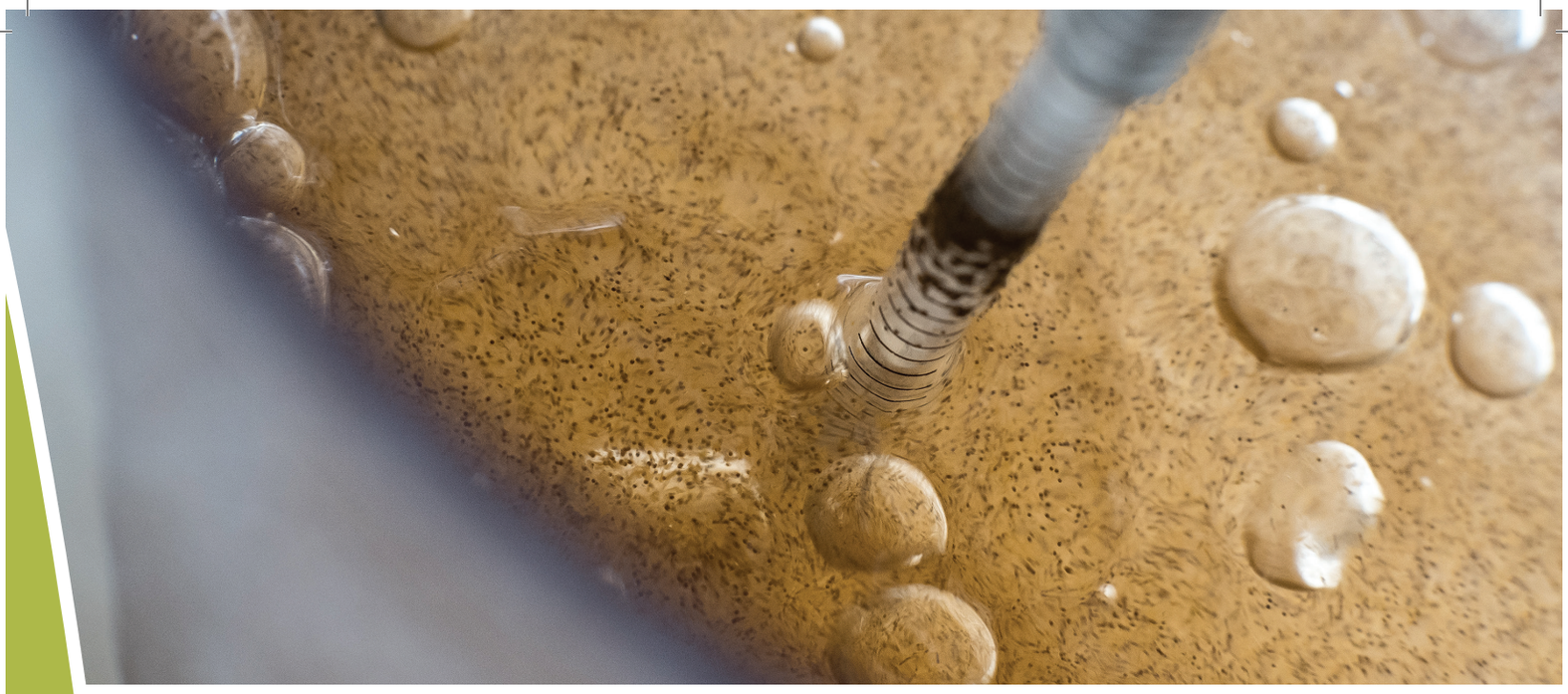


INVE AQUACULTURE **NUTRITION**

LIVE FEED &
ENRICHMENT DIETS

Easy DRY SELCO®

THE ULTIMATE ALL IN ONE ROTIFER AND ARTEMIA ENRICHMENT

SMART APPROACH TO LIVE FEED ENRICHMENT

ENHANCES LARVAL QUALITY AND ROBUSTNESS

EASY, FUNCTIONAL AND ECONOMIC

EDS (**Easy DRY** Selco®) is a dry enrichment with a formulation that boosts the rotifers and Artemia with balanced levels of fats, proteins, vitamins, key minerals, immunostimulants, essential amino acids and flavanoids turning it into a functional enrichment.

Simple and reliable EDS is the most complete enrichment for rotifers and Artemia produced.

Being not only-fat enrichment and because rich in proteins, EDS is suitable for fast growing marine fish larvae with special attention to fry quality and robustness.

INVE AQUACULTURE

CARE FOR GROWTH

SHAPING **AQUACULTURE** TOGETHER

A Benchmark Company

Easy DRY

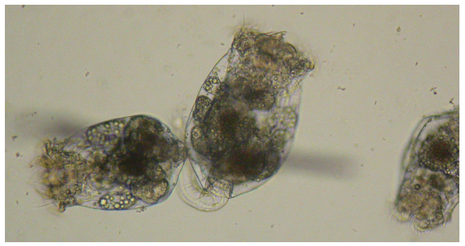
SELCO®

INSTRUCTION FOR USE

Preparation

- Emulsify **Easy DRY** Selco® in lukewarm water (preferably 35-40 °C) at max. 100g per liter by mixing vigorously for 3 minutes (using an industrial blender).
- Apply according to enrichment strategy (see below)

ROTIFERS



Easy DRY Selco® can be used in the traditional way after harvesting from the culture tank or directly into the culture tank at the last day of culture.

Enrichment in rotifer culture tank

Replace the last 8-10h of culture with two rations of EDS up to 2x145ppm T0 and T4

Separate day time enrichment:

- Rotifer density: 1000-2000R/ml Salinity 20-30ppt
- Temperature 25-27 °C
- Aeration medium-strong using open tube aeration
- Keep dissolved oxygen higher than 5ppm by means of a leaky pipe, ceramic stones or other fine bubble device
- Enrich the rotifers using 2 doses of EDS at T0 and T3 as follows:
  - 1000R/ml use up to 135ppm
  - 2000R/ml use up to 145ppm
- Rinse well and feed immediately or put in cold storage at max. 15 million rotifer per liter for max 16h

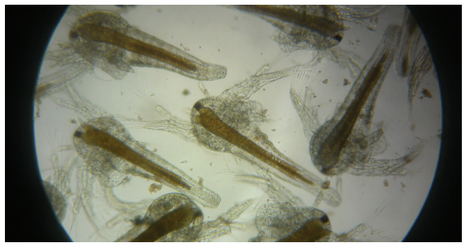
Overnight enrichment (max 24h):

- Harvest the rotifers from the culture tank, rinse and transfer to a new tank at 1000-2000R/ml
- Abiotic parameters: as above separate enrichment
- A background feeding with rotifer culture needs to be given every 6 hours prior the start of enrichment (max. 2 background feedings)
- Enrich the rotifers using 2 doses of EDS at T0 and T4 as follows:
  - 1000R/ml use up to 135ppm
  - 2000R/ml use up to 145ppm

Rotifer enrichment duration and harvesting

Rotifer enrichment with EDS is finalized in 6-9h (do not exceed 12h). After enrichment harvest and rinse well. Feed to larvae or put in cold storage.

ARTEMIA



- Prepare the enrichment tank with clean water at 20-38ppt salinity. Disinfect and pre-heat the water at 26 °C. Neutralize before transferring nauplii into the enrichment tank
- Standard enrichment density: 400npl/ml
- Dissolved Oxygen: >4ppm (optimal is 100% saturation).
- Temperature: 26 °C.
- Keep pH: >7.5 (adjust with NaOH and/or sodium bicarbonate as needed)
- Enrich the nauplli using 2 doses of EDS up to 385ppm at T0 and T10
- EDS can be used also at higher nauplii concentrations if needed:
  - with 700npl/ml use 2 doses of EDS 2 doses up to 2x500ppm per dose at T0 and T10
  - with 1000npl/ml use 2 doses of EDS 2 doses up to 2x800ppm per dose at T0 and T10.
- Harvest after 18 max 22h from the start of the enrichment
- Rinse well and feed immediately or put in cold storage

Cold storage

- Temperature 5-8 °C
- Density: rotifer up to 20 million per liter: nauplii up to 5million per liter
- Oxygen 4-6ppm (use of point aeration and diffuser collar)
- Salinity 25-38ppt

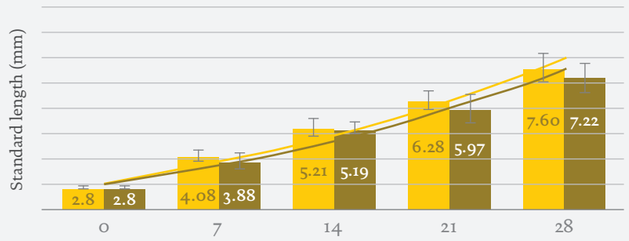
Note

Pay attention any enrichment product must be fine-tuned according to rotifer strain and local conditions. For assistance contact your local INVE Aquaculture representative.

ADVANTAGES OF EDS OVER ALTERNATIVE ENRICHMENTS

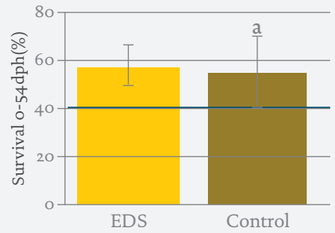
Improved growth and survival during the early stages (rotifer feeding period)

Growth EDS Seabream

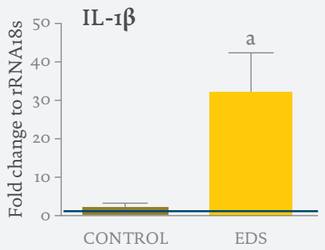


Growth rate of seabream larvae observed during the rotifer feeding phase

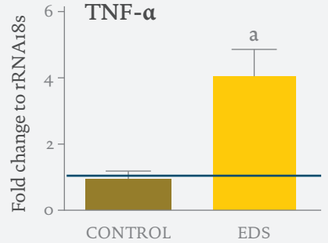
Survival rate



Similar survival rates were obtained at the end of Nursery



Treatments
a Significantly different from Control



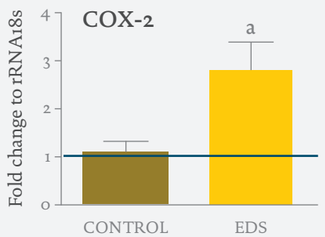
Significant upregulation of both IL-1β and TNF-α revealing a stronger immunostimulat -ing effect in the EDS treatment compared to the control treatment

Treatments
a Significantly different from Control (P<0.05)

IL-1β is a member or the interleukin 1 family of cytokines and is involved in a variety of cellular activities such as cell proliferation, differentiation and apoptosis. In this way it is an important mediator of the inflammatory process

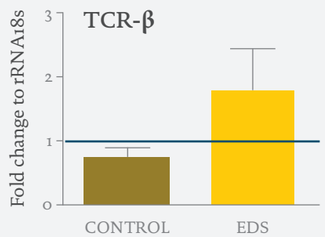
TNF-alfa (Tumor necrosis Factor) is involved in the systemic inflammation. It is one of the cytokines that make up the acute phase reaction

IL-1β (interleukine) and TNFβ (Tumor Necrosis Factor) are promoting the infiltration and activation of leucocytes and are thus altering the response to inflammations



Significant upregulation of COX-2 expression levels in the EDS treatment compared to the control treatment

Treatments
a Significantly different from Control (P<0.05)



Expression levels of TCR-β are slightly upregulated in the EDS group

Treatments
One-Way ANOVA ns

COX-2 (Ciclooxygenase) or PTGS2 catalyzes a number of reactions that produce precursors for various eicasonoids e.g. prostaglandines, leucotriens,..with anti-inflammatory characteristics

TCRβ = β chain of the lymphocyte T receptors and is involved in the recognition of antigenes

Easy DRY

SELCO®

AVAILABLE PACKAGING

Available in cardboard boxes 5 X 1 kg Alubag.

STORAGE/SHELF LIFE

The product should be stored in a cool, dry place (max. 10 °C). Once opened, it should be used within one month, kept well closed when not used and stored in a refrigerator. Do not freeze. The shelf life is 18 months from date of manufacturing.

TYPICAL COMPOSITION

GUARANTEED		
crude oils and fats		28%
crude protein		27%
crude ash		8%
phosphorus		1.2%
sodium		0.9%
crude fibre		0.5%
calcium		0.1%
DHA		95 mg/g DW
EPA		5.0 mg/g DW
ADDITIVES		
VITAMINS		
vit. A	3a672b	70,000 IU/kg
vit. D3	E671	23,500 IU/kg
vit. C		16,500 mg/kg
vit. E		4,950 mg/kg
TRACE ELEMENTS		
zinc - Zn (zinc chelate of glycine, hydrate)	3b607	40 mg/kg
ANTIOXIDANTS		
BHA	E320	50 mg/kg
BHT	E321	50mg/kg
propyl gallate	E310	100mg/kg

A QUICK GUIDE TO ENRICHMENTS

I. What is an enrichment?

The enrichments in modern marine larviculture are ingredients or products which are added to the live feed (usually to rotifers and Artemia) to enhance the nutritional or functional properties of live preys at benefits of fish larvae.

II. What enrichments exist?

Enrichments are made in 2 main forms: liquid emulsions and dry powders. Both work via the ingestion (Bio-encapsulation) by the live feed, that then transfer the nutritional qualities of the enrichment products onto the fish larvae.

III. How to optimally use an enrichment?

For optimal effect, the enrichments need to be dispersed in the water via a strong mechanical process (blending) and put into the enrichment tank where the live feed will filter the small particles.

It is therefore important:
1. to enhance the dispersion in the water as much as possible
2. to follow correct timing and dosages
3. to maximize the amount of nutrients going to the fish larvae

1. Evaluation of the enrichment

This can be done under a microscope looking at the internal organs of the live prey. However, this only provides a very rough indication of the enrichment efficiency.

Enrichment performances need accurate analytical methods. We advise you to contact your INVE Aquaculture representative for more information.

2. Dispersion in the water

It is very important to know that the better the enrichments are blended (dispersed into water), the easier it will be for the live feed to catch and filter the essential nutrients.

The live feed will be better enriched at the end of the enrichment phase, ultimately saving you costs because the live feed will be more nutritional for the fish larvae.

3. Avoid live feed starvation

Live food have high metabolism and thus will consume enrichment, this is influenced by temperature. In order to reduce this effect, soon after enrichment is terminated. Live feed is harvested washed with clean water and either fed to larvae or kept at low temperatures 5-8°C for maximum 24h. Never store enriched live feed at ambient temperature as a large part of the enrichment will be lost.

4. Tips & tricks: rotifers

Never leave the rotifers hungry when starting the enrichment. Starvation will decrease their resistance to stress and will decrease enrichment efficiency.

Monitor O2 constantly keeping it over the minimum advised value.

Rotifers will take up oil droplets, making them lighter and allowing them to float on the water surface.

This floating phenomenon will occur especially in separate enrichment tanks with clear water.

To avoid this, add a small quantity (50ppm) of culture diet - S.parkle or RoBoost - in order to increase the viscosity in the enrichment tank.

5. Tips & tricks: Artemia

Artemia can be enriched starting from Instar II nauplii. For the best enrichment we advise to check the hatching kinetics.

Monitor O2 and pH levels, constantly keeping them over the minimum advised values.

Because of the presence of nutrients in the water, the microbiological population will grow when enriching. To keep this under control and to increase the efficiency of both the nauplii and the enrichment, we strongly advise to use Sanocare ACE.

INVE AQUACULTURE

CARE FOR GROWTH

SHAPING AQUACULTURE TOGETHER

A Benchmark Company

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

TC-EN-EDS-180228