Veien mot produkter for humant konsum

Kjartan Sandnes, CSO Biomega Group AS
Regional FoU mobilisering for økt verdiskapning i biomarin næring
Ålesund, 20. september 2017
The global challenge

69% Required increase in food calories to feed 9.6 billion people by 2050

Sources: http://ow.ly/rptMN

WORLD RESOURCES INSTITUTE
The global food sources

- 6.5 bill. t. (85.1 %) Vegetables and Cereals
- 1 bill. t. (13.1 %) Animal Products
- 140 mill. t. (1.8 %) Fishery and Aquaculture

Source: FAO stat 2008
Projected Population Growth (in billions)


Sources: http://ow.ly/rpfMN
In terms of value, the market is expected to register a CAGR of 6.5% during the projected period (2021).

Growing popularity of plant protein ingredients is expected to push certain key products, such as soy and pea proteins to grow at high rates.

Egg and dairy products are expected to witness considerable demand in the future.

Increasing consumer demand for ‘purer’ products with low processing is enabling development of new products such as micellar casein and native whey.

The other factors driving the market are increasing adoption of protein ingredients in food and beverage products, and growing consumer preference for fortified foods or foods enriched with protein ingredients.

Transparency Market Research (TMR)
### Some key figures

**FAO OUTLOOK UNTIL 2050: TIMES 1.6!**

<table>
<thead>
<tr>
<th>PROTEIN TYPE</th>
<th>2010</th>
<th>2050</th>
<th>% CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOVINE</td>
<td>66.7</td>
<td>107.5</td>
<td>62%</td>
</tr>
<tr>
<td>POULTRY</td>
<td>98.9</td>
<td>201.9</td>
<td>104%</td>
</tr>
<tr>
<td>PIGS</td>
<td>109.3</td>
<td>150.3</td>
<td>38%</td>
</tr>
<tr>
<td>AQUA</td>
<td>59.9</td>
<td>113.7</td>
<td>90%</td>
</tr>
<tr>
<td>MILK</td>
<td>722.9</td>
<td>1119.7</td>
<td>55%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1057.7</td>
<td>1693.1</td>
<td>60%</td>
</tr>
</tbody>
</table>

The Biomega biorefining story

- 2000: Biomega AS established
- 2002: Production established with patented continuous enzymatic hydrolysis process.
- 2011: 30,000 tons raw materials processed.
- 2012: New plant with a capacity of 60,000 tons annually
- 2016: Aquired by Amerra Capital Management LCC, N.Y.
  Jørgen Horntvedt appointed CEO of Biomega Group AS.
2016: Global feed production surpasses 1 billion metric tons for first time

FOUR COUNTRIES PRODUCE OVER 60% OF COMPOUND FEED GLOBALLY

THE TOP FOUR AS A PERCENTAGE OF THE GLOBAL FEED PRODUCTION TOTAL

THE GLOBAL FEED MARKET AS A PERCENTAGE BY SPECIES

Source: 2014 IFIF estimates / National and Regional Associations
# Ingredients with a human market potential

## Salmigo® Protein hydrolysate
- Soluble and highly digestible marine protein
- Allows protein to be absorbed more directly, without the need for digestion
- Outperforming whey protein on bioavailability and uptake
  - Nutrition companies have for a long time been looking for alternative protein sources to whey
  - Several studies support marine protein’s position within human nutrition
- Final solid product contains ~90% proteins and are 100% water soluble
  - Traditional fish powders are not 100% soluble
- Improved taste and flavour
  - The combination of high nutritional value and neutral taste properties make the product ideal as a nutritional supplement in variety of end products
  - The spray dried product is stable and has limited risk of bacterial outbreaks

## Salmon Meal
- Biomega’s Salmon Meal is produced from top quality raw materials in order to have human grade standard
- The Salmon Meal contains between 66-70% of proteins
- Unlike the SPH, Biomega’s Salmon Meal has a defined fish taste, which makes the product a suitable nutritional supplement in products designed to taste like fish
  - Biomega can utilize its competence and process to adapt to customers requirements regarding taste and flavour
  - Ideal as an ingredient to fish soups and bouillons
- May replace less suitable products, as seaweed meal

### Applications
- Sports nutrition
- Healthcare supplements
- Protein supplements
- Soups and fish bouillon
Prioriterte kunnskapsområder for bærekraftig utvikling

Forskningsrådets vil styrke og målrette innsatsen innenfor områder særlig relevante for FN-målene der Norge har fortrinn og muligheter, og der forskning og innovasjon er særlig viktig for å møte bærekraftsutfordringer i Norge og globalt.

Prioriterte kunnskapsområder

Områder som bidrar til næringsutvikling som støtter opp om bærekraft og grønn konkurransekraft

> Rene, trygge og produktive hav
> Bærekraftig bioøkonomi
> Ren energi – grønn konkurransekraft
> Sirkulær økonomi
No more fish from wild capture?
Emerging options

Mesopelagic

Seaweed

Mussels

Insects
The R&D challenge

Enzymes go to work

Raw material
MARINE AND TERRESTRIAL

Process

Product

Sales & Marketing
Biotechnology...

...sets great things in motion