Title: Husbandry Care for Xenopus

I. Purpose:

The purpose of this policy is to outline the minimum standards of care for Xenopus laevis Frogs.

II. Policy:

All departments providing care for Xenopus must meet or exceed these minimum requirements which are based on the Public Health Service Policy, and the ILAR Guide for the Care and Use of Laboratory Animals.

III. Procedure:

All facilities housing Xenopus must follow the conditions specified in the UCD’s California Department of Fish and Game Permit to import, transport, or possess Research Detrimental Species (Permit # 537). For example water being drained from Xenopus tanks must be screened or treated to prevent escape of Xenopus and the release of reproductive material. A copy of this permit must be posted near or on the Vivarium door.

Daily: (365 days a year without exception)
Observe each animal and check for health issues. Signs to look for include red (or other) discoloration of the skin, failure to feed properly (or weight loss), open cuts or abrasions, bloating, and lethargy. Contact Campus Veterinary Services to report sick frogs. Check that each tank is individually identified and has a total frog count, and adjust posted frog count as needed. Record deaths and euthanasia in the room log. Feeding should range from daily to 2 times per week. (This depends on the nutritional quality and quantity of the food fed. Feeding interval should be based on feed manufacturer’s recommendations. Frogs should be left undisturbed for 3-5 hours after feeding.) Document room activities in room log sheet

Weekly:
Clean tanks at least once per week. Check and record water quality.

Water Quality and Temperature:
Water should be dechlorinated and chloramine free water, maintained at approximately 16-22°C (60-72°F), with 1 adult frog/2 liters of water, 5-10 cm in depth. Suggested water quality should be kept in the following ranges for optimal growth and maintenance:
Standing water tanks:
Transfer frogs to a clean tank containing water as described in water quality section. Use dedicated nets and accessories to that specific tank. Drain the water from the dirty tank. If the tank is hand cleaned, use a clean sponge or brush to aid in removing deposited debri. For disinfection, food grade hypochlorite, (e.g. ‘Klorite’) at 200ml/70L (0.28% solution), 3-10% bleach or Betadine scrub should be used. It is critical that the tanks are thoroughly rinsed clean of any residual chemical before placing frogs into the tank.

Drip Through water tanks:
Clean tanks in place with a brush to remove mild algae accumulation on an “as needed” schedule. For heavily soiled cages, net the frog and transfer it to a clean tank. Stop water flow to that specific tank and remove the tank from the system.

Biweekly: Follow the UC Davis animal facility housekeeping policy

Monthly: Disinfect and sanitize room and scrub brushes, sponges, enrichment devices and tank specific nets (plastic coated)

Feed:
Frogs should be fed palatable, non-contaminated, and nutritionally adequate food at least twice a week or according to their particular requirements, unless the protocol under which they are being used requires otherwise. Feed should be kept in properly labeled vermin controlled containers and properly stored. It should be discarded either 6 months after being received or opened, or when properly stored at the manufacture’s expiration date. (e.g. Nasco feed recommends if feed is kept dry and at room temperature, the food is stable for one year. This shelf life is extended indefinitely if feed is kept frozen. BUT, it also states a more frequent rotation of feed may be used when using xenopus for research). Feed container should be cleaned as needed or when replenished.

Identification: Each tank should have an individual identification and total frog count.

Environmental Enrichment: All frogs should have a refuge to serve as environmental enrichment, such as PVC pipe cut lengthwise. Insure that there are not any sharp edges which may cause abrasions on the frog’s skin. Other forms of enrichment are acceptable as long as they are non-porous, do not harm the frogs, and can be cleaned and disinfected

Euthanasia: 2013 AVMA Guidelines on Euthanasia

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<tr>
<th>Acceptable Methods</th>
<th>Conditional Methods</th>
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<td>Pharmaceutical grade TMS or MS222, S7.3:</td>
<td>S7.3: As appropriate by species—Inhaled</td>
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*require IACUC approval*
As appropriate by species—Injected barbiturates, dissociative agents and anesthetics as specified, topical buffered tricaine methanesulfonate or benzocaine hydrochloride

| anesthetics as specified, CO₂, penetrating captive bolt or firearm, manually applied blunt force trauma to the head, rapid freezing |

Facilities:
Floors should be moisture-resistant, nonabsorbent, impact-resistant, and relatively smooth. Refer to IACUC Policy # Physical Plant and Facilities Maintenance. A lighting regime of between 12 and 14 hours light, and 12 and 10 hours dark is recommended. Heating and air in frog rooms should be controlled in a manner that supports species specific needs (Optimal room temperatures should be between 19-25ºC/66-77ºF). All new frogs should be quarantined 14 days in a separate tank before entering the established colony. Husbandry staff should care for the quarantine tank after all other tanks are attended to.

Caging:
Tanks should be constructed of non-porous material that can be cleaned and disinfected regularly. Tanks should provide a safe environment and not be constructed of material that may cause injury to the frogs. Frogs should be housed such that their primary enclosure meets their general needs based on species needs, behavior, and goals of the study.

References:

http://www.enasco.com/prod/Static?page=xenopus


Guidance for the housing and care of the African clawed frog, Xenopus laevis. Reed BT (2005), RSPCA, Horsham, UK. Report can be downloaded at: www.rspca.org.uk/xenopus


Effect of Water Hardness on Oocyte quality and Embryo Development in the African Clawed Frog, (Xenopus laevis) Godfrey, E.W., Sanders G.E, Comparative Medicine 2004, April; (2) 170-175.
