Hatching Methods and Trouble Shooting Guide for BIO-MARINE brand Artemia Cysts.

1. **Prepare hatching solution from non-iodized salt or diluted seawater to20-33 ppt (parts per thousand) (1.016-1.024 on hydrometer).**

2. **Incubate and aerate cysts in a conical shaped container with cyst tosolution density not exceeding 2 grams per liter.**

3. **Provide hatching tank with natural or artificial light and maintainconstant temperature of 82 degrees F (28 deg. C).**

4. **Stop aeration and remove fresh nauplii after 18-24 hours.**

Note: If cysts are frozen or held in cold storage while in inventory, allow cysts to acclimate atroom temperature for at least 5 days before attempting to hatch.

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Trouble Shooting Guide for BIO-MARINE brand Artemia Cysts.

If you have followed the above procedures for hatching Artemia cysts and are still experiencing poor hatching results, the following may help to determine the reason(s) why.

Enough Light?
A simple fluorescent lamp will provide enough light to attain optimal hatch. Light needs to be constant for the duration of the hatch.

Enough Aeration?
This will depend on how many tanks you are running. Smaller applications can get by with a simple compressor or small blower. Call, fax or email for larger applications.

Constant Temperature?
Immersion heaters with a thermostat is necessary in order to keep a constant temperature of 82 degrees F (28 deg.C). Call, fax or email for larger applications.

Water Quality?
For smaller applications, use tap water with sea salt (ie: Instant Ocean). Dilute to 20-33ppt. Use a refractometer or hydrometer to measure salinity levels. Larger applications using seawater require filtration systems.Call, fax or email for larger applications.

PH?
pH levels should remain at pH8

Storage?
The longer you hold Artemia on the shelf, the greater the chance the hatch may diminish. Even Artemia kept under cool, dry conditions will begin to vary its hatch within +/- 3 to 5% over the course of 6-12 months. We cannot guarantee hatch results for Artemia kept under less than optimal conditions.

Scum?
This is caused by bacteria which means water is being UNDER chlorinated. Add 5 to 10ppm chlorine. This should be enough to keep the bacteria levels down and rid them of the scum problem. Insufficient chlorination will definitely have an adverse effect on the hatch rate. Also, OVER chlorination (depending on levels) could cause decapsulation or at least the beginning stages of decapsulation. This too, will adversely affect the hatch rate. Also, make sure the chlorine being used is of good quality (Chlorine that sits around for extended periods of time will weaken in strength and lose its effectiveness).

Color difference?
If cysts are lighter or darker in color compared to other batches or harvests, fear not. The color has NO effect on the quality or hatchability of the egg.

Trouble Shooting continued….

Diverse Size Nauplii? (high hatch rate vs.: low hatch rate)

What is being interpreted as large size Nauplii is something that arises primarily out of lesser grade Artemia. What happens is in a 70 or 80% grade, the hatching is not synchronous. As a result, you get eggs that hatch at more extreme varied intervals than with, say a 90% grade, which hatches with more synchroneity. Thus, after 12 hours, you have some eggs that have hatched and others that have not. Over the next 12 hours you have more newly hatched eggs but the ones that hatched within the first 12 hours have now had an additional 12 hours to grow even larger. At the point you are ready to feed to the larvae, you have quite a variation in sizes of Artemia. Whereas, with a top grade that hatches uniformly, you don't have to wait the additional amount of time for the remaining eggs to hatch before feeding. Therefore, you have a more uniform size, higher hatching and the ability to feed earlier.

This also affects the nutritional value of the Artemia. Given enough time in search of nutrients, Artemia will in fact consume their own yoke. Ideally, you want the *shrimp larvae* to consume the yolk, not the Artemia. Therefore.... again, the longer the Artemia is left to grow, the more time they have to consume the yolk which depletes the nutritional value of the Artemia/egg. With a top grade Artemia, you get full, uniform hatch that can be fed to shrimp larvae prior to the Artemia consuming its yoke. Therefore, you are optimizing the nutritional value of the Artemia and optimizing your feeding schedules.

Low Hatch Rate?

If you are still getting unsatisfactory hatch rate, make sure your are figuring your nauplii count correctly. The Utah strain is about 280 dry cysts per grams whereas the Russian strain is a larger egg weighing in at 230-235 dry cysts per gram. If you are basing your hatching percentage calculations of a Russian egg using the Utah strain number of cysts per gram, your hatch rate results will appear to be low…. about 20% lower. So, make sure you are figuring apples and apples.