



Marketing Aspects of Blue Mussel Production in the Baltic Sea

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Summary

This document is prepared within the GoA 3.2: Establishment of focus mussel-farms in the Baltic Sea as a result of MS73 - Support the project-farms with calculations for their market development plans. Besides the support for the projects farms with calculations for their market development plans, marketing issues as regards to the blue mussel production are very important for the further development of these farms.

In order to expand the mussel farming industry, we need to analyse what kind of products can be offered to the market, if there is a demand for our products, and think about how to help marketing the Baltic Sea grown blue-mussel products. Therefore this document will help existing and potential mussel farmers to analyse marketing aspects of their products. Document provides useful information about the blue mussel products, segments of the market, target groups of products and customers, products positioning, possible marketing strategies, pricing strategies and competition.

This document mainly focuses on marketing issues of mussel farming aiming to produce eco-organic blue mussels with main usage in industrial processing (high quality fish and poultry feed, fertilizers). Since blue mussels from Southern parts of the Baltic Sea are produced also for human consumption, marketing issues for human consumption mussel products are considered in this document as well. The important side effect of blue mussel farming is the positive impact on ecology, which coincides with exceptional ability of mussels to improve seawater quality, and this is the very special proposition point for the Baltic Sea blue mussel products.

This document is focused on today's situation which can change soon, so the marketing strategy always should be revised and adapted to the actual market situation and based on the product that the particular farm aims to offer.

Introduction

Eutrophication is a major problem in most of coastal waters in the Baltic Sea. Mussel farming can work as an appropriate measure to remove nutrients that are already there, to increase water transparency and to improve water quality. However, today mussel farming does not exist on a commercial basis in the Baltic Proper. The main obstacles are the lack of tradition, missing profitability and low salinity. Against these factors mussel farming becomes a realistic option and a potential new business in coastal waters of the Baltic Sea.

The goal of this paper is to provide mussel farmers with useful information about marketing aspects to start or develop their business. The data were gathered from mussel farms established within the project Baltic Blue Growth, which is stated as a pilot project for mussel farming in the Baltic Sea. Project farms (six in total) have been selected with the aim of covering different environmental conditions (locations both in the open sea and the archipelago) and different cultivation techniques (both long-line and net systems are used).

However, mussel farms in the Baltic Sea will require additional funding for their ecosystem services to become economically viable. The EU-Water Framework Directive and the long-term strategy of the Blue Growth in Europe are good incentives for national authorities to develop mussel farming as a management tool to compensate for nutrient discharges in nutrient trading schemes.

Mussel aquaculture in the Baltic Sea is based primarily on a two/three-year production cycle at present. After two years of mussel farming mussel size varies from 2 cm in lower salinity waters and up to 10 cm size in higher salinity waters.

Production capacity is the optimum volume of mussels that can be harvested from the farm. In the Baltic Sea this capacity is from 1 kg/collector-rope metre per year to more than 3 kg per metre of collector-rope per year. Capacity depends on different factors: water salinity, feed basis in the water, and currents in the farm site, predators and other.

Mussel size determines the possible use of mussels – small size mussels cannot compete with human consumption mussels grown in Europe or other parts of the world, but there are other possibilities to develop valuable products. In addition - mussel farming in Baltic Sea is seen as one of the possible solutions to reduce eutrophication.

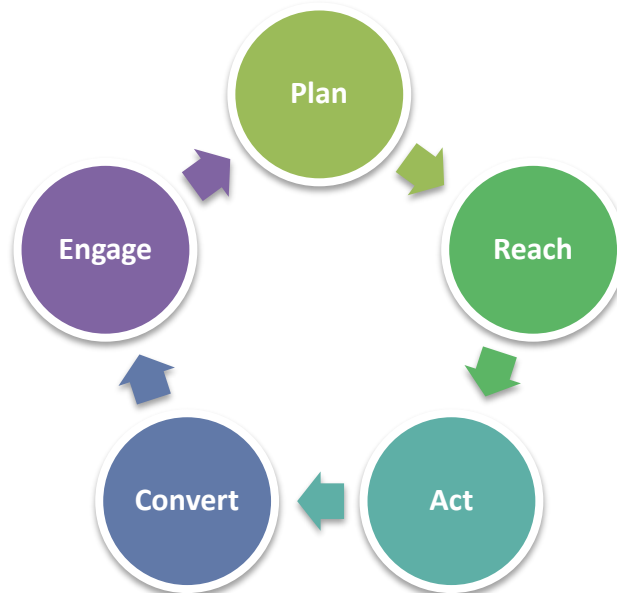
Possible product positioning differs for various mussel products, especially new and not well-known products derived from small size Baltic Sea mussels. Therefore, the new ways to distribute product into the market is needed.

The purpose of the plan is to provide mussel farmers with information about possible mussel products, its market and positioning with further aim to promote and encourage the commercial production of blue mussels in the Baltic Sea.

During the last 20 years the amount of aquaculture has increased by 7 % yearly. During the last 10 years the consumption of fish and seafood yearly increased by 2 % and this increase has a linear tendency. (Ozolins, 2017).

Europe in general does not produce enough seafood and the main exporter is China. In 2014, blue mussel was farmed in Denmark, France, the Netherlands, Canada, the UK and Ireland.

Marketing plan should follow following steps¹:



This document describes the marketing aspects and the first steps for mussel farmer, which should be considered and developed in further actions.

¹ www.smartinsights.com

1. Products offered by mussel farmers

1.1. Product background

Latin name of blue mussel is *Mytilus edulis*. These species occupies the North Atlantic and the North Pacific coasts, and live in the Baltic Sea as well. The size of mussels varies up to 10 cm; the largest specimens may reach up to 20 cm (Tyler-Walters & Seed, 2006). Blue mussel shells have been found in kitchen middens dated as far back as 6000 years ago. Until the 19th century, in most European countries blue mussels were harvested from wild beds for food, fish bait and fertilizer (Goulletquer, 2014).

Two native mussel species are suitable for farming in the Baltic: Blue mussels (*Mytilus edulis*, *Mytilus trossulus*), which are cultivated in various marine waters worldwide. As long as critical mussel densities are not exceeded, mussel farming is an environmental friendly and sustainable way to produce high quality product. The low salinity leads to dwarfism of Baltic mussels making them unsuitable for human consumption and undesirable for farming. However, small mussels could still be used for nutrient mitigation and the harvest could potentially be used for animal feed or fertilizers. The Baltic Blue Growth project recommends mussel meal, as a substitute for animal feed, as the most promising product. The ongoing increase in demand for fishmeal, poultry meal might make mussel farming more attractive as an industry.

In order to successfully deal with the mussel business, it is important to check sea salinity, which is one of the most important factor effecting mussels' size and speed of growth. In Baltic Sea blue mussel reaches the length of 2-3 cm in 18 months, but in more saline water mussel reach up to 10 cm within 18 months

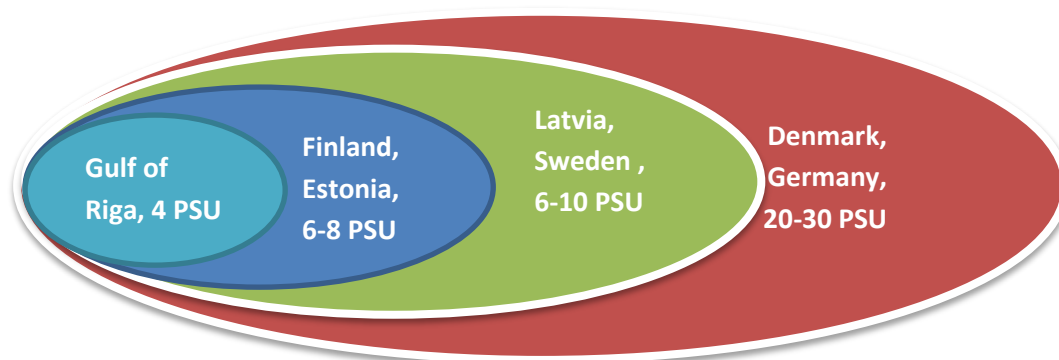


Figure 1 Baltic Sea salinity levels on different sites.

It was observed that the mussel size differs by region. Salinity in Germany and the Belts are lower than this and fluctuates a lot. For example, in Kiel fjord mean salinity is 14.3 PSU and in the Great Belt between 8-20 PSU. During the project implementation period the smallest mussels were observed near Saaremaa, Estonia, where within 12 months mussels reach less than 1 cm size.

Different mussel size differentiates the product.

1.2. Mussel farming, its product and service

At the heart of the marketing program is **the product**—the company's tangible offering to the market, which includes the product quality, design, features, and packaging.

Blue mussel is a specific product in the Baltic Sea region. Its consumer has used to buy it mostly as an imported product, thus, mussel farmers should make an interest for consumer to purchase the local product.

The mussel farmer may choose one or more of the following products:

Fresh blue mussels

Mussels are packed in large packs ready for immediate transportation to a processing site and are intended for fresh processing.

Possible processing sites:

- ✓ Fish meal processing site
- ✓ Poultry meal processing site
- ✓ Food factory
- ✓ Biotechnology processing site
- ✓ Soil fertilizer site
- ✓ Other nutrition site (such as pet-food)
- ✓ Another processing site



Figure 2 Harvested mussel in Denmark

The recommended transportation time from harvest to the start of processing is 48 h (MUSSELALIVE).

Mussel is a high-quality product, therefore, it is advisable to provide the recipient with the necessary information about the product by adding a label, e.g. **QR code**.

Laboratory analyses and their results should be ensured in accordance with national legislation as well as with the requirements of the consignee.

It would be advisable to provide general information on environmental **footprint**, reduction of phosphorus and nitrogen in the Baltic Sea.

It is advisable to indicate that the product is local, and it is advisable to receive an **eco-product** certificate e.g. Organic Certification etc., which will attract additional buyers.



Figure 3 The EU organic logo



Figure 4 EU Ecolabel for Consumers

Certification should increase consumers' willingness to obtain the product.

Consumers' interest on the product can be increased by reading information on the company's [website](#).

Frozen mussel

Mussels are packed in packages that provide an appropriate temperature regime.

Possible processing sites:

- Fish meal processing site
- Poultry meal processing site
- Food factory
- Biotechnology processing site
- Soil Fertilizer site
- Other Nutrition site
- Another processing site

Mussel is a high-quality product; therefore it is advisable to provide the recipient with the necessary information about the product by adding a label, e.g. [QR code](#).

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Blue mussel prepared for retail market

In order to offer mussels for retail, the corresponding National Food and Veterinary service permit must be obtained as well appropriate certificates must be provided.

It is recommended to obtain an MSC certificate, for more information <https://www.msc.org/>

The products are prepared in appropriate packages, paying attention to the sale of food in warm conditions, to avoid damaging of the product.

Mussel is a high-quality product, therefore, it is advisable to provide the recipient with the necessary information about the product by adding a label, e.g. [QR code](#).

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Mussels as ecosystem service providers

There are several kinds of ecosystem services that blue mussels provide:

Supporting services

In the Baltic Sea the blue mussel (*Mytilus edulis/trossulus*) is the only one native filter feeder species. They feed on phytoplankton (algae), zooplankton, bacteria and remains of dead plants and animals floating in the water. Most of ecosystem services that the blue mussel provides are related to the filtration function, because one single shell can filter many litres of sea water each hour.

Blue mussel is an important habitat builder – the structural properties of them increase biodiversity by providing substrate for attachment of algae, shelter and refuge for small animals.²

The mussels' filtration of plankton and particulate organic material from the pelagic system improves the light climate for benthic algae and increase production of other benthic organisms.³

Blue mussels are important as prey for a range of different animal groups such as echinoderms, crabs, fish and sea birds.

By filtering phytoplankton, including toxic algae, filter feeders like blue mussels can inhibit or even prevent harmful blooms. The biological control carried out by filter feeders is closely interlinked with mitigation of eutrophication as well as with the control of hazardous substances.⁴

² Pettersson P. 2006. Role of *Mytilus* for biodiversity in sediment habitats of the Skagerrak and Baltic Sea. Doctoral thesis. Department of Systems Ecology. Stockholm University.

³ Norling P. 2009. Importance of blue mussels for biodiversity and ecosystem functioning in subtidal habitats. PhD thesis, Stockholms universitet, Naturvetenskapliga fakulteten, Systemekologiska institutionen. 49 pp

⁴ Hege Gundersen, Tanya Bryan, Wenting Chen, Frithjof E. Moy, Antonia N. Sandman, Göran Sundblad, Susi Schneider, Jesper H. Andersen, Sindre Langaas and Mats G. Walday 2017. Ecosystem Services In the Coastal Zone of the Nordic Countries. Nordic Council of Ministers. 128 pp

Provisioning services

From resource utilisation point of view blue mussel is valuable food. Mussels are a good source of iron, selenium and vitamin B12. They have small but healthy fats, with a large proportion of omega-3 fatty acids.

Mussels are today farmed mainly for human consumption. The by products are often used as organic soil fertilizer. Clean mussel shells are sold as construction material for roads, gardens, drainage, filters or as isolation material. A recently developed market is animal feed (poultry industry, organic fodder to produce organic egg and poultry, fish feed). Investigations are in progress to ascertain whether live mussels can be used to filter out nutrients, e.g. at sewage works.⁵

Regulating services

Being an important habitat builder for many other species of algae and fauna the blue mussel beds have relatively high biodiversity and, thus, the ability to recover after disturbances, so the service of maintenance of resilience is important.

Blue mussels also bind CO₂ when building their shells and this carbon is stored in the shell until the animal dies and are decomposed and released back to the ecosystem – this is carbon storage and sequestration service.

Mitigation of eutrophication, or the removal of excess nitrogen (N) and phosphorus (P) from the sea, occurs through the uptake of nutrients. Mussels can then help to counteract eutrophication by being harvested and used as food, animal feed and fertilizer. Mussels can even be farmed as a way of treating waste water, although they cannot then be used as food.

Mussel beds can influence tidal flow and wave action within estuaries, and modify patterns of sediment deposition, consolidation, and stabilization. In the Netherlands, mussels are being investigated for their abilities as ecosystem engineers and show promising possibilities for a sustainable coastal protection.⁶

Cultural services

People enjoy picking their own mussel shells along the beaches or from a boat. One of the cultural services is related to recreational fishing. Blue mussels can be used in many different sea food dishes, but also as bait for fishing.

In a societal perspective, blue mussels and other bivalves are extremely important in cleaning the water for phytoplankton, including toxic algae, thus, helping maintain water fit for swimming and beaching. Especially, in regions of importance for tourism and recreation, and where property prices

⁵ Naturvårdsverket. 2009. What's in the Sea for Me? Ecosystem Services Provided by the Baltic Sea and Skagerrak. (Environmental Protection Agency Report No. 5872). Swedish Environmental Protection Agency, Stockholm

⁶ De Vriend HJ, Van Koningsveld M. 2012. Building with Nature: Thinking, acting and interacting differently. EcoShape, Building with Nature, Dordrecht, the Netherlands.

are related to proximity and condition of the sea, mitigation of eutrophication may be particularly important.⁷

It would be advisable to provide general information on environmental **footprint**, reduction of phosphorus and nitrogen in the Baltic Sea.

Consumers' interest on the product can be increased by reading information on the company's **website**.

Tourism object

Mussel farmer have a possibility to offer mussel farm as a sightseeing place for tourists and visitors. It is possible to develop mussel farm as a tourist attraction site, to offer visits to the farm, show videos about the farm, create interactive games to make an interest for children and youth. It is possible to prepare mussels for food, positioning it as local and healthy product. Mussel farm can be also a site for diving and introducing the underwater world of the Baltic Sea.

To increase younger tourists' interest, it is advisable to provide them with interactive application, such as Mussel (Blaskjell) **apps**.

In overall, mussel farmer may put emphasis on one product type, or several types. More than 1 type of product or service reduces mussel farmer's risk to be dependant.

⁷ Hege Gundersen, Tanya Bryan, Wenting Chen, Frithjof E. Moy, Antonia N. Sandman, Göran Sundblad, Susi Schneider, Jesper H. Andersen, Sindre Langaas and Mats G. Walday 2017. Ecosystem Services In the Coastal Zone of the Nordic Countries. Nordic Council of Ministers. 128 pp

2. Possible segments of the market

Choosing the value of the product must be done even before any product exists. It means - segment the market, select the appropriate target, and develop the offering's value positioning. The formula "segmentation, targeting, positioning (STP)" is the essence of strategic marketing.⁸

It is better to concentrate on the market segmentation than on market share (Figure 5).

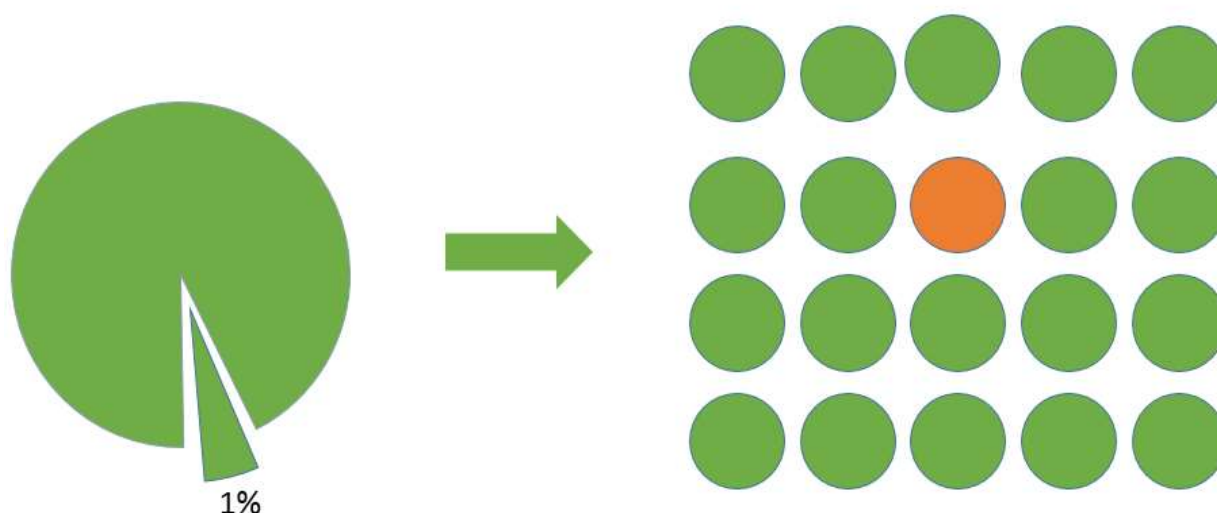


Figure 5 Segmentation of the market

Blue mussels contain a variety of substances that can be used in production of different products and materials. The possible segments of the market for Baltic blue mussel products are divided in two sectors – environmental and industrial.

ENVIRONMENT SECTOR:

Subsidies for ecosystem service and nutrient uptake

According to the World Wildlife Fund information, annually in the Baltic Sea come around one million tonnes of nitrogen and 35 000 tons of phosphorus. The mussels substantially increase the sight-depth of eutrophic waters by filtering the water from organic particles. When harvested, the nutrients stored in the mussels are removed. This means that shellfish farming can become a tool for improving of the Baltic Sea ecosystem.

INDUSTRIAL SECTORS:

Human consumption

As it was said before, the salinity of most parts of the Baltic Sea is not very favourable for mussels' growth. In order to suite human consumption, they have to grow over 2 cm. For example, in the Kiel bay (Germany) mussel farm they grow mussels for human consumption; their mussels reach size of 5-10 cm in 18-24 months. On the other hand, the meat content is relatively higher due to the thinner

⁸ Philip Kotler and Kevin Lane Keller, Marketing Management, 15th edition, Pearson Education, Inc. © 2016

shells of the Baltic mussels. Mussels are an excellent protein source that contains heart- and brain-healthy omega-3 fatty acids. That is why mussels which suite human consumption can be aimed for HORECA industry.

Fish feed production

Fish is vital source of proteins, minerals and healthy fatty acids. Small pelagic fish which are unsuitable for human consumption are primarily used for fish oil and fish meal production. Blue mussels also can be used for fish feed production. The use of blue mussels instead of fish for feed production also is of large ecological importance because many fish-stocks are overexploited on local, regional and global scales.

Poultry feed production

Poultry breeding can be divided into main areas which include:

- Commercial breeding – egg & meat production;
- Village/backyard breeding – eggs and meat on a small scale;
- Fancy/exhibition breeding – small poultry breeds by enthusiasts.

Worldwide poultry consumption is expected to rise steadily to 2020 due largely to its low cost and convenience when compared to other meats, in 2010 with average broiler consumption reaching 24,5 kg per capita, in EU - 17.8 kg per capita, in Russia – 21 kg per capita. According OECD data in 2017 in the EU poultry meat consumptions reached 24.2 kg.⁹ According to FAO, poultry meat production reaches 3.5 M tons in 2013 in Baltic Sea region.

Protein is important for all animals, but in poultry farming, for producing eggs and breeding animals to produce meat, the protein part of their feed regimen is crucial. Protein takes 22-24% of poultry feed and is one of the most expensive ingredients. Finding good quality, cheap protein is one of the challenges faced in poultry farming.

Fertilizer production

The proportion between nitrogen, phosphorus and potassium in mussels makes them suitable to use them as a fertilizer for cultivating grain. Easily decomposed shells have a liming effect and micro-nutrients like e.g. selenium are added to the soil.

The pilot project results were positive with a short period of bad smell. Composted product with straw and bark can be stored and quality assured. The discarded blue mussels as fertilizer on farmland have given good results and are of special interest for organic farmers who cannot use non-organic fertilizers. The crop has increased with between 25 and 50% compared to land which was not fertilized and had more or less the same effect as manure. The bark compost looks nice with its dark bark and shiny shell pieces. Therefore gardens and green-houses could also be a future market.

Other possible directions

There are research projects going in other possible directions to use mussels. They include adhesive products, including biomedical adhesives, anti-corrosive products. All those are perspective sectors because value added production can be realized for higher price. But we must wait for the results of further research before we look at these directions.

⁹ <https://data.oecd.org/agroutput/meat-consumption.htm>

3. Target groups of the product

Targeting is the strategic choice of segments to serve the product. With aim to choose targeting strategy, based on available information we evaluated each segment's attractiveness and blue mussel's farm compatibility.

3.1. Targeted group of products

State subsidies for pollution treatment method

Since there are such EU policies like European Union's Blue Growth strategy for sustainable growth in marine and maritime sectors, the EU Water Framework Directive (WFD) (EU, 2000), and initiatives like Baltic Sea 2020 environment program, blue mussel farm could have possibilities to apply for subsidies.

Human consumption

Human consumption (retailers & HoReCa) – highest price, but in such case the company needs to qualify as food production company. The regulations are complicated and not consistently applied between countries. Most of experts think that Baltic mussels are too small for human consumption, but there may be a niche for products such as canned mussel, mussel fondue etc. where size has a minor importance.

Fish & poultry feed production

Even though blue mussels are too small for human consumption, they still have many valuable ingredients. Co-operation with feed producers could bring less but known and stable income. Farm doesn't need to qualify as human food production company. Laboratory costs are smaller than for human consumption. Legislation is clear and transparent. Priority division could be organic poultry food and fish feed producers.

Insect meal production

Insect meal is new industry and this market has huge potential to develop because it might displace fish & poultry feed. Insects growing period is shorter. Mussel has a lot of valuable ingredients. Co-operation with feed producers could bring less but known and persistent income. Farm doesn't need to qualify as food production company. Insect meal might replace partly fish feed.

Fertilizer production

In case blue mussels are not usable for feed processing or are damaged, company can provide agriculture companies with fertilizer ingredient. It is 2nd target group after fish & poultry feed producers.

Anti-corrosive product production

Highly perspective value-added sector but still in research & development stage. It can take several years to finish research.

Adhesive product production

Highly perspective, value added sector. In USA is registered patent of recombinant adhesive protein MEFP-2 of the blue mussels (*Mytilus edulis*), issued on 7th February 2006 for 20 years.

Based on previous information, more attractive segments are following:

1. poultry feed producers;
2. fertilizer producers;
3. fish feed producers;
4. insect meal producers.

All mentioned segments' activities could be partly covered by government subsidies.

Product uniqueness is privilege of this business, using the business resources and abilities of company will help to be successful in business.

3.2. Target customers

Mussel farmer client is based mostly on business to business (B2B) business strategy offering in market following products:

- Fresh blue mussel;
- Frozen blue mussel;
- Blue mussel prepared for retail market;
- Mussels as ecosystem service providers;
- Tourism object.

| Product | Customer | Possible processing site |
|---|------------------------------------|---|
| Fresh blue mussel | Wholesaler Processing site | Fish meal processing site Poultry meal processing site Food factory Biotechnology processing site Soil Fertilizer site Other Nutrition site Another processing site |
| Frozen blue mussel | Wholesaler Processing site | Fish meal processing site Poultry meal processing site Food factory Biotechnology processing site Soil Fertilizer site Other nutrition site Another processing site |
| Blue mussel prepared for retail market | Wholesaler Retailer Customer | HoReCa Food processing site |

| Product | Customer | Possible processing site |
|---|--|--------------------------|
| Mussels as ecosystem service providers | Governmental / regional institutions, municipalities | |
| Tourism object | Tourism company Tourist | |

Based on business to customer (B2C) business strategy mussel farmers customers might be private persons interested in following products:

- Blue mussel prepared for retail market;
- Tourism object.

To achieve customer satisfaction the product should meet the customer requirements.

Probably customer should come from the same region, thus, reducing certain cost, such as transportation, distribution, investment in certain equipment, etc.

There is no certain way how to choose the customer. In regular business a businessman is looking for the customer and in rare cases the customer is looking for product, therefore it is very important to find the customer for your specific product or to organise cooperation with the potential partners.

The price, distribution conditions and volume are key factors to choose right customer. We have described the customers from different parts of the Baltic Sea region, based on geographical segmentation.

Customer of Baltic blue mussels in Germany or Denmark

Mussels which are suitable for human food should be distributed using wholesales or retailing services or selling product directly in market places.

In Germany biotechnology companies have strong background. Biotechnology company might be interested to process mussel shells, mussel meal or / and even byssus.

Animal feed processing companies might offer smaller price for product, but they might buy larger quantities of mussels, therefore these companies should be interesting for mussel farmers, too.

Mussel farm might choose to use processing company services, whereas they might do sales process on their own.

Blue mussel selling in local market is not common business in Denmark, whereas in Germany the mussel farmer has chosen to work with client directly, therefore the mussel farmer invests in packing to make the product pleasant for customer.

Customer of Baltic blue mussels in Sweden

Some animal feed processing companies have made trial processing and they are already interested in mussel processing. The market has not been established but it has a potential to develop bringing profit to mussel farmer, involved partners and achieving customer requirements.

The mussel farm might choose to use processing company services, but sales process might be done by mussel farmer.

Some mussel farms in Sweden already are seen as tourism objects and some municipalities include them in tourism brochures.

Customer of Baltic blue mussel in Latvia and /or Estonia

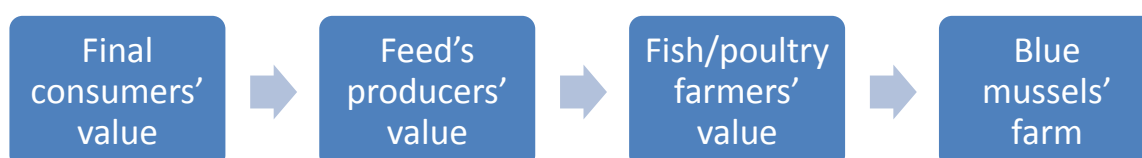
As animal feed processing companies might offer smaller price for product but they might buy larger amount of mussel, these companies should be interesting for mussel farmer as consumers offering as eco-product.

Mussel farm might choose to use processing company services, whereas they might do sales process by themselves.

These customers are potential and known now, but changing market situation can increase the amount of customers, and some of them can be replaced by others.

4. Products positioning

It is obvious that the most important value drivers for final consumer are price, brand, and quality in terms of natural raw materials. The same trend exists in whole European market. Consumers want to know where it was grown, is it organic food, etc. Thus, for Baltic mussels we can choose to position the product as organic, eco-friendly and local. Final consumers' value is driving with fish & poultry farmers value, whose are driving fish & poultry feed manufacturers' value. Blue mussel farm can offer organic food & eco-friendly fish and poultry feed ingredient under, for example, brand name ECOMUSSELS.



Blue mussels, which are leveraged in the offering 'organic and ecofriendly feed ingredient', delivers value: 'organic & ecofriendly feed production' to the customer – fish & poultry feed producers.

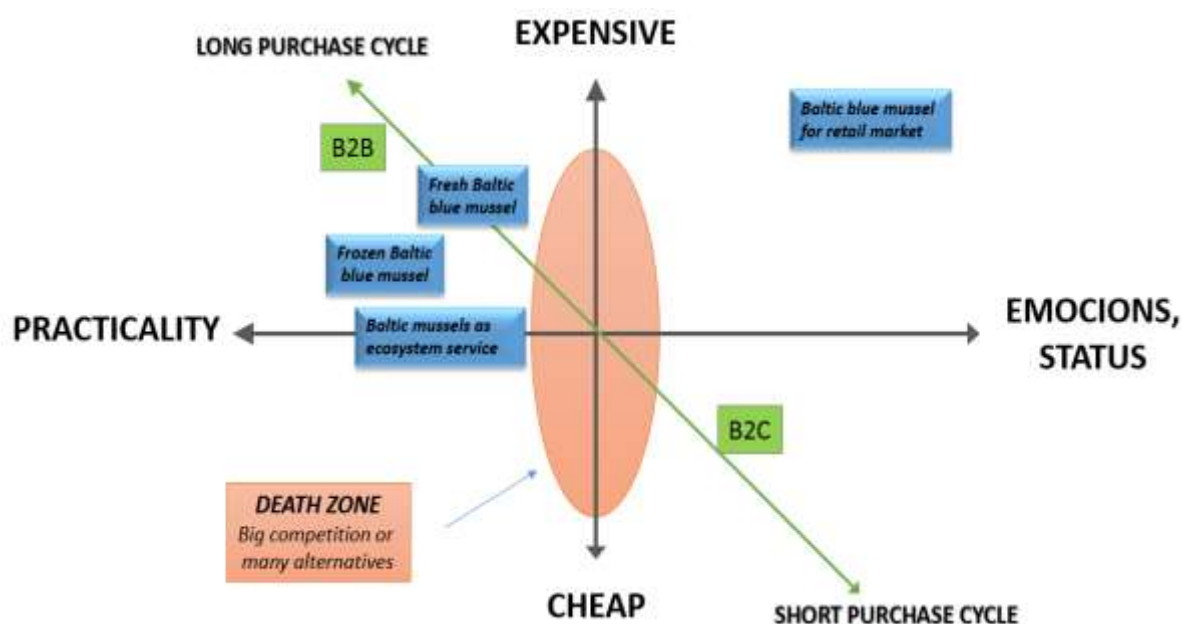


Figure 6 Baltic blue mussel products positioning

As shown in Figure 6, most products of the Baltic blue mussels are positioned in B2B market since they are targeted to be the components for feed production or other industrial production companies. Also blue mussels as ecosystem service is positioned in B2B market, but comparing to industrial use, this service or product could be less expensive.

Baltic blue mussel for retail is positioned in customer market, it is rather expensive and local niche product with high emotional story with regards to environmental responsibility, patriotic sentiments and consumers demonstration of social status.

Customer needs

Customer is looking for product which is close to its processing or packaging place, the product should have fair value, and the product should not decrease customer product value.

It is possible to reach fair value of product comparing it with the high nutritional value ingredients, e.g. Omega 3, protein, iron.

Product distribution is possible according to the customer needs.

Potential comparative advantages of blue mussel farmed at the Baltic Sea

Potential comparative advantages of blue mussel:

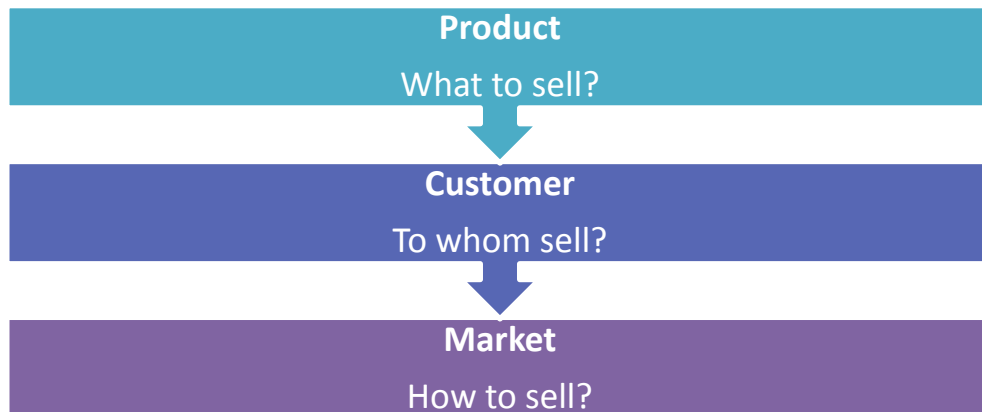
- Blue mussel farmed at the Baltic Sea reduce nutrients at the Baltic Sea, mussels are not being transported far away, thus, they have lower ecological footprint in comparison to imported mussels.
- "Layers have a very high demand for Ca in the feed in order to maintain egg quality and bone strength"¹⁰, however laying hens had not ingested enough mussel shell in comparison with hobby hens. These hens consumed large size mussel shells,¹¹ therefore the Baltic Sea mussel has potential because thinner shell is easier to crush. This issue needs further research.
- To prepare product for human consumption, the farmer needs to pay attention on food quality and need to analyse water quality regularly in comparison to product which might be suitable for feed industry. The costs for analysis should be lower for the product that is used in feed industry if to compare with costs for analysis that are used in companies that produce food for human consumption.
- Blue mussel farm might be combined with algae farming site providing higher benefit in a certain area. The nutrient value of algae and mussel are different, they can be combined to produce certain products e.g. organic fertilizers.
- The packaging might be prepared and developed according to the customer needs however transportation of mussel in larger amount would allow to save on packaging costs.
- Current research results have approved that mussel meal is suitable as feed for poultry, it allows to increase interest in potential stakeholders which are looking for eco-friendly, unique and local product.

¹⁰ Roland, D. A., et al. "Influence of Calcium and Environmental Temperature on Performance of First-Cycle (Phase 1) Commercial Leghorns." *Poultry Science*, vol. 75, no. 1, Jan. 1996, pp. 62–68., doi:10.3382/ps.0750062..

¹¹ <https://academic.oup.com/japr/article/26/2/159/2194433>

5. Marketing strategy

The task of any business is to deliver customer value at a profit. A company can win only by fine-tuning the value delivery process and choosing, providing, and communicating superior value to increasingly well-informed buyers. Marketing strategy requires setting goals, pricing strategies, and distribution strategies for a new product.



Strategy which is clearly communicated helps to keep the focus, accelerates enter to the market, clarifies the growth potential, improves experience of the end users and improves the potential to be successful in the market.

Most of the Baltic Blue mussel's products are oriented to the business market (B2B). Business market consists of all the organizations that acquire goods and services used in the production of other products or services that are sold, rented, or supplied to others. Company that supplies components for products is in the business-to-business marketplace. B2B market is characterized by close supplier–customer relationships, professional purchasing, and long purchase cycle with many steps. In B2B market communication and branding activities are very important and high-quality service play an increasing strategic and financial role in selling primarily products.

Much of what we have said also applies to the buying practices of institutional and government organizations if we look at the Baltic blue mussels as an ecosystem service. Government organisations typically require suppliers to submit bids and often award the contract to the lowest bidder, sometimes making allowance for superior quality or a reputation for completing contracts on time. Governments will also buy on a negotiated-contract basis. Because their spending decisions are subject to public review, government organizations require considerable paperwork from suppliers, who often complain about bureaucracy, regulations, and decision-making delays. Different types of agencies— defence, civilian, intelligence—have different needs, priorities, purchasing styles, and time frames. Demonstrating useful experience and successful past performance through case studies, especially with other government organizations, can be influential.¹²

If Baltic blue mussels are prepared for retail market, business is oriented on market to customer (B2C). Customers are value maximizers. They form an expectation of value and act on it. Buyers will buy from the firm that they expect to offer the highest customer delivered value. Recognizing that

¹² Philip Kotler and Kevin Lane Keller, Marketing Management, 15th edition, Pearson Education, Inc. © 2016

high satisfaction leads to high customer loyalty, companies must ensure that they meet and exceed customer expectations. The key to retaining customers is relationship marketing. Companies can use e-mail, Web sites, call centres, databases, and database software to foster continuous contact between company and customer. Many customers still prefer to talk to a live representative to receive more personal service—an ongoing priority in marketing.

Figure 7 shows the characteristics and differences working on B2B or B2C markets.



Figure 7 Differences in between B2B and B2C markets¹³

When it comes to the choice of marketing strategy, first of all two main questions need to be answered: in which industry and for what customer do we compete? As we have described previously, blue mussels can have diverse use, but at the moment, the most evident market for small blue mussels is feed industry. Thus, mussel farmers compete on the B2B market with other suppliers of ingredients for feed industry, not on the market of seafood products, as it could be assumed. Closest competitors are suppliers of fish rests which are used to produce fishmeal, which is widely used in feed industry. Mussels give approximately the same volumes of protein, more calcium and

¹³ Source: presentation of E.Stals, Market Strategy, 10 July, 2018, Liepāja; authors visualisation

contain some essential amino-acids in a higher concentration in comparing with fish rests. For the end users of feed (mostly poultry and egg producers) high level of protein means that poultry reach the necessary weight faster than if not using any hormone or other banned staff. Higher level of calcium is especially important for egg producers. In this way they give to their customer (feed industry) competitive advantage on its market.

Another problem with fishmeal is the fact that there is a lot of fake fishmeal on the market. As mussels are still not widely used in the industry, and the size of the niche will not become bigger due to natural restriction, fakes are unlikely to become an issue for the market. Despite mussel advantages to the fish meal, it is not needed to steal customers from fish meal producers. The market of eco feed is growing, and mussel's industry in any case will remain small (relatively to fish industry).

Using ecologically friendly feed for poultry provide producers with competitive advantage on their end market – consumers due to attention of people lately paid to the food origin and its eco factors. Mussels use in feed industry is a relatively new trend. In order to acquire customers, it is needed to stimulate demand. Mussel growers must act in two directions. They should convince the producers of the feed to buy our product and have to educate farmers, so they start to ask their suppliers about mussels-based feed. This is a big task which will require financial and educational resources. Due to high priority of ecological issue, especially in agricultural industry hopefully they will be able to get some support from EU funds in this work, not necessarily through grants, but through participation in some joint marketing projects.

Mussel farmers can as well join some scientific research groups by allowing using part of their sites for research projects. This will also help to brand mussel growers.



Figure 8 Possible marketing strategies for fresh and frozen Baltic Blue mussel



Figure 9 Possible marketing strategies for Baltic blue mussel as an ecosystem service



Figure 10 Possible marketing strategies for Baltic blue mussel for retail market

Communication strategy

The task of the communication is to communicate the value (of the product) by utilizing the Internet, advertising, sales force, and any other communication tools to announce and promote the product. In defining the business of mussel farmers, we can have two business market definitions – product oriented and market oriented. Market definitions of a business describe the business as a customer satisfying process so viewing businesses in terms of customer needs can suggest additional growth opportunities. As example see Figure 11 where in opposite to product oriented market definition we *grow mussels* it is advisable to use market oriented definitions that gives more information about values of the product.¹⁴

¹⁴ Philip Kotler and Kevin Lane Keller, Marketing Management, 15th edition, Pearson Education, Inc. © 2016

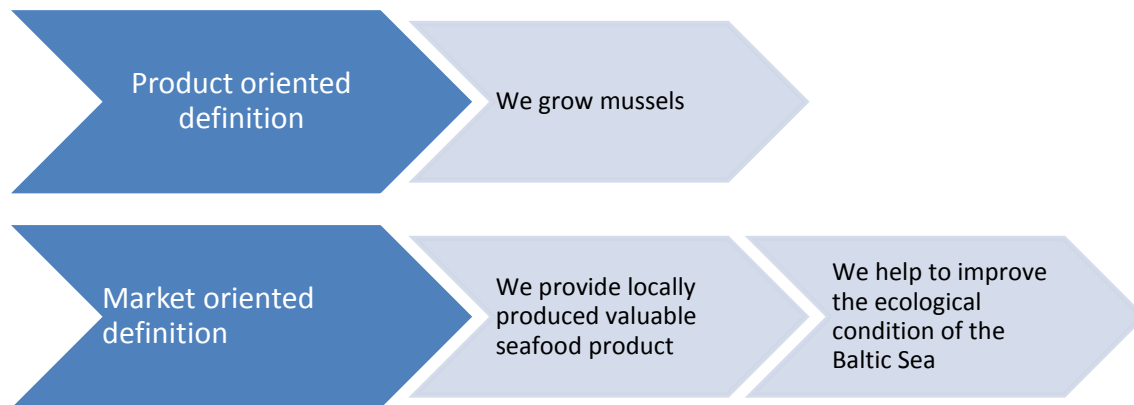


Figure 11 Market definition examples for the Baltic blue mussel¹⁵

In brief, communication strategy is about *what* to say, *how* and *when* to say it, *to whom*, and *how often*. In today's world usually a mix of different communication modes is used:

- Advertisements – for example, newspapers, magazines, broadcast media (TV, Radio), network media (telephone), electronic media (web page, audio, video) and display media (posters, signs);
- Sales promotion - a variety of short-term incentives to encourage trial or purchase of a product or service including consumer promotions (such as samples, coupons);
- Events and experiences — company-sponsored activities and programs designed to create daily or special brand-related interactions with consumers, including sports, arts, entertainment events as well as less formal activities;
- Public relations and publicity— a variety of programs directed internally to employees of the company or externally to consumers, other firms, the government, and media to promote or protect a company's image or its individual product communications;
- Online and social media marketing— online activities and programs designed to engage customers or prospects and directly or indirectly raise awareness, improve image, or elicit sales of products and services;
- Mobile marketing—a special form of online marketing that places communications on consumer's cell phones, smart phones, or tablets;
- Direct and database marketing—use of mail, telephone, fax, e-mail, or Internet to communicate directly with or solicit response or dialogue from specific customers and prospects;
- Personal selling— face-to-face interaction with one or more prospective purchasers for the purpose of making presentations, answering questions, and procuring orders.¹⁶

Not only the communication channels, but also the product's styling and price, the shape and colour of the package, the salesperson's manner and dress, the store décor, and the company's stationery all

¹⁵ Source: Philip Kotler and Kevin Lane Keller, Marketing Management, 15th edition, Pearson Education, Inc. © 2016; Author visualisation.

¹⁶ Philip Kotler and Kevin Lane Keller, Marketing Management, 15th edition, Pearson Education, Inc. © 2016

communicate something to buyers. Every brand contact delivers an impression that can strengthen or weaken a customer's view of a company.¹⁷

Examples of the communication tools that could be used by mussel farmers to promote their products are shown in the Figure 12. Mussel farmer can select the marketing communication mix that he is going to use to promote his product.

In B2C business there is a need to spend comparatively more on sales promotion and advertising, whereas in B2B business they spend comparatively more on personal selling. When choosing the marketing mix, we must also consider the type of product market in which we are selling, how ready consumers are to make a purchase, and the product's stage in the company, brand, and product life cycle.¹⁸

Communications effectiveness depends on how well a message is expressed as well as on its content. If a communication is ineffective, it may mean the wrong message was used or the right one was poorly expressed.

¹⁷ Philip Kotler and Kevin Lane Keller, Marketing Management, 15th edition, Pearson Education, Inc. © 2016

¹⁸ Philip Kotler and Kevin Lane Keller, Marketing Management, 15th edition, Pearson Education, Inc. © 2016



Figure 12 Examples of the communication tools for Blue mussel production

Increasing interest in the Baltic Sea Region to encourage blue mussel farming requires new promotion activities. Successful distribution of product would contribute mussel farmers to become wealthier.

Promotion is defined as all the activities that are directly related to publicity, advertisement, sales promotion, packaging, exhibitions, and direct marketing advertising with a customer (Baker, 2003).¹⁹ Promotion activities have been changed in last decades and are used in all fields: this process is going to continue with development of different marketing channels and extensive use of new information technologies tools. The financial crisis and free access to social media have reshaped the flow of and access to promotional information, and the more extensive use of this information for personal and business purposes.

Mussels are known as supporters of environment protection – they act as water cleaners by filtering it. That might change the consumer mentality about the price of the product as people are more interested to consume “green products” and they are ready to support this kind of production.

Table 1 The key words mentioned in English on Internet in the last 12 months (situation on September 20, 2018)

| Selected words | Total | Face-book | Twitter | Insta-gram | Blog s | Foru m | News | Video | Other |
|-----------------------|--------------|------------------|----------------|-------------------|---------------|---------------|-------------|--------------|--------------|
| Mussels | 9564 | 2118 | 1486 | 2948 | 2285 | 241 | 87 | 195 | 204 |
| Mussel | 3685 | 409 | 408 | 1185 | 1159 | 47 | 65 | 133 | 279 |
| Mussel farming | 223 | 3 | 125 | 7 | 18 | 2 | 8 | 2 | 58 |
| Blue mussel | 390 | 15 | 173 | 55 | 38 | | 13 | 13 | 83 |
| Sea aquaculture | 50 | | 23 | | 2 | | 7 | 3 | 15 |

Information source: Zaiga Ozoliņa's calculations based on collected information in website Brand24, 2018

In the last 12 months, the word “mussel” or “mussels” was mentioned mainly in Instagram, and Facebook was the second most important source.

People share photos from dinner, preparing food in the kitchen or photos from nature. People like to publish information about themselves sharing photos.

The main part of information in the position “other” comes from projects on mussel production and consumption supported by the European Regional Development Bank or by regional institutions or information published as job advertisements.

The word “mussel” or “mussels” together with words specifying the Baltic Sea Region (Germany, Sweden or Denmark) were mentioned only in two companies' websites during the last 12 months.

In the Baltic Sea Region, there are many companies working in mussel farming industry or selling mussels, and only a couple of them have homepages. Some companies are involved in publication activities, and others do not promote their company or products at all.

¹⁹ Baker, M. J. (2003). *The Marketing Book*. Oxford, MA: Butterworth Heinemann. pp.285-342

The mussel might be popularised using green marketing tools because it intakes nutrients from water however this kind of product is not cheap.

Mussel farmers do not invest in the popularisation of their products, but researchers update their websites to inform the society about their achievements. The results showed that mussel farming is not well promoted by entrepreneurs in the Baltic Sea Region. Empirical investigations confirm that several neighbouring countries apply the same approach to promote the mussel production industry, but they do not publish information in English and they update the information rarely.

The absence of promotional materials might affect customers' interest. The consumer does not have information about the trading areas or the food recipe is in a foreign language that makes it difficult to ascertain the way the product should be used. Customer search websites for information, thus increasing its awareness on the product or information regard the product.

Promotional activities on mussel farming have not been organised regularly, the documents are prepared with long-term intervals, and it does not intensify informative reliability of the mussel production industry and business.

Developers of blue mussel's market have published information on their own websites; some of them have established specific webpages. Professional associations take part in publishing information on mussel production and possible consumption in social media networks, making them more attractive for stakeholders and promoting their activities in the society. Direct marketing is not a very common form in the mussel production industry. The lack of information in the social media has influenced the interest of stakeholders and might affect industry development as well.

Due to the published research results, it is possible to observe the increase of interest of stakeholders, scientists and regional governmental institutions taking an active role in the development of mussel production industry.

Research has revealed the regional divergence in market players' behaviour in the Baltic Sea Region.

The mussel production industry might be promoted using the Internet as a place where the basic information on the market situation is updated regularly, which is useful for the end user – mussel consumers. For example - a recipe of meals from mussels or a photo of dish with mussels, thus, the product user could benefit.

Mussels are promoted as a product for human consumption as environmental friendly product, and it might be promoted as well as a tool that reduces nutrients (Stadmark and Conley, 2011)²⁰ in water (such farms are established between fish farms, for example in Denmark). It is also possible to relocate mussels from one place to another in order to restore destroyed mussel beds.

The website with target audience segmentation helps to identify all the market players and differentiate customers according to their needs and producer/distributor offers.

The promoter of farming should recognise the target market and the target audience considering his or her own product and service possibilities.

²⁰ Stadmark, J., Conley, D.J. (2011). Mussel farming as a nutrient reduction measure in the Baltic Sea: consideration of nutrient biogeochemical cycles. *Marine Pollution Bulletin*, 62: 1385–1388.

Working responsibly and creating the long-term mutual business relationships with either business players or product consumers a common goal is to reshape the consumer society driven behaviour into environmentally responsible user behaviour.

As regards the field of mussel farming, the responsible customers nurturing starts by the involvement of stakeholders in creating an active social platform, thus, connecting the existing scientific environment together with consumer's environment by raising the awareness of the use of the natural resources and their connection with the common eco-system and participation in a food chain.

Mussels are "super green food" that offer tremendous health benefits. In addition, mussels are low-fat products and they are an excellent source of protein Omega-3s, iron, zinc, vitamin C and B12 (Chronicle-Tribune, 2011).²¹ "Mussels play a key role in aquatic environments and are considered to be "ecosystem engineers" because they modify aquatic habitat, making it more suitable for themselves and other organisms" (Jovic and Stankovic, 2013).²²

"Mussels are a logical, environmentally responsible and healthful choice" (Cooper, 2015)²³ as they are taking an important role in the aquatic environment. Proper care of the ecosystem and highly valued nutrition places this product on the top of the wholesome food list. These are the basic factors that allow one to revalue this product and range it among the high value-added products for general consumption and all those aspects are important to take into account for mussel products marketing activities.

Passionate subscribers might encourage promotional advertising and educational activities providing the necessary information and new ways of how to use the product in consumer's environment. The visual communication via photos and videos play an important role in advertising the blue mussel. This might be a potentially successful channelling tool for producers for further educational and content marketing activities.

Every step-in mussel product marketing should meet the global principles of environmental responsibility.

The main novelty of the research: researchers of blue mussel are those who occasionally update information on the websites about the topic; some of them have established specific blogs. In addition to researchers' publications, the information on mussels can be found in social media via photos and videos. Professional associations take part in publishing social media networks, making them more attractive for stakeholders and promoting their activities in the society. Direct marketing is not common form in this field. However, the lack of information published by mussel farmers in the social media has influenced stakeholders' interest and might affect the development of the industry. The research has revealed the regional divergence in market players' behaviour.

²¹ Chronicle tribune. (2011). *Blue Mussel Go Green: Why Sustainable Shellfish are Safe for You Menu Available*. Chronicle tribune. [<http://www.philasun.com/food-and-beverage/blue-mussels-go-green-why-sustainable-shellfish-are-safe-for-your-menu/>] (2018.10.05)]

²² Jovic, M., Stankovic, S. (2013). Native and Invasive Mussels: *Nova Publisher*, pp.1-36.

²³ Cooper, C. (2015). *The Best Protein on The Planet*. Thenewprime.com. N.p., 2017. Web. 1 May 2017.

Promotion activities of mussel farming and mussel products are not well presented on webpages and social networks. The information about mussel farming and produced mussel products should be systemised and deliberately distributed to reach the target audience and interact with all stakeholders.

Creation of digital marketing platforms that are content driven is underway and is only at the beginning of its experience in mussel product marketing.

The promotional advertising and educational activities provided by passionate subscribers have not been set up. Dynamic content marketing might encourage a customer to return to buy a product repeatedly. It is possible to increase a product value by mentioning its benefits, therefore increasing customer's willingness to pay more for the product.

The common goal for either business players or product consumers is to reshape the consumer society driven behaviour into environmentally responsible user behaviour for creating long-term mutual business relationship.

Test marketing and referral strategy

Blue mussel products from the Baltic Sea can be positioned as new products in the Baltic Sea Region. Mussel products from the Baltic Sea are at the introduction and/ or development stage. Such products as Baltic blue mussels for feed industry or fertilizer production still need to be investigated and tested, and involvement of science and research community is crucial in this process.

To monitor and evaluate new product development, so called *stage-gate system* can be applied to divide the innovation process into stages, with a gate or checkpoint at the end of each (see Figure 13).

When the product is ready to be branded with a name, logo, and packaging, it can go in the market test.

In order to test new mussel products and avoid as much disasters as possible, test marketing can be applied before releasing a product in the market. The test market provides measures of consumers' responses to those elements that have been pre-tested—the product, the price, and the communication plan. It also measures the trade's acceptance of the product. Test markets provide better estimates of consumer's response than any pretesting. Anyway, before testing marketing, you are convinced at least that the business is there. In new product development process the saying "If anything can go wrong, it will" is in place. Disasters are common in the development and introduction of new products, and test markets are one of the ways to avoid them.²⁴

²⁴ Jay E. Klompmaker, G. David Hughes, and Russell I. Haley, Test Marketing in New Product Development, Harvard Business Review, 1976.

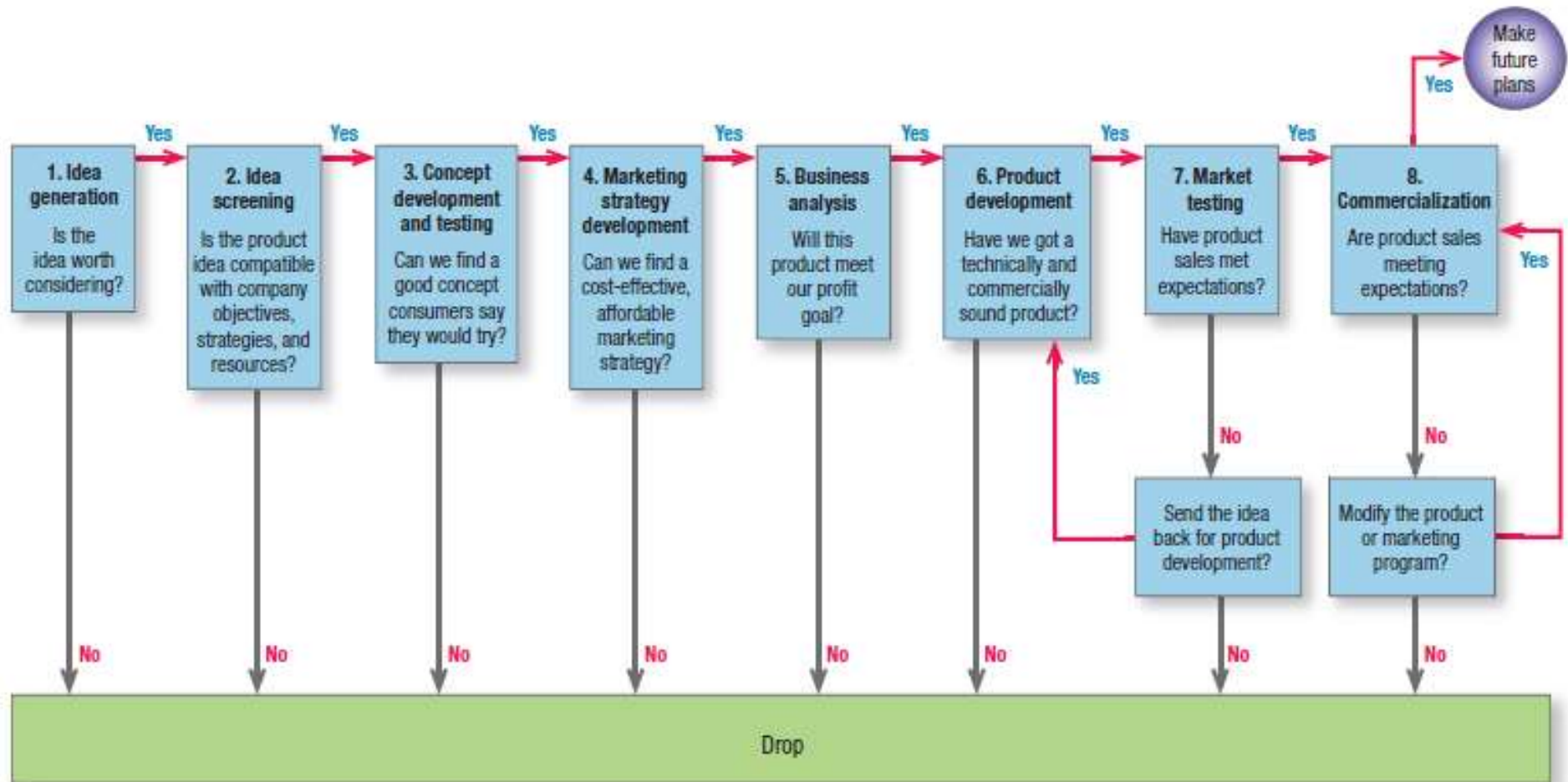


Figure 13 New product development decision process ²⁵

²⁵ Philip Kotler and Kevin Lane Keller, Marketing Management, 15th edition, Pearson Education, Inc. © 2016

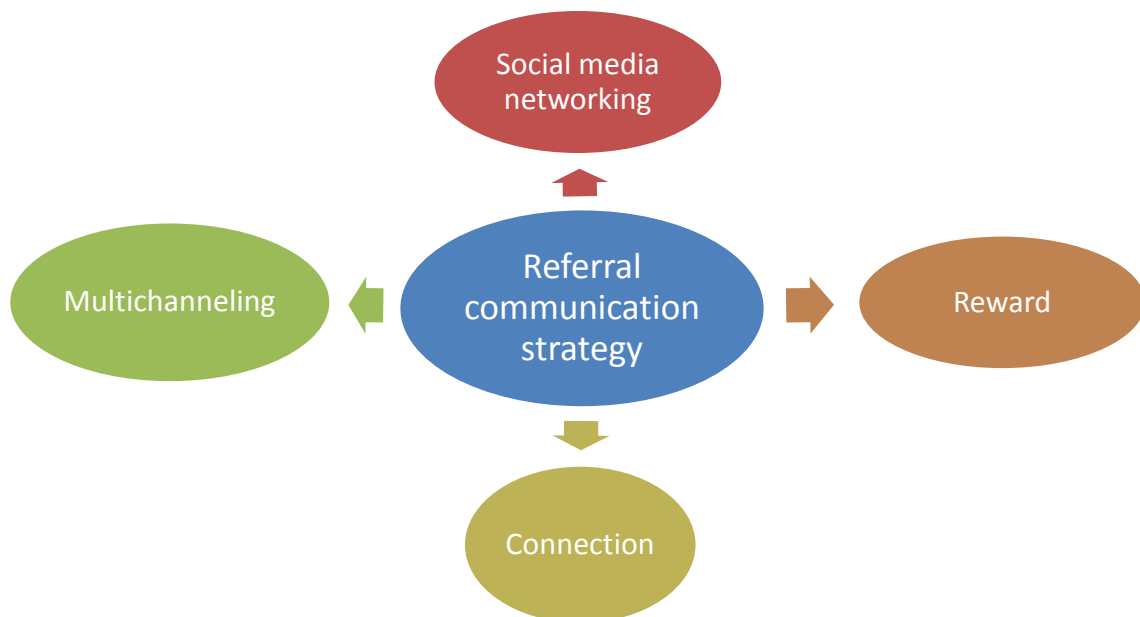
Referral strategy is a key issue to get the right audience, therefore it is important to market product with precise information about the product, because the customer is looking for evidences to trust the product.

Advertising material should be prepared for certain well-chosen customer. Also, today clients share their opinion in digital environment and it is possible to reach larger audience faster. Also, well prepared websites and specific hashtags will help to bring feedback.²⁶

Recognition from customer is the best advertisement for every enterprise; well spread recognition will increase interest in different audience. Modern buyers are multichannel buyers who want pleasant shopping experiences both online and offline.²⁷

Some tasks of referral strategy might be prepared together with scientists, other enterprises or regional institutions, thus, involving them as ambassadors who spread information about the company and the product.

Today the market requests spreading information in several ways, for instance, social media networking, media platforms, seminars and conferences etc. Social media might reach huge audience, it is easy to achieve and they bring feedback quickly.



Rewarding should not be considered in monetary way. Rewarding might be achieved through recognition, early access to sales events, offering upgraded products etc.

Many of rewards are not demanded from the customer site; however the customer feedback should help to increase larger interest about the product.

²⁶ <http://fabrikbrands.com/referral-marketing-strategy/>

²⁷ <https://rubygarage.org/blog/referral-program-ideas>



Figure 14 Example of multichannel marketing growth wheel²⁸

Multichannel marketing growth wheel, shown in Figure 14, indicate complex of marketing strategy. The marketing strategy for mussel farmer starts with setting the goals, defining customer and evaluating it needs and willingness.

Situation analysis - market analysis, customer insight and commercialisation goals are key tasks to develop any business.

Objectives – goals and vision have to be set in any enterprises. The mussel farmer may harvest every year or every second year, the harvesting period should be set taking into consideration biological and environmental factors. The farmer high harvest mussels only for municipality needs (ecosystem service) or combining ecosystem service and feed industry needs, thus targeting its product, customer and distribution channels and setting the company's **strategy**.

²⁸ <https://www.smartinsights.com/wp-content/uploads/2017/08/SOSTAC-marketing-plan-structure.png>

However, today it is important **to act** according to customer needs, therefore it is important to receive customer feedback and to **control** product, its quality and evaluate achievement to set new goals and nominate targets.

6. Pricing strategy

Pricing is one of the most vital and highly demanded components to develop marketing strategy. Pricing is difficult and must reflect supply and demand relationship.²⁹ Product price is driven by several factors, such as customer, competitor, market, product, etc., as well as factors which come on the way and request changes from supplier part. Customer has become more educated and inquisitive therefore the digital environment are playing important role in business life. Also customer is analysing existing environment trying to reduce its influence on environment acquiring information about climate change and impact.

Climate change is likely to have other effects on both the ecology and the livelihoods of people who live near the coast, including increasing their exposure to natural hazards. The climate is only one of a number of factors that are changing. Today's fishermen are faced with fuel and food price rises, changes in demand for fish and changes in market structures which are forcing fisheries and fisheries management to confront issues in the much broader contexts of the wider ecology and local and national economies.³⁰

However, in free market condition there are certain things that can be influenced by customer and supplier. One of the factor is price, therefore it is important to set pricing strategy and analyse it taking in consideration market changes and customer demand.

Setting pricing strategy, it is important to analyse factors such as:

- Fixed and variable costs;
- Competition;
- Target group and its solvency, etc.

By analysing fixed and variable cost it is possible to choose cost – plus pricing, cost based pricing, etc.

Cost – plus pricing

The price of the product is production costs plus a set amount ("mark up") based on how much profit (return) the company wants to make. Although this method ensures that the price covers production costs, it does not take into account consumer demand or competitive pricing which could place the company at a competitive disadvantage.

Cost based – pricing

This pricing strategy is similar to cost – plus pricing. The market situation and conditions has been considered analysing and considering market price. This strategy is applied in fields where price changes regularly and the company set the price according to the market demand.

Value based pricing

This strategy is applied based on the benefits that are provided to the consumer e.g. convenience, well-being, reputation or joy. This strategy is applied for medicine products, and it might be used for high value products, e.g. water resistant glue.

²⁹ <http://www.learnmarketing.net/price.htm>

³⁰ <https://www.rockefellerfoundation.org/report/key-factors-supporting-small-scale-coastal-fisheries-management/>

It's important to note that **many variables** can have an effect on pricing. These include foundational elements like supply and demand as well as constructed elements such as your business' authority, reputation and ability to inspire brand loyalty.³¹

There are certain types of customers, e.g. spenders and savers.³² For conservative spender or saver, marketing material should be set on utility, whereas marketing material for more active spender should be focused on pleasure.

Penetration pricing

Penetration pricing is a pricing strategy where the price of the product is initially kept lower than the competitors' products to gain most of the market share and to trigger word of mouth marketing.

Even though this strategy leads to losses initially, it results in many customers shifting to the brand because of the low prices. Once these customers become loyal and the brand achieves a strong market penetration, marketers increase the prices to a point where they get optimum profits without much loss of customers.³³

This strategy is common in many fields, and it might be applied to introduce market with a new product.

Analysing competitors' price

The price is set by analysing competitors, their product and price in the market.

Price Skimming

Designed to help businesses maximize sales on new products and services. Price skimming involves setting rates high during the introductory phase. The company then lowers prices gradually as competitor goods appear on the market.

One of the benefits of price skimming is that it allows businesses to maximize profits on early adopters before dropping prices to attract more price-sensitive consumers. Not only does price skimming help a small business recoup its development costs, but it also creates an illusion of quality and exclusivity when your item is first introduced to the marketplace.³⁴

Penetration strategy may be used for consumers which offer the product at low price, whereas those ones who want to offer product for high price will choose to sell product for high price.

Psychology Pricing

With the economy still limping back to full health, price remains a major concern for American consumers. Psychology pricing refers to techniques that marketers use to encourage customers to respond on emotional levels rather than logical ones.³⁵

Dynamic Pricing

Dynamic pricing, also called demand pricing, is a comparatively new pricing strategy which charges different prices of the same item from different users depending upon their perceived ability to pay.

³¹ <https://www.entrepreneur.com/article/250289>

³² <https://www.marketwatch.com/story/spender-or-saver-the-choice-may-not-be-yours-2013-04-26>

³³ <https://www.feedough.com/the-10-types-of-pricing-strategies/>

³⁴ <https://quickbooks.intuit.com/r/pricing-strategy/6-different-pricing-strategies-which-is-right-for-your-business/>

³⁵ <https://quickbooks.intuit.com/r/pricing-strategy/6-different-pricing-strategies-which-is-right-for-your-business/>

This pricing strategy is dependent on the internet and is usually used by the eCommerce websites. It uses cookies and internet browsing history of the user to understand their requirements and the urgency to buy and price of the products accordingly to increase the sales.³⁶

Captive product pricing

This method is used when the value of the main product is very low, but the value of the supporting product, which is necessary for working of main product is high.³⁷

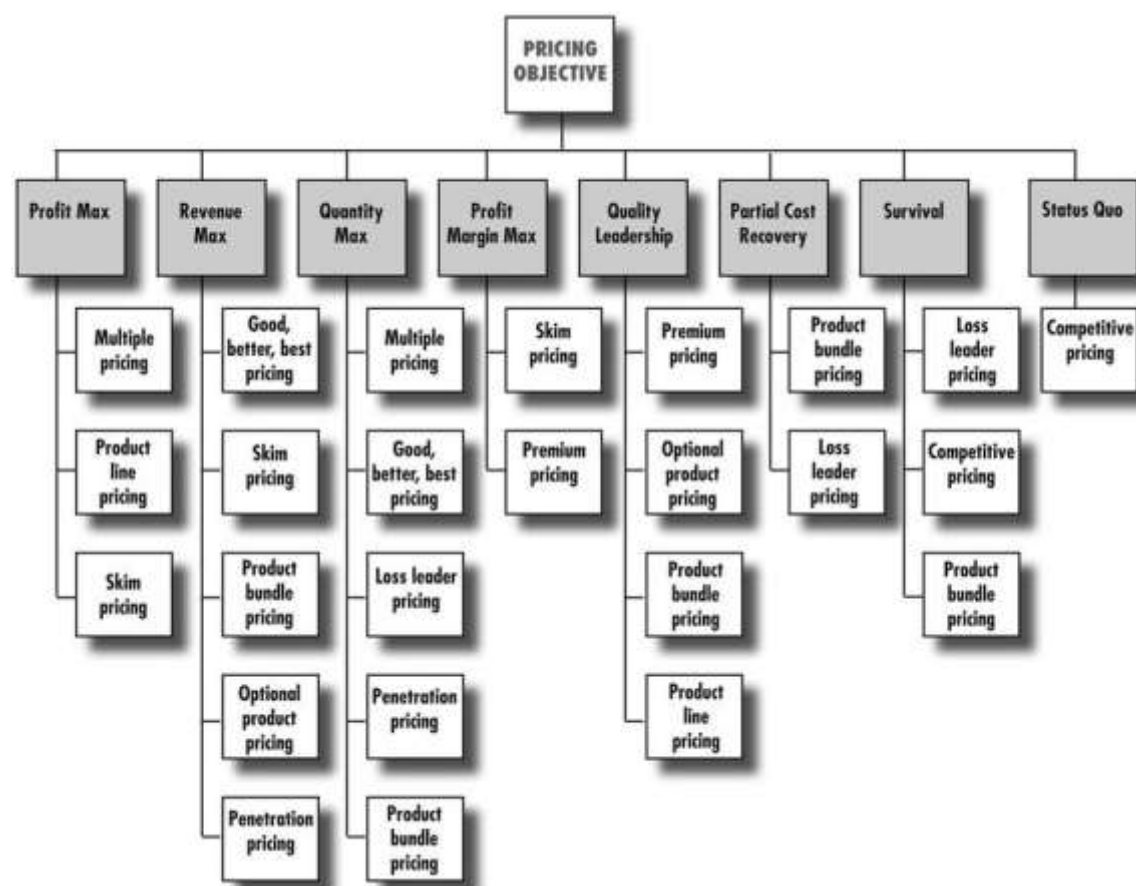


Figure 15 Pricing Objective (Cornelisse S., 2017)³⁸

Nowadays product pricing strategy is mixed using different approaches, combining e.g. cost based pricing, skimmed pricing and analysis of competitor price.

In Figure 15 based on pricing objectives different pricing strategies has been mixed.

Nowadays consumers put great emphasis on the product, thus the demand has affected the quality of the product, and product labelling, and branding has helped to increase demand of the product. The price of the product does not mean so much, however consumers compare the price of product with other products in the assortment (internal reference price) (Miljkovic and Effertz, 2010; Monroe, 2003). Consumers are, for example, likely to be willing to pay more for an organic vegetable that they

³⁶ <https://www.feedough.com/the-10-types-of-pricing-strategies/>

³⁷ <https://www.marketing91.com/captive-product-pricing/>

³⁸ <https://extension.psu.edu/understanding-pricing-objectives-and-strategies-for-the-value-added-ag-producer>

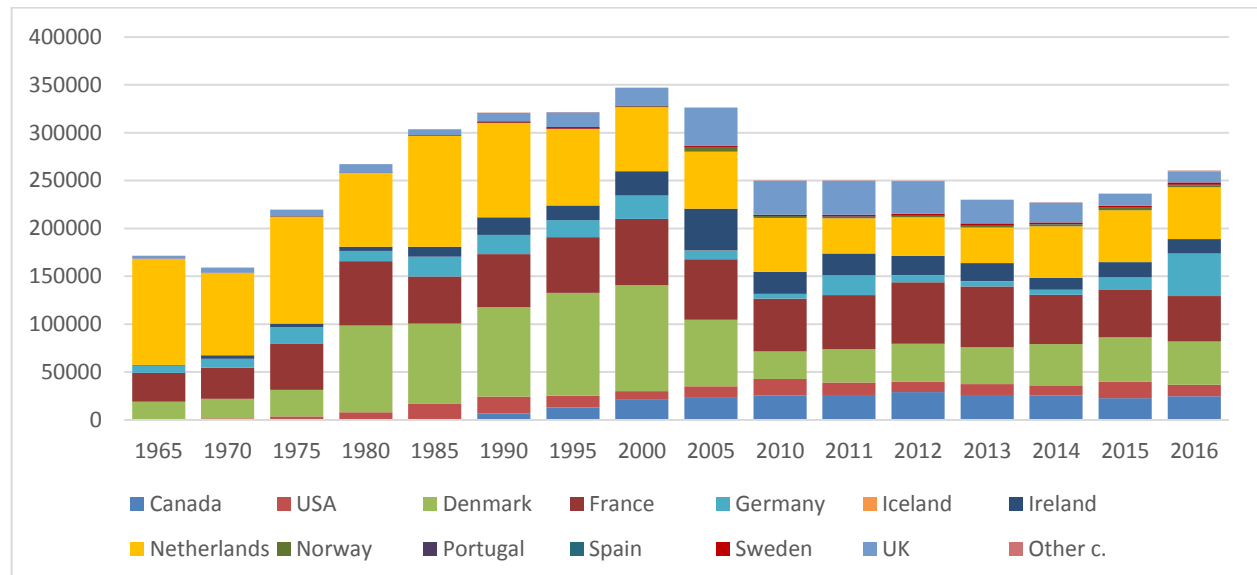
use in a fancy dinner with friends during the weekend than for a regular week-day meal (Ingenbleek, 2015).

In feed industry the price should follow the quality, as higher quality of product means the higher incomes, therefore consumer is willing to pay more. If previously the farmer tried to grow faster, today the consumer has shown interest to buy slow food, therefore the market has reshaped and the consumer is ready to pay more for higher quality product.

7. Competition

Main blue mussel producers are located around the Atlantic Ocean in northern part of the Atlantic Ocean.

Table 2 Fishing of blue mussel in the world in 1950–2016 in tons (Developed by author; FAO data, 2018)



During the last 60 years the structure of main players has changed several times. In the 1950s the main players in the sector were in the Netherlands, but in the 2000s they were in France and Denmark. In 2014, blue mussel fishing took place mainly in Denmark, France, the Netherlands, Canada, the UK and Ireland, and in 2016 blue mussel was farmed in the Netherlands, Denmark, France, Germany, Canada, the UK, USA and Ireland.

Within the last year, farmed blue mussel amount is equated in Denmark, France, and Germany. Mussel farmers in Germany have become important market players in 2016.

Blue mussel farmers are doing business to grow mussels that are suitable for human consumption.

The size of companies is different - starting from family business up to large companies.

In this chapter several potential mussel products will be described - mussel shells as supplement product, mussel meals as animal feed and fertilizer.

Mussel shell

The mussel shells are possible to offer as poultry supplement product or as garden decor.

Value

Mussel shell contains several minerals. The mussel shells are more valuable in comparison to lime but the lime price is smaller.

In market, it is possible to buy mussel shells. In comparing to large mussels the Baltic Sea mussels are smaller and shell is thinner therefore it is better for poultry.

Opportunities

Lime industry should be revised towards reduction of the carbon intensity and Carbon Capture and Storage and/or Carbon Capture and Utilization.

Because of the high carbon intensity in the lime production processes, carbon pricing directly causes higher costs for lime production. E.g., an increase in carbon prices equivalent to €1/tonne CO₂ translates into a lime production average cost increase by €1,1/tonne quicklime (for comparison: EU production costs vary between €55 and €70/tonne). This high sensitivity for energy and carbon prices has a large impact on competitiveness. Combined cost of an EU unilateral carbon price of €5/tonne CO₂ on top of the existing disadvantages in energy prices, could exceed transport costs for import for some European kilns. When carbon costs increase even more, it pays off to import lime from even larger distances. (Stork et.al. 2014).

The European Lime Association (EuLA) gathers the non-captive lime producers organised in national associations that put lime as a product in the market. It represents:

About 95% of the European non-captive lime production;

- 21 national organisations;
- Approximately 50 companies;
- 190 production sites;
- 470 lime kilns;
- 11.000 direct employees;
- 22 million tonnes total lime and dolomite production for 2011.

Production costs vary over the different types of lime kilns, between €55/tonne lime to more than 70/tonne lime. (Stork et.al. 2014).

The mussel shells should be offered adding information about footprint.

Mussel shells could be possible to sell as exclusive product packaged in approx. 5kg.

Strength

In market there is huge demand for local, eco-product. The price is possible to set, previously agreeing with customer.

The product is better than lime; therefore, it should be more valuable than lime.

Animal feed

There are many companies that sell animal feed.

Europe is the second-largest market for compound feed in the world. Total compound feed production in Europe in 2016 was estimated at 249.4m tonnes, only preceded by Asia-Pacific at 367.6m tonnes³⁹

The Europe Pet Food Market was estimated at a value of about USD 25.56 billion in 2017. The industry is forecasted to register a CAGR of over 4.77% during the forecast period.

³⁹ https://research.rabobank.com/far/en/sectors/grains-oilseeds/the_european_feed_mix.html

Pet humanization involves owners trying to incorporate pets into more and more aspects of their human lives, like holidays, nutrition, health care, and more. This led to the commercialization of human-like goods and services for pets, healthcare services, including counselling and health insurance.⁴⁰

Global demand for cereals could increase by 39 percent between 1995 and 2020 (to 2 466 million tonnes), meat demand by 58 percent (to 313 million tonnes), and roots and tubers by 37 percent (to 864 million tonnes) according to IMPACT (International Model for Policy Analysis of Commodities and Trade) predictions. This global food model of the International Food Policy Research Institute (IFPRI), also predicts that 97.5 percent of the population increase between 1995 and 2020 will occur in the developing world. This rise to a possible 6.3 billion people in these countries by 2020, would represents 84 percent of the global population (Pinstrup-Andersen *et al.*, 1999).

Most of the future world food demand will therefore occur in developing countries. An estimated 85 percent of the increase in demand for cereals (690 million tonnes) and meat (115 million tonnes) between 1995 and 2020 could occur in the developing world.

Up to 2020, demand driven meat consumption in the developing world will grow three times faster than in the developed world. Total demand for meat will double. To supply such a massive increase in livestock production, the cereal grain supply may need to double, and the demand for maize in particular will be considerable.⁴¹

| # | Country | Total compound feed production (x1000 tonnes, 2015) | Company | Total feed volume, incl. ingredients (x1000 tonnes, 2015) |
|----|-----------------|--|-------------------------|--|
| 1 | Germany | 23,345 | ForFarmers (NL) | 9,100 |
| 2 | Spain | 22,273 | Agrifirm Group (NL) | 7,056 |
| 3 | France | 21,092 | De Heus (NL) | 5,950 |
| 4 | UK | 15,449 | Nutreco (NL) | 5,900 |
| 5 | The Netherlands | 14,283 | DLG Group (DK) | 4,140 |
| 6 | Italy | 13,685 | Agravis Raiffeisen (DE) | 4,060 |
| 7 | Poland | 9,308 | Avril Group (FR) | 3,400 |
| 8 | Belgium | 6,650 | Veronesi (IT) | 3,150 |
| 9 | Denmark | 4,190 | DTC (DE) | 2,800 |
| 10 | Ireland | 3,986 | Neovia (FR) | 2,650 |

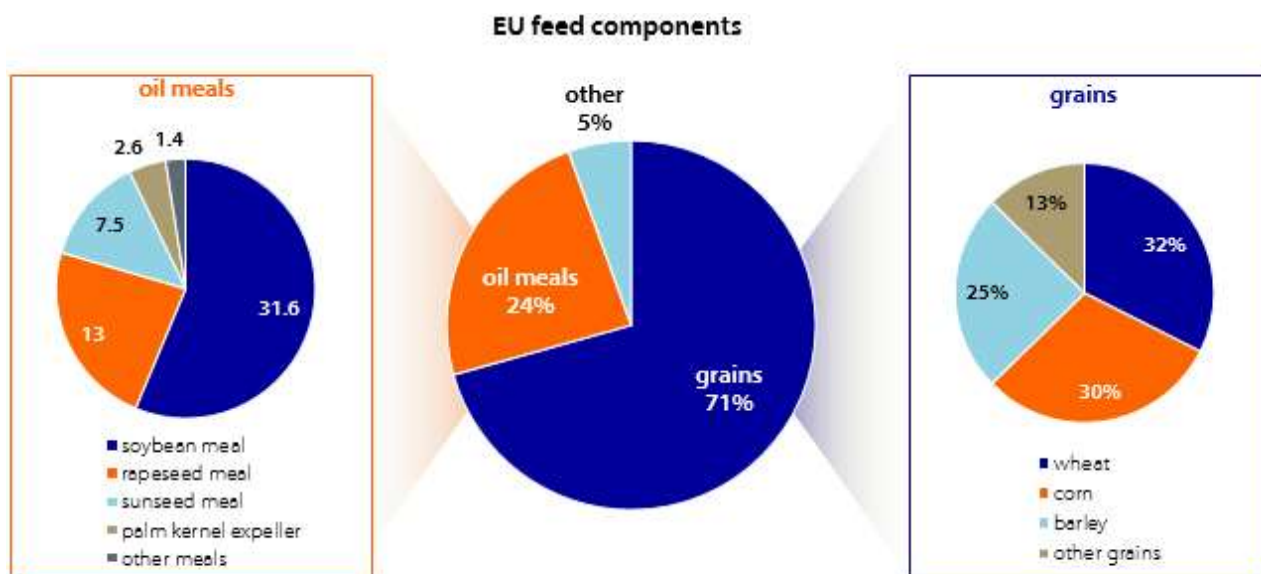
Source: FEFAC, WattAgNet, company reports, Rabobank 2017

Figure 16 the top-ten European feed-producing countries and companies⁴²

⁴⁰ <https://www.mordorintelligence.com/>

⁴¹ <http://www.fao.org/docrep/007/y5019e/y5019e07.htm>

⁴² https://research.rabobank.com/far/en/sectors/grains-oilseeds/the_european_feed_mix.html



Source: USDA, Strategie Grains, Oilworld, Rabobank 2017

Figure 17 Grains account for the largest share in the EU feed mix, followed by oil meals

Grains estimate grain for feed in the EU in the current 2016/17 season to reach 166m tonnes—slightly below the 167m tonnes of the last two seasons. About 60% of grain is used in compound feed.

Value

Roughly 5 million EU farmers raise animals for food production with a value of about EUR 130 billion. Every year, they need approximately 450 million tons of feed for their animals. In addition, 70 million pet owning households in the EU buy roughly 10 million tons of feed for their pets.

There are different types of feed:

- feed materials;
- feed additives;
- compound feed including pet food;
- medicated feed.⁴³

Opportunities

Feed industry has very strict regulation regarding marketing of feed materials and compound according to the EC Regulation 767/2009.

The Commission has adopted several acts to implement this Regulation:

- Catalogue of feed material;
- Revision of the tolerances for analytical constituents and provisions for the labelling of feed additives;
- Guidelines for the distinction between feed materials, feed additives, biocidal products and veterinary medicinal products;

⁴³ https://ec.europa.eu/food/safety/animal-feed_en

- Guidelines for the feed use of food no longer intended for human consumption.

In accordance with Article 26 of Regulation (EC) No 767/2009, the Commission published the title and reference of the "Code for good labelling practice of pet food" in **Official Journal 2011/C no. 358, p. 49**. The [code can be downloaded](#) together with the "Guide to good practice for the manufacture of safe pet foods" and the "Nutritional Guidelines for cats, dogs and pet rabbits". On 28 July 2016, the Commission published the title and reference of the "EU Code of good labelling practice for compound feed for food producing animals". The use of **insects** as **feed** material is described in Strategic Safety concept for insects as feed.⁴⁴

Due to innovative character of the mussel farming business and taking into consideration that agricultural industry is highly subsidized, we should consider different governmental and research institutions as our main collaborators at the introduction phase. There is a possibility to use support from European Maritime and Fisheries Fund (EMFF), different state or regional support schemes, etc. As blue mussel farms could create additional jobs in the coastal regions, and could improve economic situation in regions, we consider local governments and unemployment agencies as possible collaborators. It is also possible to attract EU funding for professional education, so employees from one company could be educated using EU money. It could give possibility for blue mussel farms to attract high-level professionals from other countries and decrease costs for education of workforce. Blue mussel farms could bring in significant information for research in Baltic Sea region scientifically and research institutions. It could give possibility to enhance already started pilot projects. Mussel farm can become also a research base for fish and poultry farms and feed producers in terms of researching new & better biological ingredients for feed.

⁴⁴ https://ec.europa.eu/food/safety/animal-feed/feed-marketing_en

8. Perspective products development and research

- ✓ Cultivated mussels are sustainable seafood for the future and provide a renewable, expandable supply year round. The rope cultivation method of farming has low impact on the environment. Mussels are 100% natural and contain no additives, preservatives, hormones or antibiotics. Considerable amounts of data regarding chemical composition of mussels have been gathered so far, including trace metals, nutrients and bioactive components, but since these contents can differ from place to place, and mussel farming in the Baltic Sea Region is rather new and upcoming industry, more research is needed in order to foster development of new potential mussel products.
- ✓ Essentially made of calcium carbonate, mussels' shells could be used as liming agent in acid soils, as a potential limestone or sand substitute for agricultural, construction and even engineering purposes. Shells also can find utilization for animal feed additive or constituents in fertilizers. As examples from the international market we can mention organic fertilizers that are made from algae, fish and shellfish extracts. Mussel shells as calcium source for hens has been studied, but still there is a need to continue research in this field.
- ✓ Mussels are naturally low in calories and high in Omega 3, which is known to have several heart health benefits. There are studies where using enzymatic hydrolysis process it is shown that *Mytilus edulis* by-products should be viewed as high-value products with strong potential as anti-proliferative agent and promising active ingredients in functional foods. Evidence suggests that peptides derived from the enzymatic hydrolysis of *Mytilus edulis* by-products have potential health benefits and promising applications as active ingredients for functional foods or nutraceutical and pharmaceutical products. The high nutritive potential of mussels as a source of protein, vitamin C, iron, zinc and omega-3 is well documented. However, further research on large-scale production, gastrointestinal stability, bioavailability and long term stability need to be performed.⁴⁵
- ✓ Marine organisms are constantly exposed to a hard, competitive and aggressive environment. They have therefore, developed various protective and defense mechanisms such as, the production of biotic material. ScienceDaily 2005 wrote "Pounding waves are no match for the mighty mussel, that produces strong, flexible threads that cling to rocks... mussels secrete a unique amino acid called 4-hydroxyphenylalanine... Researchers have developed a new group of adhesives for wood products inspired by the ability of mussels to cling to rocks using thread-like tentacles. These threads are proteins that retain powerful adhesive properties even in water."
- ✓ Different studies and research done so far has shown promising results and should be continued to provide a great aid and encouragement to the new and developing Baltic sea mussel industry. Baltic blue mussels have a potential to be used in development of new high quality products, and organic certification can assist in developing opportunities for markets of these products.
- ✓ Baltic blue mussels' unique value is the improvement of the Baltic sea environment, and development of this industry in combination with other marine uses has a potential to provide economic growth and employment in rural communities along the coast.

⁴⁵ Lucie Beaulieu, Jacinthe Thibodeau, Claudie Bonnet, Piotr Bryl, Marie-Elise Carbonneau, Evidence of Anti-Proliferative Activities in Blue Mussel (*Mytilus edulis*) By-Products, Marine Drugs 2013, 11, 975-990 (file:///C:/Users/User/Downloads/marinedrugs-11-00975-v2.pdf)

Conclusions

Baltic Blue mussel is a specific product in the Baltic Sea region. Its consumer has used to buy it mostly as an imported product, thus, mussel farmers should make an interest to the consumer to purchase the local product.

Nowadays consumer's willingness to buy ecological products has increased; they have become more health conscious, thus, causing a positive shift in demand for seafood consumption globally.

The possible segments of the market for Baltic blue mussel products are divided in two sectors – environmental (possible subsidies for pollution treatment) and industrial (human consumption, feed production, fertilizer production, other directions). The most attractive segments are as follows: poultry feed producers, fertilizer producers, fish feed producers, insect meal producers. Most products (except those for human consumption) of the Baltic blue mussels are positioned in B2B market since they are targeted to be the components for feed production or other industrial production companies. Also blue mussel as ecosystem service is positioned in B2B market.

We can choose Baltic blue mussels to position as organic, eco-friendly and local. Every step-in mussel product marketing should meet the global principles of environmental responsibility.

Increasing interest in the Baltic Sea Region to encourage blue mussel farming requires new promotion activities – and this is where the online and social media marketing possibilities should be used. Creation of digital marketing platforms that are content driven is underway and is only at the beginning of its experience in mussel product marketing.

Blue mussel products from the Baltic Sea can be positioned as new products in the Baltic Sea Region, they are at the introduction and/ or development stage. Such products as Baltic blue mussels for feed industry or fertilizer production still need to be investigated and tested, and involvement of science and research community is crucial in this process.

Today mussel farming does not exist on a real commercial basis in the Baltic Sea, at the moment the main obstacles are the lack of experience, missing profitability and low salinity. However, with the development of new potential products, mussel farming can become a realistic option and a potential new business in coastal waters of the Baltic Sea.

This document is focused on today's situation which can change soon, so the marketing strategy always should be revised and adapted to the actual market situation and based on the existing products.

It is remarkable that we should not concentrate on today's existing mussel market and products, and competitors, because they are mostly focused on the blue mussels for human consumption. Baltic blue mussel does not compete with mussels for human consumption. We believe that development of new, organic, high value and local products is the future driver for the Baltic blue mussel farming industry and mussel's ability to reduce nutrients in the Baltic Sea is the Baltic blue mussel's unique selling propositions.

About

Baltic Blue Growth is a three-year project financed by the European Regional Development Fund. The objective of the project is to remove nutrients from the Baltic Sea by farming and harvesting blue mussels. Farmed mussels will be used for the production of mussel meal, to be used in the feed industry. 18 partners from 7 countries are participating, with representatives from regional and national authorities, research institutions and private companies. The project is coordinated by Region Östergötland (Sweden) and has a total budget of 4,7 M€.

Partners

- *Region Östergötland (SE)*
- *County Administrative Board of Kalmar County (SE)*
- *East regional Aquaculture Centre VCO (SE)*
- *Kalmar municipality (SE)*
- *Kurzeme Planning Region (LV)*
- *Latvian Institute of Aquatic Ecology (LV)*
- *Maritime Institute in Gdańsk (PL)*
- *Ministry of Energy, Agriculture, Environment, Nature and Digitalization of Schleswig-Holstein (DE)*
- *Municipality of Borgholm (DK)*
- *SUBMARINER Network for Blue Growth EEIG (DE)*
- *Swedish University of Agricultural Sciences (SE)*
- *County Administrative Board of Östergötland (SE)*
- *University of Tartu Tartu (EE)*
- *Coastal Research and Management (DE)*
- *Orbicon Ltd. (DK)*
- *Musholm Inc (DK)*
- *Coastal Union Germany EUCC (DE)*
- *RISE Research institutes of Sweden (SE)*