



TROPICAL FISH STANDARD OPERATING PROCEDURES



March 31, 1995
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HOUSING: Goldfish may be held in a variety of fibreglass tanks:

- 1) 6' diameter insulated tanks generally used only in the general holding room
- 2) 4' and 2' circular fibreglass tanks generally only used in the research rooms. The 2' tanks have cone shaped bottoms and require a grid. Perforated PVC or egg-crate may be used depending upon fish size. The 4' tanks are not insulated.
- 3) 7' fibreglass trays (non-insulated)
- 4) 7' fibreglass living streams (insulated)
- 5) 7' square fibreglass tanks (non-insulated)

Other housing may be available, however arrangements must be made with the Aqualab Manager prior to use.

ENVIRONMENTAL CONDITIONS:

■Light: Photoperiod may be determined by the individual researcher (See Room specific SOP).

■Air temperature: In rooms 160, 180, 182, 184, 185, 186 air is set between 15°C-20°C. In the controlled environment rooms (Room 160a, 163, 165 and 183) air temperature may be held constant between 5°C-25°C or set to fluctuate on a diurnal cycle (See Room specific SOP).

■Water: Water from campus wells is pumped into the building where it is filtered prior to being supplied to each room. This ground water is recirculated within each room. All of these rooms have sand filters that require daily backwashing during these times recirculation rates drop to zero (See Room specific SOP).

■Water Temperature: Temperature is controlled and monitored by the Argus™ system to within $\pm 1^\circ\text{C}$, alarms are set to function at $\pm 3^\circ\text{C}$. All rooms have at least one plate heat exchanger. Temperature is set by the Facility Manager at the beginning of the project. Data is logged into the computer and a print-out is available upon request (See Room specific SOP).

■Aeration: Air for tanks is provided by two regenerative air blowers. Air pressure is monitored and alarmed if the pressure drops below a preset point. A third blower is present in case of failure of the other two.

WATER QUALITY:

When the room is first put into use, water quality testing should be carried out on a regular basis, until a stable state is reached. Further testing will become necessary as the rooms biomass increases (growth or greater numbers of fish) or density within tanks increases. Testing should be done at approximately the same time of the day, as diurnal fluctuations do occur in the production of nitrogenous wastes and the utilization of oxygen.

Tests should include dissolved oxygen, pH, ammonia, nitrite, nitrate. The first two tests can be carried out using hand held metres. These metres can be located either in the lab or the Aqualab Office. Aqualab has a Hach DR2000 portable spectrophotometer for the analysis of nitrogenous compounds. Procedures for the use of this instrument may be found in the Dry Lab (room 166).

In a room with a functioning biofilter and adequate water replacement, ammonia and nitrite should be near zero, with nitrate levels below 10 mg/L. Oxygen should be above 7 mg/L with 9-11 mg/L as optimal. pH should be between 8 and 9. Other tests that could be performed are copper, hardness, total suspended solids and phosphate, however these tests are generally not necessary in this system.

FEEDING:

All fish should be hand fed whenever possible. Animals should be fed to satiation a little bit at a time to allow all of the food to be eaten, especially in the two foot diameter tanks where uneaten food passes through the screen at the bottom of the tank. Fish food is

stored in bags in the freezer .

Mature fish do not need to be fed every day. Growing juvenile fish need to be fed more frequently. Fish will however grow at a rate related to how much they are fed. This is not a production facility where we want to maximize growth and minimize holding time. We only need to maintain healthy fish.

Use of automatic feeders should be restricted to fry where the need to feed more frequently is necessary. Care should be taken to provide only as much food as is necessary as large quantities of uneaten food will cause water quality to deteriorate.

THROWING FOOD AT FISH SHOULD BE AVOIDED AT ALL COSTS.

UNEATEN FOOD STAYS IN THE SYSTEM AND CAUSES A DETERIORATION OF WATER QUALITY. POOR WATER QUALITY CAUSES DISEASE.

SANITATION:

Disinfectants or detergents are not used in the routine cleaning of tanks. Tanks are scrubbed with brooms, brushes or abrasive pads and clean water to remove accumulations of algae, faeces, uneaten feed, bacteria and light build-ups of calcium.

- daily -** All tanks must be inspected daily to ensure proper waste removal and water quality.
- weekly -** All tanks must be partially drained and the sides, bottoms, standpipes and wells scrubbed. Tanks are then rinsed and refilled.
- footbaths -** footbaths are provided in aquatic rooms. They must be maintained by cleaning and replacing the disinfectant as necessary.
- net care -** Nets are stored dry between uses and dipped for at least 10 minutes and rinsed between tanks in a solution of A33™ (at a concentration of 12 mL/L).
- disinfection -** At the completion of each experimental use of a room or tank the user is required to disinfect the room or tank. Failure to do this will result in Aqualab's staff being responsible for the disinfection of the room or tank. This will result in a bill to the primary researcher for time and materials. All tanks, air stones, air hoses, stand pipes and water hoses must be scrubbed and disinfected with a quatinary ammonia disinfectant at the manufacturers recommended concentration; A33™ at a dilution of 12 mL/L. Calcium may also be removed by acid washing with a 50% solution of an acid (eg. Servac™, Muriatic acid, Lime-A-Way™, CLR™, Airkem Brawn™). All tanks must be properly rinsed afterward to ensure removal of excess disinfectant or acid.

Note: It is important to ensure that disinfected and rinse water is not mixed with system water. Contamination of system water may result in fish death as well as biofilter death. Valves are placed in the drainage trench to allow for water from the tanks to be diverted from the system directly to the sanitary sewers. Please ensure that the valves are

positioned properly. If you are unsure how they must be positioned or the valve is stuck please ask for assistance from the Aqualab staff.

ENVIRONMENTAL ENRICHMENT:

Goldfish are seldom held individually, they are generally held in circular tanks with others of the same species. Water flow may be directed in a manner to promote natural swimming behaviours. Generally goldfish do not like an active current in the tank. Tanks are covered to decrease ambient light levels thus providing more natural lighting conditions.

ANIMAL IDENTIFICATION:

■ Tank cards identifying AUP#, species, source, number, primary and associate researcher, and emergency contact person etc. are to be posted on each tank or within the confines of the room.

■ A record must be kept of species, supplier, numbers, arrival date and disposition.

Hagen Aqualab

Animal Utilization Record

Researcher:

| Species | Nº | Arrival Date | AUP Nº | Supplier | Disposition |
|----------|-----|--------------|--------|-------------------|--------------------------------|
| Goldfish | 100 | Sept 3, 2000 | 00R000 | Aquarium Services | 30 euthanized Sept 25, 2000 |
| | | | | | 30 euthanized Nov 2, 2000 |

VETERINARY CARE:

■ **All mortalities in the Aqualab must be reported to the manager.** Any fish that dies of unknown causes or is suspected of dying of a disease related problem must be bagged, tagged and taken immediately for a post mortem examination, the results of which must be reported to the manager. It is of vital importance that PM's be done on animals that die of unknown causes in this facility, there are several users and an unknown infection has the potential to cause wide spread disease problems not only for the individual researcher but also to other users. Reports including diagnosis, numbers of mortalities, treatment and success or failure of treatment are required for all outbreaks of infection and disease.

■ Veterinary care is on a consultative basis only. Advice for the treatment of diseased fish may be sought from the OVC Fish Pathology Lab (x 54640 / 52566), the Fish Health Lab in Microbiology (x 52517), or the Staff Veterinarian (Dr. Marcus Litman, X 58856). Dr. John Lumsden in the Fish Pathology Lab (X54519) is also available. Prescriptions for the treatment of disease can be received from Dr. Lumsden or Dr. Litman.

■ Surface scrapes of mortalities may be conducted if external parasites are suspected by either the primary researcher or OVC and the mucous viewed under a microscope.

DISEASE PREVENTION:

- Rubber boots should be worn in all animal holding rooms.
- Footbaths are available for all aquatic research rooms. To reduce the risk associated with introduction of disease and or transmission to and from other rooms please use rubber boots and the footbath while inside the holding room. Care should also be taken around the sump pit as this has direct connection to your tank water.
- Footbaths are provided in each research room. They should be used whenever personnel are feeding or handling animals.
- Prior to **entering and leaving** animal rooms hands should be washed in a germicidal soap. Extra care should be taken to wash hands before leaving the room after you have finished handling your animals.
- UV sterilizers must be on and functional.
- Transfer of fish between rooms should be kept to a minimum. Transfer only healthy, disease free fish. Consult with the Aqualab Manager prior to transferring fish between rooms.
- In the event of disease outbreak, nets used for the diseased fish must be isolated and disinfected separately. Tanks and all associated equipment must also be thoroughly cleaned and disinfected with a quaternary ammonia disinfectant at the manufacturers recommended concentration. **Care must be taken not to allow disinfectant into the system water as this will have a deleterious effect on the biofilters.**
- Soak nets for a minimum of **10 min** in disinfectant solution after each use, rinse with clean water and hang to dry. Nets should be stored dry between uses. To facilitate this several dip nets should be available in each room. Please use a solution of A33™ at a concentration of 12 mL/L or a "tamed" iodine formulation eg. Westcodyne™ at a concentration of 25 mL/L.

TECHNICAL PROCEDURES:

- **Anaesthesia:** Fish are anaesthetized prior to all handling procedures using a 0.05 - 0.1% (50-100 mg/L) solution of MS-222 (tricaine methane sulphonate) or a 0.025% (1 mL / 4 L water) solution of 2-phenoxyethanol (stored in research lab). After procedure fish are placed in a recovery tank (if available) prior to being returned to their experimental or holding tank. Waste water is disposed of into the trench. **Care must be taken to ensure contaminated water is not dumped back into the system water.**
- **Euthanasia:** Fish are euthanised in a 0.1% solution of 2-phenoxyethanol or via extended exposure to an anaesthetic dose of 0.1% MS-222. After the animal is dead all waste tissue must be placed in the containers in the dead stock freezer. Waste water is disposed of into the trench. **Care must be taken to ensure contaminated water is not dumped back into the system water.**
- **Blood Sampling:** (See: Fish Blood Sampling SOP).
- **Body weight:** changes may be monitored on a monthly basis. Larger fish should be anaesthetized and weighed on an electronic balance, smaller fish may be transferred to a beaker of water on an electronic balance.

■ **Identification of fish:** Fish may be marked (fin clip) or tagged, under anaesthesia, at the beginning of an experiment. A variety of approved tagging methods may be employed.

■ Fish may be tagged using 10 lb monofilament threaded through the dorsal fin and tying a disk tag to the fish. Follow this procedure with a salt bath (3% NaCl) to improve healing.

■ Opercular tags;

■ Coded wire tags inserted into the head;

■ Floy spaghetti tags inserted into the dorsal musculature posterior of the dorsal fin;

■ PIT tags (passive integrated transponder tags) placed sub-cutaneously generally on the left side posterior of the dorsal fin. PIT tags may be safely implanted into fish as small as 2-3 inches in length.

WEEKEND RESPONSIBILITIES:

Fish held in Aqualab must be monitored 7 days-a-week. Weekend and weekday tank care are similar. An individual in each lab must be identified to be on call to deal with extraordinary problems which might occur overnight or on weekends. Procedures for contacting the person(s) responsible is to be posted on the tank card or on a poster near the door of the anteroom.