



Benchmark[®]
Genetics

**Advancing
global aquaculture
through genetics**

Enhancing your farming efficiency

CONTENTS

- | | | | |
|-----------|--|-----------|--|
| 4 | Introduction: A dedicated stand-alone genetics company | 19 | Salmon genetics |
| 6 | Milestones | 31 | Shrimp genetics |
| 9 | Operational overview | 39 | Genetics services for multiple species |
| 10 | Global reach | 44 | Genotyping services |
| 12 | Business areas | 49 | Market-leading innovation and R&D |
| 14 | Facilities | 54 | Novo Holdings |
| 16 | Industry impact | | |

INTRODUCTION

A dedicated stand-alone genetics company

Who we are

As a leader in aquaculture genetics, Benchmark Genetics is entering a new era of innovation and growth. We are present in every major aquaculture market and work with a wide range of species, delivering continuous genetic improvement to the global aquaculture industry.

Our newly established stand-alone company comprises three core business areas: Salmon Genetics, Shrimp Genetics, and Genetics Services. We operate three in-house breeding programmes focusing on two main species – salmon and shrimp – with facilities in Norway, Iceland, the United States and Colombia. We are the leading provider of genetics services, drawing on extensive experience from 40 applied breeding programmes involving 30 species across 36 countries.

Our strategy is innovation-led, harnessing advanced breeding technologies such as QTL (Quantitative Trait Loci) mapping and Genomic Selection. While technology underpins everything we do, we remain firmly customer-focused, ensuring our innovations meet real-world needs.

Aquaculture genetics is at the heart of building an even more sustainable food future. At Benchmark Genetics, we are committed to delivering innovations that enhance fish performance, robustness, and environmental responsibility. By combining science with practical solutions, we empower producers to meet global demand while protecting our planet.

Kristian Botnen
CEO, Benchmark Genetics

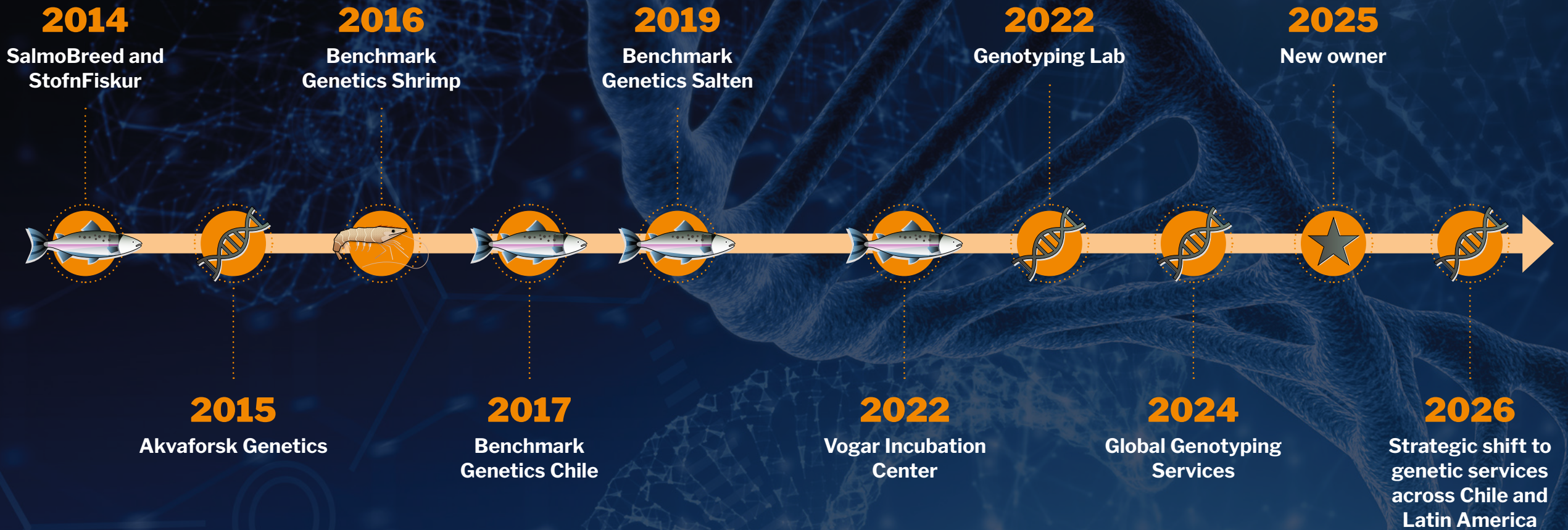


MILESTONES

Refining our focus as an independent genetics company

Benchmark Holdings acquisitions and expansions in genetics

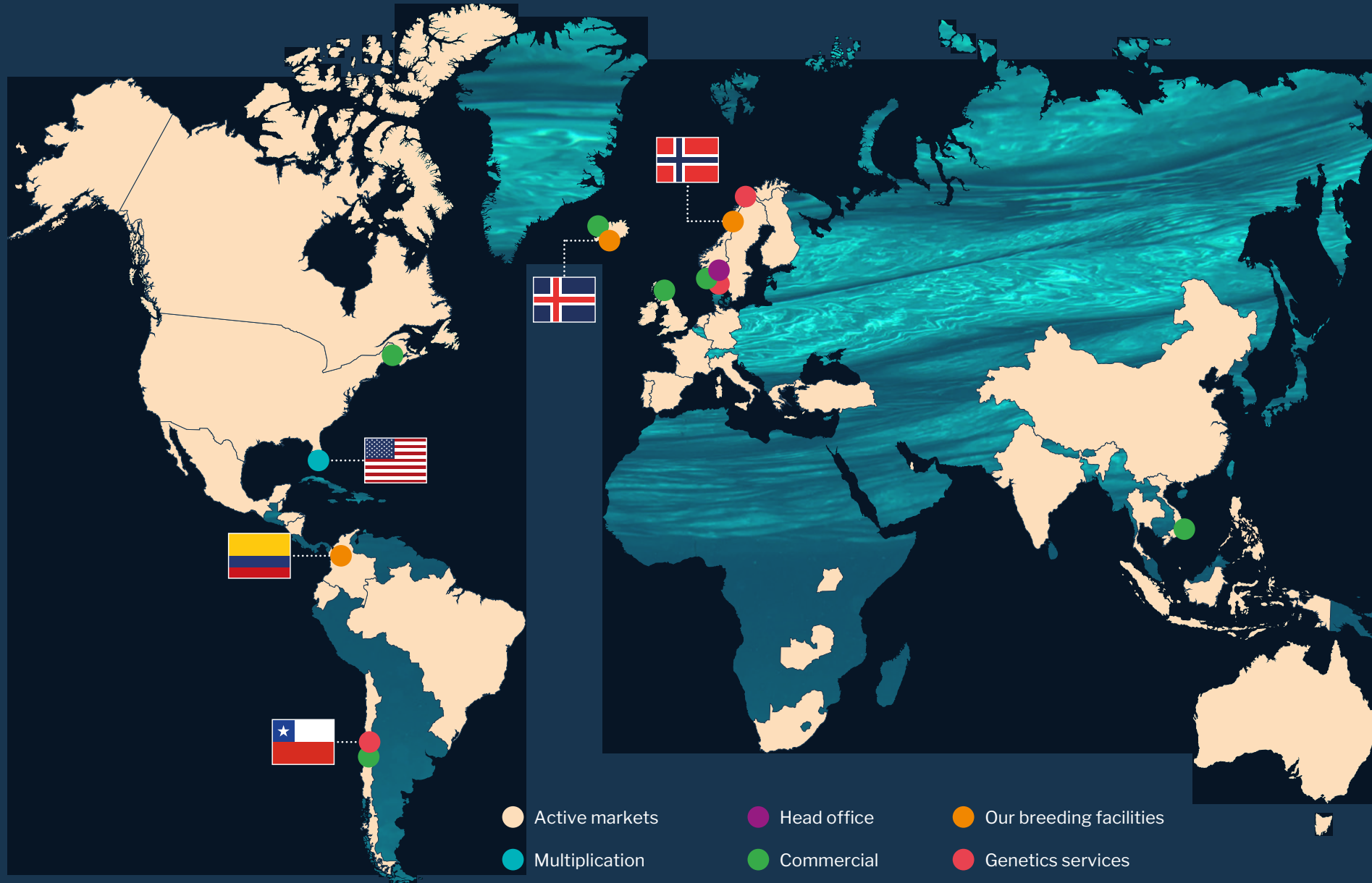
noVO
holdings



Operational overview

GLOBAL REACH

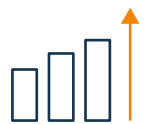
Delivering continuous genetic improvements to the global aquaculture industry



~40
Market countries



240
Employees



5
Countries with commercial operations

BUSINESS AREAS

Our approach is built around three strategic priorities



Salmon

Eggs with specialist traits



Salmo**Robust**®



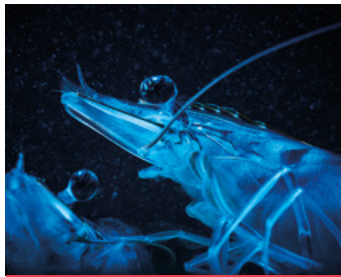
Salmo**Prime**®



Salmo**Boost**®



Salmo**RAS**®



Shrimp

Specialist shrimp breeders



BGB**201**



BGB**301**



BGR**501**



BGG**601**



External services

Consulting and breeding management

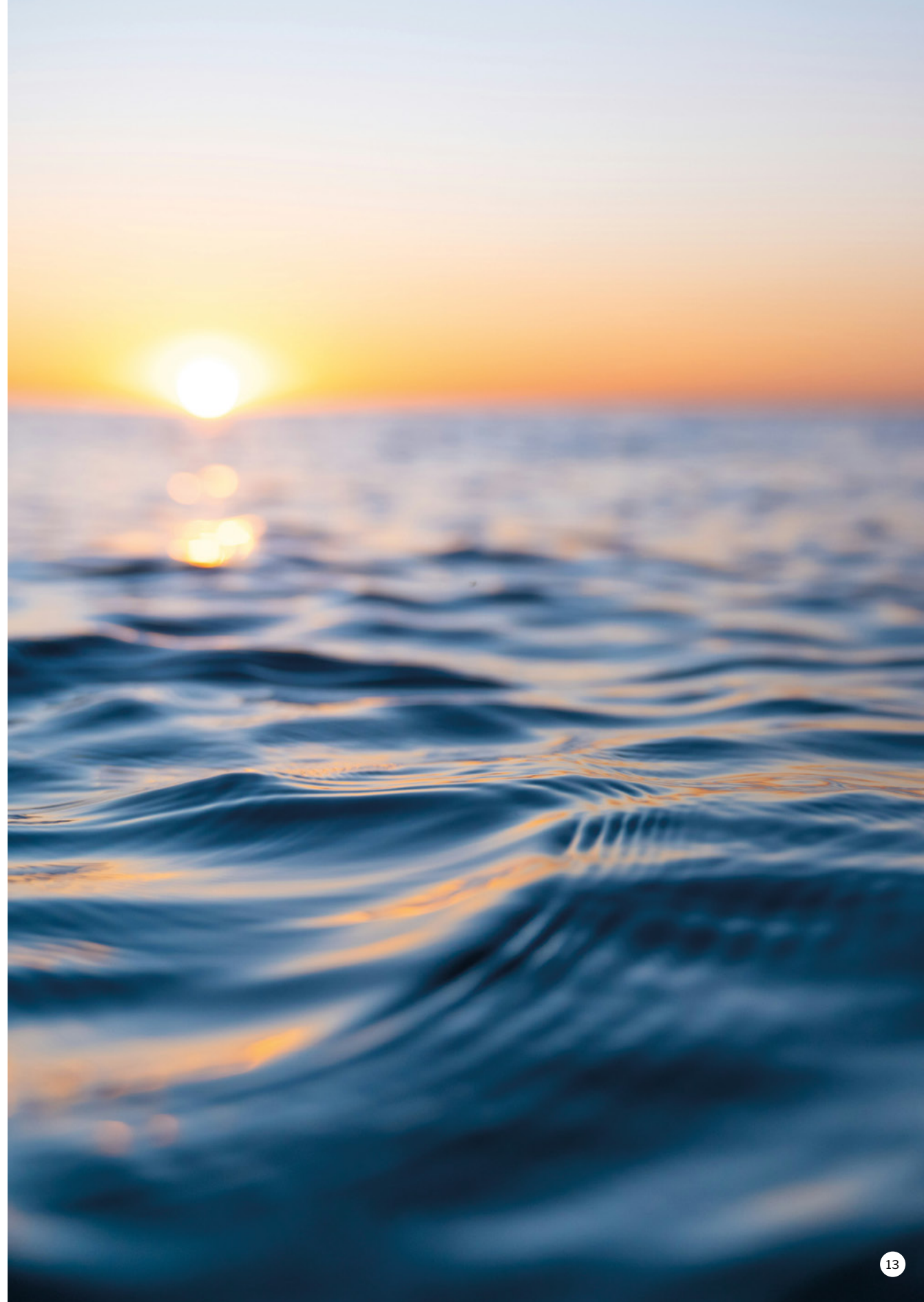


Genetics
Services



Genotyping
Services

Genotyping services and genotyping tools designed for more than **30 species**



FACILITIES



Salten, Norway



Lønningdal, Norway



Vogar, Iceland



Kalmanstjörn, Iceland



Kollafjörður, Iceland



Punta Canoas, Colombia



Fellsmere, US



Scan the QR code to
find our worldwide
directory



Benchmark Genetics invests significant amounts each year in research and development. With established breeding programs in Norway, Iceland, Colombia and the US, we can offer a solid genetic foundation for our global customer base.

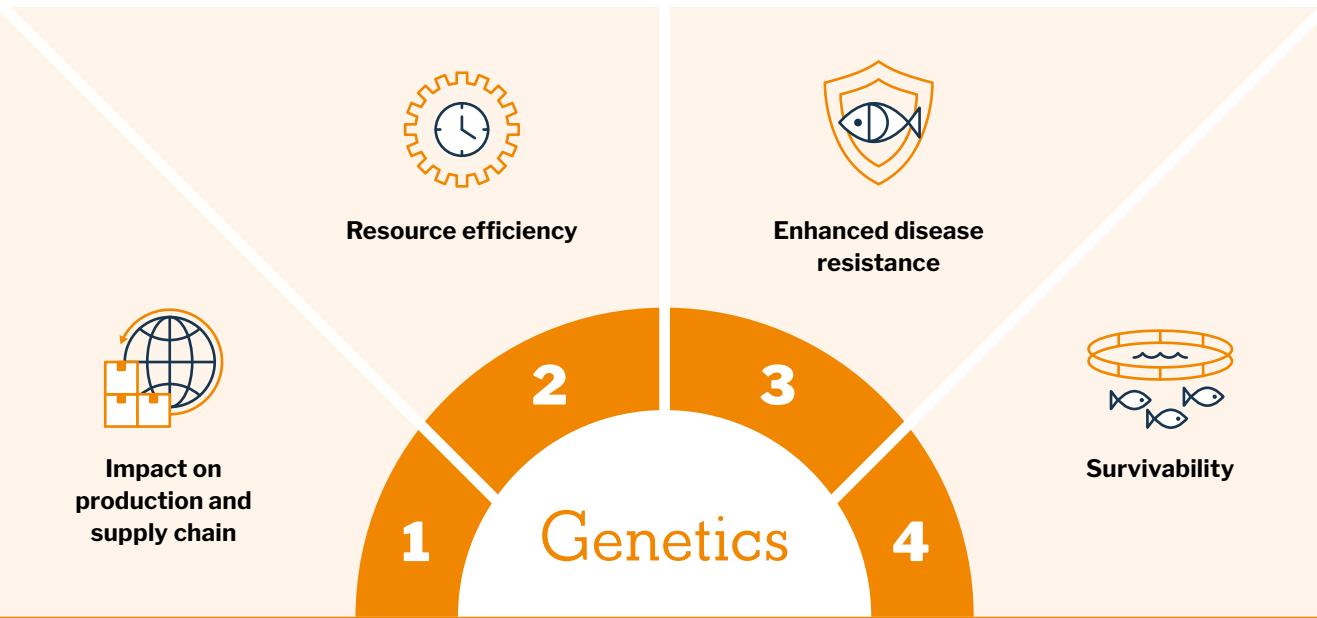
**Birgitte Sørheim, Marketing Director,
Benchmark Genetics**



INDUSTRY IMPACT

Genetics transformative impact on the entire supply chain

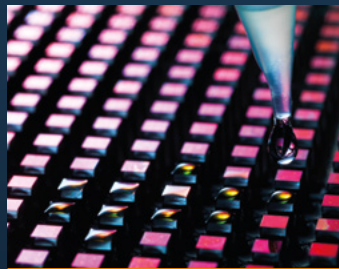
Resource efficiency, disease resistance and survivability



Current practices within Benchmark Genetics



Cryopreservation



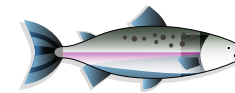
Selection methods



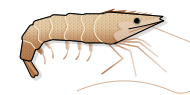
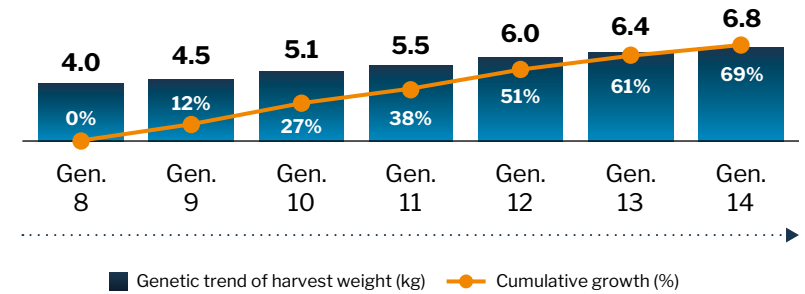
Genomics

Cumulative genetic improvement for salmon and shrimp growth

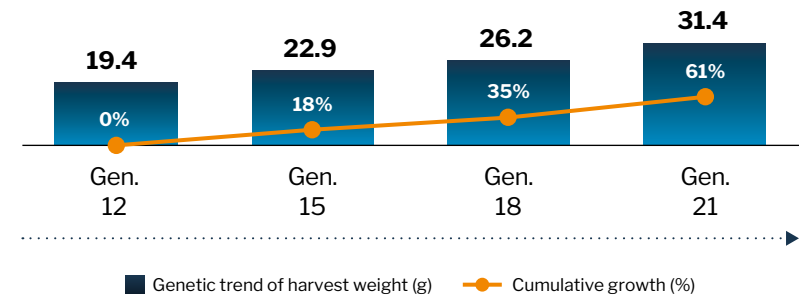
Genetic trend of harvest weight



Salmon



Shrimp



Gen. 8 for salmon and Gen. 12 for shrimp are used as the baseline to show trends, even though improvements began at Gen. 0.

Salmon genetics

Your partner in sustainable aquaculture — providing science-driven innovation for long-term growth

WHAT WE OFFER

We strive to be the foundation of our customer's success

- 1** Our Atlantic salmon ova portfolio has been developed to deliver optimised growth potential and robustness.
- 2** The Benchmark Genetics salmon strains have been improved through 50 years of breeding, providing a crucial starting point for efficient and resilient production.
- 3** Strict biosecurity protocols are one of our defining strengths. We maintain the highest standards to ensure a clean, safe, and secure supply of eggs.
- 4** In-house cryopreservation of milt enables us to select top-performing males, enhancing the genetic foundation for performance.
- 5** Robust R&D capacities translate the latest scientific developments into commercial practice, innovation and improved products.



Worldwide Delivery

Through years of global customer relationships, we have proven our ability to send ova worldwide 52 weeks a year and meet the needs of salmon producers around the globe.



Logistics

Solid procedures and decades of experience ensure that eggs maintain quality during transport.



Technical Services

Best practice support offers salmon farmers efficiency and competitive advantage. We share guidelines for order and egg delivery, hatchery manual and start feeding calculator.



Advancing salmon farming by providing a solid genetic foundation and high quality, biosecure eggs, all year round

SALMON GENETICS PORTFOLIO

Product line with enhanced genetic potential

Optimised genetics with enhanced selection intensity for key traits based on the most important needs from specific farming environments and production methods.



Solid growth and robustness

Ova selected for **strong growth and extra strong resistance to IPN.**

Additionally, it offers a balanced selection for resistance to CMS, PD, Lice and ISA, and a lower risk of early maturation.

Key properties:

- High growth performance
- Extra strong protection against Infectious Pancreatic Necrosis (IPN)
- Balanced protection against Cardiomyopathy Syndrome (CMS), Pancreas Disease (PD), Lice and Infectious Salmon Anemia (ISA)
- Lower risk of early maturation



Superior growth

Ova selected for the **highest growth potential, extra strong resistance to IPN and strong resistance to CMS.**

Additionally, it offers a balanced selection for resistance to PD, Lice and ISA, and a lower risk of early maturation.

Key properties:

- Our highest selection for growth performance
- Extra strong protection against Infectious Pancreatic Necrosis (IPN)
- Strong protection against Cardiomyopathy Syndrome (CMS)
- Balanced protection against Pancreas Disease (PD), Lice and Infectious Salmon Anemia (ISA)
- Lower risk of early maturation



Superior robustness

Ova selected for **extra strong growth, and extra strong resistance to CMS and IPN.**

Additionally, it offers a balanced selection for resistance to PD, Lice and ISA, and a lower risk of early maturation.

Key properties:

- Extra high growth performance
- Extra strong protection against Cardiomyopathy Syndrome (CMS) and Infectious Pancreatic Necrosis (IPN)
- Balanced protection against Pancreas Disease (PD), Lice and Infectious Salmon Anemia (ISA)
- Lower risk of early maturation



Optimal RAS

Premium selection of salmon ova for the specific requirements of the land-based production environment.

This product is selected for extra high growth and a reduced early maturation (All-Female), or even elimination of early maturation (All-Female/Sterile (3n)).

Key properties:

- Extra high growth performance
- All-female

Optional properties:

- Sterile (3n)
- Extra strong protection against Infectious Pancreatic Necrosis (IPN)



Custom-built for specific needs

Upon request, we can deliver customized salmon ova with a selection of traits tailored to your unique requirements. In close dialogue with our specialist teams, we can meet your specific needs of regional and potential production challenges with SalmoTailored®.

Optional key properties:

Selection with tailored levels of strength in the following traits:

- Growth performance, Cardiomyopathy Syndrome (CMS), Infectious Pancreatic Necrosis (IPN), Pancreas Disease (PD), Lice, Infectious Salmon Anemia (ISA), Late Maturation, Pigment, Gill health (AGD)
- All-Female and/or Sterile (3n)

Organic ova

Organic ova according to DEBIO/TÜN certification.

Available upon request and must be ordered well in advance (12 months before delivery).

For further information about our products visit

bmkgenetics.com/new-product-line



KEY PARTNERSHIPS

Collaboration with leading farming companies in Norway



Two broodstock licenses in Nordland supplying Benchmark Genetics Salten with breeders



Operational agreement for the two licenses owned by Benchmark Genetics



Joint venture for operations of Salmar's breeding program, 'Rauma'



10-year multiplication agreement for the SalmoBreed strain and sales of eggs. Bolaks have been multiplying the SalmoBreed strain for more than 50 years

Total of 10 licenses for breeding and R&D



Certifications

We are aiming for the highest standards of operation and fish welfare, with a minimum impact on the environment and have international accredited systems: ISO 9001: 2015, ISO 14001, Global G.A.P., Debio, TÚN, RSPCA, WOAH.



CLIENT TECHNICAL SUPPORT

Ensuring quality and traceability through expert support and smart systems



We aim to personally deliver the eggs to conduct quality controls and to support our clients at egg inlays.

Our team of technical experts have exquisite knowledge about hatchery management and are available to customers for questions, support and sharing of best practices.

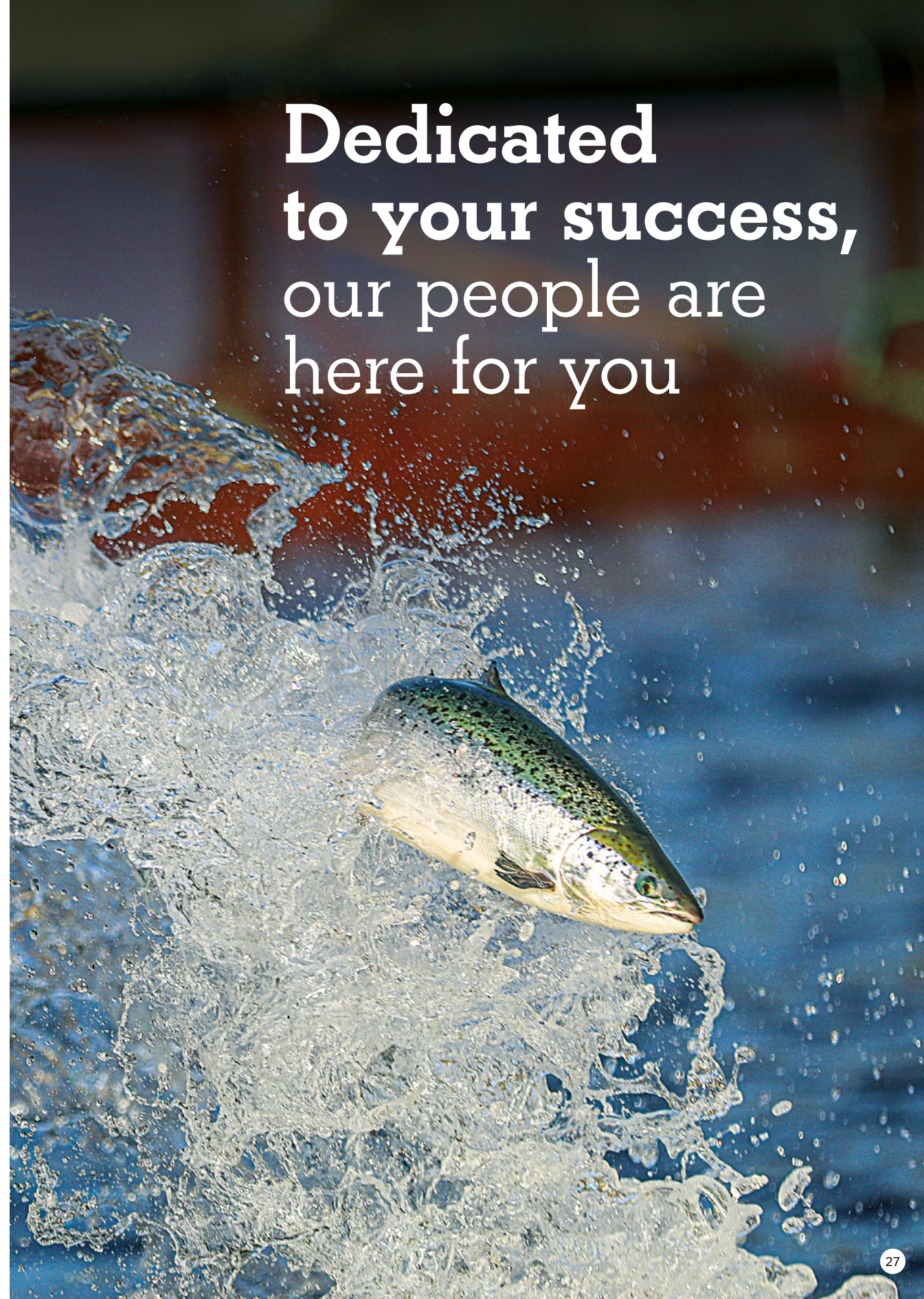
The BreedControl™ system, invented by Benchmark Genetics, helps our customers keep track of contracts, orders, deliveries, documents, certificates, and the ova benchmarking survey.

For every delivery, we keep a batch of eggs until start-feeding, so called quality groups, to register the performance of each delivery to our customers. This also ensures a good and fair claim process in case of quality deviations.



 **BreedControl**
by Benchmark Genetics

Dedicated to your success, our people are here for you



CONTACTS

For further information about us and our products, please visit bmkgenetics.com or scan the QR code to find our contacts

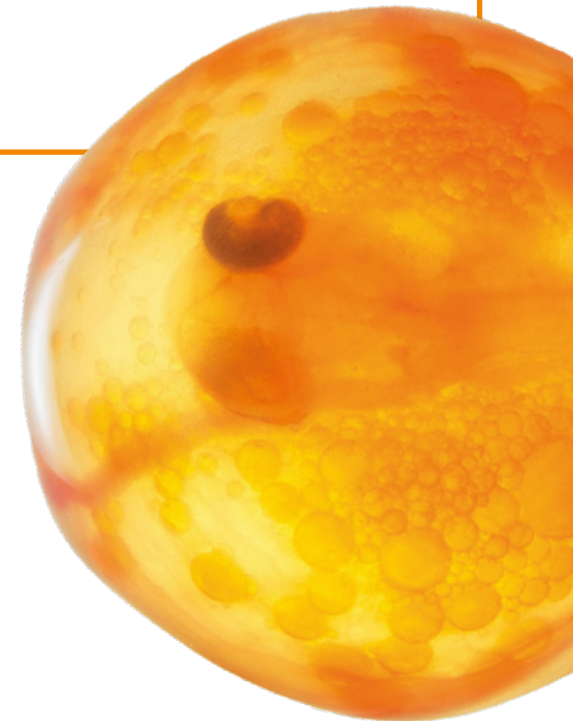


Decisions made at the genetic stage have a significant impact on optimal growth rates, production timelines, and resistance to parasites and diseases throughout the farming cycle. A salmon's performance is closely linked to the genetic potential of the egg, regardless of production conditions.

Your dedicated contact is involved from day one — bringing expertise, taking a holistic view, and applying best practices to support your success. Precise delivery and dependable follow-up are always key priorities in our commercial approach.

Alongside a strong genetic foundation, achieving consistent results across the value chain relies on high egg quality, a secure and disease-free supply, year-round delivery, and close customer support.

Kate Furhovden Stenerud
Chief Commercial Officer
Benchmark Genetics



Shrimp genetics

Investing heavily in genomic selection, using real-farm sentinel data to deliver solutions that meet the needs of modern farming

WHAT WE OFFER

A world class, unique breeding program for *Litopenaeus vannamei* (Pacific white shrimp)

Benchmark Genetics Shrimp operates a world-class breeding program for *L. vannamei* from its SPF nucleus breeding centre (NBC) in Cartagena, Colombia. This facility maintains one of the most genetically diverse domesticated *L. vannamei* nucleus populations globally and is among the longest scientifically documented breeding populations in the industry.

The production and global distribution of genetically improved, high-performing commercial product lines are managed from the breeder multiplication centre (BMC) in Fellsmere, Florida, USA.

Breeding and product development is executed by Benchmark Genetics' team of world-leading experts.

Genetic base with diversity

Our nucleus has a broad genetic base originating from founder stocks obtained from Colombia, Hawaii, and Venezuela and the wild populations in Costa Rica, Ecuador, El Salvador, Panama, and Peru.

This broad genetic base increases the genetic diversity and provides our team of geneticists with multiple options. With a wider range of selection to breed lines for local adaptation for the diverse environments found in the industry.

Global

Our global presence is consolidated by local sales technical teams, production centres, and commercial alliances in the main markets in Asia and the Americas.



Why choose our shrimp genetics?

Genomic selection

World's most documented program

Broad genetic base

Local adapted lines

Strict levels of biosecurity

A UNIQUE APPROACH

A breeding programme driven by data, genomics, and real-world performance

Using advanced genomic tools and real-world data from nucleus sentinels, our breeding programme has pioneered the development of locally adapted strains — combining strong performance in regional conditions with enhanced disease robustness and resilience to environmental stress.

Our product development has centred on creating locally adapted shrimp lines with improved growth and strong resilience to major global diseases, including WSSV, EHP, WFS and AHPND.

Our commercial strains are USDA certified as Specific Pathogen-Free (SPF), and none of our female breeders, both in the NBC and BMC, are eyestalk ablated.



LOCAL ADAPTED LINES

Genetic solutions tailored for performance, resilience and local conditions



Balanced growth, built for performance

BG B201 is a high-performing, locally adapted line developed using advanced genomic selection on sentinel shrimp raised in real commercial environments. Specifically designed for farm systems with good biosecurity or areas with lower disease pressure, BG B201 focuses on maximising growth while maintaining resilience to key industry challenges like EHP and WFS.

By combining fast growth genetics with region-specific robustness, BG B201 meets the evolving needs of today's shrimp farmers. This line is the result of close collaboration, innovative breeding strategies, and our ongoing commitment to quality — delivering improved performance season after season.



Please scan the QR code to download the BGB201 product technical card



Balanced robustness for resilient farming

BG B301 is a robust, high-performing line bred using the latest genomic technologies to thrive under disease pressure (EHP, WFS & WSSV) and environmental stress. Designed for challenging conditions, it offers a balance of fast growth and high survivability — helping farmers achieve reliable, efficient yields where it matters most.

With BG B301, you get a line built for resilience, ensuring steady production and stronger returns in tougher environments. It's the result of advanced selection on sentinel shrimp in real farm settings — delivering consistent quality and performance, season after season.



Please scan the QR code to download the BGB301 product technical card

SPECIALISED LINES

Specialised lines bred for speed, strength and challenging conditions

BGG601

Fast growth for biosecure and controlled environments

BG G601 is a specialised growth line selected for fast growth under stable, biosecure farming conditions. Designed for short production cycles, it performs best in systems with strong SPF (Specific Pathogen Free) management, where its rapid growth potential can be fully realised.

Developed through advanced breeding technologies and real-world collaboration, BG G601 is an ideal choice for producers focused on efficiency and high turnover — delivering consistent, high-quality results season after season.

BGR501

High robustness with ability to withstand challenging environments

BG R501 is a robust, specialised line developed for extreme farming environments where resilience matters most. Selected for strong resistance to WSSV and high tolerance to environmental challenges, it offers farmers predictability and performance in even the toughest conditions.

This SPF/SPR line is the product of advanced genomic selection and on-farm testing, ensuring consistent results season after season. When adverse conditions are a factor and reliability is key, BG R501 is the line you can rely on.



In the shrimp value chain, everything depends on farm success — and at Benchmark Genetics, we know our success is tied to the farmers we serve. That's why we breed, develop, and deliver our products as tailored solutions to meet farmers' real-world needs.

As the industry evolves and faces increasing pressure at every stage, our role as a genetics supplier goes beyond simply providing high-performing broodstock. Positioned at the very start of the value chain, we see it as our responsibility to work closely with both hatcheries and farms — not just as suppliers, but as partners, collaborators, and solution providers.

Bruno Decock
Head of Benchmark Genetics Shrimp

For further information about us and our products, please scan the QR code or contact us at shrimp@genetics.com



Genetics services

With decades of global experience driven by in-house breeding programs, client collaboration, and expert insight — we provide world-class genetics consultancy to aquaculture breeders worldwide

GENETICS SERVICES

Unlock the power of genetic improvement



Benchmark Genetics is a global leader in aquaculture genetics and the preferred one-stop provider of genetic services. Our team of skilled geneticists specialises in program design and operational support, ensuring tailored solutions fitting your priorities and resources.

Extensive experience across species & programs

With combined experience from close to 40 programs spanning over 30 aquaculture species including salmonids, marine and freshwater fish, shrimp, and mollusks, Benchmark Genetics delivers proven results.

Who are we for?

Everyone! From start-ups to long-standing breeding programs, we can offer you expert assistance.

How does this work?



1. Free consultation



2. Project proposal



3. Technical visit



4. Customized plan



5. Actioning & support

Contact Benchmark genetics services for more information

genetic.services@bmkgenetics.com

GENETICS SERVICES

Power your breeding success

We offer fully customisable packages to set up or improve your selective breeding program and genetics activities



Technical reviews & genetic audits

Comprehensive evaluation of your breeding and broodstock management programs, including genetic diversity, inbreeding analysis, pedigree review, and population structure assessment.



Broodstock assessment & management

Thorough assessment of broodstock quality, genetic health, and pedigree structure, with tailored management plans to secure long-term genetic viability.



Breeding program design & support

Custom breeding strategies designed just for you, full technical support during implementation and routine operations, and data hosting. Designs range from mass selection, family-based, integrated programs, and advanced marker-assisted or genomic selection.



Genotyping services

End-to-end genotyping solutions for all major aquaculture species, including custom SNP panel development.



Training & capacity building

On-site or remote training, technical workshops, and ongoing knowledge transfer to strengthen your team's capabilities.



Advanced solutions

R&D assistance, data management and hosting, bioinformatics, and bioeconomic modeling to take your breeding program to the next level.

For further information about our genetics services, please scan the QR code



For each individual programme, we are optimising the use of available infrastructure and genetic resources and adapting our technologies with one main objective in mind: To obtain the largest possible genetic gains to the benefit of our clients.

**Morten Rye, Director,
External Services and Global Strategies**



GENOTYPING SERVICES

World-leading genotyping services

At Benchmark Genetics, we deliver industry leading genotyping services designed to power innovation in aquaculture breeding programs. Our advanced technology platforms, expert team, and streamlined workflows provide the reliable, high-quality genetic data you need to make informed decisions with confidence.

Key offerings



Trusted by leading aquaculture programs worldwide



Off-the-shelf SNP array solutions & custom panels



Market-leading prices*



Open access SNP details



Simple workflow and fast turnaround times



Global solutions across >30 key aquaculture species

* Prices for SNP Arrays, species and volume dependent.



GENOTYPING SERVICES

Benchmark Genetics offers high quality, all-inclusive, genotyping services for all major aquaculture species

Genotyping solutions

We offer a range of cost-effective genotyping tools that are optimised for a range of applications to suit client breeding programs or research requirements. Harnessing Axion genotyping solutions, Benchmark Genetics provides a large range of ready-made arrays, as well as offering bespoke array design services for a range of current or emerging species.

Species	Scientific name	Panel types
Finfish arrays		
Atlantic salmon	<i>Salmo salar</i>	● ● ●
North American salmon	<i>Salmo salar</i>	● ● ●
Barramundi	<i>Lates calcarifer</i>	● ●
Hamour	<i>Epinephilus coioides</i>	● ●
Meagre	<i>Argyrosomus regius</i>	● ●
Rohu	<i>Labeo rohita</i>	● ●
Safi	<i>Siganus canaliculatus</i>	● ●
Tilapia	<i>Oreochromis niloticus</i>	● ● ●
Yellowtail kingfish	<i>Seriola lalandi</i>	● ● ●
Arctic charr	<i>Salvelinus alpinus</i>	● ● ●
Catfish	<i>Ictalurus spp.</i>	● ● ●
European seabass	<i>Dicentrarchus labrax</i>	● ● ●
Gilthead seabream	<i>Sparus aurata</i>	● ● ●
Tambaqui	<i>Colossoma macropomus</i>	● ● ●
Pacu	<i>Piaractus mesopotamicus</i>	● ● ●
Coho salmon	<i>Oncorhynchus kisutch</i>	● ● ●
Rainbow trout	<i>Oncorhynchus mykiss</i>	● ● ●
Murray cod	<i>Maccullochella peelii</i>	● ● ●
Pompano	<i>Trachinotus anak</i>	● ●
Jade perch	<i>Scortum barcoo</i>	●
Flatfish arrays		
Senegalese sole	<i>Solea senegalensis</i>	● ●
Turbot	<i>Scophthalmus maximus</i>	● ●
Crustacean arrays		
Tiger prawn	<i>Penaeus monodon</i>	● ●
Whiteleg shrimp	<i>Litopenaeus vannamei</i>	● ● ●
Mollusc arrays		
Mytilus mussel	<i>Mytilus spp.</i>	● ● ●
Pacific oyster	<i>Crassostrea gigas</i>	● ● ●
European flat oyster	<i>Ostrea edulis</i>	● ● ●
Sydney rock oyster	<i>Saccostrea glomerata</i>	● ● ●
Coral and algae array		
Coral-algae	<i>Acropora (coral) & Symbiodiniaceae (algae)</i>	● ● ●

Panel types: ● High-density ● Medium-density ● Low-density

* New arrays to be released in 2025.

Market-leading innovation and R&D

We strive to be a recognised technology leader by delivering innovative solutions and superior products driven by expertise

MARKET-DRIVEN INNOVATION

World-renowned R&D and technology leadership

Market-driven innovation


The future of the industry and your business is front of mind when we are developing our products and solutions.

Key genetics R&D priorities include:


- Optimisation of genomic selection and trait recording to continuously improve health and performance of salmon and shrimp lines, and;
- New methods for mass production of sterile production animals, as well as gene editing for key target traits.


Benchmark Genetics have successfully developed salmon lines with enhanced growth and disease resistance by innovating in breeding program design, including application of the latest genomic tools.

Key facts

 **30** scientists
18 PhD degrees

 **>20 years**
average aquaculture experience

 **500+**
scientific publications

 **40** programmes
30 species applied experience



At Benchmark Genetics we are translating the latest scientific developments into commercial practice, enhancing the sustainability of the industry to the benefit of our clients.

Ross Houston
CSO, Benchmark Genetics



International collaborations



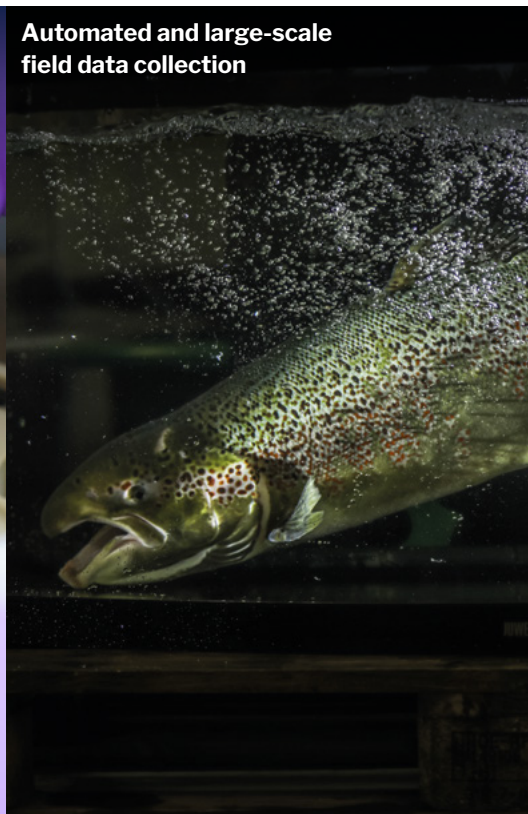
FOREFRONT POSITIONS AND R&D PILLARS

Leveraging cutting-edge genetic technologies aimed at developing next-generation breakthrough products

Our pillars for future development are centred around market disruptive technologies.

As global aquaculture continues to expand, genetic innovation is vital to optimising production, resilience, and sustainability. Benchmark Genetics molecular genetics team, based in Edinburgh, Scotland, leads this advancement with cutting-edge genotyping services tailored to the needs of global aquaculture producers.

Genomic data obtained through genotyping allows the aquaculture breeding and production industry to benefit from more efficient genetic improvement and management of their stocks.



PRESENTING OUR NEW OWNER

Benchmark Genetics operates as an independent company under the private ownership of Novo Holdings, a leading Danish investment firm

Novo Holdings — A global leader in life science investments

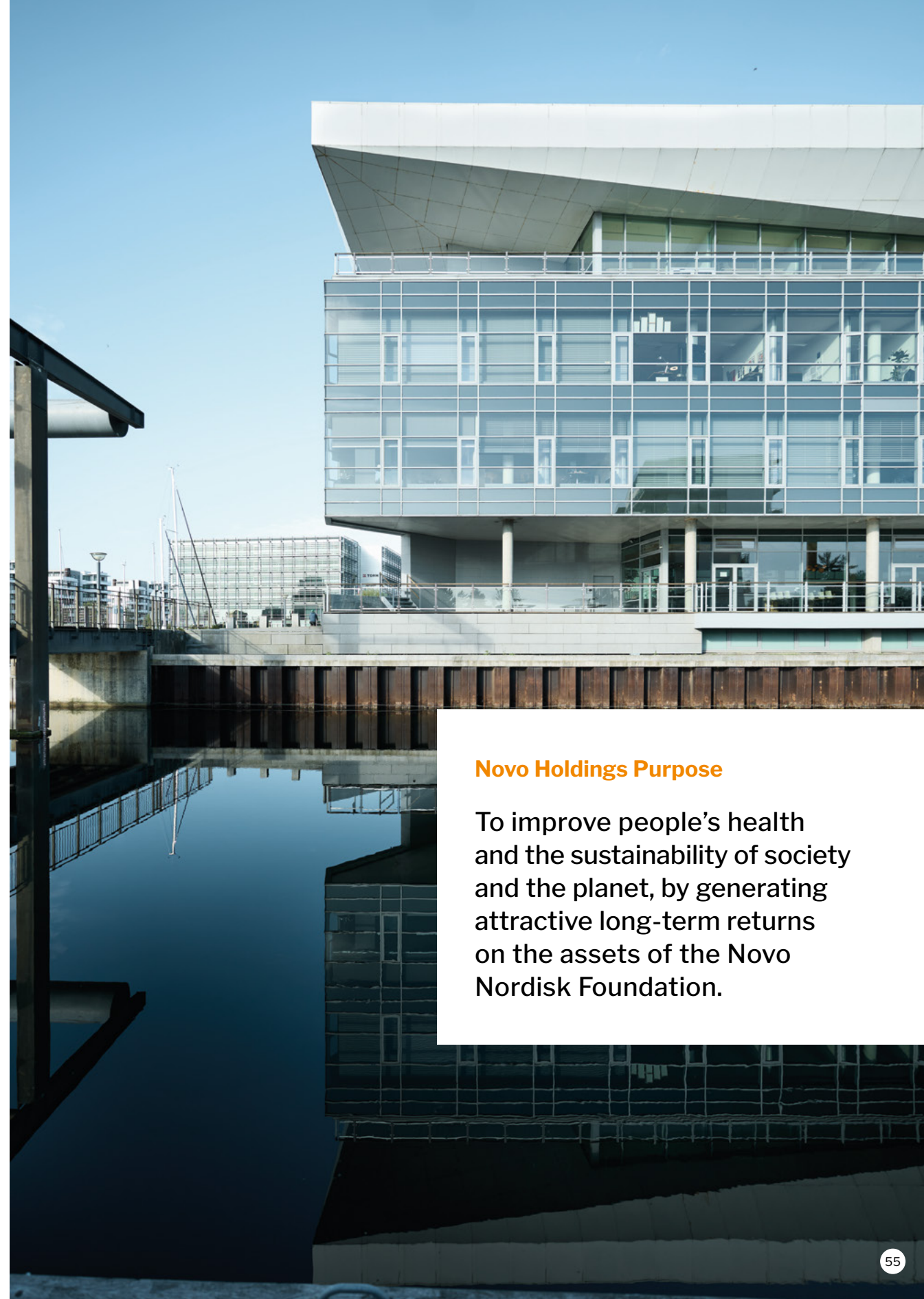
Novo Holdings is the holding and investment company responsible for managing the assets of the Novo Nordisk Foundation, one of the world's largest enterprise foundations.

With a strong focus on life sciences, Novo Holdings invests in innovative companies across all stages of development. The firm also manages a diversified portfolio that includes listed equities, bonds, real estate, infrastructure, and private equity.

A frontrunner in research and innovation, Novo Holdings recognises the transformative potential of aquaculture genetics. Through genetic advancements, the company sees significant opportunities to enhance productivity, resilience, and sustainability in global aquaculture.

Novo Holdings Purpose

To improve people's health and the sustainability of society and the planet, by generating attractive long-term returns on the assets of the Novo Nordisk Foundation.



Norway

Bradbenken 1, 5003
Bergen, Norway
+47 553 33 790

Iceland

Bæjarhraun 14,
220 Hafnarfjörður, Iceland
+354 564 6300

Chile

Santa Rosa 560, Office 25 B,
555 0000 Puerto Varas, Chile
+56 65 223 2610

North America

PO Box 7692, Portland,
ME 04112, USA
+1 207 329 4553

15369 County Road
51232948 Fellsmere, FL, USA
+1 772 316 0499

Colombia

Torre Empresarial Grupo Área –
Oficina 1002 Carrera 2, N. 11-41
(Barrio Bocagrande) 130001
Cartagena, Colombia
+ 57 313 890 8662

For more information about
Benchmark Genetics please visit
bmkgenetics.com

✉ post@bmkgenetics.com

[in](#) Benchmark Genetics

