



IACUC Guidance:	<b>TAMU-G-052</b>	Title:	<b>Guidelines on Water Quality for Fish</b>
Location		Effective Date	Review By
<b>College Station/Dallas/Galveston/Kingsville</b>		08/01/2025	07/31/2028
<b>Houston</b>		N/A	N/A

## 1. PURPOSE

- 1.1. To establish general IACUC guidelines outlining water quality for maintaining zebrafish and other fish species.

## 2. SCOPE

- 2.1. Applies to fish species maintained for use in research, teaching, or other related purposes under the oversight of the Texas A&M University IACUC, including Zebrafish.
- 2.2. Does not describe sanitation or evaluation of sanitation in depth, see TAMU-G-026.

## 3. RESPONSIBILITY

- 3.1. The **PI** is responsible for:
  - 3.1.1. Maintaining the level of water quality necessary for the overall health and wellbeing of the species maintained.
  - 3.1.2. Outlining in the animal use protocol (AUP) parameters to be monitored and the frequency of monitoring to ensure adequate water quality.
  - 3.1.3. Generating written procedures and a system of documentation of animal care including water quality evaluations.
- 3.2. The **IACUC** is responsible for:
  - 3.2.1. Reviewing and approving the parameters to be monitored and the frequency of monitoring to ensure adequate water quality as described in the AUP.
  - 3.2.2. Reviewing written procedures and water quality evaluation documentation developed by the PI for consistency with this Guidance and the approved AUP.

## 4. DEFINITIONS AND/OR ACRONYMS

- 4.1. **AUP:** Animal Use Protocol. Document submitted by the PI indicating the housing and procedures involving animals.
- 4.2. **Cleaning:** Removes excessive amounts of excrement, dirt, and debris.
- 4.3. **CMP:** Comparative Medicine Program.
- 4.4. **Disinfection:** Reduces or eliminates unacceptable concentrations of microorganisms.
- 4.5. **Fish:** A vertebrate animal that lives in water, typically breathes via gills, and usually have fins and scales. Includes all jawless (hagfishes and lampreys) and jawed vertebrates (cartilaginous and bony) fishes.
- 4.6. **Guidance:** Guidance documents are developed by the IACUC to provide procedural standards to the research community on the topics identified. Animal care and use program participants are expected to adhere to the standards described unless an exception has been requested and approved by the IACUC.
- 4.7. **IACUC:** Institutional Animal Care and Use Committee. Institutional body responsible for ensuring adherence to federal regulation and institutional policy relating to the care and use of animals in teaching, testing and research. Appointed by the Institutional Official.
- 4.8. **PI:** Principal Investigator. The individual who has ultimate administrative and programmatic responsibility for the design, execution, and management of a project utilizing vertebrate animals.
- 4.9. **RO:** Reverse osmosis. Water purification technology that removes contaminants from water by using pressure to force water molecules through a semipermeable membrane.
- 4.10. **Sanitation:** Is the maintenance of environmental conditions conducive to health and well-being.

## 5. GUIDELINES OR PROCEDURE

- 5.1. The PI should establish and document procedures and identify parameters to ensure the water quality of the species maintained. It is accepted that the PI has the experience and knowledge to maintain their fish colonies and are the best judge of which parameter and at what frequency these indicators of water quality should be monitored based on experience, the species and local water conditions.
  - 5.1.1. See **Appendix 1** for a list of standard water quality parameters and ranges for zebrafish.
- 5.2. These procedures should be outlined in the husbandry section of the AUP. In general, the following considerations should be addressed:
  - 5.2.1. Description of the water circulating system and filter system employed and source of water (RO, deionized, dechlorinated, etc.) as appropriate for the species. Established procedures used to clean and maintain filtration system should be addressed. Frequency and volume percentage of system water changes should be established.
  - 5.2.2. Description of the parameters monitored and ranges that would be considered acceptable for the species. Examples of parameters monitored could include:
    - 5.2.2.1. pH
    - 5.2.2.2. Temperature
    - 5.2.2.3. Nitrate
    - 5.2.2.4. Alkalinity
    - 5.2.2.5. Hardness/conductivity
    - 5.2.2.6. Ammonia
    - 5.2.2.7. Dissolved oxygen
    - 5.2.2.8. Salinity
  - 5.2.3. Frequency of monitoring chosen parameters should be established and documented. In general, pH, conductivity and nitrogen compounds are monitored at a range of daily to once weekly.
  - 5.2.4. Procedures and frequency of individual tank cleaning should be established and documented.
  - 5.2.5. Established procedures intended to maintain fish colony health such as:
    - 5.2.5.1. Establishment of a quarantine for sick or newly received fish
    - 5.2.5.2. Disinfection of catch nets between tanks
    - 5.2.5.3. Establishment of a sentinel monitoring program based on historical colony health and level of fish import/export activity.

## 6. RECORDS

- 6.1. Research records, including records of water quality parameter monitoring and tank cleaning and catch net disinfection, must be maintained consistent with Texas A&M University Standard Administrative Procedures (SAPS) 15.99.03.M1.03. and 29.01.03.M0.01

## 7. EXCEPTIONS

- 7.1. The PI may request an exception to the above standards by describing the departure in the AUP
- 7.2. For programmatic exceptions, the facility director or manager may submit a request for the exception using TAMU-F-013

## 8. REFERENCES, MATERIALS, AND/OR ADDITIONAL INFORMATION

- 8.1. **References:**
  - 8.1.1. [Guide for the Care and Use of Laboratory Animals](#); Ch. 3, Environment Housing, and Management - Aquatic Animals
  - 8.1.2. OLAW: Zebrafish 101 for IACUCs: [OLAW Webinar 2015](#)
  - 8.1.3. NIH: [Guidelines for Use of Zebrafish in the NIH Intramural Research Program](#).
  - 8.1.4. AAALAC: [ZebrafishReference \(aaalac.org\)](#)
  - 8.1.5. [Zebrafish Information Network \(ZFIN\)](#)



- 8.1.6. Avdesh, Avdesh et. al. Regular Care and Maintenance of a Zebrafish (Danio rerio) Laboratory: An Introduction. Journal of Visualized Experiments, November 2012
- 8.1.7. Alestrom, Peter et. al. Zebrafish: Housing and husbandry recommendations. Lab Animal, September 2019
- 8.1.8. Cartner S, Eisen J, Farmer S, Guillemin K, Kent M, Sanders G, editors. 2019. The zebrafish in biomedical research 1st edition. Cambridge (MA): Academic Press.
- 8.1.9. DePasquale, Cairsty, et al. The Impact of Flow and Physical Enrichment On PREFERENCES In Zebrafish. Applied animal behaviour science, v. 215, pp. 77-81. doi: 10.1016/j.applanim.2019.03.015
- 8.1.10. Reed, Barney, and Maggy Jennings. "Guidance on the housing and care of Zebrafish (Danio rerio)." Research Animals Department, Science Group, RSPCA (May 2011): pg. 26. Web. 25 Dec. 2016

**8.2. Resources:**

- 8.2.1. For more information on water quality, please contact:
  - 8.2.1.1. [CMP](#): at (979) 845-7433
  - 8.2.1.2. Sea Life Facility: at (409) 740-4574

**8.3. Texas A&M University SAPs:**

- 8.3.1. [15.99.03.M1.03](#) The Responsible Stewardship of Research Data
- 8.3.2. [29.01.03.M0.01](#) Security of Electronic Information Resources

**8.4. [IACUC/AWO Referenced Documents](#):**

- 8.4.1. TAMU-F-013 Request for Programmatic Exception from Animal Welfare Standards
- 8.4.2. TAMU-G-026 Guideline for the Evaluation of Sanitation Practices

**8.5. CITI Program:**

- 8.5.1. Zebrafish: CITI Working with Zebrafish (Danio rerio) in Research Settings
- 8.5.2. Fish (Laboratory): CITI Working with Fish in Research Settings
- 8.5.3. Web page: <https://about.citiprogram.org/en/homepage/>
- 8.5.4. Instructions: <https://research.tamu.edu/wp-content/uploads/2024/12/CITI-RCR-Training-Instructions.pdf>

**8.6. Acknowledgement**

- 8.6.1. Graph referenced in Appendix 1 from University of North Carolina at Chapel Hill, Zebrafish Aquaculture Core Facility <http://zebrafish.web.unc.edu/about-zebrafish/water-quality/>

**9. HISTORY**

Effective Date	Version #	Description
08/01/2025	000	College Station/Dallas/Galveston/Kingsville: New document

## Appendix 1

Ranges for Water Quality Parameters: Below are some standard parameters and ranges for user reference.

### Water Parameters for Zebrafish

The following chart<sup>2</sup> shows preferred and acceptable ranges of key water parameters for zebrafish, as well as the recommended frequency of testing for each level.

Water Parameters	Preferred	Acceptable Range	Frequency of Testing
Temperature	28.5 °C/ 82.4 °F	25 °C-29 °C or 77 °F-84.2 °F	Daily
pH	7.5	7.0-8.0	Daily
Conductivity	500-1000µS	300-1500µS	Daily
Ammonia	0ppm	< 0.02 ppm	Weekly
Nitrite	0 ppm	< 0.10 ppm	Weekly
Nitrate	0-5 ppm	< 30 ppm	Weekly
Alkalinity	100 ppm CaCO <sub>3</sub>	50-150 CaCO <sub>3</sub>	Weekly
Hardness	100 ppm CaCO <sub>3</sub>	50-100 CaCO <sub>3</sub>	Weekly
Salinity	0.35-0.7 ppt	0-1.75 ppt	Daily
Dissolved Oxygen	>6.0 ppm	6-8ppm	Daily
Chlorine	0 ppb	Low	Weekly
Copper	0 ppb	1-10 ppb	Weekly