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Implementing positive reinforcement animal training programs at primate laboratories

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ABSTRACT

In the last decade several surveys of primate care and training programs highlight a common theme; despite scientific evidence that animal training can be effective in reducing stress, increasing efficiency and improving veterinary care, animal training is not widely incorporated into animal care and management programs in laboratory settings. This is particularly important with the recent release of the internationally recognized version of the "Guide for the Care and Use of Laboratory Animals" by the National Research Council. The Guide includes multiple recommendations to incorporate training methods into husbandry and experimental procedures. To address the divide between the regulatory and scientifically based support for animal training, and a broader establishment of formal animal training programs, this paper will: describe three approaches to structuring animal training programs; provide rationale as to why facilities should have animal training programs; report on a recent survey of animal training programs at nine, large USA facilities housing nonhuman primates; discuss important elements of an animal training program; discuss negative reinforcement and means to minimize its use; and finally give a detailed description of a facility-wide animal training program.

1. What is a laboratory primate training program?

The systematic application of operant and classical conditioning techniques to training primates living in laboratory facilities has become much more common over the last two decades (Bloomsmith et al., 1998; Clay et al., 2009; Coleman et al., 2008; Fernstrom et al., 2009; Laule et al., 1996, 2003; Perlman et al., 2010; Reinhardt, 1997; Schapiro et al., 2003, 2005). A major development in this field has been extending the use of positive reinforcement training (PRT) techniques to increase the primates' cooperation with animal management and research procedures. There have been a large number of publications describing training technique, training terminology and various uses for training (Bloomsmith et al., 2007; Coleman and Maier, 2010; Kazdin, 2001; Laule and Whittaker, 2001, 2007; Ramirez, 1999; Schapiro et al., 2005). However, issues related to designing and initiating animal training programs have been less well described. Animal training programs are an important refinement in the care of laboratory primates as they can help to reduce stress experienced by animals and improve their research use by minimizing this confound. The programs may include dedicated personnel, education programs, routines

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to increase consistency among trainers, documentation systems, and evaluation of trained animals. The objective of this manuscript is to assist those caring for laboratory primates in the development of new, or in the refinement of existing, primate training programs.

2. Three approaches to structuring animal training programs

Animal training programs generally fall into three categories: project-based programs, section-wide programs and facility-wide programs (Whittaker et al., 2008). Within one institution, multiple approaches may be simultaneously operating or programs may evolve from one type of structure to another. It is essential to understand the focus and breadth of the training program to maximize effectiveness for the animals and staff. Using the framework presented here, one can determine which approach is best suited for the animal care needs and goals of the institution.

2.1. Project-based approach

A project-based training program typically includes a few animals or groups of animals and a limited number of staff. Specific behavioral objectives can be addressed. For example, one group of primates may be trained: (1) by the primary caregiver to shift from one area to another; (2) by the veterinary technician to present an arm for ointment application; and (3) by a lab technician to calmly present for pole attachment to the collar. Resulting benefits of the project-based training approach include a positive influence on animal welfare with the application of PRT to improve voluntary animal cooperation, and job satisfaction is often enhanced for the person(s) implementing the training who may take great pride and ownership in the training project. If successful, other technicians may take notice of the training accomplishment and may be motivated to incorporate training into their daily routine. A project-based approach can serve as the catalyst for other training projects, and help build the foundation for the facility's animal training program. Project-based projects, when successful, can expand to a section-wide approach.

There are common drawbacks of a project-based approach. This approach typically does not receive the institution's full support, particularly with regard to the dedication of time and monetary resources. Training is a skill that must be developed, and with this approach, support for continuing education such as conference or workshop attendance is limited. Additionally, supervisor oversight may be minimal, which may result in compromised safety of the trainer or the animal when technique, facilities, and protocols are not adequately assessed. Once animals are trained by the primary trainer, behaviors should be transferred to others. In the absence of direct supervision, this process may be difficult to implement, therefore reducing the scope of application for both the animals and institution. Finally, few animals benefit from the training conducted in a small project, and the project may not persist if the motivated primary trainer leaves the facility.

2.2. Section-wide approach

A section-wide approach to training is typically supported within a particular department or research laboratory by the manager, and involves staff implementing training toward specific objectives. For example, the objective may be training all primates in a particular laboratory to calmly move into a restraint chair. This section-wide approach typically involves a subset of animals at a facility, and there may be support for continuing education and skills development. Due to the broader scope of this approach, when applied properly, animal management will be improved for that particular area or section, and oversight of safety for animals and humans is available. If successful, the example may serve as an impetus for changes in other departments or laboratories within the facility and, over time, development of a facility-wide approach may occur.

One drawback of a section-wide approach is limited communication among all those working with the same animals. For example, animals will be trained to calmly move into a restraint chair for research purposes but similar animal movement activities, such as calmly entering a transfer box for animal care purposes, would unlikely benefit. Further, if an animal is assigned to another study with a different manager, there may be little communication between managers regarding the training the animal received. The program may not persist if the manager leaves his/her position.

2.3. Facility-wide approach

The most comprehensive is the facility-wide approach to structuring a training program. This program is implemented throughout the institution and is supported by multiple management and departmental levels including animal care, veterinary staff, colony management, behavioral management, research groups, administration, occupational health and safety, facility or operations managers, and perhaps even public relations or regulatory oversight committees (e.g., Institutional Animal Care and Use Committee, IACUC). Many more people and animals are positively impacted in comparison to the other approaches. The institutional commitment to the facility-wide training program is demonstrated by hiring for dedicated positions, supplying continuing education opportunities and training for staff, providing the necessary tools, facility modifications and safety oversight. Training responsibilities are included in appropriate job descriptions and supervisors ensure accountability for training responsibilities. Goals and objectives of the training program are communicated throughout the facility. Progress toward centralized training goals are assessed and refined, as needed, to move the program forward. A facility-wide training approach creates a framework of safety, education, consistency and communication for the multiple project-based and section-wide training applications that are often present in larger institutions.

There are few drawbacks to such a facility-wide program, but they are significant. Development and implementation of such a program takes time and monetary