ISSN: 2583-9365

Training and Development of Staff in Laboratory Animal Care Program

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Abstract

Training is an important prerequisite to work with laboratory animals in vivarium facilities. Several organizations emphasize mandatory training prior to use of animals either for experiment or husbandry practices in order to meet organizational goals and core values especially in laboratory animal research facilities. The animal care personnel (ACP), animal care supervisors (ACS), scientists, study director, investigators and veterinarians should be trained in their relevant field to perform procedures based on the kind of work they handle on day to day animal care and experimental activities. Any institution can formulate a formal training program considering their requirements and species housed within the facility. Syngene laboratory Animal Research (SLAR) has been the premier organization who explicitly support for training and development of staff at all levels with commitment to increase skill levels of team members to deliver high quality animal care on par with global standards. The noteworthy training matrix of ALAT, LAT, LATG, and FELASA "C" level certification was cleared by at least 8 and 14 staff, respectively, that includes ACS/investigators/veterinarians apart from specialized techniques on animal procedures. The training, certification and continuing professional development (CPD) showed competency among staff with improved supervisory skills and managerial performance especially animal husbandry as well as other experimental procedures. A viable option of cross-training also provided to carryout weekend animal care including critical functions during emergency situations as redundant backups such a way to maintain the well-being of animals without any compromise. Dissemination of knowledge and effective communication with transparency is an essential component for successful training outcomes and practical applications at the laboratories. Collectively, the facility veterinarians and quality assurance have been ensuring the periodical training and monitoring oversight of all the activities in vivarium.

Key words: Training, Laboratory animals, Humane methods, Continuing education, Animal welfare

Introduction

Training and certification in laboratory animal science field has evolved to create path for professionals desiring to advance their career. The institutions should employ trained people in laboratory animal field and a formal on-the-job training is necessary to ensure their skill-sets as part of the program implementation (CPCSEA 2003). Different levels of training program has been framed and conducted for animal care technicians (Weiss, 2010). In general, organizational mission and commitment is important to engage and provide professional training in terms of newer methods and techniques along with availability of materials for their research (AVMA, 2013, Pritt, 2007). In order to promote training, institutions should have adequate resources with manpower to cater the needs of animal care program depending on facility size. The collaborative efforts on training programs with regional organization and international associations promote the training and continuing education for laboratory animal science personnel as well as veterinary specialists (Turner, 2015). Training requirement may be in education, animal based research and experiments. Hence, new employee needs initial training based on their specific role in the organization and their participation in the training/workshop is important within one year of employment. Experienced staff should participate in CPD to share their experiences based on their areas of expertise (Bayne, 2011). The primary goals should include basic biology of laboratory animals and its importance in research, maintenance of animals and husbandry practices, various procedure on animals and conduct of experiments

without any confounding variables to fulfil the purposes. Apart from the above, numerous links are available on the public domain to retrieve technological information which can be viewed for immediate clarifications. Learning is a continuous process and one should attain higher levels of knowledge and understandings by training and developmental opportunities which in turn provides better care and humane use of animals. Cross training opportunities at workplaces strengthens animal care program (Henze, 2016) and a proactive training framework with periodical sessions help animal care personnel to enhance their skillsets to upkeep the standards in vivarium.

Good Laboratory Practice (GLP) is to promote technology and knowledge transfer to scientist through training, thus enables standards and compliance of the work (WHO 2009). Similarly, the NRC (1991) recommends that any suitable format of seminar and/or lecture may be well suited for communicating the institutional mandate for efficient use of resources to appropriate groups. It is essential that institution should assess current levels of staff proficiency and are required to divise a suitable framework to attain knowledge and skillsets to meet the institutional animal research. The FELASA has training and educational program modules based on the minimum requirement as well as to recognize the professional competence among others. They were categorized as Category A - Persons caring for animals; Category B - Persons performing animal experiments; Category C - Persons responsible for directing animal experiments; Category D - Laboratory animal science specialists) for laboratory animal personnel on various topics (Guillen, 2012; Weiss, 2010). However, since 2014 the FELASA have adopted the 'Function system' by replacing the 'Categories system'. Similarly, CCAC (1993) has training requirements of personnel working in the laboratory animal care program. Hence, a standard training format and documentation may be exercised throughout the facility for all the adopted procedures and verification of adequate training is also important for laboratory animal care and use program. Considering the importance of training and our mission statement "To provide high quality healthy research animals to support discovery and development of new drugs by adhering to all the principles of animal care and welfare" that leveraged all the ACP, ACS, scientists, study director, investigators, veterinarians and supporting staff are highly encouraged to attend various training/seminar/conference/workshop at national as well as international levels in laboratory animal science.

Case Report

1. Vivarium Overview

Syngene Laboratory Animal Research (SLAR) at Syngene International Limited, Bangalore, India, provides discovery and development supports in the pre-clinical research arena. The SLAR has Institutional Animal Ethics Committee (IAEC) and is accredited by Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC) International as well as certified by Good Laboratory Practice (GLP). The state-of-the-art barrier facility is built by using clean room panels with epoxy floor and 45 heating ventilation and air conditioning (HVAC) units catering more than 135 animal rooms/procedure measuring approximately 55000 sq.ft. with 15-20 air changes per hour (ACPH -100% exhaust) controlled by building monitoring system (BMS). The facility has dual corridor systems with two cage washers and two autoclaves as redundant backups. On weekdays on an average 65 animal care personnel (ACP's), 12-15 animal care supervisors (ACS's) perform husbandry activities and more than 100 scientists/study director/investigators conduct their experiments primarily on rodents, guinea pigs, hamsters and rabbits. Fifteen veterinarians have been involved in veterinary care and oversight of program in various capacities. In addition, a dedicated team of at least 10 engineering personnel are available to carry out 24x7 maintenance activities and monitoring of SLAR. Systematic training process (individual/ group) involves the use of animals for various procedures and collection of body fluids/tissues (required for experiments/ standardization) including aseptic surgeries (to obtain adequate training of surgeons/investigators while new models development) which are discussed and approved by IAEC to perform planned procedures of all the species housed within the vivarium. The facility has been importing laboratory animals from at least 12 barrier facilities across USA/Europe/ India for biomedical research.

2. Types of Training

The SLAR policy and guidelines recommends that all new ACP's/ACS's should undergo basic orientation based on their work area requirements. The training is provided in a systematic manner to the ACP's/ACS's as part of retraining/ refresher or as and when needed and a summary of training programs that are systematically followed at SLAR is listed in **Table 1**. Most of the in-house trainings conducted are power point presentation, group discussion, online module including paper based evaluation to assess the effectiveness of trainings that includes feedback of the program. The experienced staff are also encouraged to attend conferences/seminars/ workshops at national and international forum such as LASA, FELASA, AFLAS and AALAS etc.

3. Continuing Education Program (CEP)

The CE program is applicable for scientist/investigators/study directors/veterinarians and all the personnel who have access to animal procedures as follows-

3.1 On-Site Program/Workshop

a. Federation of European Laboratory Animal Science Associations (FELASA 'C')
b. Training participation at State/Central institutes/ University (e.g. NCLAS, ACTREC, CFTRI, NC3R's and TANUVAS etc.)
c. Comprehensive training by visiting other vivarium facilities
d. Training on laboratory animals by veterinarians/ investigators on site-specific requirements

3.2 Online Training/Certification

a. American Association of Laboratory Animal Science - E-library (AALAS)
b. Assistant Laboratory Animal Technician (ALAT)
c. Registered Laboratory Animal Technician (RLAT)
d. Registered Laboratory Animal Technologist (RLATG)
e. Animal welfare course/training/lecture series at academic institutions as well as CPCSEA /TANUVAS
f. Webinar series in laboratory animal science (Institutions/ Breeders/Vendors/Technology platforms)

The SLAR has been benefitted by training and audits of facilities, process and welfare aspects by Global Quality and Regulatory Compliance (GQRC) of the Bristol Myers Squibb (BMS), USA. The in-house operations team conducts on-the-job-training periodically and also maintain documentation of these training processes.

Discussion

The SLAR facility has unique business model where many clients conduct their research by sharing vivarium resources. Generally, vivarium operations and quality assurance team ensure the day to day activities and regulatory compliance, respectively. The challenges lies in import of laboratory animals by adopting stringent quarantine procedures and testing of selected pathogens before their release for experiments. In order to operate this facility with high throughput, all the staff have been trained in formal practical and theoretical aspects on various procedure/techniques to perform the activities appropriately. It is expected that adequate veterinary care must be provided to laboratory animals by the veterinarian and/or staff who have experience and trained in laboratory animal medicine (CPCSEA 2003). The AVMA described that adequate training programs needed for euthanasia in compliance with laws and local regulations, thus, enabling to perform the activities during rotation duties and shared responsibilities (AVMA 2013). The capital infrastructure of SLAR is enhanced over the years with modern and specialized equipment to facilitate husbandry functions, animal experimentation to meet the institutional 3R's with best possible practices. In general, practical competency is judged during the training period after which the individuals are allowed to work based on trained procedure without any further supervision (Weiss, 2010). The continuing professional development is offered to experienced staff with recent advancements in the field of laboratory animal science. At least 8 staff from SLAR have successfully completed ALAT, RLAT, RLATG level certifications to become first institution to provide such kind of learning platform to obtain these certifications in India. Similarly, 14 staff have been trained by FELASA "C" certifications apart from intensive job specific workshops/ training obtained from NCLAS, ACTREC, CFTRI, TANUVAS, CPCSEA, NC3R's and AALAS etc. including many national/international conferences in laboratory animal science and welfare. Apart from the above, online training resources and webinars are also arranged based on specific techniques/research needs to scientists/investigators along with veterinarians as part of interactive sessions. Refresher courses are also arranged periodically based on their expertise including questionnaire that covers reporting accidents and/or animal incidents, if any. The facility veterinarians along with Environmental Health Safety and Sustainability (EHSS) department review such incidents, if any, and provide possible solutions to mitigate probable risks, thereafter, retraining of the particular individuals to avoid recurrence in future with alignment of management. In addition, the IAEC is communicated about corrective actions taken based on types of incidence during the subsequent meeting for their opinion on animal welfare. Indeed, many of our ACP's and ACS's have been exposed with latest husbandry equipments including cage washers and walkthrough autoclaves. They are found to be competent on what they do as they maintain consistency in their performance which gives confidence to maintain laboratory animals with global standards. Nevertheless, SLAR has been committed to develop their frontline staff and promote in a fast-track system. If any ACP found to be exceptional on his/her performance, those individuals are acknowledged or promoted as permanent employee in order to motivate and retain their expertise which has been considered as valuable assets of the institution. Similarly, a cross-training program is implemented to allow staff travel from small animal populations to larger units to attain new job skills, training, operations and standardized practices between units as well as to increase personal contacts (Henze, 2016).

Conversely, a recently published information revealed that 17% of the training failure associated with adverse effects reported between 2009 to 2016 was categorized as non-compliance as reported to OLAW (Mohan, 2017). On the other hand, review of AAALAC published says that inadequacies of veterinary care in the program plotted is the third higher mandatory deficiency within the pacific rim region that underwent accreditation process between 2004 to 2009 (Bayne, 2011). Hence, at SLAR, we have established systems and charter plans to train

ACP's, ACS's on less demanding work days to increase active participation and at the same time workload is also managed by ensuring the completeness of planned husbandry activities during the training days. Similarly, possible efforts are also made to train weekend staff to cover multiple functions with relatively less number of animal care staff who report to work. Night shift staff are also adequately trained for critical activitiy monitoring considering the photoperiod along with engineering staff who ensure the HVAC performance through building monitoring system (BMS) including other utilities. A report suggested that training promotes the consideration of alternatives and humane care of animals apart from scientific aspects (Anderson, 2007). However, our facility provides considerations for training of every aspects including new employees undergo series of trainings prior to including individuals in the animal use protocol (Form B), thereafter assessed their performance at periodical interval. The trainings are captured in formats as individual and/or group in order to maximise the number of participants to benefit outcomes of new training or refresher course which is usually conducted annually for selected procedures. Considering the safety precautions and unexpected natural calamities, some of the ACP's and ACS's have been trained to perform work for essential activities of animal care and ancillary supports as redundant backups. However, a comprehensive training program for animal care including other specialized technique provides better understanding of individuals towards creating a culture and maintaining the well-being of laboratory animals.

The training program empowered all team members that eventually resulted as consistent, high quality veterinary care for animals by creating an algorithm of individual training, group training and combination of both methods (Lockworth, 2011). Overall, SLAR staff (ACP/ACS/Scientist/ /Investigators/Study Director/Veterinarians) have been trained on various aspects as per their job requirements and retain their acquired skills/scientific knowledge in laboratory animal science field and providing a greater care to animals on par with global standards by adhering institutional policy. The feedback as well as work proficiency of trained staff from cross functional team together made a framework and effectively followed for new employees at SLAR which in turn reduce time and resources than earlier. The authors convey that any institution can formulate a formal training program based on their needs and required to implement in a systematic manner for establishing successful training outcomes, thus eventually enhancing the staff proficiency thereby, improving standards of animal care and welfare within the institution.

Acknowledgements

The authors are thankful to Veterinary Science team, Investigators, Management, Environmental Health Safety and Sustainability for their support on various training of Animal Care Personnel as well as Animal Care Supervisors at SLAR.

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Table 1: Summary of comprehensive training program matrix for laboratory animal users at SLAR.

S. No.	Contents of Training Programs
1.	Entry/Exit procedure of Vivarium and traffic patterns
2.	Sanitization Procedure including decontamination
3.	Usage of appropriate Personnel Protective Equipment (PPE)
4.	Handling, Restraining, Dosing and Gender identification of laboratory animals
5.	Operations of Isolators, Individually ventilated caging systems and change stations
6.	Husbandry practices of laboratory animals and Breeding of special strains
7.	Handling of hazardous chemicals and Waste management system
8.	Zoonosis, Blood borne pathogens, Reporting of incidents and Welfare concerns
9.	Operation of cage washers/Walkthrough autoclaves and specialized equipment
10.	Monitoring of environmental parameters and building monitoring systems
11.	Recording of daily parameters of animal/procedure rooms
12.	Environmental Health Safety and Sustainability (EHSS) training series
13.	Chemical safety, Radiation safety and Biosafety training
14.	Anesthesia/Euthanasia/Necropsy in laboratory animals
15.	Use of first aid/fire-fighting, Emergency preparedness and Disaster plans
16.	Aseptic surgical procedures, Post-operative care and monitoring oversight
17.	Soft skills/Motivational/Ergonomic training and Technician week celebration
18.	Electronic training modules for various animal procedures
19.	Vernacular training for animal care personnel
20.	Training on job specific techniques including personal development

Note - The above SLAR training list covered only major/mandatory areas apart from that other trainings also provided (not shown) by covering all the aspects in vivarium.