

Anesthetics - A Question of Use

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One of the more important stock management tools that the fish culturist has at his or her disposal is anesthetics. This is a brief summary of the common questions that a fish culturist should ask themselves when determining the use of anesthetics. As anesthetics are prescription drugs in Canada, the USA and many other countries you should consult with your fish health expert and veterinarian before using these products. A veterinarian's prescription is usually required to purchase an anesthetic.

Why use an anesthetic

A common problem when culturing fish is stress from any handling or even the culturing conditions. Use of anesthetics will allow the fish to quickly normalize when they are returned to their tanks, ponds or nets after handling.

When to use an anesthetic

Stress is caused by handling for vaccination, tagging, fin clipping, sampling, spawning and transport of your fish. In all cases use of an anesthetic may be appropriate.

What anesthetic to use

As anesthetics are prescription drugs and fall under the Drug legislation in various countries, only approved products should be used. There are currently two anesthetics approved for use in fish in Canada. They are TRICAINE-S (Tricaine methanesulfonate) and Aquacalm (Metomidate hydrochloride). Over the years, many other chemicals have been used as fish anesthetics. These include 2-phenoxyethanol, carbon dioxide, quinaldine, methyl-pentynol, etc. None of these are approved and should not be used with your fish. The choice of anesthetic and dose is dependent upon many factors including the effect desired, the size and condition of the fish, and the ultimate purpose of the fish. Withdrawal time of the anesthetic is of major importance if the fish are for human consumption and this varies depending upon the product, the fish and the water temperature. TRICAINE-S withdrawal time is 5 days in salmonids at 40-50 ppbn at a water temperature greater than 10°C. Aquacalm is not approved for use in food fish. If the drug is used other than under the approved label directions, the withdrawal time is at the discretion of the veterinarian. The mode of action also affects the choice of anesthetic. TRICAINE-S acts upon the peripheral nerves while Aquacalm acts upon the central nervous system. Choosing your anesthetic and dose should be done in consultation with your fish health expert and your veterinarian.

How to use an anesthetic

This discussion relates only to TRICAINE-S and Aquacalm. After choosing the anesthetic and dose, an appropriate amount of the anesthetic should be dissolved in a small amount of water, then evenly dispersed throughout the anesthesia bath and well mixed. The fish should be fasted for 24 hours before being anesthetized to reduce contamination of the anesthetic bath. A plastic or fibreglass container should be used for the anesthetic bath. As there is often a variability in effect, always test a few fish before proceeding with mass anesthesia. This variability can result from water quality, fish size, temperature, pH, hardness, species and even the strain of fish.

Aquacalm is more stable in solution than TRICaine-S. It is always a good idea to conduct anesthesia in the shade away from UV and direct sunlight as these conditions may cause TRICaine-S solution to become toxic. The anesthetic baths should be oxygenated and replaced as they become contaminated or every 2 to 4 hours. It is not a good idea to overload anesthetic baths with fish because you do not want to prolong anesthesia time. The ideal situation is anesthesia in 3 to 4 minutes and recovery in 3 to 4 minutes. As can be seen in the accompanying charts and graph, the usual dose for TRICaine-S is 50 to 80 ppm. The usual dose for Aquacalm is 5 to 10 ppm for anesthesia and 0.1 to 0.5 ppm for sedation. One of the sedation applications for Aquacalm is in transporting fish to and from the hatchery. Aquacalm can also be used to sedate the fish prior to anesthesia with TRICaine-S. If this is done, the TRICaine-S dose needs to be reduced.

TRICaine-S is a very safe product to use. A problem may arise, however, in soft water because of the acidity of the product. Sodium bicarbonate may be used to neutralize these solutions. The aim is to have the pH the same in the anesthetic bath as it is in the rearing tank. The usual amount of sodium bicarbonate is about twice the amount of TRICaine-S, or 5 ml of 10% bicarbonate solution per litre of anesthetic bath. Do not pre-mix the solids as the sodium bicarbonate will react with **the TRICaine-S** and destroy it.

It is important that the recovery of the fish is monitored and problems corrected. The fish should be returned to high quality conditions and feed as soon as possible.

ANESTHETIC CHECK LIST

- Anesthetic (TRICaine-S, AQUACALM, etc.)
- Sodium Bicarbonate
- pH Meter
- Measuring scoops or stock solutions
- Dip net
- Plastic or fibreglass anesthetic tank
- Oxygen and diffusers
- Recovery tank