

# MAGNIFICENT

**M**icroalgae **A**s a **G**reen source for **N**utritional **I**ngredients for **F**ood/Feed and **I**ngredients for **C**osmetics by cost-**E**ffective **N**ew **T**echnologies

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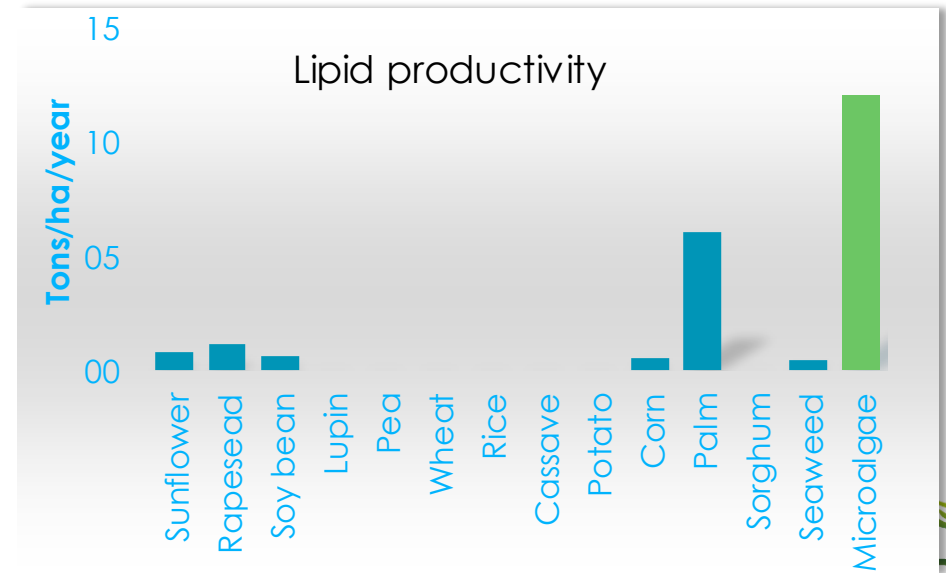
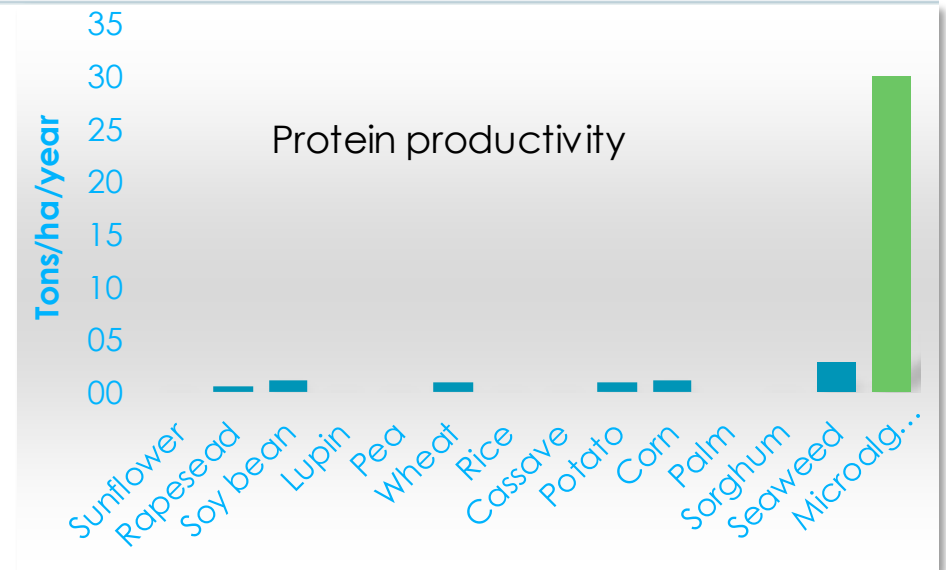
Do we have the basis to fuel growth ...?

Where will the ingredients come from...?

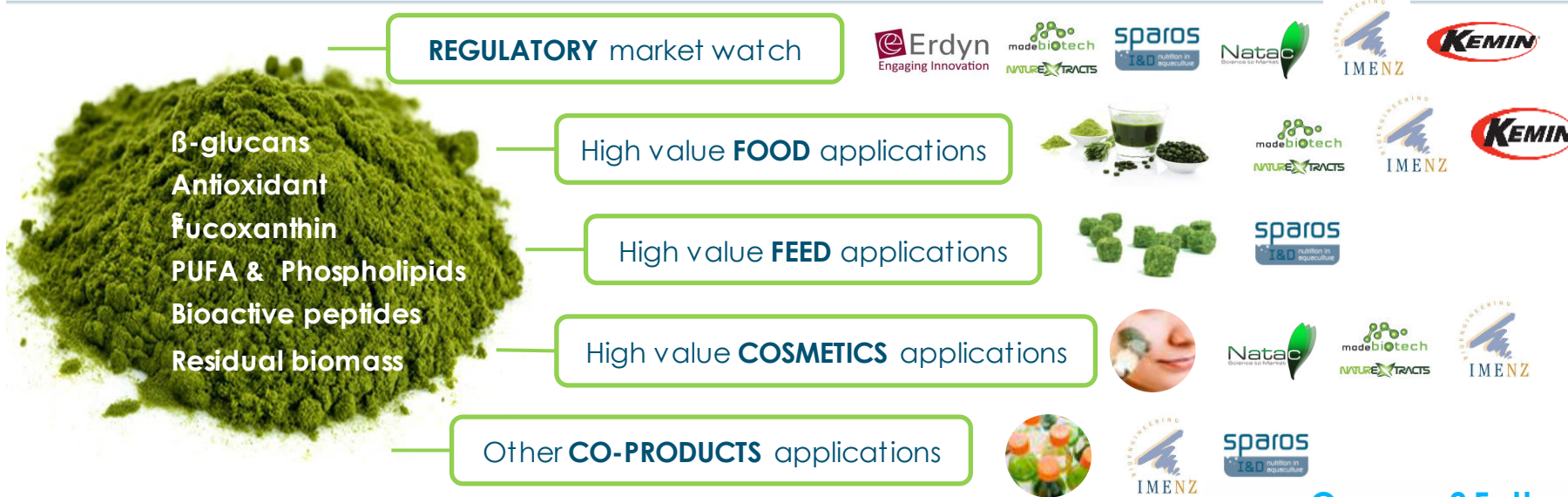
# Challenge: Sustainable ingredients

## Why Microalgae ?

- Primary producers
- Grow in seawater
- No requirement for arable land
- High productivities



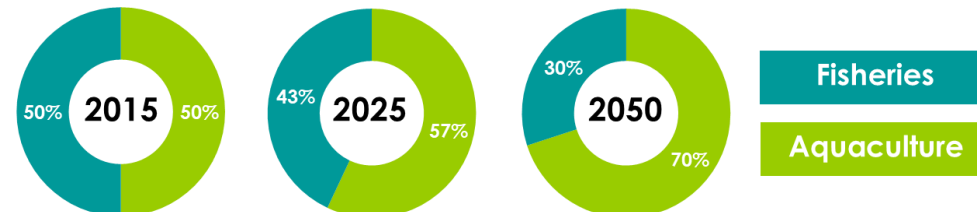
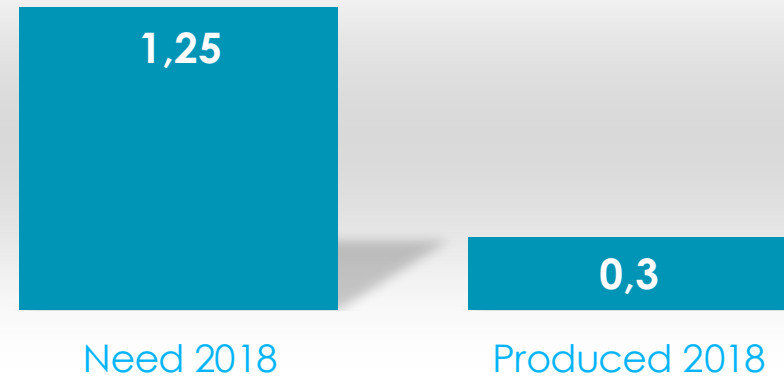
# Challenge: Sustainable ingredients



## Omega-3 Fatty Acids

- Essential for Human health, namely EPA and DHA
- Present supply is unsustainable: **Fish**
- Global shortfall in omega-3 fatty acids,

Omega-3 Fatty acids (x million ton)







Practical diet with defatted biomass of *N. gaditana* and algal oil allowed the successful replacement of fishmeal (80%) and fish oil (30%)

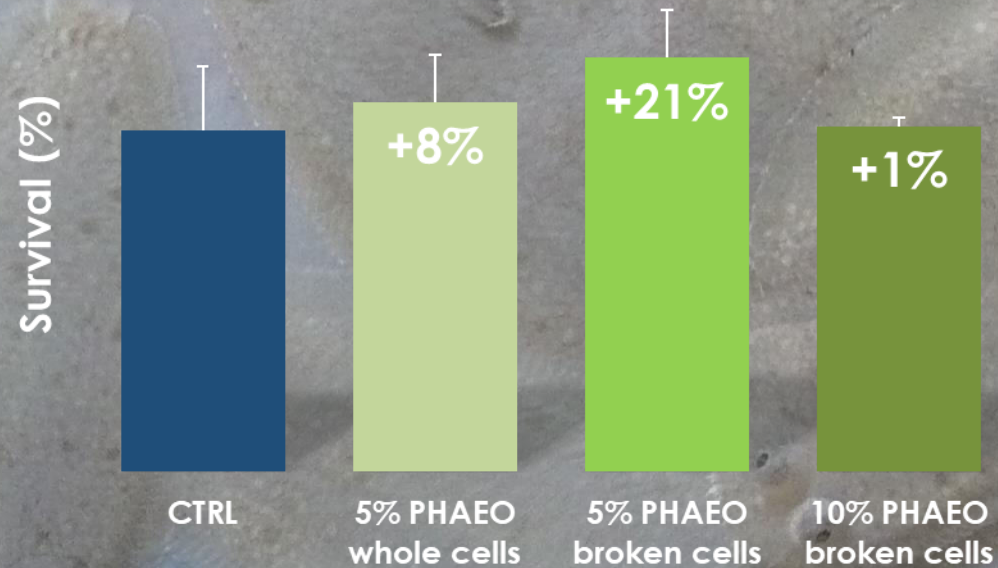
Functional role of  
microalgae in  
gilthead seabream

A consumer panel characterised algae-fed seabream as  
having a more vivid and typical operculum pigmentation



# Functional role of microalgae in Senegalese sole

Diet with 1% of fucoxanthin-rich algae (*P. tricornutum*) improved immune response to stressful events in sole juveniles



Diets with 5% of a broken cells extract of *P. tricornutum* did not affect growth, but significantly enhanced the survival of sole larvae



# Main achievements

New commercial & sustainable products with algae inside

- ❖ Replacement of marine oil from krill and copepods in aquafeed
- ❖ Replacement of fish meal by residual biomass resulting from biorefinery
- ❖ Development and testing of new prototype cosmeceuticals
- ❖ development of new ingredients for the food industry

Development of economic viable production of algae by increasing product yield and reduced operational costs

Business plan for market expansion based on the ingredients produced

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## Cultivation and Harvesting



## Sustainable Ingredients production



## End-product formulation & Applications



# In a MAGNIFICENT World...



Algae (peptides, beta-glucans, fucoxanthin) validated as raw materials in functional beverages



Algae (peptides, antioxidants, phospholipids, fucoxanthin) validated as raw material in skin care products



Algae peptides with defined antimicrobial activities and potential applications in food, feed, cosmetics, etc...



Fish larvae feed with algae beta-glucans and phospholipids



Aquafeeds with residual algae biomass resulting from a downstream biorefinery approach

# Consortium: 16 MAGNIFICENT partners



**TOTAL**



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