

# Chlorination in aquaculture operations

- The disinfection of aquaculture water in aquaculture operations may vary according to the nature of operation. In fish hatcheries, pipelines, tanks, jars, algae/artemia systems and/or nets are disinfected to ensure that production cycles are performed in pre-disinfected and pathogen free units. Similarly, all non-porous corrosion resistant equipment (i.e. airlines, air stones, stand pipes; screens, sampling containers, etc. are disinfected.
- Chlorination is also carried out as a routine treatment between crops in earthen ponds to ensure the eradication of possible left over organisms or disease before starting the subsequent production cycle.
- Chlorine was used as a disinfectant for the first time in 1879 to kill typhoid bacteria and since then, it is widely used as considered a very good disinfectant.
- Chlorination is a common disinfectant in aquaculture that is usually applied as calcium or sodium hypochlorite such as household bleach.
- Although the dose of chlorine used varies according to the purpose, exposure time and type of facilities, the level of 50 mg/liter has been effectively used for 30 minutes and this level could be looked at as a good estimate. Typically, 10-20 mg/l chlorine is being used for disinfecting seawater.

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- Aquaculture water intended to be discharged into natural waters should be disinfected. If chlorination is the system of choice, the dose and treatment duration should be sufficient to kill all pathogenic organisms that could access and threaten the surrounding water systems. In general, a concentration of 50 mg chlorine/liter is recommended for complete microbial sterilization.
- In large water bodies, the calcium hypochlorite levels should be sufficient to maintain the residual concentration at or near 10 ppm. Allow the system to stand for a minimum of 24–48 hours at this minimal chlorine concentration. The chlorine will kill all shrimp and most, if not all, of the other organisms occupying the water column

*The person(s) applying the chlorine should wear waterproof outer ware to protect their skin, an approved chlorine mask, and goggles or a face shield for eye protection.*

# Dechlorination in aquaculture operations

- In order to avoid the negative toxicity impact of chlorination on fish and water systems, treated waters should be dechlorinated before introducing fish or discharging waters.
- Chlorinated tanks are drained, freshwater rinsed, and allowed to dry before being used.
- Before water discharge from culture operations, the chlorine should be neutralized through dechlorination.
- Passive dechlorination could be done by the exposure to sunlight and air for approximately 48 hours. Aeration will significantly reduce this period.
- Whenever immediate dechlorination is required, other strategies are used. Out of which is the use of sodium thiosulfate which is added at a rate of five molecules of sodium thiosulphate for each four molecules of chlorine (or the weight of sodium thiosulphate is 2.85 times the weight of chlorine in the water).