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# Driving sustainability in aquaculture

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Geir Olav Melingen,  
Commercial Director, Salmon

FREMTIDENS SMOLTPRODUKSJON by  
NOFIMA October 2022

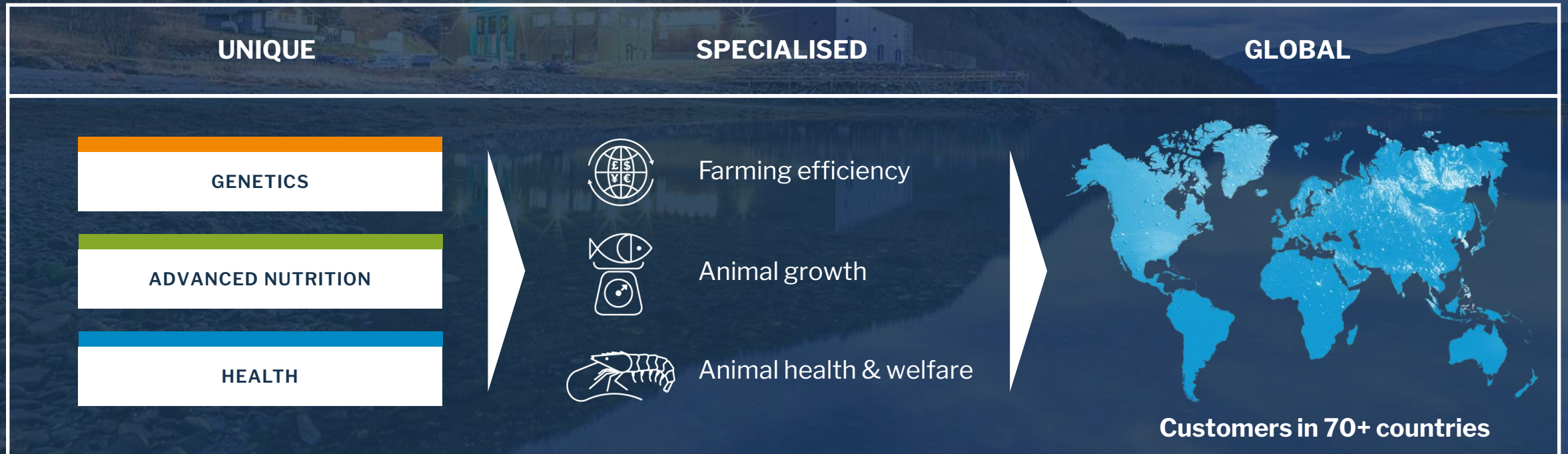
GENETICS

ADVANCED NUTRITION

HEALTH

# A market leading, aquaculture, biotechnology company

- Benchmark's mission is to drive sustainability in aquaculture by delivering products and solutions that improve yield, quality and animal welfare for aquaculture producers
- Our aim is to be the leading aquaculture biotechnology company driving sustainability





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# Genetics

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**Salmon**  
94% of revenue<sup>1</sup>



- Eggs with specialist traits (66% of revenues)
- Harvest income from farming licenses



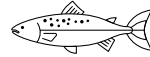
### USA

- Tilapia fingerlings – **6m capacity**
- Shrimp breeders – **100k capacity**



Expansion completed: 2022

### Iceland



- Iceland: **200m egg capacity**

Incubation centre completed 2022

### Norway (Salten)



- Norway: **150m egg capacity**

Facility completed 2019  
Ramp up ongoing

### Colombia – R&D

- Post larvae – **20m capacity**
- Breeders – **10k capacity**



### Chile

- Eggs – **50m capacity**



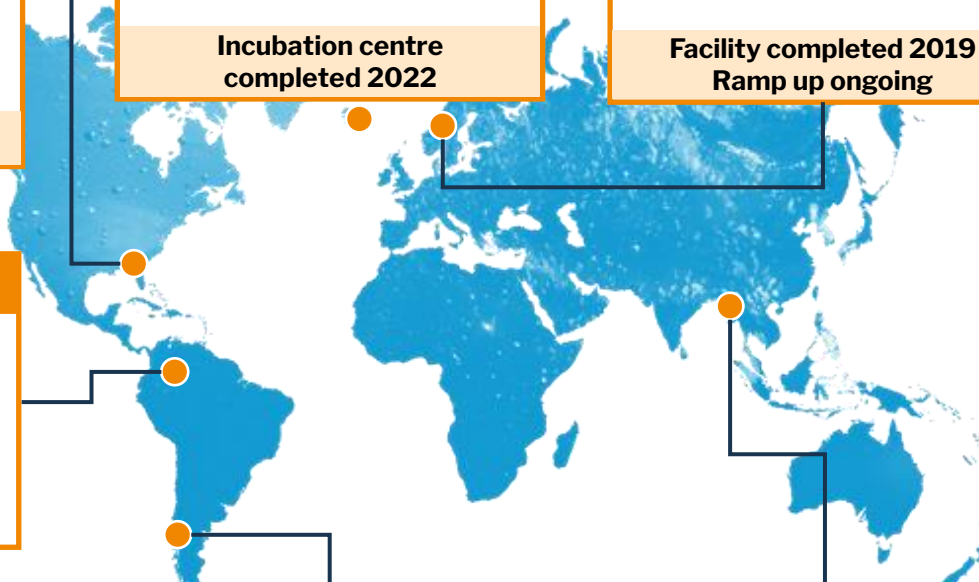
Facility completed: 2021

### Thailand

- Breeders – **32k capacity**

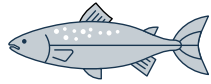


Facility completed: 2021

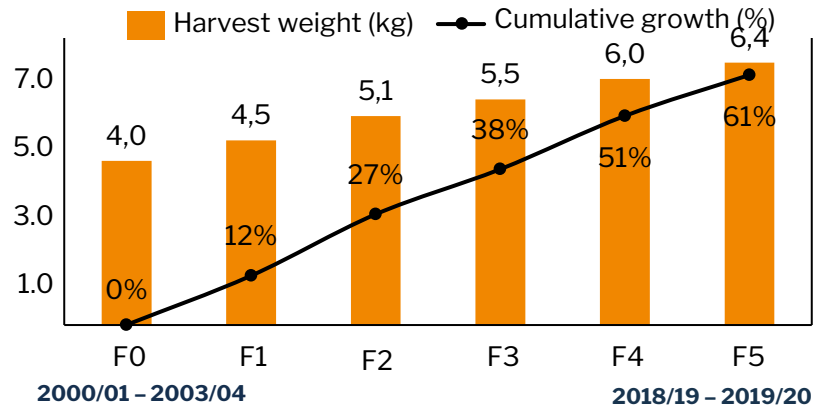


# Our products contribute significantly to our customers' success

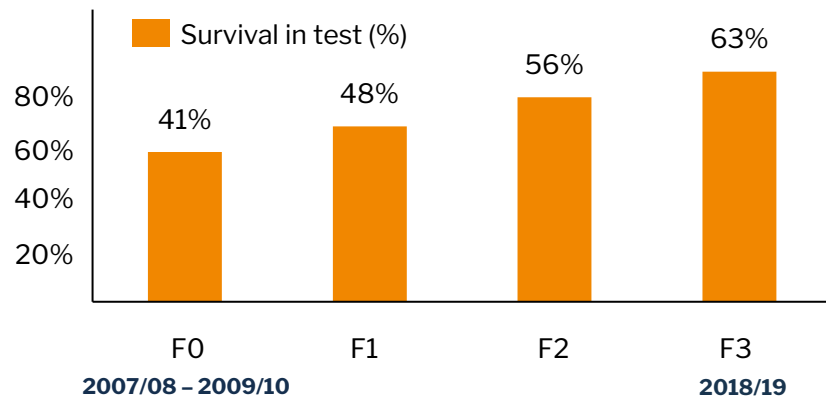
Salmon



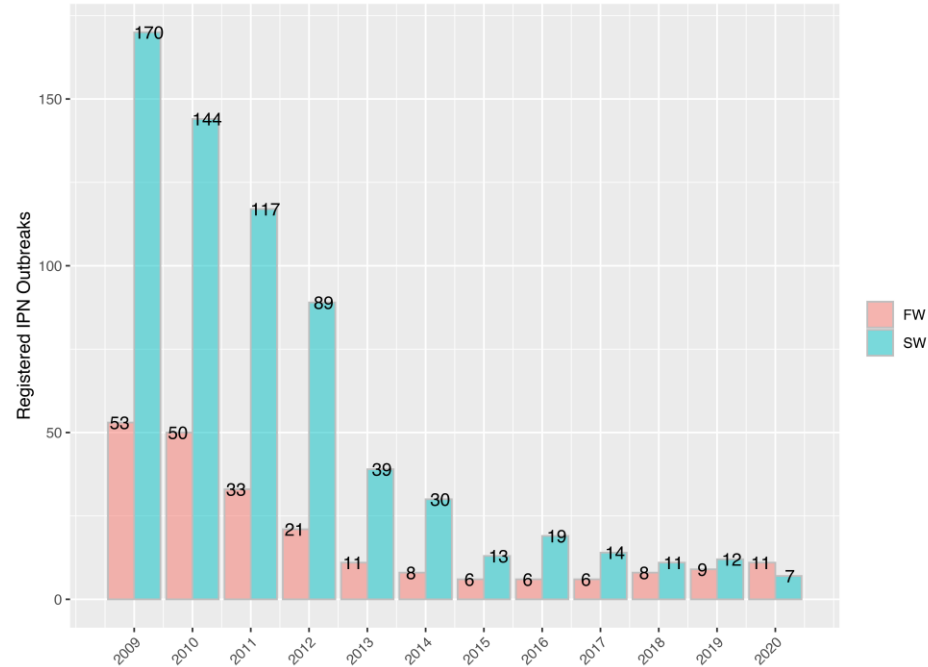
## Harvest weight - 61% increase in five generations



## Survival from pancreas disease (PD)



## Registered IPN outbreaks in both SW and FW, 2009-2020, Norway



Trait	SalmoProtect®	SalmoSelect®
QTL IPN	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GS-Lice	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GS-SWG		<input checked="" type="checkbox"/>
GS-PD		<input checked="" type="checkbox"/> Alternative 1
GS-ISA		<input checked="" type="checkbox"/> Alternative 2
QTL-CMS		<input checked="" type="checkbox"/> Optional
GS-AGD/Gill health		<input checked="" type="checkbox"/> Optional
GS-Quality		<input checked="" type="checkbox"/> Optional

**SalmoProtect and SalmoSelect**  
Two packages + additional choices =  
Simplification and flexibility

**SalmoProtect**  
The natural choice for farmers in  
regions with lower disease pressure.  
Package includes:  
• QTL-IPN  
• GS-Lice

## Economic Advantages

- Increase in growth rate**
  - Shorter production cycles
  - Increase harvest per year
- Better feed conversion rate**
  - Less feed
- Higher tolerance to disease**
  - Increase survival
  - Less use of antibiotics
  - Improves F.C.R
- Quality traits**
  - Pigmentation & Fat
  - Fillet yield increase
  - Reduced early maturation

Heart- and  
circulation health

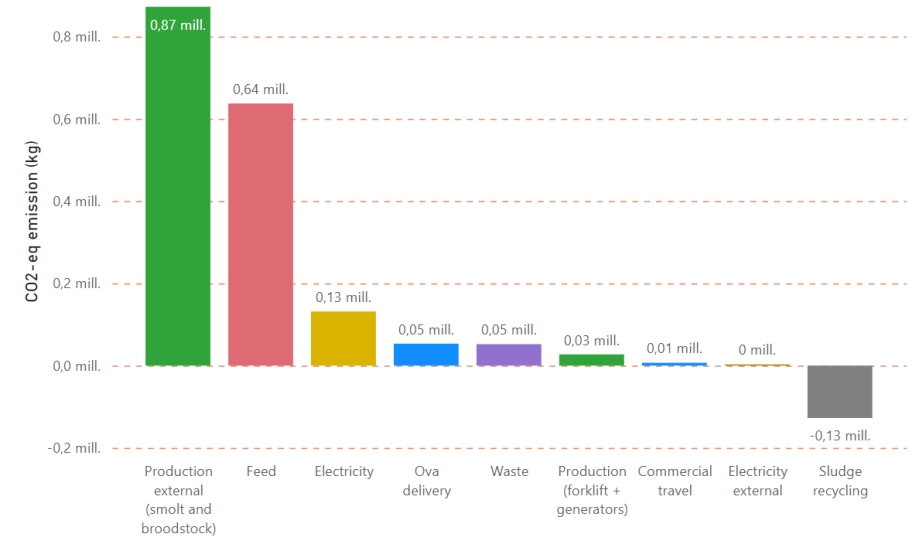


# Comparison of CO2 emission

Category	CO2-eq emission (kg)	Scope
Production external (smolt and broodstock)	872 332	3
Feed	637 235	3
Electricity	131 639	2
Ova delivery	53 325	3
Waste	52 190	3
Production (forklift + generators)	27 228	1
Commercial travel	6 911	3
Electricity external	154	3
Sludge recycling	-127 287	3
<b>Total</b>	<b>1 653 725</b>	

Est. amount of eggs delivered + overage in 2021  
**111,45 mill.**

2021 estimated CO2-eq emissions by category



Salmon fresh HOG Oslo (1 kg)

7,00  
Kg CO2-eq

European beef (1 kg)

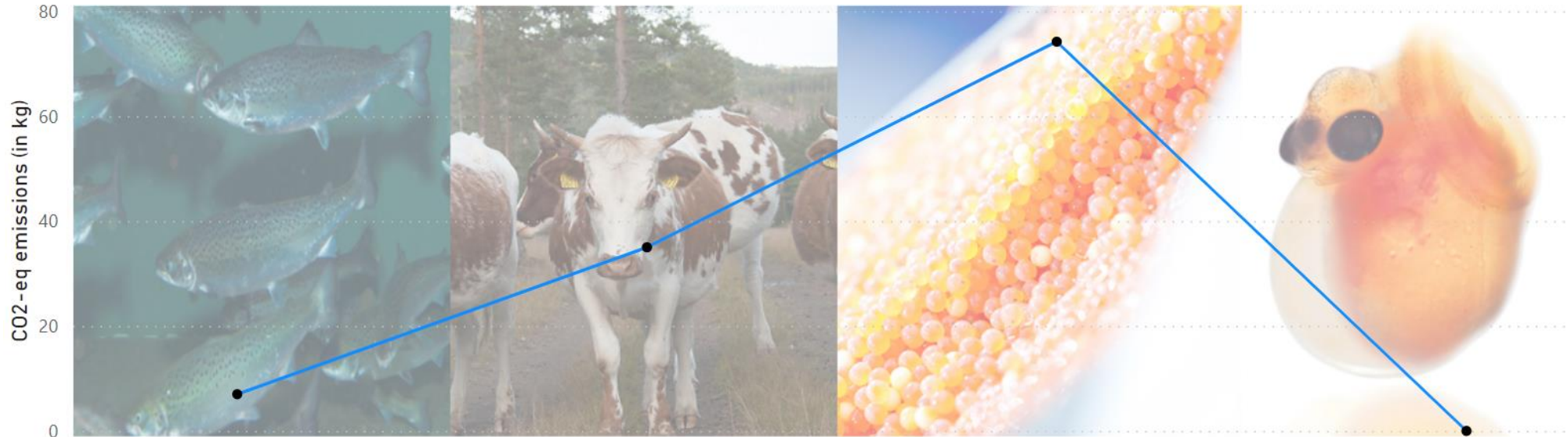
35,00  
Kg CO2-eq

5 000 salmon eggs (≈ 1 kg)

74,19  
Kg CO2-eq

Salmon per egg (1 kg)

0,005  
Kg CO2-eq



Salmon fresh HOG Oslo (1 kg)

European beef (1 kg)

5 000 salmon eggs (≈ 1 kg)

Salmon per egg (1 kg)

# New salmon genetics incubation facility in Iceland



Incubation Centre, located in Vogar, Iceland

## Key genetic contributions for land-based production:

- Year-round supply
  - High biosecurity on the ova
  - Less focus on sea-based diseases and parasites
  - Increased focus on reduced maturation/sterility
  - Simplified, but tailored ova with respect to growth
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- ***“This facility makes us able to produce more quality ova and meet the increasing demand from salmon farming”***
  - ***Jónas Jónasson, CEO Benchmark Genetics Iceland***







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# Advanced Nutrition

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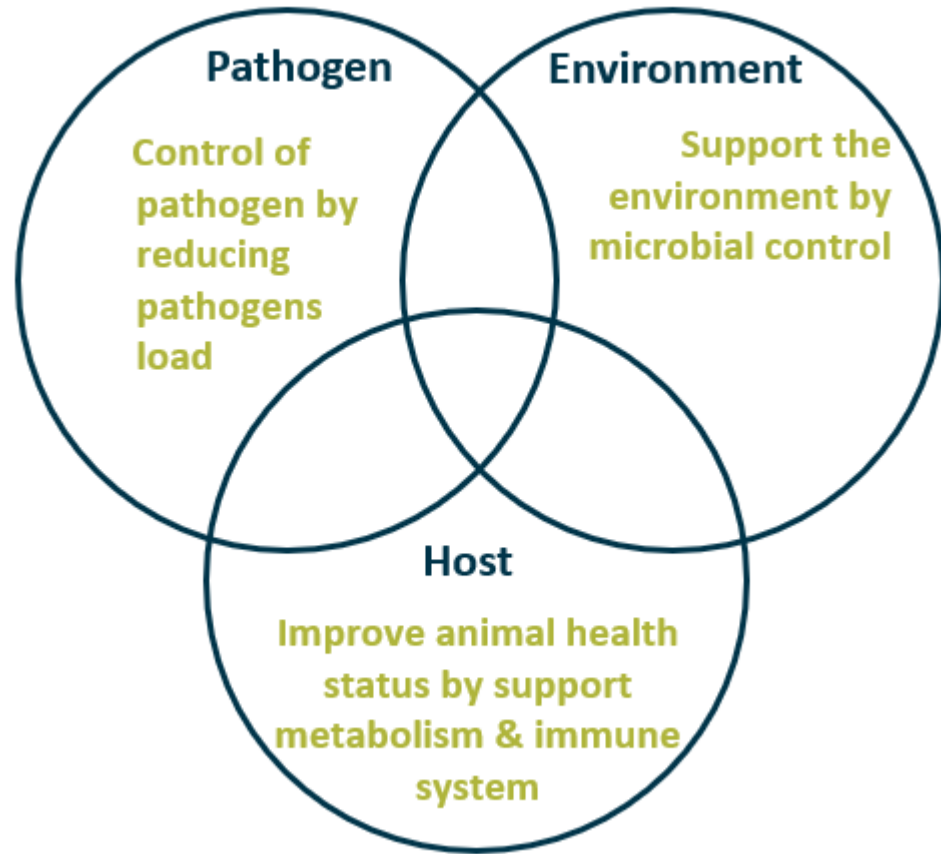


A Benchmark  
Company

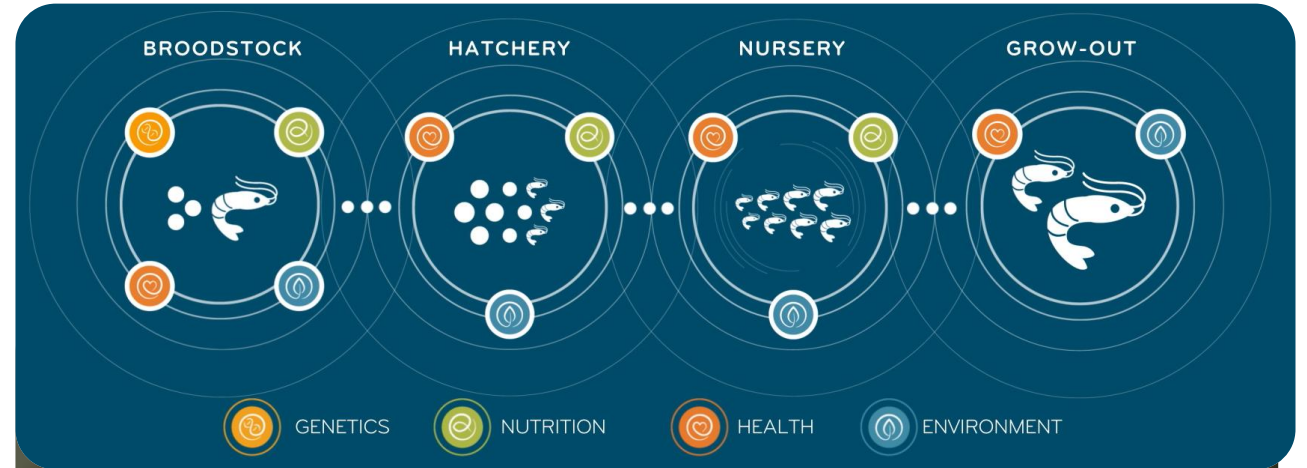
CARE FOR GROWTH



# Probiotics for aquaculture sustainability



**Holistic approach**





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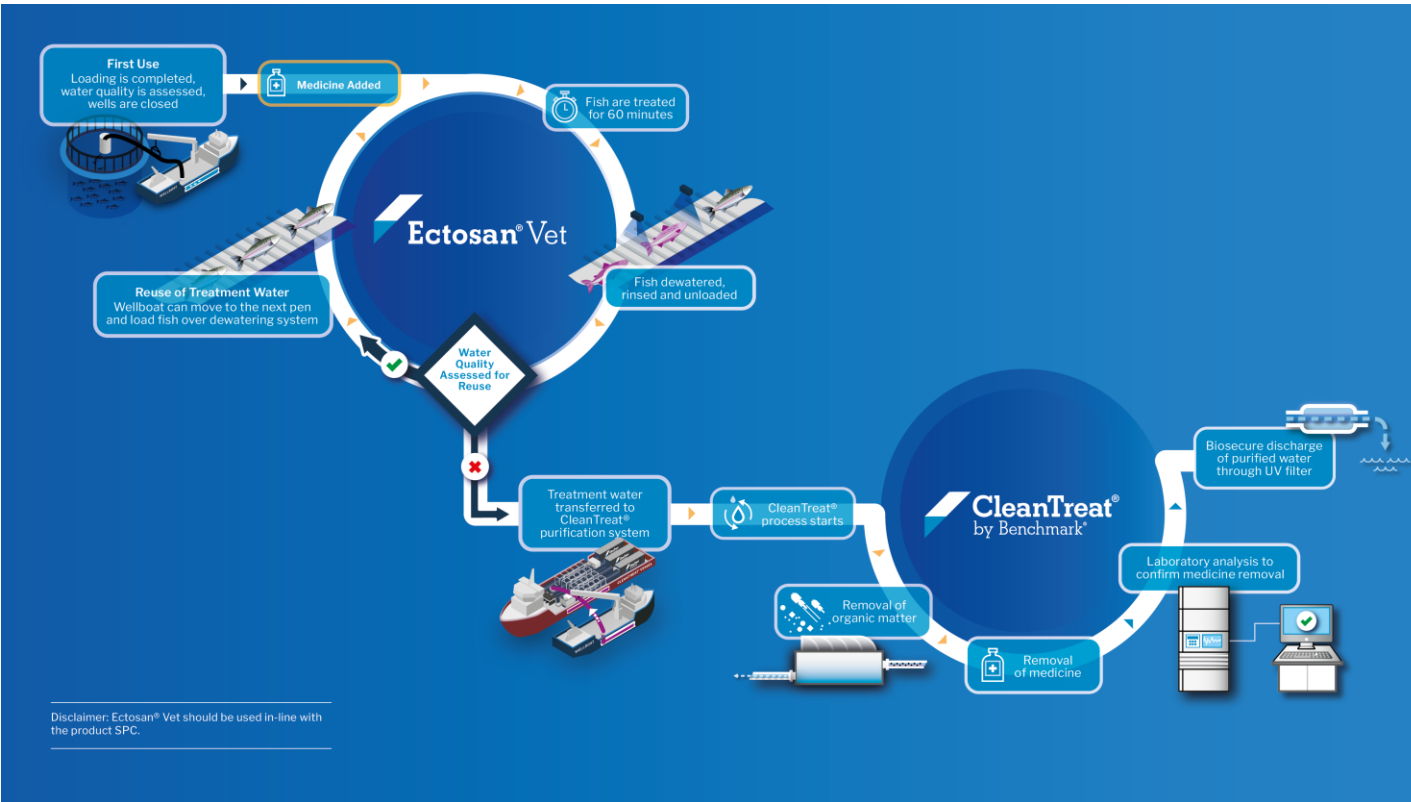
# Animal Health

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# Ectosan® Vet and CleanTreat®

First sea lice veterinary medicinal treatment to be introduced to the Norwegian salmon market in over a decade



Ectosan® Vet, used together with CleanTreat®, is a breakthrough development for the aquaculture industry – providing an effective tool for use within the Integrated Pest Management strategy for sea lice; improving fish health and welfare, whilst protecting the environment.

CleanTreat® has been awarded the best environmental score by the Aquaculture Sustainability Council (ASC), the world's leading independent certification scheme for aquaculture.

# Key takeaways

## Mission to drive sustainability

**Benchmark's mission is to drive sustainability in aquaculture** by delivering products and solutions that improve yield, quality and animal welfare for aquaculture producers

## Genetics

**Global leader with year-round supply, highest biosecurity standard and global access to supply.** A crucial starting point for resource efficiency, disease incidence and survivability across the production cycle

## Advanced Nutrition

**Early-stage nutrition** promotes growth, health and survivability throughout the production stages

## Animal Health

**A leading provider of solutions to sea lice,** making future-oriented decisions years back to come to show the combination of welfare, efficacy and sustainability is possible





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# Thank you for your attention!

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