

Guidelines for Using Wild or Cultured Captive Fish in Research and Teaching at FIU

A. Classification of fishes

1. Fishes are classified by use:
 - a. Research
 - b. Teaching

B. Identification

All procedures to ensure appropriate identification of fishes will be responsibility of the Faculty member in charge of the fishes, or by those designated by the Faculty member and certified by FIU's Animal Care Program.

1. Each aquarium/tank or set of aquaria that house the same species of fish will display an appropriate identification card.
2. Soiled aquarium identification cards should be replaced as required.

C. Housing

All procedures to ensure appropriate housing of fishes will be the responsibility of the Faculty member in charge of the fishes, or by those designated by the Faculty member and certified by FIU's Animal Care Program. Because of the diversity of the fishes and their natural habitats, no general guidelines can be provided for housing fishes.

D. Feeding

Because of the diversity of fishes and their natural habitats, no general guidelines can be provided for the feeding and watering of fishes. Specific schedules for feeding should be kept and made available to veterinary or IACUC inspectors for each species to be housed.

E. Environmental

Because of the diversity of fishes and their natural habitats, no general guidelines can be provided for fish environments. For each type of fish to be housed, temperature, lighting and water conditions should be specified.

Water Conditions

- A. Each aquarium/tank should include adequate aeration and filtration for the fishes being housed.
- B. Water quality should be measured (nitrates, nitrites, pH, salinity).

Transporting Fish

The most important single factor in transporting fish is the provision of adequate concentrations of dissolved oxygen. The importance of supplying adequate levels of dissolved oxygen cannot be overemphasized. Failure to do so results in severe stress and possibly hypoxia or buildups of blood lactic acid that may contribute to fish kills two to three days after stocking. The amount of oxygen that can be dissolved in water is based on water temperature. When the upper level is reached the water is referred to as being "saturated with oxygen". Dissolved oxygen saturation is higher for cool water than for warm water.

Sometimes a chemical anesthetic may be beneficial by producing a light sedation. The only Food and Drug Administration (FDA) approved anesthetic for food fish is Finquel (tricaine methanesulfonate). Finquel may be used at a rate of 0.1-0.5g/gal of water.

Probably avoiding stress can prevent 80-90% of disease in captive fish. Stress weakens fishes' immune systems, leading to increased susceptibility to disease. Diseases and pathogens are almost always present in tanks, but a healthy fish's immune system will prevent them from being a problem.

Common Stressors for Captive Fish

- Poor water quality: measurable ammonia or nitrates, or very high nitrates.
- The water temperature is fluctuating more than 2 degrees F per day excepting shallow water species that are tolerant of radical temperature swings or where research interests are involved as approved by IACUC.
- Incompatible species in the tank.
- Too many fish in the tank.
- The tank is too small for the fish.
- The water is too warm or too cold for the species
- Wrong pH for species.
- PH fluctuations greater than 0.2 units per day.
- Insufficient cover or hiding places present.
- Wrong water hardness for the species.
- Insufficient oxygen in the water.

Anesthesia

Some possible anesthetic compounds include 2-phenoxyethanol, pentobarbital, or (+) metomidate HCl, depending on the depth and duration of anesthesia needed, and the side effects that can be tolerated for the type of research. For instance, MS-222 is a sodium channel blocker, not acceptable for measuring electric signal waveforms under anesthesia. Pentobarbital takes 12 hours to wear off, which makes it good for long-term anesthesia, but useless as a quick knockdown for a hormone implant.

Finquel (tricaine methanesulfonate) AKA: MS-222 Recommended Dosage: 0.01% or 125mg/L in bath. Note: the needed concentration for a given level of anesthesia can vary by an order of magnitude between species. Experiment for your species, starting at lower doses.

There is wide latitude in the permissible dosage and recommended amounts. Fish are placed in a water/MS-222 solution until the desired level of narcosis/anesthesia is attained. The sustaining dose for

prolonged anesthesia should be much more dilute. Watch out for cessation of respiration (such fish may be respiration through the mouth with a siphon or peristaltic pump)

Solutions of MS-222 gradually lose their activity but a 10% solution will remain fully active if stored in a brown bottle for up to 3 days. Wear gloves when using MS-222 as it is reportedly carcinogenic.

Euthanasia

Concentrated solutions of MS-222. ([MS Word](#))