

TRADITIONAL SELCO® ENRICHMENTS

Rotifers and *Artemia* are crucial for the early feeding of (marine) fish larvae. Apart from making sure the nauplii are properly hatched and the rotifers are optimally cultured, a second important step is enriching these organisms before feeding them to the larvae.

Having been at the forefront of reliable, easy to use enrichments since 1983, INVE Aquaculture today still brings you its two "traditional" selco® enrichments, one powdered for *Artemia* and one liquid for rotifers:

1 DHA protein_{selco®}

- ✓ Specifically designed for enriching rotifers
- ✓ Enriches with well-balanced nutritional values
- ✓ Supports the growth of the rotifers during enrichment

2 Easy DHA_{selco®}

- ✓ Specifically designed for *Artemia* enrichment
- ✓ Easy preparation: very easy to disperse in water
- ✓ DHA enhanced for the best enrichment results
- ✓ Easy storage with excellent temperature stability

DHA protein selco®

DHA protein selco is a powdered enrichment product for rotifers, designed to compensate for the nutritional short-comings of rotifers as a natural feed for fish larvae. The use of DHA protein selco on the last day of the culture cycle will increase the rotifer's level enriching the live preys of essential vitamins EPA and DHA.



TANK PREPARATION

- Clean and disinfect the enrichment tank, airstones and air tubing prior to use (use e.g. 200 g/m³ active chlorine + detergent) and rinse well.
- Disinfect the water of the tank with e.g. 10 ppm OCI- and aerate gently for ± 1 hour.
- Deactivate any remaining chlorine by adding 12 ppm sodiumthiosulphate.

USEFUL POINTERS

- Always gently harvest from the culture tank the rotifers in a filter bag to avoid physical stress.
- Make sure the rotifers are always submerged, avoid "splashing" in the filter.
- After harvest, rinse the rotifers using same water T°C as the culture tank.
- First add the enrichment (or background feeding), then the rotifers.
- Use SparHe as background feeding if enriching does not take place right after the harvest.

COMPOSITION

Typical composition

Crude lipids	29 %
Crude protein	28 %
Crude ash	8.5 %
Vitamin A	75,000 IU/kg
Vitamin D3	7,500 IU/kg
Vitamin E	7,200 IU/kg
Vitamin C	20,000 mg/kg
DHA	50 mg/g dwt
EPA	12.5 mg/g dwt
ARA	2.3 mg/g dwt

OPTIMAL CONDITIONS

	Rotifers
Density	1,000-2,000 per ml
Salinity	20-30 ppt
Temperature	25-27°C
Oxygen	> 5 ppm. Use leaky pipe or fine bubble device
Aeration	medium-strong open tube to keep animals suspended

APPLICATION QUANTITY

The application quantity is based on the rotifers density and the volume of the water in the tank. To determine the rotifer density, the amount of rotifers must be counted before the start of the enrichment. Once the rotifer density has been determined, the corresponding feed rate can then be determined based on the table below:

Rotifer density (rot/ml)	Feed rate (g/m ³)
< 500	250
500 - 1,000	350
1,000 - 2,000	550
> 2,000	750

AVAILABLE PACKAGING



Box of 6 x 1 kg alufoils (pictured)

PREPARING THE PRODUCT

Fill a container with lukewarm fresh water (35-40°C)

1. Slowly add the product to the water (max. 50 g/liter)
2. Blend for 3-5 minutes.

Apply according to your enrichment strategy.

WHEN TO APPLY?

Apply in two easy steps:

Apply the first half of the calculated daily application at the beginning of the enrichment cycle.

Apply the other half of the calculated daily application 3 hours after the start of the enrichment cycle.

The enrichment is completed and the rotifers can be harvested after 6 hours.

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 24 months from the date of manufacturing.

Easy DHA selco®

Easy DHA selco is a liquid enrichment product for *Artemia*, designed to supplement the natural nutritional features of the nauplii to ensure an optimal feed for the fish larvae.



TANK PREPARATION

- Clean and disinfect the enrichment tank, airstones and air tubing prior to use (use e.g. 200 g/m³ active chlorine + detergent) and rinse well.
- Disinfect the water of the tank with e.g. 10 ppm OCI- and aerate gently for ± 1 hour.
- Deactivate any remaining chlorine by adding 12 ppm sodiumthiosulphate.

OPTIMAL CONDITIONS

	<i>Artemia</i>
Density	300-400 nauplii per ml
Salinity	25-40 ppt
Temperature	26-28°C
Oxygen	> 5 ppm. Use leaky pipe or fine bubble device
Aeration	medium-strong open tube to keep animals suspended

PREPARING THE PRODUCT

Pour the required amount of product into a dry bucket. Use a strong water jet or pour the water in from a bucket (splashing) to emulsify 150g of product per liter of (sea) water.



ENRICHMENT STRATEGY

- Use 600 ppm of product in one or two times.
- Enrich for a period of 20-24 hours.
- Harvest and wash gently the *Artemia* before supplying them to the fish larvae.

ARTEMIA COLD STORAGE

Use soft point & aeration diffuser collar.	
Oxygen	4-6 ppm
Density	< 5,000 nauplii per ml
Salinity	25-40 ppt
Temperature	4-10°C
Cold storage	6-8°C

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 the date of manufacturing.

COMPOSITION

Typical composition

Crude lipids	65.5 %
Crude protein	0.5 %
Crude ash	0.5 %
Vitamin A	1,500,000 IU/kg
Vitamin D3	150,000 IU/kg
Vitamin E	3,600 IU/kg
Vitamin C	800 mg/kg
DHA	100 mg/g dwt
EPA	75 mg/g dwt
ARA	7.5 mg/g dwt

AVAILABLE PACKAGING



Box of 9 x 1 kg bottles (pictured)

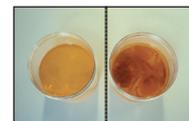
STABILITY TEST

1 week at 70°C



Easy SELCO | Traditional emulsion

2 days at -18°C



Easy SELCO | Traditional emulsion

2 days at -18°C



Easy SELCO | Traditional emulsion

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 food (usually to rotifers and *Artemia*) to enhance the nutritional or functional properties of live preys at benefits of 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 food will filter the small particles.

It is therefore important:

1. to improve 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.

II. WHAT ENRICHMENTS EXIST?

Enrichments are made in 2 main forms: liquid emulsions and dry powders. Both work via the ingestion (bioincapsulation) by the live food, who then transfer the nutritional qualities of the enrichment products onto 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 food to catch and filter the essential nutrients.

In other words: the live food will be better enriched at the end of the enrichment phase, ultimately saving you costs because the live food will be more nutritional for the fish larvae.

3 Avoid live food starvation

The metabolism of the live food continues to work during the enrichment process, meaning they also partially feed on the content of the enrichment. It is therefore advised to wash the enriched live food after enriching and feeding it directly to the fish.

In case they cannot be fed to the larvae immediately - the only option to preserve the enrichment levels is to store the live food lower than 4°C. Never store enriched live food at ambient T°C 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 disease/stress and will decrease enrichment efficiency.

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

It is important to know that during the enrichment stage, rotifers will prefer to 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 - **SparHle** - 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**.

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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