

SESSION 2: IMPROVING FEED EFFICIENCY AND FUNCTIONAL FEEDS - MORE WITH LESS



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Improving Efficiency Through A Holistic Genetic X Nutritional Approach At Hatchery And Farm Level*

Abstract

As production costs rise sharply with current events, shrimp producers require innovation findings combining genetic improvement and cost-beneficial nutrition, supported by protocols adapted to local conditions. Recent market drivers, i.e. pathogenic pressure and low farm-gate price, have led many shrimp hatcheries and farms to reduce their costs and leave the crucial prerequisites in their facilities. This is a vicious circle, as lower investment in quality broodstock, healthy post-larvae, biosecurity, poor environment and feed performance are leading to lower performance, affecting productivity and profit.

Genetics, through genomic technologies, has in the last years improved breeding efficiency for key commercial traits, ensuring high-performing, robust, disease-free broodstock with specific traits. These product lines, selected for specific traits, assure the best adaptability to thrive in specific environments and management practices, giving producers financial consistency and predictability across seasons and crops.

Beside biosecurity measures and environment management, the nutritional quality of feed at early stages in hatchery extends the key-traits to later stages of production. Feed with the correct physical and nutritional properties give a clear advantage in the hatchery, but also at nursery and grow-out phases by implementing more comprehensive and dynamic nutritional recommendations based on shifting, interacting parameters in specific rearing environments and management practices, in both Asian and Latin American conditions.

Therefore, genetics and nutrition are the cornerstones of this holistic approach for predictable, consistent, and cost-efficient performances during the whole production cycle.

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IMPROVE EFFICIENCY THROUGH A HOLISTIC GENETIC X NUTRITIONAL APPROACH AT HATCHERY AND FARM LEVEL



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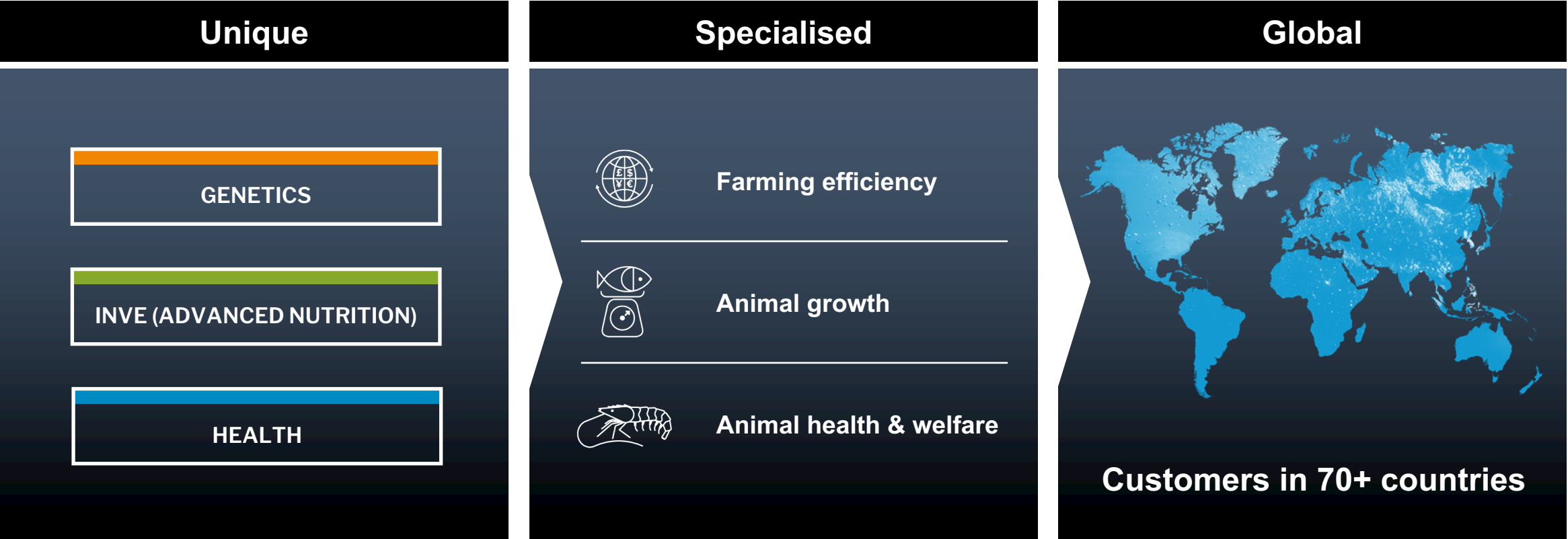
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Frederic Jozwiak - Product Manager at INVE Aquaculture

Bruno Decock - Operations Manager at Benchmark Genetics

Part of benchmark:
A market leading, aquaculture, biotechnology company



This holistic approach gives SHRIMP producers a way to improve efficiency
The subject of our talk today



IMPROVE EFFICIENCY THROUGH A HOLISTIC GENETIC X NUTRITIONAL APPROACH

Profitability / Success is a combination of:

- **Genetics:** input we can control
- **Nutrition:** input we can control
- **Management:** we control and adjust in function of
- **Environment / climate:** we adapt & adjust in function of through the 3 above inputs
- **External:** market price, global economy
we can adapt and adjust through management of predictable and consistent production



IMPROVE EFFICIENCY THROUGH A HOLISTIC GENETIC X NUTRITIONAL APPROACH

HOW?

- **Genetics:**
 - Specific product lines for specific production systems and rapid changing environments
 - Product development focus on predictable and consistent output
- **Nutrition**
 - Early nutrition is key in producing high quality PL, essential for a predictable and consistent farm cycle
- **Management**
 - Development of tools, SOP's & services to support producers



IMPROVE EFFICIENCY THROUGH A HOLISTIC GENETIC X NUTRITIONAL APPROACH

GENETICS

- New technologies such as genomics and maybe in near future gene editing, allow us to enter a new area in breeding which will help to improve efficiency
- The trend of different product lines for different culture systems and environments is another way to improve efficiency
- Robustness and Resistance are the new trend words and are needed to achieve a sustainable predictability and consistency

External factors such as climate change, market prices and global economy have emphasized the importance of genetics as a part of the solution

But its not the magic factor!

Success in profitability is a combination of other inputs



IMPROVE EFFICIENCY THROUGH A HOLISTIC GENETIC X NUTRITIONAL APPROACH

NUTRITION

Objective

Provide nutritious feed that is ingested and digested by shrimp.

Principles

- To supply feeds that are ingested and to meet the nutritional requirements of the different development stages,
- Feed uptake and nutritional requirements vary in respect of biological & physiological differences between development stages,
- Nutritional efficiency is strongly dependant of digestive system & microbiota status



IMPROVE EFFICIENCY THROUGH A HOLISTIC GENETIC X NUTRITIONAL APPROACH

MANAGEMENT

Genetics and Nutrition are key inputs, but they are none without the proper implementation of SOPs, technology and management.

Products are only as good and efficiency through the correct use and application, by going beyond just supplying products, as the following solution package:

- Technical support
- Product guidelines and SOP's
- Management tools (big data, AI)

The introduction of big data, AI and technology are helping the producers

- Services



IMPROVE EFFICIENCY THROUGH A HOLISTIC GENETIC X NUTRITIONAL APPROACH

MANAGEMENT

Technology, big data, AI, Protocols & Technical advice

Crucial in bring the industry to a new level in terms of efficiency

Providers of genetics and nutrition are following the trend by offering producers the tools to use their products:

- Genetics
 - Breed Control (a big data management tool)
 - 3 modules: Maturation, Larval and Farm
- Nutrition
 - Service desk
 - Technical support



IMPROVE EFFICIENCY THROUGH A HOLISTIC GENETIC X NUTRITIONAL APPROACH

HOW ABOUT

ENVIRONMENT & CLIMATE

- We use genetics, nutrition and management to adapt
- All stakeholders from suppliers to producers are having a responsibility, there is no just one miracle solution, it's a combined effort

EXTERNAL (market prices & world economy)

- Low farm gate prices, increasing costs...lower margins...it's a reality
- But nothing is impossible, key is to become a predictable and consistent output industry by standardizing our ways of production and a better management of the main inputs
- Shortcutting on the inputs is not the solution and only throws the industry in a vicious cycle of good and bad crops/years

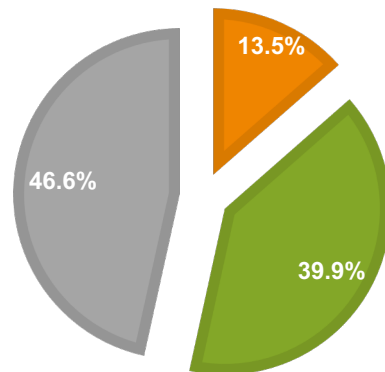


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GENETICS & NUTRITION AS % OF THE COST STRUCTURE

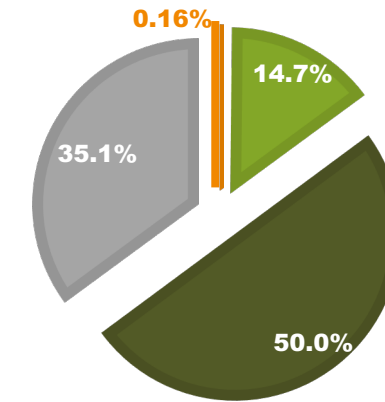
HATCHERY: AS % OF PL COST

■ GENETICS ■ NUTRITION ■ OTHERS



FARM: AS % OF FARM COST (PER KG)

■ GENETICS ■ EARLY NUTRITION ■ FARM NUTRITION ■ OTHERS



Genetics & Early Nutrition in total cost of Farm are relatively small, but important key inputs in obtaining consistency and predictability over season / crop

Cutting short on these is not a wise management decision

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HATCHERY LEVEL

Early nutrition to boost genetic potential

- Shrimp larvae stages require a different mix of feed type, size and texture,
- Formulated feed has developed to meet the needs of shrimp larva, but good development still requires inclusion of algae and Artemia,
- Nutritional levels must meet the requirement of new genetic strains.

Responsive management

- Effective management of shrimp larvae responds to changes in the larval rearing condition for optimal growth and development,
- Good management consists of fast detection of deviations, in development profile or tank environment, in order to adjust feeding program.



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FARM LEVEL

Challenges

Shrimp farming sector faces various challenges, most importantly various diseases and farm gates price, both affecting the profitability. To manage these challenges, functional feed are part of the solution by securing the zootechnical performances for better yield.

Microbial solution for functional feed

Feed probiotics proved to be a cost-efficient solution for different types of functional diets:

- In Nursery diet, to support the digestion & nutrients assimilation for efficient metabolism & PL robustness,
- In Starter feed, to inhibit the growth of Vibrio and other pathogenic bacteria inside the gut, helping Shrimp juveniles to allocate energy for growth instead of natural defenses,
- In Grower or Finisher feed, to support the overall zootechnical performance of adult shrimp by maintaining microbiota balance, health and digestion, optimizing Survival, FCR, Size & Growth at Harvest.



Take Home Messages

- **Production costs rise** sharply with ingredients cost issues. Shrimp producers must **focus on production predictability**.
- **Innovation findings combine genetic improvement, cost-beneficial nutrition & microbial solutions**, supported by **protocols adapted to local conditions**.
- **Genetics and Nutrition** are the cornerstones of this **holistic approach for predictable, consistent, and cost-efficient performances** during the whole production cycle.



We are here to help!
Do not hesitate to
contact us

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