

# Unlocking the potential of macroalgae for a thriving European blue bioeconomy



## Pilot scale sales and deliveries

### SEAMARK DELIVERABLE 7.5

Nofima



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# SEAMARK DELIVERABLE 7.5: PILOT SCALE SALES AND DELIVERIES

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Toninio Waelkens SUBMARINER;  
Algaia process and product examples

**Abstract**

The SeaMark project seeks to expand innovative seaweed cultivation and processing, transforming them into cost-effective product applications. Achieving this goal will help attract commercial investments to the industry. This report is the fifth outcome from Work Package 7 (WP7). An important objective of WP7 is to develop effective and validated GTM strategies for selected SeaMark products. Implementing robust Go-To-Market (GTM) strategies can reduce the risk of new product failures.

This deliverable (D7.5) aims to conduct small-scale sample deliveries of 6 SeaMark products, including fibre in pet food, bioactive fucoïdan in cosmetics and nutraceuticals, and green alginates in food, cosmetics, and packaging. The focus is on gathering customer feedback from product testing. This approach will provide valuable insights and experiences to inform recommendations for minimising enterprise risk, maximising market uptake and updating the GTM strategies.

The data collection was based on a survey answered by key personnel from the industry partners OCEANIUM and Algaia. Thus, the results, discussion, and conclusions are derived from the knowledge of the respondents in these companies.

An updated GTM strategy has been developed for the 6 SeaMark products. According to industry partners Algaia and OCEANIUM, the updated strategies do not significantly differ from their initial ones. However, compared to the initial GTM strategies in D7.1 and D7.3, the updated strategies are more detailed and product-specific, possibly because the companies are more comfortable sharing after their initial strategies have been validated through customer testing.

A comparison of the GTM strategies shows that each product has distinct strengths, with a common emphasis on sustainability and customer feedback to guide the GTM strategies. Key sustainability aspects include using cultivated seaweed, zero-waste processing, low water usage, and reducing or eliminating chemicals. The focus on these factors varies by product. Science-backed efficacy through in-vitro and clinical testing is crucial for market uptake, especially for OCEAN ACTIVES® C+. Similar validation is needed for other products like OCEANIUM® PET and green alginates in cosmetics. COSMOS certification and addressing colour issues in cosmetic products are also important for maximizing market uptake.

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## LIST OF ABBREVIATIONS

Abbreviation	Description
GTM	Go-To-Market
WP	Work Package
TRL	Technological Readiness Level
TAM	Total addressable market
SAM	Service Available Market
SOM	Service Obtainable Market
USP	Unique Selling Points
UPF	Ultra-processed food
B2B	Business-to-business
HUT	Home use trial

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# 1. INTRODUCTION

Cultivating seaweed offers several advantages, including the lack of need for freshwater or arable land. It does not require fertilizers; it absorbs nutrients directly from the surrounding seawater. Seaweed can also provide ecosystem services such as increased biodiversity. Seaweed contains several bioactive ingredients with potential use in food, feed, cosmetics, and other products. Seaweed cultivation is currently the fastest-growing form of aquaculture.

At the same time, seaweed cultivation faces several challenges. Compared to the rest of the world, seaweed cultivation in Europe is still on a very small scale. A significant issue is competitiveness; the industry must develop price-competitive product applications to stay viable. Businesses need to continuously adapt to the evolving needs and preferences of consumers to succeed. Nonetheless, new product development carries significant risks, as many new products fail. (Castellion and Markham 2013).

The SeaMark project aims to scale up innovative seaweed cultivation and processing into price-competitive product applications. A successful outcome will help attract commercial investments to the industry.

Implementing robust Go-to-market (GTM) strategies can be highly effective in minimising the risk of new product failure (Kuester et al., 2018). Work package (WP) 7's main purpose is to develop sound GTM strategies for SeaMark products.

In deliverable 7.4, 5 products were selected for pilot-scale sales and deliveries, as detailed in Table 1.

*Table 1: Final products selected for a feasibility study.*

Selected products	Application	Partner
Fibre	Food	Oceanium
Bioactive fucoïdan	Nutraceutical	Oceanium
Bioactive fucoïdan	Cosmetic ingredients	Oceanium
Green alginate	Cosmetics texture	Algaia
Fucoïdan extraction with enzymes	Feed	Algaia

Following the presentation of the final products to the SeaMark consortium, several adjustments and additions have been made to the list of products targeted for this delivery. These changes reflect the evolving priorities and strategic direction within the consortium.

Initially, fibre products from seaweed were focused on food applications. However, after further deliberation, the focus has shifted towards the pet food market, as this will be more achievable within the project timeline.

Green alginate for food applications has again been added, after being removed because of market issues in D7.4. Green alginate's unique properties make it a valuable addition to the food industry, offering potential benefits in terms of sustainability. Green alginate has also been expanded into packaging applications. For fucoïdan extraction with enzymes, the product has not yet been tested with customers. The goal is to update this GTM strategy for Deliverable 7.6.

A preliminary go-to-market strategy was developed for pig feed, a flagship product (deliverable 7.1). To validate and refine this strategy, a longitudinal study on the immune system effects on sows is being conducted in WP4. However, the results from this study are not yet available, so the update of this strategy will be postponed until Deliverable 7.6.

In summary, the SeaMark consortium has strategically adjusted its product focus, incorporating new insights, market opportunities, and barriers identified during the product development phase. The shift in focus to fibre products and the addition of green alginate for food and packaging applications reflect a dynamic and responsive approach to market demands and results from the product development process. These changes are expected to enhance the consortium's ability to minimize enterprise risk and maximize market uptake. Table 2 lists the 6 selected products for pilot-scale sales and deliveries.

*Table 2: Products selected for pilot scale customer testing.*

Selected products	Application	Partner
Fibre	Petfood	Oceanium
Bioactive fucoïdan	Cosmetic ingredients	Oceanium
Bioactive fucoïdan	Nutraceutical	Oceanium
Green alginate	Cosmetic	Algaia
Green alginate	Food	Algaia
Green alginate	Packaging	Algaia

## 1.1 Purpose and scope of the document

The main goal of WP7 is to develop comprehensive GTM strategies for selected SeaMark's flagship and innovation products. WP7 will identify the most relevant and promising seaweed products, establish a platform for market exploitation, and investigate the market structure and potential for these products. SeaMark will demonstrate market applications through sales and deliveries, starting with pilot-scale quantities and progressing to industrial-scale quantities. Finally, SeaMark will develop and implement a robust and proven GTM strategy for selected products.

This deliverable (D7.5) aims to carry out small-scale sample deliveries of the selected products listed in Table 2, with an emphasis on gathering customer feedback from product testing. This will allow the collection of valuable insights and experience that can inform recommendations on minimising

enterprise risk and maximising market uptake, as well as updating the GTM strategies.

Various factors, such as product safety, compliance with relevant legislation, and the practical challenges associated with shipping and delivery, must be considered in this process. Addressing these aspects will ensure a smooth and efficient delivery process that meets all regulatory requirements and enhances customer satisfaction.

### 1.2 Target audience(s)

The target audience for deliverable 7.5 is primarily the SeaMark consortium, but the extended seaweed industry and other stakeholders will also be provided with insights into different markets for different seaweed applications and GTM strategies.

### 1.3 Relevant Key Exploitable Results (KERs)

KER 1 is relevant; a suite of 12 products for high and low value market segments within food, feed, nutraceuticals, cosmetics and medical devices

### 1.4 Structure of the document

The first part of the document provides information about which products are selected for small-scale deliveries. The second part explains the methodological approach used in this study. Thirdly, the updated GTM strategies for the products are presented. Experience from customer testing is highlighted, and recommendations for how to maximize market uptake and minimize enterprise risk are presented. Finally, the conclusion summarises the findings and learnings from small-scale testing of the Seamark products.

## 2. METHODOLOGY

### 2.1 Methodology for data collection

The industry partners, OCEANIUM and Algaia, conducted small-scale sample deliveries of the selected products listed in Table 2 to customers deemed relevant for each individual product. These customers evaluated the products and provided feedback to the industry partners on product performance and other aspects relevant to the GTM strategy.

The industry partners received a structured survey developed by Nofima and Sjøkvin to systematically collect customer feedback they had received. This survey served as the primary tool for gathering insights and recommendations on how to improve the GTM strategy, maximize market uptake, and minimize enterprise risk.

The survey was based on the instrument originally developed in Deliverable D7.1, which supported the initial GTM strategy for SeaMark products. For this deliverable (D7.5), the survey was updated to include additional questions focused on customer feedback, product perception, and strategic considerations for market entry and scale-up.

The surveys were completed by key personnel from OCEANIUM and Algaia who were involved in the sample deliveries and customer interactions. In cases where responses were unclear or lacked sufficient detail, follow-up communication was initiated to clarify and enrich the data.

### 2.2 Limitations

It is important to acknowledge that the report is founded on interviews conducted with industry partners OCEANIUM and Algaia. The results, discussion, and conclusions are derived from the knowledge of the respondents in both companies. Sensitive information which could impact the competitiveness of their products and/or companies is not disclosed.

Since some of the initial GTM strategies remained unchanged, portions of the text in this deliverable are similar or identical to those in D7.1 and D7.3.

## 3. RESULTS & DISCUSSION

### 3.1 Fibre in petfood

#### Product description

Dietary fibre is a group of edible carbohydrate polymers. In Asia, seaweeds have long been consumed as traditional foods in salads, soups, and low-calorie dietetic foods. Dietary fibre constitutes 25–75% of marine algae's dry weight and represents their major component (Jiménez-Escrig and Sánchez-Muniz, 2000). Nutritional studies suggest that dietary fibres obtained from seaweeds offer potential health benefits and can be developed into functional foods (Huang et al., 2022).

Seaweed fibre is increasingly being included in pet food (Isidori et al., 2019). Fibre from seaweed includes complex carbohydrates or polysaccharides that are not found in land-based plants (Ozogul et al. 2024).

OCEANIUM® PET is a unique, multi-complex extract derived from sustainably sourced seaweed, offering a wealth of health benefits for pets.

#### Product strengths

OCEANIUM® PET is described as a highly efficacious extract, rich in dietary fibre that support a healthy digestion. It is also a high-quality protein source, with seaweed bioactives that improve gut microbiome. Additionally, the mineral-rich formula contains essential minerals like magnesium, potassium, and sodium, contributing to overall health.

OCEANIUM® PET has excellent provenance and traceability. This includes a clean label (no food additives) and a natural origin, sustainably sourced seaweed. The processing is water-based and green. OCEANIUM® PET has several certifications: vegan, vegetarian, halal, and kosher. In addition, it is non-GMO and ocean friendly. The product is believed to meet consumers' demand for sustainable products and will help brands achieve their sustainability targets.

The product has several unique selling points, i.e., attributes that are not easily replicated by competitors. OCEANIUM's seaweed products are highly efficacious, natural, and sustainable. They are sourced from regenerative seaweed farms with excellent provenance and end-to-end traceability. They utilize clean, green water-based processing methods, ensuring eco-friendly production. Additionally, their robust sourcing strategy enables OCEANIUM to scale up and produce large volumes to meet growing demand.

### Product market fit

The product OCEANIUM® PET is believed to fit in the petfood market based on three key attributes:

- Joint support.
- Skin and coat health.
- Microbiome and gut health.

The product is believed to distinguish itself from competitors because it is all-natural and vegan. In addition, it is both efficacious and sustainably sourced.

### Target market

The primary problem OCEANIUM® PET addresses are the need for natural, clean-label solutions in the pet food industry. Currently, many products used in pet food manufacturing are by-products from slaughter or are chemically or synthetic derived. It is believed that this creates a call for more natural and sustainable alternatives.

This product targets pet food manufacturers and distributors. The industry is situated in Europe and the USA and covers over 70 % of the global pet food market.

The total addressable market (TAM) for superfoods for pets is currently valued at USD 2 billion. The expected growth rate is between 8-19 %. The Service Available Market (SAM) is dominated by developed markets in North America and Europe, potentially reaching USD 4,8 billion by 2030. Target for OCEANIUM® PET is 1 % out of the Serviceable Obtainable Market (SOM), which equals USD 48 million, through partnerships with established pet food manufacturers and distributors.

Many factors influence whether the target customers will buy the product: ease of formulation i.e. mix easily, efficacy data, certifications, validated health claims through clinical trials, price, and the ability to meet supply and demand in terms of volumes.

### Competition and demand

There are not many pure seaweed extracts in the pet food market. However, potential competitors include Marinova, NutraMara, Origin by Ocean, and Alginor, who offer similar products on the global market with a focus on Europe.

The product differentiates itself from competitors by focusing on clean label, avoiding ultra processed food (UPF), provenance, traceability, and sustainability. The competitors differ by using wild-harvested seaweed, while OCEANIUM® PET uses farmed seaweed. The focus is on zero waste and a 100 % utilization of biomass, in addition to optimizing the biorefining process for net-zero production.

The company points out that it has the first-mover advantage in the industry to develop an economically viable, environmentally friendly, sustainable, zero-waste biorefinery approach to extracting food ingredients, nutraceuticals, and material ingredients. It processes sustainably farmed kelp, while the closest competitors rely on wild-harvested seaweed targeting feed and fertilizer markets. The competitors only make a portion of the products OCEANIUM can produce and lack the expertise to optimize for full extraction, resulting in lower-value products. Recently, some farming-oriented start-ups have begun focusing on biorefining. However, the company have a development lead of over two years compared to these companies.

OCEANIUM has identified the demand for the product and has set a sales target of 100 tons per year.

### Distribution

OCEANIUM® PET will be distributed both to petfood manufacturers and distributors. There are no expectations for any issues with the distribution with well-established and experienced distributors. The distribution cost, however, is not known at this stage.

### Price

The product has a premium pricing strategy, with a cost in use of 0,5 EUR/kg pet food, which equates to OCEANIUM Pet price of €10-14/kg. OCEANIUM finds that their customers are willing to pay this price.

### Experience from customer testing

This chapter details the insights gained from customer testing, during which industry partners supplied product samples to gather feedback. The partners were asked about the impact on their GTM strategy. Modifications or insights to the preliminary GTM strategy, if developed in previous deliverables, were documented.

A preliminary GTM strategy was not developed in the Seamark project for fibre for petfood, as this was initially not a flagship or innovation product and thus out of scope.

Insights gained from customer testing confirm the strength of the product with clear differentiators from both synthetic and animal-based products. The company have not adjusted their initial go-to-market strategy based on its experience with customer testing. Testing indicates that customers were persuaded by OCEANIUM's initial go-to-market strategy, which

emphasized sustainability, clean labelling, and the high efficacy and versatility of their product.

Other important insights have come from activities in WP2 (cultivation, harvesting and pre-processing) and WP3 (biorefinery processing for bioactives, fibre and biomaterial) in SeaMark. Although project participants managed to extract some high-purity beta-glucan from the primary biomass, the yield was very limited, making it economically unviable as an extract from *Saccharina latissima*. This insight made it clear for all project partners to shift focus from beta-glucan (P1) to fibre (P4) for the product aimed at petfood applications that have been tested with customers.

### Maximize market uptake

Customer testing has provided positive feedback that the product meets the industry's safety and regulatory requirements without the need to make any changes. This includes the legislative requirements for the product. These elements build up under its market uptake.

There were no practical challenges during customer testing. The product is a standard ingredient that does not alter the quality of the final product. This enables producers to use the product without any need to modify their processing steps.

The next step in maximizing market uptake is to conduct clinical trials of the product to validate health claims. OCEANIUM plans to conduct these trials in 2025-2026.

### Minimize enterprise risk

The most significant risk at this stage is maintaining the good quality and composition of the biomass supply. The company prefers to use wet biomass, but currently, that is not possible. However, after processing, there are no storage issues.

The product faces no regulatory challenges in the European market. However, the process in the US market is lengthy and can take up to two years. The European market has stricter requirements for health claims that call for lengthy clinical trials with accurate and reliable data. These lengthy trials can be expensive. They can delay market entry, but the results can be turned into an advantage for the product. Trustworthy validation of health claims enhances marketing and product uptake.

## 3.2 Bioactive fucoidan in cosmetics

### Product description

Fucoidans are a complex series of sulphated polysaccharides found in the cell walls of brown seaweeds (Vo and Kim, 2013). Bio-active properties of fucoidan, such as antioxidant, anticoagulant, antithrombotic, immunoregulatory, antiviral and anti-inflammatory effects have been reported (Wang et al., 2019), however, a large variation is observed depending on the source material (Cumashi et al., 2007).

Bioactive fucoidans are emerging as a promising cosmetic ingredient due to their non-toxic, biodegradable, and biocompatible nature. They offer a variety of benefits, including anti-inflammatory, antioxidant, and anti-wrinkling properties, which contribute to skin protection and the alleviation of skin ageing (López-Hortas et al., 2021; Naghipour et al., 2025).

OCEAN ACTIVES® C+ is a high-purity (>80%) water-soluble bioactive ingredient derived from sustainably farmed seaweed. Clinically tested, this ingredient has demonstrated remarkable efficacy in reducing skin redness by 96% and 2.5 times faster than non-treated skin. It restores and enhances the skin barrier by up to 400% and inhibits elastase by 77%, while also providing high antioxidant activity, comparable to goji berry and pomegranate. OCEAN ACTIVES® C+ is produced using cultivated seaweed from regenerative farms and proprietary, clean, water-based chemistry. It is effective at a low dosage, just 1% inclusion delivers outstanding results, making it a versatile choice for a variety of cosmetic formulations. OCEAN ACTIVES® C+ can be easily formulated into a variety of products, including face and body moisturizers, masks, overnight treatments, after-shave creams, and sun care. Its adaptability allows formulators to create products across multiple skincare categories, enhancing skin health and appearance.

### Product strengths

OCEAN ACTIVES® C+ has a purity level of over 80%, which is considered very high. It has clinically proven efficacy, with redness reduction of up to 96% and 2.5 times faster compared to untreated skin. In addition, it reduces UV-induced redness (erythema) by 92%.

The product is highly efficacious regarding bioactivity and is proven effective at just 1% inclusion. This makes it a versatile choice for a variety of cosmetic formulations like products for irritated skin, acne, sun damage, and rosacea. It restores and enhances the skin barrier by up to 400% and inhibits elastase by 77%. In addition, the product has high antioxidant activity, and it calms, soothes and hydrates the skin.

The product's provenance and traceability are described as excellent. It is derived from natural, sustainably sourced seaweed and processed with water-based, green processing methods. There is full traceability end-to-end, ensuring transparency and reliability. It is certified as vegan, vegetarian, halal, kosher, and non-GMO. In addition, it is ocean-friendly and meets consumers' demand for sustainable products, helping brands achieve their sustainability goals. OCEAN ACTIVES® C+ is also compliant with Chinese regulations.

### Unique selling points:

- Efficacious and sustainable.
- Excellent provenance and end-to-end traceability for our seaweed from regenerative seaweed farms.
- Clean, green water-based processing.

- Very high purity and bioactivity.
- Science-backed efficacy supported in-vitro and clinical testing.
- Scalability: Capable of large-scale production due to effective sourcing strategy.
- Award-winning: won the Best New Ingredient award at the Pure Beauty Awards 2024.

The unique selling points of OCEAN ACTIVES® C+ include the efficacy and sustainability of the product, sourced from regenerative seaweed farms, with excellent provenance and end-to-end traceability. OCEANIUM uses clean, green water-based processing method. The product has very high purity and bioactivity. The efficacy of the product is backed by scientific testing through in-vitro and clinical testing). Additionally, OCEANIUM has the ability to large scale production due to an effective sourcing strategy. The OCEAN ACTIVES® C+ has been recognized as an excellent product through winning the best new ingredient award at the Pure Beauty Awards 2024.

### Product market fit

OCEAN ACTIVES® C+ provides intensive redness recovery, targeting issues such as irritated skin, acne, sun damage, rosacea and sensitive skin.

The product is clinically tested and boasts high purity, demonstrating strong efficacy even at low dosages. The product fits consumers seeking sustainable and natural ingredients, aligning with the blue beauty trend. In addition, it supports regulations discouraging harsh chemicals in consumer products.

### Target market

OCEAN ACTIVES® C+ targets the global market, focusing on individuals suffering from sensitive skin, acne, and exposure to harsh environmental conditions such as wind, cold, and extreme weather. OCEANIUM's current plan is to target cosmetic ingredient distributors. In the longer term, their goal is to become a supplier to mid-sized and large cosmetics and beauty brands.

The total addressable market (TAM) for natural skincare products is currently valued at around USD 6.7 billion and is projected to reach USD 11,9 billion by 2030, a growth rate of 6-7 %. The service available market (SAM) is focused on marine-derived, high-value markets like Europe and North America. Natural biologics appear to constitute around 70 % of the eczema market.

Target of the serviceable obtainable market (SOM) is a 1 % share of the SAM market, which equals USD 110 million, through partnerships with premium cosmetic brands.

The company have several key factors that can influence the purchase decisions of the target customers:

- Efficacy data - proven effectiveness through clinical and in-vitro testing.
- Certification – such as vegan, vegetarian, halal, kosher
- Regulatory compliance - adherence to global regulatory standards.
- Price – competitive pricing that reflects the product's value.
- Supply and demand- the ability to meet supply and demand requirements consistently.

### Competition and demand

Marinova from Australia, Nutramara from Ireland, and HI-Q from Taiwan are the main competitors. They all operate globally and target similar customer segments and markets.

There are notable differences from leading competitors in several key areas, including the sourcing of raw materials. OCEAN ACTIVES® C+ focuses on farmed and sustainable seaweed, with provenance, traceability, and sustainability being key differences from the competition. The competitors use other species of seaweed that originate from wild harvest. There is also a zero-waste approach with almost 100 % utilization of biomass. OCEANIUM optimize the biorefining process for net-zero production.

Identified company strengths:

- Innovative biorefinery approach: OCEANIUM has the first mover advantage in developing an economically viable, environmentally friendly, sustainable, zero-waste biorefinery process for extracting food ingredients, nutraceuticals, and material ingredients. Their competitors target the feed and fertilizer markets.
- Sustainable practices: They use only farmed kelp while competitors use wild-harvested, which is less sustainable.
- Competitors only produce a fraction of the products OCEANIUM offers and lack the expertise for the extraction of multiple products.
- OCEANIUM estimates a two-year-plus advanced development time lead; however, recently, some farming-oriented start-ups have started focusing on biorefining.

The company has explored the demand for its product. As of now, it has one confirmed customer, and it expects to sell 40 kg in 2025. Sales expectations for 2026 in the EU are 150 kg. In the UK and Ireland market, the sales target is 20 kg in 2025, increasing to 50 kg in 2026, with additional sales in the pipeline, indicating further potential growth.

### Distribution

An official partnership with the leading ingredients specialist Kreglinger was announced in Cosmetic Business on February 18, 2025 (Cosmetic Business, 2025). Kreglinger is a Belgian distributor specialising in food, cosmetic, and pharmaceutical

ingredients, mainly in the West European territory (Kreglinger homepage, 2025).

In addition, OCEANIUM is working with a global cosmetic ingredient distributor. The company anticipates no problems with distribution.

### Price

The company's pricing strategy is described as premium priced with a competitive cost in use. Setting a higher initial price for the product can be justified by the superior quality, efficacy and sustainability of the product.

Customers' willingness to pay for the product has been identified. Willingness to pay is linked to volumes.

### Insights gained from customer testing in relation to the preliminary GTM strategy

To test the product, the company conducted a Home Use Trial (HUT) with volunteers, who independently validated its efficacy. Formulation of OCEAN ACTIVES C+ in skin cream for the HUT confirm that the product is easy to formulate, i.e. can be mixed without much difficulty. Customers' evaluations of the product's strengths aligned well with the initial go-to-market (GTM) strategy outlined in D7.3. The sustainability aspects and environmental impact narrative were particularly well received by potential customers, aligning with their own sustainability goals.

Customers' evaluation of product-market fit highlighted the need for COSMOS compliance, i.e. it will have a better product-market fit if it is certified after COSMOS standards. The COSMOS standard is a consumer guarantee for organic and natural cosmetics. The COSMOS-standard defines the criteria that companies must meet to ensure consumers that their products are genuine organic or natural cosmetics produced to the highest feasible sustainability practices (COSMOS, 2025). Some customers expressed a preference for a lighter product, particularly for «white» cosmetics. There was also a demand for a concentrated liquid version of the product. These evaluations indicate that while the product had positive strengths, some adjustments might be needed for a better market fit.

Customer feedback did not provide any new insights regarding the target market, competition, demand, and distribution. Thus, the GTM strategy regarding these issues remained the same.

Customer feedback on price was favourable but did not affect the GTM strategy.

The most important insight from customer testing was the need for COSMOS compliance. Also, some customers

expressed a preference for a white product. This feedback will be used for future efficacy testing.

The customer testing indicated no need to adjust the preliminary GTM strategy, which was thus successful. However, feedback from some cosmetic customers wanting a white product led to optimizing extraction processing steps to deliver a lighter product.

### Maximize market uptake

Learnings from customer testing show a need for stricter microbiology requirements for the cosmetics market. This information can be used to ensure that the product meets and lives up to safety standards and legislation, and further maximises market uptake.

Key factors for maximizing market uptake for OCEAN ACTIVES C+:

- Improving technical data.
- Conducting additional efficacy testing.
- Preparing comprehensive product dossiers.
- Obtaining COSMOS certification.

### Minimize enterprise risk

The most significant risk related to the production of bioactive fucoidan is maintaining the quality and composition of the biomass supply. A challenge for processing is the current unavailability of wet biomass, which OCEANIUM prefers to process but cannot access at this time. Legislation and regulations do not pose any challenges for the product.

## 3.3 Bioactive fucoidan in nutraceuticals

### Product description

Fucoidans are a complex series of sulphated polysaccharides found in the cell walls of brown seaweeds (Vo and Kim, 2013). Bio-active properties of fucoidan, such as antioxidant, anticoagulant, antithrombotic, immunoregulatory, antiviral and anti-inflammatory effects have been reported (Wang *et al.*, 2019), however, large variation is observed depending on the source material (Cumashi *et al.*, 2007).

Fucoidan is a bioactive compound that can be extracted from brown seaweeds. The nutraceutical industry has turned its attention to bioactive fucoidan due to its diverse health benefits, including antioxidant, anticancer, anticoagulant, anti-inflammatory, and immunomodulatory effects (Zhao *et al.* 2018).

Fucoidans, as a nutraceutical product, possess properties that support gut, immune, and cardiometabolic health. Some applications, including gut health, oral health, and anti-inflammatory benefits, have already been partially commercialized for human use (Fitton *et al.*, 2019).

OCEAN ACTIVES® H+ is a marine bioactive ingredient rich in fucoidan derived from sustainably sourced brown seaweed (*S. latissima*). It is a high-purity and natural seaweed bioactive with

multiple benefits. OCEAN ACTIVES® H+ is a clean-label ingredient for food, beverages, and supplements.

### Product strengths

OCEAN ACTIVES® H+ is described as rich in fucoidan with a high purity > 75 %. The product supports gut health and increases the mass and diversity of the microbiome. It is a clinically proven prebiotic that enhances good bacteria and Short-Chain Fatty Acid (SCFA) production. Clinical tests show proven effects in reducing inflammatory gut bacteria. The product shows strong efficacy at a low dosage—250-1000 mg/day—with low side effects, like bloating and gas.

The company notes that the product's unique selling point (USP) is the unique combination of enhancing good bacteria and reducing inflammatory bacteria, which can be linked to health benefits.

### Product market fit

The product addresses the need in the health and wellness sector by focusing on rebalancing the gut microbiome. Overall, health and well-being are essential, and a balanced gut microbiome can impact numerous health outcomes including digestion, immunity and even mental health.

This product's unique efficacy features compared to other products in the market are different efficacy features, effective at low dosages and has a low risk of side effects.

### Target market

The target market for OCEAN ACTIVES® H+ is consumers globally who have widespread issues due to dietary deficiency in fibre and the consumption of processed food (UPF).

OCEANIUM has identified the United States as their primary market, but limited regulatory compliance limits its reach. Europe is a potential target market if the product gets novel food approval.

OCEANIUM focuses on the nutritional supplements and functional foods industry, especially formulators, manufacturers, and distributors in the USA.

Globally, the total addressable market (TAM) for digestive health supplements is valued at USD 10.5-11 billion. With an annual growth rate of 6-9%, projections for 2030 exceed USD 17-20 billion. The service addressable market (SAM) focuses on regions with high demand for evidence-based prebiotic ingredients. Such as Europe, North America, and parts of Asia, and is estimated to reach USD 11,4 billion by 2030. The serviceable obtainable market (SOM) aims to capture 1% of the SAM, equating to USD 114 million, representing a significant revenue stream given the growing consumer interest in clinically proven products.

Key factors influencing purchase decisions among target customers include proven efficacy and cost in use.

### Competition and demand

OCEANIUM has not identified specific competitors, but it has identified a range of prebiotic competitor products. Marinova and Hi-Q offer fucoidan products, though they are not currently targeting the gut-health market. Their competitors target the global market. OCEANIUM believes its product stands out due to its efficacy, low dosage, and sustainability.

In terms of competitive advantage and company strengths, OCEANIUM is the first company to develop an economically viable, environmentally friendly, sustainable solution with a zero-waste biorefinery approach to extracting food ingredients, nutraceuticals, and material ingredients from sustainable kelp. This differentiates them from competitors who only make a small number of the products and do not optimize for full extraction of high-value products. Competitors depend on wild-harvested seaweed, which is less sustainable and primarily aimed at lower-value markets such as feed and fertilizer.

Recently, some farming-oriented start-ups have been focusing on the biorefinery approach. However, OCEANIUM believe it has a first-mover advantage in biorefinery with at least a two-year lead in advanced development.

OCEANIUM has identified a demand for the product but cannot disclose this information due to competitive sensitivity.

### Distribution

The targeted distribution channels are experienced nutritional supplement distributors in the USA, who are well-versed in handling all product-related logistics. The company anticipates no issues with distribution and logistics.

### Price

The pricing strategy currently is premium pricing linked to volumes. A high initial price can be justified by the product's quality, efficacy, and sustainability.

The willingness to pay for the product has been verified. The cost of use is noted as an important consideration.

### Insights gained from customer testing in relation to the preliminary GTM strategy

Testing the product with customers revealed that clinically validated health claims are essential. This insight led to a significant adjustment in the GTM strategy, specifically bringing forward the timing of the gut-health clinical trial. OCEANIUM conducted a 90-day randomized clinical trial comparing a placebo to OCEAN ACTIVES® H+, which was completed in December 2024.

Customer evaluations of the product's other strengths fit well with the initial GTM strategy. The technical dossier received

positive feedback from customers, which has reinforced the focus on key features such as efficacy and dosage. Customers did not identify new strengths, and their feedback regarding product strengths did not influence the company's GTM strategy.

Customer evaluations of the product-market fit closely matched the company's initial expectations, which were outlined in its preliminary GTM strategy. The product's strengths were positively received, and the customers identified some niche applications that could enhance differentiation. However, this feedback did not influence the company's overall GTM strategy.

No new target markets have been identified due to customer feedback. Customer feedback did not change the company's perception of the factors that influence a target customer's decision to purchase the product.

Customer feedback has influenced the company's perception of competition by providing a better understanding of key features and selling points. This feedback has also clarified how their product is different from their competitors, with aspects such as efficacy, dosage, and cost-in-use.

The feedback from customer testing has not changed the initial plan regarding distribution channels for the product.

No customer feedback influenced the company's initial pricing strategy. However, customer feedback did note the importance of the product's price being linked to the cost in use and the question of dosage.

### Maximize market uptake

The key factors to maximising market uptake for bioactive fucoidan in the nutraceutical market are improving the technical data, conducting additional efficacy testing (clinical trials), and developing product dossiers.

### Minimize enterprise risk

The most significant risks relating to the production of OCEAN ACTIVES® H+ are related to the quality and composition of the biomass supply. OCEANIUM prefer to process wet biomass, but access to this raw material is impossible now. Europe has stricter requirements calling for lengthy and expensive clinical trials, as they require accurate, reliable data. In the short term, this causes a delay in the market, but the result is an advantage in the long term as it offers trustworthy validation of health claims, which will improve the marketing and uptake of the product.

## 3.4 Green alginate in cosmetics

### Product description

Alginates represent a wide family of polysaccharides with polymers of mannuronic (M) and guluronic (G) acids. Features such as high viscosity, gelling properties, and high stability

make alginate an important industrial polysaccharide (Angra *et al.*, 2021).

Alginate is a natural cosmetic ingredient with moisturizer and skin-protecting effects. In skincare products, alginates act as carriers, safeguarding unstable active compounds and enhancing product efficacy. Additionally, alginates help to encapsulate unpleasant-smelling substances, resulting in products with minimal or no odour (Łętocha *et al.*, 2022).

The green alginate is an alginate that has been manufactured using eco-friendly processes and chemical-free extraction. The goal is to limit or eliminate the use of chemicals while reducing CO2 emissions.

Green alginates designed for cosmetic applications serve as texture modifiers and help stabilize emulsions. While their functionality is like traditional alginates, their eco-friendly approach of green alginates makes them more appealing for sustainable cosmetic products.

### Product strengths

Algaia has identified several strengths of green alginate produced from seaweed. One strength of this product is that it is from a natural, plant-based origin. Furthermore, the fact that it is derived from marine sources could also be perceived as an added value. Seaweed alginate represents a dependable ingredient source with low volatility in supply.

Another important strength is that the production involves eco-friendly processes. One of the main goals of Algaia is to develop eco-friendly extraction techniques that limit or, whenever possible, eliminate the use of chemicals while reducing CO2 emissions. This is also one of the goals of Seamark. If successful, it will be possible to use the claim "solvent-free" and achieve organic certification.

Another strength is its high viscosity, gelling properties, and high stability, which make it versatile through a wide range of applications. A potential strength of alginates is health claims. The product is also highly biodegradable.

As of now, no green alginates are on the market classified under COSMOS or NATRUE standards. The NATRUE Label represents a reliable, verifiable and internationally applicable standard for authentic natural and organic cosmetic products and raw materials (NATRUE 2025). However, Algaia is positive they will be able to reach these standards, and that will be a great strength and a unique selling point for their green alginates.

### Product market fit

There is a scarcity of sustainable texturizers from marine sources in the market. Most natural texturizers come from animal sources like gelatine, which may not be suitable for all customers due to sustainability concerns, religious reasons, and ethical beliefs. A plant-based source, such as green

alginate, is more sustainable and aligns better with market demands.

Pectin, the main plant-based alternative, can be less reliable as its production depends on the availability of fruit by-products. Carrageenan is also a strong competitor, but its production has a high carbon footprint and energy consumption.

Many alternative products are produced using heavy chemicals and are not as sustainable as Algaia's green alginate. The natural and sustainable origin of Algaia's product makes it quite unique in cosmetics.

However, there is a concern that the colour and smell of the product may still have to be altered to fit this market.

### Target market

The target market for the product is well-defined, focusing on cosmetic formulation companies globally, particularly in France and China.

The exact size of the alginate cosmetic ingredient market is difficult to determine, as market studies often focus on active ingredients. However, the total alginate market was valued at approximately USD 728 million in 2020, with an expected growth rate of 5% until 2028. It is estimated that around 5% of this market value is attributed to cosmetics.

Key factors influencing purchase decisions in the target market include:

- Naturality.
- Marine origin.
- Carbon impact.
- Recycling capabilities.
- Certifications like COSMOS or NATRUE standards.

### Competition and demand

Numerous competitors exist, but many use chemicals in their production processes, unlike Algaia, which avoids chemical preservation and drying. Algaia has identified a single competitor from Japan, which produces low volumes at high prices. Other potential competitors include some Chinese companies and Alginor in Norway, though their market presence in cosmetics is unclear.

In Algaia's view, one of their competitive advantages lies in local production. Their proximity to the second-largest brown seaweed source in Europe ensures a short supply chain and regular fresh seaweed supply. Their products are sustainable through eco-friendly processing and sustainable raw material sourcing. In addition, their technical support, including quality control for functionality, stability and bioactivity, is another advantage over competitors. Their customers also appreciate Algaia's flexibility with small-scale sourcing and production.

Algaia's main weakness is price. They have higher production costs compared to large multinational competitors, who can leverage economies of scale and logistical capabilities.

The global total alginate market is estimated at over 12,000 tons, with Algaia holding less than 10% market share. Green alginates see potential to grow market share, especially in cosmetics, focusing on high-value applications with smaller volume demands and higher willingness to pay.

The demand for green alginates is not well-defined as of today, but the use of alginates in cosmetics is increasing. Future demand is expected to increase with proper positioning and certifications like COSMOS and NATRUE.

### Distribution

Algaia uses direct sales and a global network of ingredient distributors. Direct sales are made to large multinational companies such as L'Oréal. JRS, Algaia's parent group, also has direct sales from its 30 offices worldwide to major cosmetic formulators and producers.

There are no issues with distribution at this point. Distribution costs vary but are typically around 15% to 20% of the sales cost. However, these costs can be lower if distribution is taken care of through JRS.

### Price

The product will be priced as a premium offering due to its unique NATRUE and COSMOS certifications. The strategy emphasises the product's unique technical advantages and certifications, positioning it as a premium option in the market.

Due to the price of biomass, the product will have higher production costs. Algaia plans to add up production costs and assess the possible markup through discussions with long-term partners. Initially, sales volumes will be limited to each customer at a fixed price. As production volumes increase, more can be allocated to each customer.

Algaia estimates a market value of EUR 25-50 per kg. The company is still refining key product elements like colour and odour but is confident in absorbing extra production costs and applying a slight markup for cosmetic applications.

With certifications, the price could be 25-30% higher than classical alginates, or even more, since the incorporation of such solutions is not in high proportions in the end-product.

### Insights gained from customer testing in relation to the preliminary GTM strategy

Customers showed interest in the product's certification potential. However, issues with colour and smell need to be addressed. Feedback on product strengths did not significantly influence the initial GTM strategy.

The product is perceived to fit well in the market, though pricing may need adjustment. Customer testing didn't identify any new product-market fit. However, the novelty lies in the potential certifications.

Customer testing could influence pricing strategy in the future, depending on ease of use, obtaining certifications, etc. Willingness to pay is now estimated at a 30-50% increase over current alginate solutions.

The most important takeaways from customer testing were the uniqueness of the product and the possibility of accessing certifications. What failed in the initial GTM strategy was making sure that customers would pay the price for it.

Other SeaMark activities have not impacted the initial GTM strategy to this point. The most important influence is the customer testing. Particularly regarding insights into market evolution and certifications. It is described as very important for justifying certifications and potential price increases.

### Maximize market uptake

There were no new insights from customer testing concerning product safety or legislation that could influence market uptake. Practical challenges with colour and smell were encountered. Also, certification of COSMOS and NATRUE is crucial for maximising market uptake.

Key considerations for GTM strategies going forward:

- Focus on certification potential to enhance product uniqueness.
- Address issues related to colour and odour to meet market expectations.
- Consider price adjustments based on real certifications.
- Leverage the product's sustainable and eco-friendly attributes.
- Ensure clear communication of the product's unique points to justify premium pricing.

### Minimize enterprise risk

The costs and smell of the product are the only identified enterprise risks related to the product. There were no identified risks for legislation and regulations for the product.

## 3.5 Green alginate in Food

### Product description

The flagship product, green alginate, is produced by Algaia. Alginates are natural polysaccharides, polymers consisting of copolymers of mannuronic and guluronic acids. Features such as high viscosity, gelling properties, and high stability make alginate an important industrial polysaccharide (Angra et al., 2021).

Alginate is used as a gelling and thickening agent in many food applications and categories such as ice cream, snacks,

dressings, puddings, creams, processed cheese and powdered products. It also has a unique property to create non-thermo-reversible gels useful for vegetable or meat chunks, casings and stuffings.

Green alginate is an alginate that has been manufactured using eco-friendly processes and chemical-free extraction. Algaia alginates are naturally occurring polysaccharides produced from brown algae.

Other applications than food include cosmetics, supplements, medical devices, pet food, textiles, welding, paper, and the latex industries. Examples of applications are biofilms, capsules, fibres for textiles and plasters, dental impressions, and stabilising pigments and gels. Green alginates are used as an ingredient in secondary processing (e.g., encapsulation systems) or by end users (e.g., cosmetics producers).

### Product strengths

Green alginate is a variant of classical alginates. The "green" aspect signifies that the product is produced without solvents like formaldehyde, ensuring a formaldehyde-free process. This process is one of the strengths of the product, making it safer and more environmentally friendly. It makes the product stand out in the market due to its unique production process.

The product's USP is to be the only alginate on the market produced through a formaldehyde-free process, offering a distinct advantage over competitors.

To ensure the unique features of the product are clearly conveyed, it is essential to train the distributors.

### Product market fit

The product addresses a possible future regulation about using formaldehyde in making alginates. It aims to address the issue of heavy chemicals like formaldehyde in the production process, even though the final alginate is formaldehyde-free. This is especially important for food applications where information about additives is limited. Green alginate stands out by offering a long-term solution that removes heavy chemicals from the production process, setting it apart from other market options.

### Target market

Currently, there is no significant problem in food applications, but potential regulatory changes could impact the agro-industry. Algaia hasn't identified its target market, but a potential market might be the vegan market. Communication about additives towards this segment is more crucial, making it a potential target. This segment is global and is valued at approximately USD 16.55 billion in 2022, with an expected annual growth rate of over 10% until 2030. A small share of this market could purchase green alginates, with several hundred tons expected to be sold, according to Algaia. Influencing factors for purchase are the distinctiveness of green alginates

compared to other sources, with emphasis on their environmentally friendly production process.

### Competition and demand

One competitor, Alginor in Norway, claims to offer green alginates, but according to Algaia, they are not yet available on the market. Also, there are some potential competitors, Chinese companies, but their claims lack verification. These competitors' target markets are primarily Europe.

Algaia differentiates itself from its competitors by offering larger volumes and a wider variety of alginate types with higher viscosity. Its long-standing market presence, inherited expertise from Cargill, and significantly larger production capacity distinguish Algaia from its competitors.

Despite that, a clear demand for the product has not been identified. However, Algaia anticipates that an increased demand may arise due to potential regulatory changes.

### Distribution

The distribution channel for Algaia's product has been identified. They have direct distribution to major clients such as Unilever, Nestlé, Coca-Cola, and Ruitenberg. In addition, they will use ingredient distributors in smaller countries.

Distribution costs are known but not shared at this moment.

### Price

The company's pricing strategy focuses on keeping prices as low as possible to be able to compete with Chinese products. Efforts are made to reduce production costs, with margins capped at 3% for commodity applications.

Customers are willing to pay for the green alginate based on competitive pricing, but it does not exceed EUR 20 per kg nowadays.

### Experience from customer testing

The product's customer testing revealed several key insights. Green alginates exhibit similar characteristics to classical alginates but have a darker/yellowish colour, which may pose a challenge. Customers identified no new strengths. There is uncertainty regarding the market demand for green alginates in food applications, and no new product-market fit was identified. No new customers were identified, but the vegan market is a potential target due to the importance of communication about additives.

Customer feedback did not alter the perception of competition or production differentiation, and there is no improved understanding of demand. No increase in demand is anticipated due to price sensitivity and the absence of regulatory changes. However, there is potential for a higher willingness to pay in the vegan market if cleaner claims are emphasised.

Significant feedback was received regarding the product's colour, and adjustments may be necessary to improve it, though this would increase costs. There was limited success in food applications due to issues with pricing and positioning. No adjustments were made based on other activities, but a key insight was the difficulty in positioning green alginates in the food market. These takeaways underscore the need to address the product's colour, explore the vegan market, and consider the potential impact of regulatory changes on demand.

### Maximize market uptake

Customer testing did not provide significant insights into product safety, as classical alginates are already formaldehyde-free. However, customer testing is more about perceptions of the process.

There are no changes planned for legislation according to customers.

Key factors for maximizing market uptake will include:

- Getting the colour that the market requires.
- Changes in regulations.
- Strategic communication positioning.
- Targeting niche markets like vegan products.

### Minimize enterprise risk

The most significant risk related to the product is that it has no market differentiation, so there is only price competition. Furthermore, potential regulation could force the acceptance of new green alginates and thereby increase the willingness to pay. However, there is also a risk that they would switch to alternative products.

## 3.6 Green alginate in packaging

### Product description

Alginates are naturally occurring polysaccharides, composed of copolymers of mannuronic and guluronic acids. Their high viscosity, gelling properties, and stability render them significant industrial polysaccharides (Angra et al., 2021).

Green alginate refers to alginate produced through environmentally friendly processes with minimal chemical input. Algaia alginates, derived from brown algae, exhibit versatile functionalities, serving as effective thickening agents, gelling agents, emulsifiers, stabilisers, biofilm, fibres, or moisture retainers across various applications.

Other applications than food include cosmetics, supplements, medical devices, pet food and in textile, welding, paper and latex industries as biopolymers. Examples of applications are in biofilms, capsules, fibres for textiles and plasters, dental impressions, and to stabilise pigments and gels. Green alginates are used as an ingredient, either in secondary processing (e.g., encapsulation systems) or by end users (e.g., cosmetics producers).

Green alginate is a versatile biopolymer used in packaging for film formation. It can encapsulate various fluids, such as water or ketchup, and create biofilms that protect surfaces like paper from grease and water.

### Product strengths

Algaia has identified several strengths of green alginate produced from seaweed. One strength of this product is that it is from a natural, plant-based origin. Furthermore, the fact that it is derived from marine sources could also be perceived as an added value. Seaweed alginate represents a dependable ingredient source with low volatility in supply, even if prices have suffered from strong decreases in the last two years.

Another important strength is that the production involves eco-friendly processes. One of the main goals of Algaia is to develop eco-friendly extraction techniques that limit or, whenever possible, eliminate the use of chemicals while reducing CO<sub>2</sub> emissions. This is also one of the goals of SeaMark. If successful, it will be possible to use the claim “solvent-free” and achieve organic certification.

Key strengths of green alginates for packaging:

- Natural Polymer – Green alginates for packaging are derived from natural sources, making it environmentally friendly.
- Degradability – It has excellent degradability, allowing it to be recycled in both industrial and individual composts.
- Compostable – Users can discard the packaging in their home compost, promoting sustainable waste management.

One of the products' USP is the green approach, limiting the use of solvents compared to other alginate producers, making it more environmentally friendly. In addition, the product is an alternative to Starch-based Biopolymers used by competitors. These competing products rely on terrestrial plant production, which requires water, nitrogen, pesticides, etc. Green alginates for packaging offer a more economical and sustainable production, where classical alginates involve expensive filter systems and petro-sourced flocculants.

### Product market fit

Green alginates for packaging work well for their intended applications, but there are concerns regarding their colour and production cost. There are no regulatory issues, as the alginate can be food-grade.

Green alginate addresses significant issues in packaging treatment and recycling. It offers a sustainable biopolymer that can be 100% recycled in home composts, offering a significant advantage across various market sectors. Unlike petro-sourced polymers, green alginate does not lead to microplastic production or require heavy recycling systems. Competitive biopolymers like starch and cellulose are derived from

terrestrial plants, which need water, chemicals, and heavy solvents for production. Green alginates offer a more sustainable alternative with fewer environmental impacts.

### Target market

Companies and sectors that use plastic packaging across various markets are experiencing the problem that green alginate aims to solve. Algaia is targeting the luxury and organic markets, with a preference for natural and sustainable products. Also, the food market, particularly the fast-food industry, seeks 100% biodegradable packaging solutions. G alginate film coating inside paper boxes is a viable solution.

- The luxury industry is primarily located in Europe, especially France and Italy.
- The paper industry is concentrated in Europe, mainly in Germany, Sweden, Italy and France.
- The Plastic Packaging Industry is predominantly in Poland, Italy and France, accounting for over 60% of the market in these three countries.

The biggest players differ between these three industries. Within the luxury industry there is LVMH in France that is by far their biggest customer. On the paper packaging industry major companies include Ancor, Smurfit, and Tetrapak. In the plastic packaging industry key players are Amcor PLC, Coveris Holding, and Sealed Air Corporation.

Price is the primary factor influencing purchasing decisions. Functionality and application mode play a part – ease of use and lack of restrictions are crucial. But traceability and sustainability are significant position factors for targeted customers.

### Competition and demand

Algaia has identified potential competitors for green alginate packaging. For green alginate, there is only one competitor from Japan—low volumes at very high prices. For alginates, in general, there are several companies that base their products on terrestrial plant solutions and classical alginates. In Europe, Alginor from Norway is also targeting a similar approach as Algaia. Competitors are likely targeting the same markets as Algaia with their green alginate Packaging solution.

There is a difference between the competing products. G alginate is derived from a different seaweed species, resulting in more gelling alginates compared to the more viscous alginates of their competitors. Competitors' alginates may be more complex to use in packaging solutions. Also, the competitors may have lower production costs due to the use of wild seaweed stock, but their long-term sustainability positioning may be challenging. Quality is similar, but green alginate offers better customer support due to extensive experience in alginate applications. However, competitors have a strong marketing strategy.

Algaia regards their strengths compared to competitors to be their expertise in process and analytical capacity, market

expertise and an existing customer network and cultivated seaweed sourcing.

Their weakness compared to their competitors is higher production costs and a heavy structure due to group ownership.

The demand for green alginates within paper coating applications is estimated to be between 5 and 20 tons, with potential growth depending on market expansion. The demand for bioplastic applications is currently small, with only a few tons anticipated.

The increase in demand is contingent on price and market demand. However, prospects and interest in sustainable solutions like green alginates are viewed as promising.

### Distribution

Algaia has identified distribution channels, and for all its products, it is business-to-business, B2B. Its primary targets are formulators, which are companies that provide packaging solutions to the end consumers mentioned earlier.

Their only concern with distribution is to ensure that customers at all levels, from direct B2B customers to large groups, are aware of the product and its benefits. The distribution costs have not yet been determined.

### Price

Algaia has identified a pricing strategy for green alginates for packaging. The objective is to set a price that ensures decent margins, targeting higher value markets and limiting volumes to manage supply if the product achieves strong sales.

The strategy involves positioning the product at a price point that balances profitability with market positioning. By focusing on higher value markets, the aim is to achieve better margins while controlling supply volumes. Their estimations are around EUR 20/kg.

The exact numbers of customers who are willing to pay for green alginate has not yet been determined.

### Insights gained from customer testing in relation to the preliminary GTM strategy

Algaia hasn't received any customer feedback yet due to limited pilot production. Samples have been sent, but evaluations are pending. So, as of now, the GTM strategy remains unchanged due to the lack of feedback.

Their potential customer is looking for alginates from cultivated seaweeds. If technically satisfied, a good market fit is expected. However, the customer is concerned about high prices for cultivated seaweeds. In that light, the customer is considering sourcing alginates from cheaper *Sargassum* species, which indicates competitive pressure.

### Maximize market uptake

Since customer feedback is still limited, no takeaways on product safety, legislation, or practical challenges were reported. However, price and volumes are key factors for maximizing market uptake.

### Minimize enterprise risk

The highest risk relates to seaweed production costs and volumes. There are no regulatory risks, and potential regulations restricting the use of plastic could support market uptake.

## 4. CONCLUSION

This report describes the results of pilot-scale testing of 6 SeaMark products. The results have been used to update the GTM strategies and give recommendations on how to minimise enterprise risk and maximise market uptake. Below is a summary of the GTM strategies and recommendations for the different products:

OCEANIUM® PET is a unique, multi-complex extract from sustainably sourced seaweed, providing health benefits for pets, including joint support, skin and coat health, and microbiome and gut health. Customer testing insights include positive feedback confirming product strength and differentiation. In terms of maximizing market uptake, customer testing has confirmed that the product meets industry safety and regulatory requirements. The next step to ensure market uptake is conducting clinical trials in 2025-2026 to validate health claims. Maintaining the quality and composition of biomass supply is crucial to reducing enterprise risk. Another potential enterprise risk is the lengthy clinical trials required for the European market. This may delay market entry, but the results can ultimately benefit the product. Reliable validation of health claims enhances marketing efforts and increases product adoption, thereby maximizing market uptake.

OCEAN ACTIVES® C+ is a high-purity, water-soluble bioactive ingredient from sustainably farmed seaweed. Clinically tested, it reduces skin redness by 96% and works 2.5 times faster than untreated skin. Produced using clean, water-based chemistry, it is effective at just 1% inclusion. It can be used in various cosmetic formulations, including moisturizers, masks, overnight treatments, after-shave creams, and sun care products. Customer feedback insights showed the need for COSMOS compliance. The preference of some customers for a white product necessitates steps to optimize the extraction processing. Customers independently validated the product's efficacy, finding it easy to formulate. The feedback aligned well with the initial GTM strategy, particularly the sustainability aspects. To maximize market uptake key factors were improving technical data, additional efficacy testing, preparing comprehensive product dossiers and obtaining COSMOS certification. To minimize enterprise risk maintaining the

quality and composition of the biomass supply is crucial. A processing challenge is the current unavailability of wet biomass, which OCEANIUM prefers to use.

OCEAN ACTIVES® H+ is a high-purity marine bioactive ingredient rich in fucoidan derived from sustainably sourced brown seaweed (*S. latissima*). It offers multiple benefits, such as enhancing good bacteria, reducing inflammatory bacteria, and supporting gut health. It serves as a clean-label ingredient for food, beverages, and supplements. Customer testing highlighted the importance of clinically validated health claims, prompting an adjustment in the GTM strategy and the timing of the gut-health clinical trial. Additional customer feedback was consistent with the initial GTM strategy. To maximize market uptake, it is essential to focus on improving technical data, conducting additional efficacy testing through clinical trials, and developing comprehensive product dossiers. To minimize enterprise risk

maintaining the quality and composition of the biomass supply is important. Lengthy and expensive clinical trials in Europe, causing short-term delays, are a risk, but may offer long-term advantages through trustworthy validation of health claims.

Green alginate for cosmetics is a natural, plant-based ingredient that serves as a texture modifier and helps stabilise emulsions. Its benefits include versatile applications, high viscosity, gelling properties, and stability. The eco-friendly production processes, aimed at reducing chemical use and CO2 emissions, could lead to "solvent-free" claims and organic certification. Customer testing has shown interest in the product's certification potential but has identified issues with colour and smell. While the product fits well in the market, pricing may need adjustment. The key takeaways are its uniqueness and certification potential. To maximize market uptake, it will be essential to achieve COSMOS and NATRUE certification, address colour and odour issues, leverage sustainable attributes, consider price adjustments, and at the same time clearly communicate the product's unique points to justify premium pricing. To minimize enterprise risk, addressing the costs and smell of the product will be beneficial.

Green alginate for food is a natural polysaccharide derived from brown algae, known for its high viscosity, gelling properties, and stability. It serves as a versatile thickening, gelling, emulsifying and stabilising agent. The eco-friendly production process, which eliminates the use of solvents like formaldehyde, is a significant strength, making green alginate safer and more environmentally friendly than competing products. Green alginate's unique benefit is its status as the only alginate produced through a formaldehyde-free process, enhancing its appeal in the market. Customer feedback shows that while green alginates exhibit similar characteristics to classical alginates, their darker/yellowish colour may pose a challenge. No new strengths were identified, and there is uncertainty regarding market demand for green alginates in food applications. The vegan market emerged as a potential target due to the importance of communication about

additives. Price sensitivity remains a challenge in the alginate for food market. Thus, to maximize market uptake, it will be important to address practical challenges with colour, which may require additional processes and increase costs. It will also be important to identify and target high-paying niche markets like vegan products. To minimize enterprise risk, exploring ways to enhance market differentiation is important. Additionally, potential regulatory changes and market reactions to these should be closely monitored. While regulatory changes might boost demand and willingness to pay for green alginate, they could also lead to buyers switching to alternative products.

Green alginate for packaging is a natural biopolymer that can be used as packaging film and coating. The eco-friendly production process, which minimises chemical input and eliminates solvents like formaldehyde, is a significant strength, making green alginate safer and more environmentally friendly. This unique production method sets it apart in the market, offering a distinct advantage over competitors. Other benefits are that it is a natural polymer, degradable and compostable, making it an environmentally friendly material. Green alginates offer a more economical and sustainable production method, avoiding the need for expensive filter systems and petro-sourced flocculants used in classical alginate production. Due to limited pilot production, Algaia has received limited customer feedback. Samples have been sent out, but evaluations are still pending. On a general level, customers expect a good market fit if the product meets technical requirements. However, concerns about the high prices of cultivated seaweeds lead customers to consider sourcing alginates from cheaper *Sargassum* species, indicating competitive pressure. Key factors for maximising market uptake include addressing price and volume concerns to better meet market demands. Additionally, gathering more customer feedback is important to fully understand how to enhance market uptake. To minimize risk, identifying alternative suppliers of seaweed will be important.

In conclusion, an updated GTM strategy has been developed for the 6 SeaMark products. According to industry partners Algaia and OCEANIUM, the updated GTM strategy did not significantly differ from the initial strategy of the companies but is more detailed and product-specific compared to the initial GTM strategy in D7.1 and D7.3. This increased specificity may be due to the industry partners' greater comfort in sharing their GTM strategies after further validation through customer testing. Additionally, new GTM strategies for dietary fibre and green alginate for packaging have been introduced. This strategic adjustment by the SeaMark consortium reflects new insights, market opportunities, and barriers identified during the product development phase, showcasing a dynamic and responsive approach to new knowledge.

Comparing the GTM strategies reveals that each product has distinct strengths, with a shared focus on sustainability and customer feedback to guide the GTM strategies. The key

aspects of sustainability include using cultivated seaweed as a sustainable raw material and ingredient and employing sustainable processing methods characterised by zero-waste, low water usage, and the reduction or elimination of chemicals. The emphasis on these sustainability factors varies across the products. Compared to the initial GTM strategies, providing science-backed efficacy supported in vitro and clinical testing for OCEAN ACTIVES® C+ has been important to ensure market uptake. Similar validation of health benefits will be important for OCEANIUM® PET, OCEAN ACTIVES® H+ and green alginates in cosmetics. Both OCEANIUM and Algaia highlighted the importance of the COSMOS certification for cosmetic products. Customer testing also revealed potential issues with the colour of both cosmetic products, which need to be addressed to maximize market uptake. There are generally few identified risks related to legislation and regulations for the products. Regulatory changes are rather perceived as a potential advantage, especially if they impose greater demand for sustainability. To minimize enterprise risks, it is important to address the colour and smell issues with the cosmetic products. Maintaining the quality and composition of the biomass supply, as well as identifying alternative suppliers, is crucial. Additionally, validating health claims for OCEANIUM® PET and OCEAN ACTIVES® H+ is essential.

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