




Revision No: 04	Replaces: 03	Date in effect: 3/13/2014	Page: 1 of 7
Author: Dr. Reynaldo Patino		Responsible faculty: (Signature/Date)  3/13/2014	

WATER QUALITY MAINTENANCE

- A. Water quality parameters for maintaining healthy fishes in captivity are species-specific.
- B. DO levels need to be checked both early in the a.m. and late p.m. for outdoor systems, especially those with elevated water temperatures.
- C. In addition to DO levels, standard water quality parameters that should be regularly measured in outdoor and indoor systems include temperature, pH, salinity/conductivity, total ammonia and nitrite. The level of unionized ammonia (toxic form of ammonia to fishes) can be estimated from the total ammonia value as a function of temperature, pH and salinity. A spreadsheet for calculating unionized ammonia levels from total ammonia values in freshwater is provided by the American Fisheries Society (http://www.fisheries.org/afs/publications/books/fishhatcherymanagement/ammonia_fw.xls).

DISEASE TRANSMISSION PREVENTION

- A. All fish populations intended for research purposes are initially quarantined and the initial health status determined prior to starting the research project.
- B. Health checks would need to be conducted upon arrival and 1 week later to alert a researcher to any potential health problems.
- C. Monitoring and recording water quality parameters and fish feeding/behavioral patterns at regular intervals would then need to be conducted for the duration of a research project.
- D. Suspect fish can be submitted to the Texas Veterinary Medical Diagnostic Lab in College Station for diagnostic evaluation or evaluated on-site using diagnostic techniques.
- E. Dip nets should be assigned to a specific aquarium or disinfected prior to use between different aquaria. A “dip net” bucket can be used for this purpose (e.g. 10 ml household bleach to 1 L water as a 1 hour dip). Nets then need to be rinsed thoroughly after this treatment to remove chlorine residues prior to netting fish. Since chlorine is highly toxic to fish, sodium thiosulfate (or other dechlorinator) should be on-hand for emergency dechlorination purposes.
- F. Transport stress can result in the occurrence of secondary infections in fish by aquatic opportunistic pathogens. Quarantine and acclimation of new fish populations for 2-4 weeks prior to initiation of a study is recommended to prevent the interference such an event would cause during a research project. A physical examination (e.g. gill biopsy, etc.) of a sample set from a new population may also be conducted to give an indication of the initial health status of a fish population upon its arrival to the facility.

Revision No: 04	Replaces: 03	Date in effect: 3/13/2014	Page: 2 of 7
---------------------------	------------------------	-------------------------------------	------------------------

- G. The presence of multiple aquaria in large open recirculating systems increases the likelihood of disease transmission by potential pathogens. Disinfection of water exiting the biofiltration system by ozonation or UV-radiation should be considered as a deterrent against disease transfer between aquaria in these systems.

HANDLING AND RESTRAINT

- A. The use of electroanesthesia in field studies is considered a viable method of capture and restraint for short minor procedures by some authorities that allow both rapid induction and recovery times, while avoiding residue problems. However, it does present safety hazards to both the operator/handler, as well as the fish. Spinal injuries and muscular hemorrhages have been reported in fish. The type of current and orientation of fish in respect to the electrodes appear to be critical to the immobilizing effect of this technique (Ross & Ross, 1984; Anesthetics and sedative techniques of fish). Use of low frequency (30 Hz) direct currents has been reported to help reduce the incidence of these injuries. Water conductivity should measure between 100-500 $\mu\text{S}/\text{cm}$ 3-6 amps to effectively transmit electric current to shock fish (Reynolds, J. 1983. Electrofishing. Pages 147-163 in L.A. Nielsen and D.L. Johnson, eds. Fisheries techniques. American Fisheries Society, Bethesda, MD). Considering its long history of use as a fish collection technique, electrofishing can be conducted with minimal risk to crewmembers providing proper safety procedures are followed.
- B. Gill netting is another collection technique used in the field to collect fish that involves the use of a static netting system that can kill or injure fish that are entrapped in the netting for long periods of time. Periodic checking of positioned nets is therefore recommended.
- C. The use of salt (500-1000 ppm) or anesthetics at low sedative doses (e.g. MS-222; 15-66 ppm) are additional considerations reportedly useful for stress reduction in transported fish (Jensen, G: Louisiana Cooperative Extension Service; SRAC Publication (392). Adequate aeration and controlled cooled water temperatures are additional important factors that can be easily addressed with the use of aerators and "kool-paks"
- D. Variation in euthanasia dosages for tricaine (MS-222) were cited in different proposals and may reflect species variation noted in different references. The standard dosage reported by DeTolla in Guidelines for the Care and Use of Fish in Research is 500 mg/L. Chemically induced euthanasia can be followed by severing the spinal cord just posterior to the level of the opercula to ensure non-recovery.
- E. All methods of immobilization should probably be tested on the study species (if possible) prior to their actual utilization in a study due to species variation that is encountered in response to various techniques.

PERSONNEL SAFETY MEASURES

- A. Use of rubber boots by caretakers in the aquatic labs would allow better traction on wet floors, decrease the potential for electrical shock and prevent transmission of pathogens with the ancillary use of disinfectant foot baths.



Revision No: 04	Replaces: 03	Date in effect: 3/13/2014	Page: 3 of 7
---------------------------	------------------------	-------------------------------------	------------------------

- B. Use of exam gloves in handling fish and antimicrobial soaps for hand cleaning would decrease the likelihood for transmission of pathogens with zoonotic potential.
- C. Electrofishing techniques utilized for electroanesthesia of fish in the field. Adequate safety procedures and precautions should be explained to students by the trainer/instructor. Specialized training of the research biologist in handling electrofishing gear and CPR is recommended, as well as, development of an emergency plan to the nearest medical facilities prior to any electrofishing expedition due to the chance of electrical shock.
- D. Only commercially available electrofishing gear should be used that has recently been inspected.
- E. Dip nets need to be made of nonconducting material and all crew members should wear rubber gloves and boots (that have been inspected for leaks). Please see fish sampling considerations presented by the Southern Division of the American Fisheries Society (in an abstract from its meeting in Lexington, KY regarding evaluation of fisheries techniques; www.sdafs.org/) for more information on commonly used fish collection techniques.

Revision No: 04	Replaces: 03	Date in effect: 3/13/2014	Page: 4 of 7
---------------------------	------------------------	-------------------------------------	------------------------

Aquatic Daily Observation Record

Location of aquari/tanks (bldg/room): _____ Month _____
 _____ Year _____

Species: _____
 PI Name: _____ Department: _____ ACUC NO _____
 Project Title: _____

Date	Day	# Tank/ Aquarium Observed	Animal Health Comments and Animal ID	Initials
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

SOP Number: SOP025

Title: Aquatic Health Recommendations



TEXAS TECH UNIVERSITY

Revision No: 04	Replaces: 03	Date in effect: 3/13/2014	Page: 5 of 7
---------------------------	------------------------	-------------------------------------	------------------------

31				
----	--	--	--	--

