



7/1/2021

### **Basic husbandry, testing, colony management and mission.**

Xenopus 1 operates 44 static lab bred adult *x. laevis* (Nasco) systems at 63-65 F. Each system houses 300-400 frogs at a density of approx. 1 frog per gallon with males and females separated. Frogs are kept on a light schedule of 14 hours dark, 10 hours light. Complete water changes are done 2-3x per week. Our system monitoring and testing data are updated monthly on our website, where spontaneous mortality, testing, and shipping records are available. This information is also available upon request and serves as a valuable data set on colony health- and can used to assess system health in university research settings. Nasco frogs were brought into our facility *in their same tanks*.

Our frogs will be tested 6x per year using environmental samples, tissues/swabbing, and whole frogs. Primarily, the systems with more intensive testing will be the ready to ship tanks, and include our *x. tropicalis*, *x. laevis*, and our wild caught populations. Testing results with system monitoring will provide a view of a healthy colony that could be valuable as a guide for institutions, as well as characterize this parameter in our colony very clearly.

#### **Feeding:**

Frogs are fed Skretting Protec and Nasco frog brittle, both are available from us. Frogs are fed later in the day of a water change, then left alone for 2 days, then water changed, then fed again on Fridays. We like feeding until close to satiation, though 1 gr. per frog per feeding day (1-3 grams per week) is a guide for adult frogs.

**Testing:**

PCR testing is for the following:

- *Batrachochytrium dendrobatidis*
- *Ranavirus*
- *Mycobacterium chelonae*
- *Mycobacterium marinum*
- *Pseudocapillaroides xenopi*
- *Aeromonas hydrophilia*

As of 6/21 our testing regimen uses an environmental sample and a whole frog or swabs on 6 systems comprised of 2 tropicalis systems, 3 lab bred adult x. *laevis* Nasco systems, and 1 wild caught system. The whole frogs will be tested for ranavirus and chytrid by Tifton Veterinary Diagnostics. Environmental samples will be done using the Xenopus 1 Custom PCR panel by IDEXX (noted above). Updates will be on our website or available upon request. As of 6/21 the exclusion of these pathogens has been attributed to overall system health. Look for more updates with our support of the Xenopus Model Organism Welfare initiative.

**System Monitoring:**

Individual system information will be available for each tank Xenopus 1 operates. This information will include testing data, mortality data, and shipping data. Nasco frogs are separated and have their own systems in their own room. Nasco tropicalis and xen1 tropicalis are in the same room in separate static systems. Updates will be on our website or available upon request.

**Breeding and tadpole husbandry:**

As of 6/21 we also operate over 40 frog embryo, breeding, and tadpole developmental systems. These will not be part of our testing program. We have all stages of tadpoles available year round. We would be happy to provide information on our frog breeding and development programs upon request. Nasco frogs will not be integrated into our existing lab bred systems. Our breeding program for Nasco frogs will not start until January, 2022.

**Xenopus tropicalis husbandry:**

We would be happy to provide specific information on tropicalis rearing upon request.

**Shipping:**

We ship adult frogs in boxes that are 22 x 15 x 9 inches and hold approximately 12 Female frogs and 18-24 male frogs. For warmer weather we use ice packs. Our frogs are tendered to FedEx directly at 8:00 p.m. avoiding afternoon transit time on trucks, and a.m. exposure prior to delivery is not a serious issue. During the winter we closely monitor the weather and do not ship when there are expected delays due to the weather. Tadpoles are shipped year round also. We have proven methods for tropicalis shipping year round, within reason. We may not ship any frogs if overnight temps are below 25 F. Note: frogs should always be acclimated to destination tank temperatures before introducing them. Do not put cold frogs into room

temperature tanks. Be aware that *x. laevis* frogs are stressed with repeated long term exposure under 40 F, short term exposure does not appear to be an issue at all.

### **International Shipping:**

International shipping is done usually from Detroit Metro Airport various destinations direct, including Frankfurt, Incheon, London, Tel Aviv, Barcelona, Milan, and other destinations. DTW is only 38 miles away. We use Lufthansa, United, and Delta primarily but are able to use World Courier and Lehmann also. **These logistics are very good, possibly the best anywhere for shipping live, and frogs reach their destinations in 24-36 hours normally.** We will forward all documents prior to shipping (Health Certificate, AWB, invoice, packing list) to you and your broker.

### **Water:**

We use well water.

Conductivity 786-920 micro siemens

PH 7.6

Ppm of the following:

Calcium 94

Magnesium 29

Sodium 14.8

Sulfur 11.5

Bicarbonate 0.22

### **Various Considerations:**

To our knowledge and in consultations with others, dozens (possibly thousands, including Africa) of people have handled xenopus for many years (since the 1960's for research, earlier for pregnancy tests) with their bare hands, with no infections from anything the frog could carry or transmit. Nonetheless, in university settings gloves should be required. We wear gloves and change them frequently, as we operate static systems and want to maintain system integrity. We also soak and rinse nets frequently in bleach and spray with 70% ethyl alcohol and do not go from tank to tank with the same net. We have disinfecting mats at entrances to our frog rooms. We wear rubber boots. We are not suggesting disinfecting mats are necessary at entrances to university frog rooms, we are trying to relate our practices to what may be considered with aquatic systems primarily for system integrity and general university guidelines. In addition, static systems should be considered where possible. Frog shipping boxes should be incinerated. Also, it is possible to Inject frogs for egg laying or squeezing with gloves, but do it quickly, the frogs' skin appears to be more sensitive to gloves than bare hands.

### **Additional Info:**

Xenopus 1 supports the Xenopus Model Organism Health and Welfare initiative. This approach to model health is xenopus community centered. The goal is betterment of the model and insuring a new age of xenopus research with centralized, accessible data. We also will be supporting students attending Bioinformatics, Imaging, Genome Editing, the International Xenopus Conference, the Resources and Emerging Technologies meeting, the Cold Spring Harbor Xenopus Course and other events and initiatives, including Model Health Org. with the

EXRC, the NXR, and Xenbase. See our website and xenbase for updates and details. Reach out to us with comments, suggestions, collaborations.

### **Xenopus 1's goals and commitments: July 2021**

Our mission is to increase xenopus use as a model organism, create awareness that helps people work with xenopus worldwide, support students, and create helpful model awareness that helps researchers, animal care supervisors, and veterinarians have species specific access to information about xenopus.

Promoting model welfare and keeping xenopus accessible is a core part of our mission. When you purchase **wild-type xenopus from Xenopus 1, your purchase supports a commercial supplier, and the health of the model.** This is because, in fact, xenopus research depends on a commercial supplier with healthy readily available frogs and a large breeding capacity, *and dedication*. **This is the core reality of xenopus as a model organism.** Xenopus, as a model, has always been used with cost benefit in mind and in this context, we embrace a valuable custodial role and a tradition, which includes enhancement of the model by supporting students, increasing model organism welfare by supporting new research and oversight protocols and practices that will make xenopus easier to work with worldwide because there will be clear understandings about maintaining, monitoring, and transporting the model. In addition, as a commercial supplier *we invest* in the model and support all aspects of xenopus use, for the future of the model. Though we are a small business **we pledge our support for the betterment of the model.** Moreover, we contribute to the model organism welfare vision that sees the model as the frog, the people working with the frog, and the larger society that cares about animal welfare and cares about truth, science, and the disease curing goals of the model's use. The importance of xenopus is, in part, that as an exotic amphibian model it gives a high return per research dollar spent and is thus, *a very efficient model*. Publicly supported Xenopus Stock Centers have a role also. Primarily this role is insuring transgenic and mutant lines are developed, and housed, for maximizing xenopus' potentially broader use as an efficient and accessible model for human disease. In this sense, with their valuable role **for transgenic lines and mutants** the NXR and the EXRC, all labs and users *and the xenopus community* are our most important strategic partners in building a better model.

**Look for updates to this guide. Please do not hesitate to reach out with any questions (or comments) at all.**