



# **Sustainable Seafood**

# **The Marine Harvest Way**

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**Marine Harvest**

# Key issues for sustainable growth in salmon farming



**marineharvest**  
excellence in seafood

# Our world



- 5000 employees in 21 countries
- 15 billion NOK in annual sales
- 298 000 tons harvested
- Sales in 50 countries



# The world needs more seafood

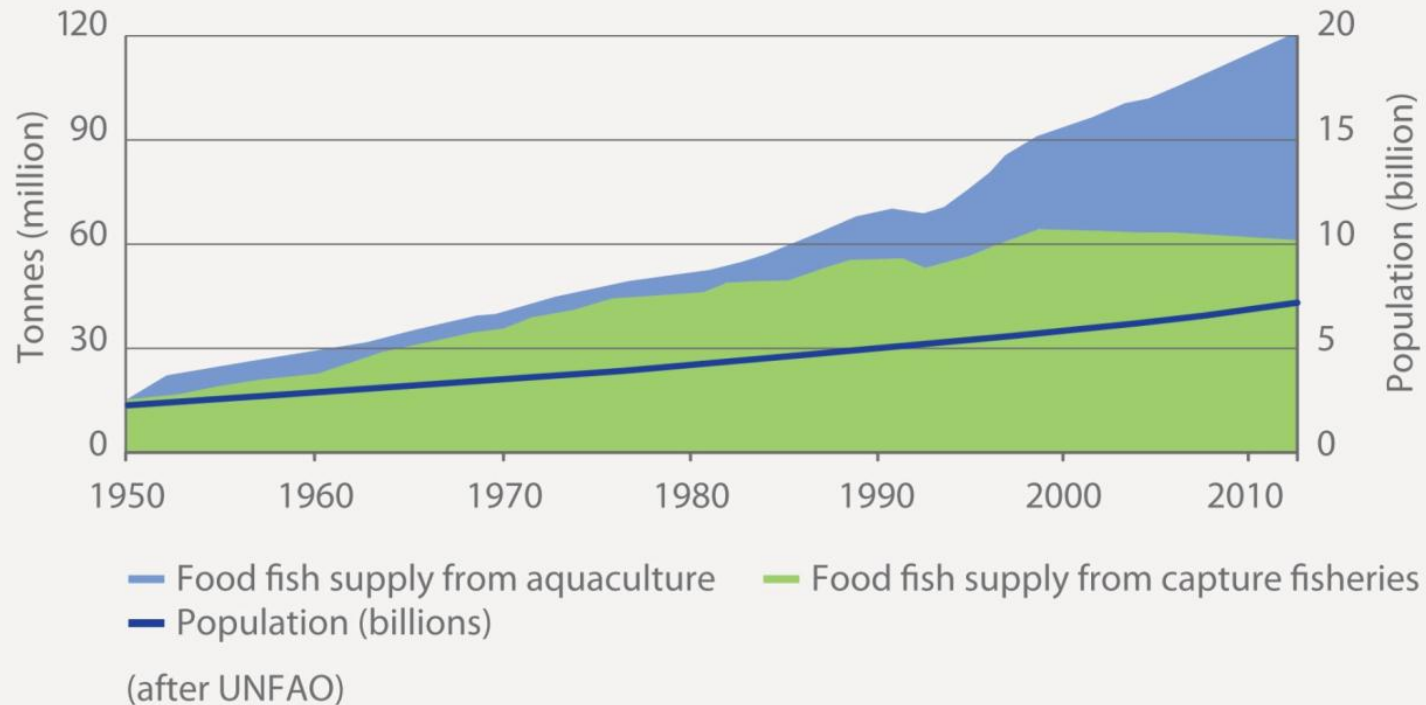
*“Given the projected population growth, it is estimated that at least an additional 40 million tonnes of aquatic food will be required by 2030.”*

*- Rohana Subasinghe, FAO*

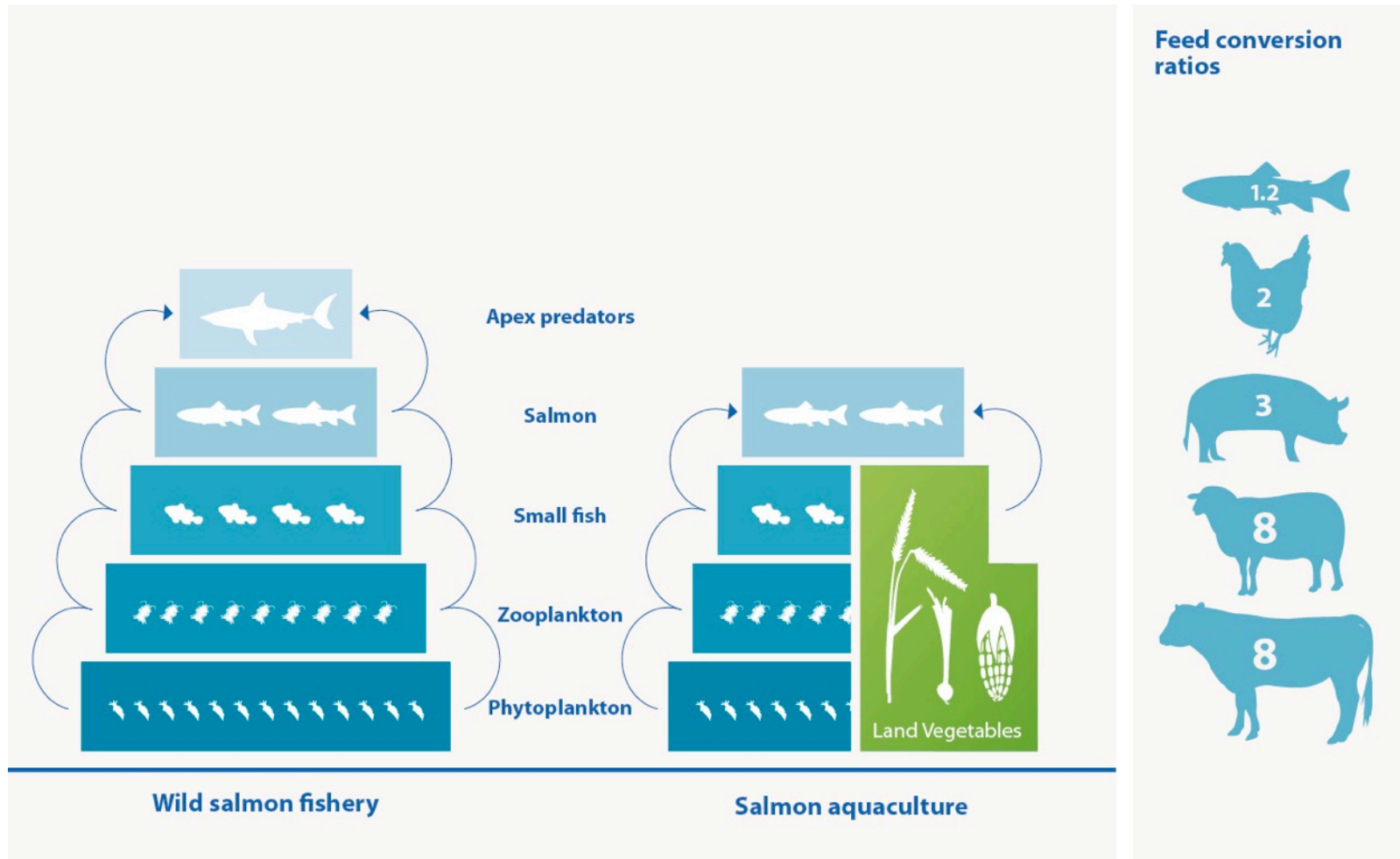


# Growth must come from aquaculture

Fish use (million tonnes)



# More efficient than the alternatives



*Conversion rate 10 : 1  
per trophic level*

*Fish oil dependency app 2,5 : 1  
(current feed)*

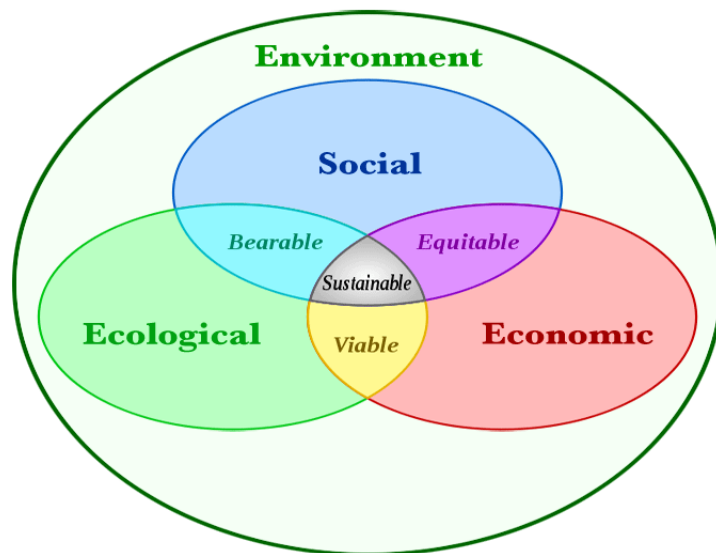




# Development and interdependence

*“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”*

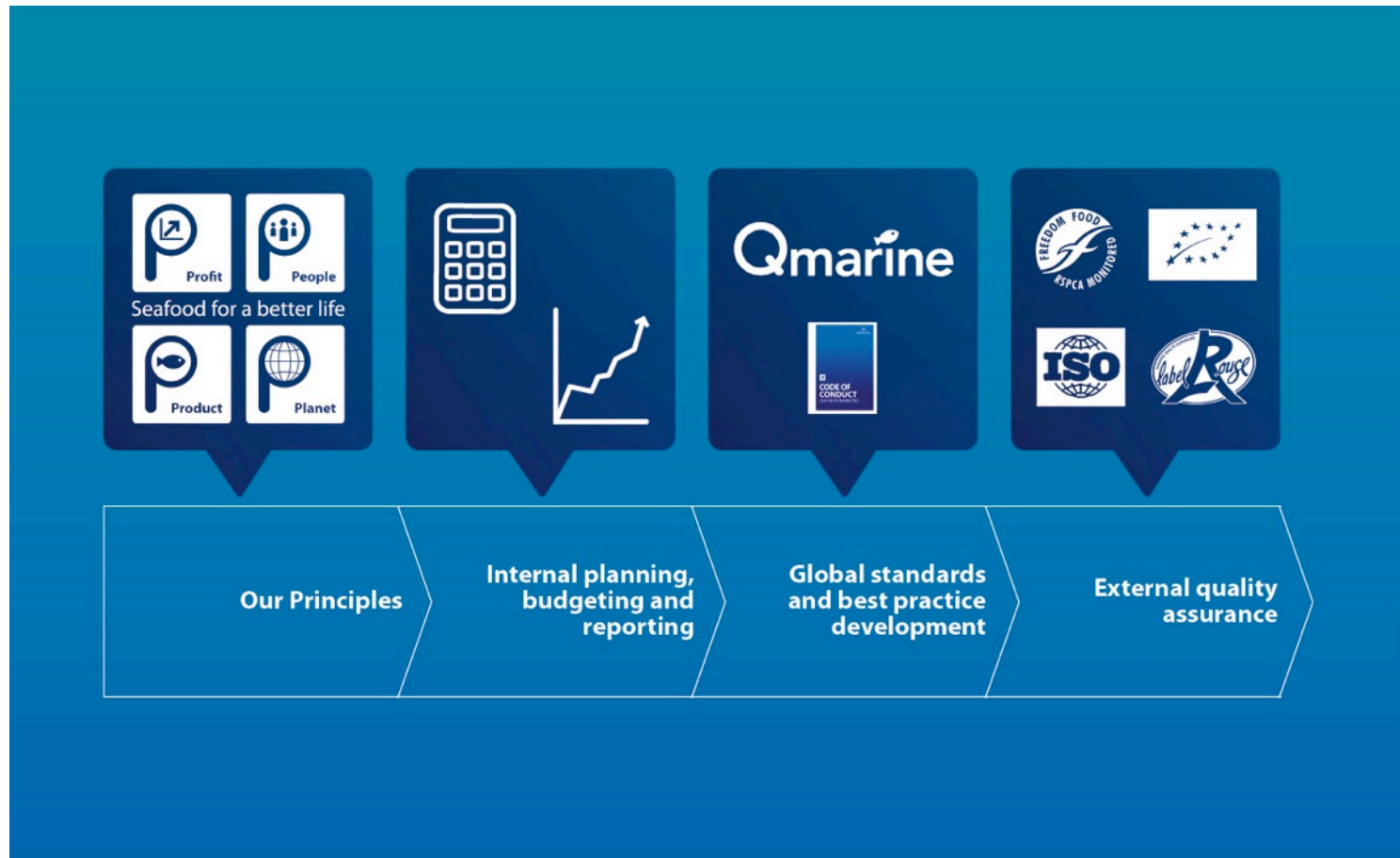
(World commission on Environment and Development, 1987)



Our mission: Seafood for a better life



# Our approach to sustainability





# One global quality system



Our global quality management programme, aligned to the Group's guiding principles.



Food Safety



Food Quality



Fish Welfare



↓  
Environmental  
Responsibility



Social  
Responsibility



Quality  
Assurance

Standard Operating Procedures developed, implemented and maintained through a specific global database.



Marine Harvest operations thereafter implement these procedures in their local quality management systems.



Norway



Scotland



Ireland



VAP



Canada



Chile



# Listen, evaluate and improve



## EXTERNAL EFFECTS OF MARINE HARVEST ACTIVITIES

Fish farming activities may have negative impacts on the environment and we are determined to reduce these impacts to an acceptable level. By being aware of the negative and positive effects that our activities have on the environment and communities, we have incorporated measures where needed to monitor and manage these in our Qmarine global quality programme.

Activity	Potential environmental impact	Potential community impact
<b>Fish processing</b>	<ul style="list-style-type: none"> <li>Isolation from water discharge into municipal sewage system or into local drainage, surface and sea water</li> <li>Contamination of water discharge from facilities with untreated generation of greenhouse gases</li> <li>Isolation of ground water from landfill of organic and inorganic waste</li> <li>Air emissions from rendering of solid organic waste</li> <li>Use of food waste in packaging - SPI</li> <li>Contamination from water treatment</li> <li>Water and electricity from processing activities</li> <li>Depletion of freshwater supplies</li> </ul>	<ul style="list-style-type: none"> <li>Other activities</li> <li>Degradation of health of employees resulting from inadequate health and safety provisions</li> <li>Degradation of health of consumers by contamination from micro-organisms or other undesirable substances in food products</li> <li>Use of limited landfill and waste management capacity</li> <li>Degradation of freshwater resources</li> </ul>
<b>Distribution</b>	<ul style="list-style-type: none"> <li>Contamination of facilities and generation of greenhouse gases by transport and in production of packaging</li> <li>Isolation of the environment by waste packaging</li> </ul>	<ul style="list-style-type: none"> <li>Risks and traffic congestion</li> <li>Financial health damage to humans from gases resulting from burning of biomass</li> <li>Visual pollution</li> <li>Potential health damage to animals and humans (especially children)</li> </ul>
<b>Fish farming</b>	<ul style="list-style-type: none"> <li>Use of fishmeal and fish oil in feed produced from fisheries classified as non-sustainable</li> <li>Impact on the environment from waste feed, faeces, excretions and antibiotic treatment of fish</li> <li>Interaction with marine resources and fish</li> <li>Visualisation of fish, faeces, faeces and in coastal regions</li> <li>Reduction in biodiversity around fish farms</li> <li>Possible genetic impact on wild fish from escaped farmed fish</li> <li>Spread of disease and parasites from farmed to wild fish</li> <li>Contamination of water and waste from land and health impacts</li> <li>Isolation from accidental fuel spills</li> <li>Use of non-renewable fuel sources for heat, light, power and irrigation</li> <li>Interference with navigation channels</li> <li>Contamination of ground and surface waters from waste disposal</li> <li>Air emissions from rendering of solid organic waste</li> <li>Water and electricity from heating, cooling, feeding systems and acoustic deterrents</li> <li>Potential lowering of fish and water table levels in freshwater farming</li> <li>Contamination of coastline beaches by waste products (plastic, polystyrene, ropes, etc)</li> </ul>	<ul style="list-style-type: none"> <li>Degradation of fish stocks with possible alteration of coastal and marine food chains</li> <li>Degradation of health of employees resulting from inadequate health and safety provisions</li> <li>Health concerns with non-sterilised and antibiotic residues</li> <li>Landscaping alteration and visual intrusion affecting tourism</li> <li>Temporary or permanent loss of seabed and/or other aquatic species</li> <li>Reduction in wild fish stock populations and related catches</li> <li>Air emissions from rendering of solid organic waste</li> <li>Water and electricity from heating, cooling, feeding systems and acoustic deterrents</li> <li>Potential lowering of fish and water table levels in freshwater farming</li> </ul>



Seafood for a better life

Qmarine



Corporate research, experience and learning



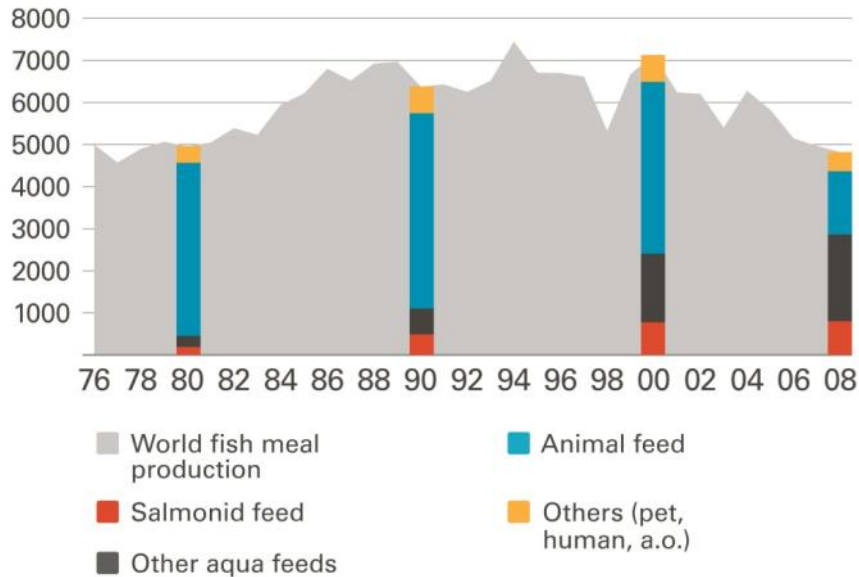
# Challenges to further growth

- Development of new markets and products
- Marine raw materials in feed
  - Growth from a finite resource of forage fish
  - Preserving wild stocks
- Fish Health and Wild-Farmed interaction
  - Disease management
  - Genetic interaction between wild and farmed fish
  - Sea lice management
- Transparency and dialogue

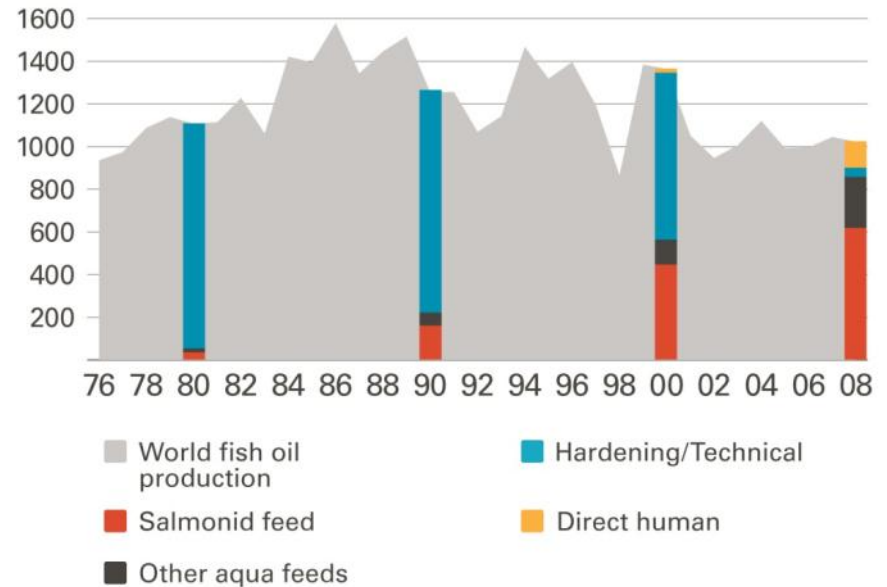


# A more efficient use of scarce resources

## Fishmeal



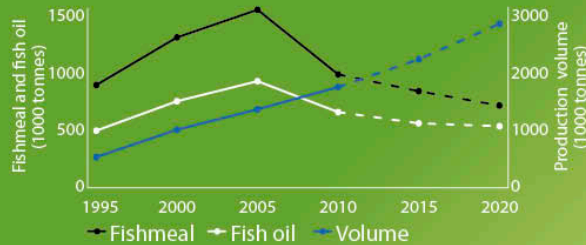
## Fish oil



# Preserving wild stocks for the future

## Changing our feeds & reducing our dependency

Higher vol. of salmon – lower utilization of fishmeal & fish oil



## Buying in sustainable seafoods

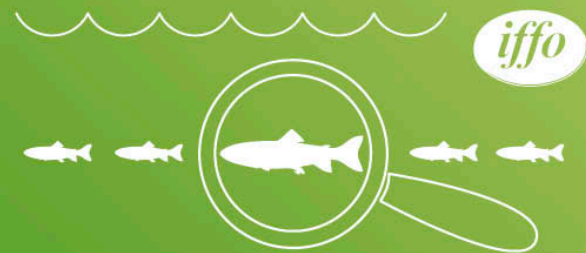


€ NOK \$



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excellence in seafood

## Improved management of wild stocks



## Working with others to encourage sustainability

global aquaculture  
**the alliance**

**asc**  
Aquaculture  
Stewardship  
Council

Salmon  
Aquaculture  
Dialogues



# Towards net fish protein producers

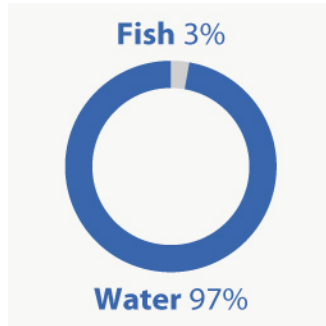
- Given sustainable management of wild fish stocks used in feed, our key challenge is to grow the industry with limits on available raw material
- One part of the solution is feed technology
- A 22-month full-scale trial at The Centre for Aquaculture Competence (MHG, Skretting and AKVA Group) recently released.
- The trial followed a complete generation of salmon from smolt to harvest, divided into 3 groups
  - The salmon fed with the lowest proportion of marine products (15% fishmeal, 9% fish oil) only depended on 1.07 kilo of fish to produce 1 kilo at harvest
  - Calculating marine protein alone showed a positive ratio: fish out exceeding fish in



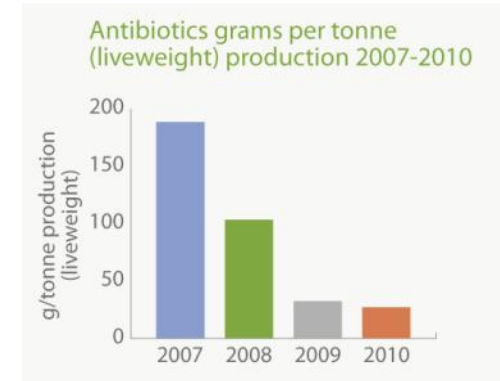


# Fish Health: Healthy fish are happy fish

Low stocking densities



Vaccination



From medication to biological control

Optimal farm location





# Improved sea lice control

From reactive  
medicines

## “New” technologies

- $H_2O_2$
- Closed treatment
- Farmed wrasse
- Mechanical
- Feed
- R&D
  - Medication
  - Breeding
  - Vaccines



## Integrated management

- Synchronized fallowing
- Product rotation
- Optimal site location
- From site to pen focus
- Product rotation
- Synchronized treatment
- Lice filtering



# Genetic integrity of wild Atlantic salmon

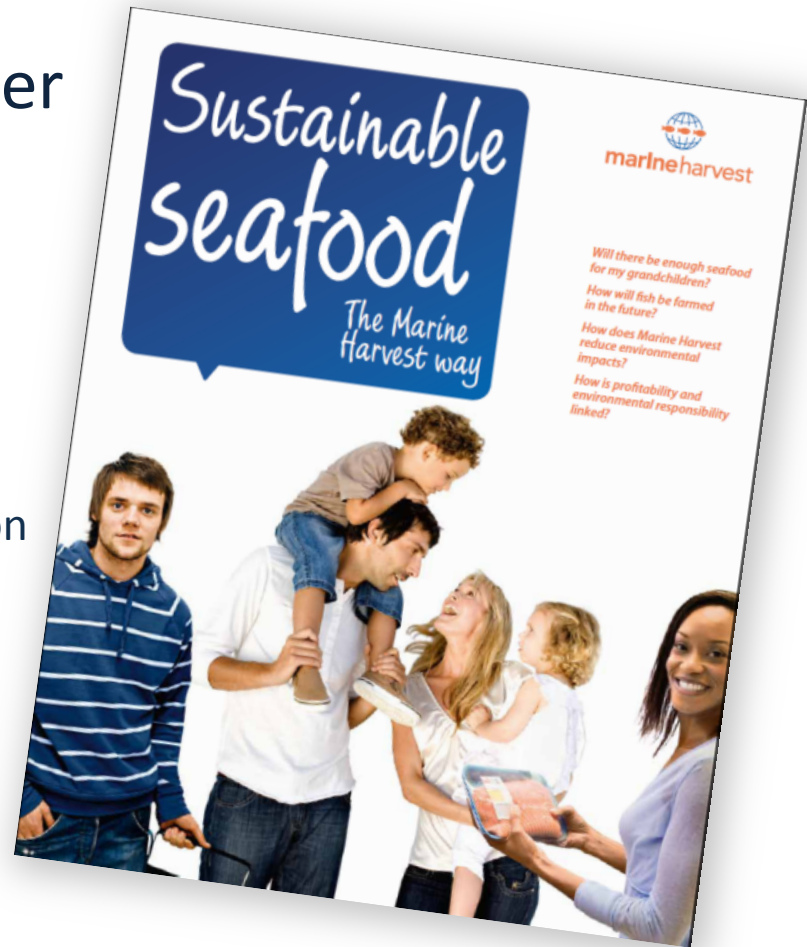


- Scientific disagreement on potential negative effect
  - **BUT:** Zero tolerance the only acceptable policy
- Strict regulation necessary (standards, equipment, behaviour)
- Significant improvements have been made (number of escaped fish and number of escaped fish returning to salmon rivers)
- New industry actions in Norway:
  - Tagging-technology under evaluation (trace fish back to responsible farm)
  - Industry pays to clean up and for enhancement efforts



# Moving out of the trenches

- Polarized debate does not foster sustainable development
- Industry must change:
  - Transparency
  - Responsibility
  - Long term focus and improved coordination
  - Proactive approach
- Decency and focus on solution
  - Multi stakeholder dialogues
  - Science based
  - Mutual respect
  - Focus on development



# Summary

- The world needs more seafood. It must come from aquaculture
- It is important that aquaculture companies implement sustainability principles as part of their quality management programmes
- Marine Harvest Group focuses on sustainable growth
  - Decreasing dependency on marine raw materials in feed
  - Improved fish health and a responsible approach to wild-farmed interaction
  - Transparency and dialogue with stakeholders
- All stakeholders need to «move out of the trenches»
  - Science-based, multi-stakeholder, dialogues based on mutual respect
  - Focus on solutions and development







# Thank You!

