



# Reed Mariculture

ENSURING HATCHERY SUCCESS™

*By Eric Henry PhD, research scientist & Tim Reed, founder and president, Reed Mariculture, Inc, edited by IntraFish Aquaculture*

March 6, 2017  
Original Link: [IntraFish.com](http://IntraFish.com)



## **Zooplankton Week Part 2: Debunking the myths about rotifers**

**In part two of our five part sponsored content series, Reed Mariculture deconstructs and corrects some of the misunderstandings around rotifers.**

Rotifers are firmly established as the preferred zooplankton feed for larvae of many aquacultured fish and crustaceans, because rotifers are the only zooplankton that can be reliably cultured in mass quantities, thanks to the application of culture protocols developed by the aquaculture industry in recent years. Nevertheless, some common misconceptions about rotifer culture persist.

**Myth:** Rotifer production is difficult because cultures are prone to crashes.

**Fact:** Rotifers tolerate a wide range of conditions (temperature, pH, salinity, oxygen concentration — they even grow in sewage treatment plants!), and with due care, cultures do not spontaneously crash. At Reed Mariculture we maintain 1,000 L production tanks, routinely producing in excess of 1 billion rotifers/day. We have not experienced a culture crash in many years, thanks to consistent control of culture parameters.

**Myth:** Rotifers cannot tolerate strong aeration (necessary for dense, highly productive cultures) because strong aeration can strip eggs from the females.

**Fact:** This does not happen, and even if it could, it has been demonstrated many times that isolated eggs develop normally. Rotifer cultures thrive with strong aeration, which is particularly beneficial in dense cultures, ensuring adequate oxygen levels and rapid and uniform distribution of feed. Research has shown that an oxygen concentration of 1 mg/L is sufficient for rotifers to maintain optimum reproductive rates, so with adequate aeration, supplementation with pure oxygen is not necessary.

**Myth:** Highly productive rotifer cultures can be started from resting cysts.

**Fact:** Although it is possible to rotifer cultures from cysts (resting eggs), commercially available cysts are derived from strains that are prone to sexual reproduction and consequent cyst formation, displacing production of asexual eggs. Cysts remain dormant and do not quickly generate more rotifers, drastically limiting culture productivity. By contrast, highly-productive domesticated strains suitable for commercial aquaculture reproduce only asexually under normal culture conditions. Asexual eggs hatch while still attached to the swimming female, and additional eggs are often produced before the first egg can hatch. Females may be seen carrying multiple asexual eggs, all of which hatch within a few hours of being produced, ensuring very rapid growth of the culture.

**Myth:** Ciliate contaminants often crash rotifer cultures

**Fact:** Although rotifer cultures easily become invaded by protozoa from their surroundings, only very rarely do protozoa cause any harm. In healthy, well-managed rotifer cultures the protozoa usually remain at low levels. Their proliferation is generally a sign that the rotifers are under stress, or especially that the feed is not being assimilated efficiently by the rotifers. Feeds such as yeast and dry particulates that rapidly leach nutrients are easily exploited by protozoa as well as bacteria that protozoa

feed upon. Feeding with algae strongly favors rotifers, and *Nannochloropsis* has even been shown to suppress the ciliate *Euplotes*.

**Myth:** Batch cultures are easier to manage than continuous cultures.

**Fact:** In continuous cultures feeding and harvest can be the same every day, simplifying the management of culture operations and so minimizing the opportunities for costly mistakes. Labor inputs are reduced because culture tanks do not require frequent sanitizing and re-inoculation.

Rotifers are most productive when fluctuations in culture conditions (temperature, pH, feed dosing, harvest rate, etc.) are minimized. The consistent feeding and harvest regimes employed in continuous culture promote rotifer health, supporting high productivity and nutritional quality. The rotifers have a younger age distribution, due to the high daily harvest rate; younger rotifers feed more actively, are more fecund, and are more vigorous swimmers.

**Myth:** Grow-out of rotifers with a cheap yeast-based feed followed by “gut loading” with an enrichment feed is most efficient and effective.

**Fact:** The extreme lipid content of conventional enrichment feeds is stressful to the rotifers, harming their health and motility. Lipid emulsions foul rotifers, requiring them to undergo a washing procedure before feeding to larvae. Harvesting on screens, washing procedures, and temperature shocks when enriched rotifers are “cold banked” before feeding to larvae can cause the rotifers to eject their gut contents (and enrichment) before they are fed to larvae. A more effective enrichment strategy is to grow the rotifer culture on a more moderate enrichment feed, so that the entire body of the rotifer is enriched. The rotifers are not stressed, so they show good motility. They require no washing, and can be fed directly into the larval tank, eliminating the labor of harvesting and washing, and avoiding shocks that cause ejection of the gut contents. Rotifers enriched during grow-out retain their enrichment in the larval tank and can deliver more enrichment to the larvae.

## **Reed Mariculture’s Role**

In addition to supplying rotifers in quantities up to one billion, Reed Mariculture has developed algae-based RotiGrow® liquid concentrate enrichment feeds for both rotifer grow-out and supplemental enrichment. These intact, whole algal cells ensure that rotifers receive the maximum nutritional benefit from these exceptional feeds, which in turn provides maximum nourishment to larvae.

Our feeds produce clean, enriched rotifers that ordinarily do not require washing, so they can be fed directly into the larval tank by automated pumps, avoiding stress to the rotifers, greatly reducing labor inputs, and allowing continuous feeding of larvae.