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Algae Based Sustainable Business Concepts

This infosheet gives readers a glimpse of two courses held at the University of Vaasa where sustainable business development challenges were approached by marketing and international engineering students. New business concepts include both micro algae and macro algae as future fuels, services and food. Through these activities, a lot of knowledge has been spread about algae based business opportunities to a large group of students.

OPPORTUNITIES IN THE ALGAE SECTOR

The last years have seen a boom in algae based products and innovations entering the global market. We now find much diversity in the use of algae in products such as chemicals, fabrics, foodstuff, fertilizer and biofuels. Algae are earning their place as raw materials of the future sustainable circular economy and the interest for this sector is rapidly growing.

The TransAlgae project organized a seminar in Vaasa September 2018 gathering 70 people to hear about the latest project findings. It also served as a kick-off for two courses held at the University of Vaasa and in collaboration with NOVIA UAS of which the results are presented in the following sections.

MARKETING CONCEPTS FOR MICROALGAE PRODUCTS

The "Marketing concepts for micro algae" course, taught by marketing professor Hannu Makkonen, involved 30 business students with the aim to develop marketing concepts for microalgae products. The task included mapping central ecosystem actors and understanding their value logics for a chosen product or service, as well as the business built around it (e.g. customer groups, needs, value-proposition, central resources and how they are used in the network).

The intensive 5 week process gave future marketing experts insight into multiple opportunities (and challenges) with micro algae. Table 1 shows the final business concepts as well as stakeholder value creation logics for algae-based products and services created by 8 working teams. At the end of the course, the concepts were presented for a "shark tank" jury including Leif Åkers, Stormossen CEO, Tauno Kekäle, VAMK rector and Erkki Hiltunen, Professor at University of Vaasa.

Business Concept för microalgae	Description of value creation logic
Water cleaning service and food product	Micro algae as a water cleaning service for pulp mills, the biomass as feed for livestock.
Wastewater / waste treatment and biofuel biomass	Making ponds for cultivating algae in livestock manure (farms). Biomass sold for biofuel production by local or national actor.
Ecosystem actor for producing composite plastics using micro algae	The Biomine service includes "green algae certificate" and works as central ecosystem actor that ties together other actors for producing composite plastics using micro algae
Removing toxic blue algae from sea and use it as energy biomass	Core concept is to clean up Baltic Sea by commercializing the exploitation of blue-green algae as part of a social project.
Natural cosmetic bar shampoo	Later a complete range of algae, natural cosmetic product series.
3D Biodegradable plastics and plastic composites	"From micro-algae to plastic" Micro algae biomass production for producers of 3D printing materials

MARKETING CAPSTONE COURSE FOR MACRO-ALGAE AS FUTURE FOOD

The second course in autumn 2018 was coached by marketing lecturer Minna-Maarit Jaskari with the aim to build value-based brand concepts for the commercialization of macro algae as food products. This marketing development challenge was tackled by multidisciplinary teams including 20 marketing students from University of Vaasa and 4 environmental engineering students from NOVA with Andreas Willfors as their responsible teacher. Students were taken on a deep dive into the world of the marine world, design thinking, food-taste and texture, sustainability, market trends, packaging, food safety and technology. The final representation of the brand concept included webpage and poster.

4 food concepts

Altogether 4 food concepts were born out of this process: protein powder, healthy snacks, granola and algae shots as well as vegan meat-a-like protein (see pictures and homepages). This course also ended with a shark tank with both business and research representatives giving tough feedback; Salla Niskanen (PhD Researcher University of Vaasa), Magnus Berg (CEO Berg Trading) and Shiva Sharma (Environmental engineer at NOVA).



Healthical - [link](#)



Ocean powder - [link](#)



Green Gold - [link](#)

Red Veg - [link](#)

CONCLUSION

The interdisciplinary collaboration brought a lot of valuable insights and was appreciated by the students. The engineering students, coming from different European universities, participated through an Erasmus-financed exchange semester, where the goal is to learn to work in a multidisciplinary and cultural environment. Working together in on this task gave insight into both marketing and working with Finns. The marketing students from Finland also gained new insights into international collaboration and product (service) development processes for new innovations.

The course findings show that algae are considered as a potential future food megatrend and there is a wide range of existing products as well as new innovations. Algae as an "environmental service" or biofuel holds a lot of potential as well and it is important to continue research in these different areas.

The courses also showed that algae are not only stand-alone products but benefit from being considered as part of systemic solutions. Uncovering and removing barriers hindering full-scale market entrance is of high importance at this stage. Most products and services presented in this infosheet, call for further research, technological development, changing consumer attitudes as well as policies that support the further development of sustainable solutions and of course, new business models.

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