Blue Mussel cleaning and processing
New cultivation and processing in Iceland

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OBO - Northlight Seafood
Blue Mussel Aquaculture

- Shells found in kitchen midden from 6000 BC
- Cultivation from 13\textsuperscript{th} Century
- Pole vs Bottom cultivation
How to strengthen and upscale existing and new technologies?

- Northlight Seafood aims at using a new method, developed by Kristján Ingi Daðason.
- The rafts float on the surface of the sea and are in sea camouflage.
- The larvae sticks to breeding lines underneath the rafts, where they grow for two years before harvesting and put on market.
The rafts

6.1 m

2.44 m
The rafts are lift up a board and mussels put in silo.

Conveyor belt moves them into containers full of sea water.
Process

The mussel is kept alive and cleaned with sea water from the tanks (ground).

Sea is pumped from ground to the tanks.
Processing steps

1. Small mussels are put back to the ocean.
2. Cleaning with purified water.
3. The processing of the shells.
5. Intensive comb treatment and freezing.
6. Fresh mussel sent to the market.
7. Frozen mussel sent to the market.
8. Shell pulverised and put back to the ocean.
Utilisation of the shell

- Rafts lift up
- Mussel gets full growth
- Rafts put down
- The larvae sticks to breeding lines

27% Utilisation

Northlight Seafood
More information:
http://www.northlightseafood.is
Can all streams from the refineries be utilized or recycled?
Research activities

Bioactive compounds

Traditional products

Feed, food, cosmetics, nutraceuticals
Many different applications

Ingredients

Aquaculture

Agriculture

Food supplements

Process aids

Cosmetics

Nature medicine

Medical products

Research chemicals
Developing and Fast Growing Market

**Market**

- **Mass market**
  - Pfizer
  - GSK
  - Abbott
  - Novartis
  - Bayer
  - AstraZeneca
  - Roche

- **Niche market**
  - Major pharmaceutical companies

**Fast-moving consumer goods companies**

- P&G
- L'Oréal
- Nestlé
- Danone
- Henkel
- Unilever

**Product**

- Disease
- Pre-disease
- Risk factors
- Human needs
- Pleasure

**Consumer healthcare:** a new mass market linked to growing risk factors
Processing steps

Protein – Lipids - Shells
Proteins

=> Bioactive peptides
  • Antimicrobial peptide
  • Antioxidant
  • Antihypertensive
  • Anticoagulant activity
  • Anti-inflammatory
  • Therapeutic applications
On it’s way to commercialization?

NZ blue mussel firm wins funding for protein production plant

By Undercurrent News  Aug. 17, 2018 09:26 BST
Lipids

Mainly from Green Mussel

- Several anti-inflammatory and anti-arthritic dietary supplements
- The best known products are Seatone and Lyprinol

Blue mussel

- Lower lipid content
- Possible for skin care and / or anti-arthritic
Shells

Bio-Concrete
✓ Aggregates & concrete additives
✓ Decorative concrete

Martinez-Garcia et al. 2017. Performance of mussel shell as aggregate in plain concrete
Which new and old technologies may create leapfrog developments in the refineries?
Biorefining - Challenges

- Novel processing technologies
- Optimization of bioprocessing
- Product development and confirmation of benefits via in-vivo testing (human studies)
- Marketing
- Need of open access biorefineries or scale-up facilities
Takk fyrir