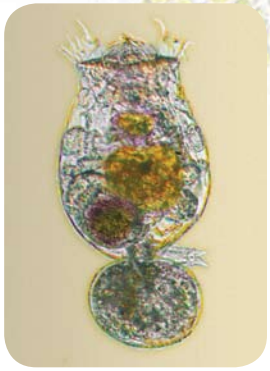
RotiGrow *Plus*™

Microalgal Grow-Out Feed with Omega Pre-enrichment

RotiGrow *Plus* is a clean, high-yield rotifer feed that maximizes pre-enrichment levels of DHA, EPA and ARA. It is the essential first step in the RotiGrow System. It can be used as a stand-alone feed or with other feeds and enrichments



Rotifer (*Brachionus plicatilis*) grown using RotiGrow *Plus*

RotiGrow *Plus* Offers:

- Healthy Rotifer Cultures — Rapid growth, minimal fouling and reduced bacteria loads
- Higher Yields — Rotifers can double daily at densities over 5,000 L-Type rotifers per ml
- Essential Omega Boost — Provides 50-100 percent of the Omega-3 fatty acids needed by the larvae of most marine species — *without secondary enrichment!**
- Optimum Enrichment — Supports full highly-unsaturated fatty acid (HUFA), full vitamin enrichment with proper protocols, and additional carotenoid enrichment of rotifers without sacrificing other nutritional factors or stressing the rotifers.
- Concentrated, Clean, Liquid Form — Exceptionally clean and easy to use with minimal foaming or clumping, which means less time spent maintaining cultures

The RotiGrow System*

A two-step rotifer feed and enrichment system employing two supplemental feeds that further enhance larval fish nutrition. All our feeds are produced using proprietary processes with 100 percent of the biomass composed of nutritionally rich blends of microalgae. All feeds contain 75–95 percent intact whole cells for whole-food, whole life-cycle support.

STEP 1

RotiGrow *Plus* — *Grow-out & Enrichment Feed*

Supports Pre-Enrichment and Higher Yields

RotiGrow *Plus* is a clean, high-yield rotifer feed that provides pre-enrichment with high levels of polar lipid DHA, EPA and ARA, with minimal triglycerides. RotiGrow *Plus* also provides essential vitamins and carotenoids (see specifications on back).

STEP 2

N-Rich™ — *One- to Eight-Hour Secondary Enrichment (with blends to meet the needs of your species of fish)*

Full HUFA and vitamin enrichment plus "Whole-Cell" Nutrition

N-Rich offers a unique blend of microalgae that provides a wide spectrum of essential nutrients, including high levels of protein, carotenoids, sterols and optimized vitamin C, A, D and B vitamins. N-Rich can raise the nutritional profile of enriched rotifers to meet the needs of any fish.

(See Rotifer Comparison Table on reverse)

Additional Products for Nutrition Enhancements:

STEP 3

OPTIONAL STEP: **Cold storage and/or Gut Loading with N-Rich or Isochrysis/ Pavlova Blend**

Digestive and "Whole-Cell" Nutritional Support for Larval Fish

N-Rich *High PRO* is a nutritionally balanced rotifer finishing feed that is easily digested when released into fish larval guts. It contains a blend of microalgae including *Pavlova* and *Isochrysis*. N-Rich *High PRO* offers an optimal fatty acid profile, plus carotenoids, sterols and the right amounts of vitamins A, D, C, and B's.

STEP 4

RotiGreen™ — *Greenwater: Isochrysis, Nannochloropsis and DHA/EPA blends*

Greenwater to Promote Overall Fish Health

RotiGreen greenwater (RotiGreen *Iso*, RotiGreen *Nanno* and RotiGreen *Omega*) further supports rotifer and larval nutrition in the larval tank to promote health and enhance survival.

No other feed is closer to nature or better for your rotifer, fish, and hatchery productivity.

* Meets Cod Egg profile for Omega-3 fatty acids when using Steps One and Two.

Who We Are

Reed Mariculture is the world's largest producer of marine microalgae concentrates. 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 zooplankton, copepods, and weaning feeds.

Our Products

Reed Mariculture's Instant Algae products are closer to nature than any other feed on the market. We produce whole-cell, whole-food microalgae feeds and enrichments from marine algae using proprietary processes. Our products provide fish, bivalve and shrimp hatcheries with clean, convenient, long shelf-life feeds that are superior choices to replace or supplement live microalgae. Our feeds ensure stable and rapidly-reproducing rotifer populations that offer rich nutritional value.

Our Services

We pride ourselves on our customer service and technical support. In addition to our expertise growing microalgae, we provide rotifer starter cultures (10 million to over 1 billion rotifers) and all the support necessary for customers growing their own cultures. We are also experts in shipping logistics, however remote your location. Our commitment to excellence will keep you coming back to Reed Mariculture.

Reed Mariculture Inc.
1-877-732-3276
www.reed-mariculture.com

Technical Data

PHYSICAL DESCRIPTION/PROPERTIES:

Description:
Concentrated Blend of Microalgae

Appearance:
Green Viscous Liquid

Algal size:	**1.5-12 µm**
Microalgal Biomass:	**>14.8%**

Composition of Biomass (dry wt.)

Protein	**55.7%**
Lipid	**19.5%**
Carbohydrate	**19.0%**
Ash	**5.8%**

Packaging

1 Liter Bag

10 Liter Cubitainer®

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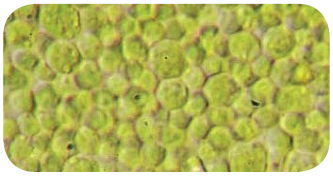
Rev 4

RotiGrow *Plus*™

Microalgal Grow-Out Feed with Omega Pre-enrichment



Photomicrograph of RotiGrow *Plus*

FEED & HARVEST RATES

Continuous Production Systems

Harvest Rate	20%	30%	35%	40%	45%
RotiGrow *Plus* Feed Rate (ml per day/million rotifers)	0.75	1.13	1.32	1.57	1.70
Rotifer Harvest (million rotifers per liter of feed)	265	265	265	265	265

NOTES: 1. **Feed rates based on rotifer count just prior to harvest**
2. For 165 micron long L-Type rotifers with a mass of 0.18g dry weight/million rotifers
3. Feed continuously for best results

Batch Production Systems

	Rotifer density (per ml)					
RotiGrow *Plus* (feed per day per million rotifers)	Day 0	Day 1	Day 2	Day 3	Rotifer Harvest (per liter of feed)	Growth Rate (per day)
1.6 ml	500	706	996	1,406	265 million	41%
2.2 ml	500	795	1,264	2,010	265 million	59%
3.1 ml	500	910	1,656	3,013	265 million	82%

NOTES: 1. **Feed rates based on rotifer counts at the beginning of the day**
2. For 165 micron long L-Type rotifers with a mass of 0.18g dry weight/million rotifers
3. Feed days 0, 1 and 2. Feed continuously for best results

FATTY ACIDS

Profile

12:0	Lauric acid	3.0	18:3n6	GLA	2.9
14:0	Myristic acid	11.4	18:3n3	ALA	0.4
16:0	Palmitic acid	24.4	18:4n3	SDA	5.4
16:1n7	Palmitoleic acid	11.7	20:3n6	DGLA	0.2
16:2n4	Hexadecadienoic	3.4	**20:4n6**	**ARA**	**2.1**
18:0	Stearic acid	1.4	**20:5n3**	**EPA**	**18.1**
18:1n9	Oleic acid	11.8	22:5n3	DPA (n-3)	2.1
18:2n6	LA	10.9	**22:6n3**	**DHA**	**41.9**

Summary

DHA : EPA : ARA **2.3 : 1.0 : 0.12**
EPA + DHA **60 mg/g d.w. (Biomass)**
Total HUFAs, 20:3n3 + **64 mg/g d.w. (Biomass)**
Total fatty acids **154 mg/g d.w. (Biomass)**

NOTE: fatty acid units after "profile" units are mg/g d.w.

ROTIFER COMPOSITION

Essential Fatty Acids and Total Lipids

Typical profiles of rotifers grown on RotiGrow *Plus* and enriched using N-Rich *High PRO*, a protein-rich feed, and N-Rich *PL Plus*, a phospholipid-rich feed.

	RotiGrow *Plus*	2-hour enrichment N-Rich *High PRO*	8-hour enrichment N-Rich *High PRO*	2-hour enrichment N-Rich *PL Plus*	Cod eggs	Cobia eggs
Protein	68%	66%	64%	65%	79%	n/a
DHA	17	30	40	36	33	42
EPA	12	13	12	10	18.6	13.5
ARA	1.9	2.0	2.0	1.9	2.2	3.4
HUFAs	43	52	58	51	56.2	68
Total Lipids	10.5%	12.5%	14.2 %	12.6%	13.2%	22%
Polar lipids	54.0%	55	55.7%	55	71%	n/a
Sterols	4%	4.2	4.3%	4.0	9.8	n/a
Free fatty acids	5.9%	5.1	4.9%	5.0	5.4	n/a

NOTE: fatty acid units after "profile" units are mg/g d.w.

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