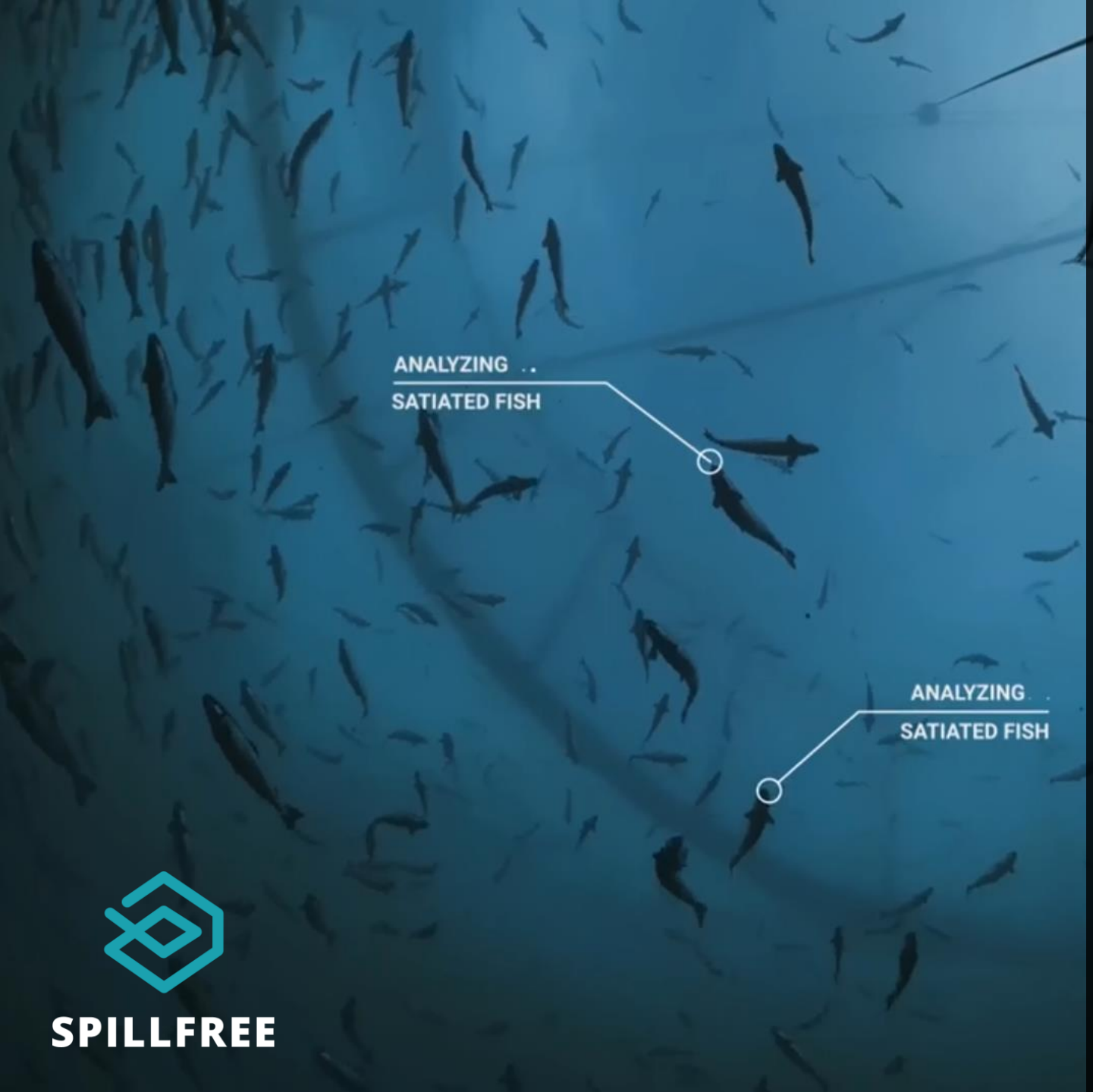

Optimizing biological performance

"Animal Health Economics in a biological perspective"

Paul S. Valle/Arnfinn Aunsmo

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The needs

- a practical interaction between biology, technology and people

Biology

Be practical professionals on how to solve our customers challenges

Technology

Value-added technology because of our operational focus and presence. We are capable of creating continuous development and local adjustments

People

Enforcing feeding performance, awareness of fish health, sustainability and knowledge

Complete digital solution for «the biology of things»

VideoTools

Smart-analysis for optimal feeding

AquaTools

Optimizing production biology and production economy

DrawTools

Digital illustration tool

LearnTools

Digital knowledge platform

AQUATOOLS
A PART OF SPILLFREE

Optimizing production biology and production economy

Scientific production management tool that investigates how to exploit the potential for improvement

- Models within MTB, feeding, health and harvesting
- Developed with the purpose of making more sustainable decisions

Developed and based on veterinarian Arnfinn Aunsmo's PhD

Read more at www.spillfree.no/en/aquatools

AQUATOOLS
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Site models

Based on number of fish

Investment model

Examines the effects of long-term investments

Cost of disease model

Illustrates effects of disease

Harvest model

Compare cases with different harvests from cages

Genetics model

Illustrates effects of improved genetics

Cost-benefit feed model

Compares the use of different types of feed

Cost-benefit vaccination model

Illustrates effects of vaccination

Optimization model

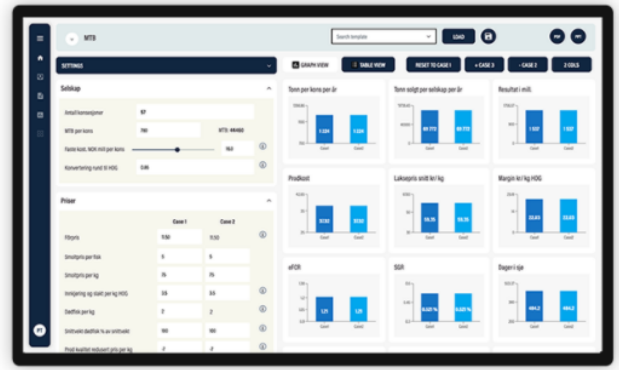
Visualize the potential utilization of licenses in a site

Company model

Based on MTB

MTB model

Visualize and compare the utilization of licenses in a company, related to different alternative changes in biological performance.



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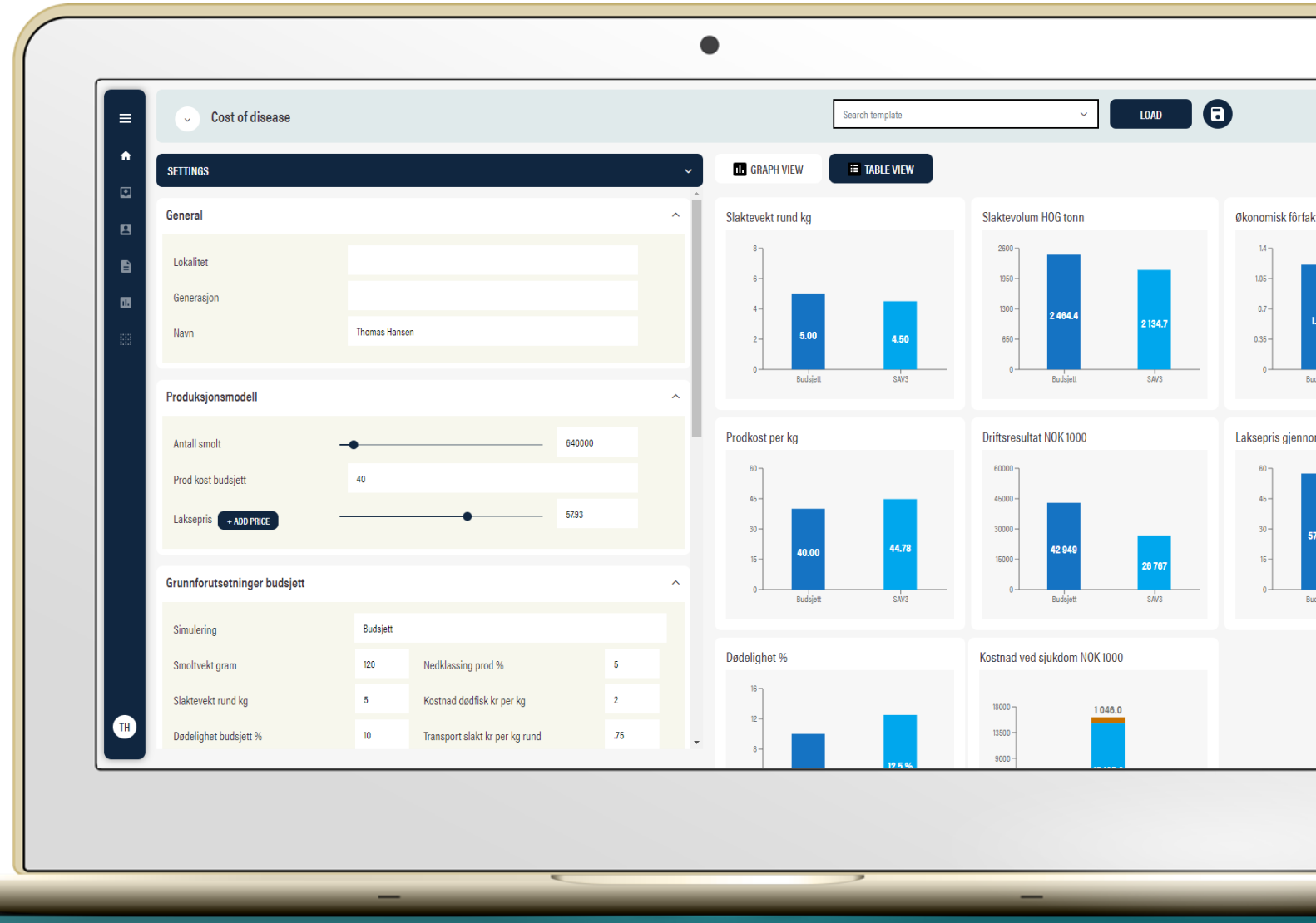
Cost of disease

- Visualize the consequences of disease (PD, SAV2, SAV3 etc.), including the biological effects of disease and the increased costs of disease (extraordinary costs, costs of treatment and costs of prevention)
- The model give results on production, feed conversion, salmon price, margins and EBIT
- Comparing two cases; with and without disease



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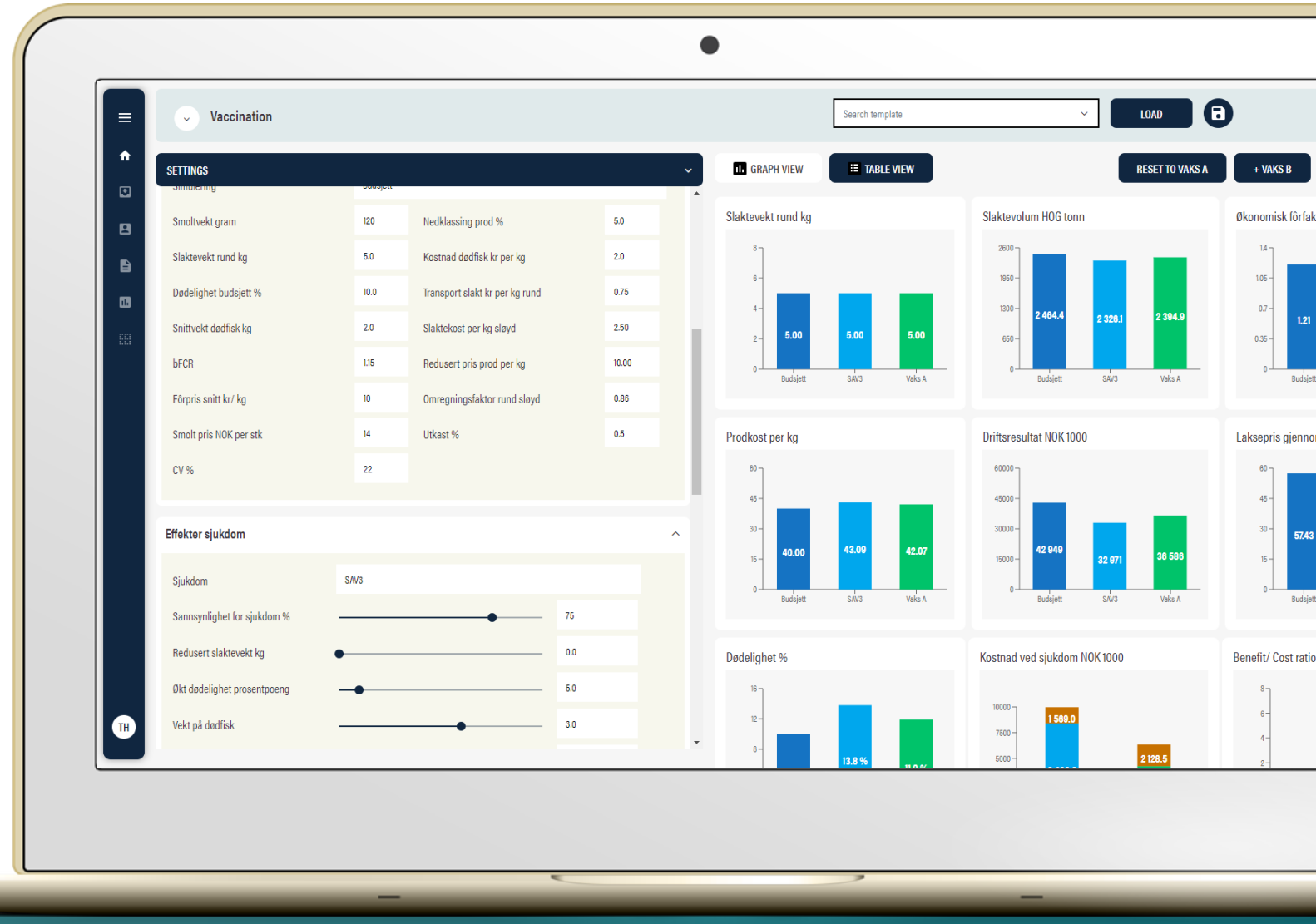
Cost-benefit Vaccination

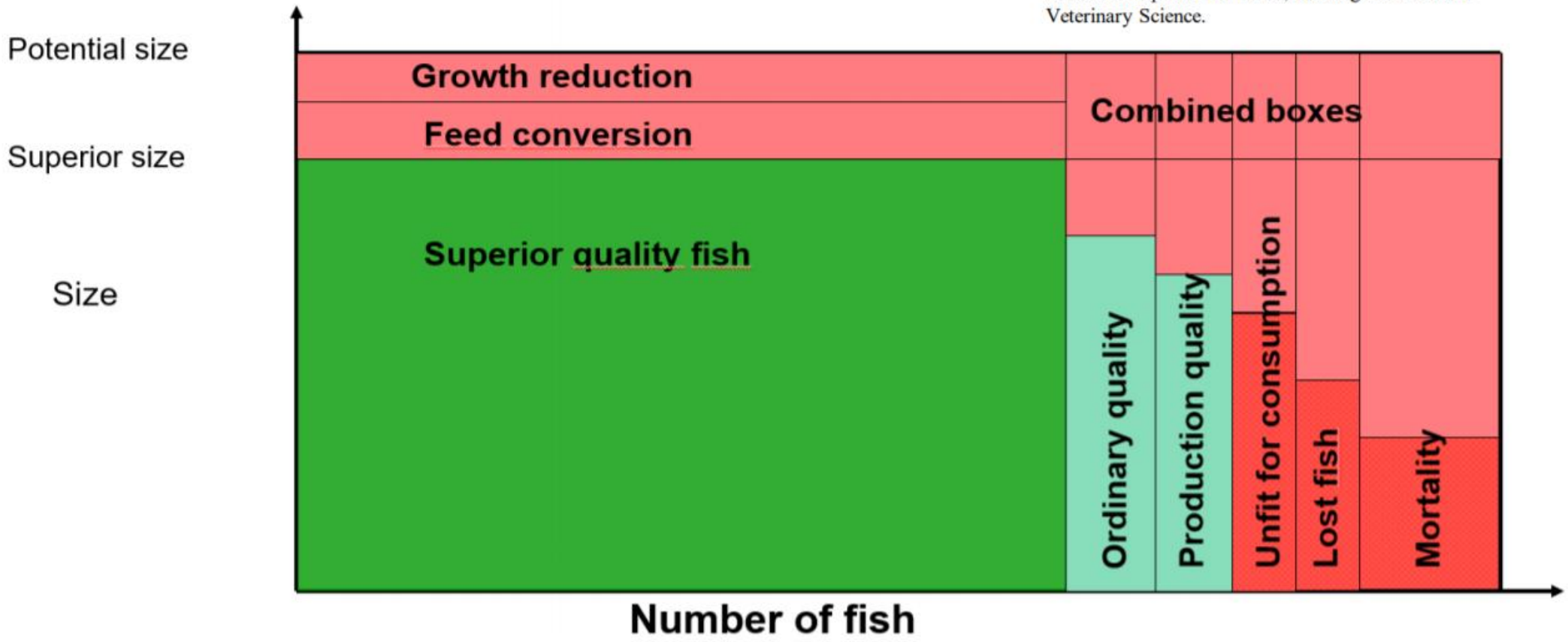
- Shows the effects of disease and different vaccines
- Illustrate effects of vaccination and give results on production, feed conversion, salmon price, margins, benefit-cost ratio and EBIT etc.
- Comparing 4 cases: No Disease, disease, vaccine A and vaccine B
- A sufficient sales tool for vaccine companies

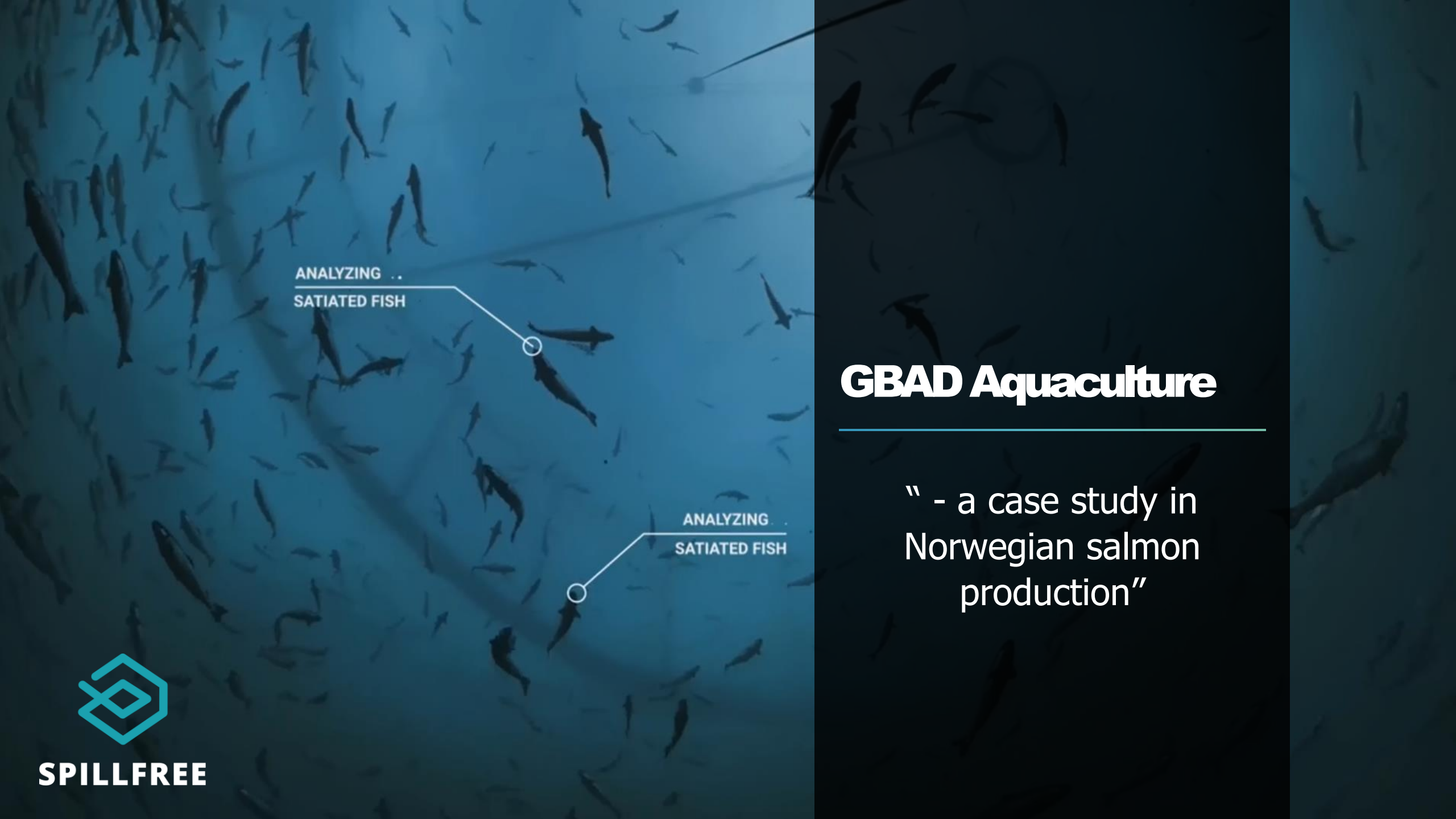


Area of losses

The biologic production-loss model (bPLM)

A. Aunsmo, 2009. Health related losses in sea farmed Atlantic salmon - quantification, risk factors and economic impact. PhD thesis, Norwegian School of Veterinary Science.





GBAD Aquaculture

" - a case study in Norwegian salmon production"

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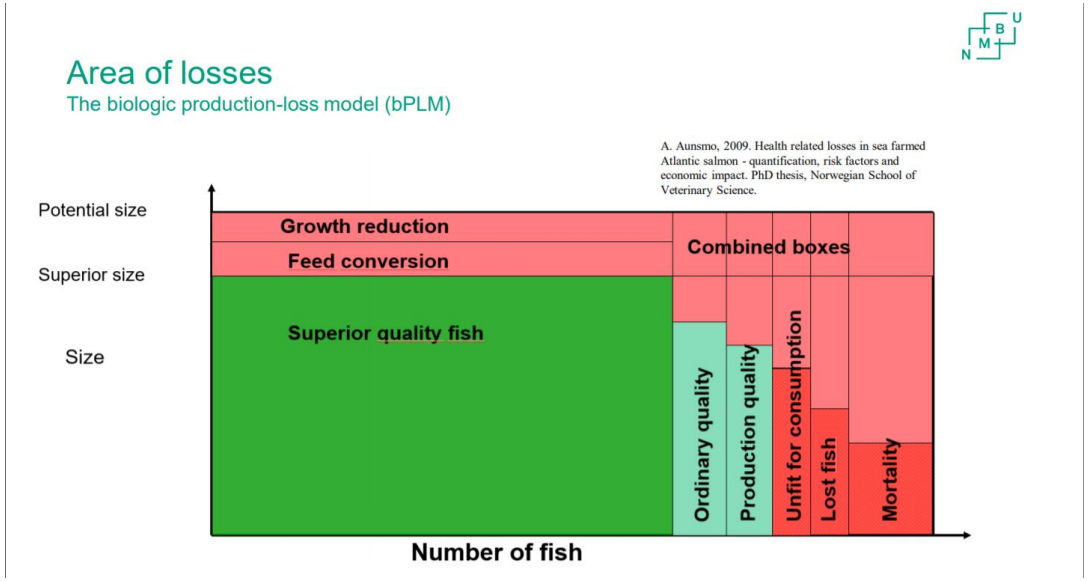
Data Sources – a more helicopter perspective

- **Statistics Norway => Statistics for Aquaculture, Directorate of Fisheries**
  - Live stock, Grow out/Juveniles
  - Losses
  - Employees
  - Investments
- **Barentswatch – visualizing Norwegian aquaculture – and diseases (ISA, PD, Sea Lice)**
- **«Market insight», Norwegian Seafood Council**
  - Global salmon trade
  - European consumption of salmon
  - Consumer insights
- **Salmon Farming Industry Handbook, MOWI**
  - Sector insight
- **More detailed projects – like DECIDE** – ref. another presentation
- **Expert opinions** re. other diseases CMS, HSMB, gill diseases etc.
- **Moving towards a Consensus re. the potential in Aquaculture**

How could it be – without diseases …?

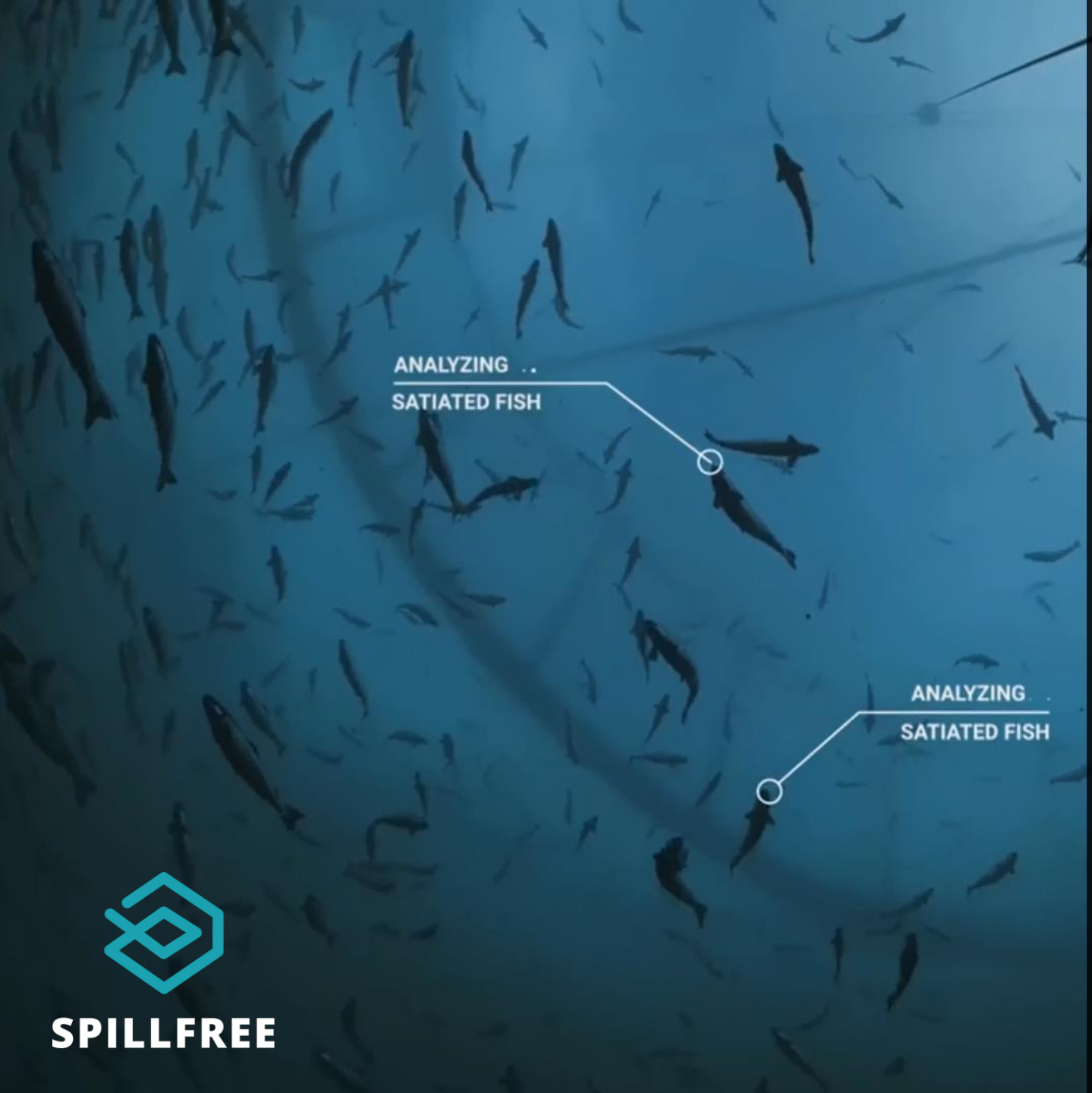
- **Simulating the biological aspects (AquaTools) – with an utopian/perfect health situations**
  - Consumer (protein) contribution?
  - Business economy impact?
  - Work force impact …??
  - National/Societal impact …??

- **Making the information available – visualizing Norwegian salmon aquaculture**
  - The actual situation
  - The potential



- **What are the interventions/regulations/investments needed …?**
  - **And what do they cost …?**

- **In taking care of BOTH**
  - **diseases AND**
  - **other welfare aspects** (ethically acceptable production)



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GBAD Aquaculture

Paving the road for other aquacultures

wrt assessing the potentials(!) in disease handling!