

HATCHERY FEED GUIDE & YEAR BOOK 2015

from Hatcheryfeed



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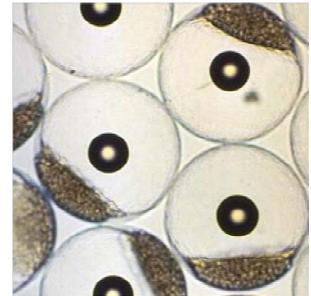
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Welcome

W

elcome to the 2015 Hatchery Feed Guide and Year Book—we hope you find it useful. This is the third edition of the Guide and as you will see, it continues to grow: the 2015 issue is more comprehensive than ever, thanks to the response of the industry.

As with the former issues, we have relied entirely on information provided by suppliers in the compilation of the listings [[See complete disclaimer information](#)]. We appreciate the time these companies have taken and the encouragement they have given us.

If you supply hatchery feeds and your products are not included we apologize; please email us to make sure we contact you in time for the next issue. If you are using a product that isn't listed, please let us know so that we can include it next time— together we can make the Guide an even more valuable resource.

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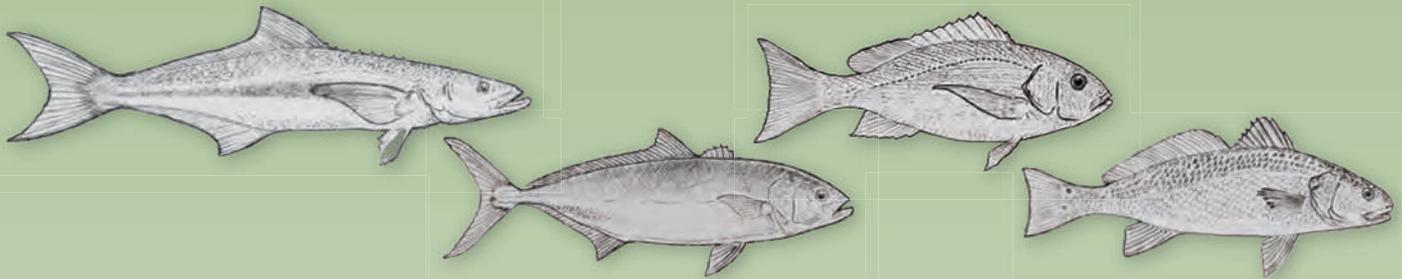
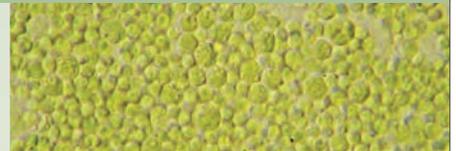
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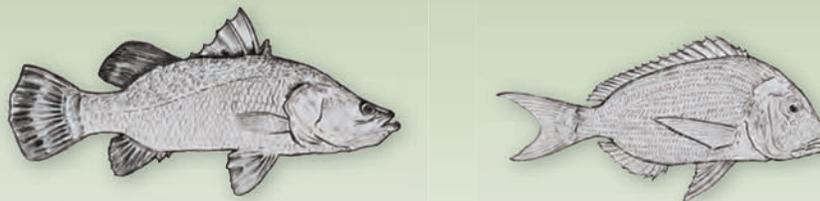
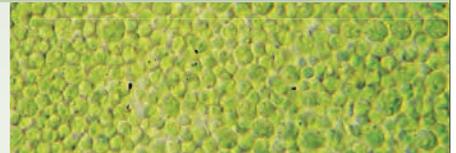
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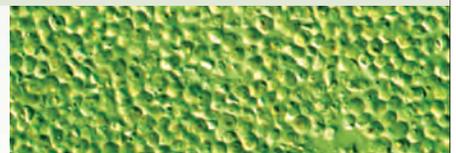
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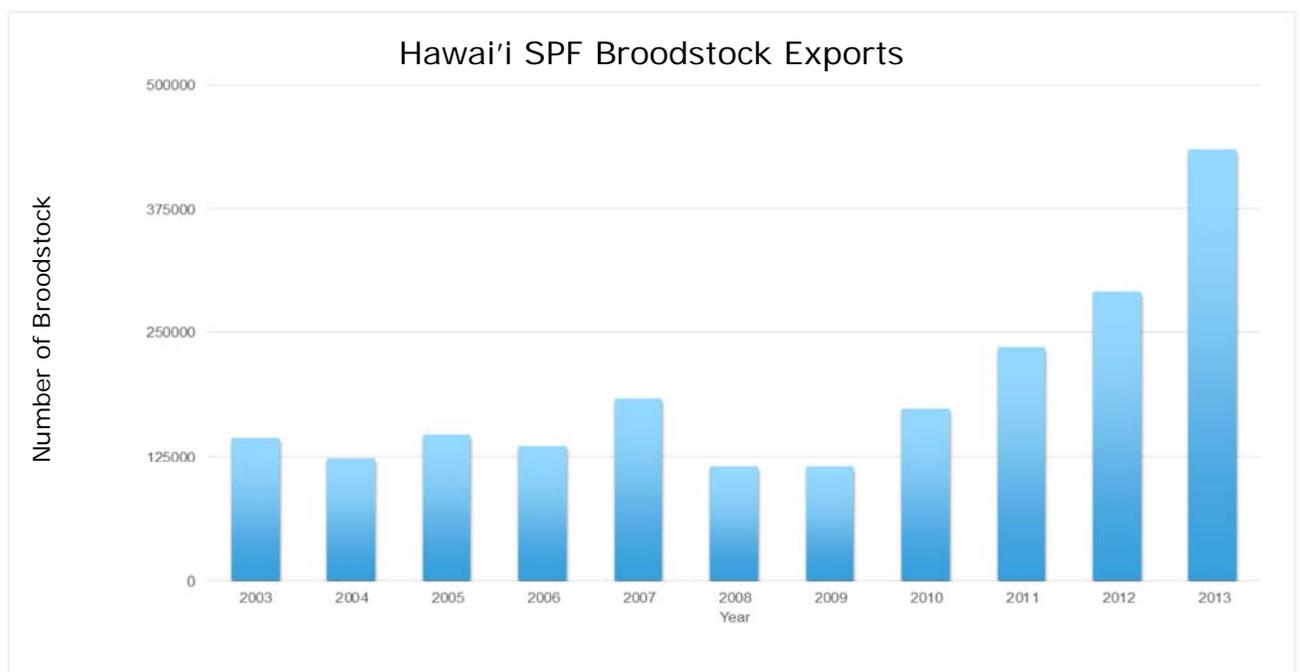
Hawai'i: Shrimp Breeding Capital of the World

Hawai'i is the birthplace and home to SPF breeding technology and the world leader in SPF broodstock supply. Jim Wyban explains how this all came about.

In 2013, Hawai'i's SPF shrimp broodstock companies exported over 425,000 SPF broodstock. With a market price of \$100/pair, these exports were worth more than \$20 million. Hawai'i is the birthplace and home to SPF breeding technology and the world leader in SPF broodstock supply. Hawai'i's remote location, year round growing conditions, excellent

air transportation, well-established shrimp breeding and disease expertise and excellent biosecurity infrastructure are all important strategic factors for why Hawai'i is home to this industry. By virtue of Hawai'i's unique resources and as the birthplace and home of SPF technology, Hawai'i can now be called the Shrimp Breeding Capital of the World.

Shrimp is the world's most valued aquaculture product. Shrimp is America's No. 1 seafood. It's well known that 90% of the shrimp Americans eat are imported and the majority of these are farm-raised in Asia and South America. What's little known is that the genetics of most of the world's farmed-shrimp starts in Hawai'i. I want to tell you about how this came about.



Source: State of Hawaii Aquatic Veterinarian

HAWAII
SHRIMP
BREEDING
CAPITAL OF
THE WORLD

In the early 1980s I was hired by Oceanic Institute (OI) to manage a large research project to help develop shrimp farming in the United States. Back then, shrimp was already the number one seafood in the U.S. and shrimp imports were more than \$2 billion per year. It was reasoned that a U.S. shrimp farming industry could replace these imports, create rural jobs, and keep a lot of dollars from going overseas.

At that time, shrimp farming was rapidly developing in South America and Asia. Shrimp were produced by catching baby shrimp from the ocean and stocking them

"...we set out to develop disease-free shrimp. We called our shrimp SPF, short for Specific Pathogen Free ..."

in large ponds. After six months food-sized shrimp were harvested. Demand for these shrimp was huge and the industry was expanding quickly. At that time, most of the world's supply of shrimp was coming from ocean fisheries.

As shrimp farming expanded a bottle-neck emerged, which was a limit of available post larvae (PL). PL were seasonal in abundance and farmers could not always catch enough to stock their ponds.



PL SPF *P. vannamei* ready to stock in ponds

In the 1940s, a Japanese scientist, Dr. Fujinaga, closed the life cycle of shrimp and this technology allowed the development of land-based shrimp hatcheries to produce PLs for the industry. Wild caught broodstock were stocked into indoor

tanks under ideal conditions of temperature, photoperiod and diet where they would spawn fertilized eggs. After hatching, the larval shrimp could be reared in tanks where they were fed cultured marine microalgae and live Brine shrimp. In three weeks after passing through a series of transformations, young shrimp - PL were harvested and could be stocked into ponds. Development of this hatchery technology removed the bottleneck of PL supply

and the industry was poised for rapid expansion.

It was during this stage of industry development that I went to work at OI. We were tasked to identify and solve obstacles to developing a U.S. shrimp farming industry. When we met with shrimp farmers in Hawai'i, Texas and South Carolina a consistent problem emerged. They had serious disease problems that were preventing reliable production. We learned that the disease problems started at the hatchery stage because wild broodstock carried disease. In other animal production systems - pigs, chickens, cattle - disease-free, domesticated animals had solved their disease problems so we set out to develop disease-free shrimp. We called our shrimp SPF, short for Specific

Pathogen Free, to reflect the quarantine and certification process through which they passed.

Our first SPF shrimp were born in Kona in 1990.

To test if these SPF shrimp could solve the disease problems, we produced a large batch of SPF broodstock in Kona in 1991 in time to supply U.S. shrimp farms with SPF PL. These are PL that are produced from SPF broodstock under biosecure conditions so they are disease free. SPF PL were stocked in commercial farm ponds in Hawai'i, Texas and South Carolina and were grown side by side with the standard PL used by US farmers. In all cases, the SPF PL far outperformed the standard PL. Faster growth, more uniform sizes and higher survival was experienced in all cases. Because of these encouraging results, we produced more SPF broodstock in Kona and in 1992, all shrimp ponds in the U.S. were stocked with SPF PL from broodstock from Hawai'i. The 1992 shrimp crop exceeded all expectations.

In every farm, production was increased and overall, total US harvest doubled over previous years.

These results were fantastic and had significant implica-

tions. I went to my boss at OI and told him there was a huge opportunity in this technology and that we should commercialize it. He told me that OI was a research company and not interested in commercial activities. So I quit my job and with my wife Carol as my partner, we started our company - High Health Aquaculture - the world's first SPF shrimp breeding company. We moved our family to Kona where we secured a lease at the Natural Energy Lab (NELHA) and began supplying SPF broodstock in 1993.

Our first commercial effort was a massive failure. A major shrimp farming company from Ecuador - El Rosario - wanted to introduce SPF technology to their farms. They invested in our company and we worked closely with

their staff to do a major production trial in El Rosario farms. We shipped SPF broodstock from Hawai'i to Ecuador. More than 500 million SPF PL were produced in Ecuador and stocked into five separate El Rosario farms. During the hatchery phase and the first few weeks after stocking everything went smoothly and all was good. I was attending a conference in Europe and got a late night call from Ecuador. They told me I should come to Ecuador immediately because our shrimp were dying everywhere.

By the time I arrived, massive die-offs were happening in all of the SPF ponds. This killed our partner's interest in SPF technology but only increased my determination. We eventually learned that our SPF shrimp had been



Broodstock tanks & hatchery at High Health Aquaculture facility in Kona Hawai'i.

HAWAI'I
SHRIMP
BREEDING
CAPITAL OF
THE WORLD



killed by a brand new virus called Taura Syndrome Virus and that our SPF shrimp were acutely sensitive to this virus. We continued to supply SPF broodstock to the U.S. industry where results were still great.

In 1997, a group from Taiwan imported the first batch of SPF broodstock from Kona to Asia. Based on great early results, the Taiwan industry rapidly adopted use of SPF PL and demand for Hawai'i SPF broodstock boomed. Our fax machine was flooded with requests to purchase broodstock and groups of Taiwanese entrepreneurs came to Hawai'i to secure their supplies. This led to several new Hawai'i companies developed to meet this demand. By 1999, success using SPF broodstock from Hawai'i

reached the front page of the Taiwan national newspaper. Use of SPF broodstock in Asia rapidly spread from Taiwan to China and then Thailand and Indonesia.

In just a few years, Asia shrimp farming was completely transformed from farming Black Tiger Shrimp which is native to Asia to farming introduced SPF White Shrimp which is native to Americas.

The economic impact of the adoption of this technology was huge. In 1998, when Hawai'i SPF broodstock began shipping to Asia, total world farmed-shrimp production was 900,000 MT. By 2010, after most of Asia had switched to farming SPF shrimp, production had grown to 3.5 million MT - a 400% increase in 12 years.



Pond harvest of SPF white shrimp in Thailand

In Hawai'i several companies developed to supply shrimp broodstock to the growing demand from Asia. Several of the groups worked on breeding their shrimp for improved performance. At my company, we focused on breeding shrimp for resistance to Taura Virus and fast growth.

Several years after Taura had devastated our commercial trial in Ecuador, Taura reached the U.S. and caused significant losses. In response we started a breeding program for resistance to Taura Virus. Many experts told us this was impossible but we tried anyway.

To do it, we'd produce a large collection of same age families at our Kona farm. The families were grown side by side in separate tanks up to 1g size. Samples from each family were then color-coded by injecting a liquid plastic tagging material. Each family got a different tag color or combination of colors. The tagged families were shipped to Dr. Don Lightner's lab at the University of Arizona in Tucson. The families were divided into two identical groups. In one group, the shrimp were fed purified virus. The other group was maintained without virus to serve as controls. Over three weeks mortalities were recorded by family. The family survival data were compiled and sent to Hawai'i. From these data, we knew which families were most resistant to the virus. These families were then selected to breed following generations. Over time, the average survivals of our shrimp increased like stair steps.

We increased their resistance to the virus from about 20% survival to over 95% survival over about eight generations of selection. This was quite remarkable because many geneticists and disease experts told us we could never do this.

In addition to breeding our shrimp for virus resistance we also selected for fast growth. Within our select families based on virus challenge, we selected the fastest growing individuals to parent the next generation. This combined selection program was very effective and increased our shrimp's virus resistance and growth rate. We started supplying our Taura Resistant broodstock to the US industry in 1999 and over the next four years, shrimp production tripled increasing from 2000 MT to 6000 MT using our broodstock.

In 2012, we sold our company to Shrimp Improvement System Group (SIS). They have made Kona their shrimp breeding headquarters and hugely expanded on our business. In 2013, Hawai'i's shrimp breeding companies exported over 425,000 SPF broodstock. With a market price of \$100/pair, these exports were worth more than \$20 million.

SPF shrimp are the foundation of a sustainable shrimp farming industry. Use of SPF shrimp has greatly reduced disease incidence in the industry and reduced the use of antibiotics in the industry. Use of SPF broodstock has reduced the spread of shrimp diseases worldwide and has eliminated the industry's practice of capturing wild animals for seedstock.

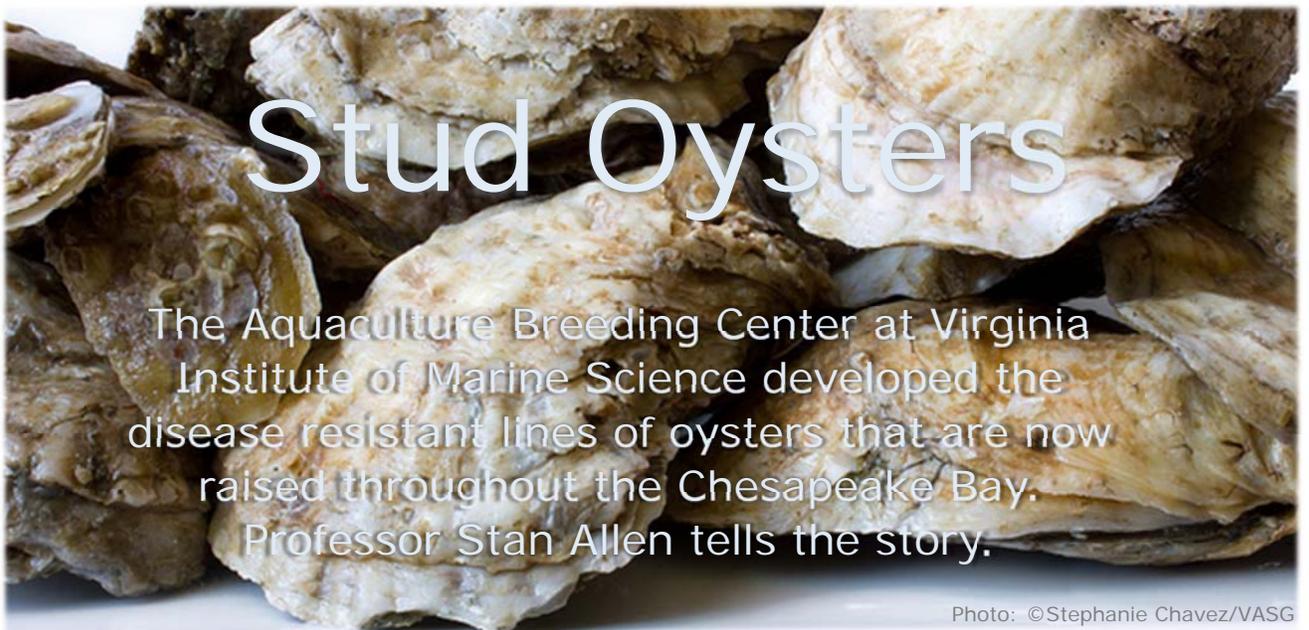
ΩHF

ABOUT THE AUTHOR



Jim Wyban is a leading consultant in shrimp breeding technology. He is often called "the father of SPF shrimp" for his seminal role in developing and commercializing SPF shrimp worldwide: he founded and developed the world's first SPF shrimp breeding company in Kona, Hawai'i in 1994, which he sold in 2012. Dr. Wyban offers consulting services in design and operations of commercial shrimp breeding and hatchery systems. His goal is to engage with projects to produce high quality, sustainable seafood for the global market.

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Stud Oysters

The Aquaculture Breeding Center at Virginia Institute of Marine Science developed the disease resistant lines of oysters that are now raised throughout the Chesapeake Bay. Professor Stan Allen tells the story.

Photo: ©Stephanie Chavez/VASG

To lay audiences, I frequently refer to the activity at our oyster breeding center as “a stud farm for oysters.” While it may be an image hard to conjure, it accurately encapsulates our activity at the Aquaculture Genetics and Breeding Technology Center (ABC).

At ABC, because of a stable funding base, we have more than eight generations of breeding in some of our five lines and over two hundred families

ABC was created in 1997 by an act of the Virginia legislature. The core funding comprises the original legislation, resources contributed by Virginia Institute of Marine Science (VIMS), and, now, revenues from intellectual property of our breeding activities. Our budget is about equally

split among the three. The combination provides a stable funding base for continuity of the breeding program.

For shellfish breeding in general, continuity has been a major programmatic challenge. In the United States, there are innumerable research programs that aspire to have full-fledged breeding programs in shellfish. The mechanisms for funding the long term commitment are generally absent. More typically, a grant is procured for several years of research on a particular problem – creating disease resistant lines, for example – and then, the funds dry up. The program is left in the challenging position of maintaining new lines without direct funding. At ABC, be-

cause of a stable funding base, we have more than eight generations of breeding in some of our five lines and over two hundred families. When ABC started, the breeding goal was achingly simple – it’s disease resistance, stupid - (harkening back to when it was the economy, stupid). Our approach was straightforward. By using mass selection, the time honored mode of domestication for the last 10,000 years, we were able to produce a number of specific lines of oysters that are quite resistant to our major disease called MSX. Luckily, the heritability for disease resistance was quite high. Another disease, Dermo, is still a threat. However, by selecting also for fast growth, oysters can reach market size



The team loads up the boats at VIMS to deploy the oysters on the other side of the York River. ©Janet Krenn/VASG

before the disease causes any mortality.

Faster growth and improved market quality were behind the rationale for creating another added value in our lines, the triploid oyster. To produce triploid oysters on a commercial scale, we first had to make a tetraploid oyster, one that has four sets of chromosomes. When the tetraploid is crossed to a diploid, the progeny are all triploid. Triploidy greatly interferes with gametogenesis and therefore the oyster can obviate the energy budget of reproduction, leading to a hardier and fatter oyster. Tetraploids from our program are also produced from disease resistant lines, so all triploids made from them are also disease resistant.

Making disease resistant lines of diploids and tetraploids is one thing; industry having

access to them is another thing altogether. This is where our program excels on a practical level. In the Chesapeake, ABC runs five different farm sites for testing and holding broodstock. For our most popular lines and for the tetraploids, we rear far more than are needed for testing or spawning the next generation: we rear thousands of extra specifically for distribution to hatcheries. Hatcheries are our primary client. At about this time every year, ABC distributes proprietary brood stock to hatcheries based on their projections for next year's seed

production. Next year's seed projections are estimated by customer demand at the hatchery. Customer demand is determined by farmers experience with previous seed they have raised. A hatchery may get 500 of this line, 400 of that, and several hundred tetraploids for the upcoming season. They then coddle the brood stock through the autumn and bring them into reproductive condition over the winter for an early start in the calendar year. Over the eight or so years we have been doing this, we have given out more than 100,000 brood stock of various types to hatcheries.

At present, in the Chesapeake Bay, about 90% of production is triploid. Much of the remaining 10% of diploid production comes from our lines as well, so the vast majority of material grown in our area derives from the ABC program. Thus, at least for this area, aquaculture has joined agriculture in the use of genetically improved seed for farming.

ΩHF

ABOUT THE AUTHOR

Professor Standish K. Allen, Jr. is Director, Aquaculture Genetics and Breeding Technology Center, Virginia Institute of Marine Science, Gloucester Point, Virginia.

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[Read more about Virginia oyster research.](#)



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*Disease Risk Management panel at GOAL 2014





Improved hatchery and nursery production in EMS - hit Mexico, with selected *Bacillus* probiotics

J.Jaime Munoz M.¹, F. Marino Pinzon M.² and Olivier Decamp³

¹INVE de Mexico, Mazatlan, Mexico. Email: j.munoz@inveaquaculture.com; ²Laboratorio Fitmar, Caimanero / Agua Verde, Mexico ³INVE Aquaculture, Thailand. Email: o.decamp@inveaquaculture.com

Under commercial conditions in Mexico, the application of a selected mixture of *Bacillus* strains during larviculture and nursery showed improved survival.



Introduction

The ongoing outbreak of Early Mortality Syndrome (EMS) / Acute Hepatopancreatic Necrosis Disease (AHPND) has had a dramatic impact on shrimp producers in affected countries in Asia and in Mexico. Following reports of the disease being associated with broodstock management, for example through the use of

contaminated polychaetes, there has been a renewed focus on larval quality. Investing in quality larvae fits in the holistic approach that we are recommending, i.e. the combination of biosecurity measures, the stocking of strong and healthy PLs and the management of the rearing conditions through the control of nutrition/feeding,

sediment and water quality and microbial communities.

In Mexico, INVE Aquaculture has been evaluating the activity of a biocide (Sanocare PUR) and probiotic strains (Sanolife *Bacillus*) against EMS-virulent *Vibrio parahaemolyticus* strains that had been isolated by the team of Dr Bruno Gomez-Gill (CIAD). More specifically, one

of the Sanolife strains of *Bacillus* was shown to inhibit the growth of ten pathogenic *Vibrio parahaemolyticus* strains. (See Shrimp News International May 16, 2014: "[CIAD Research with INVE's Products against EMS](#)")

The Sanolife strains of *Bacillus* had been selected for their ability to inhibit pathogens, be metabolically active in shrimp gut and in shrimp culture medium, degrade organic waste, and improve the feed digestibility.

The practice of nursing PLs to a larger size before stocking into ponds has been strongly encouraged since the onset of the EMS epizootic. Nursery by itself will not solve the problem of EMS/AHPND. However, provided it is done with the appropriate biosecurity and suitable feed and water management, it can contribute to improved performance of the PLs. Applying a good nursery protocol, be it in raceways or ponds, allows for better control and stabilization of growth conditions, shorter cycles in open ponds, and more crops per year.

Trial

In early 2014, it was decided to evaluate the benefit of a selected mixture of *Bacillus* strains during larviculture and nursery, under commercial



Figure 1. FITMAR Hatchery

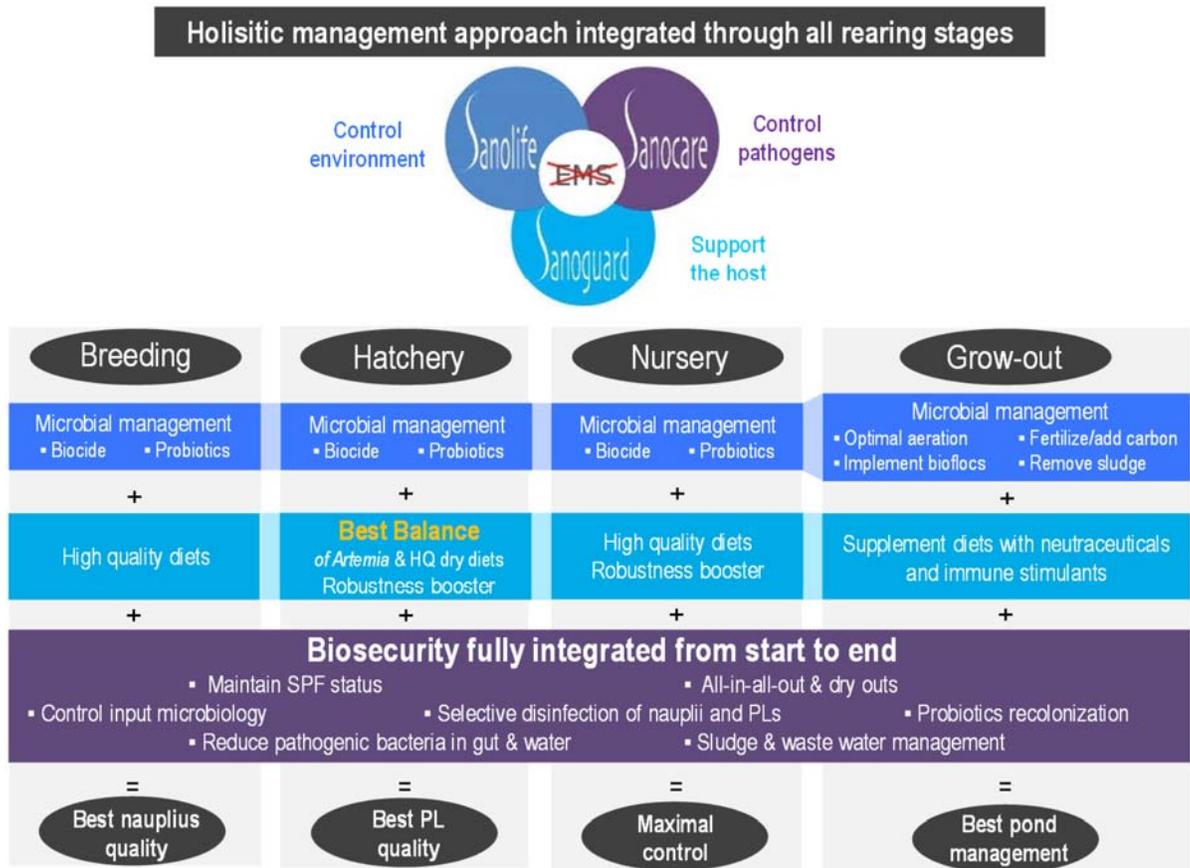


Figure 2. Raceway used for the second phase of rearing, from PL3 till PL13.

conditions. The trial was carried out at the Fitmar hatchery, in Sinaloa (Mexico). The Fitmar hatchery was built in 2009. Postlarvae production at this site increased from 615 millions in 2010 to 1.6 billion in 2013. Larval rearing is carried out in two phases. In the first phase, nauplii N5 are stocked at 6 millions nauplii per 30m³ tank. At PL3 or PL6, PLs are transferred to 60m³ raceways. Microbial products are used in both phases of culture.

As part of the trial, four tanks were reserved for the first phase of rearing, and two raceways were kept for the second phase of rearing. Nauplii were obtained from the same spawning tank and stocked at 6 millions nauplii per tanks. Two tanks were kept for the control and two tanks were kept for the treatment. After 11 days, PL3 were harvested, and transferred to the raceways, those from the two control tanks to a control raceway,

IMPROVED HATCHERY AND NURSERY PRODUCTION IN EMS - HIT MEXICO, WITH SELECTED BACILLUS PROBIOTICS



and those from the two treatment tanks to the treatment raceway. This allowed us to follow the performance of the shrimp from N5 till PL15, during the two phase production cycle. Fitmar hatchery is managed with limited water consumption. In the first phase, tanks are filled up with 50% water, and then topped up with algal culture until they reach full capacity. In the second phase, the raceway is filled with water from the beginning, and no water is exchanged during the whole cycle. In order to boost the immune system of the larvae, a complimentary feed (Sano S-

PAK) is fed to the larvae from M3/PL1 stage until the end of the first phase (PL3), and then throughout the second phase (till PL13) Commercial probiotics were applied in the control tanks and the control raceway. The mixture of Sanolife Bacillus was used for the two treatment tanks and raceways. On stocking day of the nauplii in the tanks, and on stocking day of the PL3 in the raceway, the *Bacillus* probiotics were applied to reach a final concentration of 5×10^5 cfu/ml. In the first phase, the selected mixture of Bacillus was also applied on a daily basis in order to reach a final concentration of

1×10^5 cfu/ml. In the second phase of rearing, the same mixture of Bacillus was coated on feed in order to reach a final concentration of 1×10^8 cfu/g.

Results.

The application of the selected mixture of *Bacillus* strains led to a clear improvement in survival. In the first phase of rearing, the survival was increased from 32 to 36% (Figure 3). At the end of the second phase, this improvement in survival led to a clear increase in the number of PL13 that could be harvested (Figure 4). The increased

IMPROVED HATCHERY AND NURSERY PRODUCTION IN EMS - HIT MEXICO, WITH SELECTED BACILLUS PROBIOTICS

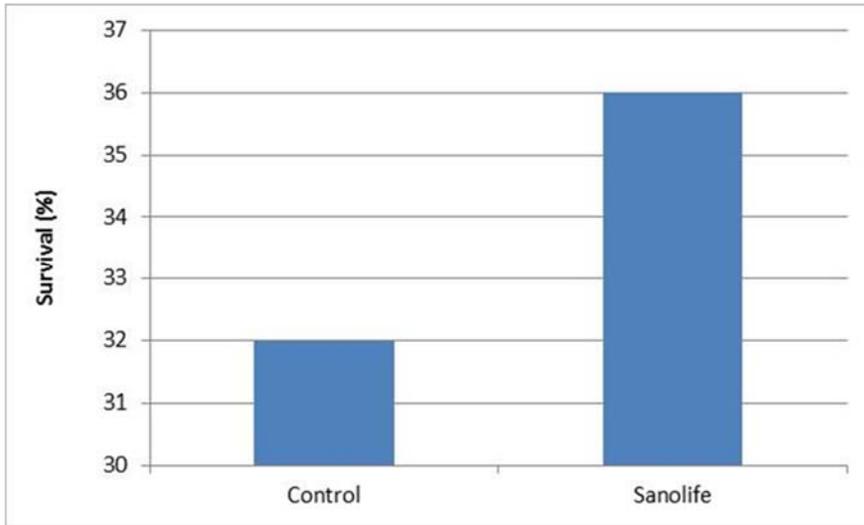


Figure 3. Survival of larval at PL3, at the end of the first phase of rearing.

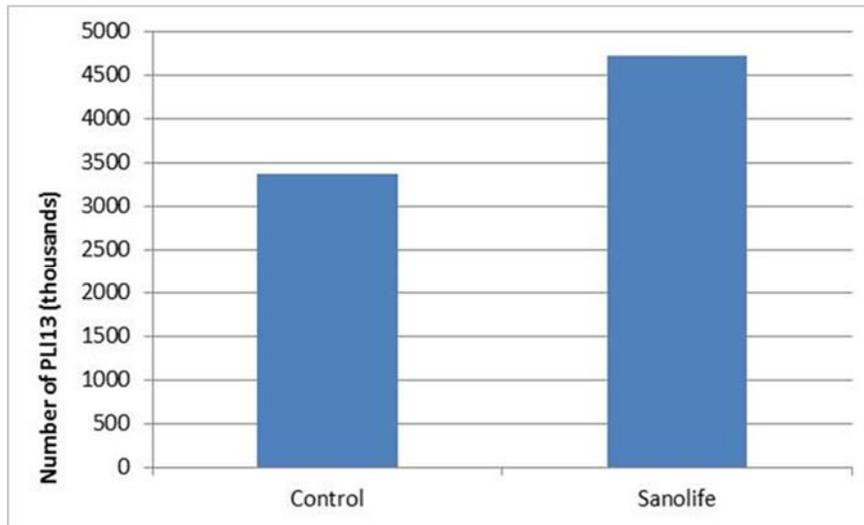


Figure 4. Number of PL13 harvested at the end of the second phase of rearing.

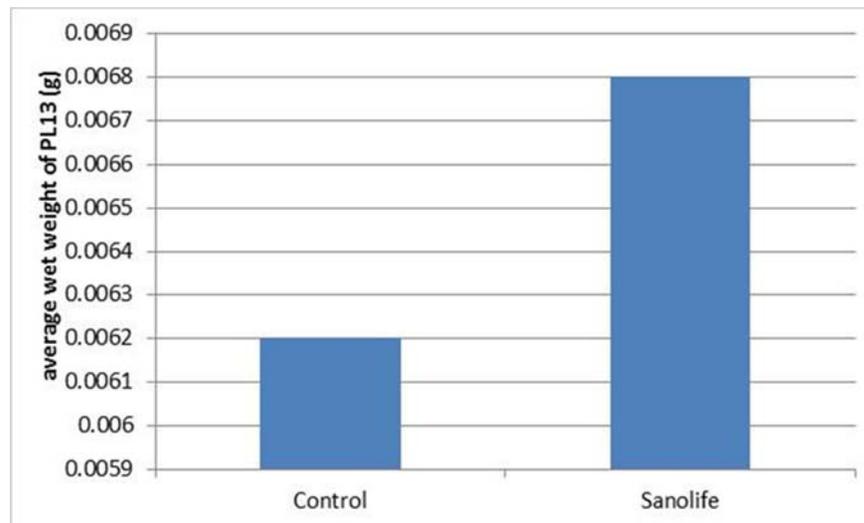


Figure 5. Average wet weight of PL13 harvested form the control and treatment raceway.

number of PLs, over 1.3 million PLs out of a 60m³ raceway represent a 39% increase in output.

Furthermore, the application of the *Bacillus* probiotic led to the production of almost 10% larger PLs (Figure 5).

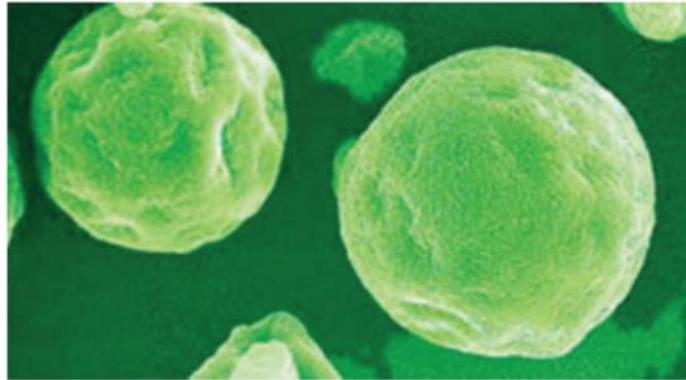
In conclusion, this trial showed the benefit of applying a mixture of selected strains of *Bacillus* with proven

action against *Vibrio* pathogens, in both early and later phase of larval production. Although no microbiological data were collected during this trial, it is most likely that the following mechanisms are involved in the improvement:

- Direct inhibition of pathogens (Aquaculture Research, 2008, 39: 334-338)
- Direct inhibition or competition with *Vibrio* leading to a reduced abundance of potential pathogens (Aquaculture Research, 2013, 44, 13–21)
- Colonization of the gut and improved feed use (Aquaculture Volume 2010, 304: 49-57)
- Improved stimulation of immune system (Fish & Shellfish Immunology, 2009, 26: 339–344; Aquaculture Research, 2011, 42: 693-703).

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Glossary of Hatchery Feed Terms

Terms you may encounter in this publication or elsewhere, relating to hatchery feed and nutrition

A

Additive — An ingredient or combination of ingredients added to the basic feed mix or parts thereof to fulfil a specific need.

Aflatoxins — A group of extremely heat-stable mycotoxins, produced by strains of *Aspergillus flavus* and *A. parasiticus*, which exhibit fluorescence on UV radiation. Aflatoxins are toxic to a wide range of eukaryotes.

Agglomeration — A process that produces a cluster of finely ground ingredients or microcapsules. For larval feed production, two methods are often used: (a) Microextrusion Marumerization (MEM): in this two-step process the ingredients are pressed through a die or screen with very small holes using either a cold extruder or a cooking extruder to produce long noodles; these are then broken into lengths approximately the same as the diameter with a marumerizer (b) PARA - Particle-Assisted Rotational Agglomeration: a lower pressure method which uses a marumerizer but not an extruder. It is capable of producing shaped feed particles of less than 400 µm in diameter.

Alevin — The larval stage of fish from hatching to the end of dependence on endogenous yolk as a source of nutrition. This term is often restricted to salmonids and related fish before they emerge from the spawning gravel or incubation substrate, to begin swimming freely.

Alga (plural: algae) — Primitive chlorophyll-containing mainly aquatic eukaryotic organisms lacking true stems and roots and leaves.

Alginates — Industrial product derived from brown algae (seaweeds).

Amphihaline — Aquatic species, which passes periodically at well defined stages of its life cycle, from salt water to freshwater and vice versa.

Androgen — (a) A fish that has only a male parent; all genes in an androgen come from the father (b) Anabolic steroid hormone that stimulates activity of accessory sex organs and sexual characteristics in males. They are often termed male sex

hormones.

Antioxidant — A substance that chemically protects other compounds against oxidating thus enhancing stability and prolonging shelf-life; for example, vitamin E prevents oxidation and rancidity of fats.

Artemia — A small crustacean. At certain periods of the year, it produces cysts, metabolically inactive as long as they are kept dry, that float at the water surface of saline waterbodies; upon immersion in seawater, these cysts hydrate and the embryo resumes its development. The cysts can be easily used as a source of live food for early stages of fish and crustaceans.

B

Berry — One of the eggs of a fish or a crustacean.

Binder — The adhesive component that holds together the non-adhesive components of a compound mixture such as aquafeed.

Bioencapsulation — A technique whereby various substances, for example nutritional elements and prophylactics, are administered into living organisms, which can then be administered as feed to another animal.

Blastoderm — The foundation from which the embryo will form on an egg. For practical purposes, the blastoderm is the same as the blastodisc or germinal disc of a fertilized egg.

Blastopore — As the blastoderm grows over the egg, it finally leaves a circular opening or blastopore.

Blastula — A hollow ball of cells, one of the early stages of embryonic development.

Breaking stage — Developmental stage of the brine shrimp cysts, when their shell (including the outer cuticular membrane) bursts and the embryo appears, surrounded by the hatching membrane.

Breeding color — Skin pigmentation developed during the spawning period.

Breeding cycle — A period between hatching and

the first spawning of a given generation.

Brine shrimp — See *Artemia*

Brood — A group of young animals produced (spawned) at the same time.

Brood fish — Sexually mature fish, especially for propagation in fish farms.

Brooding — Care of the eggs during at least the early part of development. This can be undertaken either inside or outside the animal and can be undertaken by males in some animals.

Broodstock — Sexually mature specimens of both sexes kept for the purpose of controlled reproduction (independent of whether a first or subsequent generation is produced) as well as younger specimens destined to be used for the same purpose.

C

Carotenoids — Pigment molecules found in algal cells and crustaceans (exoskeleton) as well as in plant and animal fats. Fed to fish, salmonids in particular.

Copepod — A major group of minute crustaceans common to freshwater and saltwater. They have no carapace and have a single median eye. Some are free-swimming and belong to the zooplankton, while others are parasitic on the skin and gills of fish.

Copepodite — Developmental stage of copepods after the nauplius stage.

Crumbles — Granular processed fish feed made by crushing pellets between rollers moving at different speeds; the resulting pellet fragments are screened to produce several size ranges of particles.

Crustacean — Aquatic animal belonging to the phylum Arthropoda, a major group of invertebrate organisms characterized by their chitinous exoskeleton and jointed appendages, occurring in marine and freshwaters and on land, e.g. crabs, lobsters, crayfish, shrimps, prawns, etc. Microcrustaceans include cladocerans and copepods.

Cyst — (a) The resilient non-mobile, dehydrated, resistant, inactive, dormant stage of a free-living or parasitic organism, as a response to adverse environmental conditions. (b) A non-living membrane enclosing a cell or cells.

D

Decapsulation — A process whereby the capsules of brine shrimp cysts are removed before they are used further in cultivation. The cyst, often called an

egg, is an arrested gastrula encapsulated within a hard lipoproteinaceous shell or capsule.

Die — In mechanics: a piece of metal with holes through it, used in extruding pellets.

Diet, purified — A feed made out of refined ingredients with specified analyses; used for nutritional research only.

Diet, reference (RD) — In nutrition research: a diet with which one can compare response to experimental design and dietary treatments.

Diet, standard reference (SRD) — In nutrition research: a precisely defined and reproducible test diet satisfying the nutritional needs of fish for use in feeding studies to facilitate comparisons between various experiments, species, locations, researchers and other factors and conditions.

Diet, supplemental — A prepared diet formulated to provide additional nutrients to those obtained from natural food organisms grown in the culture environment (usually ponds). It may be undiluted as a supplement to other feeds, offered free choice with other parts of the diet separately available, or mixed with other feed ingredients to produce a complete feed.

Digestion coefficient, true (TDC) — Digestion efficiency expressed as the ratio of total weight of feed consumed minus weight of excreted faecal matter minus weight of metabolic faecal nutrient excreted over total weight of feed consumed.

E

Extruder, Extrusion Cooker — A continuous cooker employing a screw, that applies pressure, high temperature and mechanical shear to produce feeds. The process gelatinizes the starchy components, denatures proteins, stretches or re-structures tactile components and causes exothermic expansion of the extrudate. When the feed leaves the die, it expands and the pellet that is formed will float.

F

Fatty acid — Organic acid composed of carbon, hydrogen and oxygen that combines with glycerol to form fats.

Fatty acid, essential- (FAE) — Fatty acid, which cannot be synthesized by an organism and must be supplied in the diet to avoid a dietary deficiency.

Fatty acid, highly unsaturated - (HUFA) — Fatty acid containing three or more double bonds between the carbon molecules.

Fatty acid, polyunsaturated - (PUFA) — Fatty

acid containing two or more double bonds between the carbon molecules.

Feed coefficient — Feed consumption per unit weight increase.

Feed conversion (FC) — In aquaculture, a term usually used in relation to defining the performance of fish diets. It is used to express, in kilos, the dry weight of a specific feed required to produce one kilogram of fish flesh, e.g. $FC = 2.8$.

Feed conversion (efficiency), absolute — In semi-intensive aquaculture: an index obtained by dividing the dry weight of feed distributed by the extra growth believed to have been obtained

Feed conversion (efficiency), relative — In semi-intensive aquaculture: an index obtained by dividing the dry weight of feed distributed by total fish production, including that obtained from available natural food.

Feed conversion efficiency (FCE) — Live weight gain over a defined period expressed as a percentage of food intake during that same period; it is equal to: $(W/F) \times 100$, where W is the live weight gain and F the weight of the dry food fed over the period.

Feed conversion efficiency, specific - (FCEs) — Measurement of fish growth. Is equal (in percent) to $G/R \times 100$, where R is the food ration in percent weight of body weight per day and G is the specific growth rate.

Feed conversion ratio (FCR) — Ratio between the dry weight of feed fed and the weight of yield gain. Measure of the efficiency of conversion of feed to fish (e.g. $FCR = 2.8$ means that 2.8 kg of feed is needed to produce one kilogram of fish live weight).

Feed efficiency ratio (FER) — The inverse of the feed conversion ratio; the live weight gain per unit dry weight of feed; for example 0.35:1 if a gain of 0.35 kg live weight is produced by one kilogram of dry feed.

Feed formulation — Feed formulation is a calculation to decide how much of each raw ingredient to use to prepare a feed. The general objective of feed formulation is to mix ingredients of differing nutritional quality so as to obtain a balanced diet whose biologically available nutrient profile approximates to the dietary needs of the animal in question. Many manufacturers use the "least cost" method, where the ingredients of a feed may change regularly according to the availability and price of different feedstuffs, but the final formulation of the feed (in terms of percentage and overall quality of protein, fats, etc.) will remain constant.

Feed rate — Quantity of feed given to animals on a daily basis, expressed as percent body weight per day or number of organisms consumed per hour.

Feed utilization — The weight increase per unit of utilized feed.

Feed, closed-formula — A diet for which the formula is known only to the manufacturer.

Feed, complete — A nutritionally adequate feed to be fed as the sole ration and capable of maintaining life and/or promoting.

Feed, compound — A feed composed of several ingredients of vegetable or animal origin in their natural state, fresh or preserved, or products derived from the industrial processing thereof, or organic or inorganic substances, whether or not containing additives, for oral feeding in the form of a complete feed.

Feed, expanded — Type of hard, relatively low-density pelleted feed with a slow sinking rate. Can be used to produce high-oil diets.

Feed, floating — Prepared feed pellets produced by the extrusion process under conditions that result in a density that will allow them to float at the water surface for extended periods.

Feed, microbound — feeds that are held together with binders from within the mix of ingredients. These can be either crumbles or on-size feeds.

Feed, microencapsulated — A microdiet consisting of ingredients that are encapsulated by a shell, or membrane.

Feed, moist — Feed which contains from 18 to 45 percent water.

Feeding value — A term referring to the nutritive value of different feeds, i.e. expressing the amount of nutrients furnished by each feed and the degree of their digestibility.

Fertilization — The addition of nutrients (fertilizers) for the purpose of artificial enrichment in order to stimulate primary production as the base of the food chain.

Fingerling — Related to any fish from advanced fry to the age of one year from date of hatching regardless of size, usually applied to trout of about 10-70 g in weight, or 8-15 cm fork length. The term is, however, not rigidly defined.

First feeding — Term given to describe the period of transition between sac fry and fry, when the fish begin to look for food after having exhausted most of their yolk sac.

Flake — A feed ingredient rolled or cut into flat pieces with prior steam conditioning.

Floc — A coagulated mass of particles.

Food, live — Common, non-specific term used to describe the living microscopic organisms (e.g. rotifers, artemia) used to feed the larvae of certain finfish and shellfish before being weaned on artificial diets.

Fry — A term used to describe a fish at the post-larval stage. All stages from hatchling to fingerling stage can potentially be covered by "fry".

Fry, advanced — Any young fish from the start of exogenous feeding (after the yolk is absorbed). For salmon and migratory trout, see Parr.

Fry, swim-up — Term usually used in relation to salmonid culture referring to fish fry, which have just absorbed almost all of their yolk, becoming buoyant and ready to consume food. Swimbladder inflation occurs at this point.

G

Green water culture — The enhancement of natural food chains in ponds or tanks by nutrient enrichment, as a means of increasing food supply to an aquaculture species.

Growth rate, absolute — The actual increase in size of an individual or stock per unit time under known or specific conditions, expressed e.g. in g/day or kg/month.

Growth rate, instantaneous- (g) — A measure of the daily weight increase determined from a sample of fish over a short period of time and calculated by the following equation: $g = (\ln W_t - \ln W_0) / (t_1 - t_0)$ where W_t is the weight of the fish after t_1 days, W_0 is the initial weight and \ln is the natural logarithm.

Growth rate, relative (GRR) — The increase in size (length or weight) of an individual or stock per unit of time in proportion to its initial size; often expressed as equal to $[(S_t - S_0) / S_0] \times 100$ where S_0 is the initial size and S_t the size at the end of the period.

Growth rate, specific (G) — An expression of daily increase in weight defined as $G = g \times 100$ where g is the instantaneous growth rate.

H

Hatchery — Place for artificial breeding, hatch-

ing and rearing through the early life stages of animals, finfish and shellfish in particular. Generally, in pisciculture, hatchery and nursery are closely associated.

Hatchery constant — A single value derived by combining the factors in the numerator of the feeding rate formula. Hatchery constant = $(3 \times \text{feed conversion} \times \text{daily length increase} \times 100) / \text{length of fish}$. This value may be used in fish hatcheries to estimate feeding rates (in percent body weight/day) when water temperature, feed conversion and growth rate remain constant.

Hatching stage — For brine shrimp: last developmental stage of the brine shrimp embryo, when the fully developed nauplius ruptures the hatching membrane and hatches, becoming a free-swimming larva.

J

Juvenile — Young stage of animals, usually up to the time they first become sexually mature. For fish usually between the postlarval stages up to the time they first become sexually mature. They are generally hardy at this stage.

L

Larva (Plural:Larvae) — An organism from the beginning of exogenous feeding to metamorphosis into juvenile. At the larval stage the animal differs greatly in appearance and behaviour from a juvenile or an adult.

Larva, (echino)pluteus — Planktonic larva of sea urchins (echinoderm Echinidae), which swims very actively to feed on planktonic organisms. After metamorphosis, settles on a substrate and becomes a juvenile sea urchin.

Larva, D — Developmental stage of mollusc, so called as the shell of the larva resembles a capital "D". Last stage of a planktonic mollusc larva prior to settlement on the sea bottom.

Larva, competent — Larva of mollusc that is ready to metamorphose and attach to a suitable surface.

Larva, eyed — Generally refers to a molluscan larva, which has developed a foot and is ready to settle out of the plankton and become benthic.

Larva, schizopod — Stage in development of decapod crustacean larva when it resembles an adult mysis in having an exopodite and endopodite to all thoracic limbs.

Larviculture— The culture of larvae, usually in hatcheries.

M

Marumerizer — a sizing and shaping device that breaks extruded strands into small individual agglomerations and shapes them into spherical particles.

Microencapsulation — Liquids and particulate dietary components are enclosed within a coating, which helps prevent dissolving and leaching, but will release under specific environmental conditions.

Microextrusion Marumerization (MEM) — see Agglomeration

Microalgae — see Phytoplankton

Micro-ingredients — Vitamins, minerals, antibiotics, drugs, and other materials normally required in small amounts and measured in milligrams, micrograms or parts per million (ppm)

Mycotoxins — Toxins naturally produced by molds and fungi

Mysis — Pelagic larval stage of a crustacean intermediate between the protozoa (zoa) and postlarva stages.

N

Nauplius (pl. nauplii) — Earliest larval stage of a crustacean.

P

Particle-Assisted Rotational Agglomeration (PARA) — see Agglomeration

Pellet — Agglomerated feed formed by compacting and forcing it through die openings by a mechanical extrusion process.

Phytoplankton — Minute plants suspended in water with little or no capability of controlling their position in the water mass. The plant component of plankton. Frequently referred to as microalgae.

Plankton — Passively drifting or weakly swimming organisms, including many microscopic plants and animals.

Postlarva (pl. postlarvae) — Stage occurring after the larval stage, resembling the juvenile but still lacking certain characteristics. For crustaceans: the stage following metamorphosis from larva (zoa) to juvenile. In penaeid

shrimp, this is commonly counted in days after appearance of postlarval features, e.g. PL12 indicates a postlarva that has lived 12 days since its metamorphosis from the zoea stage of development.

Prebiotics — Non-digestible food ingredients that stimulate the growth and/or activity of bacteria in the digestive system that have favorable effects on the intestinal flora.

Probiotics — Live micro-organisms added to feed, which confer health benefits.

Protein efficiency ratio (PER) — Ratio of live weight gain (in grams) over protein consumed (in grams). Production per unit of protein fed.

Protein utilization, (apparent) net (NPU) — The amount of nitrogen retained by the animals over the total nitrogen consumed.

Protein, biological value of (BV) — Percent digested protein retained by the animal, expressed as the percentage of food nitrogen utilized for growth and body maintenance; this involves digestion, absorption, utilization and excretion of nitrogen-bearing compounds, especially proteins.

Protein, crude — The nitrogen content in a feed or animal or plant tissue, multiplied by a factor, which is generally 6.25.

Proteins, single-cell- (SCP) — type of natural food used in hatcheries made of individual cells (unicellular organisms), such as yeasts and microalgae fed to brine shrimp nauplii.

Protozoan (pl. protozoans) — A member of the phylum Protozoa, composed of mostly microscopic animals made up of a single cell or a group of more or less identical cells, reproducing by fission and living chiefly in water; includes many parasitic forms.

Protozoa (pl. protozoae) — Larval stages between the nauplius and mysis in crustaceans; usually have seven pairs of appendages.

Proximate analysis — (Analysis of) moisture, lipid, protein, fibre, ash and (by difference) carbohydrate content of any animal or plant product or mixed substance such as a feed.

R

Rotifers — Group of microscopic, primarily aquatic, animals belonging to a distinct class of

the *phylum Aschelminthes*. They are characterized by a corona at the anterior end, which bears tufts of cilia used for feeding and locomotion. Rotifers are important live-food organisms in the rearing of marine fish larvae in hatcheries.

S

Satiation — Used to describe animals, which have been fed to the limit i.e. they will not eat any more.

Scissiparity — Asexual type of reproduction, which consists in the division of the organism into two parts.

Settlement — For molluscs this is the process by which molluscan larvae undergo a cessation of their mobile stage and begin a sedentary life stage by attachment to a suitable support.

T

Tank, spawning — Rectangular or circular hatchery tank containing a relatively large volume of water (10-30 m³) in which brood fish are introduced to spawn.

Tetraploid — An organism or cell where each chromosome occurs in sets of four.

Trace elements — Nutrient elements essential for the life and growth of an organism, but needed in only very small quantities or amounts.

Triploid (3n) — An organism or cell where each chromosome occurs in sets of three.

U

Umbrella stage — Developmental stage of the brine shrimp embryo, when it hangs underneath the empty cyst shell after the breaking stage and completes its development into a nauplius.

V

Vitamin — An organic compound occurring in minute amounts in foods and essential for numerous metabolic reactions.

Vitamin premix — A mixture of crystalline vitamins or concentrates used to fortify a formulated feed.

Viviparity — Giving birth to living young, which have already reached an advanced stage of development.

Viviparous — Bringing forth living young; the mother contributes food toward the development of the embryos.

W

Weaning — Process in which an animal's dependence on its mother, directly or indirectly (e.g. yolk sac) for food or protection comes to an end. In aquaculture, also used to refer to the transition from live food to processed feed for small larval fish.

Y

Yolk — Cells and structures that are concerned with or associated to the egg yolk and its production and development.

Z

Zoea (pl. zoeae) — Larval stage of crustaceans following metamorphosis from the nauplius larva. It may be referred to as protozoa where differentiation between the nauplius and mysis (or postlarva stage of development) is difficult.

Zooplankton — The animal component of plankton.

Zoospore — Motile, flagellated and asexual spore.

Zygote — a fertilized egg.

ΩHF

Sources: We have drawn from numerous sources and especially the [FAO Glossary of Aquaculture](#).

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[The Aquafeed Glossary](#)

[FAO Fisheries Glossary](#)

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[Feedipedia - the Encyclopedia of feed](#)

[Aquatext Dictionary](#)



The Year in Review

A round-up of hatchery-related stories from around the world that made the news in 2015

AUSTRALIA - James Cook University scientists have developed a unique process to grow barramundi faster. Researchers have been studying which barramundi parents produce the fastest growing fingerlings in an effort to get barramundi onto the plate quicker and cheaper. Their breakthrough application, based on identifying fundamental cellular processes indicative of fast growth, will remove a significant barrier and introduce a totally new approach to breeding the popular species. Fish larvae can be taken at 18 days old and the farmer told which barramundi offspring from which parents will grow the quickest. At present farmers must wait until offspring are harvested at about 18 months old to determine which parents produce the fastest growing offspring. This means they need to keep large numbers of broodstock on hand, which is an expensive process.

DENMARK - A new research project headed up by DTU Vet is seeking to use feed containing natural antibodies to combat pathogenic bacteria as a replacement for treating fish fry with antimicrobial agents. The antibodies are derived from fish blood. The immune system in fry is not sufficiently developed to allow vaccines to have the desired effect. As a result, treatment with antimicrobial agents is currently the only effective way to deal with problematic bacterial infections among fry. The fish's immune system will develop the antibodies naturally over time following exposure to the bacteria, but it is hoped that this can be achieved earlier if the fry are fed the relevant antibodies in their feed. The project will attempt to harvest the antibodies from blood collected in connection with the standard process for slaughtering fish. The feed will then

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be tested on fish suffering from bacterial infections including Rainbow Trout Fry Syndrome (RTFS), enteric redmouth disease (ERM) and furunculosis.

GLOBAL - Fish farming will likely grow more than expected in the coming decade, FAO predicted. Increased investment in the aquaculture sector - particularly in productivity-enhancing technologies including in the areas of water use, breeding, hatchery practices and feedstuff innovation - should boost farmed-fish production by as much as 4.14 percent per year through 2022. This revised estimate is notably faster than the 2.54 percent growth forecast made earlier this year in a joint report by FAO and the Organization for Economic Cooperation and Development.

ISRAEL - Dr. Roi Holzman and Victor China of the Department of Zoology at Tel Aviv University's

George S. Wise Faculty of Life Sciences has uncovered the reason why 90% fish larvae are biologically doomed to die mere days after hatching. The research suggests that "hydrodynamic starvation," or the physical inability to feed due to environmental incompatibility is the reason. Nearly all fish species reproduce externally - they release and abandon their sperm and eggs into the water, providing no parental care. The fertilized eggs then hatch in the water within a couple of days and the hatching larvae must sustain themselves. When attached to a yolk sac, these premature organisms can survive for a period of two or three days, but once the larvae, with poorly developed fins and gills, open their mouths, they start dying in droves. Over the course of two years fish larvae were observed at three significant points in their development (at eight, 13, and 23 days old). They found that the viscosity of the surrounding ocean water - not age nor development - was hampering the



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larvae's attempts to feed. "Because the water molecules around you have weak electrical bonds, only a thin layer sticks to your skin - a mere millimeter thick. If you're a large organism, you hardly feel it. But if you're a three-millimeter-sized larva, dragging a millimeter of water across your body will prevent you from propelling forward to feed. So really, it's all about larval size, and its ability to grow fast and escape the size where it feels the water as viscous fluid," Dr. Holzman explained.

MALAYSIA - The world's first ever commercially hatched lobster have been successfully bred in Sabah. The breakthrough in breeding *Panulirus ornatus*, commonly known as ornate spiny lobster, is being seen as a massive leap in Sabah's aquaculture technology that will bring Malaysia another step closer to the global market for lobsters, valued at over US\$4 billion a year. The hatchery-raised lobster juveniles are already deployed into sea-cages for the first time ever in Semporna.

U.K. - Benchmark Holdings PLC acquired Norwegian-based SalmoBreed AS and 89.45 per cent of the issued share capital of Icelandic company, Stofnfiskur HF.

The double acquisition brings together the second and third-ranked international salmon breeding companies. The Directors believe the two acquisitions to be transformative when put side by side, creating the foundations of a global business at the forefront of salmon genetics and primary breeding. Combining the strengths of Stofnfiskur and SalmoBreed brings together multi-decade development of genetics with multi-decade development of salmon egg production technology, as well as leveraging Stofnfiskur's land-based bio-secure facilities in order to produce very high quality salmon eggs all year round. With salmon consumption growing at 7% per annum and supply currently at 3 - 5% - there is an opportunity to grow this business dynamically in the near-term. As salmon production rises, more sustainable farming practices are needed and the use of genetics to breed robust salmon will play a key role in this. It will also require innovation in vaccine and drug development combined with genetics to tackle the growing

New BAP Hatchery Standards Completed

The Best Aquaculture Practices (BAP) third-party certification program expanded its coverage with the completion of new BAP hatchery and nursery standards for finfish, crustaceans and mollusks. The addition of the BAP hatchery standards represents a key advancement for the BAP program, as they allow companies to pursue four-star designation for all species covered by the BAP program. Until now, BAP hatchery standards existed for only shrimp. Now that they've been finalized, the new BAP hatchery standards for finfish, crustaceans and mollusks will replace the existing BAP shrimp hatchery standards.

For currently certified shrimp hatcheries or those in the process of certification or application, compliance with the new standards will be mandatory for recertification beginning March 17, 2015. For new hatcheries and nurseries that raise shrimp or other species and are not yet certified or in process, the new standards are effective immediately. They apply to all aquaculture facilities that produce eggs and/or juvenile aquatic animals for live transfer to other aquaculture facilities. Production facilities include ponds or tanks on land with directed inflows and outflows of water, trays located intertidally on the foreshore, or rafts or cages (net pens) floating in a body of water. They do not apply to facilities that produce only aquatic animals for harvest and slaughter for human consumption.

The technical content of the BAP hatchery standards for finfish, crustaceans and mollusks was developed by a technical committee led by John Forster of Forster Consulting Inc. in Port Angeles, Washington, USA. The BAP Standards Oversight Committee (SOC) -- whose members represent a balance of stakeholders from industry, NGOs and academia -- recommended refinements to the draft of the BAP hatchery standards before approving them for release. Input received during the 60-day public-comment period, which ended on March 31, was also integrated into the final standards.

[BAP hatchery standards](#) (PDF)

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number of salmon diseases and the development of more sustainable and ethical farming systems and practices, the company stated.

NORWAY - Live starter feed, cultivated in Trondheim, has enabled large numbers of lobster and tuna fry to survive in tanks. Now, SINTEF is setting up a production plant that will supply the world market with the feed. With the establishment of the Norwegian company, C-Feed, copepods are destined to become a new Norwegian industrial product. For several years now, SINTEF has been successfully cultivating this tiny crustacean species as feed for several marine species. SINTEF's commercialization company, Sinvent, envisages an annual global market for this type of feed of almost NOK 2 billion (Euro 244 million) in the course of about ten years. The feed should make it possible to farm a number of species that no-one has managed to bring up on an industrial scale until now. In laboratory trials of the feed, SINTEF's aquaculture scientists doubled the survival rates of lobster fry that had hatched out in aquaculture tanks. They are also the first group in the world who have managed to bring up large numbers of well-developed tuna fry. Laboratory-scale results with fry of halibut, cod and ballan wrasse also look promising. The next step will be to try out the feed on squid and on members of the grouper family.

U.K. - Scottish company Landcatch, which supplies Atlantic salmon eggs and smolts, as well as genetic services to the international aquaculture industry, became a 45 per cent shareholder in Seattle, USA-based Troutlodge Inc, the world's largest rainbow trout egg producer. Under the terms of the deal, Landcatch will diversify into a new species for the first time and enhanced support will be provided to support the growth of Troutlodge. The deal also includes a joint venture (JV) that will see a new company, Landcatch-Troutlodge Chile SA, formed to establish an independent Atlantic salmon breeding program, backed by genetics research. It aims to capture a substantial market share of salmon eggs in Chile within 3-5 years. Troutlodge Chile SA's existing trout egg production and supply operation will be developed

and expanded. It is also planned to develop a pedigree coho salmon program to service the Chilean industry. A Genetics Support Agreement will ensure all Troutlodge breeding programs will be supported by Landcatch and Hendrix Genetics, combining pioneering genetic technologies transferred from the salmon and livestock industries with Troutlodge's decades-long genetic improvement program.

USA - Probiotics are already used at salmon and shrimp farms and they have now been developed for bivalve shellfish. Because there was no established protocol for identifying and screening probiotic candidates for bivalve shellfish, researchers adapted a method they found in an agriculture journal covering dairy cows. The NOAA scientists said this research will provide a template that someone else can follow for any species of shellfish, anywhere in the world. To find probiotic strains, NOAA Fisheries scientists collected bacteria that occur naturally in the digestive glands of healthy adult Eastern oysters. They then grew those candidate strains in petri dishes along with a pathogenic strain of Vibrio bacteria that had caused a disease outbreak a few years before. The strains that were most effective at inhibiting growth of the pathogen in a petri dish then advanced to the next stage of testing: the guts of live oyster larvae. The 15th strain they tested, dubbed OY15 by scientists, was the most effective.

Many probiotics are thought to work by competitive exclusion of potential pathogens. Scientists initially expected they would see the same mechanism at work with oyster probiotics. What they found instead was that OY15 worked by stimulating the immune system. OY15 is a Vibrio species that it lacks the genes that cause pathogenicity. Trials at commercial and university hatcheries are scheduled: oyster probiotics could hit the market in two to three years. ΩHF

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MARCH

Mar 16-18: AquaME
Dubai, UAE

[Details](#)

Mar 23 - 26: Buhler Aqua
Feed Workshop
Uzwil, Switzerland

[Details](#)

Mar 25-27: Extrusion
Course
Ås, Norway

[Details](#)

APRIL

Apr 6 - 10, 2014: IAAAM
Conference
Chicago, Illinois, USA

[Details](#)

MAY

May 26 - 30: World Aqua-
culture 2015
Jeju Island, South Korea

[Details](#)



JUNE

Jun 9: Aquafeed Horizons
Conference
Cologne, Germany

[Details](#)

Jun 10: FIAAP International
Conference
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Jun 9-11: FIAAP/VICTAM/
GRAPAS
Cologne, Germany

[Details](#)



Jun 21-27: International
Symposium on Genetics in
Aquaculture

Santiago de Compostela,
Spain

[Details](#)

JULY

Jul 20-22: International
Conference on Aquaculture
& Fisheries
Brisbane, Queensland,
Australia

[Details](#)

NOVEMBER

Nov 5-7: Expo Pesca/Acui
Peru
Lima, Peru

[Details](#)

Skretting Marine Hatchery Feeds

Established in 2006, Skretting Marine Hatchery Feeds (MHF) has become the undisputed market leader in delivering specific products and services to marine fish and shrimp hatcheries. Skretting MHF unit combines local market knowledge, innovation and experience to deliver the highest quality products and services. MHF's product portfolio meets every aspect of the animals' early lifecycles, from feeds suited to the specific stages of conditioning, maturation, spawning and recovery of broodstock through to green water application products, live feed components and early weaning,



PL17 fed on PL diet

nursery, pre-ongrowing and transfer diets.

MHF has made a name for itself by working together with clients and developing novel approaches to production bottle-necks: in particular new concepts in rotifer production such as ORI-ONE and the patented *Artemia* replacer, GEMMA Micro.



Rotifer fed on ORI-ONE

NEPTUNE
VITALIS
ORI-GO
GEMMA
PERLA
PL

**THE MARINE
HATCHERY FEED
PORTFOLIO
FROM SKRETTING**





MANUFACTURED FEEDS

SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
Aller Aqua	ALLER PARVO EX	Fish	Larvae Fry Nursery	Crumbles	ALLER PARVO EX is a complete starter feed for tilapia, catfish and carp. The feed meets the demands of fry and serves as a good support for fast growth and robust fish.	WEBSITE
Aller Aqua	ALLER FUTURA EX	Fish	Larvae Fry Nursery	Crumbles Mini pellets	ALLER FUTURA EX is rich in easily digestible proteins and contains a high amount of natural micronutrients, attractants, minerals and vitamins. The formulation includes raw materials of the highest quality and ingredients especially suited for fry.	WEBSITE
Aller Aqua	ALLER FUTURA MP EX	Fish	Larvae Fry Nursery	Micro pellets	ALLER FUTURA MP (micro-pellets) EX is an alternative or a supplement to the existing crumbles. The feed is produced by a low-temperature, agglomeration technique, which is gentler to the raw materials than traditional extrusion technology. The physical properties of the ALLER FUTURA MP are defined by homogenous, easy-to-handle, dust free pellets.	WEBSITE
Aller Aqua	ALLER PERFORMA	Fish	Larvae Fry Nursery	Crumbles Mini pellets	ALLER PERFORMA is first of all good value for money and provides excellent growth rates as well as FCR. The product is suitable for a wide variety of conditions and a broad range of species.	WEBSITE
Aller Aqua	ALLER PERFORMA ORGANIC EX	Fish	Larvae Fry Nursery	Crumbels Mini pellets	The starter feed ALLER PERFORMA ORGANIC EX is good value for money, and can provide excellent growth rates and high feed efficiency. Raw materials of the best quality, with excellent taste characteristics help optimize feed intake and wellbeing of the juvenile fish in the early stages of their life	WEBSITE
Aller Aqua	ALLER ORGANIC FRY EX	Fish	Larvae Fry Nursery	Mini pellets	The starter feed ALLER ORGANIC FRY EX provides good value for money with excellent growth rates and high feed efficiency. The feed intake and wellbeing of juvenile fish is optimized by inclusion of raw materials of the highest quality, with excellent taste characteristics.	WEBSITE
Aquafauna Biomarine	AlgaMac-Series	Fish Shrimp	All	Various	High Omega rotifer and artemia enrichment diets, Non-GMO single celled enrichment and culture diets, larval diets for marine shrimp and finfish made from whole fish, microencapsulated larval diets, add water make-on-site maturation paste diets, single cell formulation components.	MORE INFORMATION
Argent Chemical Laboratories	Cyclop-Eeze (Deep Frozen)	All	All	Whole organism	Whole frozen micro-crustacean, 3,000 ppm+ AstaxanthIn.	WEBSITE

SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
Argent Chemical Laboratories	Cyclop-Eeze (Freeze Dried)	All	All	Whole organism	Whole freeze dried micro-crustacean, 3,000 ppm+ Astaxanthin.	WEBSITE
Argent Chemical Laboratories	Hatchfry Encapsulon O - III	All	Larvae PL	Micro-Encapsulated	Complete diet, hydro-stable, all marine proteins Made in USA, Micron sizes: HF-0 (30-50) HF-1 (50-150) HF-2 (150-250) HF 3 (250-350).	WEBSITE
Argent Chemical Laboratories	Spirulina Microfine	All	All	Spray Dried Microfine	Finest purity made in USA.	WEBSITE
Argent Chemical Laboratories	Argentemia Platinum Grade 0	All	Larvae PL Fry	Artemia Cysts	High Ω3, High hatch rate Small nauplii.	WEBSITE
Artemia Shrimp Technology	High Quality Artemia Cysts	Shrimp Marine Fish, Sturgeon Aquarium Fish	Larval	Pond Culture	High quality, over 90% hatching and about 300000 nauplii/g Artemia franciscana cysts produced in controlled earthen ponds fed on marine algae	WEBSITE

Are your products missing?

Make sure we include them next year

Email: editor@hatcheryfeed.com



BernAqua – InVivo NSA	Caviar	Fish	Larvae Juveniles	Agglomerated Micro-capsules	Caviar is an agglomerated product, classified in different sizes to match the different stage of the fish larval development. Each capsule is filled with small peptides and low MW soluble proteins, nucleotides, EFA based phospholipids, a balanced profile of chelated trace minerals, etc.	DATASHEET
BernAqua – InVivo NSA	Nori	Fish	Larvae Juveniles	Agglomerated Micro-capsules	Nori is an agglomerated feed high in protein and moderated in fat content, which preserves hepatic conditions and promote fast growth. The essential fatty acids of the feed are only originating from the protein fraction. Nori is perfectly water stable. It has an excellent buoyancy and water stability.	DATASHEET
BernAqua – InVivo NSA	MeM	Fish	Juveniles	Cold Extruded	MeM is a nursery feed for fish cultured in intensive conditions. MeM is produced following a new technology, which involves cold Micro-extrusion and Marumerization. This innovative technology ensures a full water stability of soluble and insoluble nutrients in the feed while avoiding the use of chemical binders.	DATASHEET

SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
BernAqua – InVivo NSA	Royal Caviar	Shrimp	Larvae Post larvae	Agglomerated Micro-capsules	Royal Caviar is formulated and produced to mimic the basic features of live food. Royal Caviar increases profitability and performance of shrimp hatcheries. Royal Caviar is produced following a unique technology, which involves the agglomeration of microcapsules. The new key ingredient is giving Royal Caviar a better palatability so increased performance.	DATASHEET
BernAqua – InVivo NSA	BioSpheres	Shrimp	Larvae Post larvae	Agglomerated Micro-capsules, Extruded & Crumbled	The BioSpheres range comprises four different feeds, each one exclusively and independently formulated for the shrimp stage it is targeted to. Each of the feeds is easily identified by their color and physical properties which are following the evolution of the needs of the shrimp throughout its cycle.	DATASHEET
BernAqua – InVivo NSA	Vitellus	Shrimp	Larvae Post larvae Juveniles	Extracted Artemia	Vitellus is exclusively composed of first quality Artemia cysts. The cysts have been opened and their content extracted. Vitellus is processed with the most modern techniques which guarantee the total preservation of the unique nutritional qualities of the Artemia cyst.	DATASHEET
BernAqua – InVivo NSA	MeM	Shrimp	Juveniles	Cold Extrusion	MeM is a nursery feed for shrimp cultured in intensive conditions. MeM is produced following a new technology, which involves cold micro-extrusion and marumerization. This innovative technology ensures a full water stability of soluble and insoluble nutrients in the feed while avoiding the use of chemical binders.	DATASHEET
BernAqua – InVivo NSA	Royal Oyster	Shrimp	Broodstock	Cold Extrusion	Royal Oyster is a high quality supplementary shrimp maturation feed. Royal Oyster speeds up the recovery of breeders after each spawn. Royal Oyster improves nauplii quality and pigmentation. Royal Oyster is produced by Cold-extrusion and marumerization. This process avoids the use of artificial binders and nutrient-loss in water.	DATASHEET
Biomar	LARVIVA Multigain	Shrimp	Larvae	Powdered	Complete dry formula high quality feed with all nutrients required to boost disease and stress resistance of shrimp larvae. LARVIVA Multigain can be used as a supplementary diet, fed directly to the shrimp tanks.	DATASHEET
BioMar	LARVIVA Shrimp-ProStart	Shrimp	From Z1-Z2 onwards		Agglomerated, high protein larval feed with the right amino acid balance, for first feeding and replacement of live feed. Available in appropriate size range. Complete nutritional profile. Of constant quality always off-the-shelf available. Includes Bactocell®, a probiotic that is documented to have positive effect on shrimp survival and growth performance.	DATASHEET
BioMar	LARVIVA Shrimp-PL	Shrimp	From PL1 onwards		An extruded and granulated feed with high digestibility, based on the best raw materials of marine origin. Great importance has been ascribed to palatability, which together with high protein content ensures maximum growth and survival during the early life stages. Contains immune stimulants, and high levels of vitamins and minerals.	DATASHEET

SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
BioMar	LARVIVA ProStart	Fish	Larvae		Agglomerated, high protein larval feed with the right amino acid balance, for co-feeding with live feed and for early weaning. Includes Bactocell®, a probiotic that is documented to reduce vertebral deformities in marine larvae as well as in salmonids..	DATASHEET
BioMar	LARVIVA ProWean	Fish	Larvae		Weaning and nursery feed for fish larvae. Extruded granulates of highest quality to use in standard weaning procedures. Includes Bactocell®, a probiotic that is documented to reduce vertebral deformities in marine larvae as well as in salmonids.	DATASHEET
Biomat	SPIROO microFEED PLUS	Fish Shrimp Bivalve	Larvae PL fry	Micro-packaged <i>spirulina</i>	Patent-pending micro packaging technology enables the production of a new and unique larvae and fry micro feed, based on 100% organic, contaminant-free, closed PBR, high-protein <i>spirulina</i> microalgae. SPIROO micro FEED PLUS features field tested neutral buoyancy, highly attractant, palatable and digestible proteins and nutrients with superior water stability. Room-temperature storage.	DATA SHEET
Bio-Oregon	BioVita Starter	Salmon Trout	First feeding fry	Extruded Crumbles	BioVita Starter is a premium fish feed with high levels of fish meal and fish oil. For use in first feeding, it contains an enhanced vitamin pack and pigment to promote healthy fish and natural coloration. Natural palatability enhancers ensure an active first feeding response.	DATASHEET
Bio-Oregon	BioClark's Starter	Salmon Trout	First feeding fry	Extruded Crumbles	BioClark's Starter combines traditional dietary values with an increased level of alternative ingredients to reduce cost and to promote sustainability. For use in first feeding, it contains an enhanced vitamin pack and pigments to promote healthy fish and natural coloration. Natural palatability enhancers ensure an active first feeding response.	DATASHEET
Bio-Oregon	MicroVita	Salmon Trout	First feeding fry	Extruded Micro-Pellets	MicroVita micro-pellets are based on the premium BioVita Starter formulation. MicroVita micro-pellets are available in 0.6 & 0.9 mm sizes, and can be used as direct replacements for our #1 & #2 starter crumble sizes. Micro-pellets are clean, durable and uniform in shape.	DATASHEET
Bio-Oregon	BioVita Fry	Salmon Trout	Parr	Extruded Pellets	BioVita Fry is a premium fish feed with high levels of fish meal and fish oil. It contains an enhanced vitamin pack and pigments to promote healthy fish and natural coloration. Natural palatability enhancers ensure an active feeding response.	DATASHEET
Bio-Oregon	Bio-Olympic Fry	Salmon Trout	Parr	Extruded Pellets	Bio-Olympic Fry is our most advanced fry diet and provides maximum growth rates and shortened production times. Bio-Olympic Fry has demonstrated growth improvements of up to 20% in controlled trials.	DATASHEET

SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
Bio-Oregon	BioClark's Fry	Salmon Trout	Parr	Extruded Pellets	BioClark's Fry is a mid-level energy fish feed for moderate or controlled growth. It includes an increased level of alternative ingredients to reduce cost and to promote sustainability. It contains an enhanced vitamin pack and pigments to promote healthy fish and natural coloration.	DATASHEET
Bio-Oregon	BioBrood	Salmon Trout	Broodstock	Extruded Pellets	BioBrood is designed to meet the needs of developing and maturing eggs and sperm. It contains premium fish meal and fish oil and extra vitamins and minerals for improved fecundity, sperm motility, brood health, egg quality, and fry survival. BioBrood should be fed for 6-12 months prior to spawning.	DATASHEET
Bio-Oregon	BioPro	Salmon Trout	Parr	Extruded Pellets	BioPro is a health promoting diet specifically formulated for freshwater salmon and trout. BioPro is designed to be fed leading up to stressful situations, including periods of high disease risk or adverse environmental conditions such as elevated summer water temperatures, intense sunlight or low dissolved oxygen.	DATASHEET
Bio-Oregon	BioSupreme	Salmon Trout	Smolt transfer	Extruded Pellets	BioSupreme is specifically formulated to prepare salmon for the transition from fresh to saltwater. Like BioTransfer, BioSupreme contains elevated levels of dietary salt and now includes newly identified ingredients that are essential for increasing feed intake and growth following transfer. BioSupreme should be fed for 6 weeks prior to release or transfer to saltwater.	DATASHEET
Bio-Oregon	BioDry 1000LP	Salmon Trout	Parr	Extruded Pellets	BioDry 1000LP (Low Phosphorus) is an extruded, low-pollution fish feed which is formulated to reduce the amount of phosphorous discharged into the environment. This diet contains less than 1% dietary phosphorus.	DATASHEET
Cargill	LiquaLife Z-M	Shrimp	Larvae	Pre-stabilized nutrient beads	LiquaLife® products are liquid feeds for larval and post-larval shrimp produced through a patented technology. Each drop contains pre-stabilized nutrient beads and direct-fed microbials to deliver optimum nutrition for better survival rates and growth. LiquaLife® feeds are designed to complement live feeds,	WEBSITE
Cargill	LiquaLife M-PL	Shrimp	Larvae PL	Pre-stabilized nutrient beads	such as algae and Artemia, and completely replace conventional dry feeds. In addition, the probiotic bacteria in LiquaLife® feeds help prevent the accumulation of toxic ammonia.	WEBSITE
Cargill	LiquaLife PL	Shrimp	PL	Pre-stabilized nutrient beads		WEBSITE

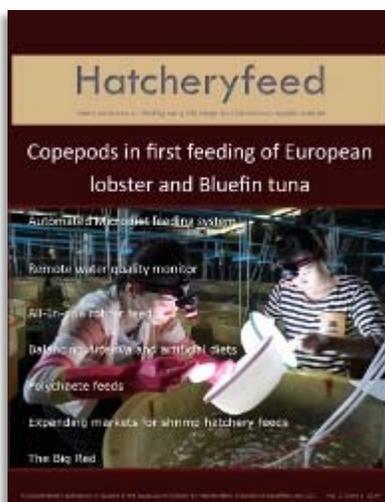
SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
Cargill	LiquaLife PL*	Shrimp	PL	Pre-stabilized nutrient beads	LiquaLife® PL is designed for PL transport and ideally replaces Artemia in the transportation of your PL's from the hatchery to the farms, making sure your PL's are active and stress free while reducing your costs and hazards. LiquaLife® PL improves water conditions during travel, due to the probiotic bacteria in its micro capsules. Reduces water contamination risks and mortality caused by stress. Prevents the contact of personnel with caustic and toxic products used in Artemia decapsulation. Reduces personnel and production costs by not having to hatch or produce Artemia.	WEBSITE
Cargill	Aquaxcel	Shrimp/ Fish	Larvae PL/ fry Finger- lings	Micro- extruded	Combining superior nutrition and modern micro-extrusion technology, AQUAXCEL® gives young animals all they need to thrive. Our feeds are designed to give you the best cost-benefit ratio to take to your bottom line..	WEBSITE
Cargill	Aquaxcel 0.3 mm, 0.6 mm, 0.8mm	Shrimp	Larvae/PL	Micro- extruded	Complete feeding program designed for shrimp hatcheries, maternities and raceways that is composed of advanced starters, maximizing performance, nutrient stability, and cost-benefit to farmers.	WEBSITE
Cargill	Aquaxcel 0.8mm, 1.5mm, 2.0mm	Shrimp	PL	Micro- extruded	Advanced starter feeds designed to provide enhanced performance of PL's in nursery, transfer ponds and direct stocking of growout ponds.	WEBSITE
Cargill	AquaXcel Warm Water	Fish		Micro- Extruded	Combining superior nutrition and modern micro-extrusion technology, AQUAXCEL® gives young animals all they need to thrive. Our feeds are designed to give you the best cost-benefit ratio to take to your bottom line.	WEBSITE
Cargill	AquaXcel Cold Water	Fish		Micro- Extruded	Combining superior nutrition and modern micro-extrusion technology, AQUAXCEL® gives young animals all they need to thrive. Our feeds are designed to give you the best cost-benefit ratio to take to your bottom line.	WEBSITE
Cargill	AquaXcel Marine	Fish		Micro- Extruded	Combining superior nutrition and modern micro-extrusion technology, AQUAXCEL® gives young animals all they need to thrive. Our feeds are designed to give you the best cost-benefit ratio to take to your bottom line.	WEBSITE
CreveTec	L100, L200	Shrimp	Larvae	Crumbles	Extremely attractive diet due to inclusion of highly digestible ingredients. All feeds contain micro-algae and hydrolyzed proteins	WEBSITE
CreveTec	PL300, PL500	Shrimp	PL	Crumbles	Extremely attractive diet due to inclusion of highly digestible ingredients. All feeds contain micro-algae and hydrolyzed proteins	WEBSITE
CreveTec	PL800, PL1000	Shrimp	Nursery	Crumbles	Extremely attractive diet due to inclusion of highly digestible ingredients. All feeds contain micro-algae and hydrolyzed proteins. Growth of PL12 to 1,2 g in 4 weeks in intensive nursery systems	WEBSITE
CreveTec	Broodstock growing pellet	Shrimp	Broodstock	Pelleted	Pellet with 54 % proteins. Contains krill and squid.	WEBSITE
CreveTec	Maturation pellet	Shrimp	Broodstock	Semi-moist	Semi-moist pellets with 10 % fresh polychaetes.	WEBSITE

SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
EWOS Canada/ Norway/Scotland	EWOS start (015P, 040P, 1P)	Salmonids	Hatchery Fry	Extruded Pellets	EWOS start uses the best fishmeal & fish oil to produce a clean, slow sinking and homogenous pellet. Using EWOS start has been shown to improve water quality, optimise SGR and FCR and will give a more even fish size distribution.	WEBSITE CONTACT
EWOS Canada	Micro (#0, #1, #2)	Salmonids	Hatchery Fry	Crumbles	A premium all fishmeal/oil freshwater diet. Results in excellent raceway hygiene and cost effective growth.	WEBSITE CONTACT
EWOS Canada	Micro 1.2mm	Salmonids	Fingerlings	Extruded Pellets	A premium all fishmeal/oil freshwater diet. Results in excellent raceway hygiene and cost effective growth.	WEBSITE CONTACT
EWOS Canada	Transfer (1.5, 2.0 and 3.0mm)	Salmonids	Fingerlings, Smolts	Extruded Pellets	Premium smolt feed used to prepare fish for transfer to salt water OR when combating stressors.	WEBSITE CONTACT
EWOS Canada	Pacific (1.2, 1.5 and 2-9mm)	Salmon, Trout, Coho	Fry Fingerlings Grower	Extruded Pellets	High protein and moderate fat diets. Blend of premium fish meals and select alternative proteins	WEBSITE CONTACT
EWOS Canada	Vita (1.5, 2-9mm)	Salmon, Trout, Bass, Sturgeon	Fry Fingerlings Grower	Extruded Pellets	Moderate protein and low fat with fishmeal and highly digestible alternative ingredients	WEBSITE CONTACT
EWOS Canada	Calform (2-9mm)	Salmon Trout Bass	Fingerlings Grower	Extruded Pellets	Floating/slow sinking feed	WEBSITE CONTACT
EWOS Canada	Natura (#0, #1, #2)	Pink & Chum Salmon	Hatchery Fry	Crumbles	High quality fish oil, low tem fish meals and select alternative ingredients	WEBSITE CONTACT
EWOS Canada	Brood (5,7,9 and 10.5mm)	Salmon Trout	Feed 10 months prior to egg take	Extruded pellets	Nutritionally optimized fatty acids, fishmeal based diet	WEBSITE CONTACT
EWOS Chile	EWOS micro (018, 075, 2)	Salmonids	Hatchery Fry	Sphere-izer Agglomeration System feed (SAS)	A comprehensive and complete range of hatchery diets from first –feeding to fry. Please refer to www.ewos.com or contact your local representative for details.	WEBSITE CONTACT
EWOS Chile	EWOS Transfer (5,15,50,100,200)	Salmonids	Fry Smolt	Extruded Pellet	A comprehensive and complete range of hatchery diets from fry to pre-transfer. Please refer to www.ewos.com or contact your local representative for details.	WEBSITE CONTACT
EWOS Norway	EWOS fry (5P, 15P) EWOS smolt (30P, 50P)	Salmonids	Hatchery Fry Smolt	Extruded Pellets	A comprehensive and complete range of hatchery diets from first –feeding to pre-transfer. Please refer to www.ewos.com or contact your local representative for details.	WEBSITE CONTACT
EWOS Scotland	EWOS micro (5P, 15P, 30P, 50P)	Salmonids	Hatchery Fry Smolt	Extruded Pellets	A comprehensive and complete range of hatchery diets from first –feeding to pre-transfer. Please refer to www.ewos.com or contact your local representative for details.	WEBSITE CONTACT

SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
Frymarine U.A	Resting copepod eggs of <i>Acartia tonsa</i>	Marine finfish, Crustacean, Shrimp	Larvae	Resting eggs	Resting Copepod eggs (<i>Acartia tonsa</i>) for use in first feeding. Our eggs are produced by adults which fed on high quality live algae. Eggs can be stored for a couple of months. Hatching is easy and their nutritional content is exceptional.	DATASHEET
Frymarine U.A	Rhodomonas live Algae	Copepod, Artemia, Rotifers	Various	Live algae	High quality algae to improve the nutritional content of your live feed.	DATASHEET
Gold Coin Biotechnologies Sdn. Bhd.	ENCAP® (Zoeal, Mysis, Early Post Larvae, Late Post Larvae)	Shrimp	Larvae Feed	Micro-encapsulated	ENCAP® products are microencapsulated with ingredients of the highest quality and digestibility. With our process being carried out at low temperature where minimum heat is involved, there is minimal nutrient loss. When used in hatcheries, the product also display the following advantages: simplicity to use, minimum water pollution, minimal feed wastage, controlled buoyancy, high attractability and faster growth to larvae.	WEBSITE
Gold Coin Biotechnologies Sdn. Bhd.	MPF (Early Post Larvae) (Late Post Larvae)	Shrimp	Larvae Feed	Micro-particulated	Microparticulated feed is formulated based on the highly specialized feeding habits of the post larvae. Highly digestible marine proteins are used to allow the young post-larvae's alimentary canal assimilate these important nutrients.	WEBSITE
Gold Coin Biotechnologies Sdn. Bhd.	HiPro (Early Post Larvae) (Late Post Larvae)	Shrimp	Larvae Feed	Powder	Minimal feed wastage promotes strong attractant for consumption and prolonged feed uptake by larvae. This product is simple to use; just add straight into the rearing tanks .	WEBSITE
Gold Coin Biotechnologies Sdn. Bhd.	GCMAT-SH1 Broodstock and Maturation Feed	Shrimp	Broodstock	Maturation diet powder mix	Mix the maturation powder mix with water at hatchery level to prepare semi-moist feed to reduce usage of live and fresh foods and lowers the bio-security risks associated with those. This feed contains high level of marine proteins, vitamins, omega-3 PUFAs and highly digestible ingredients for fast growth.	WEBSITE

The Hatcheryfeed Magazine 2015

The very latest developments in commercial hatchery feed and feeding



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SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
Inve Aquaculture 	O.range	Fish	Larvae up to juveniles	Crumbled dry feed	The ultimate marine fish dry diet range. Consists of 4 diets that perfectly fit the fish's nutritional needs throughout the different hatchery stages. Optimal HUFA and DHA/EPA profiles. Excellent stability and floatability. Formulated using only top quality raw ingredients.	WEBSITE CONTACT
Inve Aquaculture 	Fish Breed-M	Fish	Broodstock	Powdered	A consistent, high quality powdered concentrate for moist broodstock feeds. Decreases or eliminates the use of fresh fish feed, thus reducing risk of infection. Optimizes productivity while offering consistent spawning and fertilization rates.	WEBSITE CONTACT
Inve Aquaculture 	Lansy Breed	Fish	Broodstock	Pellets	Soft pellets that enhance the nutritional quality of the offspring and provide a more predictable output. Allows for better and increased egg production. Available in 8, 12 or 24 mm pellets.	WEBSITE CONTACT
Inve Aquaculture 	NRD	Fish	Larvae up to juveniles	Crumbled dry feed	Top performance dry diet range for marine fish. One diet line for the co-feeding, weaning, post-weaning, nursery and pre-ongrowing stages.	WEBSITE CONTACT
Inve Aquaculture 	BREED-S FRESH	Shrimp	Broodstock	Semi-moist pellets	Pioneering, soft shrimp maturation diet with fresh marine ingredients. Replaces up to 70% of the fresh feed. Offers full-biosecurity, a consistent nutritional quality and superior egg quality while boosting the spawning performance.	WEBSITE CONTACT
Inve Aquaculture 	EPAC	Shrimp	PL	Crumbled pellets	Post-larval shrimp feed range for low cost applications. NEW formula that includes more marine proteins and lipids, offers better water stability and increased palatability and attractiveness to the PLs. Maintains a clean and healthy rearing environment while allowing a reliable output of robust PLs.	WEBSITE CONTACT
Inve Aquaculture 	FRIPPAK FRESH	Shrimp	Larvae	Micro-encapsulated	A range of advanced larval shrimp feeds. Minimizes <i>Artemia</i> consumption, offering the best balance between live food and formulated diets. Contains high levels of fresh and natural ingredients. Offers higher survival rates and shorter production cycles. Now with NEW formulas for #2 CD and #3 CD.	WEBSITE CONTACT
Inve Aquaculture 	FRIPPAK PL FEEDS	Shrimp	PL	Crumbled	High quality diet range for post-larval shrimp. Complementary with our FRIPPAK FRESH range for the larval stages. Minimizes <i>Artemia</i> consumption and produces the best quality PLs. Increases survival rates.	WEBSITE CONTACT
Inve Aquaculture 	LANSY-Shrimp	Shrimp	Larvae PL	Micro-encapsulated, crumbled and flaked	A range of high quality dry diets covering all hatchery stages. Replaces at least 40% of the <i>Artemia</i> needs. Manufactured according to the highest sanitary standards, ensuring consistent survival and uniform growth. Excellent	WEBSITE CONTACT

SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
Inve Aquaculture 	VANNA (China only)	Shrimp	Larvae PL	Micro-encapsulated, crumbled and flaked	A performing diet range for economic <i>vannamei</i> larviculture. Highly nutritional, well balanced formulation. Largely reduces the use of live algae and Artemia. Produces strong, healthy PLs. Non-GMO.	WEBSITE CONTACT
Lucky Star	Initial	Fish	Larvae	Micro-encapsulated	Nutritionally balanced to satisfy the requirements of marine fish species. Slow sinking to maximize feed availability and avoid feed loss. High levels of digestible protein, utilizable lipids, cholesterol and vitamins. Effective co-feed with rotifer, artemia and micro algae.	WEBSITE
Lucky Star	MP Enhance	Fish	Larvae	Formulated particle	Extrusion micro-particulate granule which offers an economical choice. Effective co-feed with rotifer, microalgae and <i>artemia</i> .	WEBSITE
Lucky Star	Micro Elite	Shrimp	Larvae	Encapsulated	Micro Elite shrimp larval feed is processed by the most advanced encapsulated technology with the following characteristics: Excellent feed buoyancy in water column to maximize feed availability. Encapsulated granules extending water stability and minimize nutrition leaching. Balanced fatty acid profile.	WEBSITE
Lucky Star	Brine shrimp flake	Shrimp	Larvae	Flake	Lucky Star brine shrimp flake is delicately formulated to satisfy the nutritional requirements of quality shrimp larvae.	WEBSITE
EPICORE/ MEGASUPPLY 	EPIHITE Z, M, PL	Shrimp	Larvae Post larvae	Liquid	EPIHITE is a unique range of advance technology liquid larval hatchery feeds that provide superior hatchery nutrition and cause fewer pollution problems than traditional dry feeds.	DATASHEET WEBSITE CONTACT
EPICORE/ MEGASUPPLY 	EPIFEED LHF 1, 2, 3	Shrimp	Larvae Post larvae	Liquid	EPIFEED LHF is a unique range of advance technology high concentration liquid larval hatchery feeds that provide superior hatchery nutrition and cause fewer pollution problems than traditional dry feeds.	DATASHEET WEBSITE CONTACT
EPICORE/ MEGASUPPLY 	EPIBAL 300, 500, 700, 1000	Shrimp	Post larvae Nursery Raceways	Granular	EPIBAL is a range of high energy granular hatchery feeds for post larval shrimp.	DATASHEET WEBSITE CONTACT
EPICORE/ MEGASUPPLY 	EPIFEED MBF	Shrimp	Broodstock	Pellet	EPIFEED-MBF is a specially formulated dry diet that provides excellent nutrition for maintaining prolific spawners and for improving reproductive performance. It represents an enormous step towards a bio-secure system in all production areas by replacing fresh natural feed.	DATASHEET WEBSITE CONTACT
EPICORE/ MEGASUPPLY 	EPIFEED BLACK ARTEMIA FLAKE	Shrimp	Larvae Post larvae	Flake	EPIFEED ARTEMIA BLACK FLAKE is a high quality flaked hatchery feed for post larval shrimp. Its high-energy nutritional profile enhances animal health and growth.	DATASHEET WEBSITE CONTACT

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SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
EPICORE/ MEGASUPPLY 	EPIFEED DRY 150	Shrimp	Larvae Post larvae	Granular	EPIFEED DRY 150 is a high energy granular hatchery feeds for Zoea to early post larval shrimp.	DATASHEET WEBSITE CONTACT
Pacific Trading Aquaculture 	Otohime	Fish	Larvae	Granulate	Otohime is made from highly selected raw materials with easily digested protein and high quality lipids to promote the vitality of fish larvae, sizes 75mu to 1400mu. Amazing cleanliness, excellent dispersibility on water surface and ideal sinking speed, this is considered the premium Japanese larval diet around the world.	DATA SHEET
ProChaete Innovations Ltd	Larvae Feeds 1 – 5 Sizes are from < 100 micron up to 1000 micron.	Shrimp	Larvae		The core protein source is polychaetes, but other marine raw materials are also present in the product. The feed is produced in an extrusion and spherizing process. It provides an excellent route to reducing the use of Artemia in the first feeding process.	DATASHEET
ProChaete Innovations Ltd	Complete Maturation Feed	Shrimp	Broodstock	Extruded	ProChaete CMF pellets can be used in addition to fresh / frozen products, or as a complete diet, meaning that the farmer would not need to hold stocks of other types of feed.	DATASHEET
ProChaete Innovations Ltd	Semi-Moist Maturation feed	Shrimp	Broodstock	Extruded	ProChaete has developed a unique product which has Semi Moist properties and is soft in texture, giving a feed which is highly nutritious and palatable. It's designed to be fed to shrimp along with squid, either at the same time, or as an additional meal during the day.	DATASHEET
ProChaete Innovations Ltd	Frozen worms	Shrimp	Broodstock			
ProChaete Innovations Ltd	Grow-out Feed	Shrimp	PL	Extruded	Our in-house research has led to the development of three targeted grow-out diets: SGO 35% 1mm & 1.8mm, plus SGO 30% 2.4mm.	DATASHEET
ProChaete Innovations Ltd	FMR	Shrimp & Marine Fish		Powder		
Reed Mariculture 	Instant Algae TP 1800	Shrimp, Bivalves	All life stages	Single-species Microalgae, 8% dry-weight;. Refrigerated liquid concentrate; no blending required.	Always available. TP 1800 can be used to replace live algae production, augment existing production during peak season, or to have available in case of a culture crash. <i>Thalassiosira pseudonana</i> is high in DHA and EPA and works fabulously for shrimp and bivalves at all stages.	WEBSITE CONTACT

SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
Skretting Marine Hatchery Feeds 	Vitalis CAL	Marine fish	Broodstock	Extruded	Extruded diet which should be offered to brood fish from the onset of vitellogenesis and should be fed until 1 month after spawning to allow optimal development, sustenance and recovery through the whole spawning period.	Contact Skretting Marine Hatchery Feed to get a product sheet. WEBSITE CONTACT
Skretting Marine Hatchery Feeds 	Vitalis REPRO	Marine fish	Broodstock	Extruded	Extruded diet which should be offered outside the spawning window to maintain optimal condition of the spawning fish.	Contact Skretting Marine Hatchery Feed to get a product sheet. WEBSITE CONTACT
Skretting Marine Hatchery Feeds 	GEMMA Micro	Marine fish	Early weaning	Cold Extruded	Unique, patented diet, which is specifically formulated and produced to facilitate early weaning without the use of <i>Artemia</i> .	Contact Skretting Marine Hatchery Feed to get a product sheet. WEBSITE CONTACT
Skretting Marine Hatchery Feeds 	GEMMA Wean	Marine fish	Co-feed & weaning	Cold Extruded	Cold extruded micro diet which has been developed to co-feed and wean marine larvae during the larval rearing phases. Optimal diet to follow on from rotifers and co-feed with minimal <i>Artemia</i> .	Contact Skretting Marine Hatchery Feed to get a product sheet. WEBSITE CONTACT
Skretting Marine Hatchery Feeds 	GEMMA Diamond	Marine fish	Post-weaning	Cold Extruded	Extruded micro pellet diet which has been designed to give juveniles the best start by assuring fast and efficient growth and low feed conversion under pre-growing conditions.	Contact Skretting Marine Hatchery Feed to get a product sheet. WEBSITE CONTACT
Skretting Marine Hatchery Feeds 	Perla MP	Marine fish	Transfer & pre-ongrowing	Extruded	Complete mini pellet starter diet which has been designed as a specific pre-ongrowing feed.	Contact Skretting Marine Hatchery Feed to get a product sheet. WEBSITE CONTACT

SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
Skretting Marine Hatchery Feeds 	PL	Shrimp	Larval & post larval nutrition	Cold Extruded	Feeding programme which has been engineered to offer advanced nutrition to shrimp hatcheries. It can be utilized from zoea stages until pre-growing stages	Contact Skretting Marine Hatchery Feed to get a product sheet. WEBSITE CONTACT
Skretting USA	Starter Crumble	Trout and Steelhead	First feeding fry	Extruded Crumbles	Starter Crumble is a nutrient-rich, crumbled starter feed suitable for Trout, Steelhead and a range of other cold and warm water species. Starter Crumble is produced from a highly digestible, extruded pellet.	Contact Skretting to get a product sheet WEBSITE CONTACT
Skretting USA	Nutra ST & MP	Trout and Steelhead	First feeding fry	Micro-pellets	Nutra ST & MP are high-performance, pelleted diets designed to give your fish the best possible start. Nutra ST is produced at only one plant in the world, and is designed to give small fish (<0.15g) the best possible nutrition in start feeding. Nutra MP is used after ST, and is a uniform micro-pellet with semi-floating characteristics, giving excellent growth and feeding efficiency.	Contact Skretting to get a product sheet WEBSITE CONTACT
Skretting USA	Classic Fry	Trout and Steelhead	Parr	Extruded Pellets	Classic Fry, previously called Extruded Steelhead, is a medium-energy, extruded sinking or floating fry diet. Classic Fry is specifically formulated to achieve good growth and healthy fry.	Contact Skretting to get a product sheet WEBSITE CONTACT
Skretting USA	Oncor Fry	Trout and Steelhead	Parr	Extruded Pellets	Oncor Fry is Skretting USA's best diet for Trout and Steelhead fry, formulated to ensure good water stability, excellent growth and low FCR. Oncor Fry has a higher level of digestible protein and higher energy content than Classic Fry to ensure that your fish get off to the best possible start.	Contact Skretting to get a product sheet WEBSITE CONTACT
SPAROS Lda 	SPAROS Larvae	Marine fish	Larvae, Nursery	Micro-encapsulated, Extruded	SPAROS larval feeds are produced using advanced technologies of microencapsulation and low-shear extrusion. This combination allows creating microparticles with a high digestibility and stability in water. SPAROS larval feeds contain a large fraction of soluble proteins, n-3 HUFA's and marine phospholipids, vital nutrients for an enhanced performance of first-feeding larvae.	Contact Sparos to get a product sheet. WEBSITE
SPAROS Lda 	SPAROS Broodstock	Marine fish	Broodstock	Dry Extruded	SPAROS broodstock feeds meet nutritional requirements at specific stages of sexual maturation resulting in optimal fecundity and egg quality, while maintaining fish health. Our feeds contain highly digestible marine protein sources, enhanced levels of arachidonic acid and other HUFAs, marine phospholipids, vitamins, minerals, nucleotides and natural antioxidants including carotenoids.	Contact Sparos to get a product sheet. WEBSITE

SUPPLIER	PRODUCT NAME	SPECIES	LIFE STAGE	FORM	DESCRIPTION	MORE INFORMATION
SPAROS Lda 	SPAROS Ornamental	Marine fish	All life stages		SPAROS's ornamental fish feed range, contains natural antioxidants, carotenoids and other pigments, to improve fish coloration and welfare. SPAROS can produce a range of feeds on-demand, containing for example microalgae rich in highly unsaturated fatty acids, and other natural immunostimulants, as well as prebiotics, probiotics and optimal vitamin doses.	Contact Sparos to get a product sheet. WEBSITE
Tromso Fiskeindustri 	Aglonorse Extra	Fresh water and marine fish	Larvae	Agglomerated	Agglomerated larval diet, formulated with marine ingredients with high digestibility. Designed and formulated to, minimize the use of artemia. An excellent early weaning diet for marine, fresh and ornamental fish larvae.	WEBSITE CONTACT
Tromso Fiskeindustri 	Aglonorse	Fresh water and marine fish	Larvae and fry	Agglomerated	Agglomerated larval diet, formulated with marine ingredients with high digestibility. Designed for co-feeding with artemia. An excellent weaning diet for marine, fresh and ornamental fish larvae.	WEBSITE CONTACT
Zeigler	EZ Artemia	Shrimp	Larvae, PL	Micro-capsule	100% Artemia Replacement formulated as a complete balanced diet to mimic the color, taste, texture, and nutritional value of Artemia nauplii.	DATA SHEET
Zeigler	EZ Larva	Shrimp	Larvae, PL	Micro-capsule	Premium Liquid Larval Diet designed to produce high quality PLs and maintain excellent water quality. Contains algae, pigments, and high HUFA content.	DATA SHEET
Zeigler	Larva Z Plus	Shrimp	Larvae, PL	Micro-particle	Premium Dry Larval Diet scientifically and commercially proven to produce the highest quality PLs. Contains algae, pigments, and high HUFA content.	DATA SHEET
Zeigler	Larva Esencial	Shrimp	Larvae, PL	Micro-particle	Dry Larval Diet designed to promote fast growth while maintaining water quality in larval rearing systems. Contains pigments and HUFAs from marine sources.	DATA SHEET
Zeigler	Larva AP-100	Shrimp, Fish	Larvae, PL	Micro-particle	Dry Larval Diet nutritionally balanced for marine larvae. Contains pigments and HUFA's from marine sources	DATA SHEET
Zeigler	Shrimp Starter	Shrimp	PL	Crumble	A complete nutrition alternative for feeding post larvae. A high protein, nutrient dense diet fortified with vitamin packs and pigments to enhance survival and growth.	DATA SHEET
Zeigler	PL Raceway Plus	Shrimp	PL	Crumble	Complete, premium diet for Nursery and Raceway systems that is proven to yield larger, more robust and healthier animals for stocking in ponds. Contains pigments and high levels of HUFAs from marine sources.	DATA SHEET
Zeigler	Brine Shrimp Flake – Red	Shrimp	PL	Flake	Highly digestible flake diet formulated for <i>P. monodon</i> with special pigments added for preferred coloration of the larval rearing tank. Contains high quality brine shrimp.	DATA SHEET
Zeigler	Brine Shrimp Flake - Black	Shrimp	PL	Flake	Highly digestible flake diet for coloration of the digestive track in <i>L. vannamei</i> . Contains high quality brine shrimp and algae for a nutritionally balanced formula.	DATA SHEET
Zeigler	EZ Black	Shrimp	PL	Micro-particle Flake	Micro-particle flake diet for coloration of the digestive track in <i>L. vannamei</i> . Contains high quality brine shrimp.	DATA SHEET



Hatchery Feed Pioneers



Who We Are: Reed Mariculture (RMI) is the world's largest producer of marine microalgae concentrates. Founded in 1995, we are a small but mighty, science-based, family-run business who likes to get our hands wet. We are dedicated to constant innovation to ensure the ongoing success of our customers.

Algae When You Need it!
Our Instant Algae®

larviculture feeds are used by over 500 hatcheries, universities, and marine ornamental operations in more than 80 countries around the world. We also produce and distribute clean, hatchery-scale rotifer and copepods starter cultures, Otohime and TDO weaning and juvenile feeds, and related supplies.

(See our product listings in this guide.)



Ensuring Stable and Productive Cultures: Reed Mariculture feeds and enrichments are produced using bio-secure, proprietary processes. Our long shelf life products provide fish, bivalve and shrimp hatcheries with clean, convenient and nutritious feeds that can replace in-house microalgae. The result: clean, efficient and stable production.

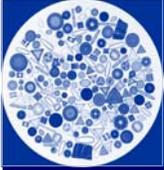


Who We Serve: Hatcheries/commercial aquaculture, public aquariums, public and private researchers, breeders and aquarium retailers and hobbyists.

Extraordinary Customer Service: We are known for outstanding customer service and technical support, and expertise in world-wide shipping logistics. Give us a call and let us know what we can do for you.

For more information, visit www.reed-mariculture.com
or call: 1-877-732-3276.





ENRICHMENTS & SUPPLEMENTS

SUPPLIER	PRODUCT NAME	SPECIES	PRODUCT TYPE	FORM	DESCRIPTION	MORE INFORMATION
Algal Scien. f c	Algamune AM	Finf sh shrimp	Algae meal supplement with beta 1,3 glucan	Dried and milled algae meal in bags	Algamune AM is a dried and milled algae meal produced from a pure algal culture. It contains over 45% beta 1,3 glucan as well as essential omega 3 fatty acids and vitamins. The algae meal comes in bags and can be top-dressed or pelleted with standard feeds.	DATASHEET
Algal Scientif c	Algamune AP	Shrimp Shellf sh Rotifers, <i>Artemia</i> , f lter-feeding f sh	Algae paste with beta 1,3 glucan	Refrigerated or frozen bags (nominally over 20% solids)	Algamune AP is a wet algae paste harvested from a pure algal culture. It contains over 45% beta 1,3 glucan as well as essential omega 3 fatty acids and vitamins. The paste can be added to tanks to enrich the diet of f lter feeding species.	DATASHEET
ALLER AQUA	ALLER ARTEX	Fish	Larvae Fry Nursery	Crumbles	ALLER ARTEX is the best solution for full or partial substitution of live Artemia to young fry in the early stages after hatching. A natural feeding solution for fry, the feed has high palatability which is immediately ingested and consequently not polluting the water.	WEBSITE
Aquafauna Biomarine	AlgaMac-Series	Fish Shrimp	All	Various	High Omega rotifer and artemia enrichment diets, Non-GMO single celled enrichment and culture diets, larval diets for marine shrimp and f nf sh made from whole f sh, microencapsulated larval diets, add water make-on-site maturation paste diets, single cell formulation components.	MORE INFORMATION
Aqua-In-Tech	PRO4000X	Fish Shrimp	Water conditioner probiotic for hatchery tanks and ponds	Tablets	Targeted delivery of large number of bacterial spores (>60 billion per tablet) to pond and hatchery tank bottoms. No activation required. Used for bio-augmentation and bioremediation. Bacteria. Stable f eld proven bacterial strains are the subject of a US patent for use in catfish ponds. Sludge degradation and ammonia reduction.	WEBSITE
Aqua-In-Tech	AQUAPRO-EZ	Fish Shrimp	Water conditioner probiotic for hatchery tanks and ponds	Bags	A mixture of selected bacterial strains and nutrients packaged in a biodegradable bag for direct addition to ponds and tanks. Sludge degradation and ammonia reduction	WEBSITE e
Aqua-In-Tech	MBX	Shrimp & Fish Broodstock; Shrimp Larvae, PL	Bacterial Extract		An extract from a non-pathogenic environmental bacterial species that is a source of nucleotides and nutrients shown to enhance PL stress tolerance and survivals in ponds.	WEBSITE
BernAqua – <i>InVivo NSA</i>	Red Pepper	Fish	Enrichment	Stable Emulsion	Red Pepper is a complete enrichment product for rotifers and Artemia. Red Pepper contains, besides essential fatty acids, the most important nutrients. The level of Vitamin C included is unique on the market. Red Pepper is also containing chelated trace minerals and immunostimulants. Red Pepper disperses easily. All nutrients are well protected as not to leach.	WEBSITE

SUPPLIER	PRODUCT NAME	SPECIES	PRODUCT TYPE	FORM	DESCRIPTION	MORE INFORMATION
BernAqua – <i>InVivo NSA</i>	Olio Ω3	Fish	Enrichment	Stable Emulsion	Olioω3 is a stable emulsion based on refined fish oils, stabilized with carefully selected emulsifiers. Olioω3 is also enriched with Vitamins E and C that are acting as antioxidants in the body of the fish larvae. Olioω3 is readily forming a uniform and stable emulsion of lipid droplets, filtered efficiently by rotifers or Artemia.	WEBSITE
BernAqua – <i>InVivo NSA</i>	Olio DHA-base	Fish	Enrichment	Emulsion-based	Olio DHA-base is an oil based solution formulated with the very best refined fish oils and stabilizing emulsifiers. Olio DHA-base is also enriched with Vitamins E and C. Olio DHA-base readily forms a uniform and stable emulsion of lipid droplets when mixed with water. These lipid particles are filtered efficiently by rotifers or Artemia.	WEBSITE
BernAqua – <i>InVivo NSA</i>	Ω3 Algae	Fish	Micro-algae	Powder	ω3Algae is only composed of a selected blend of Chlorella Algae. The processing ensures the preservation of all nutritional characteristics and the total elimination of all bacteria and viruses. ω3Algae is easy to use, reaching complete cell separation in just a few minutes of blending. The suspension remains remarkably stable in water.	WEBSITE
BernAqua – <i>InVivo NSA</i>	Ω3 Yeast 60	Fish	Rotifer Feed	Powder	ω3Yeast60 is a selected yeast-strain, not genetically modified. ω3Yeast60 is presenting the highest levels of protein associated with EFA and vitamin C levels comparable to the highest levels found in live micro algae. No oils are mixed or top coated on the yeast. ω3Yeast60 can support fast growth at high densities for long period of time, without presenting the risk of rotifer degeneration or culture crashes.	WEBSITE
BernAqua – <i>InVivo NSA</i>	Royal Pepper Energy	Shrimp	Booster	Liquid	Royal Pepper Energy is a high quality shrimp supplementary liquid feed aimed at improving health and stress resistance. Royal Pepper Energy is targeted at difficult stages such as the Zoea - Mysis - PL transition. Royal Pepper Energy is produced following a unique technology that involves the formation of protein wall capsules around a liquid lipid core.	WEBSITE
BernAqua – <i>InVivo NSA</i>	Royal Pepper Protein	Shrimp	Booster / Micro-bial	Suspension	Royal Pepper Protein is a high quality shrimp supplementary liquid feed aimed at improving health and stress resistance. Royal Pepper Protein is used throughout the larval cycle, and fences off Zoea syndrome and Post Larvae stress.	WEBSITE
BioMar	LARVIVA Multigain	Rotifers Artemia	Enrichment		Complete dry formula to enrich live feed with all nutrients required by marine larvae or other first feeding species.	DATASHEET
Industrial Plankton	PBR 1000L	Marine Fish Shellfish	On site algae production equipment	Live Algae	Fully automated equipment produces live algae on site for hatchery feed. 1000L tank, self cleaning and sterilizing, automated harvesting, UV sterilization, user friendly touch screen controls. Requires 4'X4'X7' space.	DATASHEET

SUPPLIER	PRODUCT NAME	SPECIES	PRODUCT TYPE	FORM	DESCRIPTION	MORE INFORMATION
Inve Aquaculture 	S.presso	Fish	Live food enrichment	Liquid	Complete liquid enrichment for <i>Artemia</i> and rotifers. Innovative suspension/emulsion technology that performs in different conditions and densities.	WEBSITE CONTACT
Inve Aquaculture 	S.tream	Fish	Rotifer diet		Semi-continuous rotifer culture diet with superior performance. Easy to adapt to any previous equipment, it is clean, easy and quick to use. Cost-effective, can be used from 2000 up to 8000 rotifers per ml.	WEBSITE CONTACT
Inve Aquaculture 	S.parkle	Fish	Rotifer diet	Liquid	Sparkling clean batch diet for a consistent, performing rotifer culture. Allows re- inoculation up to 50 consecutive generations. Cost-effective and easy to use as it is designed to reduce the workload providing short and highly productive runs.	WEBSITE CONTACT
Inve Aquaculture 	EASY SELCO	Fish	<i>Artemia</i> enrichment	Liquid	The original, easy to use liquid enrichment for <i>Artemia</i> . Easy preparation: no mixing needed. Easy application: 1 single dose is possible. Easy storage: enhanced temperature stability.	WEBSITE CONTACT
Inve Aquaculture 	A1 DHA SELCO	Fish	<i>Artemia</i> enrichment	Liquid	All-in-one liquid <i>Artemia</i> enrichment. Enriches up to 500 nauplii per ml. Optimal DHA inclusion and increased levels of natural marine phospholipids. Bacterial control during the enrichment cycle while ensuring increased survival rate of the fish larvae.	WEBSITE CONTACT
Inve Aquaculture 	DHA PROTEIN SELCO	Fish	Rotifer enrichment	Liquid	All-in-one powdered enrichment for rotifers with an optimal DHA/EPA ratio. Ensures a high nutritional value and allows continued rotifer growth during the enrichment process. Makes for increased survival rates of the fish larvae while reducing the number of deformities.	WEBSITE CONTACT
Inve Aquaculture 	Sanocare SURE	Fish		Liquid	Water conditioner for improved rotifer quality. Improves survival rate of the fish larvae, increases the coloration of the rotifers and thus also the attractability for the fish.	WEBSITE CONTACT
Inve Aquaculture 	Sanocare ACE	Fish		Liquid	Water conditioner for improved <i>Artemia</i> quality. Increases the quality and vitality of hatched, concentrated and stored <i>Artemia</i> nauplii. Stabilizes pH levels and avoids foaming off during hatching, enrichment or storage.	WEBSITE CONTACT
Inve Aquaculture 	Sanolife MIC-F	Fish			Microbial mixture for disease control, gut microflora colonization and water quality improvement in fish hatcheries. Inhibits a number of pathogenic bacteria. Produces enzymes and degrades waste. Colonizes the digestive tract and improves growth and survival rates.	WEBSITE CONTACT
Inve Aquaculture 	Sanolife GWS	Fish			Green water conditioner for larval fish rearing. Replaces up to 100% of the live algae while maintaining the rotifer quality inside the tank. Improves water quality and microbial flora. Diffuses light inside the tank, reducing the stress levels of the fish.	WEBSITE CONTACT

SUPPLIER	PRODUCT NAME	SPECIES	PRODUCT TYPE	FORM	DESCRIPTION	MORE INFORMATION
Inve Aquaculture 	Sanoguard S-PAK	Shrimp			Health booster for shrimp, for improved resistance to stress and diseases. Strengthens the immune system and health. Facilitates recovery after a period of stress. Improves survival and growth rates.	WEBSITE CONTACT
Inve Aquaculture 	Sanolife MIC	Shrimp			Microbial mixture for disease control and improved water quality in shrimp hatcheries. Inhibits Vibrio and other pathogenic bacteria. Produces enzymes and degrades waste. Colonizes the digestive tract. Produces strong PLs while improving survival and growth	WEBSITE CONTACT
Lucky Star	Nutri - HUFA	Fish Shrimp	<i>Artemia</i> / Rotifer enrichment	Fluid	Lucky Star Nutri – HUFA is an <i>Artemia</i> /Rotifer enrichment product which consists of essential unsaturated fatty acids that are desirable by marine fish and shrimp larvae.	WEBSITE
EPICORE/ MEGASUPPLY 	EPICIN G2 Hatchery	Shrimp / ma- rine and fresh- water fish	Probiotic for hatchery water	Powder	EPICIN-G2 is a natural microbial ecosystem with added stabilizers and growth stimulants for detoxifying aquaculture hatchery water. It eliminates water-fouling waste products such as ammonia, nitrites and hydrogen sulfide, thereby lowering stress and providing a healthier environment for aquatic animal growth. It also improves animal health and disease resistance by creating a probiotic environment.	DATASHEET WEBSITE CONTACT
EPICORE/ MEGASUPPLY 	EPICIN G2 DFM	Shrimp / ma- rine and fresh- water fish	Direct fed probiotic	Powder	EPICIN-G2 DFM is a natural microbial ecosystem with added stabilizers and growth stimulants. It eliminates water-fouling waste products such as ammonia, nitrites and hydrogen sulfide, thereby lowering stress and providing a healthier environment for aquatic animal growth. It also improves animal health and disease resistance by creating a probiotic environment. When applied to feed at the feed mill, EPICIN-G2 DFM is especially effective in improving FCR and reducing secondary pathogen mortality in viral weakened shrimp.	DATASHEET WEBSITE CONTACT
EPICORE/ MEGASUPPLY 	EPICIN HOD	Shrimp / ma- rine and fresh- water fish	Probiotic	Powder	EPICIN-HOD Hatchery Organics Digester is a natural microbial ecosystem for detoxifying the tank environment in aquaculture hatcheries by mineralizing and bioremediating solid organic waste and detritus, which usually settles on the tank bottom. The biologic catalysts of EPICIN-HOD Hatchery Organics Digester immediately start the process of digesting accumulated organic matter; these microorganisms have been specially selected due to their ability to produce a wide variety of powerful enzymes to decompose the different organic wastes produced in the larviculture tanks. It also improves animal health and disease resistance by creating a probiotic environment; EPICIN-HOD Hatchery Organics Digester is fortified with unique accelerators to increase the microbial action.	DATASHEET WEBSITE CONTACT

SUPPLIER	PRODUCT NAME	SPECIES	PRODUCT TYPE	FORM	DESCRIPTION	MORE INFORMATION
EPICORE/ MEGASUPPLY 	EPICIN PONDS	Shrimp marine and freshwater f sh	Biological aquaculture pond water treatment	Powder	EPICIN-Ponds is a natural microbial ecosystem with added stabilizers and growth stimulants for detoxifying aquaculture grow-out ponds. It eliminates water-fouling waste products such as ammonia, nitrites and hydrogen sulfide, thereby lowering stress and providing a healthier environment for aquatic animal growth. It also improves animal health and disease resistance by creating a probiotic environment.	DATASHEET WEBSITE CONTACT
EPICORE/ MEGASUPPLY 	EPICIN PST	Shrimp marine and freshwater f sh	Biological aquaculture pond soil treatment	Powder	EPICIN-PST pond soil treatment is a specially formulated biological and biochemical system designed to accelerate the biological decomposition of highly fouled aquaculture pond soil. It is a natural microbial ecosystem to inoculate the soil wastes and start the bioremediation process. It also is fortified with unique accelerants to speed the microbial action.	DATASHEET WEBSITE CONTACT
EPICORE/ MEGASUPPLY 	EPIZYM AGP- Complete	Marine and freshwater microalgae	Algae growth media for pure and indoor cultures	Liquid	EPIZYM-AGP-C is a complete concentrated medium for producing high levels of nutritious marine algae and other phytoplankton used for feeding shrimp and other marine animals. It is a one-pack, liquid version of the Guillard's f/2 medium with added cellular growth stimulants.	DATASHEET WEBSITE CONTACT
EPICORE/ MEGASUPPLY 	EPIZYM AGP (M)	Marine and freshwater microalgae	Algae growth media for large and outside culture tanks	Liquid	EPIZYM-AGP-M is a concentrated medium for producing high levels of nutritious marine algae and other phytoplankton used for feeding shrimp and other marine animals. It is a one-pack, liquid version of the trace elements, micro-nutrients, vitamins and minerals of the Guillard's f/2 medium with added cellular growth stimulants.	DATASHEET WEBSITE CONTACT
Pacific Trading Aquaculture 	Super Fresh Chlorella SV-12	Fish Rotifers	Rotifer diet green-water technique	Fresh live chilled liquid	Super Fresh Chlorella SV12 has been developed in Japan especially for Rotifer cultivation. Each cell contains DHA, EPA and Vitamin B-12 ensuring optimal enrichment. Delivered live and fresh within 5 days of order and is considered a vital cornerstone of RELIABLE stable high and low density rotifer cultivation.	DATASHEET WEBSITE CONTACT
Pacific Trading Aquaculture 	Emerald	Rotifers	Rotifer diet	Powdered	<ul style="list-style-type: none"> • Spray dried fine Chlorella powder • Axenic culture production (Patented process) • Economical • Designed for high and low density rotifer cultivation • Long shelf life • Stable production 	DATASHEET WEBSITE CONTACT
Reed Mariculture 	Instant Algae Isochrysis 1800	Fin fish - Zooplankton and Artemia enrichment, Bivalve Shellfish, Shrimp	Single-species Microalgae, 8% dry weight	Refrigerated liquid concen- trate; no blending required	Always available. Isochrysis 1800 can be used to replace live algae production, augment existing production during peak season, or to have available in case of a culture crash. Isochrysis is high in DHA and often used to enrich zooplankton such as rotifers or Artemia.	WEBSITE CONTACT

SUPPLIER	PRODUCT NAME	SPECIES	PRODUCT TYPE	FORM	DESCRIPTION	MORE INFORMATION
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae Nanno 3600	Finf sh - as a rotifer feed or for greenwater	Single-species Microalgae, 18% dry weight	Frozen or Refrigerated liquid concen- trate; no blending required	Nanno 3600 is our original high-yield rotifer feed. It is a single-species product (<i>Nannochloropsis</i>) and produces phospholipid-rich rotifers. It also provides a high Feed Conversion Rate with minimal organic waste, and gives an EPA and ARA pre-enrichment boost for use with high-DHA enrichment protocols. Store frozen for 3 years.	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae Pavlova 1800	Finf sh - Zooplankton enrichment; Bivalve Shellf sh; Shrimp	Single-species microalgae, 8% dry weight	Refrigerated Liquid concentrate; no blending required	Pavlova is a small golden/brown f agellate whose nutritional prof le is very similar to Isochrysis . It is excellent for enriching rotifers and other zooplankton. Its sophisticated sterol composition makes it particularly popular in cold water f sh hatcheries. Pavlova is very difficult to grow so it is not produced by many hatcheries.	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae Tetraselmis 3600	Finf sh - feed stimulant effect for zoo- plankton and Brine Shrimp; Bivalve Shellf sh; Shrimp	Single-species microalgae, 18% dry weight	Frozen Liquid concentrate; no blending required	Tetraselmis is a large green f agellate with a very high lipid level. It contains natural amino acids that stimulate feeding in marine animals. Tetraselmis increases fecundity in zooplankton, is a standard feed for many Bivalves, and is excellent for increasing growth rates and f ghting "Zoea Syndrome" in larval Shrimp.	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae TP 1800	Finf sh - Zooplankton; Bivalve Shell- f sh; Shrimp	Single-species microalgae; 8% dry weight	Refrigerated Liquid concentrate; no blending required	Thalassiosira pseudonana is a small diatom used in Shrimp and Bivalve Shellf sh larviculture. With the most balanced omega prof le of our diatoms, and small cell size (4 – 10 micron) it is a great feed for even the smallest animals.	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae TW 1200	Finf sh - Zooplankton; Bivalve Shellf sh; Shrimp	Single-species microalgae; 6% dry weight	Refrigerated Liquid concen- trate; no blending required	Thalassiosira weissflogii is a large diatom used in Shrimp and Bivalve Shellf sh larviculture. Considered by many to be the single best algae for larval Shrimp, the large cell size (5 – 15 micron) extends the algae feeding period until the end of the PL stage.	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae Shellf sh Diet 1800	Bivalve Shellf sh; Ascidians/ Tunicates; Sea Urchins; Soft Corals; Brine Shrimp; and Copepods	Microalgal blend; 8% dry weight	Refrigerated Liquid concen- trate; no blending required	Shellfish Diet 1800® is a mix of four marine microalgae that have all demonstrated success with a variety of Shellf sh including Oysters, Clams, Mussels, and Scallops. Shellf sh Diet can be used with pre-set larvae all the way up through broodstock as a complete live algae replacement .	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae RotiGrow <i>OneStep</i>	Finf sh- Zooplankton feed	Microalgal blend; >14.8% dry weight	Frozen Liquid concentrate; no blending required	RotiGrow OneStep is a clean, high-yield, microalgal blend rotifer feed that maximizes balanced pre-enrichment levels of DHA, EPA and ARA. RotiGrow <i>OneStep</i> eliminates the secondary enrichment step for those f sh with a higher DHA requirement at the larval stage.	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae RotiGrow <i>Plus</i>	Finf sh - Zooplankton feed	Microalgal blend; >14.8% dry weight	Frozen Liquid concentrate; no blending required	RotiGrow Plus is a clean, high yield rotifer feed that maximizes pre-enrichment levels of DHA, EPA and ARA. The essential f rst step in the RotiGrow System . Depending on the nutritional requirements of the f sh larvae, it can be used as a stand-alone feed or in combination with one of our N-Rich enrichment products.	WEBSITE CONTACT

SUPPLIER	PRODUCT NAME	SPECIES	PRODUCT TYPE	FORM	DESCRIPTION	MORE INFORMATION
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae RotiGrow <i>Nanno</i>	Finf sh - Zooplankton feed	Microalgal blend; >16.4% dry weight	Frozen Liquid concentrate; no blending required	RotiGrow <i>Nanno</i> is a clean, high yield single species rotifer feed that produces phospholipids-rich rotifers. Our highest yielding feed, it provides the highest biomass conversion rate of our products, with the least organic waste in the tank. Gives a high EPA and ARA pre-enrichment boost for use with high DHA-enrichment protocols.	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Chlorella Ltd. Chlorella V12	Finf sh – Zooplankton feed	Live microalgae concentrate; 14% dry weight	Refrigerated algal concen- trate – highly perishable	This Chlorella , grown in Japan, is a super fresh grow-out feed enriched with DHA using a patented methodology. It provides a moderate DHA, EPA and ARA enrichment (25mg/g HUFA pre-enrichment). It is naturally high in vitamin B-12, a nutrient necessary for larval health.	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae N-Rich <i>High PRO</i>	Finf sh - Zooplankton enrichment	Microalgal blend; 9% dry weight	Refrigerated Liquid concen- trate; no blending required	N-Rich <i>High PRO</i> feeds ensure that the rotifer's soft tissue and gut contain the highest levels of proteins and lipids rich in phospholipid HUFAs, as well as a host of carotenoids, sterols, vitamins, enzymes, and other key nutrients. High PRO is especially protein-rich (>45%), keeping rotifers healthy and vibrant while they are being enriched.	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae N-Rich <i>PL Plus</i>	Finf sh - Zooplankton enrichment	Microalgal blend; 9% dry weight	Refrigerated Liquid concen- trate; no blending required	N-Rich <i>PL Plus</i> provides a high phospholipid content (approximately 50%) plus other bioavailable polar and membrane lipids for rapid rotifer tissue enrichment with minimal triglyceride storage. Rotifers emerge vibrant and swimming from the enrichment process. Near optimum enrichment in 1-2 hours when used with RotiGrow <i>Plus</i> .	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae N-Rich <i>Ultra PL</i>	Finf sh - Zooplankton enrichment	Microalgal blend; 9% dry weight	Refrigerated Liquid concentrate; no blending required	N-Rich <i>Ultra PL</i> provides a very high HUFA enrichment from bioavailable polar and membrane lipids for rapid rotifer tissue enrichment with minimal triglyceride storage. Rotifers emerge vibrant and swimming from the enrichment process. Extreme DHA enrichment in as little as 2 hours when used with RotiGrow <i>Plus</i> .	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae RotiGreen <i>Omega</i>	Finf sh - Greenwater	Microalgal blend; 8% dry weight	Frozen Liquid concentrate; no blending required	RotiGreen <i>Omega</i> is effective Greenwater with Optimum DHA, EPA & ARA nutrition for f sh larvae as well as enrichment maintenance for rotifers in the larval tank. Marine microalgae concentrates stay extremely clean with excellent suspension in the tank. *RotiGreen <i>Omega</i> may require special care for larva with an infating air bladder.	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae Rotigreen <i>Nanno</i>	Finf sh- Greenwater	Microalgal blend; 8% dry weight	Frozen Liquid concentrate; no blending required	RotiGreen <i>Nanno</i> balances DHA/EPA with ARA to optimally nourish f sh and maintain the health of rotifers. Extremely clean, it offers excellent suspension in the water column. RotiGreen <i>Nanno</i> is as effective as live <i>Nannochloropsis</i> , and is replacing our Nanno 3600 for greenwater applications.	WEBSITE CONTACT
 Reed Mariculture ENSURING HATCHERY SUCCESS	Instant Algae RotiGreen <i>Iso</i>	Finf sh- Greenwater	Microalgal blend; 8% dry weight	Refrigerated Liquid concentrate; no blending required	RotiGreen <i>Iso</i> is a pure algae formulation that is as effective as live. A highly nutritious greenwater when swallowed or gill fed by larvae, it can maintain or further increase the DHA/EPA ratio in your rotifers and larval f sh to meet their nutritional requirements. Naturally high in the carotenoids.	WEBSITE CONTACT

SUPPLIER	PRODUCT NAME	SPECIES	PRODUCT TYPE	FORM	DESCRIPTION	MORE INFORMATION
 Reed Mariculture <small>ENSURING HATCHERY SUCCESS</small>	Instant Zooplankton "Mini L 160" Live Rotifers	Fin f sh— Live Larval Feed	Live Zooplankton	A dense culture of Live Zooplankton packaged in 1 – 1.5 liters of salt water in breathable bags.	Reed Mariculture supplies pure cultures of a strain of <i>Brachionus plicatilis</i> (L-type) with a typical lorica length of about 160 µm. This species is euryhaline, capable of thriving in salinities of 5-40 ppt. It is available in quantities from 1 million to 1.5 billion, concentrated and packaged into "breathable" bags.	WEBSITE CONTACT
 Reed Mariculture <small>ENSURING HATCHERY SUCCESS</small>	Instant Zooplankton <i>Parvocalanus crassirostris</i> Copepods	Fin f sh— Live Larval Feed	Live Zooplankton	A dense culture of Live Zooplankton packaged in 1 – 1.5 liters of salt water in breathable bags.	Copepods are the feed of choice for wild marine fin f sh. <i>Parvocalanus crassirostris</i> is a small, pelagic calanoid copepod. The nauplii (newly hatched larvae) are small measuring in the 40-100 µm range, making them a suitable feed for small-gape fin f sh larvae. Adults are in the 200 to 400 µm range.	WEBSITE CONTACT
 Reed Mariculture <small>ENSURING HATCHERY SUCCESS</small> Distributor to the Americas	Otohime Larval Weaning Diets	Fin f sh - Larval Weaning Diet	High quality dry larval weaning diet	Pellets: Granular, Marumerized and Extruded	Otohime Larval Weaning Diets from Japan provide superior nutrition for juvenile and adult fin f sh. They are amazingly clean with excellent particle integrity in water, provide optimal nutrition and stimulate a strong feeding response for improved growth and survival rates. A balanced diet suited for virtually all fin f sh.	WEBSITE (Otohime) WEBSITE CONTACT
 Reed Mariculture <small>ENSURING HATCHERY SUCCESS</small>	APBreed RGcomplete	Fin f sh - Zooplankton Feed	Microalgal blend; 4.4% dry weight	Very stable refrigerated liquid concentrate; includes ammonia control; no blending required	RGcomplete is a super-concentrated microalgal-based premium quality feed for filter-feeding invertebrates. It has been sized especially for Breeders, Aquarists, and Propagators and includes both a pH buffer and ClorAmX® (ammonia neutralizer). It has a long refrigerated shelf life of at least six months. Suitable for a wide range of zooplankton with a balanced Omega profile.	WEBSITE (AP Breed) WEBSITE CONTACT
 Reed Mariculture <small>ENSURING HATCHERY SUCCESS</small>	APBreed SDAquarist	Shell f sh, Corals	Microalgal blend; 4.4% dry weight	Very stable refrigerated liquid concentrate; includes ammonia control; no blending required	A mixed diet of four marine microalgae (<i>Isochrysis</i> , <i>Pavlova</i> , <i>Tetraselmis</i> and <i>Thalassiosira pseudonana</i>) that provides superior nutrition for all types of shell f sh, crustaceans and other filter feeding invertebrates, increasing both growth rate and survival. Complete with ammonia control and buffered for a long refrigerated shelf life.	WEBSITE (AP Breed) WEBSITE CONTACT
 Reed Mariculture <small>ENSURING HATCHERY SUCCESS</small>	APBreed TDO	Fin f sh - Pelletized Feed/Weaning Diet	High quality dry diet	Pellets: Granular and Extruded	TDO is the top-selling hatchery larval fin f sh diet "top dressed" with <i>Haematococcus</i> (astaxanthin source), natural feed stimulants, a natural immune-stimulant, and more! Prime source of easily digested proteins and high quality lipids with an excellent HUFA and phospholipid profile. High in the carotenoid astaxanthin for color enhancement.	WEBSITE (AP Breed) WEBSITE CONTACT
Salem Microbes	Four f sh Slime & Sludge Buster	FISH	Water conditioner, Microbial enrichment	FREEZE DRIED	A super soluble blend as BIOFILTER ADDITIVE of non-pathogenic consortium of Bacillus Spp. to remove Slime and Bottom sludge. Keeps Water devoid of suspended and settled wastes. Rapidly builds up favorable bacteria after Chemical/Drug treatments. High production of enzymes Amylase, Protease, Lipase, Cellulase, Xylanase, Gelatinase, Lignosulfonase removes all kinds of wastes.	DETAILS

SUPPLIER	PRODUCT NAME	SPECIES	PRODUCT TYPE	FORM	DESCRIPTION	MORE INFORMATION
Salem Microbes	Four Fish Ammonia Control	FISH	Water conditioner	LIQUID	Liquid blend of Nitrifying bacteria designed to control ammonia and nitrite in breeding and display tanks, to seed biofilter for quick nitrification cycle.	DETAILS
Salem Microbes	Four Fish Oxygen Support Tablet	FISH	Oxygen support	Effervescent Tablets	Designed for improving the dissolved Oxygen levels in tanks, overcoming the sudden drop due to climate change or mechanical breakdown and during transport.	DETAILS
Salem Microbes	Seedone	Shrimp Hatchery	Microbial culture	Fully Soluble Powder	Instantly soluble, super-concentrated, probiotic blend for use in aquaculture hatcheries with high livability, adapts faster to a wide range of salinity and acts instantly. For use in Broodstock, Naupli, Zoea, Mysis and Post Larvae stages.	DETAILS
Salem Microbes	Stressbeat	Shrimp Hatchery	Microbial Feed Additive	Powder	Isolates of "Bacillus" species and its cellular components. Promotes phagocytosis, improves hepatopancreas health and improves digestion in times of stress.	DETAILS
Salem Microbes	Encon	Shrimp Hatchery	Microbial enrichment	Liquid	Liquid blend capable of reducing ammonia and sulphide gas, minimizes the need for frequent water exchanges and ensures better bio security.	DETAILS
Skretting Marine Hatchery Feeds 	NEPTUNE	Marine fish	Water conditioner	Powder	Blend of selected micro algae and micro particles offering a convenient solution for replacing live algae in greenwater applications.	Contact Skretting Marine Hatchery Feed to get a product sheet. WEBSITE CONTACT
Skretting Marine Hatchery Feeds 	ORI-ONE	Marine fish	Combined culture & enrichment	Powder	Diet which has been developed to offer excellent rotifer reproduction and measured nutritional incorporation without the need for a separate enrichment.	Contact Skretting Marine Hatchery Feed to get a product sheet. WEBSITE CONTACT
Skretting Marine Hatchery Feeds 	ORI-GREEN	Marine fish	Rotifer & <i>Artemia</i> enrichment	Powder	Diet which has been designed to ensure a very fast and efficient uptake by the live feed. The algae in the formulation also provide a natural pre-biotic effect and stimulate rotifer and <i>Artemia</i> condition.	Contact Skretting Marine Hatchery Feed to get a product sheet. WEBSITE CONTACT
Skretting Marine Hatchery Feeds 	ORI-GOLD	Marine fish	<i>Artemia</i> enrichment	Liquid suspension	Natural blend of encapsulated marine HUFAs, phospholipids, algae and proteins for enriching <i>Artemia</i> . It is boosted with specific proteins to offer a more balanced profile and increase gut retention in the <i>Artemia</i> .	Contact Skretting Marine Hatchery Feed to get a product sheet. WEBSITE CONTACT

SUPPLIER	PRODUCT NAME	SPECIES	PRODUCT TYPE	FORM	DESCRIPTION	MORE INFORMATION
Tromso Fiskeindustri 	Phosphonorse	Rotifers and artemia	Enrichment	Oil	A blend of phospholipids, marine oils, vitamins and carotenoides. Designed to boost the DHA content of rotifers and artemia, and give an excellent nutritional composition of the live prey.	WEBSITE CONTACT
Zeigler	EZ Bio	Shrimp	Larvae, PL	Powder	A multi-functional biologic treatment for use in shrimp and fish hatcheries. Used to lower risk from pathogenic bacteria and improve water quality.	DATA SHEET
Zeigler	EZ Mate	Shrimp	Maturation	Form into Worm	Partial replacement for fresh maturation foods to promote increased nauplii production; and brood stock health. Completely biosecure and contains high levels of pigments, HUFA's, vitamins, and minerals.	DATA SHEET
Zeigler	Maturation Supplement	Shrimp	Maturation	Pellet	Promotes rapid ovarian development and increased mating in maturation systems.	DATA SHEET
Zeigler	Shrimp Broodstock	Shrimp	Broodstock	Pellet	Power-packed with special ingredients for stronger, healthier brood stock and improved reproductive performance.	DATA SHEET

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All our publications are available free of charge, in support of our industry.

SPAROS

SPAROS is a science and technology-driven SME dedicated to the development of new products and tailored nutritional solutions, as well as innovative cutting-edge technology services, for the aquaculture sector. SPAROS commercializes its own range of premium aquafeeds for larval and broodstock stages and manufactures customized feeds for third parties.

It also has an important business area in contract research for fish feeds, where it tests feed additives, ingredients and alternative formulations, having an important portfolio of multinationals customers.

The alliance of a strong scientific background in the areas of fish nutrition and aquaculture, with a pilot-scale feed mill, has allowed SPAROS to gain momentum as a private contract research organization for these industrial players developing new products for the aquaculture market. Having under its responsibility the management of an extensive network of experimental rearing facilities, SPAROS is now clearly identified by major feed industry players as a valuable partner in the research and development process associated to testing the biological efficacy of novel ingredients and additives in fish.



Custom feeds for hatcheries

Feeds for fish larvae and post-larvae

- SPAROS larval feeds are produced using advanced technologies of microencapsulation and low-shear extrusion. This combination allows creating microparticles with a high digestibility while stable in water.

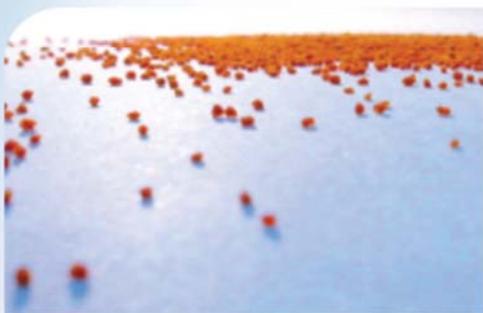
Feeds for enhanced Broodstock performance

- SPAROS broodstock feeds meet nutritional requirements at specific stages of sexual maturation resulting in optimal fecundity and egg quality, while maintaining fish health.

Relying on the use of premium ingredients, we can offer Tailor-made feeds, in which you may specify the origin and contents in:

- Protein & amino acids
- vitamins & mineral
- HUFA& phospholipids
- taurine & additives

- Novel formulations for emergent and new farmed species
- Production of small batches (down to 5 Kg) according to your requirements.
- Broad range of sizes (100 µm to 12 mm)



sparos@sparos.pt
www.sparos.pt

The SPAROS feed plant is equipped among other auxiliary feed manufacturing equipment (grinders, mixers, dryers, automatic sieves), with a twin-screw extruder, a vacuum coater for post-extrusion applications of fats and additives, a low-shear extrusion and a fluid-bed dryer for the manufacture of fish larvae and fry diets and a fluid-bed dryer for the microencapsulation of bioactive compounds (additives) and manufacture of fish larval weaning feeds.

SPAROS has an intense R&D effort, including the development of tools, focusing on mechanistic modelling and *omic* technologies, to predict biological performance and feed utilization of fish under different nutritional and environmental scenarios. The SPAROS team comprises 9 full time R&D collaborators (4 PhDs and 5 MSc) with a strong scientific background and over 150 publications in peer review journals on the areas of nutrition and aquaculture.

Watch our corporate video at: <http://youtu.be/A4m3gyYHfWM>

For more information visit: www.sparos.pt

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The aquafeed industry's leading international technical conference returns to Cologne with a stellar line-up of industry experts and applied scientists.

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- Effect of extrusion technology on physical and nutritional quality of fish feed
- Ingredient selection and extrusion parameters for aquatic feeds
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Brought to you by Aquafeed.com, the aquafeed industry's information provider, the 8th international Aquafeed Horizons conference will take place along side the FIAAP/VICTAM/GRAPAS 2015 feed and grain trade shows.

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R&D Services

SUPPLIER	SERVICE	SPECIES	LIFE STAGE	FEED TYPE	DESCRIPTION	MORE INFORMATION
AquaBioTech Group	Aquatic nutrition R&D and aquaculture consultancy services	Barramundi, Catfish, Pike Perch, Salmon, Sea Bream, Sea Bass, Sturgeon, Shrimp, Tilapia, Trout etc.	Larvae, PL., Fry, Nursery, Broodstock	All kind of feeds	The AquaBioTech Group is an international consulting company located in the centre of the Mediterranean on the island of Malta, although operating globally with clients and projects in over fifty-five countries. The AquaBioTech Group undertakes a variety of aquaculture, fisheries, marine surveying, aquarium and aquatic environmental projects throughout the world.	MORE INFORMATION
ABT Innovia	Aquatic nutrition & nutraceutical R&D. Novel protein testing; efficacy of dietary health and growth promoting supplements	Barramundi, Catfish, Pike Perch, Salmon, Sea Bream, Sea Bass, Sturgeon, Shrimp, Tilapia, Trout etc.	Larvae, PL., Fry, Nursery, Broodstock	All kind of feeds	ABT Innovia offers research services to support the development of feed additives (pre- and pro-biotics, growth and health promoting feed additives) and alternative protein sources, among other activities, with a wide range of commercially important species under any combination of culture conditions in our fully licensed and bio-secure R&D facilities.	MORE INFORMATION
	Aquatic nutrition & nutraceutical R&D feed testing. Efficacy of dietary supplements. Efficacy of health products.			All types.	ABT Innovia offers research services to support the development of live feed enrichments, water treatment processes and products, algal products and production processes, among other activities, with a wide range of commercially important species under any combination of culture conditions in our fully licensed and bio-secure R&D facilities.	
Aqua UGent	Extensive R&D and consultancy services based on proprietary model systems in: <ul style="list-style-type: none"> • Nutritional research • Hatchery management • Microbial management • Morphological development • Aquatic veterinary medicine • Life cycle analysis • Genomics and breeding • Environmental monitoring 	Rotifers (Rotifera) Brine shrimp (Artemia) White shrimp Freshwater prawn Bivalves Tilapia Pike perch and jade perch	Larvae Post-larvae (shrimps) Fry Adults (bivalves)	All kinds of feeds	We provide multidisciplinary expertise and innovations to facilitate your development and testing of live and compound feeds, raw materials, additives, probiotics, ...	MORE INFORMATION: Laboratory of Aquaculture & Artemia Reference Center (ARC) UGent Aquaculture R&D Consortium

SUPPLIER	SERVICE	SPECIES	LIFE STAGE	FEED TYPE	DESCRIPTION	MORE INFORMATION
Nofima AS	Aquatic nutrition, R&D and aquaculture consultancy services	Mainly salmonids	Larvae, Fry Smoltification, Grow-out, Broodstock	All kind of feeds for experimental use	Nofima offer the best solutions to develop and test new ingredients and feeds. We have extensive knowledge in technology and raw materials, and highly skilled scientists. Nofima provide research along the whole value chain, from feed ingredient to food for human consumption and market analyses.	MORE INFORMATION: NOFIMA NOFIMA Feed Technology Centre
SPAROS Lda 	Customized feeding trials Expertise on: Nutrition, digestive physiology and metabolism Nutritional modulation of immune response Aquaculture farming systems Aquafeed processing technologies	Nile tilapia; Common carp; Rainbow trout; Gilthead seabream; European seabass; Meagre; Turbot; Senegalese sole	Larvae, PL., Fry Nursery, Broodstock	All kind of feeds	SPAROS is a technology-driven SME dedicated to test and develop your products. We offer our experience to: <ul style="list-style-type: none"> Evaluate the efficacy of your new products (ingredients, additives, feeds) on: growth performance; feed efficiency; digestibility; metabolism; immune and health status Dose response and tolerance trials with novel feed additives for registration dossiers	MORE INFORMATION
SPAROS Lda 	Technology tests in aquafeeds Our technology platform comprises: <ul style="list-style-type: none"> Twin-screw extruder Low shear and temperature controlled extruder Vacuum coater Micropulverizer Lab scale encapsulation All other auxiliary manufacturing equipment 	Nile tilapia; Common carp; Rainbow trout; Gilthead seabream; European seabass; Meagre; Turbot; Senegalese sole	Larvae, PL., Fry Nursery, Broodstock	All kind of feeds	SPAROS' pilot-scale feed mill, can offer <ul style="list-style-type: none"> Tailored feed formulation scenarios and the manufacture of experimental feed batches Extrusion tests to assess the stability of your products to industrial processing conditions Characterization of the effect of test products on the physical pellet properties (e.g., hardness, water stability, fat absorption, sinking speed). 	MORE INFORMATION

Help us make this Guide more comprehensive!

Do you use a feed or R&D services that aren't listed?

Please tell us so we can include it next time.

If you are a feed supplier and have not been listed, please contact us for inclusion in the next issue.

Email: editor@hatcheryfeed.com



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- see UGent Aquaculture R&D Consortium

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Lucky Star

- see Big Nutrition

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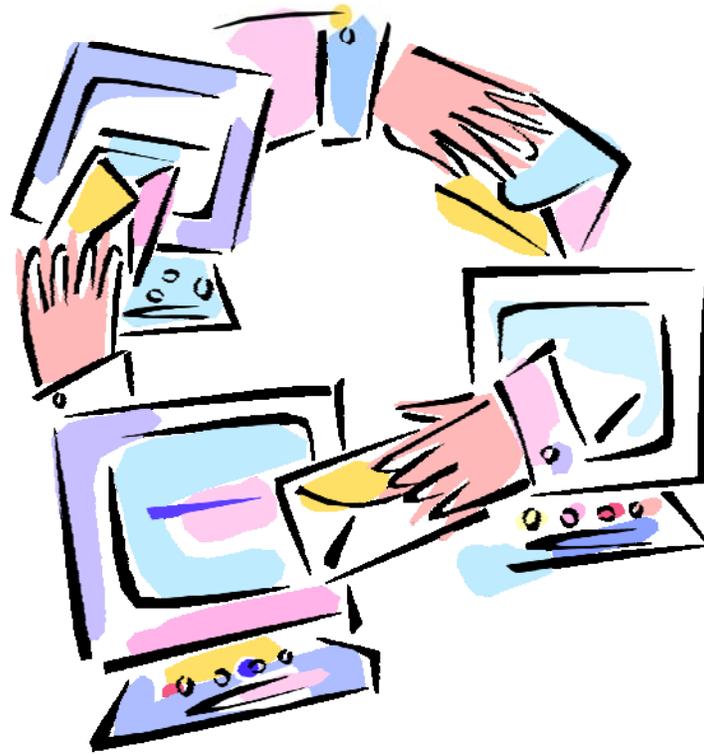
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