INVE AQUACULTURE **NUTRITION**
HATCHERY DIETS

O.range

Fish hatchery diet

THE FINEST MARINE FISH HATCHERY DRY DIET LINE

ONE DIET RANGE FOR THE ENTIRE HATCHERY CYCLE

OPTIMAL ∑Ω3 HUFA AND DHA/EPA PROFILES

EXCELLENT STABILITY AND FLOATABILITY IN THE WATER

The different diets in the O.range perfectly meet the nutritional needs of the fish larvae and fry throughout the different hatchery stages. Formulated with the best marine ingredients available in todays market to maximize fry performance and improve their resistance to stress.

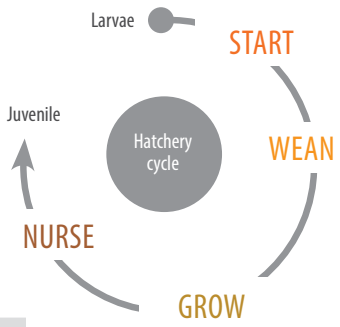
INVE AQUACULTURE

A Benchmark Company

CARE FOR GROWTH

O.range

FISH HATCHERY DIET



CHARACTERISTICS

START	Formulated to initiate fish larvae to artificial feeds Highly digestible and attractive to the larvae Optimal DHA/ EPA Ratio that covers requirement of marine fish larvae
WEAN	Excellent stability and floating properties in water Perfectly in balance as a partial Artemia substitute Contains free nucleotides to improve cell growth
GROW	Contains high levels of lipids and proteins Formulated to support exponential fish growth Ensures easy transition from weaning to post- weaning phase
NURSE	Formulated with highly digestible raw materials For an easy transition from hatchery to juveniles Formulated using the best quality marine proteins

O.range formulated feed range are specifically designed and formulated, in order to cover complex nutritional requirements from fish larvae until juveniles. The use of high quality raw materials, vitamins and oligoelements ensure high quality hatchery formulated feed line. Furthermore O.range is composed of 4 different formulations and size range that guarantee seamless nutritional transition from one hatchery stage to the other.

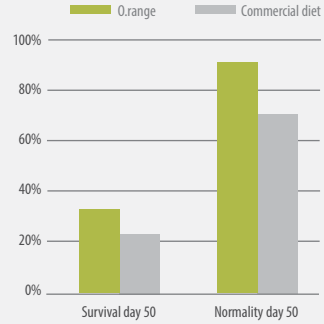
USE

Diet	Diet size	Particle size	Use
START	1/2	(<200 µm)	For co-feeding during the rotifer feeding phase.
	2/3	(200-300 µm)	For co-feeding during rotifer and the start of Artemia feeding phases.
WEAN	2/4	(212-400 µm)	Cofeeding diet used during late rotifer and early Artemia phases.
	3/5	(315-500 µm)	A nutritionally rich weaning diet during the enriched Artemia phase.
GROW	3/5	(315-500 µm)	A well-balanced diet at the end of the weaning and post-weaning phases.
	5/8	(500-800 µm)	
NURSE	5/8	(500-800 µm)	From the post-weaning phase and during all the nursery phases.
	8/12	(800-1180 µm)	This diet will allow for a smooth transition between the different phases with special attention to fry robustness and growth.

PERFORMANCE

High survival rates

High survival and low deformities

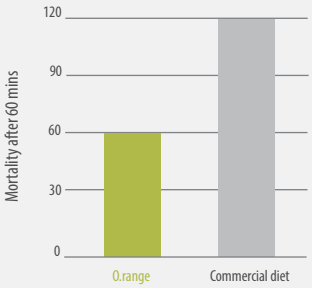


At 50dph*, significantly higher survival rates (32%) are obtained with O.range compared to other diets (23%). Additionally the percentage of fish without deformities is higher when fed O.range as compared to other diets.

*days post hatch

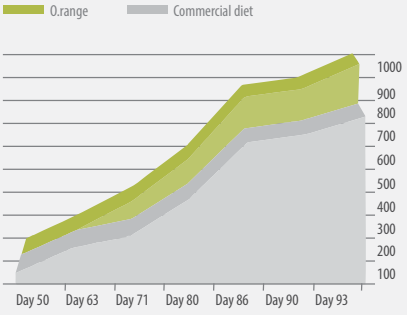
Better resistance to stress

Sea bream stress test 60 dph - 71 ppt



As illustrated stress test performed on 60 days old seabream post-larvae (3 replicates). After one hour, O.range shows a better resistance to stress, resulting 50% less mortality, compared to an alternative commercial diet.

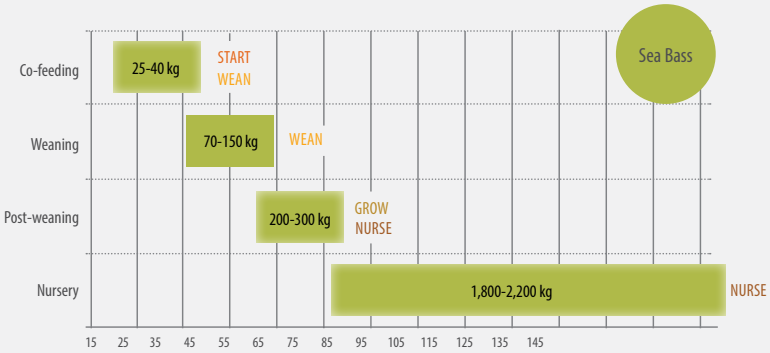
Exponential growth



Following successful weaning, post-larvae show an exponential growth. The graph above clearly illustrates that when compared to the control diet, O.range performs better and keeps a more constant consistent growth pattern trough out post- weaning phase.

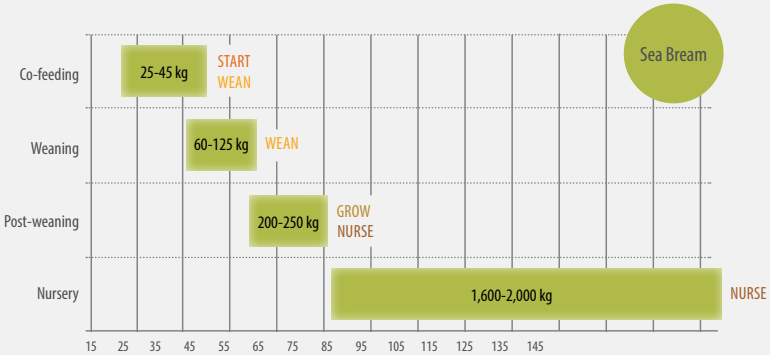
FEEDING REGIME

Marine fish larvae generally have a high growth rate and therefore require high levels of proteins and essential amino acids. Additionally, the O.range diets, especially the ones for larval and post-larval feeding are easily digestible, aiming to improve the assimilation of the essential nutrients in the early stages.



Tentative feeding regime for Seabream (Sparus aurata) reared from hatching to juveniles.

This feeding regime has to be adapted to local conditions such as the rearing system, temperature, fish density ect....
Initial 2 days old larvae density is up to 120 larvae per liter. Temperature 18°C at day 3 rising up to max 20°C.
Salinity 35-37 ppt.
Photoperiod 14-16 hours daylight.



Tentative feeding regime for Seabass (Dicentrarchus labrax) reared from hatching to juveniles.

This feeding regime has to be adapted to local conditions such as the rearing system, temperature, fish density ect....
Initial 2 days old larvae density is up to 120 larvae per litre. Temperature 16°C at day 10 rising up to max 18°C.
Salinity 35-37 ppt.
Photoperiod 14-16 hours daylight.

NOTES

Gradually switch to another nutritional block from larvae to juvenile according to the larval development, mouth opening & fish size.
The feeding regime should be adapted to your local conditions (rearing system, temperature, fish density, etc...).

The initial fish density is 100 larvae per liter and 15-30 larvae per liter during weaning. Temperature: 18-20°C. Salinity: 35-37 ppt.
Photoperiod: 16 hours of daylight. Quantities expressed in kg per million juveniles for each phase per day.

O.range

FISH HATCHERY DIET

WHAT MAKES A GOOD QUALITY LARVAL FISH DIET?

Both *biotic* and *abiotic* factors greatly influence the critical stages of larval rearing. The development of the fish larvae and their gastrointestinal tract, their digestive physiology and metabolic processes should be taken into account to understand their specific nutritional requirements.

Digestibility is crucial

Feed digestibility is of great importance, especially at the initial stages of larval development when no functional stomach is present and the digestive tract is still immature. The digestive system is still immature in relying on cytosolic enzymes, later switching to brush border enzymes and pepsin production leading to juvenile fish digestive system.

Therefore, a careful selection is made when using protein sources for the specific stages of the fish larvae. Not only proteins of sustainable marine origin are used, but also adequate protein sources in hydrolised form to obtain most optimal uptake of amino acids and peptides in the initial stages of larval development. The inclusion of dietary n-3 highly unsaturated fatty acids play a vital role in marine fish nutrition. High quality n-3 HUFA inclusion in INVE products covering broodstock life food and larval diets promote larval development juvenile growth survival and quality.

How to judge micro diet quality

In order to evaluate the quality of micro diet components.

the following aspects should be considered.

1 Attractability
2 Digestibility
3 Nutrient balance

This is especially of great importance in the early stages. Not only a good quality diet, but also an adjusted feeding protocol is crucial to produce healthy and performant fry.

Finally, one of the fundamental steps in microdiet production is to reach the optimal balance between its physical characteristics and the nutritional characteristics of the different ingredients.
For the initial stages of larval development, floating or slowly sinking feed is provided to obtain satisfactory feed acquisition and feed uptake.

PACKAGING

START 1/2	10 x 1 kg alufoil bags/carton
START 2/3	5 x 3 kg alufoil bags/carton
WEAN 2/4	5 x 3 kg alufoil bags/carton
WEAN 3/5	5 x 3 kg alufoil bags/carton
GROW 3/5	2 x 10 kg alufoil bags/carton
GROW 5/8	2 x 10 kg alufoil bags/carton
NURSE 5/8	20 kg bag
NURSE 8/12	20 kg bag

STORAGE/SHELF LIFE

Store in a dry place (max. 25°C). For prolonged storage, refrigeration (5°C) is advised. Once opened, the product should be used within 1 month, kept well closed and stored in a refrigerator.

TYPICAL COMPOSITION

		START	WEAN	GROW	NURSE
ANALYTICAL CONSTITUENTS					
crude protein		54%	54%	53%	51%
crude fat		13%	13%	12%	12%
crude ash		11.5%	11.5%	9.7%	11.5%
ash insoluble in hydrochloric acid		3.2%	3.2%	-	-
calcium		1.5%	1.5%	1.5%	1.7%
phosphorus		1.3%	1.3%	1.3%	1.5%
crude fibre		1%	1%	1%	1%
sodium		0.7%	0.7%	0.7%	0.5%
DHA		20 mg/g dwt	20 mg/g dwt	19 mg/g dwt	18 mg/g dwt
EPA		10 mg/g dwt	10 mg/g dwt	10 mg/g dwt	10 mg/g dwt
ADDITIVES					
VITAMINS					
vit. A	3a672a	14,000 IU/kg	14,000 IU/kg	14,000 IU/kg	12,500 IU/kg
vit. A	3a672b	6,000 IU/kg	6,000 IU/kg	6,000 IU/kg	-
vit. D3	3a671	2,800 mg/kg	2,800 mg/kg	2,800 mg/kg	2,500 mg/kg
TRACE ELEMENTS					
iodine (potassium iodide)	3b201	5 mg/kg	5 mg/kg	5 mg/kg	5 mg/kg
copper (copper(II) chelate of glycine hydrate (solid))	3b413	6 mg/kg	6 mg/kg	6 mg/kg	6 mg/kg
manganese (manganese chelate of glycine, hydrate)	3b506	45 mg/kg	45 mg/kg	45 mg/kg	45 mg/kg
zinc (zinc chelate of glycine, hydrate (solid))	3b607	50 mg/kg	50 mg/kg	50 mg/kg	50 mg/kg
selenium (selenomethionine produced by *Saccharomyces cerevisiae* NCYC R646 (selenised yeast inactivated))	3b813	0.3 mg/kg	0.3 mg/kg	0.3 mg/kg	0.3 mg/kg
ANTIOXIDANTS					
BHA	1b320	75 mg/kg	75 mg/kg	75 mg/kg	40 mg/kg
BHT	E321	75 mg/kg	75 mg/kg	75 mg/kg	40 mg/kg
propyl gallate	E310	100 mg/kg	100 mg/kg	100 mg/kg	100 mg/kg
COLOURANTS					
astaxanthin	2a161j	100 mg/kg	100 mg/kg	70 mg/kg	-

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For more information, please contact your local INVE Aquaculture Service Center or take a minute to visit our website: www.inveaquaculture.com

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