AAALAC PREPARATION
BROWN BAG SEMINARS

The DUKE ANIMAL PROGRAME has reserved the following dates for Brown Bag seminars on how your lab can prepare for the upcoming AAALAC accreditation site visit in October.

All sessions will be from 12:00 to 1:00 PM in the BRYAN AUDITORIUM (Room 101).

⇒ AUGUST 20TH
⇒ SEPTEMBER 3RD
⇒ SEPTEMBER 11TH
⇒ SEPTEMBER 14TH
⇒ SEPTEMBER 17TH

Please mark your laboratory calendars and plan to everyone in your lab attend one of these sessions!

Knowing the game plan makes for a successful outcome!

Wishing you a strong research month,

New Procedures for Carcass Disposal

DLAR is shifting from incineration to alkaline hydrolysis for the disposal of animal carcasses. There are several advantages of the new processes, but there are also certain specific changes required of the research community.

**PACKAGING:** Nothing other than carcasses and tissue can be digested. That means NO plastic bags, gloves, drapes, paper, gauze, or other materials can go into the digester.

The pictured bag is 17”x16” and is (or will shortly be) available in DLAR animal facilities around campus. This bag is compostable and is identified by the words “BAG to NATURE” and “Compostable.” There are two sizes, the small bags are green in color and the larger sizes are white.

**IMPLEMENTATION:** The changes are being implemented building by building, starting in MSRB-2.

**COOLER STORAGE:** Carcasses should be placed in the location designated in your DLAR housing facility. If returning carcasses from your lab, they should be transported to the main Vivarium. All carcasses placed in the digestible bags will go into metal 55 gallon drums on the right side of the cooler. Until all buildings have transitioned to the new digestible bags, carcasses that should not be digested must be placed in the large red bins on the left side of the cooler (these will be incinerated off-site).

For additional questions, contact Peg Hogan @ hogan012@mc.duke.edu.

IACUC SEMIANNUAL SITE VISITS

Inspections take place on Thursdays from 1-4.

♦ Aug. 6: LSRC & SANDS
♦ Aug. 13: GSRB2 & West Main
♦ Aug. 20: BRYAN & NAN DUKE
♦ Sept. 3: JONES, ENG., RP 1-4, & GSRB1
♦ Sept. 10: MARINE LAB
♦ Sept. 17: CARL, EYE CENTER & DURF
♦ Oct. 1: CCIF
♦ Oct. 8: FOSTER ST., BIOSCI, FRENCH SCIENCE, GROSS HALL, & IEMAS
♦ Oct. 15: DUKE SOUTH, GHRB, VRH
♦ Oct. 29: VIVARIUM – MSRB 1
♦ Nov. 5: LEMUR CENTER & MSRB2

Upcoming Deadlines

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<td>July 23, 2015</td>
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<td>September 3, 2015</td>
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EOHW WANTS TO HEAR FROM YOU!
Dr. Epling adds: ‘We won’t bite!’

On the Job Injuries: Duke Employee Occupational Health and Wellness (EOHW) sees employees for any work-related injury or illness. If an accident happens, contact your supervisor immediately. If it is a life threatening or major injury, please call 911 of go directly to an urgent care or the Emergency Department. For all other injuries or exposures, call EOHW at 684-3136 option 2 to schedule an appointment. The clinic hours are 7:30am-4:30pm Monday-Friday, closed every Wednesday 12-2:00pm. When EOHW is closed, you may reach an occupational health nurse by calling the Blood and Body Fluid Exposure hotline at 684-8115. The employee and supervisor/manager must complete the incident report in the Safety Reporting System (at www.hr.duke.edu/workcomp or srs.duhs.duke.edu) within 24 hours of the injury. If the injury does not require medical care, it is still necessary to complete the injury report form to enable the Safety Office to investigate, track, and take corrective actions to prevent future occurrences. We would also like to hear about “near misses” that do not result in injury so that we can try to prevent injury in the future.

Non Work Related Injury and Illness: In addition to work related injury/illness/exposure, EOHW performs return to work and fitness for duty assessments. Medical treatment for personal health conditions must be obtained at the employee’s Primary Care Provider.

Bites and Scratches: For any bite where skin is broken, follow standard procedures for first aid:
⇒ Safely secure the animal
⇒ Remove personal protective equipment
⇒ Immediately clean the wound with warm water and soap (or chlorhexidine or povidine-iodine scrub for exposures involving non-human primates) for at least 15 minutes
⇒ Apply adequate pressure to control bleeding and apply light bandage if needed
⇒ Notify supervisor of the incident.

The Blood and Body Fluid Exposure hotline 684-8115 is a 24 hour resource available for reporting needle sticks, punctures wounds, bites, scratches, and other occupational exposures. Employees should report this type of injury through the hotline, and managers may seek occupational health related assistance after hours on this line as well. Professional medical attention at EOHW is highly recommended for any rodent-inflicted wound that is more than a superficial scrape.

Non-human Primates: Bites and scratches from nonhuman primates pose their own set of potential serious health consequences. Medical attention for lemur bites will include an assessment of need for post-exposure rabies vaccination.

Macaques may be infected with Herpesvirus simiae (Monkey B virus). Macaques at Duke come from a Monkey B virus-free colony and undergo routine surveillance, but this cannot 100% guarantee that they are free of the virus. Macaques infected with this virus may be asymptomatic, yet can transmit the virus through scratches, bites, and splashes. Humans infected with B virus may develop a potentially fatal encephalomyelitis if not handled properly. Initial signs and symptoms usually occur 5-21 days following the exposure and can include a flu-like illness, a blistering skin eruption at the site of infection, or nervous system abnormalities. The virus then spreads along the nerves to the brain and other organs and may be fatal 80% of the time if left untreated. Luckily, Herpes B virus can be treated with medications if started very early. This is why it is imperative to contact EOHW as soon as possible following a potential exposure. All employees working with Macaques should carry the Medical Alert Information Card to show to medical providers who may not be familiar with the Herpes B virus.

Refer to the Herpes B Virus Exposure Guidelines available in the vivarium. Do not delay first aid for the wound. Herpes B virus is readily killed by most disinfectant soaps, and the flushing action is the most effective method of removing the virus. Evaluation at EOHW (or the ED when EOHW is closed) is required, and antiviral medication may be prescribed.

International Travel: Employee Occupational Health and Wellness provides travel-related health services to employees who must travel abroad on Duke related business and will refer employees to other resources when necessary. Employees should contact EOHW well in advance of anticipated travel as vaccinations may sometimes entail a series of inoculations. Consistent with University reimbursement practices, the applicable Duke cost center or program will pay for direct costs associated with obtaining the necessary vaccinations that are recommended for travel to non-U.S. destinations when the assignment is a requirement of, or directly related to, the current position at Duke. EOHW can provide travel health services to spouse and children 18 and over. Costs for dependents are the responsibility of the employee.

Sharing the Value of Animal Research

This comes from FBR: Watch and Share FBR’s New Video. Those of us in the biomedical research community are often asked by friends, family and acquaintances: why must we use animals in research? We have just released a short new video that answers this very basic question and is designed to be a shareable teaching tool for the public. Featuring several of the country’s leading scientists and medical experts, this video highlights why animal research is critical for medical progress and the advancement of both human and animal health.
MUSTS & SHOULDS

The Guide states that, "Must" indicates actions that the Committee for the Update of the Guide considers imperative and mandatory duty or requirement for providing humane animal care and use.

"Should" indicates a strong recommendation for achieving a goal; however, the Committee recognizes that individual circumstances might justify an alternative strategy." Given the fundamental importance of the recommendations in the Guide that are prefaced with a "must," AAALAC's Council on Accreditation typically categorizes site visit findings that do not conform with a "must" statement in the Guide as a Mandatory item for correction. In AAALAC's nomenclature, a Mandatory item is a serious deviation from the recommendations of the Guide, and/or other AAALAC International standards, which has to be corrected to achieve or continue Full Accreditation. This judgment is based on the Council's assessment of the potential for the program deficiency to adversely affect the health, well-being or safety of animals or humans.

The second category of findings identified by AAALAC during the on-site assessments of animal care and use programs is comprised of "Suggestions for Improvement (SFIs)." These are recommendations that the Council on Accreditation feels are desirable to upgrade an already acceptable or even commendable program. SFIs are used to draw attention to recommendations that are typically denoted as "should" statements in the Guide. AAALAC considers the offering of SFIs to be an element of the peer review process that is designed to assist accredited programs by sharing the cumulative knowledge and experience of the Council. It should be noted that there is no obligation for institutions to make program changes based on suggestions for improvement; implementation of suggestions is, however, one means of promoting a high quality animal care and use program. Also, an SFI does not automatically become a Mandatory item for correction during the next site visit cycle if the same situation (e.g., procedure, practice, etc.) is observed. However, if an issue is identified that is a "should" statement in the Guide, but is one of numerous issues noted within the same program area that collectively signal a broader problem, then it may be wrapped into a Mandatory item for correction. It is also worthwhile to note that several requirements in the Guide are not prefaced with the word "must." Other terminology is occasionally used to convey the same level of imperative for complying with the statement. Examples include:

♦ "... the IACUC is obliged to weigh the objectives of the study against potential animal welfare concerns."
♦ "Information that is critical to the IACUC's assessment of appropriate endpoint consideration in a protocol includes precise definition of the humane endpoint (including assessment criteria), the frequency of animal observation, training of personnel responsible for assessment and recognition of the humane endpoint, and the response required upon reaching the humane endpoint."
♦ "The committee is responsible for oversight and evaluation of the entire Program and its components...."
♦ "An integral component of veterinary medical care is prevention or alleviation of pain associated with procedural and surgical protocols."

In summary, while the words "should" and "must" are generally associated with SFIs and Mandatory items for correction, respectively, the site visit finding is ultimately judged by the Council on Accreditation in the context of AAALAC's Three Primary Standards as well as the scope and impact of the

AALAS Learning Library

Duke University has a membership to the AALAS Learning Library which provides training that is essential for technicians, veterinarians, managers, IACUC members, and investigators working with animals in a research or education setting. Emphasizing the appropriate handling, care, and use of animals, the courses are designed to help you study for AALAS certification, meet training mandates of regulatory agencies, and improve your knowledge in technical areas.

Contact Bill Wade (w.wade@duke.edu) for your Duke sponsored <free to you> web code!
Applications for the Fall 2015 Research Animal Coordinator (RAC) certification program are now being accepted. To apply, go to the animal program website [http://vetmed.duhs.duke.edu](http://vetmed.duhs.duke.edu) and click on the RAC certification program tab. Complete the application and submit to [w.wade@duke.edu](mailto:w.wade@duke.edu).

The next class will start in September 2015.

The RAC program is designed to provide lab managers and other research staff with the tools and resources that facilitate animal care & use at Duke. RACs often become the lab “go to” person on all things protocol and compliance related. RAC candidates receive instruction on a variety of topics related to protocol development, IACUC procedures, post-approval monitoring, site visits, occupational health & safety, employees health, controlled substances, and DLAR operations. The class facilitators are the Directors and senior staff personnel who serve as subject matter experts in the specific area of discussion for that class session. The small class size of 6 to 8 RAC candidates allows dialogue with these senior staff and encourages networking with the IACUC, OAWA, OESO, EOHW and many more.

All applications must be signed by the participant and the PI. We look forward to seeing you in the course!
The Duke Lemur Center (DLC) is a unique place. It is home to the largest and most diverse collection of lemurs outside the island of Madagascar. Due to the size and diversity of this population, the DLC attracts individuals across the globe to participate in non-invasive research in many areas including behavior, biomechanics (locomotion and feeding), cognition, and communication. In order to meet the daily needs of the DLC veterinary, husbandry, education and research departments, the DLC has developed a comprehensive animal behavior program encompassing positive reinforcement training.

The animal training program employs basic operant conditioning techniques. The program began in 2008 and currently includes 106 animals covering 13 species. This accounts for nearly 50% of the animals housed at the DLC. Incorporated into a very busy day, training is part of the primate technician’s daily responsibilities. Interest in training and enrichment is one of the criteria evaluated when hiring a technician.

Figure 1. Technicians pair the delivery of food with the sound of the whistle to condition a bridge.

Figure 2. When one technician is working with multiple animals, the goal of the session is to reinforce individuals for calmly participating in the training session.

Positive Reinforcement Training in Lemur Species

By Sonia D. Doss, M.Ed., RLATG, CPIA and Meg H. Dye, BS
new technician. Previous experience with training techniques is not a requirement for employment. All DLC technicians complete a course on operant conditioning techniques and application, attend required lectures, participate in training sessions, and work with the behavioral management coordinator to identify training goals and develop shaping plans.

Each technician is scheduled daily for up to three afternoon animal training sessions. The daily training schedule is discussed at each morning meeting to accommodate changes in staff, animal locations, or research projects. On average, each animal in the training program is trained three times a week with each training session lasting 5 minutes. The number of training sessions an animal participates in may vary from week to week due to staff availability, animal location, and accommodation for husbandry or research needs. Duration of a session may vary depending on the species, number of trainers on the session, and if the session is being use for data collection.

When establishing training with naïve lemurs, the technicians begin by conditioning a sound that means “good.” At the DLC, the technicians use a high pitched Acme dog whistle. In early conditioning, the delivery of a favorite food item from the individual’s diet is paired with a short, precise blast on the whistle. Through the positive association with the delivered food, the whistle becomes a conditioned “bridge” between the completion of a correct behavior and the time it takes to deliver the reinforcement (Figure 1).

As the animals progress, two short whistle blasts serve as a signal to the lemurs that a training session has begun. Training begins with the animals approaching the technician(s), stationing in front of a technician, being bridged (for completing the behavior of coming to the technician) and being reinforced. If one technician is working multiple animals, the focus of the session will consist primarily of the stationing behavior and reinforcing all individuals for calmly participating in the session. Groups that are more advanced with their training will readily move into different cells allowing one technician to separate each animal in the group. Easy and calm separations are invaluable for animal management, routine physicals, or simply one-on-one training time with an animal and a technician (Figure 2).

Shape recognition is a useful behavior that is conditioned with the lemurs. When working with multiple animals, shapes (circle, square, triangle, etc.) allow each animal to easily identify where it should station at the beginning of the session (Figure 3). Each lemur housed within a group is trained to touch a specific shape which is not conditioned with any other animal in their group. The behavior of shape recognition can also be used for additional cognitive challenges during a session when a lemur is asked to find its specific shape amongst other shapes within a close proximity.

During a training session, the lemurs can be asked to participate in a variety of husbandry and veterinary related procedures. Behaviors can include a visual examination, body tactile, acceptance of medication from a syringe, or an injection of insulin for a diabetic animal (Figure 4). Voluntary tail
Figure 6. A female aye-aye is conditioned for a voluntary ultrasound to confirm pregnancy.

Tail shaves are conditioned through approximations of tail touches and tail manipulation. Tail shaves are a reliable method of identifying individuals within a group from a distance for both staff and observational research projects (Figure 5). The behaviors of voluntary ultrasound and abdominal palpation have assisted the veterinary staff with confirming pregnancies and postpartum examinations (Figures 6, 7).

Training animals to enter a transport kennel or sit on a scale are additional priorities within the training program. Animals are kenneled for a variety of reasons, including primary enclosure cleaning, veterinary procedures, movement from primary housing to the research room, transport to another area for breeding, or placement along the scheduled visitor tour path (Figure 8). All animals are routinely weighed for a variety of reasons and voluntary scale training reduces the stress for both the animals and the handlers. Each individual animal at the lemur center is weighed as often as once every two weeks to once every two months depending on health status, age, reproductive status, and species (Figure 9).

Some of the DLC’s female Cocquerel’s Sifaka (Propithecus coquereli) have been trained to voluntarily allow infant removal during a training session. Due to the species delicate husbandry, sifaka infants must be closely monitored and weighed on a frequent schedule. Conditioning a female to allow a technician to temporarily remove her infant to be weighed allows the process to be calmer for both mother and infant. The behavior of removing a sifaka infant during training sessions became highly useful when an infant male needed veterinary intervention. During training sessions, the infant was removed from his mother 151 times by the age of 4½ months. The reasons for the increased number of removals from his mother included routine weighing, administration of antibiotics, veterinary procedures, exploratory surgery, and assisted feedings up to 3 times per day. Due to the success of consistently removing the infant from his mother during a training session, the infant was always returned to his mother and did not need to be separated for extended periods of time.

Research specific training sessions can be led by the primary primate techni-
cian, the DLC behavioral manager, the research project coordinator, or the research technicians. Any proposed research project that requires animal manipulation, which is defined as interacting with the animal in any way, requires approval by both the DLC research committee and the Duke IACUC. The DLC research committee is more familiar with the animals’ capabilities and limitations; therefore, they are charged with assessing research design, proposed study subjects and sample size, frequency of use, and scientific merit. The Duke IACUC also reviews and discusses the proposed projects as any other Duke-based protocol, but does not approve any DLC-based protocols without the approval from the DLC research committee. Likewise, any proposed modifications must also be reviewed by both committees before approval. Any proposed research projects that are defined as observation-only, that is, no animal manipulation occurs, fall under the Duke IACUC approved DLC animal observation protocol. This type of research is reviewed on a case-by-case basis by the DLC research committee.

Once the needs and the goals of the proposed project are defined, the specific training can commence. For example, locomotion and grasping studies are often used to study gait, force, movements, and grasping. To assist with timely data collection, a target or point-follow behavior is conditioned. Both behaviors are greatly used during

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**Figure 7.** A female sifaka allows a voluntary postpartum exam by the DLC staff veterinarian.

**Figure 8.** Voluntary kenneling is primary goal for all of the animals in the training program. The behavior is extremely useful in many aspects for animal management, husbandry and research.

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*Based on a 75 in³ cage filled to a volume of 28.13 in³ (leading competitor) and 18.75 in³ (Pure-o’Cel).

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many research projects where animals are expected to jump from one area to another, travel the length of a pole or ramp, or progress smoothly across a surface containing a force plate without hesitating or halting. When the animal has successfully traversed the medium of interest the behavior is bridged and the animal is reinforced (Figure 10).

The use of training techniques allows researchers to ask questions in which answers cannot be achieved through traditional methods. To understand if the nocturnal aye-aye can discriminate between a white card and a black card under extremely dark conditions, individual animals are conditioned to choose a white card. During a research trial when an animal is simultaneously presented with a white card and a black card, the researcher will rely on the aye-aye’s response to determine how well the aye-aye can discriminate the choices in dark conditions (Figure 11).

Overall, the positive reinforcement training program has continued to evolve the behavioral management of this unique population of animals to ensure the highest animal welfare standards are met. Use of the training methods discussed in this paper addresses a wide variety of the unique husbandry, veterinary, and research needs that have been identified at the Duke Lemur Center.

The authors thank all the staff at the Duke Lemur Center for their assistance with training session observations and the development of this article. All photo credits—David M. Haring, Duke Lemur Center. Duke Lemur Center publication #1290

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