OULU UNIVERSITY OF
APPLIED SCIENCES

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BUSINESS POTENTIAL OF ARCTIC BERRY WAX: ORGANIC CANDY INDUSTRY

Value proposition and framework for business

BUSINESS POTENTIAL OF ARCTIC BERRY WAX: ORGANIC CANDY INDUSTRY

Value proposition for arctic berry wax

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ABSTRACT

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This thesis project is a case study about the suitability, value proposition and possibility of market entry of the product arctic berry wax to organic candy manufacturing industry. The study was conducted as a part of an international WAX-project studying the arctic berry wax. There are four universities taking part in the research of the wax and this thesis was part of Oulu University of Applied Sciences (Oamk) WP5: Identifying the business potential of arctic berry wax.

Arctic berry wax is a wax that can be gathered from the waste product of the current processing methods of the berries. Through qualitative research and analysis of documents and observations this thesis focuses on creating a value proposition for arctic berry wax regarding the candy manufacturing field. In addition to this the wax is compared to other similar products already on the market to find out the strongest existing competitors. Based on the data gathered a forecast for the potential market entry of arctic berry wax was made.

The results of this thesis show that there is potential for the wax to enter the market based on the features of the wax in comparison to existing waxes on the market. However further research is required about the wax and some of the values such as arctic image of the wax don't bring additional value for most companies in the field.

For future research it is recommended to consider niche markets where the additional features of the wax could bring more value. For the business possibilities of the wax in the candy manufacturing more about possible certifications and the behavior of the wax in use needs to be studied.

Keywords: Berry wax, wax, value proposition, new product forecasting, features, market research, business opportunity, market entry

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1 INTRODUCTION

The Commissioner for the thesis is The Oulu University of Applied sciences (OUAS) and the research will be part of a WAX project that is an international cross-organizational project that is focused around berry wax. The organizations taking part in the project are Centre of Microscopy and Nanotechnology (CMNT) of University of Oulu, Luleå University of technology, Norwegian Institute of Bio Economy Research and OUAS. The project is planned to take place over the duration of three years and it is divided into six work packages (WPs). The work packages include studying different areas relating to berry wax, berries producing the wax as well as the utilization of the wax. This thesis will be a part of WP5: Identifying the business potential of arctic berry wax.

Confectionary industry was worth $198.4 billion in 2014. Out of this market $62.60 billion consisted of sugar candies and $24.60 billion of gum candies. (Bernard 2015, 25.) The size of this industry is projected to grow in the upcoming years. The ingredients market for manufacturing sweets was $76.25 billion in 2016. The market is projected to grow from this to $109.48 billion by 2025. The largest market for these ingredients in 2016 was Europe followed by North America and Asia-Pacific region. (Thompson 2017, 7.)

Increasing health awareness and consumers becoming more demanding in means of the ingredients of the products has had an effect even in the candy industry. Due to this companies have been looking for new innovative ways of producing more natural products with fever artificial flavors, colors and preservatives. (Goldschmidt 2017, 58.) The ingredient this thesis focuses around, arctic berry wax, is a natural side product that can be extracted from the side stream material of the process that arctic berries, especially lingonberries, go through. The wax meets vegan classification and is completely organic and ecological product.

The research for this thesis focuses around the potential new ingredient, arctic berry wax. Due to the wax being a new discovery and the circumstances that research about the qualities of the wax are conducted at the time of writing of this study, this research focuses mainly on building a value proposition for the product.

For the creation of the value proposition empirical data gained through attending Biofach 2018. The Biofach is the world's largest organic food trade fair that is organized annually. The fair acts as a

meeting place for different actors from organic field. This includes political representatives, experts, researchers and businesses. (Biofach 2018.) The fair was attended to gain additional knowledge about the organic market. The fair was chosen as a source of information for this study due to arctic berry wax having organic and vegan values. At the trade fair the focus of discussions and the lectures attended was around organic food and sweets/confectionary businesses within organic food field to determine if the current known values of arctic berry wax act as value creators for them.

The research questions for this thesis are as follows:

Is there demand for a new ecological and natural ingredient/coating agent in candy industry?
What is the value proposition for the arctic berry wax in sweets industry?
Is there potential for business within the candy industry for arctic berry wax?

The aim of this study is to determine the suitability of arctic berry wax for the candy industry as a market in means of business. This will be determined through data analysis and feedback from the industry.

The following sub questions are also addressed in this study: What are the market entry possibilities for arctic berry wax to the industry. How well does the arctic berry wax compare to current actors on the market? What kind of additional information about arctic berry wax is needed? What kind of businesses arctic berry wax would be suitable for?

Methodology:

The methodology for getting answers for these research questions will be qualitative in nature and will consist mainly of document analysis in form of analyzing academic articles. A qualitative approach to the study was chosen based on the focus of the study being the B2B market. (Desai 2002, 8-10.) A limited amount of data regarding the subject was available further supporting the choice of qualitative approach. Observations were important for the study and for this an approach of observing as a participant was chosen (Desai 2002, 14). Influencing the participants to discussions was avoided but clarifying questions were asked. The data and participants were mainly gathered from Biofach- trade fair.

The data obtained was analyzed using Value proposition canvas- theory from the book: “Value proposition design: how to create products and services customers want” by A. Osterwalder, G.

Bernarda, T. Papadakos, Y. Pigneur, A. Smith 2014. Based on this analysis a new product forecast will be conducted for the possibilities of arctic berry wax in sweets industry using theories found from the book “New Product Forecasting: An Applied Approach” by Kenneth B. Kahn 2014 as well as Philip Kotler’s “Marketing management” from 2016.

2 ARCTIC BERRY WAX

Berries growing in the Arctic areas have developed unique ways to adapt to the demanding climate in the area. Due to this kind of an adaptation the berries have qualities that are specific to only berries growing in these areas. Out of the arctic berries bilberry and lingonberry are of a special interest.

2.1 Marsi-study

In Finland berry picking industry is focused towards the North. Marsi-study is an annual study conducted by Finnish Agency for Rural Affairs and Kantar TNS Agri Oy (Maaseutuvirasto 2016.) The aim of the study is to determine the quantity of berries and mushrooms entering the markets yearly as well as the berry picking costs and -incomes. The study does not cover all the sales that are related to berries and mushrooms however as a large portion of the sales are direct sales meaning that the information about these doesn't reach those conducting the study. (Marsi 2016.)

In the Marsi-report Finland is divided into four geographical regions, Western Finland, Eastern Finland, Oulu+Kainuu region and Lapland. Due to the interest of this study and the project being arctic berries and arctic berry wax, the Oulu+Kainuu and Lapland regions are of interest. The Oulu+Kainuu area is more commonly known as Northern Ostrobothnia. The two regions also have the largest amount of areas that are certified for organic berries. The requirements for an area to be certified for organic products include that no chemical fertilizers or pesticides have been used in the past three years. In addition, there are also other rules and regulations that require supervising to be fulfilled. (Marsi 2016.) These two areas cover 46% of the berries delivered to the stores in Finland. Lapland had 43% of Finland's bilberry market with 2344,9 tons of bilberries being picked from the region. However out of the lingonberry market Lapland only had 10% of the country's market with 1134,6 tons in 2016. Northern Ostrobothnia region was the second largest in lingonberry in the country with its 2430,3 tons being 22% of the market. The region also had 28% of the bilberry market with 1557,5 tons being picked and entering the stores. (Marsi 2016.)

2.2 Extraction of arctic berry wax

Arctic berry wax can be extracted from the berries itself or the current waste product that is a leftover from the processing methods of the berries. In the case of the WAX-project the focus is in the extraction of the wax from the waste product. Extracting more goods from the existing materials increases the efficiency of the process. Studies about this type of a more circular business model have been conducted and it has been found that it not only has a smaller impact on the environment but is also more beneficial for the companies practicing it. Companies can get more out of existing resources and inputs with the more definitive approach of the circular economy compared to the more traditional linear economy approach where goods are manufactured from raw materials, sold, used and then straight up disposed. In the circular model a company attempts to take use out of the different stages of the process. (Ellen MacArthur foundation 2013.)

There are only prototypes of the arctic berry wax available at the time of writing of this thesis. However, there are estimates on how much of the wax can be produced on a yearly basis that base on existing data on smaller samples as well as expert estimates on larger scale extracting costs and requirements. Petri Sudqvist, the main researcher of the extraction methods estimated that 35 tons of wax can be gained from the amount of leftover product in the processing of lingonberries. respectively in a smaller scale process. Bilberries which have less wax composition in them compared to lingonberries have a smaller potential in means of amount of wax extracted. For the quantity of wax 19 tons in a yearly basis is expected to be possible if it enters a large-scale extraction. (Sundqvist 2017.)

2.3 Features of arctic berry wax

Industrial-goods can be classified in terms of their relative cost as well as how they enter the production process. The class under which arctic berry wax falls into is the materials and parts classification and under this, the sub category of natural products. (Kotler 2016.)

The nature of natural products is that generally they have low unit value, have large quantities and their supply is limited in nature. In the natural products field there are few larger producers who market and sell directly to the industry and long-term contracts are common due to the dependency of market of these products. Price and reliable delivery are the major factors due to the homogenic

nature of the market (Kotler 2016.) Arctic berry wax being in this category limits its possibilities in terms of separating itself from the other products available. However, there is still a chance for product differentiation and the added value gained from doing this.

Product differentiation can create significant competitive advantages. The means for differentiation include factors such as performance quality, durability and reparability. (Kotler 2016, 393.) In terms of arctic berry wax the features and performance quality are the main possibilities for product differentiation. The performance quality of the wax is still under research so in the case of candy industry the features of the wax will be focused upon.

The features of a product are supplementary elements to the products basic functions. The basic function of arctic berry wax in the candy industry is to act as a coating/glazing agent for candies, increasing shelf life and fulfilling other functions that are determined further on later in this thesis. Arctic berry wax being an organic and vegan creates value for the industry due to the increasing customer awareness and the current health trends. (Goldschmidt 2017, 58.) In addition to this the brand image of arctic nature and arctic lifestyle can be considered as a value creator for some companies. The further value creators are always company specific and due to this an individual analysis of the company and the product is necessary. (Kotler 2016, 410.)

3 USE OF WAXES IN THE CANDY INDUSTRY

Candy industry is a part of a larger market of confectionery industry. The industry was worth $198.4 billion in 2014. Pastries and other food items that are specifically considered as sweet items belong to the market in addition to candies and chocolate. (Bernard 2015, 25.) This thesis focuses on the candy portion of the industry.

3.1 Use of waxes in manufacturing of candies and confectionaries

Food additives are ingredients and substances that are used in food manufacturing to improve certain qualities of the products. In the case of waxes these qualities include shelf life, stability and non-stick features. Common additives include substances such as gelling agents, stabilisers, antioxidants and coating agents. In Europe all accepted food additives are labelled and identified by specific E numbers. To gain an E number the additive needs to fulfill safety regulations that are set by European Food Safety Authority (EFSA) and authorized by European Union. EFSA is the authority that also sets limits on how much of a certain additive can be found in a single finished product. (EFSA 2017.)

Existing food additives that are waxes fall into the miscellaneous category when it comes to food additives. They are found between E numbers of E900-E920. Only a select few of these substances are allowed in manufacturing of sweets. The predetermined roles and uses of the wax substances in candies are glazing and coating of the candies. (EFSA 2017.)

3.2 Competing ingredients in the industry

Waxes exist in natural and synthetic substances. Those classified as natural can be divided into two groups: renewable and non-renewable. Non-renewable waxes are generally gained from fossilized sources such as oil. Renewable waxes are gained from re-growing sources such as animals and vegetables (Endlein, Peleikis 2011). Both natural and synthetic wax substances are used in the candy industry.

3.2.1 Food additives

These waxes are generally considered as food additives and most of them are marked as e-codes on the packaging of the finished products amongst the other ingredients and additives (Evira 2018.) Due to limited amount of information about the synthetic waxes available only natural waxes are focused on in this study. The “E” in the word e-code stands for Europe and means that the additives that have the e-code have had their safety assessed and approved by the European Food Safety Authority. In case of waxes in candy industry, adding these compounds to the products aims to improve preservability and aids in modifying the structure of the product. (Evira 2018.)

3.2.2 Natural Waxes

Natural waxes are either plant or animal based. Candelilla wax and carnauba wax are leaf waxes. Beeswax and shellac are animal based. All these four waxes also fall under the category of renewable waxes. A wax that is widely used in candy industry that is made from non-renewable source: oil, is microcrystalline wax. (Endlein, Peleikis 2011.)

3.2.3 Renewable

Beeswax (E901)

Beeswax is a side product from honey production and beekeeping. While bees produce honey they also build up honey combs and these honey combs are where the beeswax is found from and harvested at the same time as honey. Beeswax is harvested both as organic and non-organic material and for beeswax to qualify for organic certificate it needs to happen in strictly controlled and regulated conditions. (Endlein, Peleikis 2011.)

In candy industry beeswax is certified to be used as a coating agent and a glazing agent to create a shiny layer on top of the candies. The wax is also used elsewhere in the food industry as an ingredient in soft gelatin capsules and water-based flavoured drinks to mention a few. (EFSA 2007.)

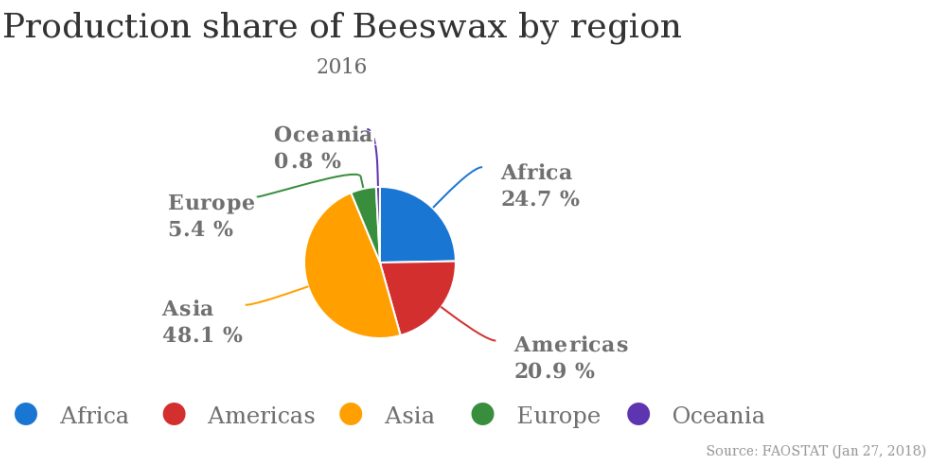

Figure 1. Beeswax production (FAOSTAT 2017. Cited 14.01.2018)

The Figure 1 shows that 48.1% of the world production of beeswax happens in Asia. India alone produces 23500 tons of beeswax annually (FAO 2017.). Despite large amounts of beeswax only a limited amount of it is available for glazing and coating as large portions are used as foundations for frame hives by beekeepers as well as for multitude of other industries (CBI 2015) The prices of beeswax vary from 3.5-7 euros/kg depending on the purity of the wax and the quantities of wax ordered (Alibaba 2018, Cited 11.01.2018).

Candelilla wax (E902)

Candelilla wax is obtained from candelilla plants. These plants are found in deserted and dry regions of southern United States and to a higher extend from dry regions in northern Mexico. Candelilla wax is a fully plant based product and it is both organic and vegan certified. (FAO 2006.)

In production of sweets candelilla wax is licensed to be used as a glazing agent as well as a texturizer for chewing gum. It can also be used as a coating agent. (FAO 2006.) In 2003 1132 tons of candelilla wax was exported from Mexico, 39% of the exports going to USA. (Schneider 2009.) The prices of candelilla wax vary from 8-25 euros/kg depending on the purity of the wax (Alibaba 2018, Cited 11.01.2018).

Carnauba wax (E903)

Carnauba wax is gained from leaves of a Brazilian Palm called Copernicia ceriferia. Wild trees are harvested and the crude wax is extracted from the leaves after drying (Endlein, Peleikis 2011.) Carnauba wax is organic and vegan friendly.

Carnauba wax is used in confectionary business as glazing agent and in chewing gums. It is also widely used in cosmetology due to its excellent oil binding capacities. The wax is also commonly used as a mixture with bee wax. (Endlein, Peleikis 2011.) In Brazil 22.4 tons of wax were produced in 2006. USA and Germany were the main destinations of exports for the wax. (Puttalingamma 2013). The price of carnauba is between 7,5-15 euros/kg depending on quality and refinement (Alibaba 2018, Cited 11.01.2018). At the current moment, carnauba wax is the most used wax for manufacturing gummies and other sugar sweets.

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Shellac wax (E904)

A type of insect called Laccifer lacca. Shellac is its exudation and the insect is parasitic on certain trees. The wax is a by-product of harvesting of shellac and it is removed from the shellac to improve the alcoholic solutions of shellac. It is mainly harvested in India and Thailand. (Endlein, Peleikis 2011.)

Shellac wax has been improved to be used in manufacturing of candies as a glazing agent. It is also commonly used in stick based cosmetics such as mascaras. (Endlein, Peleikis 2011.) India, which is the largest producer of shellac based products ahead of Thailand exported 42.15 tons of shellac wax in 2009. Price of shellac wax varies between 5-10 euros/kg (Alibaba 2018, Cited 11.01.2018).

3.2.4 Non-Renewable

Non-renewable natural waxes are generally made from fossilized materials. In most cases they are a by-product of manufacturing of oil based products.

Microcrystalline wax (E905)

Microcrystalline wax is obtained from petroleum. It is authorized as a food additive in Europe by EFSA. The use of this wax is licensed in limited amounts in for glazing of sweets and candies as well as chewing gums. It is also allowed to be used for the surface treatment of certain fruits. (EFSA 2013.)

Information about the production quantities of the wax were not available while conducting this study. However European chemicals agency estimates that 100000 to 1000000 tons of products in same category as the wax are imported to EU on a yearly basis for various uses. (ECHA 2018.)

3.3 Competition analysis

Due to the limited amount of information available about the waxes a comparison of the features of the waxes will be used to determine the current materials that arctic berry wax best compares to and is most likely to compete with if it were to hit the market. This comparison will also show the waxes with the strongest position on the market at the current stage. A simple competitive matrix will be formed based on factors deemed relevant to this study such as availability, nature of the wax, chosen features of the wax as well as the price of the wax for where this factor is known. Competitive matrix is a tool that can be used to compare a company or a product to the competitors and it offers a possibility to see the differentiation on the market. (Alter 2018, Cited 17.03.2018.)

Factor	**Arctic berry wax**	**Beeswax**	**Candelilla wax**	**Carnauba wax**	**Shellac wax**	**Microcrystalline wax**
Renewable	+	+	+	+	+	-
Price	?	+	+	+	+	?
Natural	+	+	+	+	+	-
Organic	+	+	+	+	+	-
Vegan	+	-	+	+	-	-
Supply	?	+	-	+	+	+
Used in industry	?	+	+	+	?	?

Table 1. Competitive matrix of the waxes ("+" =match for feature, "-"=no match, "?"=no information)

The information in Table 1 is a summary of the information about each wax that was discussed earlier in this chapter. The factors represent possible features and qualities of the waxes and each wax is compared based on this. As seen from the table, the microcrystalline wax and shellac wax both differ largely from arctic berry wax. Microcrystalline wax being a non-renewable wax that is only strong in supply in comparison to the other waxes lacks a most of the features that the other waxes offer. Shellac shares a lot of the features of the other waxes. However, it is not vegan and

the data of its use in the industry was not found during this study, even if it is allowed as a food additive. The candelilla wax compares well to the other waxes in means of the features but it suffers from being extremely limited in supply in comparison to the other waxes.

Beeswax and carnauba wax are the biggest competitors on the market for the arctic berry wax based on the competitive matrix. Both are widely used in the industry and they are both low cost ingredients that have a strong supply. Arctic berry wax has an advantage over beeswax by being vegan but carnauba wax matches this feature as well. Carnauba wax, the leading ingredient in the industry at the current state matches all the needs of the industry. The main disadvantage for carnauba wax is that Europe is the largest market for the ingredients and the wax originates in Brazil causing longer supply chains. This is where arctic berry wax could have an advantage due to it being a European product.

4 CREATION OF A VALUE PROPOSITION

Creation of a value proposition aims to the result of describing and explaining the benefits a customer would get from the product or service, that the one completing the value proposition is offering. It is a method of analyzing information available. The term value proposition itself refers to this description of the benefits a service or a product offers to the customers. In the process of creating a value proposition information about the business environment, the customer and the product/service is used to create a fit between the product/service and the customer. (Osterwalder et.al. 2014.)

When business is conducted decisions are required. Every decision made in a business setting has certain factors affecting and directing the decision. These factors that influence the business decisions are generally referred to as the business environment. Despite these factors being both external and internal, the term business environment is commonly used when referring to just the external factors. (Cherunilam 2009, 1.)

4.1 Value proposition canvas

Value proposition canvas is a tool that aims to make value propositions more tangible and easier to visualize. By doing this the tool also makes it easier to discuss value propositions. The canvas itself consists of two sides. Customer profile is the side of the canvas where your information about your customer, customer needs and other customer related factors are clarified. The other side of the value proposition canvas is called value map. In value map it is described and determined which aspects of your product/service provide value to the customer and how. The aim of completing these both sides is to create a fit between them. The fit determines how well your product suits the customer and from which aspects. (Osterwalder et.al. 2014.) In this study the value proposition canvas will be applied for a B2B setting of candy manufacturing companies acting as customers and arctic berry wax being the product.

4.1.1 Customer profile

The customer profile is a part of the value proposition canvas with which a certain customer segment or a single customer can be analyzed. The profile consists of customer jobs, gains and pains. Customer jobs portion is a description of what the customers are trying to do in their work or life. Customer gains is about what the customers are aiming to achieve with their efforts and the pains section determines what kind of risks and difficulties are involved in customer jobs. (A. Osterwalder et.al. 2014.)

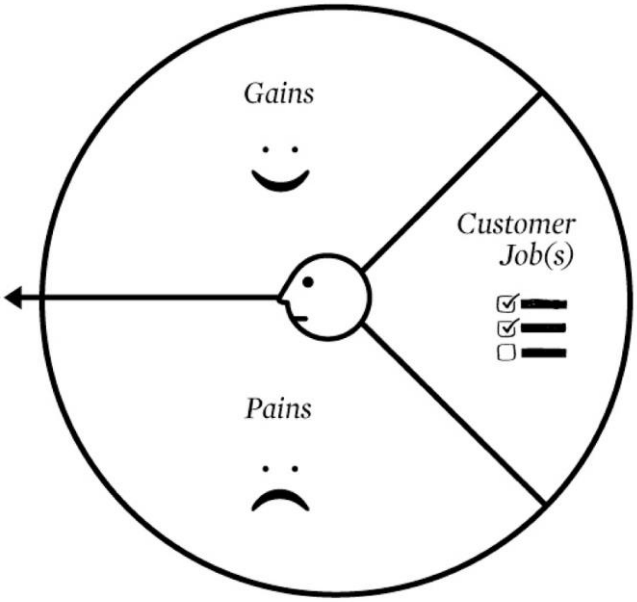

Figure 2 Customer Profile (Osterwalder et.al. 2014, 9. Cited 12.01.2018)

Figure 2 is customer profile as defined by Osterwalder et.al. In this case about arctic berry wax a customer profile of the candy industry is analyzed to get a picture of the needs of the industry. The sectors of customer profile seen in Figure 2 are used to do this. Each sector is analyzed separately to form a further understanding about the potential customer or a target market. It is recommended that the analyzed jobs, pains and gains are all ranked according to estimated customer needs (Osterwalder et.al 2014, 9).

Customer jobs

Customer jobs are something that a customer is attempting to get done or needs that the customer is trying to fulfill. Problems customers are trying to solve can also be counted as customer jobs.

Functional jobs are where a customer is attempting to perform a certain task or solve a problem. Social jobs are those where customers want to fulfill certain social values as well as determine how they look to others. (Osterwalder et.al. 2014, 12-13.) For the functional jobs in the candy industry when businesses are looking for materials that are comparable to arctic berry wax they generally are looking to do two things: to increase shelf life and to improve the outlook of finished products as well as making the finished products not stick to packaging. This is due to the qualities that these products have. As of social jobs, companies quite often have certain policies when it comes to social values. (Kotler 2016, 63.) Due to this companies are looking for ingredients to produce their goods with that fulfill those values. Examples of this kind of values are sustainability and ecological values.

Customer Pains

Customer pains are annoyances and problems that customers face while completing their jobs. These involve problems, undesired outcomes, obstacles in completing of jobs and potential risks. These factors make customers life or work more difficult than hoped. (Osterwalder et.al. 2014, 13-15.)

In case of candy industry, the customer pains vary from problems in manufacturing of goods to problems and risks with logistics of the materials for manufacturing of the goods. During the manufacturing process certain goods may not react as they have been expected to react with the other ingredients and materials being used. Some of the ingredients may also not fulfill the functions they are expected to while applied to the goods. This increases the costs of the production process for the company. (Osterwalder et.al. 2014.) Risks that the candy producers have when it comes to production and logistics involve breaking of manufacturing equipment as well as delays in shipments. Because the products used for similar functions as arctic berry wax in the manufacturing process are produced outside of Europe in most cases, delays of shipments can have large effects on the companies and slow down production majorly. (Martin 2016.)

Customer Gains

Customer gains are what customer want out of the products together with the outcomes and benefits. Some of the gains are determined by customers but some of the gains are added benefits that the customers may not even expect. (Osterwalder et.al. 2014.)

For the candy industry the main gains that the companies are looking for are improved shelf life, improved quality of the products as well as improved social values of the finished product by using more ecologically, sustainably and socially responsible products. Added gains can include things such as improved production efficiency and easing of production (Osterwalder et.al. 2014, 16).

4.1.2 Value Map

The value map is the part of the value proposition canvas with which the products or services a company is offering are analyzed. The profile consists of analysis of the product/service itself, pain relievers and gain creators. (Osterwalder et.al. 2014, 36)

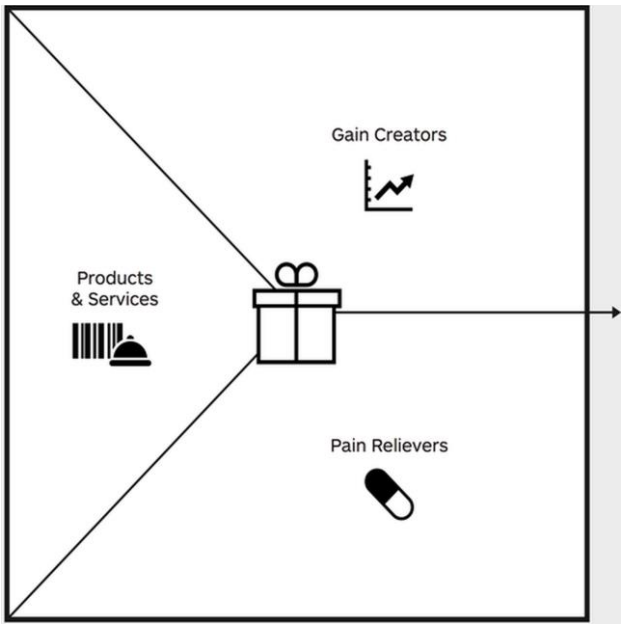

Figure 3 Value Map (Osterwalder et.al. 2014, 28 Cited 12.01.2018)

In this study arctic berry wax and the value it brings to the candy industry are evaluated. Similarly, to the customer profile it is recommended that the ideas and values in each section are ranked based on importance and meaning to the customer. (Osterwalder et.al. 2014, 20.) Figure 3 represents the value map part of the value proposition matrix. Each section of the matrix is analyzed separately to obtain a better understanding of the specific strengths of arctic berry wax for this industry.

Products and services

The products and services portion of the value map is for the tangible and intangible goods/services a company offers to customers (Osterwalder et.al. 2014, 29). As an example, for a single company this could involve the product, logistics and help service that is related to the product. In case of this study, arctic berry wax fills these needs that the industry has or the potential is there to fill the needs that the product itself doesn't yet fulfil. Several services are possible to be added in the further development phases to match these needs but at this stage of the research those cannot yet be estimated and analyzed.

Pain Relievers

The factors and features of the product that ease the pains of customers either directly or indirectly are called pain relievers (Osterwalder et.al. 2014). As mentioned, arctic berry wax would offer pain relief through it being easily accessible for the European market as a Nordic, European product. Due to it being a Nordic product it would be unlikely that big delays in supply chain would take place as a location near the markets reduces the variables in supply chains (Martin 2016). In the case of the largest direct competitor, carnauba wax, these delays are more likely due to shipments from South America to Europe having more variables.

Gain Creators

Gain creators are used to describe how a product or a service create gain for the customer. Not all the customer gains are necessary to be addressed, only those relevant in each case. (Osterwalder et.al. 2014, 33.) In case of arctic berry wax, the customers would gain both from primary elements of the product, such as increase of shelf life, glazing and non-stick benefits based on the current research. These are elements that the wax shares with its competitors. In addition to these, the wax offers features that create more value such as it being organic and vegan as well as being natural and from fully renewable source. The importance of these features within candy manufacturing industry is company dependent in comparison to the primary elements, which provide equal value to all entities in the field producing similar products (Osterwalder et.al 2014).

4.1.3 Fit

When put together the value proposition canvas shows the match between the customer profile and value map. This explains how well the product or service matches the needs and wants of the customer segment. (Osterwalder et.al 2014.) By taking a closer look at this fit, further analysis about the suitability of the product for its customers can be made.

	Arctic berry wax
Customer jobs	
Shelf life	x
Appearance of products	x
Non-stick	x
Social values	x
Ecological Values	x
Customer Pains	
Manufacturing issues	?
Delays in logistics	?
Customer Gains	
Ecological factors	x
Sustainability	x
Natural product	x
Renewable source	x

Table 2. Fit of arctic berry wax for candy manufacturing industry (X=match ?=unknown)

Table 2 highlights which customer jobs, pains and gains arctic berry wax fulfills at the current stage of research. In means of customer jobs and customer gains the wax is a direct match for the most important factors of customer needs. For the customer pains, not enough of the production methods of the wax or the possible logistics of the wax are known at this stage of research to give an estimate on how well it answers them. Based on the matches the arctic berry wax has for customer gains

and jobs, it can be estimated that the berry wax would have potential on the market in case the customer pains are matched during the further development of the business for the product.

5 NEW PRODUCT FORECASTING

New product forecasting includes series of theories and can be conducted with various objectives. The result of a forecast can be a multitude of different kinds of results. (Kahn 2006.) Market potential is one of these possible end results and it is considered as a prediction of maximum total market volume or as a forecast of market entry possibilities (Kahn 2006.) Due to the nature of arctic berry wax and the stage of research regarding arctic berry wax the market entry possibilities are the objective of this research along with total market potential. For determining the total market potential, numbers from trade journal "Candy Industry" will be presented for both the current situation and for the forecast.

5.1 Total market potential

Total market potential is defined as the maximum amount of sales available for all companies in the industry during a specific period of time (Kotler 2016).

The size of the industry is projected to grow rapidly in the upcoming years especially in developing areas of Asia Pacific in countries such as India and China. This is due to the improving standards of living and consumers having more money to spend on a yearly basis increasing the demand for confectionary products. (Transparency Market Research, 2017.) This growth of the ingredient market increases the demand for waxes used in the industry as well.

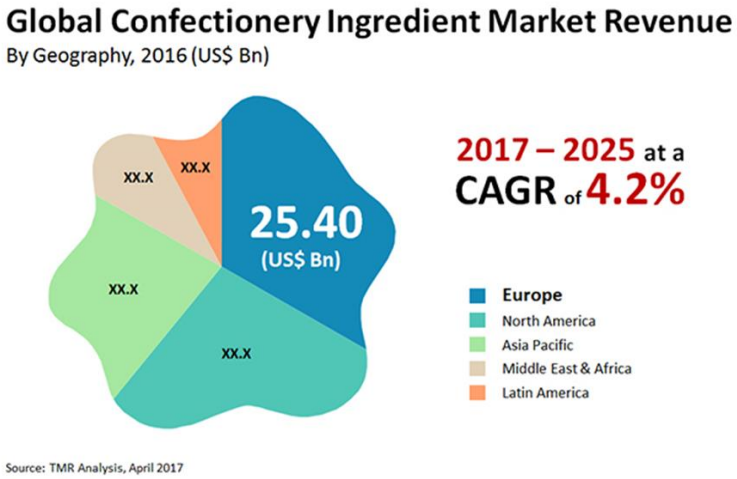

Figure 4 Confectionery ingredient market revenue (Candy Industry June 2017, Cited 13.11.2017)

The ingredients market for manufacturing sweets was $76.25 billion in 2016. The largest market for these ingredients in 2016 was Europe followed by North America and Asia-Pacific region. Europe had 25.40 (US$ Bn) worth of worlds confectionary ingredient market as shown in Figure 4. The market is projected to grow from this to $109.48 billion by 2025 which means that a compound: annual growth of 4.2% is expected over the next 8 years. The growth is expected to be moderate in areas such as Europe and North America where the market is already saturated to a higher extend. Asia Pacific has the potential for the fastest growth. The increasing demand for the finished products is expected to increase the production in the area as well and through this the demand for ingredients is also due to increase. (Thompson 2017, 7.)

5.2 Market reception

To determine the market entry possibilities, representatives of companies were approached and at the organic food fair Biofach 2018 in Nuremburg, Germany. The aim was to interview the representatives of the companies but due to the nature of the fair the representatives only agreed to short discussions. None of the companies agreed to a recorded discussion upon asking either. Due to this the data is based on the observations made during the discussions.

Feedback from companies at Biofach

Multiple companies of various sizes and from multiple nations were approached before and during the Biofach- fair. The common factors between the companies approached was that all of them had organic or vegan product lines and all of them were from the candy manufacturing field. Additional criteria were that all the chosen companies used some sort of a wax product in their current product lines. No responses from companies were obtained prior to going to Biofach. When at Biofach the representatives of some companies contacted prior to the event were approached directly at the fair.

Caramelos Cerdan

Caramelos Cerdan are a Spanish company founded in 1914 and they are one of the leading producers of hard boiled sweets such as lollipops. Their products can be found from over 35 countries. Organic product line was only a small part of their products. (Biofach 2018. Cited 12.02.2018.)

Mindsweets Gmbh

Mindsweets Gmbh is a small German based company producing and selling vegan and organic candies. Their main product is gummies although they also sell vegan chocolates and other sweets. (Biofach 2018. Cited 12.02.2018.)

The Organic Factory BV

The Organic Factory is a Dutch sweets manufacturer. Their product line includes several different types of sweets. Their main products are gummies and liquorice. The company was founded in 1980. (Biofach 2018. Cited 12.02.2018.)

Makulaku

Makulaku is a Finnish manufacturer of liquorice. They have been on the field since 1994. In 1997 Makulaku was the first company in the world to launch organic liquorice line. In 2011 they expanded their organic line to include filled liquorice. (Biofach 2018. Cited 12.02.2018.)

	Caramelos Cerdan	Mindsweets Gmbh	The Organic Factory BV	Makulaku
Using waxes	x	x	x	x
Organic product line	x	x	x	x
Vegan product line		x	x	
General interest		x	x	x
Interest in testing				x
Arctic as a factor				x
Certificate demands	x		x	

Table 3. Discussion observations at Biofach 2018

Table 3 was formed based on the topics covered during the discussions at Biofach and the observations from these discussions. Arctic berry wax has some interest within the candy industry due to its organic and vegan qualities as seen in Table 3. The arctic factors were not seen as bringing additional value for the company's other than Finnish Makulaku. Most of the candy manufacturing companies approached were using natural waxes in their products, predominately carnauba wax. When questioned about the use and availability of carnauba wax the consensus was that it is easily available through large suppliers and unless an ingredient that is of better quality, as easy to obtain or brings additional values the representatives did not see a need for a substitute. Makulaku was the only company that voiced a direct interest of potentially testing and using arctic berry wax in their products if they were to get further information and further discussions were held. Two of the four representatives wanted arctic berry wax to have certificates before they would have further interest. They type of certificates was not specified.

5.3 Forecast for Arctic Berry wax

The candy industry is large enough for arctic berry wax to enter. The expected growth of the ingredient market creates a need for a new ingredient to enter the market as the current dominating waxes on the market are from natural, renewable sources and due to this the increase in supply for these waxes is limited. The market reception for the wax was that there is either general interest at the current stage or extremely limited interest for the wax. The only exception to this was a

Finnish company that saw the arctic values as well as the ingredient being domestic as a value creator.

When it comes to the markets abroad, the main difficulties lay in entering the saturated markets. Informing the companies of the arctic berry wax and obtaining true interest for it is likely to prove challenging due to the ease of obtaining carnauba wax that is a direct competitor that has all the same values as the arctic berry wax that the companies in this industry view as important. Entering the market will require strategic planning. Due to the market size it seems worthwhile to try to penetrate the market but the success will be dependent on the cost of producing the wax as well as how well the wax ends up comparing to the other waxes being used.

6 CONCLUSIONS AND DISCUSSION

The aim of this thesis was to study if arctic berry wax would be a suitable ingredient for candy industry and if it would be possible for arctic berry wax to enter the candy ingredient market. Due to the topic being open in the beginning and pioneering of nature it was difficult to narrow down the topics to be studied. In the beginning the aim was to create a framework for business within the candy ingredient market but due to lack of information available this had to be cut off from the end study. In addition to this the study was originally planned to consist of theory part and interviews to determine market interest but another form of market study had to be chosen due to difficulties in finding and arranging company interviews.

The validity and reliability of this study was built around the use of the existing theories. The results of the discussions and observations were documented in available manner to avoid altering of the data. To support this, while having discussion in Biofach, a list of topics to be covered was followed to keep the data comparable and consistent. This was done to avoid misleading of result by the researcher covering differing topics with representatives (Desai 2002, 124). In addition to this, references to other, existing research that was used for the study was provided to ensure the reliability of the sources used. Main problems for the reliability of this research was limited amount of available information as well as the small sample group of companies approached. These factors may lead to variance between results of this study and possible following, similar studies. (Desai 2002.)

The study was conducted using value proposition theory as a base for analyzing the market and the product. A focus of the features of arctic berry wax was taken due to limited information about the core values of the wax for the industry. The competition on the market was also inspected and compared to arctic berry waxes core product as well as features. Based on this analysis of the wax and the market a forecast was conducted for arctic berry wax entering the market.

Based on the findings of this study the arctic berry wax would be a suitable ingredient to be used in the candy manufacturing. Due to candy manufacturing being a steadily growing business and consumers of these products becoming more aware of the ingredients, the arctic berry wax would have a chance to enter the market under certain conditions. The difficulties are that there is one dominating ingredient on the market that has both the same values and features to offer for

companies as the arctic berry wax. Due to this there was a lack of interest from the companies towards the berry wax until the research would be at a later stage. Further studies about the berry wax need to be conducted and relevant certificates for the field need to be obtained before companies would be willing to show real interest. One exception to this was a Finnish company but no further talks had the chance to take place while conducting this study.

The price of extracting arctic berry wax will play a crucial role on if the wax has a true possibility on the mass production of organic sweets as carnauba wax is a cheap substitute. If the production costs of berry wax and the price of berry wax would end up being more than that of carnauba wax, it is hard to see a real chance of berry wax entering the market in large scale. This does not exclude the possibility of entering the market in a smaller scale as the interest from Makulaku towards the ingredient shows.

If entering the candy ingredients market is to be pursued in the future it is recommended that another attempt at interviewing companies is made while having information about the features and the behavior of the arctic berry wax while used as a coating/glazing agent. At the time of conducting this study not enough information was available for that. It is recommended also to consider the costs of extracting the berry wax before deciding to pursue entrance to the market at it is an important and determining factor for the success of such an attempt. Arctic berry wax has many value creating features that make the wax a high-quality product. However, it does not get a full use of these features in the candy manufacturing as these are not found to be an important value creator by the companies in this industry. Due to this the companies on candy manufacturing field are likely not ready to pay an increased price for the wax despite it being a high-quality product.

For the further studies about the arctic berry wax it is recommended to divert the study more towards niche markets that are estimated to be suitable for the wax. The unique values and features that the wax represents as an arctic product may be better suited for smaller more specific markets in comparison to mass production.

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Topic list for discussions at Biofach:

-Main products
-Customers
-Value propositions
-Partners, supply chain
-Important factors in the products
-Ingredients
-Interest in testing new ingredients
-Interest in arctic berry wax
-Arctic as a factor
-Certificates