal friendship. The interviewer can also show intimacy and empathy and thereby fake a friendship, which can lead to intimate answers, which the participant might regret later (Kvale 2009). The interviews were performed on a very friendly basis, but there were no intensions to obtain any intimate information. The interview guide did also not have any question, which could cause any potential problems for the interviewees. All participants are presented anonymously with changed names, as cannabis is still illegal in Denmark. When the participants were informed about the purpose of the study, some responded that they wouldn't mind having their names in the study. But no original names were used. Names and companies mentioned by the participants in the interview, where left out in the transcription, as well as a few sensitive sentences. All material from the interviews were left in a safe place and treated as confidential as possible in order to protect the participants (Kvale 2009). Nevertheless, is an online computer always a security risk of hacking and the report will be available in the public afterwards.

4.5 Conduction of the interviews

Half of the interviews were performed with Internet calls and recorded on a mobile phone, as the participants lived far away. Internet calls were a very convenient way to perform interviews, but as the participants did not had access to video calls, there were no recording of face expressions. Furthermore, could it be hard to hear everything from the bad Internet connection. The other interviews were conducted at locations chosen by the participants, who made

the connection between the interviewer and interviewees more intimate compared to Internet calls. The way the interviewer response to an answer can be just as important as the answers itself, as it is important to allow the interviewees to reflect and continue the flow of words, which can provide much deeper and thoughtful answers (Kvale 2009). Though it was a high priority not to disturb the interviewees, the interviews sometimes evolved into more friendly conversations.

4.6 Transcription of interviews

The transcriptions were performed in Danish and were done as precise as the recoding's as possible. All sounds and expression as "um" were also added. The recordings were repeated several times as the connection of the internet made it possible to hear all words, while some of the participants also talked very fast and with a dialect. Therefore, the transcription was a very time consuming. The face-to-face interviews were easier to understand and were also without dialect. The specialist and manufacture interviews were, not transcribed as thoroughly as the cannabis users the latter required a more personal analysis. It can be essential to do the transcription immediately after the interviews to capture all the nuances (Tolley et al 2016), but due to planning of the field trip, the transcription of the Danish cannabis users had to be performed later in the process.

4.7 Grounded Theory analysis

Grounded theory where used in order to achieve a greater understanding of the data from the interviews of the Danish cannabis users. Grounded theory was intended for the interview coding and creation of categories and themes. Though the purpose was not to create any theories, the analysis of the interviews did reveal certain theoretical ideas, which were instantly noted and also included in the thesis. Overall the Grounded theory analysis provided a more structured overview of the interviewee's suggestions and needs for cannabis edible products in a legal context.

Historically were grounded theory developed in the 1960s by the duo Barney Glaser, which was inspired by critical-rationalist thinking and Anselm Straus, which were inspired by pragmatist and interactionism thinkers. They aimed to move qualitative studies beyond the descriptive studies, into more explorative theoretical framework with abstract conceptual understandings of the phenomena (Charmaz 2006). Grounded theory has been further developed by Kathy Charmaz which disagreed with the original belief of Grounded theory, that the data are separated from the scientific observer. She argued that we are not discovering theories but are rather constructing our Grounded theories by our involvement, interactions, perspectives and research practices (Charmaz 2006). These beliefs have been further developed by Adele Clarke, which put even more emphasis on the researcher as an actor. She developed Situational Analysis, which is based on actor-network theory, which believes that objects, human actors and discourses can equally influence our social worlds and networks (Clarke 2005).

4.8 The Case study

The case study method has its roots in the social sciences, especially in sociology. In the 1930s the case study method was accepted as a procedural alternative to the statistical method, as it allowed the researcher to gain a more personal meaning, beneath the surface of the situation ([Baker 2006](#)). Case studies are mostly performed in a small geographical area or with a limited number of individuals. Thereby enabling the researcher to closely investigate real-life phenomenon by thoroughly analysis of events, conditions or relationships ([Zainal 2007](#)). The San Francisco Bay Area was chosen, due to the many open communities, which made it easy as a researcher to enter and study the cannabis aspects. The research design for the case study was based on exploratory research, as the objective was to discover new thoughts and ideas as an inspiration for the future of legal edibles in Denmark. The research process was therefore unstructured and open, and thought of as a pilot study. The result was a high degree of inspiration and ideas and motivation for the following study in Denmark. Further in the process of the thesis, I came to the conclusion that a more structured and descriptive research approach could have provided more diverse data and other interesting angles to the analysis ([Singh 2016](#)), which could be a suggestion for a future research. The case study will furthermore be used in comparison with the Danish context of cannabis. Therefore, you could argue that it to some degree is a comparative case study. The comparative case study is concerned with the cultural production of structures, processes, and practices of power, exploitation, and agency. Furthermore, it draws upon Marxist, feminist, and critical race theory ([Bartlett & Vavrus 2017](#)). The tools used at the field trip to California were observations at ten dispensaries as well as interviews with the customers and staff. Unfortunately, it was not allowed to use your phone at the dispensaries, which prevented me from taking any pictures, or record the interviews. Therefore, everything was written down as notes and later written down as a diary of the whole trip. Taking notes during interviews may be distracting and interruptive of the free flow of information (Kvale 2009). But I discovered very early in the process that note taking was crucial to document the large amounts of information from each interview. Nevertheless, were even more data missing, as the notes were written fast and therefore lacked certain details which also could be forgotten afterwards. As I was able to speak the same language as well as linguistic interpretation and dialect I was able to do a participant observation and blend in to the environment (Tolley et al 2016). Thereby the participants were more willing to open up and share their stories. In general people were very friendly in the setting of the study, which made it easy to find key information's. They could provide a deeper understanding of the setting, and the cultural norms than the observations and short interviews could provide (Tolley et al 2016). Social media were also a very useful tool to observe and study how people reacted on the new regulations and taxes. Cannabis Facebook groups were the most important source of information as everything concerning the cannabis market, like events, personal stories or official news, is shared and debated instantly in the groups. Critiques towards case studies are that they are often based on a single case with few participants, which makes it hard to generalize. Furthermore, are the researchers more prone to be biased and involved with the participants ([Zainal 2007](#)). Though I as a researcher, to some degree, was biased

by the personal experiences, the field trip was only used as a pilot study. The data from the field trip was validated with new literature searches, as it was used in the theoretical framework. The field trip did have an impact on the direction of the thesis, to include more of the medical aspects of cannabis. The aim of the field trip was, as mentioned earlier, to provide a direction for how the thesis should precede. As the field trip was performed after the interviews of the Danish cannabis users, the new direction did create some conflict with the interview data and should preferable have been performed before the interviews.

4.9 360 Perspective

In order to understand a product, it is important to consider the many complex factors and aspects, which define it, including what context it is made for. With the 360-perspective model it is possible to understand a design by adding words to the function, form structure and design (Engholm 2001). In a design perspective all product need to balance between function, form and structure/technique. While some products focus more on the function with engineering designs, others can focus more on the form, with esthetical designs. Most commonly an equal balance between the two creates the most useful design and the overview of these factor can be provided with the use of a design model. It is also important to understand the context since access to raw materials and the consumer trends and even the economy as well as environmental factors can influence the development of products (Engholm 2001). The 360 Perspective model is besides the design model by Vita Riis, also made up by the Taste Model, which is developed by Carolyn Korsmeyer. The taste model provides a more scientific framework to analyse taste in six different categories that are based on physical, mental and cultural aspects of taste (Korsmeyer 1999). Since it can be abstract to imagine legal edible cannabis products in Denmark, it become more tangible by using the model to provide an overview of some of the internal and external factors. When it comes to food and beverages, taste is a great part of the experience. People that consume cannabis become more sensible to taste, while edibles furthermore integrate taste aspect into the act of consuming cannabis.

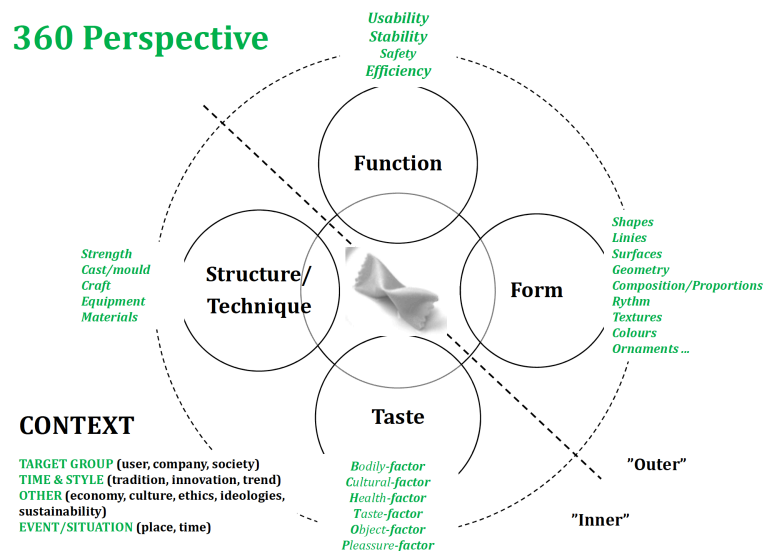


Figure 3. The 360 perspective. The Design and Taste models mixed together at the Integrated Food Studies at Aalborg University.

Summarizing

The ontology is constructionism and the epistemology is interpretivism. The methodology is based on an inductive approach using a case study and grounded theory and the 360-perspective design model for analysis. The Methods are Semi structured open-ended questions and observations for analysis. Four Danish participants were chosen randomly and through personal networks. Half of the Interviews were performed with Internet calls and the interview guide used an exploratory approach. Transcription was in Danish and all of the participants are presented anonymously.

5.0 Theoretical framework

The following chapter will demonstrate and argue why the path dependence and path creation theory as well as grounded theory is suitable for this thesis. As great institutions run our world, it is crucial to understand the institutions impact on our societies in order to provide change and development.

5.1 Path dependence theory

Path dependence was first described, in an article from 1985, by the economist Paul A. David. He wrote about the QWERTY keyboard setting, which was developed more than 100 years ago to avoid fingers getting stocked on typewriters. QWERTY is still the dominant standard in writing, even though better options are available. He argued that our technology and industries are shaped by historical events, sometimes occurred by chance, rather than sequences of economic and practical logic, which is referred to as path dependence (David 1985). In Denmark cannabis also seem to be caught in historical events, which might have occurred by chance. The path dependence theory can therefore be used to provide a greater understanding of the historical

criminalization of cannabis. Path dependence are caused by various reasons; Increasing returns, which means that repeated actions and choices will become more valuable and thereby make changes more costly, Self-reinforcement, meaning that actions and choices lead to forces or complementary institutions that will further encourage these choices and actions, Positive feedback is a creation of positive externalities from others doing the same choices or actions, like cheaper prices from mass production, and finally lock-in, which is when one choice or action have become the predominant since most people are doing it (Page 2006). In 2009 Sydow et al developed a dynamic framework, dividing the emergent process of organizational path dependence into three distinct stages; The Preformation phase which is an open situation with no restrictions in actions, but once a choice its made it set of self-reinforcing processes. In the Formation stage the range options narrow and a dominant action patterns arise as it becomes more and more irreversible. Finally in the Lock-in phase, as mentioned above, the system loses its flexibility and ability to adopt better strategies as one particular action or choice has become the dominant mode (Sydow et al 2009).

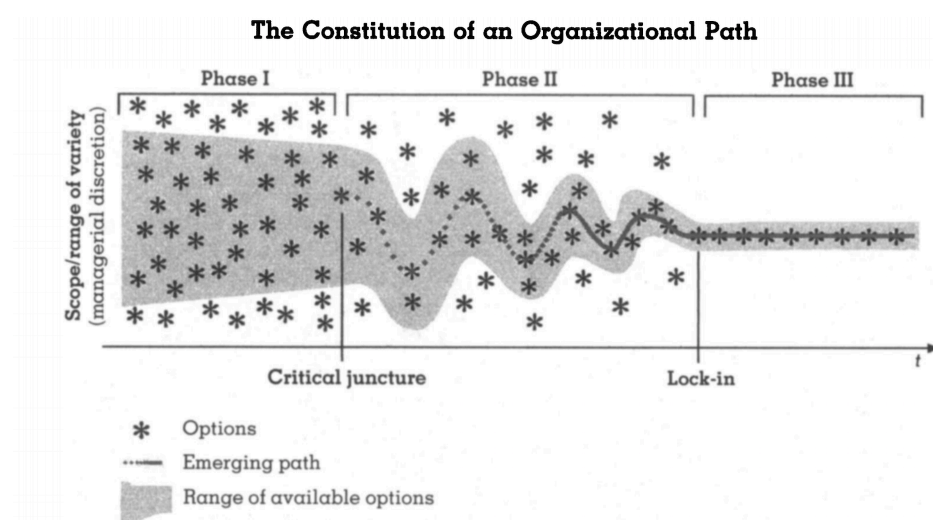


Figure 4. Path Dependence evolving from no restrictions in actions to a lock-in, where the system loses its flexibility and ability to adopt better strategies

The path dependence theory is thereby able to provide a framework, which can map the different steps toward where we are now. The California case study will be validated with further empirical data and compared with the Danish process. Thereby provide an overview of potential common patterns between the two cases.

5.2 Path creation theory

Garud and Karnøe introduced path creation in 2001. They believed that entrepreneurs are embedded in the structures, but are able to navigate, reflect and act in different ways than present social rules and technology dictate. (Garud & Karnøe 2001). The path creation is possible when multiple competent actors coordinate their activities collectively and move away from existing institutional, organizational or technological paths (Sydow 2012). From the California case

study it became clear that entrepreneurs and activist have the possibility to create change when they organize their activities and reach for a common goal.

In a technology context the approach can be adaptive by using existing knowledge or technology, which there can be build upon and thereby through their interactions create more functionality to the existing paths. The approach can also be to make a breakthrough with new radical inventions in order to create a faster outcome than long-term adaptations. Furthermore there are three overall path dependent barriers to path creation, which are: cognitive barriers from technological paradigms as a collectively shared way to do things. Institutional hysteresis as institutions being the frame to the economy but also being influenced by the industry causing feedback effects and thereby co-evolve with the economic pathways as they become locked-in. Finally social barriers, which at landscape level could be the form of legal rules enacted by governments, the grass roots level may be the historical ways of doing things and at the meso-level may be informal but conventional rules that lead to social sanctions if not followed ([Simmie 2011](#)). According to a study from Finland that analysed an urban building project, they found the process from path dependence to path creation could be divided into three phases. Phase one were a slow process since the stakeholders had no visions and the general belief was that the building design just had to follow the past history of the urban neighbourhood. Therefore no one would take ownership and all decisions were based on compromises. The second phase was characterized by dynamics and path creation when it was revealed that a metro station would be built right on the location. The largest shareholders finally took ownership of the project and dared to have greater visions. Furthermore an investment in a project director provided the necessary overview of the project and a focus on a better communication and relationship among the stakeholders. In the third phase the new path became institutionalized and all the stakeholders began to see the changes and visions, as a natural and expected part of the project ([Aaltonen et al 2017](#)). The Danish 4-year trial with medical cannabis has already meet institutional barriers as well as the legalization of recreational cannabis use in California has turned their market up side down. The path creation theory will be used to study how California were able to create new paths in a locked system as well as study the historical and cultural context of Denmark.

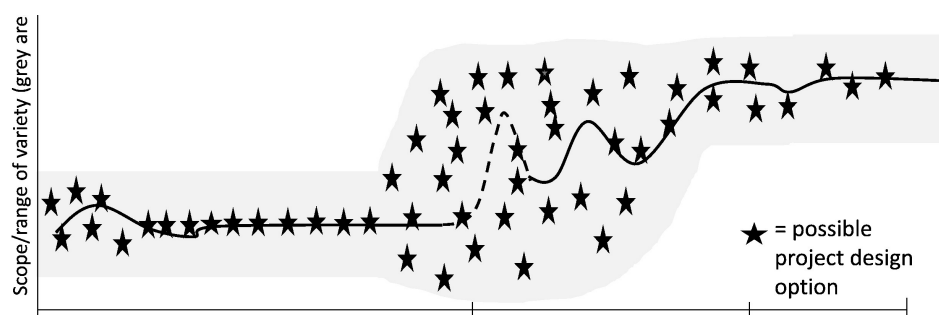


Figure 5. The path creation is evolving from reliance on history, dynamics and path creation and finally institutionalisation of the path.

5.3 Theory of experience economy

Joseph Pine and James Gilmore were the first to write about the experience economy in a journal, in 1998. They wrote about how the economy had evolved from food commodities prepared at home, to industrial innovations with premixed ingredients, and then the service economy that provided finished food product. Thereby providing value through processing, which saves the consumer time and effort, but increased the price, which is the progression of economic value. Joseph Pine and James Gilmore were describing the new phenomena of the 1990s, which were the experience economy, where not only product and service were sold, but also personal experiences. They argue that, companies to a higher degree can profit from selling experiences and services than just products. Thereby they have to be able to design experiences that the customers are willing to pay for (Pine & Gilmore 1998). In 2001 Joseph Pine and James Gilmore wrote about the transformation, which is the customization of the experience. The transformation offers a greater change on the individual than the experience, as it is customized for that exact individual. Thereby the customer has become the product, which require an even greater understanding of the customer. As the commodities once turned into customization, the experience economy will at some point also be regarded as a commodity and then the transformation economy will take over (Pine & Gilmore 2001).

5.4 The Four Realms of an Experience

Experiences can, according to Pine and Gilmore, be divided into two dimensions, of which one is about the customer's participation. Customers can either have the role of "passive participation", meaning that they do not affect the performance or event at all. Examples can be an audience at a concert, which are only observing the event. At the opposite side of the spectrum is the "active participation", which plays an important role in the performance or event and thereby contributes to the experience of others.

The other dimension is concerning the connection between the customer and the event or performance. Customers can in this aspect be in the "absorption" or the "immersion". The absorption is viewing or listening from a distance like watching TV at home or standing far away from the actual experience. The immersion is when being surrounded by the event and the smells sights and sounds. E.g. like going to the stadium and watch football instead of just watching it on TV at home (Pine & Gilmore 1998).

From the dimensional aspect it is possible to create the four categories of experiences:

- Entertainment: passive participation and absorption
- Educational events: active participation and absorption
- Esthetic: passive participation and immersion
- Escapist: active participation and immersion

An experience can preferable consist of all of the realms to provide a deeper experience. Nevertheless, is it a matter of doing the exploration, scripting, and staging of the factors that can create the desired experience. Just like goods and

service require a process of research, design, and development in order to succeed (Pine & Gilmore 1998). The four realms of experience can be used to provide a greater understanding of what kind of event that cannabis user would attend to in a legal context.

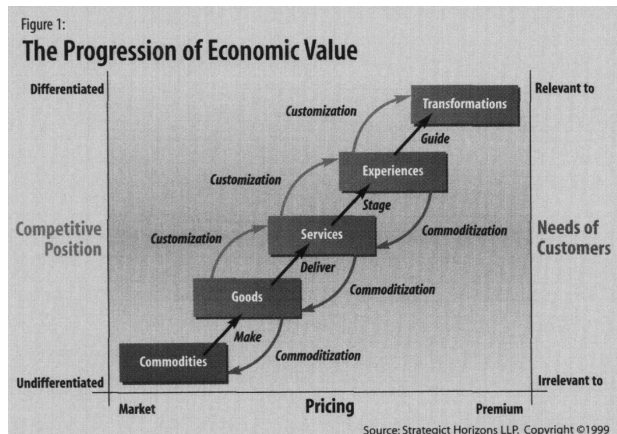


Figure 6. The Progression of Economic Value

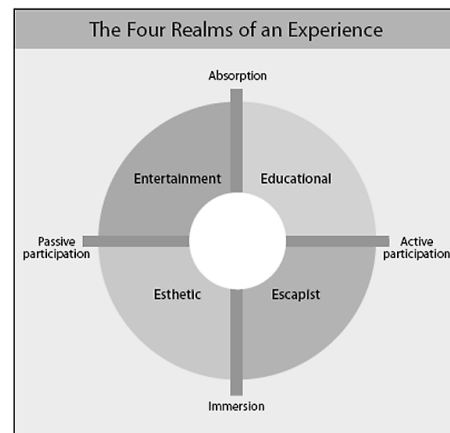


Figure 7. The Four Realms of an Experience

5.5 Summarizing

The ontology is constructionism and the epistemology are interpretivism. The methodology is based on an inductive approach using a case study and grounded theory and the 360-perspective design model for analysis. The methods are semi structured open-ended questions and observations for analysis. Four Danish participants and two specialists, are chosen randomly and through personal networks for the interviews. Half of the Interviews are performed with Internet calls and the interview guide uses an exploratory approach. Transcriptions are in Danish and all of the participants are presented anonymously.

The theoretical framework is based on Path dependence and pat creation, which will be used to understand the process toward both criminalization and legalization. The theory of Experience provides an understanding of experience economy through the progression of economic value. Furthermore an understanding of the different categories of events were provided with the four realms of an experience.

6.0 The case study

In this chapter a field trip to California will be presented with findings based on grey literature and qualitative methods. Most information was found by joining several cannabis communities on Facebook and by observations, notes and conversations with customers and staff at ten different cannabis dispensaries in the San Francisco Bay area. The aim of the case study is to provide insight and inspiration in order to understand a legal cannabis market and thereby understand what new edible cannabis products we can expect in a Danish

context. The first part will be based on literature search, while the last part will present the empirical data from the field trip

6.1 Early history of Cannabis in California

For many years the only cannabis available in California were the Spanish introduced fibre crop named hemp or cannabis sativa. Only a few Asiatic foreigners and bohemians rarely used the intoxicant variant by the name hashish or Indian hemp. In the 1850s the psychoactive variant Cannabis indica had become widely available in American pharmacies in the oral form, after William O'Shaughnessy introduced it to the western medicine. The California gold rush and travel writer Bayard Taylor had published the first popular American writings about intoxication from cannabis in 1854. Taylor wrote about his experiences with hashish in Egypt and Syria, in the same manner as the popular European writings about the "Club des Haschiscins" in that period. In 1857 Fitz Hugh Ludlow created a sensation with, what was called, the first psychedelic book "The Hasheesh Eaters". Ludlow had as a college student tried a sample of medical cannabis extract and then became very fond of the hallucinogenic visions of cannabis in his writing. Though Ludlow visited San Francisco shortly in 1863 where he became an influential figure in the literary circles, there are no records about that he introduced hashish to California. It seems that Chinese opium houses, gambling houses, bars and brothels were the biggest interest of the pleasure seekers in California upon the gold rush. In 1883 Harry Hubbell Kane wrote about hashish houses for both sexes of the better classes in New York and other cities on the East coast, but he only wrote about opium in California and mention no hashish houses at the west coast. Middle East emigrants are mentioned in an article from 1895, to grow, smoke and eat hashish, the opium of the Arabs, in California. But cannabis was never grown for medicine in California until world war one, where all the pharmaceutical supplies of cannabis indica being imported from India or Madagascar came to an end. America then became self-sufficient with medical cannabis, mostly grown near Mississippi ([Gieringer 1999](#)).

6.2 The criminalization of cannabis in California

The U.S., British and Chinese government agreed to control the opium traffic in 1906, which lead to the American federal Pure Food and Drugs Act, where cannabis was listed together with alcohol, opiates, cocaine and chloral hydrate as intoxicating ingredients that needed special labelling. The year after California made its own state law prohibiting the sale of opium, morphine and cocaine without prescription and in the following years the California state drug laws became stricter. In 1913 the California Board of Pharmacy succeeded in prohibiting both hemp and "loco-weed" which was how they described a dangerous recreational use of cannabis from Mexico. There had been no public debate in California about the abuse of cannabis and the prohibition was unfortunately written in a way so it unintendedly prohibited the medical use of cannabis. But with little or no enforcement, medical cannabis was still prescribed in California in the years after ([Gieringer 1999](#)). During the alcohol prohibition in the 1920s few American cities such as New Orleans experienced public concerns about drug use of opiates and cocaine, while cannabis was widely used but

generally not mentioned in this context. The Federal Bureau Of Narcotics was created in 1930, but the drug use continued to increase. When the alcohol prohibition ended the bureau started to treat cannabis as a serious threat to the American society. In this period literature started to describe cannabis by the Mexican name marihuana, with focus on violence, murder, sex, addiction and insanity, often with the bureau as the source. Only 16 states had anti cannabis laws when The Federal Bureau Of Narcotics was created in 1930, but in 1937 most states had anti cannabis laws and cannabis finally become illegal at federal level, same year ([Armstrong and Parascandola 1972](#)). Medical cannabis had been listed in the U.S. Pharmacopeia for almost a hundred years, when it was removed around 1941. The year before had the American scientist Roger Adams and the British Scientist Alex Todd isolated cannabidiol, (CBD), for the first time. The Israelis Raphael Mechoulam and Yechiel Gaoni isolated Tetrahydrocannabinol (THC) in 1964. Despite cannabis illegal status the American Food and Drug Administration (FDA) approved the National Cancer institute to give oral synthetic THC to cancer patients undergoing chemotherapy in 1980. In 1985 the new synthetic THC medication Marinol were approved by the FDA for chemo patients and later also for AIDS patients, though many patients stated preference of inhaling whole plant cannabis ([Martin and Rashidian 2014](#)).

6.3 Rise of the hippie and gay culture in San Francisco

San Francisco and especially the Haight-Asbury district became the centre of the world in the summer of love in 1967, when more than 100,000 youth arrived from the US and abroad, while the radio played the Mama and Papas hit, San Francisco. The young people came mostly for reason like sex, drugs and rock'n'roll but some also to join civil rights or anti-war movements. The Haight-Asbury district attracted too many people and run-away youth that weren't into the "turn on, tune in, drop out" phrase by Timothy Leary and the summer of love became the autumn of drug abuse and winter of disrespect. In October 1967 Bay Area residents made a Death of the Hippie funeral happening in order to tell people to go home and continue the revolution there ([Achenbaum 2017](#)). Besides psychedelic drugs like LSD, cannabis smoking gained popularity throughout the summer of love. In 1954 Alice B. Toklas had published the popular cookbook, which besides recipes from French cuisine also included some Moroccan cannabis confection. The American version of the book did not include the hashish fudge recipe, before the second version in 1960. The second version became very popular in the western hippie culture and even mainstream in the movie I love You Alice B. Toklas from 1968 starring Peter Sellers ([Eplett 2015](#)). San Francisco's liberal attitude had attracted many gay and lesbian people to the city, which actually lead to the fight for medical cannabis.

In the 1980s the AIDS epidemic made San Francisco a death camp for gay men, which often died within 12 months of a pneumocystis outbreak. Both Dennis Peron and Donald Abrams had a partner infected with HIV virus and they had both observed closely how cannabis made their loved ones survive longer than other HIV infected patients. Donald Abrams was a Stanford University-educated haematologist and oncologist and had been working with AIDS since the first symptoms in 1979. Due to the federal schedule 1 category of cannabis he was

constantly denied to do any research or publish anything from his experience with HIV patients and cannabis. Dennis Peron was a gay cannabis activist providing illegal cannabis to HIV patients. Dennis Peron had been shot by the police during a cannabis raid and was often arrested and beaten up by homophobic policemen. Dennis Peron teamed up with Mary Rathbun, an elderly lady that under the name, Brownie Mary, made illegal cannabis brownies for HIV and cancer patients. Together they set up the San Francisco Cannabis Buyers Club and co-wrote the book, Brownie Mary's Marijuana Cookbook and Dennis Peron's Recipe for Social Change ([Hecht 2014](#)). Since 1911 the state of California has allowed its voters to influence their state laws and constitution as direct democracy, through the initiative system. Activists, interest groups, elected officials, and voters across the political spectrum first have to collect a high number of signatures and then all voters in the state can vote yes or no to the proposal ([What's Next California 2011](#)). One of Dennis Peron's greatest achievement, together with many other activist, were when California finally voted yes to Proposition 215 which he co-authored ([Hecht 2014](#)). It was also known as the Compassion Act of 1996 or the Medical Marijuana Initiative. The main purpose were to ensure that all seriously ill patients had the right to obtain medical marijuana recommended by a physician, without any of the parts being prosecuted by the state ([Richards 1998](#)).

After almost 20 years of work with AIDS patients, Donald Abrams finally found a way to do research on medical cannabis, with Proposition 215. As a Trojan horse he could study the risk of legal medical marijuana being harmful for patients using anti-AIDS drugs. He received one million dollars in funding, 1,400 government cannabis joints, and a research supply of the synthetic THC Marinol and then started enrolling patients into the study in May 1998. Together with his 16-member research team, his study found that medical marijuana did not interfere with anti-AIDS drugs and that the medical marijuana patients gained twice as much weight and had more healthy cells than the test group. The pot smokers were furthermore superior in weight gain, healthy cells and physical surplus, compared to the Marinol group. But he realized that none of the leading research journal would public his results and he were rejected by The Journal of the American Medical Association, The Lancet and The New England Journal of Medicine. In the next decade several clinical studies on cannabis were conducted in California and finally in 2003 the Annals of Internal Medicine of the American College of Physicians did an interview with Donald Abrams and published his five years old study ([Hecht 2014](#)).

6.4 The legal cannabis market in California

6.4.1 The first medical marijuana dispensaries

The semi legal medical marijuana market in California grows steadily after Proposition 215. But the market was not properly regulated by the state and the federal U.S. Department of Justice closed down many shops and sued person that distributed medical marijuana. Oakland was the first city in California to believe in the Cannabis market and officially protest against the federal authorities. With Measurement Z in 2004 they provided licenses and regulation in order to move

the dispensaries out of the underground and making medical marijuana a substance comparable to alcohol and tobacco. With Measurement F in 2009 the city started taxing the medical marijuana dispensaries and clubs as normal business. ([Kerr 2010](#)). People of colour and Latinos had suffered the most during the American war on drugs and though the cannabis legalization had resulted in less harassment by the police and more business opportunities, they were still a minority in the legal cannabis industry. When Harbourside opened in Oakland in 2006, it was a pioneer for dispensaries with clean and welcoming spaces, like an Apple shop, which set the standard for many other dispensaries in the Bay Area. When the Justice Department tried to close down Harbourside in 2012, the city of Oakland sued the federal government and the Justice Department would finally drop its case against the dispensary in 2015. ([Halperin 2016](#)).

6.4.2 The first medical marijuana edibles

In the beginning of the legalization edibles available at the California dispensaries were typically homemade cookies or brownies wrapped in a sheet of cellophane. The first real branded edibles were laced chocolate truffles made by the producer Tainted Inc. that shipped its products internationally, and the edible market kept evolving. But the Drug Enforcement Administration (DEA) had noticed the new visible players and after two years of planning they shot down Tainted Inc.'s business in 2007 for good. The Tainted Inc. founder then became an active cannabis spokesperson instead of an edible businessman ([Bienenstock 2018](#)). In the same line of DEA operations, the founder of the edible producer Beyond Bomb, known for parodies of popular snack bars with names like Kif Kat Bars, Reefer Peanut Butter, Stoney Rancher and Rasta Reese's, was sentenced to nearly six years of prison. DEA agent Javier Pena then stated that they would continue to shut down these production lines, one marijuana-candy factory at a time ([NBC News 2007](#)). In 2010 the first chocolatier with an established mainstream chocolate brand and retail shop entered the cannabis edible world. The result were the FDA approved Bhang chocolate bars, with a professional look, taste, quality, consistency and labelling. The THC content was lab tested and listed on the ingredient label. The chocolate bar could easily be broken into squares for small precise doses and it even came in a childproof packaging. A new era in edibles had begun ([Bienenstock 2018](#)).

6.5 Author's personal experience in California

The aim of my fieldtrip to California was to observe and experience edible cannabis products and cannabis dinners in a legal and regulated context. I had chosen the San Francisco Bay Area since I had been there twice and had contacts there. In contrast to Los Angeles, the Bay Area has good public transportation and a proper walking distance. I had done cannabis food traveling research by joining several communities on Facebook, browse and sign up for cannabis events at my destination and look through cannabis webpages, YouTube videos and articles. But besides one evening at a Coffeeshop in Amsterdam in 1993, I had no prior experience with a legal and regulated cannabis market. The three most prominent themes from my cannabis field trip at the Bay Area were: Business, Community and Proposition 64.

Business	Community	Proposition 64
Consumer freedom	Medical before recreationally	Consumers before patients
Entrepreneur freedom	Bottom up activism	Increased regulation
Food innovations	Patient caregiver relationship	Increased taxes
Increased knowledge	Feminine compassion	Uncertain future
Limited marketing	Community based industry	Less competitive market
Fear of DEA	Common goals	Pesticides prohibited
Fear of robberies	Common threats	Release of prisoners

Table 1. The most prominent discoveries from the field trip to the Bay Area

6.5.1 The business aspect of cannabis

The business part was the American dream coming true for people that used to be stigmatized and chased by the police. I could really feel the joy of freedom from people now daring to go public and work and make money from their interest in cannabis. Just like I noticed the many “techies” from Silicon Valley, next door, that had risen from the shadows of the high school athletes and conquered the world with their interest in technology.

I went to ten different dispensaries and the people I meet all seemed to actively have chosen cannabis as their profession and seemed interested to learn more about the plant and how people can use it. All the dispensaries had certain similarities: guards in front of the shop, ID check and registration at entrance and no allowance of using cell-phones indoor. The federal government still prosecutes cannabis workers occasionally and doesn't allow the cannabis industry any access to banks or to borrow or store money; so, all sales are in cash. Therefore, the dispensaries are in constant risk of both DEA raids and robberies, even though they follow the state regulations for cannabis sale. The dispensaries had their products behind glass for customers to see, while the sales staff, known as budtenders, would present the products. The Medical Marijuana patients need a doctor's prescription to buy cannabis products and the doctors will often recommend certain products. But the patients are free to choose any products themselves. Therefore the budtenders were required to have a great knowledge about the many different cannabis products, but also about what medical conditions they fit. But in general, the recreationally cannabis users were least informed, as they had no doctors or patient networks to consult with. I noticed budtenders of all ages, while some were quite young. At one dispensary I was told that they mostly hire people from the cannabis industry and especially people that had attended to classes at the Oaksterdam University of cannabis. Some dispensaries had spent a lot of money and thoughts about the interior while others were more modest. I was told that then opening up a dispensary, first step would be to locate an area permitted by the city and then to apply for a state license. The state license is easy to obtain, but only temporary for the first five months, so new dispensaries would not spend much money and time on interior before they knew if the license would be denied or made permanent after the five months. It seemed that the type of

neighbourhood and the desired type of customers also had an impact on interior. It is not allowed to smoke in any public spaces in California and only a few dispensaries have smoking lounges, since it can be a problem to obtain a fire license for the building. Raw cannabis flower and concentrate for smoke is still the biggest market compared to edibles and I was very impressed by the new technology behind the smoking, vaping and dabbing devices. The cannabis plants' leaves had earlier been considered as waste, later used for edibles and in recent years they were used to make strong THC and CBD concentrates for the experienced recreationally users or patients with high tolerance. On the other side, newly developed vaping devices could deliver small and precise doses, suitable for people to micro dose recreationally or medically. Though the smoking market had thousands of different cannabis strains with different effect and taste, to choose from, the California edible market also provided a taste of consumer freedom. The quality of the labelling varied a lot between the many different edible products, but the looks of the packaging and the products themselves seemed mostly very professional. Most of the edible products were in the category of sugar rich candy, snacks, cakes or drinks. But I did see a few products like herb tea and healthy snacks at the dispensaries and also cannabis infused olive oil that could be bought online. The cannabis market is not allowed to advertise in any of the broader media. Therefore, the communication channels are: human promoters, flyers or monitors at the dispensaries, advertising in cannabis magazines or through social media. Unfortunately, social media like Facebook can close down whole Facebook pages or any post that encourage drug use. The edible market has become very popular among the recreational users since it is discreet, convenient, has precise doses and produces no smoke. But another aspect is cannabis dining, which either performed with cannabis pairing or cannabis infusion has become very popular. Cannabis and food goes well together especially due to the taste enhancing effect from cannabis use. Furthermore, cannabis flowers pose a widely varied flavour spectrum, which can be paired with food similar to wine pairing. When dosed right, the high from cannabis also create a relaxing and fun atmosphere around the table similar to wine drinking. Cannabis dining had for a long time been an underground or bring-your-own-weed phenomenon. But with the legalization of recreational use of cannabis, highly skilled and recognized chefs have brought cannabis dinners out into the open with private high-class seven course dinners. Besides new culinary opportunities and challenges, the chefs often get involved as a way to remove the public stigmas attached to cannabis use. Except for the cannabis infused private dinners, I didn't experience any frozen or heated edible products. I also attended a cannabis wedding expo, which indicated that cannabis has the potential to enter the same domains and events where alcohol is present.



figure 8. Discreet and feminine cannabis smoking equipment, at a weeding expo in San Francisco

6.5.2 The community aspect of cannabis

Even though cannabis has become an industry in California it is still not business as usual and I did experience a strong sense of community. I realized that the medical part of cannabis is much stronger than the recreationally since cannabis has prolonged the life of AIDS and cancer patients since the 1980s. The patients and caregivers have together found extraordinary many illnesses that cannabis can help with, without any influence from scientific researchers or the medical industry. Furthermore, the medical legalization with Proposition 215 was only possible due to the political work of the patients and caregivers. Therefore, the whole foundation for the cannabis industry in California is based on communities created by the people. The high degree of compassion in the cannabis communities in California has also attracted many females into the industry. I attended a monthly potluck for a cannabis community, which had a memorial for the late cannabis activist Dennis Peron. In a speech by the brother, he said that Dennis was a small gay guy that had been arrested almost 30 times, beaten up and even shot by the police, but never gave up his fight for medical cannabis to patients. In an article just before his death Peron proclaimed that all cannabis use is medical, even when people think it is not. Wayne Justmann had survived the HIV crisis by suing the government's denial of his right to medicine and thereby became the first legal medical marijuana patient in California. In his speech that evening, he proclaimed that it is our duty as humans to fight for all patients' rights for medical marijuana. Many of the dispensaries would also have certain discounts or even free products for patients with serious illness. The cannabis market in California seemed totally opposite to the Danish cannabis market, where recreationally use has been the dominant discourse and medical use has only been acknowledged in the last few years. Besides the strong medical community the cannabis business seemed like a small community. Throughout the entire trip I always met people in the industry and they often seemed to know each other. In the Facebook community's people in the industry would share information about regulation, location and equipment for business and for hiring of people. I presume that the common fear of the federal government together with the public stigmatize of all cannabis use and production, also made the cannabis business share a common goal and bring the recreationally users closer to the medical users.

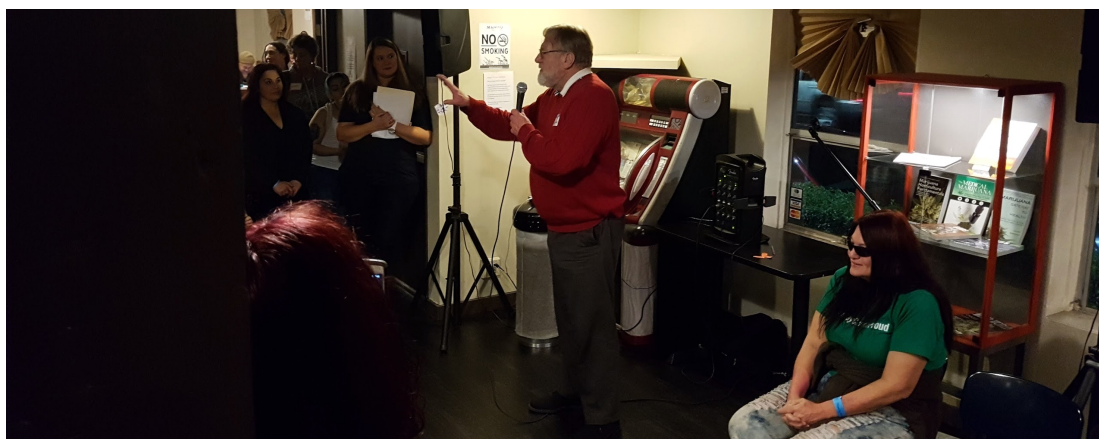


Figure 9. Wayne Justmann speaking at the memorial for Dennis Peron held at the monthly Potluck at a dispensary in Oakland.

6.5.3 Proposition 64 – The new era

Prior to my trip I believed that the legalization of recreationally cannabis starting in California from January 1. 2018 would be welcomed as the final goal of cannabis consumer freedom. But I realized that Proposition 64 had become the biggest worry for everybody in the cannabis industry. Somehow Proposition 64 overruled the focus on the patients in Proposition 215 and instead prioritized to protect the recreational users. It is now required to have a track and trace system from cultivation to sale and a personal transportation for all cannabis products. Furthermore, with a high increase in taxes it has become difficult for the small cannabis entrepreneurs to survive as the increasing prizes at the legal market has pushed many customers back to the illegal market. Edibles are also restricted not to be mixed with alcohol, caffeine, nicotine or anything that has to be held below 5 degrees of Celsius like dairy, meat or seafood. The shape of the edible products, the wrapping and the advertising is also not allowed to appeal to children and products need to have child resistant containers and proper labelling, furthermore business selling alcohol or tobacco is prohibited from selling any cannabis. The THC content of edible products are limited to a total of 100 mg which has to be easily divided into portion sizes of 10 mg. Patients that actually require higher doses of THC felt overlooked for the concerns of the novice recreational cannabis users that fitted the 10 mg doses. The edible manufactures have until July 1. 2018, to make their products fit into the new regulations, which they are stressed about. Few manufactures of edible products that couldn't be divided into the 10 mg portion sizes have had to give up on products, while others still make higher dose edibles for loyal medical patients that need the high THC dose. Tinctures, capsules and topicals are allowed to have 2000 mg medically and 1000 mg recreationally. On the other side people are very positive about the release of prisoners, which are serving time for cannabis-only sentences and for the requirements for independent testing for pesticides and mold, which will remove the "dirty cannabis" from the market. But again there were concerns about how the conventional farms could contaminate the organic farmers nearby with their pesticides and thereby prevent the framers from passing the test and be able to sell their products legally. Small manufactures were also worried about the price of the test since it could be very expensive to test small batches of quality edible products and the cannabis they used had in fact already been tested before they bought it. Many people in the

cannabis industry have informed the state authorities about these issues in the public common period and are now awaiting the final decisions in July 1. 2018. Meanwhile are there people in the cannabis industry with good economy, waiting to take over the companies that will not survive Proposition 64.

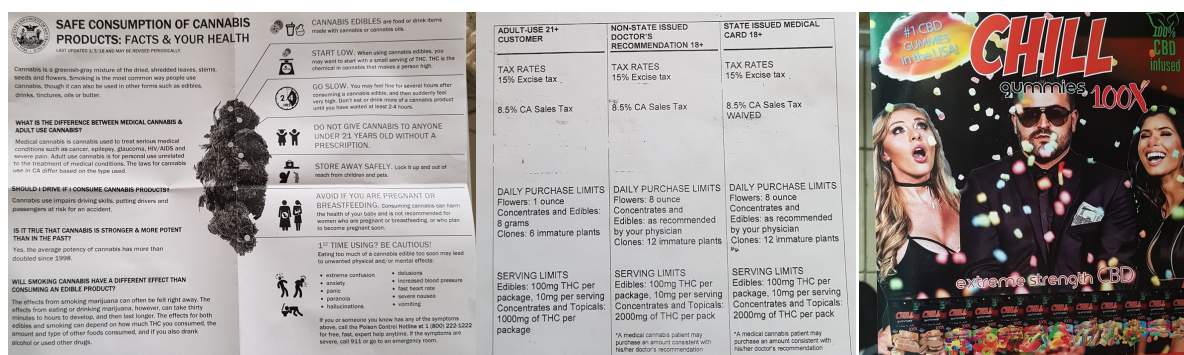


Figure 10. Proposition 64 introduces more consumer protection and taxes, while pushing the medical cannabis market into a recreational mainstream business. Picture 1+2: information leaflets from dispensaries. Picture 3: A CBD edible advertisement in a cannabis magazine.

6.5.4 The edibles

The main purpose of the field trip to California was to study the edible products and understand why people would choose edibles instead of smoking cannabis. Observations were conducted at 10 different dispensaries, where both staff and customers were interviewed about their preferences for edibles. Furthermore, where people interviewed at a cannabis wedding expo, a cannabis farmers market and at a cannabis infused dinner. The answers could overall be categorized into reasons like: Avoiding smoke, convenience, variety and different high. Edibles were more practical to consume in a time were smoking of tobacco has been prohibited in many places and seen as very unhealthy. Furthermore, can edibles provide a more exact dose and be consumed discreet anywhere. The product and taste variations of edibles seemed endless which made it exciting to shop around. The effect from edibles was also more intense and longer lasting though it took some time from consumption to feel it, which some enjoyed while other didn't. The delayed effect of edibles could cause unpleasant overdoses, which generally resulted in being very tired and high for a few hours. As edibles are a processed product compared to smoking the cannabis plant flowers, many of the edible products did not contain all the active cannabinoids, terpenes and other substances. They were often made with cannabis concentrates and not the whole spectrum of the plant, which the labelling often did not inform about. Nevertheless, by paying a little more and actively search for them, it was possible to locate edible products with a better quality of cannabis added.



Figure 11. Different cannabis edibles, which respectively contain 10, 80 and 50 mg of THC in a packet. With the new regulation starting from July 2018, a portion size can be maximum 10 mg of THC.

The field trip to California provided a deep insight into the communities, business' and their overall worries about the new regulations and taxes from proposition 64. The next part will use the theoretical framework of path dependence and path creation to analyse the many factors and historical events that lead to the criminalisation and legalisation in California. The same framework will afterwards be used to analyse the Danish context of cannabis.

7.0 Path dependence and path creation - California

In order to achieve a greater understand of how the legal Danish cannabis market might evolve, theory from path dependence and path creation will be used, including the California case study. The starting point will be from around the 1850s where William O'Shaughnessy introduces cannabis to western medicine from Asia.

7.2 Preformation phase

The first step in path dependence is the Preformation phase which is an open situation with no restrictions in actions, but once a choice it's made it set of self-reinforcing processes ([Sydow et al 2009](#)).

7.2.1 From plant medicine toward synthetic drugs

In California cannabis would be sold at the pharmacies with a minimum of regulation. Drugs at pharmacies were in the 19th century primary made by alkaloid isolates from plants sources such as morphine, atropine, quinine, cinchonine, caffeine, nicotine, atropine and codeine and most often sold without prescription. In Europe and especially Germany and Switzerland, the newly developed chemical industry went into the pharmaceutical industry and started out with chloral hydrate and coal tar. New synthetic drugs were then produced for certain diseases and illness and the drugs could now be patented ([Chandler 2005](#)).

7.2.2 Concerns about opium and cannabis

The U.S., British and Chinese government agreed to control the opium traffic in 1906, which led to the American Federal Pure Food and Drugs Act, where cannabis was listed together with alcohol, opiates, cocaine and chloral hydrate as intoxicating ingredients that needed special labelling. The year after California made its own state law prohibiting the sale of opium, morphine and cocaine without prescription and in the following years the California State drug laws became stricter. In 1913 the California Board of Pharmacy succeeded in prohibiting both hemp and “loco-weed” which was how they described a dangerous recreational use of cannabis from Mexico. There had been no public debate in California about the abuse of cannabis and the prohibition was unfortunately written in a way so it unintendedly prohibited the medical use of cannabis. But with little or no enforcement, hemp drugs were still prescribed in California in the years after ([Gieringer 1999](#))

7.3 The formation stage

The second step is the formation stage where the range of options narrows and a dominant action pattern arises as it becomes more and more irreversible ([Sydow et al 2009](#)).

7.3.1 Chemical drugs take over

During World War one, the American drug companies started to produce their own drugs and develop new ones. In the 1920s and 1930s the American drug companies set up their own research facilities and built up larger integrated organizations. They commercialized new drugs like vaccines, vitamins, insulin, heart disease, sedatives and tranquilizers mostly as prescriptive drugs. In the same period most of the long-established whole-sellers of drugs expanded their over-the-counter sales of proprietary drugs, instead of focusing on new research and development. They also entered the chemical consumer market for soap, toothpaste, shampoo, cosmetics and household products and became pioneers in massive national advertising ([Chandler 2005](#)).

7.3.2 Fear and illegalization (Self-reinforcement)

The Federal Bureau Of Narcotics was created in 1930, but the drug use continued to increase. When the alcohol prohibition ended in 1933, the bureau started to treat cannabis as a serious threat to the American society. In this period public literature started to describe cannabis by the Mexican name “marihuana” and associate it with violence, murder, sex, addiction and insanity, often with the bureau as the only source. Only 16 states had anti cannabis laws when The Federal Bureau Of Narcotics was created in 1930, but in 1937 most states had anti cannabis laws and cannabis finally became illegal at federal level, same year ([Armstrong and Parascandola 1972](#)).

7.4 The Lock-in phase

The third phase is the Lock-in phase, where the system loses its flexibility and ability to adopt better strategies as one particular action or choice has become the dominant mode ([Sydow et al 2009](#)).

7.4.1 American cannabis law goes international

The UN Commission on Narcotic Drugs was appointed in 1946 in New York and its first suggestion were a worldwide monopoly on opium, which never really came into force in the 1953 protocol on opium, due to resistance from the opium producing countries. Cannabis had been investigated for addiction without much effort in the 1930s, and the slow pace at UN level continued into the 1940s. But in year 1950 the Secretary-General of the UN was forced to do something and therefore provided the first draft for a Single convention on Narcotic drugs, which had included cannabis. The proposal for cannabis had two alternative suggestions, which both suggested that recreational use was bad and should be prevented, while they differed in the belief that:

1) *“Cannabis has no legitimate medical use compared to less dangerous drugs and all Indian hemp shall be illegal and only used for science”*

2) *“Cannabis does have legitimate medical use and each national state shall have monopoly with exclusive right to produce and trade cannabis and ensure that no illegal traffic leaks out of the system”.*

The UN member states were disagreeing about the medical status of cannabis, while long established customs and traditions with recreational use of cannabis in the Middle- and Far-east was not taken into consideration. It was decided to obtain more information, which turned into a prosecution of cannabis instead of a fair search of scientific evidence. The World health organisation (WHO) should conduct information on physical and mental health issues from cannabis use, which included a final statement authored by Pablo Osvaldo Wolff, the former secretary of the Expert Committee on Addiction Producing Drugs. Wolff's document were based on a mix of publications and scientific papers and newspaper clips from South American countries, which all had a negative approach to cannabis use. The WHO would also provide the arguments that cannabis had been removed from pharmacopoeia's in many countries and thereby no longer had any medical use. The WHO had also conducted a survey from 18 different countries showing the different usages of cannabis. The survey provided information of cannabis being used in social life routines in religion and medicine, at folk dance, before sport and hunting events, for creativity and inspiration and different kinds of social cultural gatherings. But when the UN secretary produced a final survey to inform the delegates, it contained a brief summary not mentioning any of the cultural aspect from the different member states. Instead they shortly described unemployed, criminals, labours, odd-jobbers, seamen and a few students and cabaret artists as cannabis users. New studies in that time, had found cannabis to have certain antibiotic qualities, which became of great interest worldwide, even among the cannabis critical

countries, such as the US and USSR. The WHO provided the report “The merits of antibiotic substances obtainable from cannabis sativa” in 1960, which included published results on experiments with cannabis extracts from 1957 to 1959. These results concluded that cannabis did have antibacterial activity for a number of diseases. But the WHO report argued that none of these experiments could be considered valid and that other less harmful drugs would be superior if they had been included in the experiments. Therefore became all cannabis products illegal in the UN with The Single Convention on Narcotic Drugs in 1961. Cannabis was placed in the schedule one category together with the most dangerous and addictive illegal drugs, which have no medical use ([Mills 2016](#))

7.4.2 The war on drugs

While drugs were highly used by American soldiers in the Vietnam War, president Nixon announced a national War on drugs back in the US In 1969 ([Musto and Korsmeyer 2002](#)). It starts with the Federal Comprehensive Drug Abuse Prevention and Control Act of 1970, which register and trace all legal drugs from production to dispensing to patient. Further more it schedules the most abuse drugs into five categories with cannabis/marijuana being among the most abusive and dangerous drugs, like in the UN schedule ([Gabay 2013](#))

Besides heavy spending's on drug law enforcement, the Nixon administration did at first, prioritize drug treatment and rehabilitation, which ended up being far more costly than anticipated. When Nixon was re-elected as president in 1972, he had gone for a more hard communication strategy and approach to both crime and drugs, which probably won the election for him. The solution to crime and drugs would be spending's on law enforcement over treatment as he abandoned all results and strategies of his earlier drug campaigns ([Musto and Korsmeyer 2002](#)).

The American Drug Enforcement Administration (DEA) was created by the Nixon administration in 1973 in order to centralize all federal drug enforcement and end rivalries between federal organs. The DEA would have the authority to conduct drug enforcement in the US and abroad and to collect and evaluate all foreign intelligence of supply and distribution syndicates, while the FBI should assist the DEA with organized crime. The Idea was planned to be a consolidation of three Justice Department agencies: The Bureau of Narcotics and dangerous Drugs, the Office for Drug Abuse law Enforcement and the Office of National Narcotics Intelligence. Furthermore, they received a transfer of 500 Custom Service investigations agents from the Treasury Department and a transfer of 900 inspectors from the Immigration and Naturalization Service (INS). But the INS inspectors were not transferred to the DEA due to pressure from labour unions and the Custom service still had the power to stop the drugs at the border. In the first two years of the DEA, the smuggling and street sales of dangerous drugs had increased, together with the federal government spending's to prevent it. The critical results were blamed on old interagency rivalling ([CQ Almanac 1975](#)).

The war on drugs continues and is legitimized by drug abuse now being seen as the cause, rather than the symptom on social problems. Though government administration makes several cutbacks on healthcare, education, children and

drug-abuse programs between 1981 and 1990, poverty death and disease in poor communities are communicated as problems created by the people themselves, because they use drugs they shouldn't. The increasing social and economic inequality in the US furthermore makes illegal drug trafficking, and drug use, more attractive for the poorest population. For the middle- and upper class segment the drug use is increasing simultaneously with cases of stress and depression, while leisure time is decreasing. Furthermore leisure seems to lose its quality of leisure and becoming another stressful job or mean of consumption. The war against drugs continues with the changing governments, while the consequences caused to society by the legal over-the-counter and prescription drugs, as well as alcohol and to some degree tobacco, face less restrictions (Johns 1991). With the Comprehensive Crime Control Act of 1984 and the Anti Abuse Act of 1986, third time possession of cannabis or other illegal drugs are punished with minimum five, ten or twenty years of prison regardless of what the judges believes the punishment to be (Schlosser 1994).

7.4.3 Biotech and university patents

Biotechnology had for centuries been limited to fermentation of food and beer and of penicillin made from mold. Penicillin had a mass production breakthrough at World war two when it was made from a mixture of corn steep liquor and lactose. The new era of biotechnology started in the 1970s when scientist at Stanford University and University of California in San Francisco discovered recombinant DNA (rDNA), which mean developing DNA from any species. Based on their hybridoma technology scientist from Harvard University shortly after produced monoclonal antibodies, which can be used to diagnose or treat molecules and cells in the body (Chandler 2005). Until now it had been a very difficult process for government-funded projects to obtain patents. But in 1980 Stanford University and University of California in San Francisco, patented their successful recombinant DNA methods, while in the same year the US Congress passed the Bayh—Dole Act. Thereby making it easier for government funded projects to claim their patents. In the following years patents to academic institutions, especially in the life science, grew rapidly. So did industry funding which often was associated with certain degrees of trade secrets and publication delays, until patents were in order (Cook-Deegan and Heaney 2010).

Due to the Comprehensive Drug Abuse Prevention and Control Act of 1970 cannabis studies face many barriers as the substance it categorized as both illegal and with no medical use. There are no economic motives to do research on therapeutic benefits from cannabis use, while laws, rules and prejudice also prevent studies (Andreae et al 2016)

7.5 Path creation – Reliance on history

During the Nixon presidency the Shafer Commission published a report stating that all cannabis use should be made legal. Nixon discarded the results, but the conclusions of the report would later be used throughout the US. In the period from 1973-78 there were 11 states changing their state laws so possession of up to 1 ounce of cannabis (28 grams) is only fined with \$100-250\$, where California had the \$100 fine (Israel et al 1981). In 1991 the voters of San Francisco passed the Proposition P measure that urged lawmakers to make cannabis available for

patients. Officials in California were positive towards medical use of cannabis and other cannabis laws were approved in 1994 and 1995. But California's governor Pete Wilson vetoed the measures as he was against any use of cannabis, in line with the federal authorities ([Lu 2012](#)). As mentioned earlier voters in California have since 1911 been able to change the state laws through the initiative system ([Israel et al 1981](#)). Activist Dennis Peron had several times been arrested, beaten up and even shot by the San Francisco police as he was actively providing the illegal cannabis to patients. He had come to the conclusion that cannabis had to be taken directly to the voters in order to be legalized. But first step were to hand in 433,000 signatures and that would require more organization and financial resources. With his allies he formed a political action group for medical marijuana, which was supported by several wealthy people that donated around \$2 million ([Lu 2012](#)). Some of the founders were: the New York-based international investor George Soros, the Ohio insurance company owner Peter Lewis, the University of Phoenix founder John Sperling, the Men's Wearhouse owner George Zimmer, the Chicago commodities broker Richard Dennis and Laurance Rockefeller of the Rockefeller family. Thereby it was possible to show the human side of medical cannabis, since some of the money was spend on TV ads showing cancer patients easing their symptoms with cannabis, as well as the doctors describing medical marijuana and the relatives to the patients ([Bailey 1996](#)). The supporters gathered around 850,000 signatures and the Compassionate Use Act was approved by 56% of voters in California in 1996, which made California the first state in the US with legal medical marijuana. The Clinton administration replied shortly after that federal drug laws would be enforced and physicians who recommended medical marijuana to their patients, where warned about losing their registration with the Drug Enforcement Administration and being prohibited from participating in the Medicare and Medicaid programs ([Lu 2012](#)).

7.6 Emergent path creation process

The first cannabis edibles in California were mainly brownies inspired by the Alice B. Toklas book and movie. But with Proposition 215, dispensaries could legally sell any kind of cannabis products and anyone was free to produce them. Therefore all kind of edibles products are being made, as there is limited regulation and even less control of the products or their labelling. After a couple of years the first professional edible products enter the dispensaries, though it is still dangerous to be a visible player in the cannabis industry due to the federal drug laws. Many edible producers start to copy the designs and fonts of the well-known candy brands, and then make similar cannabis names like Weetos instead of Cheetos. That is considered theft of intellectual property, but except from occasionally DEA raids, the growing legal cannabis industry is free to do anything. In the first couple of years the market is dominated by many small start-ups, as big business is less willing to enter the risky semi legal cannabis market in California. But the small communities have more faith in the cannabis market. Inspired by Holland Richard Lee opens up Americas first cannabis trade school, the Oaksterdam University in Oakland in 2007. The school creates a curriculum with focus on all parts of the cannabis industry and thereby making the cannabis entrepreneurs more professional and the cannabis industry more

legit. As the school attracts many new cannabis entrepreneurs, other cannabis schools open up ([Oaksterdam University 2018](#)). Different kinds of cannabis incubators start up, with support to women, coloured people or anyone that want a more professional approach to enter the cannabis industry. In Oakland City officials start to fight for its citizens and entrepreneurs against the federal laws and other officials follow (Kerr 2010). The Harborside dispensary in Oakland becomes the largest dispensary in America and starts a trend with more professional looking interiors and designs in dispensaries. The cannabis products also become more sophisticated and while some just make products they like, others are more specific about targeting certain segments as the competition grows. In 2000 the Center for Medicinal Cannabis Research was established with a \$3 million funding in its first year to support and coordinate scientific cannabis research at universities and research centres in California. The data was planned for the development of appropriate guidelines for pharmaceutical use of cannabis ([ScienceDaily 2000](#)).

7.7 Institutionalization of the new path

In 2010 the voters vote no to Proposition 19, which could had legalized recreationally use of cannabis in California. Proposition 19 was funded with \$4 million, while the next cannabis ballot would be funded with \$20 millions. With Proposition 64 California voted yes to both legal recreational use and the growing of six plants for own consumption, in California for everybody above 21 starting January 1. 2018. Proposition 64 had gotten the nickname “the Parker initiative” since the former Facebook president and founder of Napster, Sean Parker, had contributed \$7.5 million, while another \$4 million came from George Soros. The campaign stated that Sean Parker had only “*expected a professional and ethical campaign*” and had not influenced the writing of the bill to Proposition 64 ([Robinson 2016](#)). While Proposition 215 was made with a focus on the care of the patients, proposition 64 switched the focus to protect the society, children and new cannabis consumers. Legal regulated adult cannabis products, were estimated to yield another \$1 billion in tax a year and eradicate the illegal markets ([Roberts 2016](#)). All uses of pesticide in cannabis agriculture were also banned and enforced by mandatory pesticide test of both raw plant material and in processed products. The fungicide Myclobutanil, known as Eagle 20, had been banned for tobacco production by the federal government as it becomes dangerous when it is heated. But it has been widely used in the unregulated cannabis market, which proposition 64 is trying to eradicate ([Walker 2017](#)). Only certain kinds of “natural” pesticides, like e.g. garlic, are allowed with Proposition 64 ([California cannabis Cultivation 2017](#)). In order to ensure safe products for new recreational consumers of cannabis, the maximum THC content in edibles has been lowered, though medical users need the higher doses ([Richards 2018](#)). The labelling has also been stricter and many food items are banned from being added to the cannabis edibles ([Alexander 2018](#)). With similar regulations across state borders it becomes easier to have a large-scale production of cannabis products, which makes it more attractive to invest in the cannabis industry. The California based billion-dollar cannabis retailer MedMen has announced a joint venture with the Canadian licensed Cronos Group, which distribute cannabis all over Europe and Australia and is listed on the NASDAQ.

MedMen has cultivation factories and stores in California, Nevada and New York and has announced to go public on the Canadian Securities Exchange, as cannabis is still illegal in the US at federal level. The Corona beer seller Constellation Brands Inc, based in New York, has recently paid \$191 million for a 9.9 percent stake in the Canadian seller of medicinal-marijuana product; Canopy Growth Corp. Big alcohol is monitoring the cannabis industry very closely and especially the women seem fond of the drinkable edibles since they have less calories than cookies and candies ([Kaplan and Skerrett 2017](#)). There is also a growing amount of companies in the cannabis industry that, "*Don't touch the plant*" e.g. 'cannatech' companies delivering the apps, products and computer systems behind the industry. They can enter the cannabis industry without the usual risk and regulation and can freely move across state borders ([Weed 2018](#)). Successful 'cannatech' apps are Weedmaps; showing dispensaries nearby, Reefer; providing marketing and loyalty programs from dispensaries to customers and YoBuddy; showing dispensaries but also cannabis users nearby to socialize with ([Halperin 2017](#)). Eyechronic delivers a TV network for dispensaries with customized advertisements, government messaging from state sponsors, interactive touch screen tools, and education and entertainment for consumers to view during their shopping experiences. Eyechronic partnered with almost 300 dispensaries across 16 states in its first year and has been granted a \$3 million funding from Tuatara Capital, L.P., which manages over \$108 million in market-leading cannabis companies ([Cision PR Newswire 2018](#)). Vaporizers for less harmful intake of cannabis and lightning systems for growing of cannabis plants are also a big market in the cannabis industry ([Halperin 2017](#)). All cannabis products are now added an extra 15% state tax to benefit the state economy and local societies. In order to prevent illegal cannabis markets there is a mandatory control of the distribution chain with track and trace of each cannabis plant, video surveillance and guarded storing and transportation. Unfortunately many cannabis customers have returned to the illegal market as a response to the new taxes and regulations on products. The small-scale "mom and pop" producers, as well as medium sizes, are threatened economically by the new taxes and extra expenses from the regulation, such as testing and transport of cannabis ([Schroyer 2018](#)). The State and city officials have to some degree involved the cannabis entrepreneurs, patients and customers in the final adjustments of proposition 64, to be released June 1. 2018. Through open discussions and written feedback. The market is therefore changing as medium and larger cannabis enterprises can take over market shares and even buy up the smaller ones that doesn't survive the new regulations and taxes. The cannabis market is still growing and is slowly becoming a legit competitor to events where alcohol is served ([Halperin 2018](#)). I have observed the new business opportunities like wedding, wellness and experience industries opening up and merging with the cannabis industry. Even fast food companies like Jack In The Box dare to make a partnership with rapper Snoop Dog's cannabis digital media company, Merry Jane, in order to launch a temporary Merry Munchie Meal, when California legalized recreationally cannabis use ([Richards 2017](#)). These things happen as the cannabis stigmas in society are broken down and the cannabis users are becoming legal consumers. Thereby having greater possibilities and expectations to shop around in search of safe and customized cannabis products. Meanwhile the FDA might approve the first non-synthetic cannabis based

medicine on a federal level in June 2018. The drug Epidiolex contains real plant CBD to treat epilepsy and is produced by the UK-based biopharmaceutical company GW Pharmaceuticals PLC. If the FDA approves the drug, the DEA will have to reschedule CBD to a category that has medical benefits ([Scutti 2018](#)).

8.0 Path dependence and path creation - Denmark

The theoretical framework were able to follow California all the way to the legalization of recreational use of cannabis which included 22 years with a legal edible market for medical use. The theoretical framework will now be used on the Danish context of cannabis, with the same time line, though the process of legal cannabis is a little different in Denmark compared to California. Since Denmark has only started its 4-year trial with medical cannabis this year, the last two steps of the path creation will present the context of food and medicine regulations and norms in Denmark. As well as the edible possibilities of the medial cannabis manufactures in Denmark.

8.1 The preformation phase

8.1.1 First Danish pharmacies

Denmark's first hospital pharmacy opened in 1758 at Bredgade 66, in Copenhagen, which was a time with drugs of organic origin ([Dansk Farmacihistorisk Fond n.d.](#)). From 1772 to 1913 only pharmacies were allowed to prepare and sell medicines. But due to new pharmacy laws and regulations the production of medicine was slowly taken over by the pharmaceutical companies ([Danmark Apotekerforening n.d.](#)).

8.1.2 Medical Cannabis from the 1800s

In Scandinavia different cannabis medicines containing extracts and tinctures were available in the pharmacies throughout the 1800s and the early 1900s. In Danish newspapers and magazines there was advertises for the award winning Maltos Cannabis that was "*an excellent lunch drink*", which according to the advertise, were recommended by doctors for both children and youth around year 1900. The cannabis drink could be bought in all pharmacies and bigger groceries in Denmark and Norway as a medicine for pulmonary disease, anemia, gastric catarrh, scrofula, neurasthenia, asthenia and emaciation ([Decorte et al 2016](#)). According to pictures from the Danish Pharmacy Historical Foundation, the medical cannabis products; Cannabisol, made by Løvens Kemiske Fabrik in Copenhagen, and Fructus Cannabis, were available in Danish pharmacies in that period ([Dansk Farmacihistorisk Fond n.d.](#)). From Chinese traditional medicine, hempseed is known as the fructus of Cannabis sativa, which beside medicine has been commonly used as a non-staple food for centuries. It contains a variety of essential fatty acids, such as linoleic acid, alpha-linoleic acid and antioxidant peptides ([Chen et al 2017](#)). The Cannabisol tincture from Løvens Kemiske Fabrik had Cannabis Indica labelled on it. In a new study scientist describe how they isolate the cannabinoid cannabisol from high potency cannabis sativa plants, rich

in CBG. Cannabisol is in the study described as a dimeric cannabinoid, made by two THC cannabinoids bounded with a methylene bridge, like a butterfly. ([Zulfigar et al 2012](#)). CBG has furthermore found to be a 'parent' cannabinoid that turns into THC and CBD in the plant ([Havelka 2017](#)). There seem to be no available information or explanation about how the Cannabisol tincture got its name, as the latter cannabis studies were not available 100 years ago. Though one source mention the Danish produced Cannabisol tincture as a medicine against depression, which was used up to the 1950s ([Decorte et al 2016](#)). Another source mention the same tincture as a sedative medicine, that in the 1950s where replaced by chemical pills like Restenil ([Dahlin 2013](#)).

8.1.3 Abuse of pharmaceuticals

In the beginning of the 20-century the Danish authorities was keen on following the international agreements on opium, which lead to the Danish pharmacy law in 1913, the law about production and trade with opium in 1930 and the doctor prescription law in 1934. Despite the new laws, the number of psychiatric hospitalizations for morphine weaning increased sharply in Denmark after world war two ([Indenrigsministeriet 1953](#)). In a WHO statistics, Denmark had the highest use of the pharmaceuticals; morphine and codeine. The Danish Ministry of Interior decided to analyse the situation and found that the only drug abuse occurring, were from legal drugs, like morphine, prescribed by doctors and obtained from pharmacies. Contrary to the use of illegal drugs in other UN member states. Based on the analysis Denmark did not sign the UN opium protocol in 1953. Instead Denmark passed the law on euphoric substances ("loven om euforiserende stoffer") in 1955. Smoking of opium would be listed as a "category A substance" which was completely illegal. The legal medical drugs that were of concern of euphoric propagation, like amphetamines, different types of morphine, codeine, cocaine, cocoa leaves and cannabis, would be in the B category. The substance abusers were categories as either doctors and other medical staff and patients, which were good citizens, though with a weak character concerning euphoria. The other group were the social deviants and criminals and the law was especially made for the latter two, which now could be sentenced up to two years of prison for illegal acquisition of pharmaceuticals ([Mogensen 2017](#)).

8.1.4 Cannabis enter Denmark

Due to the close contact between the US and Denmark after world war two, few incidents of illegal marijuana cigarettes occur in Denmark. While only a single incident of marijuana cigarettes is mentioned in Danish newspapers in 1950, the Danish communication from both newspapers, government health institutions and doctors are in the following years inspired by the fear of cannabis in the US. In 1960 Denmark has the first criminal marijuana case, which attract a lot of media attention. Several Danish women are involved in the case but only two foreign men from the US and the West Indies, with connections to the Danish Jazz environment, are sentenced. Drug use is slowly entering the youth culture while health authorities still believe that drug abuse comes from the legal medical use of pharmaceuticals and that only dangerous criminals and social deviants would use illegally imported drugs. Though cannabis is considered to

be very dangerous, it is still not seen as a real threat to Denmark, since cannabis is becoming less available in the pharmacies, due to the rise of other new synthetic products ([Sørensen 2015](#)).

8.2 The formation stage

8.2.1 Prohibition of cannabis

When the UN adopted the Single Convention on Narcotic Drugs in 1961, Denmark implemented the conventions into the national law in the same year. According to a documentary from the Danish national TV station Danmarks Radio, no studies were received from the UN in order to justify the total prohibition of the cannabis plant in Denmark. The Danish Health Authority recommended the total prohibition of cannabis since cannabis has limited medical use. A civil servant from the Danish Health Authority had furthermore made hand written notes in their document mentioning: *“The cannabis prohibition would not make any grounds for objections”*. Therefore the law was passed without any public debate in order to protect the future youth, as there were no noticeable cannabis problems among the present youth ([Danmarks Radio 1997](#)). From 1965 Danish newspapers starts to write about average young people using drugs. Besides opium and methadone stolen from pharmacies, illegal cannabis was no longer limited to a few foreigners at the jazz clubs. Young people would use cannabis as a way to understand themselves and their society and as a way to provoke and create a distance to the social norms and the older generations. The new generations use of drug did not fit into the older understanding of euphoria from legal medicine or alcohol. That started a large public debate in the national Danish medias with doctors, psychologist, editors, journalist, policemen and politicians, about cannabis and youth from 1965 to 1969. The debates spanned from cannabis not being more harmful than alcohol and should thereby not being categorized as a drug and about cannabis making people insane and addicted from the first time being used. In 1968 the Danish government were proposing to extend the drug penalty frame from two to six years of prison. The justice system were interested in harder punishment and expansion of the investigation methods. While others, from both prohibition and legalization points of view, was worried about the harder penalties would: bring the cannabis market closer to other drugs, make the cannabis market more attractive for the organized international criminals and that it would criminalize cannabis users that had no other criminal intentions. Most parties in the Danish parliament were against a legalization of cannabis in order to protect children and youth, but also against cannabis being in the A category together with the most dangerous and addictive drugs. As a compromise the parties accepted the minister of Justices' proposal in 1969, to keep cannabis in the A category and include cannabis in the criminal code with §191, that extended the penalty frame up to six years. But in the enforcement of the law, should cannabis possession for own consumption only cause warnings and the six-year penalty should only be for possession of between 10-15 kg of cannabis ([Houborg and Vammen 2012](#)). The Social democrat, Conservative and Radical-left parties were interested in further investigations of:

- 1) Cannabis health hazards compared to alcohol and cigarettes
- 2) New scientific studies about cannabis
- 3) The consequences of the criminalization of cannabis

There were also critics towards the Danish Health Authority not being able to justify why they recommend the UN prohibition of cannabis to the Danish parliament. Therefore it was decided to revise the cannabis law after two years, to discuss if cannabis should be legal again. The Danish Health Authority proclaims that there were not likely to come any new relevant information about cannabis, even though they were aware of new studies pointing towards cannabis being relatively harmless compared to other drugs. Therefore the Danish parliament never conducted the planned revision of the cannabis law in 1971 (Danmarks Radio 1997).

8.3 The lock-in phase,

8.3.1 The fight against drugs

In the 1990s cannabis, but also drugs like ecstasy, becomes more popular among the youth in Denmark, which create a lot of negative media attention. Young people that took "party drugs" could use cannabis as a way to relax again and in general drugs were more commonly accepted among the youth. The Danish government adopted the hash club law in 2001, which could close down any place on the suspicion of cannabis sale. The Danish parliament was satisfied with the new hard approach to cannabis. The government went from left wing to right wing the same year and the new government would present an even harder approach to cannabis. The Danish government radically changed the Danish liberal cannabis policy in 2004, with its plan of action in title "The Fight against Drugs" (Kampen mod Narko). Without any public discussion §191 was extended from six to ten years of prison, while more serious drug crimes were increased to 16 years of prison, with possibilities of even longer sentences. The possession of cannabis up to 9,9 gram for own use, was no longer settled with a warning but instead a fine, known as the zero tolerance. Furthermore is possession of euphoric substances with intentions of transfer or sale to others at discotheques, restaurants or school parties, where young people are present, always leading to custodial sentences (Storgaard 2004). The plan of action is also focusing on drug treatment, which has to be guaranteed by the public in 14 days and there is a big focus on cannabis treatment for young people. But while the big focus is now on the drug enforcement and treatment, the harm-reduction and prevention become less of a priority. The police close down Denmark largest cannabis market at Pusherstreet, Christiania in Copenhagen for a while in 2004, which spread some of the cannabis market out in the city (Houborg and Vammen 2012).

8.3.2 Increasing gang violence

The criminal market for cannabis and other drugs had also become more organized and dangerous in Denmark. In 1984 a member of the biker club Hells Angels kills the president of the rival biker club the Bullshits, partly in order to get access to the cannabis market at Christiania. The Bullshits biker club dissolves and the members join other biker clubs, while the murderer of their president becomes the president of the Hells Angels, after serving his prison sentence. In 1996-97 another bloody riot between Hells Angels and the rivalling Biker club Bandidos leads to a law prohibiting the bikers to enter certain places. In 2008 a new war starts between Hells Angeles and gangs of young second generation foreigners. In the years after new gangs like Brothas, Souljaz, Black Cobras and Bloodz enter the cannabis market which create more tension between the many groups. From 2011-13 Bandidos team up with Bloodz that are rivals to Black Cobras and that cause several attacks between the groups. In 2013 the German biker clubs Black Jackets and Gremium and the Dutch biker clubs No surrender and Satudarah enter the Danish market. Satudarah accepts second generation foreigners as members and as well as Brothers they later become members of Black Jackets, Black Army, Loyal To Familia and Bloodz. They would control the streets in the following years together with Hells Angels and Bandidos. In 2017 rivalling between Brothas and Loyal To Familia results in many months of shootings in Copenhagen ([Thisgaard 2017](#)).

8.3.3 Zero tolerance toward cannabis

The increasing crime and violence, often connected with the cannabis market, provide the police and the criminal justice system with many new tools. From 2003 the police were allowed to use undercover agents, internet, telephone and room tapping when they suspect any criminal activity and to set up temporary strip-search zones anywhere ([Storgaard 2004](#)). In 2007 the cannabis laws are changed again so first time possession of cannabis for own use is a 2,000 DKK fine, second time 3,000 DKK, Third time 4,000 DKK etc. A warning instead of a fine is only possible if the user informs about the dealer, is a tourist that leaves the country right away or has severe addiction problems (Houborg and Vammen 2012). From 2012 would people loose their driving license for three years and be fined one monthly pay if they were caught driving and had any traceable amounts of THC in the blood. In that period many people loose their driving licenses, as THC from cannabis can be traceable up to six weeks after consumption. The Danish Health Authorities had already in 2014 informed the parliament that people could loose their driving license without even being intoxicated. But it was first after a public debate in the media that the law was finally changed in 2017 to include a minimum level of allowed THC in the blood while driving ([Haislund 2017](#)).

8.4 Path creation - Reliance on history

8.4.1 The first medical cannabis

Though recreational use of cannabis is illegal in Denmark, the medical use is slowly becoming legal. Since 1997 the Danish health authorities have approved clinical studies of the patented synthetic cannabis medicine Marionol's effect in Danish patients with eating disorders, sclerosis, nerve pain and spasticity. Between 2002 and 2011, the Danish health authority have approved Danish doctors to use Marinol on patients around 2.000 times which "lægemiddelovens §29" allow for pharmaceutical products that haven't been approved for sale (Sundhedsstyrelsen 2015). In 2010 a Danish farmer finds a dead Vietnamese man in his slurry tank and the police becomes aware about Vietnamese having large illegal cannabis production inside Denmark as well as in other European countries (Nielsen 2013). In 2011 GW Pharmaceuticals requested to sell the patented medical spray Sativex in Denmark, which contain THC and CBD concentrates from cannabis. The same year the minister of health, Bertel Harder, changes the narcotic substance law to allow pharmaceuticals made from cannabis to be approved as medicine in Denmark (Damløv and Sørensen 2016). Only pure THC and CBD and a few synthetic THC cannabinoids were allowed as medicine, not the whole plant. Sativex could only be prescribed by specialists in neurology to patients with severe sclerosis, which 182 patients has been prescribed between 2011 and 2015 (Sundhedsstyrelsen 2015). In this period more people in Denmark are becoming aware about medical cannabis and in 2014 the national TV station DR2 transmit the program "Sick Danes on hash medication" (Syge danskere på hash medicin) (Harder 2014). In 2015 Claus "Moffe", who manufacture and sell medical cannabis illegally, shows and explain openly about his activities at the national TV station DR3 (Sejr 2015). As the demand for medical cannabis is increasing and the raw materials are becoming available legally in appropriate quality, Glostrup pharmacy starts to manufacture their own cannabis medicine as magisterial medicine in 2015. Doctors hold the entire responsibility for the treatment, as the magisterial medicine is not allowed for normal sale. Any doctor can prescribe magisterial medicine if the patient is allergic to the approved medicine or if there is none of the approved medicine that has a similar effect (Lægemiddelstyrelsen 2017). At Glostrup Pharmacy they manufacture oil- and capsules with components from cannabis, which can be either THC or CBD. In the first year 20-30 doctors prescribed Glostrup's magistral cannabis medicine for around 200 patients (Damløv and Sørensen 2016). The Danish Medicines Agency "Lægemiddelstyrelsen" recommends doctors not to prescribe the magisterial cannabis medicine, due to lack of scientific evidence on the effects. But the Multidisciplinary Pain Department at the National Hospital shows great interest in conducting their own clinical trials with cannabis as medicine (Sundhedsstyrelsen 2015). In 2016 Claus "Moffe" and his wife is arrested and detained for 53 days for manufacturing and selling cannabis to patients. The couple has four children and could be facing up to several years of prison, which is portrayed in a documentary at DR1. That further increases the public debate and demand for legal medical cannabis (Madsen 2016).

8.4.2 The 4-year trial is decided

In 2016 the government and most other parliament parties agree to establish a 4-year trial starting from 2018, where any doctor can prescribe medical cannabis with real plant parts. The doctors will again have the full responsibility and the cannabis treatment is only possible when all other treatment has failed. The 4-year trial is intended for patients with multiple sclerosis, spinal cord injury, chronic pain or nausea and vomiting after chemotherapy. But doctors can also prescribe medical cannabis for other types of illness. The 4-year trial is estimated to include 1,500 patients and has a 22-million DKK budget to management and five million DKK to research ([Folketinget 2016](#)). In 2018 another five million DKK is included for research of the trial ([Lægemiddelstyrelsen 2018](#)). The chairman of the Medical Association subsequently reports that doctors are put in an extremely difficult situation, professionally, legally and ethically, as there is no scientific evidence that cannabis treatment works ([DR 2016](#)). Furthermore has the chosen Dutch cannabis producer a restriction that only allow them to export 10% of the needed cannabis for the 1,500 Danish patients. As the medical cannabis friendly countries Canada and Israel had no export and Australia and Germany had no production, several Danish farmers and politicians suggest to produce the medical cannabis inside Denmark ([Schmidt 2016](#)). In 2017 the Danish government announces, that commercial producers in Denmark, together with the 4-year trial, can grow cannabis for medical purposes. The focus is on strict control of the production to avoid illegal use and to secure high quality products for the Danish patients and for the possibilities of export. Meanwhile the Medical Association and the Danish Medicines Agency continue to advocate against the use of real cannabis contents, as there is no scientific evidence on their effect ([Rasmussen 2017](#)). Same year the Danish actor Søs Egelind has openly talked about her use of cannabis during her chemo treatment and she instantly receive letters from sick people all over Denmark asking for advice about medical cannabis. In order to help the sick people avoiding the illegal cannabis market she join the newly founded association "Cannabis Denmark" together with influential people from the Danish horticultural organization, Danish Technical University and the Organization of Agriculture and Food.

8.4.3 The 4-year trial begins

When the 4-year-trial starts, at January 1. 2018, most doctors refuse to prescribe their patients with medical cannabis. The patient association therefore suggests making a list of doctors prescribing cannabis, which the non-prescribing doctors could refer their patients to. The doctors can thereby avoid any responsibility of the further treatment with cannabis. But the chairman of the medical practitioner's association believe its a bad idea, since the medical practitioners are supposed to treat their own patients and it would furthermore overload the cannabis friendly doctors ([Vad and Frydendahl 2018](#)). The privately practicing pain physician Tina Horsted, is one of the few doctors prescribing cannabis to her patients and with the increasing demand for medical cannabis, her patient waiting list has exceeded one year. Therefore she is considering to open up new cannabis clinics in Denmark, Sweden and Norway and to create a knowledge centre for medical cannabis ([Torpegaard 2018](#)). Another barrier to the 4-year

trial is the high prices on the legal cannabis medicine. The patients are not receiving any funding for the newly introduced cannabis medicine, since it is not approved for the Danish market. After some public media attention the parliament decided that, dying patients would receive a 100% funding of medical cannabis treatment from 2019 with retroactive effect. Other medical cannabis patients can receive a 50% funding for up to 10.000 DKK of medicine a year. [Coogan 2018](#)). At the end of March 2018, around 100 doctors have prescribed medical cannabis to 262 patients as part of the 4-years trial ([Johansen 2018](#)).

8.4.4 The Danish cannabis growers

There are 16 companies across the country that has been finally approved to grow medical cannabis in Denmark, while four applications are being processed ([Lægemiddelstyrelsen April 24, 2018](#)). The Danish Medicines Agency, the Danish Farmers Agency and the National Police have checked the projects. These three bodies have to approve all applicants' personal circumstances, which have denied access for two companies. Many of the companies are newly founded, though two are very well established. Spectrum Cannabis Denmark is a partnership between the world's largest cannabis company Cannabis Growth Corporation from Canada, and Danish Cannabis ([DR 2018](#)). Cannabis Growth Corporation is producing and selling medical- and soon recreational cannabis through its subsidiaries Tweed Inc, Bedrocan Canada Inc. and Tweed Farms Inc ([Reuter 2018](#)). Danish Cannabis is 50% owned by the family business Møllerup Gods, which is a large Danish producer of industrial hemp used as food sources, while a friend of the family owns the other 50%. Spectrum Cannabis Denmark will invest \$10 million in a factory in Jutland that will produce medical cannabis oil and capsules and have a planned turnover at 500 million DKK a year with production from 2018 ([Kirkegaard 2017](#)). Aurora Nordic Cannabis is a Joint venture between the Danish tomato gardening company Alfred Pedersen & Søn and the worlds second largest cannabis producers Aurora, which is also from Canada. Aurora owns 51% of Aurora Nordic Cannabis and has evenly with Alfred Pedersen & Søn, both invested 250 million DKK in new green house and factories at Fyn. The investment is planned to turnover 600 million DKK in 2019, and reach is full potential with an annually 1.5 billion DKK turnover from 2023 and employ up to 150 people ([Attrup 2018](#)).

8.5 The emergent path creation process

The Danish 4-year trial is more medically regulated compared to the free medical marijuana market in California with Proposition 215 from 1996 to 2018. Therefore Denmark will most likely not experience the same cannabis and food product developments of tasty edibles, ranging from brownies to lollypops. The first edible medical cannabis products in Denmark will be serious and functional as they are still treated as traditional medicine, even though they are not regulated as normal approved medical products. That places the cannabis trial products in a grey-zone, though they are more controlled than in California during Proposition 215. Especially since both the normal approved-, the magisterial approved- and the 4-year-trial approved medical cannabis products all belongs to the Danish Medicine Agency. Only dietary supplements, foods, like

hemp oils and consumer and industrial products made from low THC cannabis, belongs to the ministry of Environment and Food of Denmark. CBD is also considered a medical product, which belongs to the Danish Medicine Agency ([Lægemiddelstyrelsen 2017](#)). Furthermore the preparation of products for the medical cannabis trial scheme is expected to comply with the requirements of “Eudralex Vol. 4, EU Guidelines to Good Manufacturing Practice Medicinal Products for Human and Veterinary Use, Annex 7 Manufacture of Herbal Medicinal Products” or similar rules. While Any further processing of the product, e.g. cannabis extracts, is also expected to be carried out in accordance with the rules on good manufacturing practice for medicinal products, “Eudralex Vol. 4, EU Guidelines to Good Manufacturing Practice Medicinal - Products for Human and Veterinary Use” or similar rules ([Lægemiddelstyrelsen 2018](#)). When looking at the cannabis product chain in the Danish 4-year trials, it becomes even more obvious how “pharmaceutical” the cannabis products has to be: step 1) “Cannabis starting products”, which is processed plant part or plant extracts, step 2) the “cannabis intermediate” which is the cannabis product manufactured by a private company, a regional hospital pharmacy or a regional company authorized by the Danish Medicines Agency and step 3) the “cannabis final product”, which is the labelling and medical approval at a pharmacy or a hospital pharmacy, of a cannabis intermediate after a doctor has prescribed it to a specific patient ([Retsinformation 2018](#)).

But even though the Danish Medicines Agency, doctors and pharmacies are influencing the product chain, it is still up to the cannabis intermediate manufactures to develop the new medical cannabis products. Therefore it is important to understand what is expected from a medicine besides the active ingredients by looking at what kind of functions and forms the medical industry already uses

8.5.1 The functional design of medical substances

Historically all medicines were made from natural sources and excipient could be made of ingredients like; bitter chocolate, cane sugar, arabic gum, wheat starch, liquorice root, milk sugar, glycerol, sugar juice, and melted cocoa butter ([Dansk Farmacihistorisk Fond n.d.](#)). But now, most tasty products to be found at Danish pharmacies are dietary supplement, which often is gummy bears or chewable tablets containing multivitamins for children, as well as shakes with synthetic chocolate or strawberry taste for underweight people ([Apopro 2018](#)). Prescription medicine can have a thin coating of sugar and synthetic flavours, but often have no flavours’ added and e.g. parents can be recommended to mix the child’s medications with juice or other food items to ensure that they eat it ([Apotek n.d](#)). Medicine in the shape of liquid fluid and drops are especially intended for children and adults who have difficulty sinking a tablet or capsule. Though, they need to be accompanied with dosage targets, e.g. cups or pipettes to ensure dosage accuracy. To achieve a faster effect than conventional oral solid formulations, soluble tablets, dispersible tablets and effervescent tablets can be dissolved in liquid prior to oral administration. Other alternatives to solid medications can be semi-solid oral formulations, like oral paste or gel to be swallowed after ingestion. Nevertheless is the solid oral drug forms the most

commonly used and they primarily include; tablets and capsules and, to a lesser extent, powders and granules, while chewable tablets are often used for acid neutralizing agents. Fluid intake together with solid oral drugs is extremely important to ensure that the drug does not stick to the oral cavity or oesophagus and to ensure that a reproducible release of the drug is obtained. Conventional tablets and granules may be coated with film or sugar so after swallowing they should fall into smaller particles within 15 minutes. From the particles, the drug is released, which must then dissolve in the gastrointestinal tract before it can either be absorbed or act locally. A faster insertion effect can be achieved by shortening the decay time by, for example, formulating with hydrophilic excipients and disintegrate that is easily wetted with and dissolved in saliva or water. An orodispersible tablet can also be placed on the tongue where it will be decayed or dissolved within three minutes, which is good for rapid pain treatment. A delayed release of a drug substance can be provided with oral enteric preparations, which have an acid resistant coating that prevents the drug from being released in the stomach. Water should be the first choice of fluid, as acid and alkaline reactive fluids, like soft drinks and milk, may lead to the acid-resistant coating of the drug is dissolving prematurely. A drug can also be formulated to immediately deliver a portion of the dose, while still having a longer duration of action. This is known as oral depot preparations and may be embedded in a tablet matrix consisting of lipid, plastic or other water-insoluble from which the drug is released over a longer period of time during the gastrointestinal transit process. Oral depot preparations may also be formulated as an osmotic pump provided with semipermeable film coating. The semipermeable film only allows water from the gastrointestinal fluid to access the pump, whereby the drug dissolves independently of the surrounding environment, e.g. local pH in the intestine. This increases the osmotic pressure inside the formulation and the drug is squeezed out through one or more well-defined holes in the semipermeable film. Characteristic of most oral depot preparations is that they contain a dose that is substantially higher and therefore can give a particular risk of overdose if the compositions are e.g., crushed or chewed during consumption. The patients also need to be informed about the delayed effects, to prevent that more doses are taken ([Jacobsen 2016](#)).

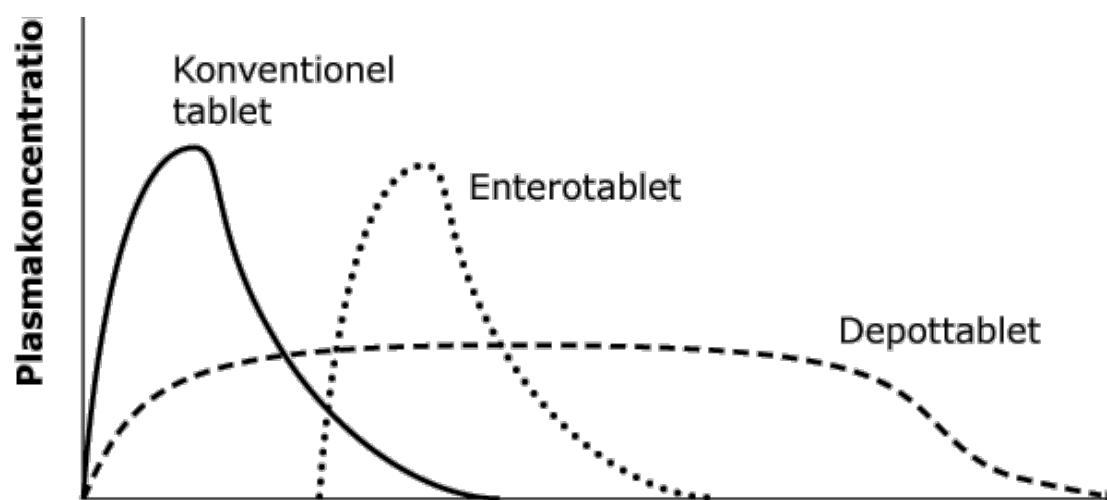


Figure 12. The amount and time of drug release from respectively conventional oral preparations, enteric preparations and depot preparations ([Jacobsen 2016](#)).

Drugs and excipients are called for raw materials, which can be divided into chemicals and 'droger', depending on their origin. Chemicals are well-defined substances that can be accurately described, for example, with a chemical formula, like synthetic cannabis, while a droger could be real cannabis plant parts, which can be a little more difficult to dose and standardize. Previously, many chemicals were actually extracted from plants, but today, chemicals are only synthesized, i.e. chemical or biological, while droger can be of vegetable or animal origin. A droger often contains many substances, which may have an effect on the organism. Droger of vegetable origin are often dried plants, such as a whole dried plant, herb, or parts of a plant. It can also be a vegetable oil, e.g. peanut oil or olive oil, essential oils, such as peppermint oil or anise oil. Drogen of animal origin can for example be fats from sheep's wool, lanolin or oil, for example cod liver oil or fish oil ([Tang n.d.](#)).

Besides the active medical ingredients, medicine also contains excipients as mentioned above. Excipients are substances that do not have disease treating or therapeutic effects and shall not affect the final effect from the active ingredients. Excipients can be used to: enable the technical preparation of the drug, as mentioned earlier, mask and correct the taste or odour of the drug, improve the identification of the drug, ensure good compatibility with blood, tear and tissue fluids, control the uptake and effect of the drug, and ensure the durability of the drug, meaning physical, chemical, microbiological stability ([Apotek.dk 2017](#)). All effects and side effects of the excipient should be described in the medicines package leaflet, just like the medical active ingredients. Examples can be that: *"lozenges and chewable tablets can be harmful to the teeth if used over 14 days"*, or that *"glucose can cause headache, stomach upset and diarrhoea"*, for certain patients ([The European Commission 2017](#)). The excipients used must meet the requirements of the European Pharmacopoeia, or national pharmacopoeia of a EU Member State. However, if the substances are not monographed, full documentation is required for the substance ([Lægemiddelstyrelsen 2016](#)). Development of a novel excipient is often not very attractive because of long development times, high costs, strict toxicology studies and risk of failure. Therefore pharmaceutical manufacturers are often reluctant to use novel excipients, as it will add additional risks to their medicine, since the authorities might not approve their drug, just because of the new excipient ([Kolter 2011](#)).

8.5.2 The 4-year trial product requirement

It seems that the pharmaceutical priorities are basically targeting functionality, and not the more pleasurable aspects, in contrast to the tasty medical marijuana edibles in California. By now the available products of legal cannabis containing THC or CBD in Denmark range from functional capsules, oils, liquids, sprays, powders to dried cannabis flowers as floss or granulate. The latter to drink as tea or inhaled with a vaporizer. But the Danish 4-year trial might leave a little space for product development toward edibles. Going one step back to bill No. L 57 proposed on October 5. 2017 by the Minister of Health Ellen Trane Nørby, the following comment is included on the bill for the 4-year trial: *"The term "further dosage-like formulations" covers the various forms, such as cannabis starting products may be prepared as, for example tablets, capsules or lozenges, but also*

other forms, At present, there are no well-defined pharmaceutical forms, but which allows for a metered dose of cannabis starting products” (Folketinget 2017). From June 30. To August 7. 2017, all relevant organizations could comment on the planned 4-year trial to the Danish Medical Agency. Many organizations mentioned the lack of clinical studies in the 4-year trial, while some asked about what dosage and products the doctors should use for their patients. The Danish Medical Agency answered: *“At present, it is unknown what products will be included in the scheme (...) it will be possible for the doctor to indicate dosage at a time based on the product information. (...) The guide does not recommend specific products, and it will be the doctor who will consider the treatment with a given product, from the products that are available in Denmark at the time of treatment” (Høringsportalen 2017).* When the 4-years trial finally was passed there were no “well defined pharmaceutical forms” added in the Law on medical treatment with medical cannabis. Therefore the 4-years trial’s § 3 paragraph 1 only mention: *“A cannabis starting product can consist of cannabis drugs and drug preparations and further dosage-like formulations thereof” (Retsinformation 2018).* In the application for inclusion, on the Danish Medicines Agency's list of cannabis intermediates, it has the following options: Granules, capsules, oral spray, fluids, drops, powders, tablets, herbal teas, which all are selected on the basis of "Standards for pharmaceutical forms and terms that may be used for labelling". The Danish Medicines Agency's furthermore informs: *“if the product applied for, does not have one of the pre-defined pharmaceutical forms, a description must be given” and continue “the packaging must not cause confusion with food or cosmetics.” (Lægemiddelstyrelsen 2017).*

Even though there appear to be more suggestions than specific requirements, for what the 4-year trial’s medical cannabis edibles can look like, besides the packaging, the products still have to be inside the medical world from plant to patient. But since the medical “grey zone” of the 4-year trial could provide a little freedom to the product development of medical cannabis products, it is relevant to study the manufactures food potentials:

8.5.3 The food potentials of the medical cannabis manufactures

The only two cannabis products that have been approved in the Danish trial period by now are Bediol and Bedrocan, that are manufactured by the Danish company CannGros. The products contain real cannabis flowers with dosed THC and CBD levels, which can be taken orally as a tea or vaporized for faster intake (Lægemiddelstyrelsen 2018). CannGros import their cannabis from the Dutch company Bedrocan B.V, but has future plans to import cannabis from Canada as well as produce other products like oils and capsules (CannGross 2017). By now there are nine companies that have applied to be authorized as cannabis intermediate product manufacturers at the Danish Medicine Agency. Two are already approved, while one applicant has put their application on hold and two of the companies will be growing their own cannabis in Denmark. The applicants seem to be well-established medicine manufactures (LægemiddelStyrelsen May 3. 2018). Only three of the medical cannabis manufactures seem interesting in a food context, which is Spectrum Cannabis Danmark ApS and Aurora Nordic A/S, which both are producing their own cannabis in Denmark, and Medcan Pharma,

as mentioned above. Spectrum Danmark A/S is owned by the Danish Møllerup Gods and Canadian Canopy Growth, that both have large potentials to go into the edible market. Canopy Growth has up to now been growing, manufacturing and distributing dried flowers, oil and soft gel cannabis products for medical uses. But with the passing of Bill C-45, recreational use of cannabis will become legal in Canada from July 1, 2018, which opens up for product development in the booming North American adult cannabis edible market ([Smallcap Power 2017](#)). Canopy Growth's consumer brand Tweed, is distributing edible cannabis products from rapper Snoop Dog's own brand, Leafs by Snoop ([Canopy Growth n.d.](#)), which include the products; fruit chews, fruit gummies, chocolate bars and peanut butter gems, which is a cake ([Leafs by Snoop 2018](#)). Canopy Growth has recently made a licensing agreement with Isodiol International Inc. for the manufacture and distribution of Isodiol's CBD marijuana-infused "Pot-O-Coffee" and "Pot-O-Tea" branded products in Canada and internationally. The CEO of Isodiol International Inc. has stated that they will continue to develop their Pot-O-Coffee product line as well as other drink and cold brew products ([Smallcap Power 2017](#)). Møllerup Gods are manufacturing many different and also innovative hemp food products, like seeds, flour, protein powder, oil, sausages, mustard, pesto, snack bars, gin, tonic water, beers and even cosmetics with hemp ([Møllerup Gods 2018](#)). Aurora Nordic cannabis is owned by Canadian Aurora Cannabis Inc. and Danish Alfred Pedersen & Søn, which have potentials to manufacture cannabis food products too. Aurora Cannabis Inc. is also awaiting the Canadian recreational legalization and has recently increased its stake in the Canadian hemp producer Hempco, to 35%. Hempco is manufacturing hemp foods, hemp fibre and hemp pharmaceuticals ([Cision 2018](#)). But besides hemp products like oil, protein powder and hulled hemp seed nut, Hempco's consumer brand Planet Hemp also offers different variations of "superfood" hemp smoothie mixes ([Hempco 2018](#)). Planet Hemp has recently launched a CBD food supplement containing Canadian hemp seed oil and full spectrum CBD oil from European grown hemp. The product is sold online in UK, where CBD is legal as a food supplement ([Planet Hemp 2017](#)). Aurora has furthermore bought a minority stake of 19.9%, with the ability to increase it to 40%, in Liquor Stores N.A. Ltd., which operates 231 retail liquor stores in Western Canada and several U.S. states. The investment will be used to convert existing liquor stores into cannabis outlets, to establish new locations and to renovate existing liquor stores ([Remiorz 2018](#)). It seems that Aurora is planning to go beyond cannabis sales just from pharmacies, as the recreational cannabis market is opening up. Alfred Pedersen & Søn is the largest Scandinavian producer of both conventional and organic tomatoes, known for the brand "Katrine and Alfred Tomatoes", as well as peppers and cucumbers ([Katrine & Alfred n.d.](#)).

Medcan Pharma is owned by the Bagger-Sørensen family, which has ambitions about developing cannabis chewing gum, as cannabis is better absorbed in the oral cavity, rather than passing through the normal digestive system ([Sennov 2017](#)). The family company has manufactured several famous chewing gum brands in the last 100 years and has also owned Fertin Pharma, which is world leading in chewing gum with nicotine, caffeine, vitamin and other medical ingredients ([Søderberg 2018](#)). The Bagger-Sørensen family has made billions of DKK from selling many of their chewing gum brands and 70% of Fertin Pharma,

which they mainly invest in medical companies. But they have also invested in The Brew Company that makes coffee, tea and herb brewing bags to-go, Hatt et Söner that produce champagne and For Emma which is a Gluten- and lactose free bakery run by the wife of one of the Bagger-Sørensen brothers ([Vecata Invest n.d.](#)). Their company MedCan Pharma is a subsidiary to Okono, which produce alternatives to tobacco such as e-liquids with nicotine and flavors, and disposable and rechargeable e-cigarettes and cartomizers ([Okono n. d.](#)). MedCan Pharma writes that they “*develops and produces innovative food products, food supplements and pharmaceutical products with cannabinoids for both the B2C and the B2B market*”. On their webpage they mention their future products as: Chewing gum, lozenge and other oral composition and C-liquids ([Medcan 2017](#)). The latter being e-liquids made by cannabinoids and propylene glycol and maybe some flavours, to be used in vaporizers or e-cigarettes ([Leaf Science 2017](#)).

It seems that among the medical cannabis manufactures there are few potentials to create more food like products. MedCan Pharma has medical and chewing gum experiences, large resources and the will to invest in new products, like development of food like cannabis products. Møllerup Gods are also very innovative in development of hemp products and are making alcoholic products like beer, gin and even the tonic water from hemp. Alfred Pedersen & Søn are historically more food producers than cannabis producers or medical producers, therefore it seem possible that they would consider producing cannabis food products when the market is ready for it. Both Canopy Growth and Aurora are spreading their assets in the cannabis industry as they are preparing for the large business potentials, as medical use and North American recreational adult use of cannabis is becoming legal.

	MedCan Pharma	Spectrum Cannabis Danmark ApS	Aurora Nordic A/S,	CannGros
Food only	Chewing gum, coffee, tea, herbs, champagne, bread and cake		Tomatoes, Peppers and cucumbers Liquor store sales channels	
Hemp food		Seeds, flour, protein powder, oil, sausages, mustard, pesto, snack bars, gin, tonic water, beers	Oil, protein powder, hulled hemp seed nut, superfood smoothie mixes	
CBD only		“Pot-O-Coffee” “Pot-O-Tea”	CBD and hemp oil food supplement	
Medical Cannabis	Chewing gum, lozenges and other oral composition	Oils, soft gel capsules, milled powder and flowers	Oil drops, Double Milled Decarb powder (which can be mixed with food at home) and	Oil, flos and granulate (can be used as tea or in food)

			flowers	
Recreational Cannabis		Fruit chews, fruit gummies, chocolate bars and peanut butter gems. (Canada goes legal in July 2018)	(Canada goes legal in July 2018)	

Table 2. Food experience among the Danish Medical cannabis manufactures.

8.5.4 The controversies of recreational use

The medical aspect of cannabis is really evolving in Denmark at the moment, as the cannabis flower is added to the European Pharmacopoeia 9.4 and “Danske Lægemiddelstandarder”, together with green tea, mate leaf, guarana and other natural plants ([Lægemiddelstyrelsen 2018](#)). But though it is a step in a direction that can have an indirect influence on a future legalization of recreational use, it still took 22 years before California went from legal medical marijuana to legal recreational use of cannabis. In Denmark a little more than half of the population believes in a full legalization of cannabis, but the majority of the government and the parliament are still against it ([Larsen 2017](#)). The mayor of Copenhagen has several times proposed a 3-year trial with legal and state controlled sales of cannabis in Copenhagen, in order to reduce the violent aspects from the illegal sale ([Københavns Kommune 2011](#)). The new Danish party, Alternativet, is proposing the government that cannabis should be legal to grow at home for own consumption ([Folketinget 2018](#)). The chairman of the Social democrats has recently published a book where he argues for a total legalisation of cannabis ([Korsgaard 2018](#)). Nevertheless are parliament leader arguing that cannabis is dangerous and that either Holland or states in the US has lowered their crimes through legalization, but instead had an increase in accidents and young people using cannabis. Several of the Danish politicians base their arguments on data from the 2016 report “Lessons learned after 4 years of marijuana legalization” ([Larsen 2017](#)), from the US anti-cannabis lobbyist organization SAM - Smart Approach to Marijuana ([Sam 2016](#)). Since January 24. 2018, Danish citizens have been able to make suggestions to changes in the law or in the society on the webpage “Borgerforslag.dk”. The suggestion has to be supported by 50,000 people with voting rights for the parliament elections, in a period of 180 days. Then members of the parliament can present the proposal as a concrete resolution for discussion at the parliament ([Folketinget 2018](#)). Three citizen suggestions are at the moment about a full legalization of cannabis. A former politician that publicly spoke about his former use of medical cannabis for stress and insomnia has made the most popular suggestion. His suggestion has been supported by a little less than 10,000 people after almost three months while the other two suggestions has received much lesser support ([Borgerforslag. dk 2018](#)).

The Danish 4-year trial has by now approved two medical cannabis product by CannGros, which can be taken orally as tea or mixed in food and it seem plausible that other new food-like cannabis products can be approved as cannabis

medicine, even though medicine is generally much more functional than pleasurable. It is kind of a dilemma since medical cannabis products now are legal to manufacture, but will be limited by the medical regulations and functional focus on the excipient. On the other hand recreational use has much greater gastronomic possibilities and a greater variety of products, but all products are illegal and enforced with a zero tolerance in Denmark. Therefore the rest of the path creation will look at what food regulation there already is in Denmark and the EU, in order to understand the Danish food context that cannabis can be introduced to in a future with legal recreationally use of cannabis.

8.6 Institutionalization of the new path

If Denmark legalizes the recreational use of cannabis, there will be many different food regulations, and different ways to categories cannabis, which has to be taking into consideration before entering the Danish food market. While the medical cannabis edible market in California was free to evolve in its own way, the legalization of recreational use of edibles were more strict and regulated from the very start. Nevertheless, the decriminalization of recreationally use of cannabis in Denmark will provide many different possibilities for consumers. A less strict model for the medical part could be to categorize cannabis as a natural medicine and as dietary supplements, which will be introduced before the actual food perspective of cannabis.

8.6.1 Natural Medicines

Natural medicines are based on plant, animal origin or minerals occurring naturally in nature. It is only intended for treatment of light diseases that does not require a doctor, and therefore has less strict requirement of scientific evidence on effects and side effects, than conventional medicine. Furthermore are the active substances not isolated and concentrated in larger doses than they exist in nature and there might not be any knowledge about which of the substances that actually provide the desired effect. Nevertheless does natural medicine still belongs to the Danish Medicines Agency, while e.g. food supplements and additives belongs to the Danish Food Agency ([Styrelsen for patientsikkerheds Råd Vedr. Alternativ Behandling](#)). To decide if the drug or food law covers a product, it is generally considered based on the purpose of the product. It is thus primarily the manufacturer or importer who makes this choice. If a product is marketed as preventive or healing, disease and disease symptoms, it is considered a medicine. If a product is marketed as a supplement to the usual diet without being a drug, it is a dietary supplement. While companies manufacturing, importing, storing and distributing natural medicines must be authorized by the Danish Medicines Agency before the activity commences, no authorization is required for retail sale of natural medicine. Expert reports on the pharmaceutical, toxicological and clinical documentation must be prepared by a person with sufficient qualifications and experience. It must be signed and dated by the expert and attached to a brief overview of the expert's background, education and experience as well as professional relation

to the applicant company. The processing time for an application is a maximum of 180 days ([Lægemiddelstyrelsen 2012](#)).

Traditional plant medicine

A subcategory is the traditional plant medicine, which is always made from plants and is regulated even less strict than natural medicine, since no scientific evidence is needed. Though manufactures must be able to prove that the plant has been used in a medical context for a minimum of 30 years, including at least 15 years in the EU. Both natural medicines and traditional plant medicines can provide a risk of interaction with other medicine. Information about the natural- and traditional plant medicines can be acquired from the European Medicine Agency and the Danish Health Agency ([Styrelsen for patientsikkerheds Råd Vedr. Alternativ Behandling](#)).

Though the Cannabis plant seems like a natural medicine, as the plant contains hundreds of different active substances that all together create effects on the human body, it can treat light disease, and it can potentially interact with other medicines. But due to the cannabis prohibition in 1961, cannabis plant medicines were prohibited from pharmacies all over the world, and therefore it no longer qualifies as a traditional plant medicine in the European Union, as the comeback of cannabis plant medicine occurred less than 15 years ago. Furthermore was the first legal medical cannabis products from the US in the 1980s, made from synthetic cannabinoids, which has followed the more controlled and dose precise path of conventional medicine.

8.6.2 Dietary Supplements

The use of dietary supplements in Denmark is among the highest in Europe, as they are used by 60% of the Danish population. Highest use is among children, followed by women and finally men. The usages of dietary supplements increases together with level of education for men, though it does not for women. Plant based supplements are used by 10% of the population ([Knudsen 2014](#)). In addition to vitamins and minerals, dietary supplements may be other substances that have a nutritional or physiological effect, e.g. amino acids or caffeine or inositol. Nutritional supplements may also consist of concentrates or extracts from ingredients, such as plant extracts, containing active substances that affect nutritionally or physiologically. Examples of different parts of the plant are ginkgo biloba or garlic. Dietary supplements are not medicinal products and are therefore not intended to cure or prevent disease. Dietary supplements must therefore not contain medicinal substances, euphoric substances or substances covered by the Doping Act. But dietary supplements must still be marketed in dosage form, e.g. capsules, lozenges, tablets, pills and other similar forms, powder letters, liquid ampoules, droplet dispensing bottles and other similar forms of liquids and powders intended to be consumed in less sized amounts. Dietary supplement must not be harmful to health, and former assessed dietary supplement are listed by the DTU Food Institute ([Fødevarestyrelsen n.d.](#)). All food supplements, intended to be marketed in Denmark, must be notified to the Danish Food Agency. If companies use substances with a nutritional or physiological effect in an amount above the general permit, in a dietary

supplement, they must submit a notification to the Danish Food Agency. If the desired substance is not in the general permissions, the company must apply for approval of a new substance. Submission of substances and application for approval of a new substance must be sent no later than six months before the product is marketed in Denmark. Only when the company has received permission for additions from the Danish Food Agency, they must report the actual dietary supplement. The company has to be able to document the product's safety and if e.g. caffeine is added with a physiological purpose, it must be labelled: "*Contains caffeine. Should not be taken by children or pregnant women*". Dietary supplements must furthermore be labelled with the following: 1) the product name "dietary supplements", 2) the recommended daily dose, 3) a warning not to take a higher dose than the recommended daily dose, 4) an indication that dietary supplements should not enter instead of varied a diet, 5) an indication that the products should be kept out of reach of small children ([Fødevarestyrelsen 2017](#)).

Though THC is the best-known active substance in Cannabis due to its psychoactive properties, the plant contains many other cannabinoids and substances, without psychoactive properties. Industrial hemp products are more easily categorized as a food supplement as their plant origin contain many, terpenes, polysaccharides, flavonoids, and other antioxidants, but less CBD and even lesser THC. As mentioned earlier the categorization between a medicine and a dietary supplement, is up to the manufacture or importer if they marketing the products with a medical claim or not. Thereby CBD and maybe even THC could be marketed as dietary supplements, with no medical claim, if they are not limited by being categorized as an illegal drug or a prescriptive medicine only. In the UK can CBD concentrates be sold as a dietary supplement as long as it is only being marketed as a dietary supplement and not a medicine ([Cannabidol n.d](#)).



Figure 13. The Danish medical cannabis manufacture Aurora Nordic Cannabis A/S, is now selling a CBD food supplements in the UK from their company Planet Hemp ([Planet Hemp 2018](#))

8.6.3 The addition of nutrients in food

Substances which are added for nutritional or physiological purposes and have a purity of at least 50% or is concentrated 40 times or more, usually not consumed as a food by itself or used as a typical ingredient in foods, it is governed by the Danish rules of addition of substances. It is the responsibility of the company that the applied substances are actually covered by the definition, since the Food Agency does not investigate whether a technological additive has been concentrated 40 times or more during the manufacturing process. According to food regulations companies is responsible for ensuring that the food sold is not dangerous to consumers. Which is partly regulated at EU level when it comes to addition of vitamins, minerals and other substances. By now, only Ephedra herbs are prohibited throughout the EU, while Bark of Johimbe is under EU surveillance ([Fødevarestyrelsen 2017](#)).

General permit for additives in food

If a company uses an addition that has already become assessed safely by the Food Agency, the company must inform the Danish Food Agency that they will use a general permit. The company must not self-draft or have documentation for the security and will not have to pay for a general license. But will be responsible for the products compliance with the license, including the relevant specification and EU rules. The term mutual recognition means that in most cases an EU country can not prohibit or restrict the marketing of a product that is already legally marketed or produced in another EU country with identical content and intended use. Unless they can prove that a marketing ban is necessary to protect human health, that the prohibition is suitable to ensure this protection and that the prohibition does not go beyond necessary. If the food authorities prohibit a product, they must simultaneously inform the EU Commission of the marketing ban. Companies wishing to market products in Denmark, which are legally marketed and produced in another EU country, must comply with the Danish rules for the addition of vitamins, minerals and certain other substances and follow the procedures contained herein. The Danish Food Agency has to take the rules on mutual recognition, into account in the case processing ([Fødevarestyrelsen 2017](#)).

Permit for new additives in food

It is the company's responsibility to report an additive of nutrients to a product when additive is not subject to a general authorization. Notification must be made no later than 6 months before the product is to be marketed in Denmark. There is a fee and case processing associated with reviews. The risk assessment fee is 33,000 DKK and the steps must be repeated each time the additive is added to another category of food ([Erhvervsstyrelsen 2018](#)). The Danish Food Agency then collects the risk assessment from the DTU Food Institute for use in the case. Before the six months have elapsed, the Danish Food Agency will send a decision to the company. If the Agency does not comply with this deadline, the company is allowed to market the product. The deadline is only three months if the company includes data that has already been assessed and approved in another EU or EEA country, though there is no guarantee that it will be approved in Denmark also. It is the company's responsibility to ensure that they do not apply for substances that should instead be approved at EU level in accordance with EU rules. This

may, for example, be novel foods, which are substances and ingredients, including extracts of ingredients of vegetable, animal or mineral origin, that have not been used in the EU to a significant extent before 15 May 1997 ([Fødevarestyrelsen 2017](#)).

Labelling of additives in food

Only direct addition of vitamins and minerals, or added substances with an approved claim of a nutritional or physiological effect has to be indicated in the mandatory nutrition declaration. Other added substances have to be labelled in the ingredient list. Whether a company adds a substance to a regular food or dietary supplement, the Danish Food Agency recommends that the measured value does not exceed the tolerance limits, including analysis uncertainty of 80-150% relative to that declared. The analysed content of an added substance must not exceed the maximum allowed amount in a general license, with more than the analysis uncertainty ([Fødevarestyrelsen 2017](#)).

Addition of fresh plants and plant extracts

The Danish rules do not regulate the use of fresh plants (fresh, dried, chopped, sliced or powdered) or plant extracts made by simple aqueous extraction, possibly followed by evaporation. Example: An herbal substance is dried, and that created by the drying process, one concentration of the substances inside the herbal. Even though the drying process has concentrated on the substances in the drug, the dried plants must not comply with the Danish rules. Example: An infusion is made by pouring a dried drier of boiling water (equivalent to a cup of herbal tea). The substances in the liquid that appear are not covered by the Danish rules. The company must ensure the necessary knowledge about the content and the safety of ingredients before the product is marketed. It is the company's responsibility to document that there are no safety hazards when consuming the product, the ingredients are allowed to use and market, and to evaluate the ingredients if necessary. Certain drugs and extracts may be subject to the rules for novel foods and food ingredients, and then the company must have EU approval before use. The Danish Food Agency has made a guide that specifically provides assistance in the preparation of a safety assessment of plant ingredients and extracts in dietary supplements. DTU Food Institute has prepared the "DrogeList", which is a collection of plants, parts of plants and fungi that can represent a safety issue based on toxicological assessments. The list is for guidance only, not exhaustive and is not necessarily updated. It is not the responsibility of the Danish Food Agency to update the DrogeList. Lists from other countries can also be used in the assessment of food safety. In product safety checks, the Food Agency may ask to see the company's safety assessment. The Food Agency's assessment may differ from the DrogeList in case of new scientific evidence about the risks or documentation of the company. It is important that the company is kept informed of new scientific evidence, as the company must be able to document the safety of the products it markets. After assessment of specific products, the Food Agency has ordered a withdrawal or withdrawal from the market based on; inter alia risk assessments from the DTU Food Institute ([Fødevarestyrelsen 2017](#))

8.6.4 Novel food in The European Union

All new foods that has been introduced for the first time in the European Union after 15 May 1997, has to be approved as a Novel Food, without prejudice to other EU food legislation, before it can be sold legally. Novel Food's can be newly developed, innovative food, food produced using new technologies and production processes and it also includes food science products like engineered nanomaterial's, vitamins or any isolate used for human consumption ([European Commission 2018](#)). An example can be Chia seeds mixed with fruit juice. Chia seeds have been approved as a novel food in the EU in 2009, while the number of food categories to which it could be added was extended in 2013. In the following years it has been used in baked products, breakfast cereals, fruit, nut and seed mixes and as 100% packaged seed, which every time required new approvals. When the applicant requested an 'extension of use' to market chia seed in fruit juice and fruit juice blends, all safety issues had to be evaluated. Though the mix of the chia seed into the juice is a novel food, previous experience with the, chia seeds, other chia products and the fruit juice can be used in the evaluation ([Food Safety Authority of Ireland 2015](#)).

When it comes to Cannabis Sativa L, meaning industrial hemp, it is not a novel food since it was used in the European Union as food before May 1997. In the European Union, the cultivation of Cannabis Sativa L. varieties is granted if they are registered in the EU's 'Common Catalogue of Varieties of Agricultural Plant Species' and the THC content does not exceed 0.2 %. Except if a country's own regulation says otherwise. Extracts of Cannabis Sativa L, in which the CBD levels are higher than the CBD levels in the source of Cannabis Sativa L, are considered novel in food. Therefore a safety assessment under the Novel Food Regulation is required for all single food products that has are enriched with CBD concentrates, if it cannot be proven that is has been used in the EU before 1997. The safety has to be evaluated by the European Food Safety Authority, usually within nine months from the date of receipt of a valid application from the Commission. According to the new EU Regulation 2015/2283 on novel foods starting 1. January 2018, conventional foods from third world countries can now be approved as novel foods, much faster, if they are consumed safely for 25 years and EFSA has placed no safety concerns ([European Commission 2018](#)). According to legal recommendations from a law firm to the Int. Hemp Organization, the authorities themselves have to prove that a hemp product has therapeutic effects and thereby being a medical product, before they can prohibit it as a food ([Büttner 2016](#)). The Attorney also points out that if the authorities cannot prove that the Novel food regulation is applicable and that the foodstuff was not used before May 1997, the distribution is possible without a Novel food marketing authorization. The attorney also request a more clear definition of CBD enriched products, which can be a medical product, compared to hemp extracts, which can be a food product ([Büttner 2016](#)). From July 2018, all hemp products in Denmark can have a THC content up to 0,2%, like in the EU, and thereby be sold legally without prescription in order to protect the hemp farmers. Hemp food products and cosmetics are mentioned in the statement, but it does not confirm if CBD enriched products will be categorized as hemp foods ([Sundheds- og Ældreministeriet 27 April 2018](#)). When even the non-psychoactive cannabinoid CBD is in such a grey-zone when it comes to food, THC

will probably also cause a lot of confusion, as a recreational legal, but medical product.

8.6.5 Functional food

Functional foods are common foods with a particular health-promoting effect. It is a concept invented in the early 1980s in Japan. From here it has spread to the United States and Europe ([Fødevarestyrelsen 2018](#)). Functional foods is a not a well-defined term but could be categorized into four levels;

- 1) Nutritionally modified products that have been optimized by removing something or leaving something else that you usually would remove, like skimmed milk or wholegrain products
- 2) Products that have been added, for e.g. vitamins or minerals, like orange juice with extra vitamin C
- 3) Products that have been added probiotics, i.e. living bacterial cultures that affect bowel wall and flora, or prebiotics, i.e. fibre components
- 4) Products qualifying for a health claim such as the margarine product Becel pro.activ, which has proven benefits in terms of cardiovascular disease prevention ([Løberg n.d.](#)).

Less food processing with fewer added ingredients have become qualities that more Danish consumers seek now a day. As e.g. organic foods are seen as cleaner and closer to nature, which is an expression of consumer demand for transparency and honesty about content and production ([Hovgaard 2016](#)). Therefore the functional foods that will dominate the markets of the future are predominantly considered to be products that are already considered healthy, and not the enriched gummy bears, which had much attention in the public debate. According to different food experts, are trust and a clear understanding of the health benefits and the taste of the products important aspects, as both the authorities and consumers in Denmark in general are sceptical toward functional foods ([Løberg n.d.](#)).

8.6.7 Nutritional claims

Nutrition claims are messages indicating that a food has particular beneficial nutritional properties due to a specific content or absence of energy, nutrients or other substances. Examples of nutrition claims are: 1) Sugar Free, 2) High fibre content, 3) Contains omega-3 fatty acids ([Fødevarestyrelsen 2018](#)). For beverages with an alcoholic strength of more than 1,2% vol., it is only allowed to use the following nutritional claims: 1) Energy-reduced, 2) Reduced alcohol content, 3) Low alcohol content ([Fødevarestyrelsen 2018](#)). Only when using a nutrition claim on the alcohol content, a nutrition declaration becomes mandatory for alcohol beverages above 1,2% vol. ([Fødevarestyrelsen n.d.](#)).

Health claims

Health claims are messages that tell you that there is a connection between a food intake or a food ingredient and the effect on health. Examples of health claims can be: *Calcium is important for the development and maintenance of the bones* or *Plant sterols have been shown to lower blood cholesterol levels. A high cholesterol level is a risk factor in the development of coronary heart disease*. It is forbidden to use indications that a food can prevent, alleviate or have beneficial effects on diseases or disease symptoms. This is stated in EU Regulation No 1169/2011 on food information to consumers ([Fødevarestyrelsen 2018](#)).

8.6.8 Alcohol in food and beverages

Besides drinking alcohol with food, has alcohol for many years also been used in the food for gastronomic purposes. E.g. desserts, meat and fish dishes that are put on fire with alcohol, which adds crisp to the dish and can provide an impressive show for an audience. Alcohol is also used in marinades, soup, stews, sauces, glaze, and desserts and in bread. Vanilla extract contains alcohol, which can be used for various dishes, while liquor filled candies are ready to use as desserts or with coffee ([Davidson n.d](#)). In these cases alcohol is mostly used as an added flavour and less for its intoxicating effects. In Denmark only beverages and food containing more than 1.2% by volume of alcohol that must be labelled with information on the actual alcoholic strength, while other foods, such as chocolate and salami sausage where alcohol is added in small amounts, should not be labelled with alcoholic strength. However, it must be stated in the list of ingredients that the product has been added with alcohol ([Fødevarestyrelsen n.d.](#)).

The alcohol drink context in Denmark

Ready-to-Drink alcohol products, where known brands like Bacardi and Smirnoff are mixed with soda beverages, enter the Danish retail market and bars in 2001 with great success, especially due to massive marketing. In 2004 the candy manufacture Tom's cooperate with the alcohol industry and create vodka shots with taste, name and logo of a popular candy brand. That becomes a new trend for other Danish candy brands to follow afterwards. The Danish energy drink Cult becomes an Energy alcohol drink in the new product Cult Shaker, which also uses the same logo font and often promotes both products together ([AlkoholPolitisk Landsråd 2005](#)). "Alkoholreklamenævnet" is an organization in close cooperation with the industry and ombudsmand, which create guidelines for good alcohol marketing practices and treats and resolves complaints regarding the marketing of alcoholic beverages in Denmark. The most important issues they handle are: 1) Marketing aimed at children and young people, 2) Marketing that promote large or intentional consumption, 3) Marketing that is intrusive or provocative, 4) Marketing linked to active sports ([Alkoholreklamenævnet 2018](#)). Nevertheless is "alco pops" the second most preferred drink after beer for the boys while alco pops are the most preferred drink for the girls, among the 15 years old in Denmark. Alco pops followed by other hard liquor is the most preferred choices of alcohol drinks among the 15 years old in Denmark ([Statens Institut for folkesundhed 2017](#)). While the Northern European countries in general are very restricted about alcohol

marketing, alcohol manufactures can be very creative. E.g. by expanded the marketing of their alcohol brands through innocent chocolate products that has added either the flavour or small amount of alcohol together with the brand name and logo of the alcohol brands. In Denmark the energy- and alcohol energy drink manufacture Cult and the candy manufacture Tom's has created a Cult energy bar together ([Brujin and Roseth 2008](#)). Besides a few alcohol chocolate products, it is a rare sight in Denmark to find candy containing larger amount of alcohol. Meanwhile the US adult candy shop, [Sugarfina](#), can offer a large variety of "cocktail candy" including champagne gummy bears, while the UK shop [The Naked Marshmallow Company](#) offers alcohol infused marshmallows.

Alcohol ice creams

The worlds first commercial ice creams with alcohol, Freaky Ice, is launched in 2003 in the Dutch party scene and contains up to 4,8% alcohol and is available in four different flavours ([Brujin and Roseth 2008](#)). The alcohol Ice cream becomes available in the Danish bars and discotheques in the same year, while the Danish importer ensures that it will only be sold to people above 18 years and not in retail from the start. There is a public debate in the Danish medias about regulation of mixed alcohol and candy products appealing to children. A professor from the centre of alcohol science refers to the alcohol ice creams and the new Cocio chocolate milk with an alcohol content, as "*a wolf in sheep's clothing*" towards children ([Mikkelsen 2003](#)). The sweet alcohol soda pops has become very popular in Denmark with a great variety in products and in recent years even coffee alcohol beverages have entered the retail market ([Mørch 2017](#)). But the alcohol ice creams are in contrast leaving the retail market fast after they enter. In 2016, a Swedish DJ-duo and a bartender produce the, Push-up Ice cream, N1ce, which becomes available at festivals and in a few shops in Denmark. One of the shops belongs to the large retail chain Coop, who rapidly prohibits all their retail shops to distribute any alcohol ice cream ([Nord Jyske 2016](#)). The same year two 18 years Old Danish students launch the alcohol push-up ice cream, Suck It. The ice cream was planned for nightclubs, events and later for retail stores. The latter in a thawed form to be placed next to the other alcoholic products, in order to prevent children from buying it accidentally as an ice cream in the supermarket freezer ([Paulsen 2016](#)). Like N1ce, Suck It never becomes a success in the Danish retail market, though they are still sold abroad and maybe at festivals in Denmark ([N1ce 2017](#)). Frozen cocktails have in recent years evolved from boozy slushies to frozen prosecco slushies, the frosecco's, in bars, nightclubs and restaurants. The recent summer hit of frozen rosé wine, frosé, are just one of many cocktails that also has reached the Danish bars. But the popular ready-made frosé popsicle has only been available outside Denmark ([Rahim 2017](#)). The supermarket Aldi, are in the UK, offering 4.5% alcohol ice popsicles based on four different cocktails, for just £2.99 for a pack of four ([Rodionova 2018](#)). Another upcoming product is the cocktail bag that can be used to serve slush ice cocktails at stadiums, festivals and concerts, where there must be no glasses ([Linddal 2017](#)). Meanwhile restaurants and food entrepreneurs in the US, have success with fresh homemade alcohol ice creams sold from their own shops or online ([Ventiera n.d.](#)).

8.6.9 Caffeine added in beverages

In 2009 the Danish Food Agency increased the allowed limit of caffeine to be added to soft drinks from 150mg/litre to 320mg/litre, which introduced the energy drinks on the Danish market. Red Bull rapidly establishes a leading market position on the energy drink market, though many other brands enter the dynamic market in the following years. At first, energy drinks had a limit size at 250ml in Denmark. But in 2011 the Danish Food Agency allowed any sizes for energy drinks to be sold in Denmark. At the same time, all energy drinks in Denmark had to be labelled with: "*high caffeine content*" and "*Should not be consumed by children or pregnant or breastfeeding women*" ([Christensen et al 2014](#)). At the moment the Danish Food Agency has allowed caffeine to be added in beverages and solid foods, in the following maximum amounts ([Retsinformation 2017](#)):

Drink or food item	Energy drinks	Aroma drinks <5% alcohol	Aroma drinks 5-50% alcohol	Aroma drinks >50% alcohol	Hard candy, lozenges and likes	Chocolate bars and likes	Dietary supplements
Added caffeine	320mg/L	150mg/L	100mg/L	300mg/L	113mg/kg	101mg/kg	300mg per recommended daily dose, divided into minimum 3 doses.

Table 3. Maximum allowance of added caffeine in beverages and food in Denmark ([Retsinformation 2017](#)):

"Læskedrikreklamenævnet" is an organization in close cooperation with the industry and ombudsman, which create guidelines for good soft drink marketing practices and treats and resolves complaints regarding the marketing of soft drinks in Denmark. Their work with energy drinks and soft drinks is especially handling: 1) marketing against children younger than teenagers, 2) Marketing that promotes a larger consumption 3) Marketing that promotes an inactive lifestyle or an unhealthy diet 4) marketing that promotes soft drinks and especially energy drinks being mixed with alcohol ([Læskedrikreklamenævnet 2014](#)). Nevertheless becomes energy drinks widely popular among young people in Denmark, which also mix them with alcohol, while the new generation of children consider energy drinks as normal as soft drinks ([Christensen et al 2014](#)). The sales of energy drinks in Denmark has increased from four million litres in 2010 to 16 million litres in 2016 and is expected to grow to 25 million litres in 2021 ([Hansen 2017](#)).

The theoretical framework has provided a deep insight into the context of cannabis in both Denmark and California on multiple levels. It has become obvious that the two cases have very different contexts and are in different stages of the legalisation process. The next part of the thesis will analyse and compare the two cases within the framework. Furthermore will the interviews

with the Danish cannabis users be analysed with Grounded theory, while the most prominent findings from the interviews will be presented.

9.0 Analysis and results

9.1 Path dependence

"Path dependence is when historically events, sometimes occurred by chance, rather than sequences of economic and practical logic, are shaping our technology and industries" ([David 1985](#)).

When comparing the path dependence and path creation processes of the cannabis evolvement in California and Denmark, they seem to be linked together several times. When the medical use of cannabis was introduced to the western culture around the 1850s, both Denmark and California had a long period with medical cannabis products available legally. Eventually the chemical industrial revolution begins to replace the medical cannabis and other plant medicines with synthetic ones, which also happens as self-reinforcing processes at both locations. But the timeline is a little different for Denmark and California throughout the different steps, since recreational use of cannabis is introduced to California much earlier than Denmark. Furthermore is the fear and prohibition of cannabis a self-reinforcing process that starts out in California in 1913 upon the international opium regulations, grows stronger at federal level in the US in 1937, right after the alcohol prohibition has ended and finally reaches Denmark and the rest of the world through the UN in 1961. Even though recreational cannabis use in Denmark was quite rare at that time. The dominant action pattern throughout the world is to define cannabis as a substance of abuse and no longer as a medical or industrial product. The lock-in phase of the path dependence again set of earlier in the US as their war on drugs starts around 1969 while Denmark 25 years later quit its liberal cannabis policy and start their own war against drugs. Thereby their systems loose their flexibility and ability to adopt better strategies, as the action of punishment and enforcement of the prohibition has become the dominant mode.

9.2 Path creation

In some cases the new path is built on the existing path and thereby create more functionality to it over time. But the new path can also be a breakthrough, as a radical new invention, which makes a faster impact on the existing path ([Simmie 2011](#)). In the US they have already experienced the consequences of the federal governments war on drugs. Therefore California and many other states starts to decriminalize possession of cannabis for own use to a minor fine in the 1970s, while in Denmark the possession of cannabis for own use is not really enforced. Furthermore it seems that the population of California is more motivated to change the path, since the large group of homosexuals living in San Francisco and California are literally dying from HIV due to the health systems lack of flexibility in a time with inefficient HIV medicine. This is known as institutional hysteresis,

where feedback effects between the institutions and the industries create economic pathways leading to a lock-in. The people in California observe the life prolonging medical effects of cannabis on HIV patients and thereby switch the cognitive beliefs about cannabis back from recreationally use to medical use, much earlier than in Denmark. The path creation in California is therefore based on a bottom up approach that aims for a radical breakthrough with a faster outcome, in order to save lives. The first attempt is the law for medical cannabis use in 1991, which the governor of California vetoes four years later.

"The first step of the path creation is a slow process shaped by the history, until actors or entrepreneurs manage to coordinate their activities to move away from the existing paths" (Sydow 2012).

The cannabis activist in California becomes more coordinated and starts to receive funding by wealthy business people in California. Thereby it is possible to finance TV ads that visualize the merits of the patients and their families, which provide enough attention to collect 850,000 signatures and launch the direct democracy legalization of medical marijuana in California.

In Denmark the path creation start right after the medical legalization in California, as the first synthetic medical cannabis products then enter Denmark. The process in Denmark is a strict top down approach in a slow pace. The medical use of cannabis concentrates become legal in 2011 and in 2016 the government and parliament approve a 4-year trial with medical cannabis plant medicine, which is more based on the existing medical regulation than the radical medical cannabis breakthrough in California. Nevertheless does the doctor and medical organizations in Denmark believe the 4-year trial to be a radical path change as the medical cannabis plant medicine is not tested and approved as other conventional medicine. The doctors become one of the greatest barrier to the four-year trials attempt to create a path creation, as they still follows the lock-in of the path dependence and have no interest in being flexible about their profession. In the emergent path creation process, both Denmark and California are attracting shareholders that dare to take ownership and have greater vision for the legalization project. In California there is almost no limits to the booming innovations of new cannabis products, while the Danish 4-year trial is using the conventional medicine procedures as a frame, but seem open for new product development. The Danish medical aspect of medicine is very functional, compared to the medical edible market in California. But some of the medical cannabis manufactures in Denmark have experience and qualifications to move the path toward more edibles. The Danish cannabis market is also more attractive to investors as the Danish market has access to the banks and is approved and protected by the authorities, while California is facing the barrier of being in a criminal grey zone due to the federal prohibition of cannabis.

In the third phase, which is the institutionalization of the new path, California switch to a more top down approach similar to the Danish. California enters the recreational consumer market with focus on regulation, safety and taxes, instead of the medical marijuana caregiving patient approach. The path creation process is no longer in the hands of the medical activist as, the new bill is written by

other people, with larger visions and the project starts to include more stakeholders, to whom regulations and taxes is seem as a natural part of the process. A future recreational consumer cannabis market in Denmark could be similar to the recreational market. California is experiencing with proposition 64 from 2018. Though the start point with proposition 215 in California and the 4-year trial in Denmark are completely opposite, concerning regulation and taxes. It is also worth noticing that Denmark has been 20-30 years behind California in the whole process:

California	Denmark
1906 Cannabis, alcohol, opiates, cocaine and chloral hydrate listed as an intoxicating ingredient that needed special labelling (US) (UN)	1913 The Danish pharmacy law (UN)
1907 Prescription needed for opium, morphine and cocaine (CA)	1930 The law about production and trade with opium (UN)
1913 Cannabis illegal, but not enforced (CA)	1934 The doctor prescription law (UN)
1930s National anti-cannabis media campaign based on fear and race (US)	1945< Increasing abuse of especially morphine prescribed by doctors (DK)
1937 Cannabis illegal at federal level Recreational, medical, industrial (US)	1950s The American fear of cannabis enter Denmark (DK)
1969 The War on drugs (US) Cannabis listed among the most abusive and dangerous drugs with no medical use, like the UN schedule	1955 The law on euphoric substances Cannabis is placed in the B category as a legal medical drug with concern of euphoric propagation (DK)
1996 Medical Marijuana legal (CA)	1961 Cannabis illegal in Denmark Recreational, medical, industrial (UN)
2018 Recreational Cannabis legal (CA)	2004 The Fight against Drugs (DK) Cannabis users are treated as criminals and drug-abusers, both legally and as a discourse
	2018 Medical Cannabis 4-year trial (DK)
	?? Recreational Cannabis legal (DK)

Table 4. The time frames of the prohibition and legalization process, of cannabis in California and Denmark. US: The United States, CA: California, DK: Denmark, UN: The United Nations.

9.3 Introduction of new cannabis food products

9.3.1 Processing of the interviews

In order to under stand the actual needs of cannabis user in Denmark, four interviews with Danish cannabis users were conducted of which three participants had a recreationally use, while one had a medically use. Another person with a mixed illegally medically and recreationally use was furthermore participating in one of the interviews. Grounded theory was used in order to understand the large amount of data from the interviews and to locate and order

the most relevant themes. The Danish interviews were performed before the study trip to California and therefore the interview guide was explorative and included many different subjects, as there was no clear direction yet.

In the first part of the data analysis, which is the immersion process, the transcriptions of the Danish interviews were read several times. Based on the California study trip and the path creation, it came clear that there were some overall themes it would be relevant to follow when choosing sequences of text to code in the next part. These themes actually covered most of the interviews, but were useful to exclude some parts that would not be relevant for further analysis in this master thesis. The themes were: 1) Pleasant use 2) Unpleasant use and 3) Future legal perspectives. These themes were found useful, as the main purpose with the analysis would be an understanding of cannabis users and what products or events that could fit their use of cannabis in a food context. The excluded parts were some of the many questions about the participant's opinions regarding the authorities and about their teenage use of cannabis, which would not be relevant in a legal context. Though some of the teenage use was included for the "unpleasant use" and furthermore to study how their use changed over time. The theme "Pleasant use" provided an understanding of what products the users preferred, even though these preferences are not developed in a legal context. The "Unpleasant use" provided information of what to avoid in product or events, while the "Future legal perspectives" was more like a brainstorm made by the users, though they had experience with some of the suggestions.

In the next part the chosen sequences of text were coded into short precise phrases or statement, which were not coloured but instead placed in a table, to provide an overview. Many similarities and patterns became visible when transcribing and reading through the interviews, which became even clearer in the coding process. Throughout the whole process, ideas, thoughts and revealed patterns, were noted on post-its for further use.

The next part was the creation of categories, which in this regard were suggestions for products or events. Suggestions based on the previous "unpleasant use" themes, could be made into suggestions like; "products that doesn't encourage increased use" or "events with limited alcohol use". Some of the coding's was made into overall categories, which provided a more manageable overview. Since this process simplify and generalize the meaning of the coding, it was important to go back and look at the original phrases and codes to ensure that no important data or meaning was lost in the process.

All the categories were finally organized into tables to provide the final overview. This part often includes an identification of themes, which is an explanation or an interpretation of the subject that is investigated. As edible products or event is the final goal, the identification of themes, have been the following: the "purpose" and "properties" of the products and events and "Medical products".

9.4 Analysis of the interviews

The analysis is based on Grounded Theory in order to understand the users and their actual need for legal cannabis edible products and events. The analysis will start with an introduction to the participants and then provide the most relevant findings, which is divided into three sections: Pleasant use, Unpleasant use and Future legal perspectives. Since one of the interviewees only used cannabis medically he, is analysed in the last part by himself, while the first part will focus on the three recreationally users. The following is an overview of the interviewee's personal data, though their names have been changed.

"Carsten"	"Anders"	"Henning"	"Mikkel"
Age: 64 Retired Live in Spain, From Aarhus Single, no children Hobbies: used to sail, do advertising, administrate Facebook groups, paints and draw	Age: 40 Graduated Media graphic designer, working as a concept developer and art director at an advertising agency. From Copenhagen Just divorced, single dad with two part time children age 12 and 14 Hobbies: Muscle training, outdoors life, DIY handyman, grows his own cannabis as a hobby project. Eat vegetarian and healthy food	Age: 67 Retired electrician, From North Jutland Divorced, single, one son 39 years old, Hobbies: Play many music instruments, keyboard and guitar Eats everything: Danish and foreign food	Age: 35 Educated chef (season worker) and musician Divorced, single part-time dad with two girls age four and seven Hobbies: Produce and sing hip-hop Music, photographer, aquarium fish, to hangout and ride his bicycle. Food preference: Sustainable local food, fine dinning and homemade food, experimental and innovative food. Is a flexitarian.
Recreational use	Recreational use	Medical use	Recreational use

Table 5. Personal data of the four Danish cannabis users

9.4.1 Pleasant use

Relaxation and calming the mind seemed to be the overall effect and purpose of recreationally cannabis use among the participants. The participants smoke in the evening when all tasks are done, while one has more spread out smoking and working patterns. The primary smoking type is joints with cannabis flower or hash, mixed with cigarettes:

"...I do not have diagnosed ADHD, but as you can hear, I speak a lot and in order to dampen my behaviour and my mind, my thoughts and my self-understanding, then cannabis has been very good for me, because it has just gotten me those three floors down as you can see, and sooo, there is peace and sooo, there is not so much trouble. In that context it is also very good as a pain reliever. That's something I've discovered later in my life" (Carsten 64)

It is clear that the participant is using cannabis in a grey zone between recreational and medical use, as he has become aware of the medical properties later in his life and. The overlap between medical and recreationally use of

cannabis were also mentioned in scientific studies from the state of the art ([Barrus et al 2017](#)).

“Like if you go to a pub and get one or two quick drinks, you have that warm feeling in your body and stomach, heart and cheeks, and you get a little bit more down, the shoulder lower, you get that feeling ahhhhhhh, after work beer ahhh, you also have that to a certain degree with cannabis (...) But you have a different sense of how your contact is with other people and I could feel it when I started again, that I had actually missed that in those years where I was smoke free (cannabis) for twelve thirteen years or how long time it was” (Carsten 64)

The recreational use of cannabis is defiantly still a desired as the participant use cannabis in social contexts and to feel good. His past use of alcohol has also been used for both social settings and as a way to relax, during his long break from cannabis. In that period he experienced a few years as an alcoholic, which had personal consequences, before he finally quit alcohol and returned to cannabis as the source for relaxation.

“I compare it very often with a after work beer, but it could actually be as a sleeping pill or a relaxation pill, here at the end of the day, um. That's exactly how I use it (cannabis) ” (Carsten 64)

The other participants were also appreciating the calming effects from cannabis though their purpose seemed more recreationally than medically.

“When you smoke (cannabis), I think it's as if you can sometimes come down to a level where you think, okay, all the little things you do not appreciate can suddenly be appreciated because you have the surplus to embrace it or to accept that (...) you have to be a little dull in order to could, how to say so, to accept things are as they are. Also, just see things from a more relaxed perspective than just worrying about getting from A to B fast” (Mikkel 35)

“I never really think I've thought of it as a medication for something, but more like something I've just done because it's been nice to calm down and somehow just nice to smoke weed and chill” (Anders 40)

Cannabis is also used as an occasionally alternative to alcohol, since cannabis can be used without losing the control, due to the relaxing effects. Though the participants mention that the relaxing and sensible effects of cannabis can make it unpleasant to be in a context with very drunk people. As drunken people often speak loud and fast, and are the opposite of relaxed. They also mentioned that accidentally smoking too much strong cannabis when being really drunk was a very unpleasant feeling that should be avoided. But the participants didn't mind using cannabis in a contexts where moderate amounts of alcohol were included:

“It is a natural part of our gathering and where we just stay... Yeah, have it really nice and being adult foolish, and yes, use it as an alternative to get really drunk. Not saying that there cant be some beer in it or a couple of glasses of wine or

something, but that (alcohol) is not the primary thing. It may also be possible to find a board game and sit and play some Draw and Guess" (Anders 40)

The participant that has quitted alcohol himself, still value that alcohol is being consumed by others in moderate amounts, as an important factor in a social context

"I also intend to invite to the last barbecue party tonight, (...) and then smoke a joint and, sooo I have wine and alcohol in the house. I have always had. I have fifty bottles of different things and all my guests are always asked if they want beer or they want wine. So I have no problem with alcohol. I'm trying to do it well for my guests." (Carsten 64)

But he still believes that alcohol in high amounts is not suitable with cannabis as they provide two different kinds of effects.

"Because one thing is smoking (cannabis). Most people can manage it. Now I'm high to some extent. But as soon as you mix alcohol, you have a variable in how intoxicated people are, how stupid they behave, and again, mixing alcohol with cannabis, that is a relaxing substance, that does not make you want to dance or fight or fuck or whatever it is, and then alcohol. I know that as soon as you start mixing those things, it will be cannabis people will point out as the problem and not alcohol, even though that everyone who smokes knows that alcohol in that context clearly is the Bad Guy." (Carsten 64)

Some of the participants also mentioned that they are able to use cannabis in a more creative setting like when painting and drawing or making music or food. Though one of the participants admitted that unfortunately he could not use cannabis as a creativity enhancer in his job and therefore had to use cannabis in leisure time settings, like it is the case with alcohol nowadays:

"The smiles come a little easier and the conversations too run a little easier. Those good ideas, they also come in a different way. Now, as I say, I draw and paint a lot, and drawing and painting and sitting and being creative and at the same time being able to concentrate and not overthrow the easel all the time, there is cannabis really excellent. It would have been a little more problematic if alcohol had been my preferred choice." (Carsten 64)

"It's the calmness. When I smoke (cannabis), I can focus, immerse myself completely; in relation to if I drink I may be very flying, you can almost run on the walls. But when you smoke then you become, I don't know if you get more creative, I just think you can immerse yourself more into something. That's what I'm looking for in it. At least being able to smoke a joint and say, okay, now this is what we are focusing on" (Mikkel 35)

9.4.2 Unpleasant use

The participants had smoked for the first time at age 10-12 or 13-14, while they became more regular user around age 14-15. The use of cannabis in the teenage

years was done in groups with a peer pressure of being able to smoke a lot on different kinds of smoking equipment's and often in the daytime. The unpleasant use of cannabis was mentioned as smoking too much, too often or in the wrong settings, which mostly occurred in the teenage years but also in the young adulthood

"If you are in some state of mind where you can not cope with your own life situation and use it like escaping it. Um, because to me it just worsen this feeling of not handling your own everyday life and it can be something as simple as having a lot of tasks at work and having a lot of stress and being unable to see how to handle all this stuff and then and say, fuck it, I just smoke a joint or because I was used to do it at some point almost every day. (...) And then there are those times where you just smoked too much (at once), right, but it's been a lot of years since it happened to me. That was when I was young-ish." (Anders 40)

The participants all expressed that they had become better at controlling their intake, as they got older and more experienced, though it took many years of less controlled consumption. They can still have small peaks in their consumption, which they solve with small breaks instead of quitting, as they have become less worried about losing control.

"I know if I'm going to have a break from smoking (cannabis), because I've just smoked too much, well I know I can count on that first week's time or something I'm just a little bit grumpy and maybe have a little more pace or a little less patient to when people piss me off and I just have to say that, I may sleep a little bit worse, but it's also the only two points. There I have a slight backlog as I have smoked stable, not necessarily much, but smoked steady over a period of time. So from experience I know that it's just a matter of, I know if next week has no big projects that I have to attend to and I have some time to be alone. Well, that's where I'm placing my smoking break" (Carsten 64)

The participants also mentioned the criminals, the unsafe products and the lack of both product variety and information at the illegal cannabis market, as part of the unpleasant use:

"It brings people to some places where they also can get all kinds of other shit thrown in their heads. But if it (cannabis) was legal, you could sit in a park and enjoy it or go and find out what's really in it and say okay I'd like this because it's that kind of purity or I would like this because it is made in this way. You cannot because it is not controlled and I feel it's really sad. It's too bad because you're taken to some places where it's not always nice to be because it's just being criminalized. And of course, the types that are criminals, they are just not comfortable to be around" (Mikkel 35)

The participants were also aware about health consequences from the tobacco used with the cannabis, though they continued to use tobacco

"I have also read about, what can you say, that the harmful effect is significantly less if you do not mix tobacco and your feeling of high also gets better and cleaner,

you can say you do not get all, what can you say, the harmful substances from the tobacco and the cigarette” (Anders 40)

“When you smoke it (cannabis) with a cigarette, you get all those things you do not want. You get nicotine and tar and all kinds of chemicals into the lungs. In fact, you should just smoke it pure, but it’s just too strong” (Mikkel 35)

9.4.3 Future legal perspective

The participants were mostly interested in plain legal, tested and labelled products, without harassment from the police.

“I don’t know if cannabis is suitable for Friday’s bars. I could imagine such events, now it sounds paradoxically that it is called Green Concert, which could be called Green Concert. The festivals all around, try to listen, instead of having a criminalization where people do not contact you if they have problems with drugs, then make it legal. Now, I’m experientially saying that if you have smoked too much (cannabis), just pop some sugar, cause sugar in the blood binds the THC molecules, then after half an hour to an hour you’re down again” (Carsten 64)

But though the participants at first had difficulties to imagine the variety of products and events to expect from a legal cannabis market, they were able to brainstorm and generate several suggestions after a while.

“Something like the day of the cake. It is commonly known that, what can you say, that one’s reward centres they want, they will have something more, um, over an hour to one and a half hour, and then you can go and get a little hungry, so I could imagine in connection with enjoyment events where one has to eat some tasty food and drinks. I could also imagine sensual, um, a little more sensual events, um, like, group hugs, um, it could be a beach trip where you lay and bake and feel the heat of the sun. It could be forest trips, it could also be urban walks, like experience, um, events, but also assuming that you get the amount and type and dose (cannabis) that is just appropriate for yourself, but also for the event you attend in, um, as I think can give an extra dimension to really many things. But of course there are also some contexts that probably will not fit so well, but a bit softer values I think. Music too, um, sit-down concerts. Perhaps also therapy” (Anders 40)

“You could easily make a twenty dish Michelin menu, where it (cannabis) might be through the whole menu, um, that would be so cool. I would like to go out for dinner at that restaurant (Friend saying: are you sick. I would make twenty different kinds of cakes. Cake buffet, he he he). Sauces I would also make, delicious juice and different things, jellies, were you got (friend say: weed jelly) a nice high, um, but not so you just got really stoned, when you really just want to have fun, laugh a lot, get your laugh on, you could control it, a bit like a Michelin menu where you pair the wine when you eat, you really also pair it according to what the wine does to you, how it affects you. Yes, that could be so good” (Mikkel 35)

9.4.4 Medical cannabis use

The medical participant was very critical toward the Danish doctors as they would not prescribe medical cannabis or listen to him or his friends, about their experiences with the use of illegal acquired medical cannabis. The reason that he started to use medical cannabis was to avoid the side effects from the many different drugs his doctor had prescribed him. Especially to avoid his latest prescription, which was a chemotherapy drug that the participant refused to use, as he only suffered with rheumatoid arthritis and not cancer.

"But I just did not dare, start taking them (chemotherapy drug). You could get bigger lungs, I also got X-ray, X-ray photographed my lungs, so they had something to compare with when I had used this preparation for half a year, to see if I had gotten larger lungs. I also got my feet, they came, they were also X-ray photographed, that was also something that could happen at the footsteps, by taking those damn (pills)." (Henning 67)

After a brief research with information from the Internet and attending to a local medical cannabis meeting, he eventually bought some illegal cannabis medicine.

"But I've got my life back. In the morning just to take the socks on, it was a struggle, and to button the shirt it was a fight, it could take five minutes just to button a shirt. And also I always do a lot of stuff my self, even repair my car. I'm also an electrician. I've got to screw a lot. I could not even use a screwdriver. But now there is nothing wrong. It sometimes happens that there is a bit in one of my feet, my foot joints, just one two three days on such a little cure again (medical cannabis) then it's gone" (Henning 67)

He was satisfied with the effect but mentioned that it took some time to find the right dose for him

"If you took too much you became dizzy, you felt badly from this euphoric substance. (...) But it was just that next time you should have just use a little less of that THC and then there's nothing, nothing to notice." (Henning 67)

The participant had no interest in products like medical cannabis food edibles, as his only interest was to get access to legal controlled, dose precise and full spectrum content of cannabinoids in the cannabis medicine

"I still think it would be the oil, so you can see the dosage, and be aware of what you are getting, at all. As I say, you buy from a reputable company from Holland, and it is organic, grown ecologically, and that's also a plus. There is also someone who uses pesticides, I will not have that" (Henning 67)

Though the participant did not mention any suggestions for future products, he did provide the information that the cannabis medicine tasted a little bit burned, that it was difficult to dose correct and that he had to take his medicine before

going to sleep in order to avoid driving his car and risking losing his driving license.

9.4.5 The suggestions for cannabis products and events

The grounded theory analysis became a very useful as a tool to include the more hidden needs of the participants, which will be used in the final analysis of what products we might experience in a Danish context where recreational use of cannabis is legal. The relevant phrases from the interview were coded and then narrowed down to the following categories, which furthermore were divided into the themes: Purpose of products and events, Products properties and Medical products:

Alternative to alcohol Cosy and fun alternative to alcohol products	Events with no or limited alcohol use Chill out events Outdoor events Non-alcohol settings	Product to be consumed by one person Products to be taken by one or two people
Products for leisure time After eight treats	Food and taste products or events Cannabis pairing	Relaxing alternative to alcohol Relax the mind products Relaxing products
Products for social events Social cannabis clubs Wedding events Bachelor parties	Creativity stimulating Products Creativity Enhancing products	Mental sensibility and focusing products or events Physical sensibility products or events

Table 6. Purpose of products and events

Whole substance spectrum cannabis products Product variation Healthy products Tasty products Dose precise products Customized products Social accepted products Products for home growers	Proper information and service Better and informed products Proper and understandable labelling Information and advice about responsible use
	Professional products and -intake settings Professional products Sugar added products to prevent feeling sick from overdose
	Products that doesn't encourage increased use Products that doesn't encourage higher use for young people

Table 7. Products properties

Products for osteoporosis patients	Easy to use products Oral products Better tasting products
Dose precise products Proper information Regulated products Tested products	Products with all active substances Products with less side effects

Table 8. Medical products

10.0 Idea for new edible products and events in Denmark

10.1 Products

From the case study in California it came clear that all kinds of edible cannabis products could be made, though most products were long-lasting products like chocolate bars, candies, chips or drinks. The edibles were mostly consumed in order to avoid smoking, for convenience, and for a greater taste and product variation. The participants from the Danish interviews also found it desirable to avoid the unhealthy aspects of smoking cannabis with tobacco, though the act of smoking could be an important part in a social context. Nevertheless could the social aspect of smoking together also be a reason for over consuming cannabis. Though the Danish participants had many suggestions toward what to do when being high from cannabis, there were fewer suggestions about what products to use it in. One did mention a lot about cannabis infusion in fresh made food, which will be discussed in the next chapter. The Danish participants were in general interested in professional, dose precise products that could be used alone, in small groups or in settings that suited the relaxing effects of cannabis, which could include creative, cosy, fun, sensible or other leisure time activities. From the context of the Danish market, alcohol soda pops has gained massive popularity, especially among young people, where girls prefer them to beer. Alcohol ice creams has in contrast not been accepted by the retailers and are considered to be a “*wolf in sheep clothing*” towards children as they are sold next to the other ice-creams. Nevertheless is alcohol slush ice and cocktails accessible at bars and nightclubs. Medication and the excipients are manufactured with focus on the functionality of absorption and dose. Though the functionality also can include a thin sugar covering in order to make children or people with less appetite use them.

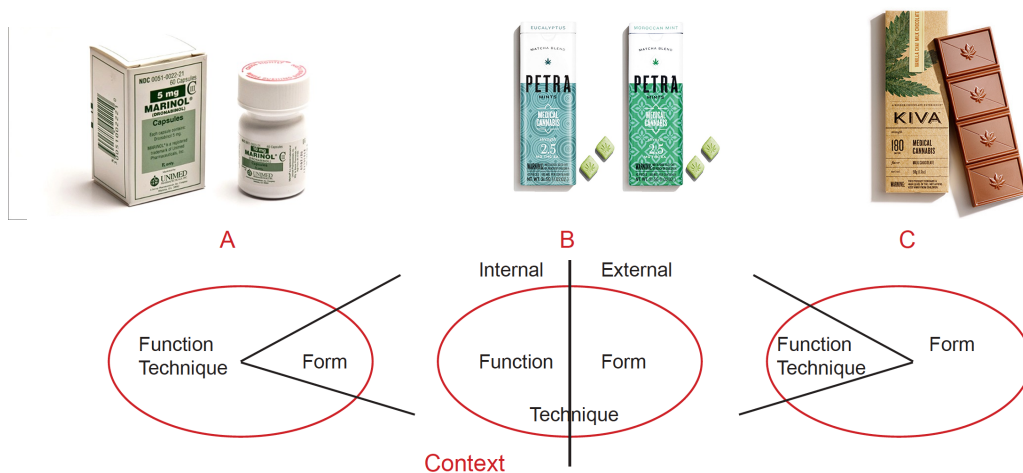
10.1.1 The 4-year trial

The 4-year trial in Denmark is in a grey zone between the natural and traditional plant medicine and the conventional medicine. In the 4-year trial cannabis is allowed as a real plant medicine on the basis of historical use and experiences, while the medical cannabis manufactures have to make the plant material into dose precise medications, which are sold at pharmacies and prescribed by doctors. Among the most successful cannabis edible products in California are the Kiva Terre Bites, which are chocolate covered espresso beans micro dosed with 5 mg of THC concentrates and the Petra Mints which are based on green tea maccha and stevia with 2.5 mg of THC concentrates. Compared to other cannabis edible chocolates and snacks in California, they are easy to dose and besides the espresso beans, chocolate covering and maccha tea, they fit the typical medical forms like e.g. pills and capsules.



Figure 14. Medical edible products from California

As mentioned earlier are pharmacy companies often reluctant to use novel excipients, as it will add additional risks to their medicine, since the authorities might not approve their drug, just because of the new excipient ([Kolter 2011](#)). In the application for inclusion, on the Danish Medicines Agency's list of cannabis intermediates, it is written, “the packaging must not cause confusion with food or cosmetics.” ([Lægemiddelstyrelsen 2017](#)). It is also important to consider other functionality aspects of the excipients, besides the taste and aesthetics, as it is a medicine. E.g. oral depot preparations from which the drug is released over a longer period of time, can provide an unintended overdose if the preparation is crushed or chewed and are thereby only made to be swallowed and not eaten ([Jacobsen 2016](#)). Therefore safety issues and concern about approval have made function and technique the most dominant priorities for medication. While the medical marijuana edible market in California for a long time has been less restricted and freer to focus more on the form and aesthetics. Though the two edible products above seem to have weighted function and form equally.



- A. Emphasis on the inner dimension, function and technique – as in e.g. “Engineering design”.
- B. The inner and outer dimension is weighted equally, as e.g. in the functionalism.
- C. Emphasis on form, the outer dimension – as e.g. in the historicism and deconstructivism.

Figure 15. Overview of designs where function, technique and form are prioritized differently (Engholm 2001)

Nevertheless seem the Danish 4-year trial less strict than the normal medical procedure, some of the approved Danish medical cannabis manufactures are already producing other food items and the Canadian investors are at home entering the recreational cannabis market in July 2018, which could be influenced by the edible trends in the US. Furthermore have hemp and CBD products become successful at the dietary supplement market, which the Danish approved medical cannabis manufactures probably also will supply with cannabis products.

10.1.2 Natural medicines and dietary supplements

If products like the Kiva Terre Bites and Petra Mints products were to be sold as natural medicine in Denmark, the active substances like THC are not allowed to be isolated and concentrated in larger doses than they exist in nature. But with the micro doses it might not be a problem, at least not compared to the 1000 mg THC edible products that were allowed in California before proposition 64. If cannabis plants with a THC content above the 0,2% limit, are allowed to be categorized as a natural medicine, in Denmark, they no longer need to be prescribed by a doctor and sold at pharmacies as they could be sold online and in herbal shops, just like dietary supplements. The natural medicine cannabis products could furthermore be marketed with health claims of preventing or healing disease and disease symptoms. Since dietary supplements are not allowed to market any health claims, many of the natural CBD rich hemp products, which nowadays are sold as cosmetics or dietary supplements, would probably also enter the natural medicine category in order to be allowed to market their health claims. Nevertheless, does many online shops already provide health claims about CBD hemp food supplements or cosmetics, though it is not allowed for these categories. Furthermore, an expert report with

pharmaceutical, toxicological and clinical documentation is needed for the approval of natural medicine. Such thorough documentation is not required for traditional plant medicine or dietary supplements or cosmetics, as they more or less only need to be proven safe for human consumption.

Regardless of whatever cannabis products are market with medical claims or not, the possibilities of new products from cannabis seem endless as cannabis contains 100s of different cannabinoids with different effects. The effects of the cannabinoids furthermore change at they develop from the “mother” cannabinoid CBG to a pre-acid-cannabinoid e.g. THCa, to the activation of the cannabinoid by heating to e.g. THC and finally due to aging becomes another kind of cannabinoid e.g. CBN. Only heated THC, or THCV in larger amounts, is known to have an intoxicating effect. Thereby, many different non-intoxicating cannabinoids might not only be limited to medications but could also be isolated and used in a variety of natural medicines, dietary supplements and functional foods, regardless of THC will be allowed for these categories or not.

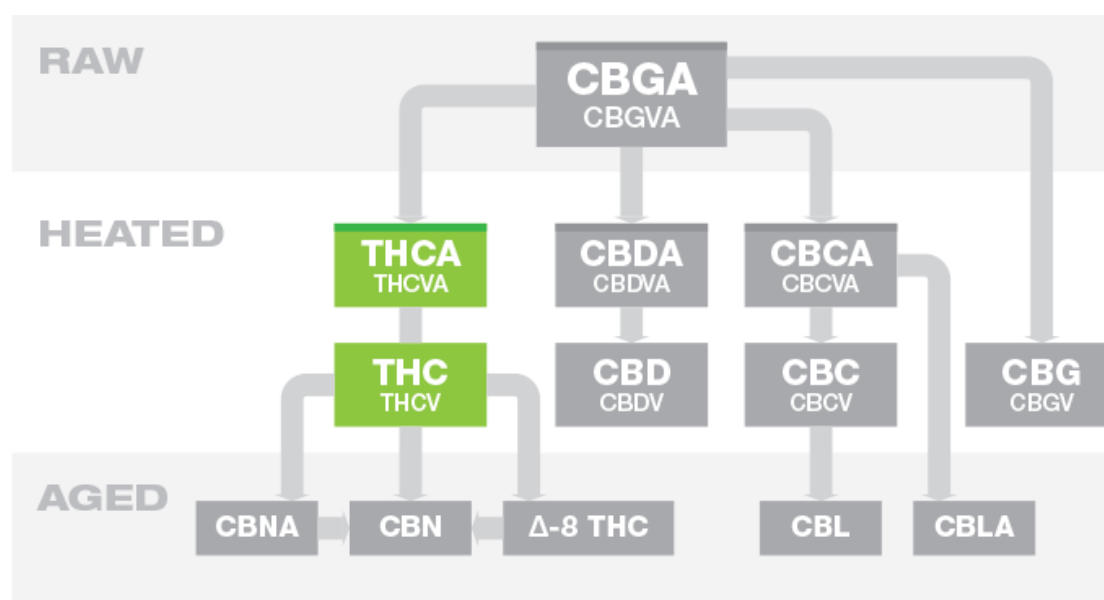


Figure 16. Example of how cannabinoids change over time and from exposure to heat ([Hawaiian Ethos 2017](#))

According to the Danish Medical Agency’s interaction database, does the medical preparation Sativex, which contains both THC and CBD extracted from the Cannabis plant, to a smaller degree, interact with the medical substances Ketoconazol and Rifabutin, which need to be taken into consideration for people using different medications ([Lægemiddelstyrelsen n.d.](#))

Both natural medicine and dietary supplements must be marketed in smaller sized doses, e.g. in the form of pills, capsules, and liquids or in powder form. At the moment there are 47 natural medicines approved by the Danish Medical Agency which all are the medical shapes mentioned above except for a few tea, medical plasters and lozenges products ([Lægemiddelstyrelsen 2018](#)). The Danish Agency of Food has registered 3.029 dietary supplements products which include gummies, liquorice, chewing gum, effervescent tablets, gels, peanut butter, fizzling soda powder, vitamin water concentrate, shots, protein powder,

vitamin pills, capsules, liquids etc. ([Fødevarestyrelsen 2018](#)). Many of the dietary supplements are either high or low in calories, proteins and vitamins and made for people, that eat too little to much or maybe don't have time to eat real food. The malnourished segment could be interesting since THC in cannabis is mentioned as an appetite stimulant in scientific studies from the state of the art, by the Danish interviewees and by several sources from the California field trip. To combine two different functions in one product; energy- and vitamin-dense food and the appetite stimulating THC would probably categorize it as a functional food instead. Furthermore, according to the law, dietary supplements are not allowed to contain medicinal substances, euphoric substances or substances covered by the Doping Act, which also include functional food.

Natural medicines	Dietary supplement	Functional food	Alcohol and caffeine in food and beverages
Disease health claims	Nutritional or physiological effect (no disease health claims)	Health-promoting effect (no disease health claims)	Nutritional claims: energy-reduced, reduced alcohol content, low alcohol content (no disease health claims)
Small size doses (daily doses)	Small size doses (daily doses) food	Beverages and food	Beverages and food
Intoxication not allowed	Intoxication not allowed	Intoxication not allowed	Intoxication allowed

Table 9. Overview of how different categories of medicines, food and beverages are regulated.

The only oral CBD hemp products available at present time in Denmark are products like oils capsules, tinctures and tea. A full spectrum product available in Denmark is the Sana Hemp Juice, which is cold, pressed plant's leaves, flower and seeds and the juice is immediately frozen and freeze-dried. Thereby it contains CBDA instead of CBD, as it is not heated.



Figure 17. Sana whole food hemp dietary supplement ([Sana Hemp](#))

10.1.3 Functional- and novel food and food additives

While the natural medicines and dietary supplement are limited to small size doses, functional and novel foods can have any food shape available. Nevertheless, the functional and novel foods are not allowed any health claims

toward disease according to the Danish law, besides having particular health-promoting effects. As mentioned earlier the Danish consumers are in general more interested in consuming healthy additives in food products that already are healthy, than e.g. gummy bears. Hemp is already considered to be a functional, healthy and sustainable food and has the potential to become more of a staple food in the future. Therefore functional- and novel foods could be hemp or cannabis as staple foods, containing higher doses than the original source, of cannabinoids, terpenes or nutritional substances. Similar examples are e.g. orange juice, which is fortified with extra vitamin C. It could also be cannabis plant based foods where only the THC is removed, like when fat is removed from skimmed milk. Furthermore it could be raw hemp or cannabis products that only contain the unheated cannabinoids, like THCa, and thereby have no intoxicating effects, which could include juices or even fresh salads.

Nutritionally wise, hemp contains around 30-35% protein, with all nine essential amino acids, 41% fat, of which more than 80% is polyunsaturated fatty acids, including Omega 6 and Omega 3 in an ideal ratio of 3: 1. Hemp is also rich in dietary fibre, magnesium, iron, vitamin B1, B2 and E and has high content of vitamin D, with 24 mg per 100 gram ([Hansen 2018](#)). Science is providing us with a better understanding of cannabis beneficial properties, and eventually the many different cannabinoids will be approved safe for human consumption. Thereby food products can include the leaves and flowers of the cannabis and hemp plants instead of just the seeds, and more possibilities for new product development of functional cannabis foods will arise. There is also an increasing demand for sustainable products where all aspects of the commodity are used. Furthermore has California in the last ten years gone from thrashing all their cannabis leaves, to selling and using them for concentrates, instead of just focusing on the high potent cannabis flowers.

Coffee is also used for flavouring in different food products, in some cases just for the taste of coffee and not for the effects of the caffeine. Similar can cannabis be added as a flavour for products market toward cannabis users, even though no THC need to be present in the food product. The flavours of cannabis, known as the terpenes, come in different varieties and are also known to have certain beneficial properties, which furthermore could qualify them for use in functional foods.

While cannabis edible entrepreneurs in California used to copy the larger chocolate and snack brands, a group of young entrepreneurs from France has done the opposite. They have named their company O.G. Krunch, inspired by the cannabis strain O.G. Kush, and are manufacturing chocolate snacks with either puffed rice, nuts or maccha tea, that looks exactly like cannabis bud flowers and are wrapped in plastic bags similar to the sale of illegal cannabis ([O.G. Krunch 2018](#)).

10.1.4 Alcohol in food and beverages

Nevertheless, there can be no recreational use of cannabis without the intoxication from THC.

Alcohol has a longer history than humans, as it is made from the sugar inside fruit and vegetables that interact with the natural occurring yeast on the outside. Though anaerobe processes and distillation is needed for stronger products. The cannabis plant is also believed to be millions of years old. Both cannabis and alcohol has been used for nutritional, medicinal and other purposes as well as recreational use, throughout the human history. In Denmark alcohol is the only allowed recreational intoxicating substances and it is used frequently in many different cultural and social contexts. If cannabis were legalised on the same terms as alcohol, cannabis would be allowed for sale 24 hours a day, in retail stores, 7Elevens and all other places where alcohol is sold. Together with the same availability as alcohol, cannabis would probably also face the same product restrictions. Coop has, as mentioned earlier, denied any of its retailers to sell ice creams with alcohol in order to protect the children. Alcohol is generally only used in food in small amount as a flavour additive or as a way to market the alcohol brand. Nevertheless, are alcohol beverages like beer, sweet alcohol soda pops, alcohol energy drinks and wine, sold right next to the beverages children are usually drinking. Though the strong liquor is sold together with cigarettes at the cashier. Therefore, it seems that cannabis edibles will be sold as beverages rather than foods when it comes to acceptability in the retail stores and the historical and cultural consumption of intoxicating substances in Denmark.

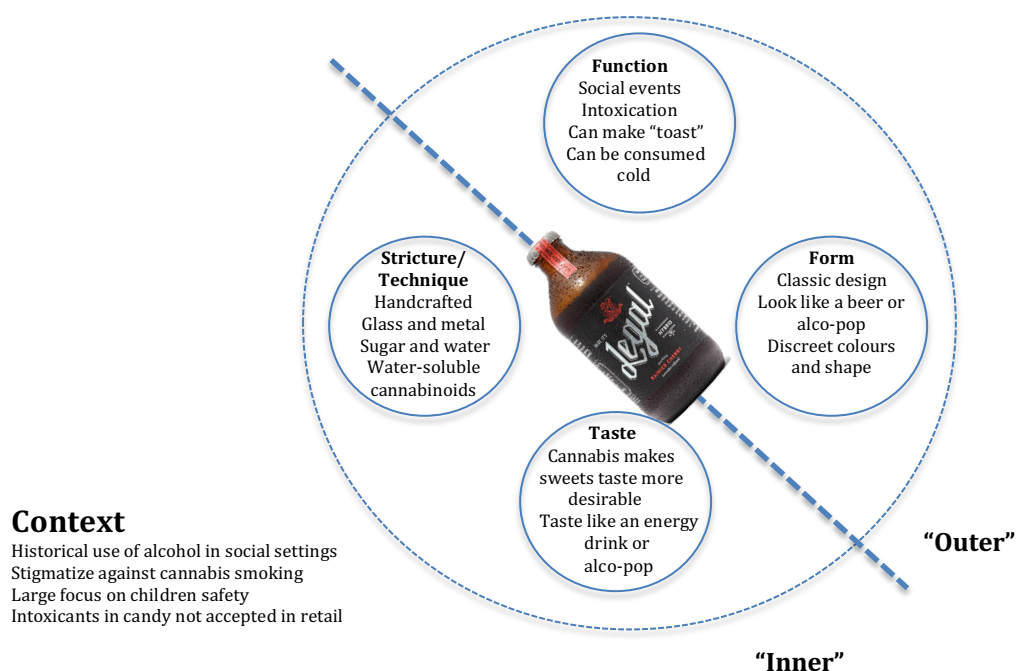


Figure 18. Figure 19. The 360-degree design perspective of a cannabis edible beverage, in a Danish context (Korsmeyer & Riis mashup).

Cannabinoids are fat-soluble, meaning that you normally would have to either eat the real plant source or add fat if you want to use a concentrate from the cannabis plant. Though real cannabis juice, not made from concentrate, would be one of the healthiest ways to consume cannabis, the taste would probably be a barrier for some people. Therefore, edibles made from concentrates have previously been added both fat and sugar which increases the calorie content and also limited the product variation. With new technology it is possible to make cannabinoids water-soluble and tasteless, which mean that they can be added to anything with no need for extra fat or sugar to control the taste of cannabis ([Bennett 2018](#)). Several beverages are already available in the US, like THC infused; sweet fizzling drinks, soda pops, fruit juices, water, syrups, coffee, alcohol-free wine or wine with cold pressed cannabis. Alcohol, dairy products, caffeine extracts and nicotine are prohibited to be use in cannabis products in the US.



Figure 19. THC infused beverages from the US: Somatik, Legal, La Grandeur, Elixirs, Quencher and Sprig.

It is worth noticing that beverages can be more difficult to divide into portion sizes, compared to food. Therefore THC infused beverages for people with low tolerance could be in micro dose one-portion sizes, somewhere between 1 to 5 mg THC. Another aspect to consider is that smoking of cannabis and drinking in a social context, both provide a peer pressure to consume more, than if you do it by your self. The interviewees all mentioned how smoking with others influenced their intake as they are expected to follow the group and it is cool to be able to smoke a lot. The youth in Denmark is furthermore having the highest intake of alcohol in Europe. Therefore consuming edibles as food could remove the peer pressure from drinking, as edibles has the potential to be used as an individual act. Though it might be easier to overdose from accidentally eating a small edible than drinking a whole bottle of infused soda. The social act of toasting and celebrating with glasses in the hands are also important cultural aspects in Denmark, which need to be taken into consideration. Alcohol beverages have nevertheless a high content of calories, which could be in favour of cannabis, though extra snacking must be expected from cannabis use. As intoxicated people might temporary forget their need for sugar and liquids, infused beverages can a solution to provide both.

As mentioned earlier the mayor of Copenhagen has several times proposed government-owned and government-run stores to sell legal hash and thereby stop the crime and violence from the illegal sale. If dispensaries like in the US were used in Denmark it could be possible to offer infused edibles, as there would be no children allowed in the dispensaries compared to the supermarkets. The dispensaries could provide a greater variety of dose precise quality edible cannabis products, compared to what the illegal Danish “hash market” has been able to offer so far.



Figure 20 An illegal cannabis cake from Denmark and a “party box” from California

10.1.5 Information, labelling and regulation

The interviewees mentioned how a legalization of cannabis could provide proper information, labelling and service about the cannabis products and in general provide advices about responsible and safe use. From the field trip to California the “budtenders”, meaning the staff, seemed proper knowledgeable and motivated to inform about cannabis and its usages at the ten dispensaries I visited. The Danish version of a dispensary would probably require certain education or courses for the staff, as cannabis in Denmark is seen as somewhere in between a medication with no scientific evidence about its properties or safety and a highly abusive illegal drug. Another mean to protect the consumers from the industry and to create a more healthy use of cannabis, would be similar marketing regulations as alcohol and energy drinks. Childproof packaging and safer products were also a high priority when California voted yes to proposition 64 and legalised recreationally use of cannabis. A scientific study in the state of the art furthermore recommended proper information to parents, as children would be more interested in the sweets than the warning labels on edibles. In 2018 a Danish 14 years old boy died from an overdose of opioid prescriptions pills that had been left unsecured on a table, while his girlfriend went into a coma ([Tuxen & Vejle 2018](#)). In the US in 2014, a New York Times columnist published her accidentally overdose of a chocolate edible, which among other incidents lead to massive education campaigns sponsored by regulators and cannabis industry leaders to protect the “edible beginners” ([Lawrence 2017](#)).



Figure 21. Billboard informing about safe consumption of edibles for tourist visiting legalised states in the US ([Lawrence 2017](#)).

The interviewees mentioned that social setting could increase the use of cannabis and the exposure to criminal environments where other drugs could be present. They had also experienced how feeling stressed about their life could lead to an increased use of cannabis which lead to a pattern of more stress and more cannabis use. A too high intake of cannabis could furthermore lead to an undesired passive behaviour, sometimes in social settings where it was not appropriate. They all stated that they had become more aware about these things as they got older and more experienced. Younger people and beginners could benefit from the experience of older users as a way to gain control of their cannabis use and their life:

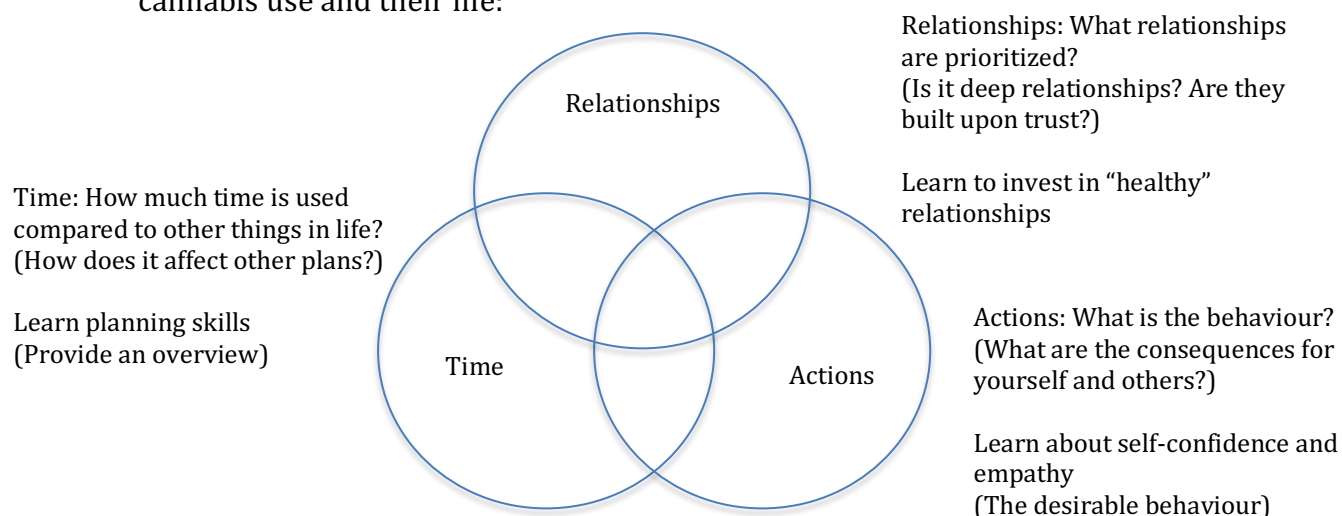


Figure 22. Overlapping themes from cannabis use, which could benefit young people to learn about.

10.2 Events

10.2.1 Progression of economic value

Cannabis infused fine dining can be a social adult only setting, with focus on dose precise consumption of cannabis. As we have entered the experience economy, cannabis can be used to provide taste-enhancing values and be part of a memorable experience at dinner events. From the view of the “Progression of economic value” cannabis can; 1) be sold as a commodity, meaning the raw plants, 2) be manufactured to a standardized processed good, like an cannabis edible, 3) be customized by delivering certain services, like loyalty programs at a dispensary, or products specially targeted you 4) made memorable by staging personal experiences, such as a dinner event 5) made influential by delivering a customized cannabis experience, specially targeted your needs



Figure 23. The Progression of Economic value

10.2.2 The Four realms of experience

The Four realms of experience distinguish between absorption, meaning outside the event and immersion, meaning, inside the event, while the participants furthermore can be passively or actively participating in the event ([Pine & Gilmore 1998](#)). The interviewees mentioned that cannabis made them more sensible, focused and relaxed compared to people consuming alcohol. They also suggested being outside in nature and being part of calm events as desirable, in contrast to the illegal use of cannabis, which often occurred in smaller settings and at home. Therefore cannabis events with limited or no alcohol consumption could provide a setting where cannabis users were able to enjoy the physical and mental settings. Special Lounges where cannabis user can meet and use cannabis are seen in the Social Clubs in Spain and the Coffee shops in Amsterdam, which the interviewees mentioned. In California few places had cannabis lounges, like the Barbara Coast dispensary in San Francisco, which I visited on an educational tour guide around the dispensaries. These places would be in the absorption experience, as people would either watch TV or sit and talk.



Figure 24. The Barbary Coast dispensary in San Francisco was on of the few dispensaries with a cannabis-smoking permit. Cigarettes were not allowed ([Barbary Coast](#))

While smoking lounges are more passive experiences, a dinner event could focus on the immersion by creating an intimate setting where cannabis users could mingle, flirt or network with other cannabis users. Furthermore, learn about new cannabis products and safe consumption, while focusing on the food and cannabis in the same way as wine and food complement each other. Combined with predefined micro dosing of cannabis, adjusted for personal tolerance levels, the setting could furthermore support a more active participation. The event could be an escapist experience by involving the participants in the making of food guided by a professional chef or ending the dinner with a creative dessert workshop. It could also be dinner role-plays specially designed for cannabis users or small games or other activities for the participants. As the interviewees mentioned that cannabis, in the appropriate amounts, could enhance both creativity and laughter. When participating in a high class infused dinner, at the field trip to California, I observed how a guest spontaneously started to draw on a piece of paper. The nearby guests were asked to draw new objects on the paper, which turned into a story and the piece of paper became the centre of both amusement and conversation for a while. The event could also focus on the esthetical by letting the participants enjoy the food, the story telling, the surroundings, each other, maybe calm music and entertainment and thereby engage all the five senses of taste, sight, touch, smell, and sound.



Figure 25. People arriving at an infused cannabis dinner in San Francisco 2018

10.3 Campaign to promote legitimize use of cannabis with food

According to the Danish food entrepreneur Claus Meyer, the great food categories in Denmark has in the last couple of year experienced an increasing variety of products and producers. Especially beer has experienced a great increase in variety, followed by foodstuff like apple juice, chocolate and coffee. Outside the typical food categories Denmark has in the last 15 years furthermore experienced a large innovation force, partly due to the public concerns about unsustainable food production and a larger insight into the making of novel foods. Finally are people with higher degrees becoming more interested in entering the business of food productions, like civil-engineers, professional designers and other academics ([Irma 2018](#)) In order to speed up the process and reach cannabis' full edible and gastronomic potential in Denmark, I have interviewed another food start-up specialist about how to introduce cannabis in Denmark with food. He provided an understanding of how to introduce cannabis edible products as novelty foods or cannabis as a whole new food and drink category.

10.3.1 Cannabis as a new food category

In California many of the cannabis edibles are copies of other food items, like chocolate bars, cake, chips, sweet beverages, tea, etc. When looking at the new innovative vegetarian food products they often also tend to be copies of other food products like, minced meat, milk, butter, cold cuts, etc. instead of working toward their own food category. Which is probably due to the fact that many consumers are conservative in their food choices (Linddal 2017). Nevertheless does cannabis has endless possibilities to be consumed as food or with food. Therefore it could be interesting to actually promote cannabis as a new food category, at least as a way to lift the image of cannabis.

10.3.2 Positioning the messages higher

Journalist covering certain objects like criminals, minorities and deviants, might positioned the object they write about on a lower level than themselves and the receivers, though they as communicators often are unconscious of this process (Windahl et Signitzer 2009 pp175). According to the food specialist I interviewed it is important to create the positive story about how cannabis can be used and what product it can be used in e.g. by adding the seriousness from wine and then consider the cannabis category with the same respect. The "terroir" expression could also be included, which among other aspects, is about being able to taste that something is grown in certain areas like e.g. wine grapes or coffee beans.

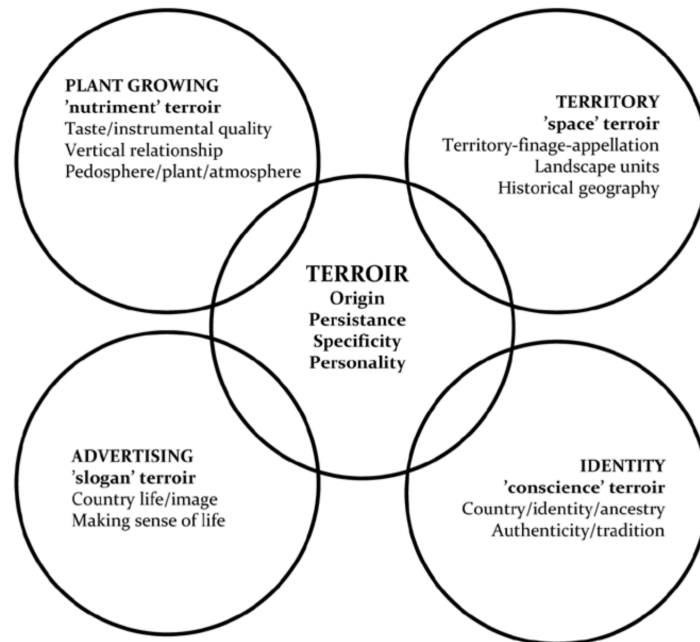


Figure 26. A typology of terroir. ([Vaudour 2002](#))

Another project to add seriousness to the story could be gardening where aspects of taste and effects could be analysed by e.g. Copenhagen University as a Danish study with Danish results. Furthermore to introduce the world to the diversity of the category by illustrating and letting people taste it. Make workshops with food manufactures, farmers and other from the product value chain. To work with it and do all kinds of things, which create words and language and colours to the product. Thereby letting the opinion leaders put their own words to the experience, which they can spread out.

	<i>Myrcene</i> 	<i>Limonene</i> 	<i>alpha-Pinene</i> 	<i>Beta-Caryophyllene</i> 	<i>Nerolidol</i> 	<i>Linalool</i>
<i>Aromas</i>	Earthy Mixed Herbs Mushroom Forest Floor Skunk Mango	Lemon Lime Grapefruit Blood Orange Tangerine	Pine Trees Pine Needle Wet Wood Rosemary Dill	Clove Black Pepper Cinnamon	Perfume Jasmine Ginger Flower Tea Tree	Citrus Blossom Violet Lavender Rose Lilies Geranium
<i>terpene benefits</i>	Sleep Aide Muscle-relaxant Anti-depressant	Stress Reliever Weight Loss Aide Mood-enhancer	Aids Asthma Provides Energy Anti-inflammatory	Anti-anxiety Anti-inflammatory Antioxidant Pain Reliever	Antifungal Anti-depressant Sleep Aide	Anti-anxiety Sleep Aide Muscle-relaxant Anti-depressant Anti-acne
<i>cannabis strains</i>	Kosher Kush Himalayan Gold White Widow	Lemon Haze OG Kush Tangle	Bubba Kush Jack Herer Trainwreck	Rockstar Northern Lights Skywalker OG	Island Sweet Skunk Skywalker OG Banana Kush	Lavender OG LA Confidential Amnesia Haze
<i>terpene effect</i>	Sleepy Sedated	Enhanced Mood Uplifted	Alert Focused	Reduced Pain Calm Stress Free	Tranquil Peaceful	Relaxed Rejuvenated
<i>food pairings</i>	Mushroom Risotto Spinach Quiche Truffle Popcorn	Oysters Seared Scallops Lemon Bar	Pesto Pasta Sautéed Pine Nuts Rosemary Popcorn	Seared Spiced Steak Chipotle Spiced Nuts Pumpkin Pie	Vegan Curry Lavender Olive Oil Honey Yogurt Parfait	Coconut Jasmine Rice Ginger Honey Chicken Carrot Ginger Cake
<i>wine pairings</i>	Pinot Noir Syrah Grenache	Chardonnay Sauvignon Blanc Albariño	Pinot Gris Vermentino New Zealand Sauvignon Blanc	Zinfandel Cabernet Sauvignon Petit Sirah	Rosé Beaujolais Pinot Blanc	Muscat Riesling Viognier

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Terpene & Aroma Guide

Discover Your Herbal Palate

Figure 27. Examples of cannabis flavours and food and wine pairing ([The HerbSomm 2018](#))

10.3.4 Opinions leaders

Interpersonal communication is superior to mass communication, as it not only transfers information but also influence. Opinion leaders are able to influence followers as they are; the personification of values, by their competences and from their strategic social location (Windahl et Signitzer 2009 pp71-72).

According to the food specialist it is crucial to create a community and involve others to verbalize the ideas and story, as it is impossible to start up a food category by oneself. He recommends to start out, by mapping different communities, that could be relevant to target the new food category; art, design, fashion, food, etc. Also to consider the aspects of why cannabis is being used; e.g. medicinally or recreationally, since the food aspect is basically just a way to consume the products. Next step is to locate the right opinions leaders and ambassadors that will legitimize cannabis in the eyes of the consumers. Meaning the people who represent the professionalism, seriousness, and are the trendsetters.

10.3.5 Motivation

Opinion leaders are selective about what information they receive and they must find it worthwhile in order to inform others about it (Windahl et Signitzer 2009 pp75). Therefore the food specialist recommends that opinion leaders from different communities, need to be approached with different strategies, in order to be motivated. It is important to find out what motivates them and while chefs would typically need to be involved in the development of a food product, others could be more interested in the growing of the commodity. Create curiosity about the whole plant and let them experiment with the different aspect of the commodity; thereby being motivated by having real tasks and ownership of the process. If they have a real role in the process, it will have real meaning for them and they will share it with other people in their network. Finally it is important to have a media strategy, where both opinions leaders and journalist has to be part of the creation of the story. Therefore provide them with interesting parts and let them have the joy and satisfaction of creating the rest by themselves.



Figure 28. Chefs have become active promoter of cannabis infused food in the US ([Murrieta 2017](#)) Photo: Emily Mazzei.

11.0 Discussion

The thesis was an explorative journey into an interesting and to some degree unexplored field. The aim were to give the cannabis users a voice and provide another perspective than the eternal debate about cannabis abuse, psychosis and vulnerable young victims of a dangerous drug. The State of the art provided more useful scientific studies than expected, which were a clear indication of how limited we are in Denmark when it comes to scientific curiosity toward cannabis. The theoretical framework with path dependence and path creation provided a simple but yet comprehensible overview of how societies and institutions becomes locked-in in paths which can be hard to change. Actor-Network Theory could also provide a deeper insight into the many discourses, policies and arguing about evidence concerning cannabis. An interesting field to study further in another project.

The thesis changed directions several times as the start point were to focus solely on recreational cannabis, which changed as the case study were targeting a 22 year old medical cannabis market in California, which indeed were based on patient caregiving. At the same time were the Danish cannabis market going to be medical for the next couple of years. Though it were interesting to investigate the functionality of medical drugs and compare them to the functionality and design if the edibles. Though the field were only touched briefly in this thesis. Which could be another interesting project to focus on.

Due to limited structure and inefficient time planning, the thesis also changed direction from a pure consumer project to focus on the historical event as the main object. Though the research design and the theoretical framework provided interesting data, the study were to explorative for a to long part of the process. Therefore some part of the thesis is discussed very thoroughly while other parts were not. Interesting fields to precede with are the whole food cannabis products. From both scientific and empirical sources the healthy benefits of cannabis are mentioned, which also include the unheated products. As a functional food cannabis has all the healthy nutritions known from hemp products, as well as non-activated cannabinoids and different other substances, which science is beginning to understand the functions of. The thesis had a long chapter with food regulations in Denmark and the EU, which is also an interesting field as hemp and CBD and medical cannabis is breaking down the stigmas and creating a new path where cannabis once will be a commodity or traditionel plant medicine like e.g. ginger.

The greatest experience for the researcher were to experience cannabis as an almost average consumer good, which also were customized for all kinds of possible segments. From the dose precise Vapepen which provide exactly 2.5 mg THC for medical patients and is created in an authentic medical design. While a tea manufacturer produce cannabis infused tea customized with design and advertising to mature women, which were not the first segment I would have in mind with cannabis in the Danish context of illegalization and stigmatises. But the next five years is defiantly going to change a lot about the beliefs of cannabis in Denmark, as the medical cannabis industry is expected to earn billions from plants grown on Danish soil.

12.0 Conclusion

The aim of the thesis was to study what edibles we can expect in a future with legal cannabis. Furthermore, to understand the cannabis users from a consumer perspective as we might end up with a legal cannabis market in Denmark in the next couple of years. Therefore, I believe it is important to study the cannabis market and the users in a legal context, compared to the large focus on abuse and crime which colors much of our scientific studies and public debate nowadays. The focus of the thesis where from a food perspective, which also is a non-existing theme in the illegal context of cannabis in Denmark. The case study in California provided a deep insight into a booming cannabis business with a great variety of edible products. From the state of the art it was found that edibles in the legalized states in the US were often unreliable in content of the active cannabinoid THC and that novel users often ate too much, too fast. The interviews with customers and staff at the cannabis dispensaries revealed that edibles can be consumed safely, and that safety and regulation is the greatest priority of the authorities since the legalization of recreational cannabis use in 2018. Besides the increased state taxes on cannabis. The Theoretical framework highlighted the great differences in the legalisation process of medical marijuana in California in 1992 and the 4-year trial with medical cannabis in Denmark from 2018. While California experienced a SME and mom and pop entrepreneur paradise with limited regulation of edible products, The Danish version is highly regulated with medical standards and a dependency on the prescription of medicine from doctors, which has become a great barrier for the patients as they are denied their cannabis medicine. The legalization processes were also very different as California experienced a bottom up approach with activism, while Denmark had a governmental top down approach. Nevertheless, has the legalisation process in California been taken over by people that focus more on the market than the patients, which could be a similar pattern in Denmark when the cannabis market becomes more wealthy and political influential.

The Danish interviews revealed that cannabis is mostly used to relax, but also can be used to enhance creativity if it is consumed in small amounts. The interviewees were mentioning different relaxing and more sensual events with limited or no alcohol present, as well as food tasting as desirable legal activities that fitted cannabis users. They did not mention any processed edible products and was more focussed on the legalization aspects. In the path creation theory process the Danish context of alcohol and food had been investigated which together with the 360-perspective design model concluded that cannabis beverages would be more acceptable for recreational cannabis use, as Denmark has a strong integrated drinking culture and is less tolerant toward candy with alcohol added in order to protect the children. Medical wise were edibles found to be possible solution as long as they are available in small doses and have a functional design, like e.g. lozenges, though the 4-year trial has not defined exactly how medical the medical cannabis product has to appear. Furthermore did some of the approved Danish medical cannabis manufactures, already produce food, while two companies where originally from Canada, where recreational use will be legal from July 2018. Therefore, food and cannabis in a legal recreational context might be a reality in Denmark in the next couple of years.

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14.0 Appendix

Don't want to smoke	Can't smoke	Convenience	Variety	Different high	Cannabis in general	Don't like edibles
Have children around (health & influence)	Not allowed in a certain place and events you cant leave	On the go	Edible consumers like to shop around and try new products	Last longer (good as medical, e.g. sleep)	Alternative to alcohol with less hangover and less body damage	Easy to overdose without proper information or small portion sizes
Patient is a child	Last longer (can do it less frequent)	Exact dose	Endless combinations of food and drink products	More bodily high (good for body pain and deep relaxation)	Enhance taste experience and appetite of food	Often hit you harder than smoking (after a while)
Medical condition	Don't have to step outside or away from the rest of the group	Discreet	Endless combinations of taste		Can be used as a medicine (with less side-effects)	A lot of waiting time to get high and even more waiting time to get back.
Care about health (lungs)		If it contains no terpenes, police cant detect it	Can be mixed with other medical herbs or super foods		Less calories than alcohol (depend on food source)	Contains often poor quality THC or CBD and no terpenes
Fear of stigma					Better for sleep and relaxation than alcohol and coffee in the evening	The whole practise of smoking is also desirable (and to do it frequently)
Care about voice (singer or vocalist)					Is more intimate for lovers than alcohol	Food products last shorter than weed when

						opened
New recreational users often prefer edibles					More creative and mind-expanding than alcohol, coffee	Too much sugar for diabetics, obese and people with high THC tolerance

Appendix 1. Findings of edible preferences in the Bay Area

Initial Conditions	New Path Creation Process	New path establishment process	Barriers to new path creation	Landscape change
<p>Cannabis is illegal</p> <p>Aids epidemic</p> <p>Need for less harmful medicine</p> <p>Large use of cannabis in the population</p> <p>Citizens suing the federal authorities for denying access to medicine</p>	<p>P215 Legal medical</p> <p>P64 Legal recreational</p> <p>City of Oakland and other official institutions sue the federal authorities to protect their local cannabis business and citizens</p>	<p>New vaping technology with less unhealthy than smoking</p> <p>New indoor growing and lightning technology</p> <p>FDA might approve cannabis products</p> <p>Professional edible products for mass production</p> <p>Professional cannabis startup incubator programs and cannabis educations</p> <p>Larger business and actors with influence believe and invest in</p>	<p>Economic:</p> <p>No access to Credit card systems or money deposit at banks</p> <p>Hard to obtain funding's for cannabis business and start-ups as it is illegal federally</p> <p>Cannabis investment can still be confiscated by the federal authorities</p> <p>Competition from illegal cannabis market</p> <p>Difficult to patent a plant as medicine.</p> <p>Cognitive:</p> <p>Cannabis connected to other hard</p>	<p>Many people employed in the legal cannabis industry</p> <p>California \$7 billion cannabis industry</p> <p>Large tax revenues</p> <p>CBD and to a lower extent medical cannabis is accepted as medicine in many places in the world</p> <p>Small cannabis business are being replaced by larger due to stricter regulation and taxes</p> <p>Increase in investments in the</p>

		<p>cannabis business and cannabis reforms</p>	<p>drugs and abuse</p> <p>Unknown benefits and consequences of cannabis intake due to restrictions on scientific cannabis studies</p> <p>Alcohol, cigarettes, coffee and sugar are still the common accepted and preferred intoxicants of choice.</p> <p>Prescription and OTC drugs are still the common accepted and preferred medical drugs of choice.</p> <p>Institutional: Tough regulation about places to grow, produce or sell cannabis and cannabis products</p> <p>Tough regulations and taxes on cannabis edibles compared to</p>	<p>cannabis industry</p>
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			other food or alcohol	
			All pesticide use prohibited	
			Restrictions on advertising for cannabis	

Appendix 2. Path creation in The San Francisco Bay Area

Initial Conditions	New Path Creation Process	New path establishment process	Barriers to new path creation	Landscape change
Media and social-media attention about cannabis as medicine Increasing medial use of cannabis around the world 1997 Legal to do clinical studies on synthetic cannabinoids in Denmark Synthetic cannabis and concentrates of THC and CBD used for medicine in Denmark	2011 The narcotic substance law changed to allow pharmaceuticals made from cannabis to be approved as medicine in Denmark 2015 Glostrup Pharmacy produce Magisterial cannabis medicine from plant concentrate 2016 The 4-year trial with medical cannabis from plants is approved 2016-2018 2x5 mio. DKK to medical cannabis	Danish growing and manufacturing of cannabis medicine The worlds largest cannabis company invest in Danish cannabis production Product development of food like cannabis medicine The cannabis flower is added to the European Pharmacopoeia 9.4 and "Danske Lægemiddelstandarder" 0,2% THC allowed in hemp products Funding for medical cannabis patients Recreational cannabis use becomes legal from July 2018 in Canada (H.Q. of the two	Economic: High cost of cannabis medicine Cognitive: Focus on addiction and health risk for young people Cannabis plant medicine not considered as safe or useful as synthetic medicine due to limited scientific evidence Institutional: Danish Zero Tolerance against	16 Companies approved to grow cannabis 9 companies approved to manufacture medical cannabis The two largest growers have invested more than 300 mio. DKK in Danish factories and green houses >2 billion DKK a year turnover expected in the

	research	largest investors)	illegal drugs Doctors are recommend ed not to use cannabis medicine	Danish cannabis industry.
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Appendix 3. Path creation in Denmark

