

Guidelines for Preparation and Use of Tricaine Methanesulfonate (MS-222)

1. Purpose:

Tricaine Methanesulfonate (MS-222) is a popular anesthetic agent used in aquatic species, and is intended for the temporary immobilization of fish, amphibians, and other aquatic, cold-blooded animals.

2. Policy:

Tricaine Methanesulfonate is appropriate for the temporary immobilization of fish, amphibians, and other aquatic, cold-blooded animals. Pharmaceutical grade MS-222 must be used in a **buffered** solution for all intended uses on live vertebrate aquatic species. Two examples of pharmaceutical grade MS-222 are Finquel and Western Chemical's Tricaine-S.

3. Procedure:

The 2013 AVMA Guidelines for the Euthanasia of Animals states:

"A 10g/L of stock solution can be made and sodium bicarbonate added to saturation resulting in a pH of 7.0 to 7.5 for the solution."

The stock solution should be stored in a dark brown bottle and refrigerated or frozen if possible. The solution should be replaced monthly and any time a brown color is observed. See expiration date on the MS-222 bottle. Stored solutions should be labeled with the expiration date of the powder from the parent bottle.

"MS-222 is an acceptable method of euthanasia for finfish and some amphibians and reptiles. When used for large finfish and some amphibians (eg, *Xenopus* spp.), a secondary method should be used to insure death."

4. Methods of Application:

- a) General anesthesia: For most situations where rapid or moderately rapid anesthesia is required, MS-222 may be applied in a bath. The container may be made of glass, plastic, steel, aluminum or other suitable material and must be large enough so that the animals are not overcrowded.
- b) Surgery and physiologic studies: The fish may be anesthetized to loss of reflex, removed from the bath and positioned so that the gills are bathed in a sedating concentration of MS-222.

5. Dosage:

Western Chemical, Inc. has a [guide and treatment calculator](#) available on its website.

You are encouraged to discuss proposed dosages with the Einstein Veterinary staff during the protocol approval process.

6. Safety:

Follow directions from EH&S for disposal.

Safe practices include:

- Wear protective clothing, gloves and goggles when handling the MS-222 powder.
- Work inside a fume hood to prepare the solution.
- Wear gloves and use a utensil to stir until all powder is dissolved.

- Wear gloves when handling animals exposed to MS-222
- Do not discard MS-222 directly into the sink.

7. Disposal:

Tricaine can be collected in a bottle, a hazardous waste label must be placed on it and the waste form sent for pick up.

<http://einstein.yu.edu/administration/environmental-health-safety/laboratory-safety/chemical-safety/waste-disposal.aspx>

Hazardous waste label:

<http://einstein.yu.edu/images/administration/environmental-health-safety/waste-label.jpg>

Hazardous waste form:

<http://einstein.yu.edu/administration/environmental-health-safety/laboratory-safety/chemical-safety/chemical-waste-pick-up-request.asp>